LA-UR-21-31522
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Title:	Emergency Planning and Community Right-To-Know Act of 1986, Title III, Section 313, Toxic Chemical Release Inventory Summary Report for 2020
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Intended for:	Environmental Regulatory Document
Issued:	2021-11-19 (rev.1)

LA-UR-21-31522
November 2021

Emergency Planning and Community Right-To-Know Act of 1986, Title III, Section 313, Toxic Chemical Release Inventory Summary Report for 2020

Prepared by the Environmental Protection Division

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Acronyms and Terms

CAS	Chemical Abstracts Service
ChemDB	chemical inventory-tracking database
DEHP	di-(2-ethylhexyl) phthalate
DOE	U.S. Department of Energy
EO	Executive Order
EPA	U.S. Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
Form R	Toxic Chemical Release Inventory Report
HCl	hydrochloric acid
HE	high explosive
LANL	Los Alamos National Laboratory
LANSCE	Los Alamos Neutron Science Center
lbs	pounds
MMscf	million standard cubic feet
MO_x	mixed oxide
MRF	Material Recycle Facility
NPDES	National Pollutant Discharge Elimination System
OB/OD	open burn/open detonation
PACs	polycyclic aromatic compounds
PBTs	bioaccumulative toxics
ppm	parts per million
RCRA	Resource Conservation and Recovery Act
RLWTF	Radioactive Liquid Waste Treatment Facility
SERF	Sanitary Effluent Reuse Facility
SO_3	sulfur trioxide
SWSC	Sanitary Wastewater Systems Consolidation
TA	Technical Area
TRI	Toxic Release Inventory
TRI-DDS	TRI-Data Delivery System (software)

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EMERGENCY PLANNING AND COMMUNITY

TOXIC CHEMICAL RELEASE INVENTORY SUMMARY REPORT FOR 2020

By
Environmental Compliance Programs Group

ABSTRACT

For reporting year 2020, Los Alamos National Laboratory (LANL) submitted Toxic Chemical Release Inventory Reports (Form R) 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 2020 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 2020, 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 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 Rs 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 lbs 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, the EPA promulgated a final rule on persistent bioaccumulative toxics (PBTs) (EPA 1999a). 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 lbs. The lower threshold for lead became applicable in reporting year 2001.

The EPA compiles the data submitted on the Form Rs 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 the 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 2020, the Laboratory submitted Form R reports for lead. No other EPCRA Section 313 chemicals were used in 2020 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 2020 and describes the environmental release data reported on the Form R. 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 2020. Appendix B and C include copies of the Form R reports submitted to the EPA.

1.1 Facility Information and Contacts

LANL is located at a 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 Triad National Security, LLC.

Facility information is as follows:

- LANL
  - TRI facility identification number: 87545LSLMSLOSAL
  - LANL technical contact: Mr. Walt Whetham at (505) 695-88056
  - LANL public contact: Mr. Peter Hyde at (505) 667-3792
- Los Alamos DOE complex
  - TRI facility identification number: 87544SDLSL52835
  - DOE technical and public contact: Ms. Adrienne Nash at (505) 665-5026

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 lbs.

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 lbs.

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 lbs.

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 lbs to 0.1 grams. 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:

- 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 lbs 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 Abstracts 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 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 ChemDB. ChemDB 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 performed to determine if bulk chemicals were purchased and only a portion of them used in the calendar year.

3.1.1 Inventory

For calendar year 2020, a total of 49,662 records were added to ChemDB and evaluated; 12,337 were pure chemicals and 37,325 records were mixtures. Individual items with identifiable CAS numbers in ChemDB 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 ChemDB 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 for the remaining mixtures purchased in quantities greater than 50 lbs 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 50 lbs would be identified. Listed chemicals with thresholds less than 50 lbs were examined individually, based on process knowledge and known potential sources. Each mixture that contained an EPCRA Section 313 chemical was further evaluated to determine the weight of each constituent. The totals for these amounts were then added to the quantities of pure EPCRA Section 313 chemicals.

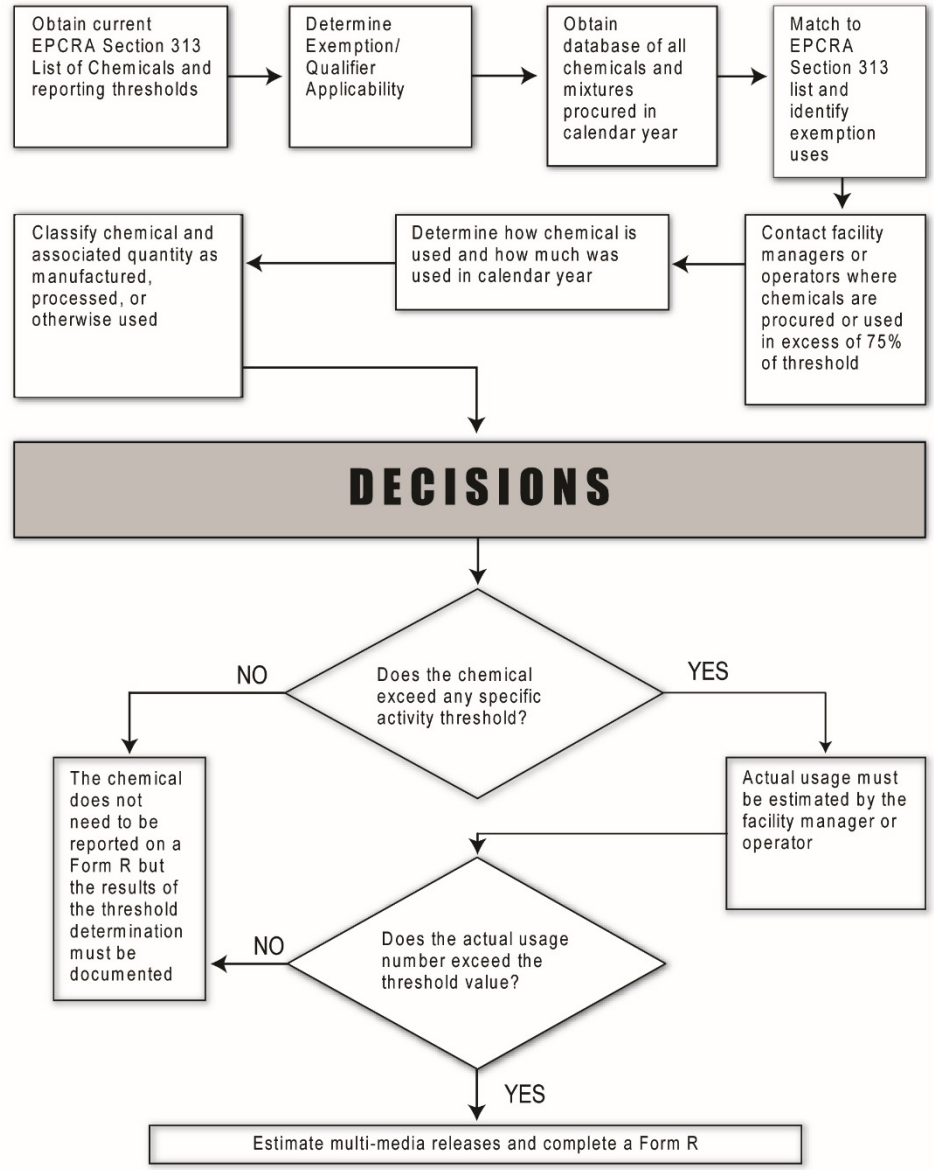


Figure 3-1. Flowchart process of analysis for EPCRA Section 313 reporting

3.1.2 EPCRA Reporting Tool

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

- Identifies and labels exemptions through electronic text searches. The exemptions are from 40 Code of Federal Regulations 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 ChemDB 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 2020 ChemDB 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 2020, the chemicals that were analyzed in more detail included:

- mercury compounds,
- sulfuric acid,
- PACs,
- nitric acid,
- nitrate compounds,
- 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 ChemDB, 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 in Table 3-1.

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.

Table 3-1. Top 10 EPCRA Section 313 Chemicals Procured in 2020

CAS No	Chemical Name	Total Procured (lbs)
7647-01-0	Hydrochloric acid	64,315
67-63-0	Isopropyl Alcohol	2,132
Glycol Ethers	Glycol Ethers	1,764
7697-37-2	Nitric Acid	1,649
7782-50-5	Chlorine	1,345
75-09-2	Dichloromethane	1,217
7647-01-0	Hydrochloric Acid (aerosol forms only)	1,180
67-56-1	Methanol	887
78-48-8	S,S,S-Tributyltrithiophosphate	882
108-88-3	Toluene	698

* The total procured for HCl includes both aerosol and aqueous forms. See Section 4.6 for additional analysis.

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 2020 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 lbs. In 2020, mercury was used in four areas at the Laboratory. Each is described below.

4.1.1 Mercury Procurements

A listing of all procurements in 2020 of mercury and mercury compounds was extracted from ChemDB. 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 ChemDB for 2020 was 3.9 lbs. The purchasers or users of the mercury and mercury compounds were contacted to determine:

- 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, and
- If the mercury was used in a laboratory experiment setting and, 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 0 lbs of mercury was determined to be laboratory exempt. The chemical names of the exempted containers are “mercury standard solutions” which contain only parts per million (ppm) quantities of mercury.

The total amount of mercury applied to the otherwise used threshold from chemical purchases is 3.9 lbs.

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 lbs. Each reservoir is a closed system and only opened occasionally when minor repairs or maintenance are performed.

During 2020, minor maintenance was performed on the mercury shutter system. However, no mercury was removed or added to the shutter system in 2020.

In 2019, a major maintenance project was performed on the mercury shutter system. One of the 12 shutters (FP15) was removed and replaced with a temporary brass beam plug. Approximately, 960 lb of mercury was removed from the shutter and is now in storage at LANSCE and LANL reported on mercury in 2019. A new shutter will be designed and fabricated in the future and at that time, the 960 lb of mercury will be added to the new shutter. Therefore, LANL will be above the threshold when the project takes place and will have to report on mercury in that year.

4.1.3 Fuel Combustion

In 2020, 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 1.7 lbs 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 69,522 gallons of diesel fuel in 2020 and this equates to 0.0005 lbs of mercury towards the otherwise used threshold.

4.1.4 Conclusion

The total amount of mercury qualifying as otherwise used equals 3.9 lbs, which is below the reporting threshold value of 10 lbs. The total amount of mercury compounds manufactured was 1.7 lbs and is also below the reporting threshold of 10 lbs. Therefore, it was determined that reporting mercury under EPCRA Section 313 is not necessary for 2020. A summary of the 2020 mercury threshold determination is provided in Table 4-1.

Table 4-1. Summary of 2020 Mercury Threshold Determination

Description	Amount of Mercury (lbs)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lbs)
Purchasing of Mercury Standards and Instruments	0.0	Procurement data and facility personnel interviews	Laboratory Exempt	NA*
Other Procurement	3.9	Procurement Records	Otherwise Used	10
LANSCE Shutter System	0	LANSCE Facility Records		
Fuel Combustion	0.0005	Fuel Use Records and EPA Guidance		
Fuel Combustion	1.7	Fuel Use Records and EPA AP-42	Manufactured	10

* NA = not applicable.

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 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 1,212 lbs, 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.

For 2020, ChemDB shows that a total of 140 lbs of sulfuric acid was procured and used at various locations at the Laboratory. Most of these were small purchases ranging from 1.0 to 30 lbs, and are most likely used in analytical chemistry work. This liquid form of sulfuric acid is not reportable under EPCRA. As for the other purchases of sulfuric acid captured in ChemDB, they are assumed to be in aerosol form since the specific usages are 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 2020

Description	Amount of Sulfuric Acid (lbs)	Data Source	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lbs)
Fuel Oil Combustion Byproducts	0.21	AP-42 and fuel use records	Manufactured	25,000
Natural Gas Combustion	1,211	AP-42 and facility records		
Asphalt Production	0.63	AP-42 and facility records		
Storage Tanks	0	EPA Tanks 4.0 model		
Total Manufactured	**1,212**			

* NA = not applicable.

4.3 Polycyclic Aromatic Compounds

PACs are a chemical category included on the EPCRA Section 313 list as part of the PBT rule. The threshold for reporting PACs is 100 lbs. Benzo(g,h,i)perylene is a PAC that has its own separate threshold. The threshold for benzo(g,h,i)perylene is 10 lbs.

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 ChemDB dataset was done using CAS numbers for the 25 chemicals and text searches for the 51 chemical mixtures. No matches were identified. An analysis of ChemDB data showed a total of 43.4 lbs of PACs from 2020 chemical purchases.

4.3.2 PACs from Asphalt Production

In 2020, the Laboratory's onsite asphalt plant produced approximately 136 tons of asphalt. Additionally, Española Transit Mix provided 10,685 tons of asphalt amounts to LANL. Therefore, a total of 10,821 tons of asphalt was used at LANL in 2020.

A review of project management records for 2020 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.

In 2020, using the 8 ppm concentration, the total amount of PACs otherwise used at LANL in asphalt was 8.62 lbs, which is below the reporting threshold of 100 lbs.

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 1.29 lbs of benzo(g,h,i)perylene reportable towards its 10-lb otherwise use threshold.

4.3.3 PACs from Fuel Oil Combustion

Approximately 69,522 gallons of diesel fuel were used in 2020 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 10.86 lbs 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 4.44 lbs 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 0.001 lbs for total PACs and 0.0002 lbs for benzo(g,h,i)perylene.

4.3.4 PACs from Natural Gas

Approximately 956.6 million standard cubic feet (MMscf) of natural gas were burned at the Laboratory facilities in 2020. Using AP-42 emission factors (EPA 1998b) and fuel records, approximately 0.02 lbs of PACs were produced from natural gas combustion, which is applied to the manufacture threshold. Approximately 0.001 lbs 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

Asphalt production was the largest source of PACs at the Laboratory in 2020. The total amount otherwise used from all sources was 62.9 lbs. The total amount manufactured from combustion of fuel oil and natural gas was 0.021 lbs. Both threshold quantities for otherwise use and manufacture were below the 100-lb threshold; therefore, it was determined that reporting of PACs under EPCRA Section 313 was not necessary.

Benzo(g,h,i)perylene concentrations in asphalt tar and diesel fuel totaled 5.7 lbs towards the otherwise used threshold. Combustion processes accounted for 0.001 lbs, which is considered to be manufactured. These values are below the reporting threshold of 10 lbs. Therefore, benzo(g,h,i)perylene reporting was not necessary under EPCRA Section 313 in 2020. Table 4-3 summarizes the PACs and benzo(g,h,i)perylene threshold determinations.

Table 4-3. LANL 2020 Threshold Determinations for PACs and Benzo(g,h,i)perylene

EPCRA Chemical/ Compound	Process or Material	Amount (lbs)	Total (lbs)	EPCRA Section 313 Activity Determination	EPCRA Activity Threshold (lbs)
Total PACs	Purchased	43.4	**62.9**	Otherwise Used	100
	Impurity in natural gas	0.02			
	Asphalt tar	8.6			
	Impurity in fuel oil	10.9			
	Natural gas combustion	0.02	**0.021**	Manufactured	100
	Fuel oil combustion	0.001			
Benzo(g,h,i)perylene	Purchased	0.0	**5.7**	Otherwise Used	10
	Impurity in natural gas	0.001			
	Asphalt tar	1.3			
	Impurity in fuel oil	4.4			
	Natural gas combustion	0.001	**0.0012**	Manufactured	10
	Fuel oil combustion	0.0002			

4.4 Nitric Acid

In general, nitric acid is used in high volumes 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 2020 did not exceed the EPCRA Section 313 otherwise use threshold of 10,000 lbs.

4.4.1 Procurement

Nitric acid procured and used at the Laboratory in 2020 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 2020, a total of 1,649 lbs of nitric acid was procured at the Laboratory, based on queries of the ChemDB system. In most cases, the nitric acid is purchased at LANL as "Lab Grade" or 'Reagent Grade" which is 65-70 percent nitric acid in water. In 2020, a large portion of the purchases were 100% percent nitric acid. For small purchases, the percent nitric acid purchased was determined from the purchase specifications or assumed 70 percent reagent grade. The concentration of the nitric acid purchases was taken into account and the resulting amount of pure nitric acid purchased was calculated to be 1,634 lbs.

Historically, between 70 to 75% of total nitric acid has been used in laboratory use, which is an exempt activity. Since the amount purchased in 2020 is less than 16% of the threshold for reporting, no attempt was made to separate the laboratory use and otherwise use.

4.4.2 TA-55 Plutonium Processing

Plutonium processing facility management was contacted to obtain information on the amount of nitric acid used in plutonium processing in 2020. TA-55 personnel did not purchase any bulk nitric acid for their bulk storage tank in 2020, nor did the facility perform any plutonium processing activities. The bulk nitric acid system was out of service for most of 2020. No nitric acid was moved from the bulk storage tank to smaller storage tanks within some of the processing areas. Therefore, no nitric acid was used for plutonium processing activities, and there were no nitric acid emissions.

4.4.3 Summary

Nitric acid use in 2020 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 2020.

Table 4-4. Nitric Acid Threshold Determination for 2020

Description	Amount of Nitric Acid (lbs)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lbs)
Laboratory Use	0	Lab Exempt	Exempt
Otherwise Use		Otherwise Use	10,000
• Non-Lab, or unknown use	1,634		
• Plutonium Processing (TA-55 actual use)	0		
Total Otherwise Use	**1,634**		

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 lbs for manufacture/import or process and 10,000 lbs for otherwise used. Only the manufacture and otherwise used thresholds apply to the Laboratory for 2020 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 2020. 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 ChemDB was performed to determine the amount of chemicals applied to the otherwise used threshold. Approximately 117 lbs of nitrate compounds were purchased in 2020. A few of the 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 for 2020 indicated that the average nitrate concentration of the influent was 0.70 milligrams per liter and the total flow into the system was 66,924,000 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 0.70 milligrams per liter, and adjusting the weight to include the sodium ion, the total sodium nitrate processed as an impurity was 539 lbs in 2020.

The information provided by SWSC Plant personnel 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 2020 was 92,608,000 gallons. The average nitrate concentration was 0.82 milligrams per liter. This calculates to a total of 866 lbs 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 (MO_x) fuel process and from the Nitric Acid Recycling System, both located at the Plutonium Facility, is sent to the RLWTF for treatment. At the RLWTF, the waste acid is collected in a 5,000-gallon holding tank. Once the tank is approximately 25% full, the waste is neutralized using 25% sodium hydroxide. Once neutralized, the wastewater is sent to a 20,000-gallon holding tank awaiting the evaporation process. Periodically, the wastewater collected is sent through an evaporator to reduce the volume of water. The distillate is about two-thirds the volume of the initial aqueous stream. The remaining one-third is concentrate, called evaporator bottoms, and is sent off site for drying, repackaging, and is then returned to LANL for disposal at TA-54.

The RLWTF received no acid waste transfers from TA-55 in 2020 and the facility did not the treat acid waste in 2020. 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). Since there was no treatment of the nitric acid waste, there were no nitrate compounds formed in 2020.

4.5.4 Summary

Nitrate compounds that apply to the otherwise used reporting threshold of 10,000 lbs includes the chemicals found in ChemDB. A total of 117 lbs of nitrate compounds were purchased and assumed to be in aqueous form. This is well below the 10,000-lb EPCRA 313 threshold.

Nitrate compounds that apply to the manufacture reporting threshold of 25,000 lbs includes 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 amount manufactured as a by-product at the SWSC Plant is 866 lbs. No nitrate compounds were formed due to nitric acid neutralization activities at the RLWTF in 2020.

The amount of nitrate compounds processed as an impurity at the SWSC Plant was 539 lbs. This applies to a separate 25,000 processing threshold. Table 4-5 provides a summary of nitrate compounds at LANL in 2020.

Table 4-5. Summary of Nitrate Compounds at LANL in 2020

Description	Amount of Nitrate Compounds (lbs)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Activity Threshold (lbs)
Purchased in ChemDB (assumed in aqueous form and otherwise used)	117	Otherwise Used	10,000
Processed at the SWSC Plant	539	Processed	25,000
Manufactured at the SWSC Plant	866	Manufactured	25,000
Manufactured at the RLWTF	0		
Total Manufactured	866		

4.6 Hydrochloric Acid

The total amount of HCl procured in calendar year 2020 was 202,180 lbs. A total of 201,000 lbs of 31% HCl was used at SERF. This equals 63,135 lbs of pure HCl. The remaining 1,180 lbs is attributed to many small users and is 34 to 38% HCl and is used in various laboratory settings.

The large quantity of HCl used at SERF is used for ph adjustment of treated sanitary effluent, and in the microfilter cleaning tanks. The HCl is received as a 31% aqueous solution in 300- to 330-gallon totes and transferred to a 1,500-gallon HCl storage tank where it is then piped to the two processes in a nearly closed system. The aqueous form of HCl is exempt from EPCRA 313 reporting and HCl in aerosol form needs to be considered for threshold determinations (EPA 1999b). However, when the HCl is transferred into the storage tank, HCl vapors in the head space of the tank are vented in aerosol form.

In 2013, the EPA TANKS 4.09 emissions estimating software was run to estimate the amount of HCl vapors formed based on the number of turnovers of the tank and tank and site conditions (see Table 1). HCl is not a listed chemical in the TANKS software. EPA instructions describe two options for using the TANKS software for chemicals not included in the chemical list: (1) use a feature to add new chemicals with physical properties such as molecular weight, vapor pressure, liquid density, vapor density; (2) use a surrogate chemical that is included in the TANKS chemical list that has similar physical properties. For this analysis we have chosen a surrogate chemical, ethylcyclopentane, which has a similar, but slightly

higher vapor pressure. This should result in a slightly higher (conservative) estimate of emissions. Meteorological data from Albuquerque was used from the TANKS program, which should also provide slightly conservative estimates since Albuquerque has slightly higher average temperatures than Los Alamos.

Results from the TANKS software showed a total of 114.6 lbs of HCl vapor formed and emitted from the tank in 2013 when total HCl was 510,000 lbs. Since the amount of HCl purchased and throughput to this tank is approximately 38% less, emissions would also be less. Therefore, it was deemed unnecessary to run the TANKS software again since the estimate from 2013 can be used as a worst case estimate for 2020.

Using a worst case assumption that all minor purchases of HCl end up in vapor form, we have a total of 1,180 lbs of HCl towards the otherwise used threshold, and 114.6 lbs of HCl from the SERF tank counted towards the manufactured threshold. Both of these are well below the reporting thresholds of 10,000 lbs for otherwise used, and 25,000 lbs for manufactured. Therefore, it is not necessary to report HCl in 2020.

4.7 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.

4.7.1 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 micrograms 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 0.0025 grams in 2020. 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 0.00022 grams in 2020.

4.7.2 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 69,522 gallons of diesel fuel in 2020. Total dioxin formation from burning diesel fuel was calculated to be 0.0008 grams for 2020.

The total calculated dioxin emissions in 2020 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 2020.

Table 4-6. Dioxin Threshold Determination for 2020

Description	Amount of Dioxin Formed (grams)	EPCRA Section 313 Activity Determination	EPCRA Section 313 Threshold (grams)
HE Burned	0.00022	Manufactured	0.1
HE Expended	0.0025		
Fuel Combustion	0.0008		
Total Dioxin Formed	**0.00355**		

5.0 LEAD 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 lbs, effective for reporting year 2001. In 2020, lead and lead compounds were otherwise used, processed, or manufactured in the following operations at the Laboratory.

5.1.1 Lead Procurements

A listing of all procurements in 2020 of lead and lead compounds was extracted from ChemDB. 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 ChemDB for 2020 was 5.06 lbs. Line items in ChemDB 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 2.55 lbs. The total amount of lead and lead compounds from procurements applied to the otherwise used threshold is 2.51 lbs. This includes 0 lbs applied to the lead threshold and 2.51 lbs applied to the lead compound threshold.

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. In order 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 for 2020, the previous years (2002 through 2018) reports were used to supply information used in the 2020 calculations.

The total lead released to the environment at the firing range in 2020 was lower than the previous year. It was determined that 724.5 lbs of lead was released to land (non-air) and 13.9 lbs of lead compounds were otherwise used.

Lead compounds are also manufactured through the firing of ammunition. Additionally, firing of ammunition containing lead created (manufactured) 2.5 lbs of lead compounds as air emissions.

5.1.3 Lead from Fuel Combustion

In 2020, 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 956.5 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 lbs/MMscf. The lead compound emissions from these sources totaled 0.48 lbs towards the manufactured threshold. The Laboratory also burned an estimated 69,522 gallons of diesel fuel in boilers, heaters, and diesel-fired generators. The AP-42 emission factor for diesel fuel combustion is 0.00123 lbs per 1,000 gallons, this equates to 0.09 lbs 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 69,522 gallons of fuel oil contained 0.25 lbs of lead and 956.5 MMscf of natural gas contained 2.95 lbs of lead, totaling 3.20 lb which is added to the otherwise used threshold.

5.1.4 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 0 lbs of lead were shipped offsite for reuse in 2020.

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.

5.1.5 Other LANL Operations Using Lead and Lead Compounds

The Sigma Foundry, located at TA-3-66, melts lead in order to declassify parts. In 2020, the foundry did not melt any lead and there were no stack air emissions as a result.

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 resumed processing in 2013 and reported that no lead was sent to Ace Metals for recycling in 2020.

5.1.6 Conclusion

Table 5-1 summarizes the threshold determination for lead and lead compounds for 2020. Based on these operations, it was determined that lead was otherwise used and processed over threshold quantities.

Table 5-1. Summary of Threshold Determination for Lead and Lead Compounds for 2020

Activity	Lead Use (lbs)	Lead Compound Use (lbs)	Comments
Lead Purchases (ChemDB)	0	2.51	Otherwise Used 9.74 lbs purchased, 0.67 lbs Lab Exempt
Firing Range	724.5	13.9	Otherwise Used
Firing Range	0	2.51	Manufactured
Fuel Combustion	0	0.56	Manufactured (sum of natural gas, diesel, and propane from asphalt plant)
Fuel Combustion	3.20	0	Otherwise Used
Lead Recycle/Resale from MRF (sold to Ace Metals)	0	0	Processed, all of it is reused and not reported on the Form Rs
Sigma Foundry	0	0	Processed
TOTALS	**Otherwise Used – 727.7**	**Otherwise Used – 16.41** **Manufactured – 3.06**	**Reporting Thresholds = 100 lbs**

5.2 Environmental Releases and Offsite Disposal

For 2020, LANL exceeded the otherwise used threshold of 100 lbs for lead and also exceeded the processed threshold of 100 lbs for lead. Therefore, a Form R for lead must be submitted, which includes reporting on air emissions, water discharges, land disposal, and offsite waste disposal.

5.2.1 Air Emissions

In 2020, LANL emitted lead compound emissions to the atmosphere in the form of both fugitive and stack emissions. The sources for the lead compound air emissions include the firing range, fuel combustion, Sigma Foundry, and the RLWTF evaporator.

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 In order 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 for 2020, the previous years (2002 through 2018) reports were used to supply information used in the 2020 calculations. Based on the results of the analysis, a total of 2.5 lbs of lead compounds were emitted as fugitive air emissions from the firing range in 2020.

5.2.1.2 Fuel Combustion

In 2020, 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 0.56 lbs of lead compound stack emissions.

5.2.1.3 RLWTF Evaporator

The RLWTF has 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 0.02 grams of lead, which equates to 0.00004 lbs of lead emitted as stack air emissions.

5.2.1.4 Sigma Foundry

The Sigma Foundry, located at TA-3-66, melts lead in order to declassify parts. In 2020, the foundry did not melt any lead. Thus, there were no Sigma Foundry lead stack air emissions in 2020.

5.2.1.5 Conclusion

In 2020, the Laboratory emitted a total of 3.06 lbs of lead to the atmosphere, including 2.5 lbs of fugitive emissions and 0.56 lbs of stack emissions. 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 RLWTF Evaporator. Table 5-2 summarizes lead air emissions from the Laboratory as reported on Form R.

Table 5-2. Lead Air Emissions from LANL in 2020

Emission Source	Total Lead Emissions (lbs)	Fugitive or Stack
Firing Range	2.5	Fugitive
Fuel Combustion	0.56	Stack
Sigma Foundry	0	Stack
RLWTF Evaporator	0.00004	Stack
Total	**3.06**	

5.2.2 Releases to Water

This section describes the amount of lead released to the environment from the Laboratory during 2020, 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.

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 Resource Conservation and Recovery Act (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 2020, LANL sampled for a full slate of analytes (including lead) at each outfall as part of the NPDES Permit renewal process. The New Mexico Environment Department 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.

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 Annual Site Environmental 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 2020. Total lead release to streams was 0.254 lbs. Table 5-3 was used to complete Section 5.3.1 of the Form R.

Table 5-3. Lead Releases to Water in 2020 from LANL NPDES Outfall

Canyon	LANL NPDES Outfall Lead (lbs)
Mortandad Tributary to Rio Grande	0.013
Sandia Tributary to Rio Grande	0.190
Los Alamos Tributary to Rio Grande	0.051
Total of NPDES Discharges	**0.254**

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 tables created with data extracted from the TRI-DDS. A total of 724.5 lbs of lead was released to land at the firing range at LANL in 2020.

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 2020. 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 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 Protection and Compliance Group had to obtain the necessary information from material safety data sheets 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 material safety data sheet did not give the percentage of lead, the most conservative was assumed from the range given.

5.2.4.1 Disposal Fate

The EPCRA Form R requires information about each treatment/disposal facility that received waste from the Laboratory, including how much was sent to each waste treatment/disposal facility and additional information regarding waste treatment, recycling, or disposal conducted at each facility. A Waste Disposal/Treatment Code must be entered in Section 6.2.C of the Form R for each facility receiving waste. The Waste Disposal/Treatment Codes were updated by 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 2008) guidance document.

5.2.4.2 Results

The amount of lead contained in waste that was shipped offsite from the Laboratory in 2020 was 14,388 lbs. This total weight of lead was calculated by multiplying the total waste weight (kilograms) by the percentage of lead within each waste item, and then converted to pounds.

EPCRA reportable waste items shipped offsite from the Laboratory to several waste treatment/disposal facilities in 2020 are summarized in Table 5-4. As per EPCRA guidelines, only the values greater than 0.5 lbs of lead in 2020 were included in the summary table and on the Form R. For the facilities that added between 0 lbs and 0.5 lbs of waste, the facility information was included on the Form R and a value of 0 lbs was entered for the amount of waste disposed.

Table 5-4. Summary of Waste Disposal Facilities Receiving LANL Lead Waste in 2020

Company	Address	Facility EPA ID	Ultimate Fate of Waste	Total Lead (lbs)
Energy Solutions, LLC	Tooele County, I-80, Exit 49, Clive, UT 84029	UTD982598898	Landfill	**3,917.7**
Perma-Fix Northwest, Inc.	2025 Batelle Rd, Richland, WA 99354	WAR000010355	Other Land Disposal	**846.1**
Veolia ES Technical Services, LLC	9131 East 96th Avenue, Henderson, CO 80640	COD980591184	Other Land Disposal	**50.9**
Waste Control Specialists, LLC, TSD Facility	9998 W. State Highway 176, Andrews, TX 79714	TXD9888088464	Other Land Disposal	**30.4**
Waste Isolation Pilot Plant	4021 National Parks Highway, Carlsbad, NM 88221	NM4890139088	Solidification/Stabilization of Metals	**9,541.1**
U. S. Ecology (NV)	Hwy 95, 12 miles south of Beatty, Beatty, NV 89003	NVT330010000	Other Land Disposal	**2.1**
			Total	**14,388**

5.3 Other Information Provided on Form R

Environmental releases of lead as air emissions, to surface waters, and onsite land releases were reported to be 3.06 lbs, 0.254 lbs, and 724.5 lbs, 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 14,388 lbs 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 2020, the RLWTF resulted in a 99.996% 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 2020.

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 for lead.

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 2020 was divided by the amount used in 2019 to obtain an activity ratio of 0.57.

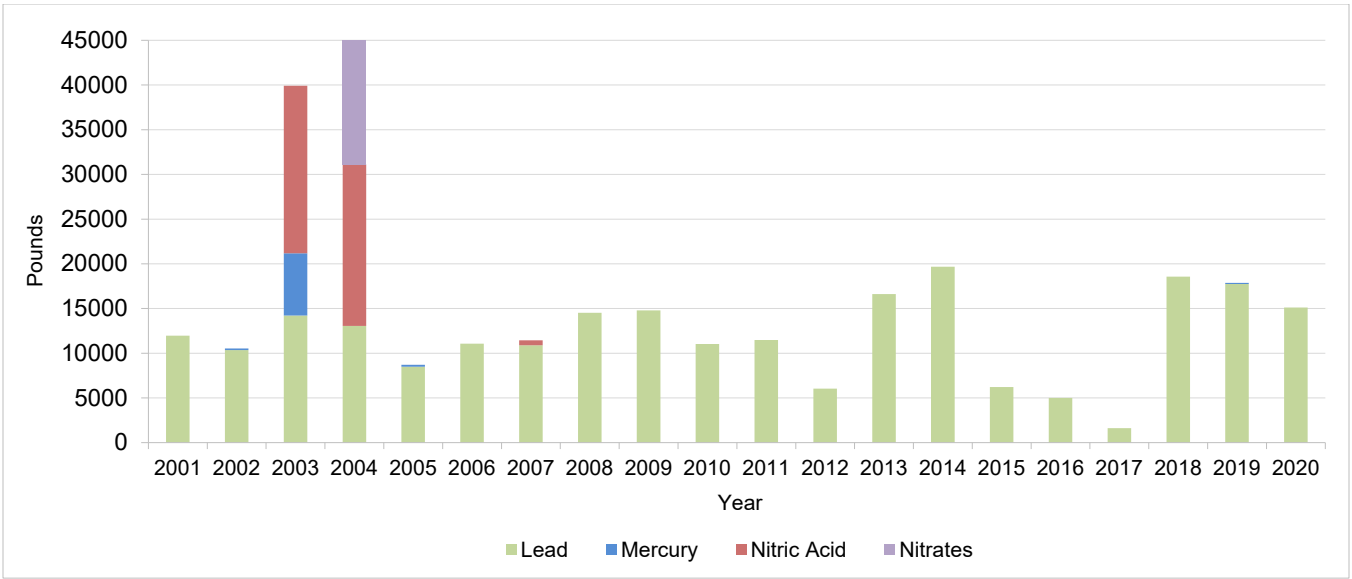
6.0 EPCRA SECTION 313 SUMMARY AND TRENDS

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/.

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 (EPA 1999a). 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 lbs (from 10,000 lbs). 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 100 lbs for lead. Therefore, LANL has submitted environmental release data on lead since the rule changed. Figure 6-1 provides a summary of LANL-reported releases for the period from 2001 through 2020.



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

Several points are worth noting from this chart:

- 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 MO_x 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. However, the treatment process for 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 lbs 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.

REFERENCES

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

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

EPA (Environmental Protection Agency), 1998a. "Compilation of Air Pollutant Emission Factors," AP-42, Chapter 1.3—Fuel Oil Combustion (September 1998).

EPA (Environmental Protection Agency), 1998b. "Compilation of Air Pollutant Emission Factors," AP-42, Fifth Edition, Section 1.4—Natural Gas Combustion (July 1998).

EPA (Environmental Protection Agency), 1998c. "Emission Factors for the Disposal of Energetic Materials by Open Burn and Open Detonation" (1998).

EPA (Environmental Protection Agency), 1999a. "Emergency Planning and Community Right-to-Know Act—Section 313: Persistent Bioaccumulative Toxic Chemicals" 40 CFR Part 372 (October 1999).

EPA (Environmental Protection Agency), 1999b. "Emergency Planning and Community Right-to-Know Act—Section 313: Guidance for Reporting Hydrochloric Acid," EPA 745-B-014 (December 1999).

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

EPA (Environmental Protection Agency), 2000b. "Emergency Planning and Community Right-To-Know Act—Section 313: Guidance for Reporting Toxic Chemicals within the Dioxin and Dioxin-like Compounds Category," EPA 745-B-00-021 (December 2000).

EPA (Environmental Protection Agency), 2001a. "EPCRA Mercury Guidance Document," EPA-260-B-01-004, Table 3-1 (August 2001).

EPA (Environmental Protection Agency), 2001b. "Emergency Planning and Community Right-to-Know Act—Section 313: Guidance for Reporting Toxic Chemicals: Polycyclic Aromatic Compounds Category," EPA 260-B-01-03 (June 2001).

EPA (Environmental Protection Agency), 2001c. "Emergency Planning and Community Right-to-Know Act—Section 313: Guidance for Reporting Toxic Chemicals: Pesticides and Other Persistent Bioaccumulative Toxic (PBT) Chemicals," EPA 260-B-01-005 (August 2001).

EPA (Environmental Protection Agency), 2001d, "Emergency Planning and Community Right-to-Know Act—Section 313: Guidance for Reporting Releases and Other Waste Management Quantities of Toxic Chemicals: Lead and Lead Compounds," EPA 260-B-01-027 (December 2001).

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

EPA (Environmental Protection Agency), 2008. "Toxic Chemical Release Inventory Reporting Forms and Instructions for RY2007," EPA-260-K-07-001 (March 2008).

Merck Index, 1989. An Encyclopedia of Chemicals, Drugs and Biologicals, Eleventh Edition. Merck and Co., Inc. Rahway, NJ.

APPENDIX A:

EPCRA Section 313 Chemicals Used or Procured in 2020

CAS number	Chemical Name	Threshold (lbs)	Sum (lbs)
7647-01-0	Hydrochloric acid (aerosol forms only)	10000	64,315.121
67-63-0	Isopropyl alcohol (mfg-strong acid process)	10000	2,131.872
Glycol Ethers	Glycol Ethers	10000	1,763.528
7697-37-2	Nitric acid	10000	1,648.582
7782-50-5	Chlorine	10000	1,345.15
75-09-2	Dichloromethane	10000	1,216.838
67-56-1	Methanol	10000	886.7839
78-48-8	S,S,S-Tributyltrithiophosphate	10000	882.104
108-88-3	Toluene	10000	698.4537
9016-87-9	Polymeric diphenylmethane diisocyanate	<10000	573.7438
75-05-8	Acetonitrile	10000	485.1121
101-68-8	Methylenebis(phenylisocyanate)	<10000	424.7062
68-12-2	N,N-Dimethylformamide	10000	413.3142
110-54-3	n-Hexane	10000	403.4483
67-66-3	Chloroform	10000	352.1112
107-21-1	Ethylene glycol	10000	279.7496
110-82-7	Cyclohexane	10000	220.1656
106-42-3	p-Xylene	10000	189.8177
Cyanide	Cyanide Compounds	10000	172.4382
7664-93-9	Sulfuric acid (aerosol forms only)	10000	139.9869
7664-39-3	Hydrogen fluoride	10000	135.2146
10049-04-4	Chlorine dioxide	10000	120.1731
75-71-8	Dichlorodifluoromethane	10000	120
Nitrate	Nitrate compounds (water dissociable)	10000	117.265
1344-28-1	Aluminum oxide (fibrous forms)	10000	109.7795
71-36-3	n-Butyl alcohol	10000	108.0371
75-45-6	Chlorodifluoromethane	10000	104.4496
Polychlorinated Alkanes	Polychlorinated alkanes (C10 to C13)	10000	95.3545
872-50-4	N-Methyl-2-pyrrolidone	10000	88.559
Zinc	Zinc Compounds	10000	81.5654
123-31-9	Hydroquinone	10000	79.3656
78-93-3	Methyl ethyl ketone	10000	74.7273
Cobalt	Cobalt Compounds	10000	60.4958
Polycyclic aromatic compounds	Polycyclic aromatic compounds (includes 21 chemicals and 51 mixtures)	100	44.4193
1330-20-7	Xylene (mixed isomers)	10000	42.8377
108-10-1	Methyl isobutyl ketone	10000	40.1781

CAS number	Chemical Name	Threshold (lbs)	Sum (lbs)
7664-38-2	Phosphoric acid	10000	29.8203
71-43-2	Benzene	10000	26.0246
7632-00-0	Sodium nitrite	10000	26.0141
79-01-6	Trichloroethylene	10000	25.7498
Nickel	Nickel Compounds	10000	20.6822
123-91-1	1,4-Dioxane	10000	20.5554
95-50-1	1,2-Dichlorobenzene	10000	20.5243
110-86-1	Pyridine	10000	19.7204
75-52-5	Nitromethane	10000	18.8326
Barium	Barium Compounds	10000	18.1945
Chromium	Chromium Compounds	10000	16.4694
1634-04-4	Methyl tert-butyl ether	10000	14.6925
79-10-7	Acrylic acid	10000	12.5633
74-85-1	Ethylene	10000	12.5016
Silver	Silver Compounds	10000	12.1495
121-44-8	Triethylamine	10000	11.0437
56-23-5	Carbon tetrachloride	10000	10.8663
7664-41-7	Ammonia	10000	9.3926
26628-22-8	Sodium azide (Na(N3))	10000	9.0519
101-80-4	4,4'-Diaminodiphenyl ether	10000	9.0388
108-93-0	Cyclohexanol	10000	7.3071
Manganese	Manganese Compounds	10000	7.0211
108-90-7	Chlorobenzene	10000	5.873
107-06-2	1,2-Dichloroethane	10000	5.5246
84-74-2	Dibutyl phthalate	10000	5.5115
7440-43-9	Cadmium	10000	5.3345
Lead	Lead Compounds	100	5.0559
77-09-8	Phenolphthalein	10000	5.0112
110-00-9	Furan	10000	4.8545
127087-87-0	Poly(oxy-1,2-ethanediyl), α-(4-nonylphenyl)-ω-hydroxy-, branched	10000	4.172
80-62-6	Methyl methacrylate	10000	4.1666
7440-66-6	Zinc (fume or dust)	10000	3.7089
64-18-6	Formic acid	10000	3.6575
127-18-4	Tetrachloroethylene	10000	3.5935
109-86-4	2-Methoxyethanol	10000	3.1944
7440-02-0	Nickel	10000	2.9761
Mercury	Mercury Compounds	10	2.8365
111-42-2	Diethanolamine	10000	2.7557
62-53-3	Aniline	10000	2.6794

CAS number	Chemical Name	Threshold (lbs)	Sum (lbs)
98-95-3	Nitrobenzene	10000	2.6537
7429-90-5	Aluminum (fume or dust)	10000	2.5511
7440-50-8	Copper	10000	2.2755
115-07-1	Propylene	10000	2.2392
7782-49-2	Selenium	10000	2.0611
74-88-4	Methyl iodide	10000	1.9839
50-00-0	Formaldehyde	10000	1.6735
95-47-6	o-Xylene	10000	1.649
139-13-9	Nitrilotriacetic acid	10000	1.3227
Chlorophenols	Chlorophenols	10000	1.3226
106-89-8	Epichlorohydrin	10000	1.3007
120-12-7	Anthracene	10000	1.1574
81-07-2	Saccharin (manufacturing)	10000	1.1023
57-41-0	Phenytoin	10000	1.1023
57-14-7	1,1-Dimethyl hydrazine	10000	1.1023
7439-97-6	Mercury	10	1.0661
61-82-5	Amitrole	10000	1.0582
121-69-7	N,N-Dimethylaniline	10000	1.0534
Antimony	Antimony Compounds	10000	0.9367
7440-62-2	Vanadium (fume or dust)	10000	0.8818
78-79-5	Isoprene	10000	0.7506
842-07-9	C.I. Solvent Yellow 14	10000	0.6612
77-73-6	Dicyclopentadiene	10000	0.5511
7440-41-7	Beryllium	10000	0.5098
106-88-7	1,2-Butylene oxide	10000	0.4552
556-52-5	Glycidol	10000	0.4408
Cadmium	Cadmium Compounds	10000	0.4406
75-21-8	Ethylene oxide	10000	0.4333
107-11-9	Allylamine	10000	0.4188
100-42-5	Styrene	10000	0.3994
7726-95-6	Bromine	10000	0.3419
7783-06-4	Hydrogen sulfide	10000	0.3351
75-15-0	Carbon disulfide	10000	0.2784
Selenium	Selenium Compounds	10000	0.2753
95-54-5	1,2-Phenylenediamine	10000	0.2314
7723-14-0	Phosphorus (yellow or white)	10000	0.2314
60-11-7	4-Dimethylaminoazobenzene	10000	0.2204
330-54-1	Diuron	10000	0.2204
Beryllium	Beryllium Compounds	10000	0.2204
122-39-4	Diphenylamine	10000	0.2204

CAS number	Chemical Name	Threshold (lbs)	Sum (lbs)
106-51-4	Quinone	10000	0.2204
104-94-9	p-Anisidine	10000	0.2204
120-80-9	Catechol	10000	0.2204
91-22-5	Quinoline	10000	0.2204
108-38-3	m-Xylene	10000	0.1904
75-56-9	Propylene oxide	10000	0.1893
7440-22-4	Silver	10000	0.1763
Arsenic	Arsenic Compounds	10000	0.1432
302-01-2	Hydrazine	10000	0.1102
94-36-0	Benzoyl peroxide	10000	0.1102
1763-23-1	Perfluorooctane sulfonic acid	100	0.1102
1464-53-5	Diepoxybutane	10000	0.0661
107-30-2	Chloromethyl methyl ether	10000	0.0551
13463-40-6	Iron, pentacarbonyl-	10000	0.0523
100-25-4	p-Dinitrobenzene	10000	0.044
554-13-2	Lithium carbonate	10000	0.022
Polybrominated Biphenyls	Polybrominated Biphenyls (PBBs)	10000	0.0154
77-47-4	Hexachlorocyclopentadiene	10000	0.011
92-87-5	Benzidine	10000	0.011
357-57-3	Brucine	10000	0.011
87-62-7	2,6-Xylidine	10000	0.011
7440-48-4	Cobalt	10000	0.0009

APPENDIX B:
Form R for DOE (Lead)

***** Do not send to EPA: This is the final copy of your form.*****

Form Approved OMB Number: **2070-0212**
Approval Expires: **2024-03-31**

Complete form online via TRI-MEweb. For a trade secret submission, send completed forms to TRI Reporting Center, P. O. Box 10163, Fairfax, VA 22038. The annual public burden related to the Form R is estimated to average 35.71 hours per response for a facility filing a report on one chemical. See the Reporting Forms and Instructions for more information on submissions and the Paperwork Reduction Act.

EPA	FORM R	TRI Facility ID Number
United States Environmental Protection Agency	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.	**87544SDLSL52835**
		Toxic Chemical, Category, or Generic Name
		Lead

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: **2020**

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? [ ] Yes (Answer question 2.2; attach substantiation forms) [**X**] NO (Do not answer 2.2; go to Section 3)
2.2	Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "Yes" in 2.1)

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

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

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
Adrienne Nash General Engineer	**Reference Copy: Copy of Record Resides in CDX**	**2021-06-09**

SECTION 4. FACILITY IDENTIFICATION

4.1	Facility or Establishment Name **U.S. DEPARTMENT OF ENERGY, LOS ALAMOS NATIONAL LABORATORY**	TRI Facility ID Number **87544SDLSL52835**	BIA Code
	Street **3747 W JEMEZ RD**		Facility or Establishment Mailing Address (if different from physical street address)
	City/County/State/ZIP Code **LOS ALAMOS / Los Alamos / NM / 87544**	City/State/ZIP Code / /	Country (Non-US)

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

4.3	Technical Contact name	**ADRIENNE NASH**		Email Address **ADRIENNE.NASH@NNSA.DOE.GOV**		Telephone Number (include area code and ext.) **505-665-5026**	
4.4	Public Contact name	**ADRIENNE NASH**		Email Address **ADRIENNE.NASH@NNSA.DOE.GOV**		Telephone Number (include area code and ext.) **505-665-5026**	
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)	**US DEPARTMENT OF ENERGY**	No U.S. Parent Company (for TRI Reporting purposes) [ ]
5.2	Parent Company's Dun & Bradstreet Number	NA [**X**]	

***** Do not send to EPA: This is the final copy of your form.*****

EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION	TRI Facility ID Number 87544SDLSL52835 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.)

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 Sub-Uses: b. [ ] As a formulation component Sub-Uses: c. [ ] As an article component d. [ ] Repackaging e. [ ] As an impurity f. [ ] Recycling	a. [ ] As a chemical processing aid Sub-Uses: b. [ ] As a manufacturing aid Sub-Uses: c. [X] Ancillary or other use Sub-Uses: Z399

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 [ ]	2.5	C	
5.2	Stack or point air emissions	NA [ ]	0.56	E1	
5.3	Discharges to receiving streams or water bodies (Enter one name per box)	NA [ ]			
	Stream or Water Body Name	Reach Code (optional)			
5.3.1	SANDIA TRIBUTARY TO RIO GRANDE		0.19	M2	0%
5.3.2	MORTANDAD TRIBUTARY TO RIO GRANDE		0.013	M2	0%
5.3.3	LOS ALAMOS TRIBUTARY TO RIO GRANDE		0.051	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.

***** Do not send to EPA: This is the final copy of your form.*****

EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)	TRI Facility ID Number 87544SDLSL52835 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)
5.4-5.5	Disposal to land on-site			
5.4.1	Class I Underground Injection wells	[X]		
5.4.2	Class II-V Underground Injection wells	[X]		
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	[ ]	724.5	C

Optional Waste Rock Piles Information
You may check this box if your Section 5.5 quantities include "waste rock piles." [ ] Enter quantity of "waste rock piles" (pounds/year*)

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.

*** Do not send to EPA: This is the final copy of your form.***

EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)	TRI Facility ID Number 87544SDLSL52835 Toxic Chemical, Category, or Generic Name Lead

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS — NA [ ]

6.2.1 Off-Site EPA Identification Number (RCRA ID No.)	COD991300484
Off-Site Location Name:	CLEAN HARBORS DEER TRAIL LLC
Off-Site Address:	108555 E HWY 36

City	DEER TRAIL	County	Adams	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 . 0	1 . O	1 . M65

6.2.2 Off-Site EPA Identification Number (RCRA ID No.)	FLD980711071
Off-Site Location Name:	PERMA-FIX OF FLORIDA INC
Off-Site Address:	1940 NW 67TH PL

City	GAINESVILLE	County	Alachua	State	FL	ZIP	326531649	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 . 0	1 . O	1 . M41

6.2.3 Off-Site EPA Identification Number (RCRA ID No.)	NMD147273528
Off-Site Location Name:	SPECIAL WASTE DISPOSAL, INC.
Off-Site Address:	91 LIBERTY VALLEY ROAD

City	MOUNTAINAIR	County	Torrance	State	NM	ZIP	87036	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 . 0	1 . O	1 . M65

6.2.4 Off-Site EPA Identification Number (RCRA ID No.)	NVT330010000
Off-Site Location Name:	US ECOLOGY NEVADA, INC
Off-Site Address:	HWY 95 11 MI S OF BEATTY

City	BEATTY	County	Nye	State	NV	ZIP	89003	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 . 2	1 . O	1 . M64

6.2.5 Off-Site EPA Identification Number (RCRA ID No.)	UTD982598898
Off-Site Location Name:	ENERGY SOLUTIONS CLIVE FACILITY
Off-Site Address:	U.S. INTERSTATE 80, EXIT 49

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 . 3918	1 . O	1 . M65

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

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 . 846	1 . O	1 . M64

6.2.7 Off-Site EPA Identification Number (RCRA ID No.)	NV3890090001
Off-Site Location Name:	U. S. DOE, NNSA/NFO
Off-Site Address:	NEVADA NATIONAL SECURITY SITE

City	MERCURY	County	Nye	State	NV	ZIP	89023	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 . 0.1	1 . O	1 . M94

6.2.8 Off-Site EPA Identification Number (RCRA ID No.)	NM4890139088
Off-Site Location Name:	U.S. DOE WASTE ISOLATION PILOT PLANT
Off-Site Address:	4021 NATIONAL PARKS HIGHWAY

City	CARLSBAD	County	Eddy	State	NM	ZIP	88220	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 . 9541	1 . O	1 . M41

6.2.9 Off-Site EPA Identification Number (RCRA ID No.)	COD980591184
Off-Site Location Name:	VEOLIA ES TECHNICAL SOLUTIONS LLC
Off-Site Address:	9131 E 96TH AVE

City	HENDERSON	County	Adams	State	CO	ZIP	80640	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 . 51	1 . O	1 . M64

6.2.10 Off-Site EPA Identification Number (RCRA ID No.)	TXD988088464
Off-Site Location Name:	WASTE CONTROL SPECIALISTS
Off-Site Address:	9998 W STATE HIGHWAY 176

City	ANDREWS	County	Andrews	State	TX	ZIP	79714	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 . 30	1 . O	1 . M64

6.2.11 Off-Site EPA Identification Number (RCRA ID No.)	NMD986683563
Off-Site Location Name:	WASTE MANAGEMENT OF NEW MEXICO
Off-Site Address:	33RD STREET NORTHERN BLVD

City	RIO RANCHO	County	Sandoval	State	NM	ZIP	87124	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 . 0	1 . O	1 . M64

6.2.12 Off-Site EPA Identification Number (RCRA ID No.)	UTD981552177
Off-Site Location Name:	CLEAN HARBORS ARAGONITE, LLC
Off-Site Address:	11600 N APTUS ROAD

City	ARAGONITE	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 . 0	1 . O	1 . M41

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

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

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Waste Treatment Efficiency Estimate
7A. 1 a	**7A. 1 b**	**7A. 1 c**
W	2 : H123 3 : H077 4 : H082 5 : H124 6 : H129 7 : H122	E2
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.

***** Do not send to EPA: This is the final copy of your form.*****

EPA FORM R PART II. CHEMICAL - SPECIFIC INFORMATION (CONTINUED)	TRI Facility ID Number 87544SDLSL52835 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. SOURCE REDUCTION AND WASTE MANAGEMENT

		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 - 8.7 Production-Related Waste Managed					
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	1848.932	727.814	1500	1500
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	12987.2	4847	5000	5000
8.1d	Total other off-site disposal or other releases	2913.8	9541.1	5000	5000
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	NA	NA	NA	NA
8.6	Quantity treated on-site	NA	NA	NA	NA
8.7	Quantity treated off-site	NA	NA	NA	NA
8.8	Non-production-related waste managed**		NA		
8.9	[ ] Production ratio or [X] Activity ratio (select one and enter value to right)		0.57		
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))			Estimated annual reduction (Enter code(s)) (optional)
8.10.1	NA				

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

** Includes quantities released to the environment or transferred off-site as a result of remedial actions, catastrophic events, or other one-time events not associated with production processes

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

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

Section 8.11: If you wish to submit additional optional information on source reduction, recycling, or pollution control activities, provide it here.	
Topic	**Comment**

Section 9.1: If you wish to submit any miscellaneous, additional, or optional information regarding your Form R submission, provide it here.	
Topic	**Comment**
You have reported 0 lbs transferred off-site.	**Error Reviewed / No Comment.**

APPENDIX C:
FORM R FOR LANL (LEAD)

***** Do not send to EPA: This is the final copy of your form.*****

Form Approved OMB Number: **2070-0212**
Approval Expires: **2024-03-31**

Complete form online via TRI-MEweb. For a trade secret submission, send completed forms to TRI Reporting Center, P. O. Box 10163, Fairfax, VA 22038. The annual public burden related to the Form R is estimated to average 35.71 hours per response for a facility filing a report on one chemical. See the Reporting Forms and Instructions for more information on submissions and the Paperwork Reduction Act.

EPA	FORM R	TRI Facility ID Number
United States Environmental Protection Agency	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.	**87545LSLMSLOSAL**
		Toxic Chemical, Category, or Generic Name
		Lead

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: **2020**

SECTION 2. TRADE SECRET INFORMATION

2.1	Are you claiming the toxic chemical identified on page 2 trade secret? [ ] Yes (Answer question 2.2; attach substantiation forms) [**X**] NO (Do not answer 2.2; go to Section 3)
2.2	Is this copy [ ] Sanitized [ ] Unsanitized (Answer only if "Yes" in 2.1)

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

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

Name and official title of owner/operator or senior management official:	Signature:	Date Signed:
Marjorie Stockton Acting Team Leader	**Reference Copy: Copy of Record Resides in CDX**	**2021-06-03**

SECTION 4. FACILITY IDENTIFICATION

4.1	Facility or Establishment Name: **TRIAD NATIONAL SECURITY, LLC, LOS ALAMOS NATIONAL LABORATORY**	TRI Facility ID Number: **87545LSLMSLOSAL**	BIA Code:
	Street: **BIKINI ATOLL RD SM30**		Facility or Establishment Mailing Address (if different from physical street address): **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: **WALTER WHETHAM**	Email Address: **WALT@LANL.GOV**	Telephone Number (include area code and ext.): **505-695-8056**		
4.4	Public Contact name: **PETER HYDE**	Email Address: **PAHYDE@LANL.GOV**	Telephone Number (include area code and ext.): **505-667-3792**		
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)	**US DEPARTMENT OF ENERGY**	No U.S. Parent Company (for TRI Reporting purposes) [ ]
5.2	Parent Company's Dun & Bradstreet Number	NA [**X**]	

***** Do not send to EPA: This is the final copy of your form.*****

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.)

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 Sub-Uses: b. [ ] As a formulation component Sub-Uses: c. [ ] As an article component d. [ ] Repackaging e. [ ] As an impurity f. [ ] Recycling	a. [ ] As a chemical processing aid Sub-Uses: b. [ ] As a manufacturing aid Sub-Uses: c. [X] Ancillary or other use Sub-Uses: Z399

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 [ ]	2.5	C	
5.2	Stack or point air emissions	NA [ ]	0.56	E1	
5.3	Discharges to receiving streams or water bodies (Enter one name per box)	NA [ ]			
	Stream or Water Body Name	Reach Code (optional)			
5.3.1	SANDIA TRIBUTARY TO RIO GRANDE		0.19	M2	0%
5.3.2	MORTANDAD TRIBUTARY TO RIO GRANDE		0.013	M2	0%
5.3.3	LOS ALAMOS TRIBUTARY TO RIO GRANDE		0.051	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.

***** Do not send to EPA: This is the final copy of your form.*****

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)
5.4-5.5	Disposal to land on-site			
5.4.1	Class I Underground Injection wells	[X]		
5.4.2	Class II-V Underground Injection wells	[X]		
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	[ ]	724.5	C

Optional Waste Rock Piles Information
You may check this box if your Section 5.5 quantities include "waste rock piles." [ ] Enter quantity of "waste rock piles" (pounds/year*)

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.

*** Do not send to EPA: This is the final copy of your form.***

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

SECTION 6.2 TRANSFERS TO OTHER OFF-SITE LOCATIONS — NA [ ]

6.2.1 Off-Site EPA Identification Number (RCRA ID No.)	COD991300484
Off-Site Location Name:	CLEAN HARBORS DEER TRAIL LLC
Off-Site Address:	108555 E HWY 36

City	DEER TRAIL	County	Adams	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 . 0	1 . O	1 . M65

6.2.2 Off-Site EPA Identification Number (RCRA ID No.)	UTD981552177
Off-Site Location Name:	CLEAN HARBORS ARAGONITE, LLC
Off-Site Address:	11600 N APTUS ROAD

City	ARAGONITE	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 . 0	1 . O	1 . M41

6.2.3 Off-Site EPA Identification Number (RCRA ID No.)	UTD982598898
Off-Site Location Name:	ENERGY SOLUTIONS CLIVE FACILITY
Off-Site Address:	U.S. INTERSTATE 80, EXIT 49,

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 . 3918	1 . O	1 . M65

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

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 . 846	1 . O	1 . M64

6.2.5 Off-Site EPA Identification Number (RCRA ID No.)	NV3890090001
Off-Site Location Name:	U. S. DOE, NNSA/NFO
Off-Site Address:	NEVADA NATIONAL SECURITY SITE

City	MERCURY	County	Nye	State	NV	ZIP	89023	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 . 0.1	1 . O	1 . M94

6.2.6 Off-Site EPA Identification Number (RCRA ID No.)	NM4890139088
Off-Site Location Name:	U.S. DOE WASTE ISOLATION PILOT PLANT
Off-Site Address:	4021 NATIONAL PARKS HIGHWAY

City	CARLSBAD	County	Eddy	State	NM	ZIP	88220	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 . 9541	1 . O	1 . M41

6.2.7 Off-Site EPA Identification Number (RCRA ID No.)	COD980591184
Off-Site Location Name:	VEOLIA ES TECHNICAL SOLUTIONS LLC
Off-Site Address:	9131 E 96TH AVE

City	HENDERSON	County	Adams	State	CO	ZIP	80640	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 . 51	1 . O	1 . M64

6.2.8 Off-Site EPA Identification Number (RCRA ID No.)	TXD988088464
Off-Site Location Name:	WASTE CONTROL SPECIALISTS
Off-Site Address:	9998 W STATE HIGHWAY 176

City	ANDREWS	County	Andrews	State	TX	ZIP	79714	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 . 30	1 . O	1 . M64

6.2.9 Off-Site EPA Identification Number (RCRA ID No.)	NMD986683563
Off-Site Location Name:	WASTE MANAGEMENT OF NEW MEXICO
Off-Site Address:	33RD STREET NORTHERN BLVD.

City	RIO RANCHO	County	Sandoval	State	NM	ZIP	87124	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 . 0	1 . O	1 . M64

6.2.10 Off-Site EPA Identification Number (RCRA ID No.)	FLD980711071
Off-Site Location Name:	PERMA-FIX OF FLORIDA INC
Off-Site Address:	1940 NW 67TH PL

City	GAINESVILLE	County	Alachua	State	FL	ZIP	326531649	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 . 0	1 . O	1 . M41

6.2.11 Off-Site EPA Identification Number (RCRA ID No.)	NMD147273528
Off-Site Location Name:	SPECIAL WASTE DISPOSAL, INC.
Off-Site Address:	91 LIBERTY VALLEY ROAD

City	MOUNTAINAIR	County	Torrance	State	NM	ZIP	87036	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 . 0	1 . O	1 . M65

6.2.12 Off-Site EPA Identification Number (RCRA ID No.)	NVT330010000
Off-Site Location Name:	US ECOLOGY NEVADA, INC
Off-Site Address:	HWY 95 11 MI S OF BEATTY

City	BEATTY	County	Nye	State	NV	ZIP	89003	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. 2	1. O	1. M64

SECTION 7A. ONSITE WASTE TREATMENT METHODS AND EFFICIENCY

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

a. General Waste Stream (enter code)	b. Waste Treatment Method(s) Sequence [enter 3-character code(s)]	c. Waste Treatment Efficiency Estimate
7A. 1 a	7A. 1 b	7A. 1 c
W	2: H123 3: H077 4: H082 5: H124 6: H129 7: H122	E2
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.

***** Do not send to EPA: This is the final copy of your form.*****

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. SOURCE REDUCTION AND WASTE MANAGEMENT

		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 - 8.7 Production-Related Waste Managed					
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	1848.932	727.814	1500	1500
8.1c	Total off-site disposal to Class I Underground Injection Wells, RCRA Subtitle C landfills, and other landfills	12987.2	4847	5000	5000
8.1d	Total other off-site disposal or other releases	2913.8	9541.1	5000	5000
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	NA	NA	NA	NA
8.6	Quantity treated on-site	NA	NA	NA	NA
8.7	Quantity treated off-site	NA	NA	NA	NA
8.8	Non-production-related waste managed**		NA		
8.9	[ ] Production ratio or [X] Activity ratio (select one and enter value to right)		0.57		
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))			Estimated annual reduction (Enter code(s)) (optional)
8.10.1	NA				

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

** Includes quantities released to the environment or transferred off-site as a result of remedial actions, catastrophic events, or other one-time events not associated with production processes

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

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

Section 8.11: If you wish to submit additional optional information on source reduction, recycling, or pollution control activities, provide it here.	
Topic	**Comment**

Section 9.1: If you wish to submit any miscellaneous, additional, or optional information regarding your Form R submission, provide it here.	
Topic	**Comment**
Non Covered NAICS	**Error Reviewed / No Comment.**