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LLNL-AR-853547

Source Reduction Evaluation Review and Plan for the DOE California Sites

(Lawrence Livermore National Laboratory Version) U.S. Department of Energy (DOE)

J. Blazo

August 22, 2023

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Prepared for DOE California Sites

Source Reduction Evaluation Review and Plan Hazardous Waste Management Performance Report Summary Progress Report

September 1, 2023

Prepared by

U.S. Department of Energy
Livermore Field Office
Livermore, California

Source Reduction Evaluation Review and Plan

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I. INTRODUCTION

The Department of Energy (DOE) is the owner of multiple facilities in Northern California. The facilities are described below and include Lawrence Livermore National Laboratory (LLNL), Lawrence Berkeley National Laboratory (LBNL), Sandia National Laboratories/California (SNL/CA) and SLAC National Accelerator Laboratory (SLAC). Through their operations, the facilities generate more than 12,000 kilogram of hazardous waste or 12 kilograms of extremely hazardous waste and, thereby, are subject to the requirements of Chapter 31 of the Title 22 California Code of Regulations, Waste Minimization. The Northern California sites are primarily research and development facilities in the areas relating to national security, energy technology innovations, high-energy physics, bioscience and the environment.

As mentioned above these DOE sites are primarily research and development facilities. The research projects vary in duration and span a wide variety of areas. In contrast to manufacturing facilities or continuous processes, the waste generated is varied and sometimes in small quantities. Therefore, even though this document breaks down the waste streams based on CWC, as required by the regulations, the quantities of waste within one waste code category could be from many different locations and dissimilar processes. Because of the nature of work at the sites, it is not always economically feasible to try to implement source reduction measures for every process that generates a portion of the identified major waste stream. This document identifies those processes that generate major portions of the waste within an identified major waste stream and evaluates source reduction opportunities for the waste generating process.

Lawrence Livermore National Laboratory: LLNL is managed and operated by the Lawrence Livermore National Security (LLNS) for the DOE, National Nuclear Security Administration (NNSA). LLNL includes two sites, Livermore Site (Site 200) and Site 300. The Livermore Site is located in Livermore and covers approximately one square mile in Alameda County. Site 300 is approximately ten square miles and is near the City of Tracy in San Joaquin County and Alameda County. LLNL was established in 1952 and employs approximately 9,000 employees and contractors. LLNL is a large quantity hazardous waste generator and operates hazardous waste treatment, storage and disposal facilities under hazardous waste treatment and storage permits at the Livermore site and site 300. LLNL also operates a hazardous waste treatment unit at Livermore site under the California Tiered Permit Program.

Contact Person: Jonathan Blazo, Environmental Analyst
Phone Number: (925) 724-7602

EPA ID #	Livermore Site:	CA2890012584
	Site 300:	CA2890090002

The address is:
Lawrence Livermore National Laboratory (Main Site)

7000 East Avenue L-626
Livermore, CA 94550-9234
SIC Code: 8733, 9611
NAICS: 54171, 928110, 541380

Lawrence Livermore National Laboratory Site 300
Corral Hollow Road
Tracy, CA 95376
SIC: 8733, 9611
NAICS: 92811, 54171, 541380, 928110

[redacted]

laboratory with strong programs in cosmology, chemistry, biology, materials science

[redacted]

Phone Number: (925) 294-1479

EPA ID #CA2890012923

The address is:
Sandia National Laboratories/California
7011 East Avenue
Livermore, CA 94551-0969
SIC Code: 9611, 8733
NAICS: 92811

The DOE Livermore Site Office has prepared this multi-site Plan, Progress Report and Summary Progress Report in accordance with the requirements of Chapter 31 of the Title 22 CCR and Guidance Manual for complying with the Hazardous Waste Source Reduction & Management Review Act of 1989, dated December 2010. The reporting year for this document is calendar year 2022 and the baseline year is 2018.

For preparation of the Plan in this document, routine hazardous wastes generated in calendar year 2022 at each site were considered separately to identify the "major" waste streams. Routine waste streams were separated into Category A, B and C waste streams.

Table 1, Total routine Category A, B & C hazardous wastes, in pounds, generated in CY 2022

	Sites	[redacted]
Hazardous Waste Generated	LLNL	
Category A	217,805	
Category B	189,906 + 639,964[1]	
Category C	396	
Total	1,048,071	

[1] Aqueous waste that is treated and reclaimed for reuse on site. Because this single waste stream is so large, it was excluded when calculating total LLNL Category B wastes so as not to dwarf other waste streams of significance.

Category A waste streams consist of wastes that were processed through an on-site wastewater processing unit and discharged to a publicly owned treatment works. Major Category A waste streams were identified for California Waste Codes (CWCs) that consisted of five percent or more of Category A and Category B waste streams combined.

Table 2, Major Category A waste streams generated in CY 2022 for each site, in pounds

	Sites
CWC	LLNL
132	217,805
791	--

[redacted]

Category B wastes streams include all other hazardous wastes except for extremely hazardous waste streams. Major Category B waste streams were waste streams that consisted of five percent or more of the total Category B wastes streams.

Table 3, Major Category B waste streams generated in CY 2022 for each site, in pounds

	Sites
CWC	LLNL
122	17,708
132	81,522
134	639,964[1]
135	31,150
181	--
221	27,450
222	--
223	32,076
331	--
352	--
551	--
741	--
792	--

[redacted]

[1] Treated and reclaimed for reuse on site.

Category C waste streams were all the routine extremely hazardous waste streams. Major Category C waste streams were CWC-identified waste streams that consisted of five percent or more of the total Category C waste streams.

Table 4, Major Category C waste streams generated in CY 2022 for each Site, in pounds

	Sites
CWC	LLNL
135	43
141	53
181	--
342	80
551	--
725	220
791	--

This document is organized by CWC; and where possible the common information about a particular CWC for different sites has been described in one section. The CWC-specific sections include the following information:

- Generating site(s)
- Calendar year 2022 waste generation quantities in pounds (lbs.)
- A block process or flow diagram for waste generating and/or handling processes
- A narrative explanation of the generating process including identification of hazardous characteristics and hazardous constituents where necessary
- An explanation of waste reduction/pollution prevention activities to date
- An evaluation of planned waste reduction/pollution prevention activities for the next four years

Where appropriate, each waste reduction/pollution prevention activity evaluation includes the following:

- Description of source reduction measure
- Technical feasibility
- Economic feasibility
- Evaluation of effects in product quality
- Evaluation of effects on employee health and safety
- Federal, state and local regulatory agency requirements
- Discussion of releases and discharges
- Evaluation of effects on land, water and air, and
- Schedule for implementation

The evaluation of source reduction measures considered the following approaches:

- Input changes
- Operational improvements
- Production process changes
- Product re-formulation, and

- Administrative steps

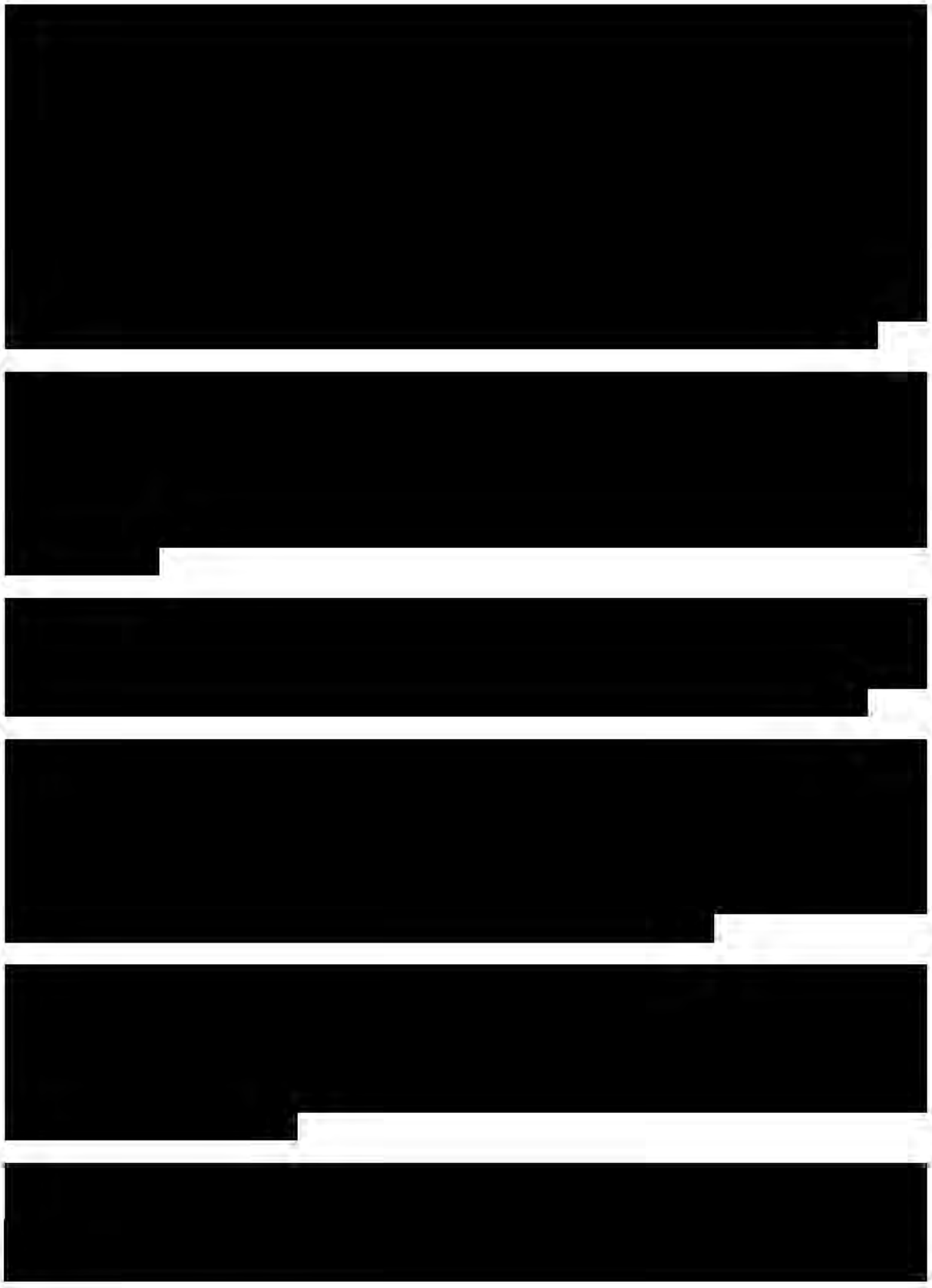
II. CATEGORY A WASTE STREAMS

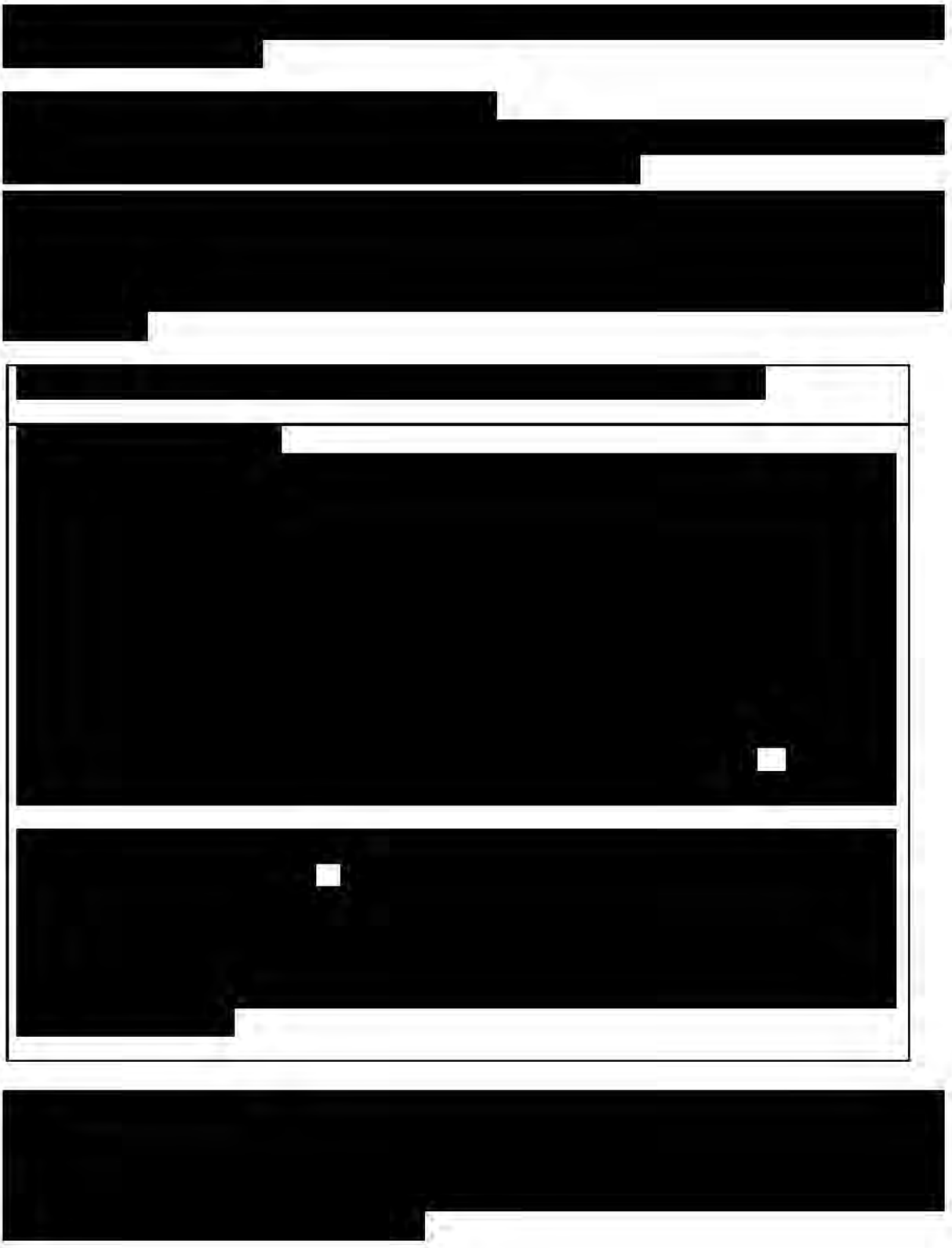
Category A waste streams are defined as "Hazardous wastes that are processed through an on-site wastewater treatment unit prior to discharge to a publicly owned treatment works (POTW) or to a receiving water under a National Pollution Discharge Elimination System (NPDES) permit."

1. CWC 132: Aqueous Solutions with Metals

Site	2022 quantity (lbs.)
[redacted]	
LLNL	217,805

[redacted]





1.2 Tank Farm Aqueous Solution Treatment

Site	2022 quantity (lbs.)
LLNL	217,805

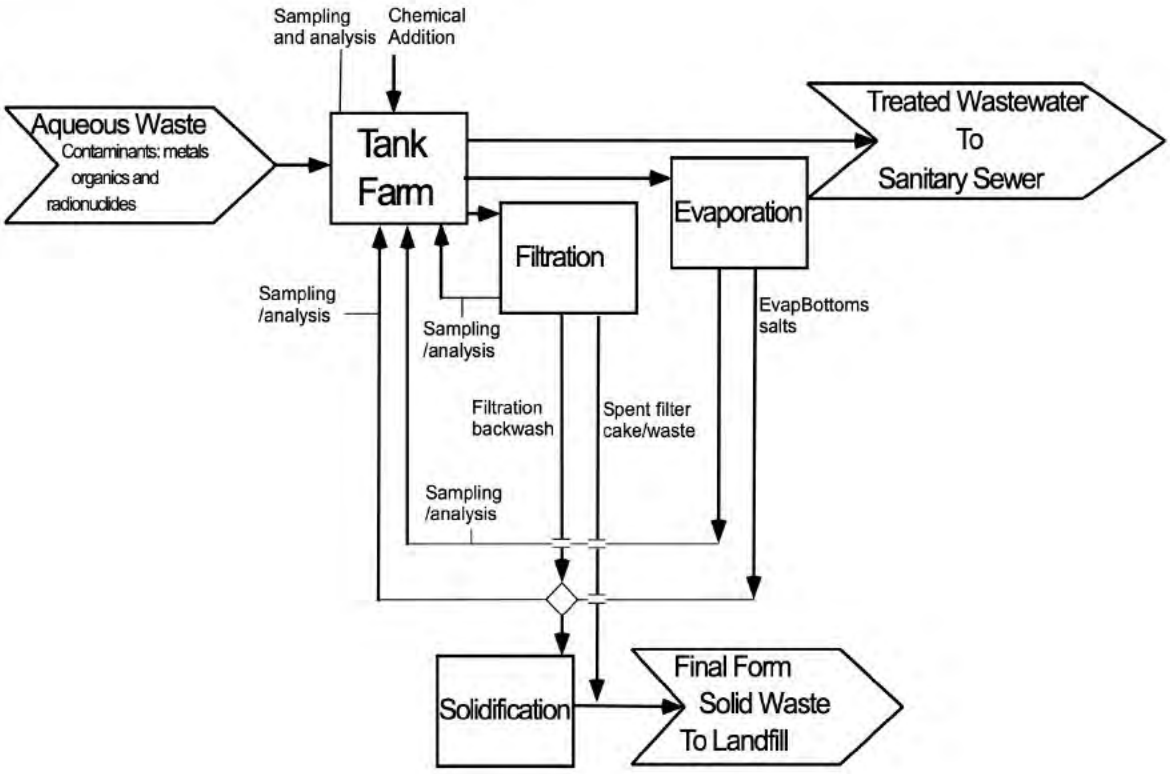


FIGURE II.1.2: CWC 132 PROCESS FLOW DIAGRAM FOR TANK FARM AQUEOUS SOLUTION TREATMENT PROCESS

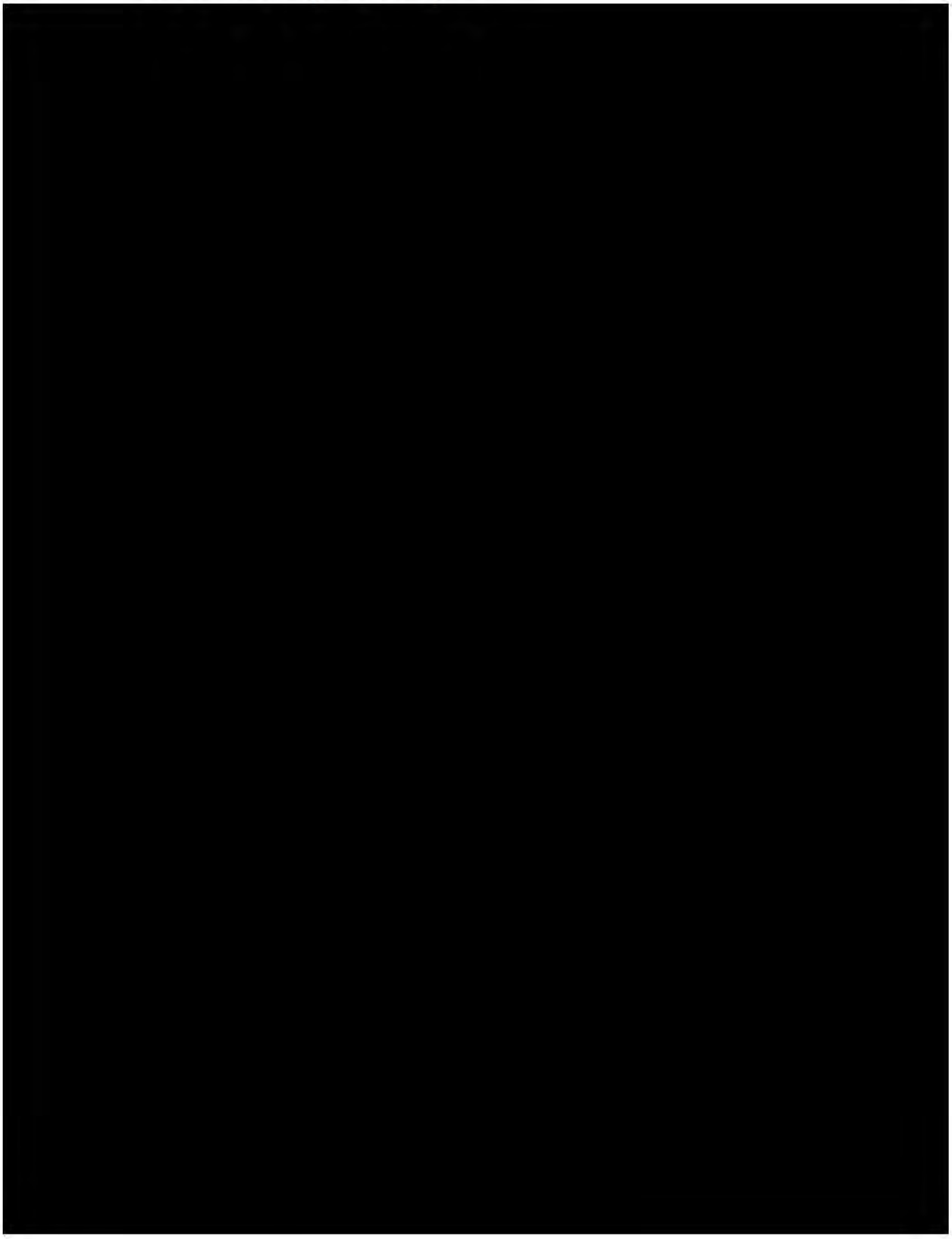
Compatible aqueous solutions generated from various LLNL programmatic activities and operations such as debris washing, sample preparation and analysis and equipment maintenance and cleanout are consolidated at the B695 Tank Farm for treatment.

The treatment process involves addition of appropriate treatment chemicals followed by filtration using a rotary drum to separate solids from liquids. The liquid portion of the waste is tested to ensure it meets POTW discharge limits prior to discharging to the sanitary sewer. Residual solids are sent offsite for disposal.

SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure: The volume of waste received into the Tank Farm for processing is dependent on the volume of programmatic wastes generated. The decrease may be the result of

the combination of the following: 1) 2018 may have included all aqueous waste going to the tank farm (including no- hazardous waste), 2) a natural fluctuation in programmatic waste generation that is eligible for treatment at Building 695, and 3) A reduction in the over classification of non-hazardous waste as hazardous waste. Some non-hazardous waste may be eligible for direct discharge to the POTW. LLNL is continuously evaluated waste streams that are treated and identifying those that are not hazardous wastes and can be discharged to the POTW. Additionally, by identifying a greater number of waste streams that are eligible for treatment helps reduce the total amount of hazardous waste that must be shipped to an off-site TSDF.

2. CWC 791: Liquids with pH≤2



III. CATEGORY B WASTE STREAMS

Category B waste streams are defined as "All other hazardous wastes, including waste shipped off-site for treatment, recycling or disposal, manifested waste, and waste that is treated or disposed on site."

1. CWC 122: Alkaline solution without metals (pH ≥ 12.5)

Site	2022 quantity (lbs.)
LLNL	17,708

1.1 CWC 122 – NIF B391 Grating Debris Shield (GDS) Optics Processing

Site	2022 quantity (lbs.)
LLNL	17,708

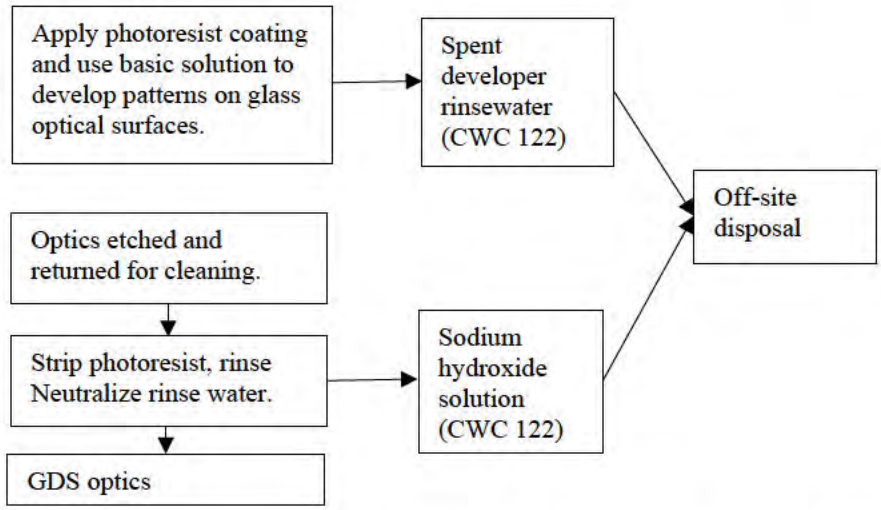


FIGURE III.1.1: NIF B391 GRATING DEBRIS SHIELD (GDS) OPTICS PROCESSING

This process generates two CWC 122 waste streams. First, the optics are prepared for etching by applying a photoresist coating, which is developed using an alkaline solution. An acid is then used to etch the pattern into the optics. The photoresist film is stripped from the optics using an NaOH solution and the generated rinse water is neutralized in an automated batch neutralizer. Spent developer and NaOH solution is sent for off-site disposal.

SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure:

The facility reuses hydroxide-based rinses multiple times prior to disposal. LLNL plans to continue with current source reduction measures, disposing of the aqueous waste offsite only when analytical results do not allow for discharge to sanitary sewer.

2. CWC 132: Aqueous Solution with Metals

Site	2022 quantity (lbs.)
LLNL	81,522
[redacted]	

2.1 CWC 132 – Building 111 HVAC Condensate

Site	2022 quantity (lbs.)
LLNL	81,522

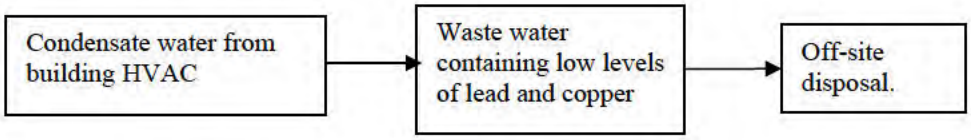


FIGURE III.2.1 BUILDING 111 HVAC CONDENSATE

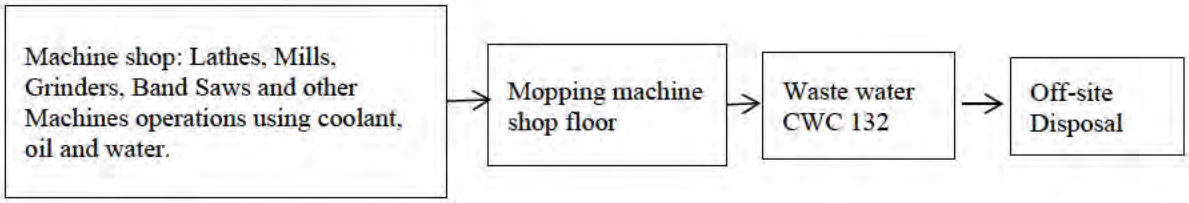
Condensate water containing low levels of lead and copper is generated as a result of using the HVAC system to cool building 111. The condensate drains into a containment pan that has attached piping to allow for gravity draining into a large tote container.

SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure: The volume of HVAC condensate generated is dependent upon numerous factors such as ambient air temperature, humidity, and timing and duration of HVAC use. The settings on the chillers have been adjusted to reduce condensation. LLNL is pursuing funding to replace the HVAC units with units that will not leach lead and copper into the condensate. Funding may not be available in the near future to replace these units and condensate will continue to be collected in the interim.

2.2 CWC 132 – Coolant from machining operations

Site	2022 quantity (lbs.)

[redacted]



[redacted]

[redacted]

[redacted]

3. CWC 134: Aqueous Solution with Total Organic Residues Less Than 10 Percent

Site	2022 quantity (lbs.)
LLNL	639,964

3.1 B322 Plating Shop Rinsewater Recycling

Site	2022 quantity (lbs.)
LLNL	639,964

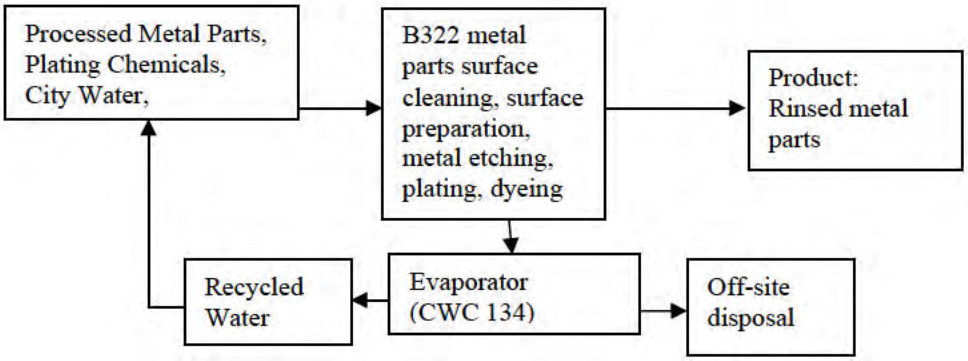


FIGURE III.3.1: PLATING SHOP FLOW DIAGRAM FOR RECLAIMED RINSE WATER PROCESS

Water generated from the rinsing of parts in the B322 plating shop is typically contaminated with organic chemicals and hazardous metals used in plating operations. While the shops employ pollution prevention measures to minimize wastewater generation during rinsing operations by using spray rinsing of parts rather than drag out rinsing, this is still one of the largest hazardous waste streams at LLNL. However, the bulk of this waste stream is reconditioned and recycled through B322 evaporator unit. Because this single waste stream is so large, it was excluded when calculating LLNL Category B wastes so as not to dwarf other waste streams of significance.

The volume of waste is dependent on workload and can vary from year to year.

SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure: LLNL plans to continue with current source reduction measures using the evaporator to reclaim rinse water and return it back to the plating shop for reuse as a water conservation measure. No other source reduction measures are planned at this time.

4.0 CWC 135: Unspecified Aqueous Solution

Site	2022 quantity (lbs.)
LLNL	31,150
[redacted]	

4.1 CWC 135 – B391 HF etching solution

Site	2022 quantity (lbs.)
LLNL	31,150

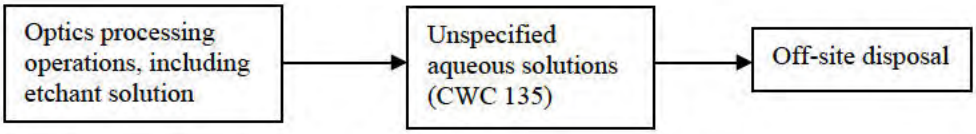


FIGURE III.4.1: NIF OPTIC PROCESSING FLOW DIAGRAM

This waste is generated from glass and silicon surface cleaning and etching. Ammonium fluoride is combined with hydrofluoric acid to better control the etching process. This waste stream is generated from NIF optics processing operations. These processes have been optimized to generate the minimal amount of waste while producing the high-quality optics required. For example, optics are batched to minimize solution change out between types, and baths are reused before spent etchant must be discarded and replaced.

SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure: LLNL plans to continue existing best management practices to minimize this waste stream. No other source reduction measures are planned at this time.

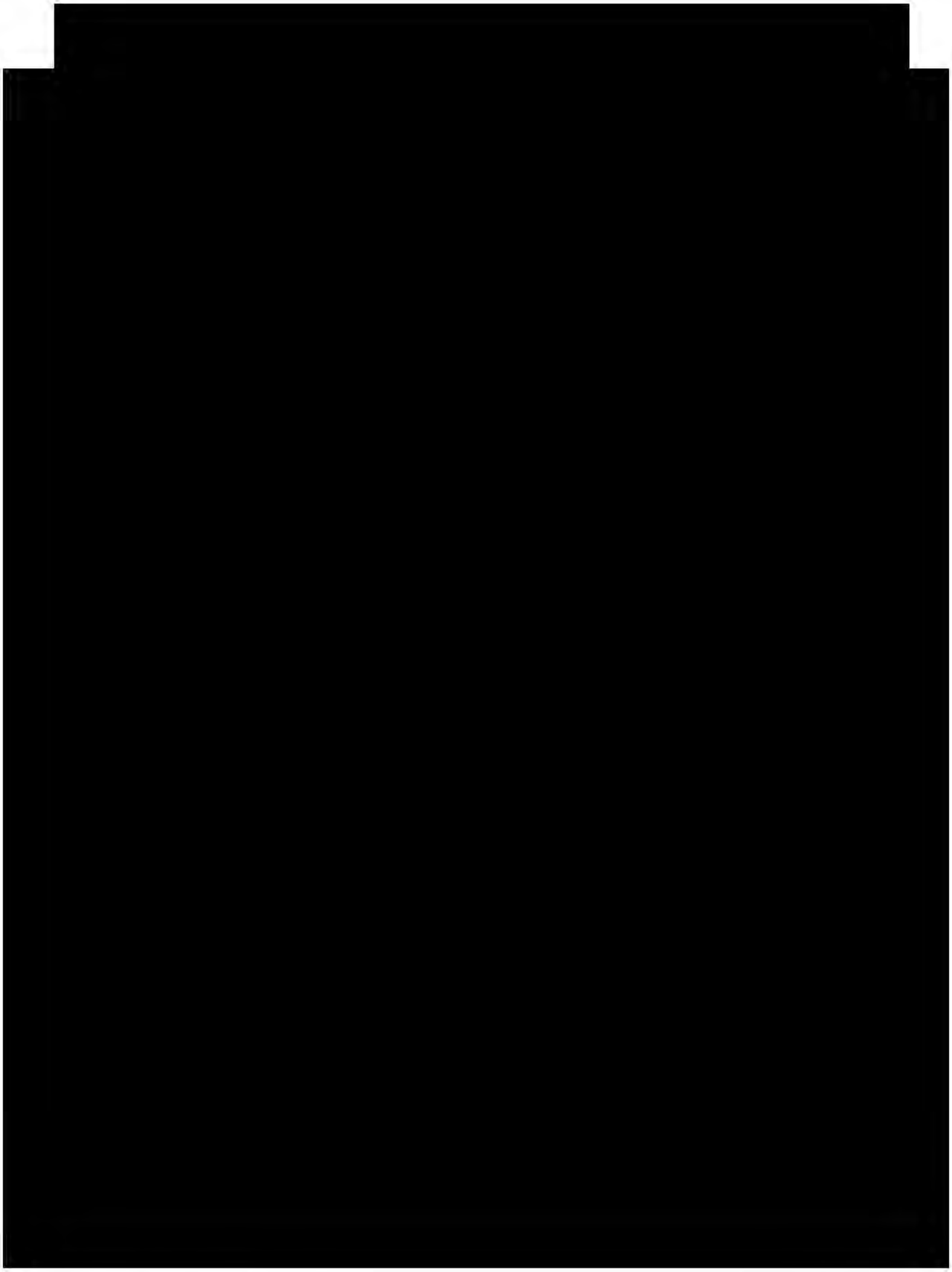
4.2 Facility and Research Equipment Cleaning and Maintenance

5.0 CWC 181: Other Inorganic Solid Waste

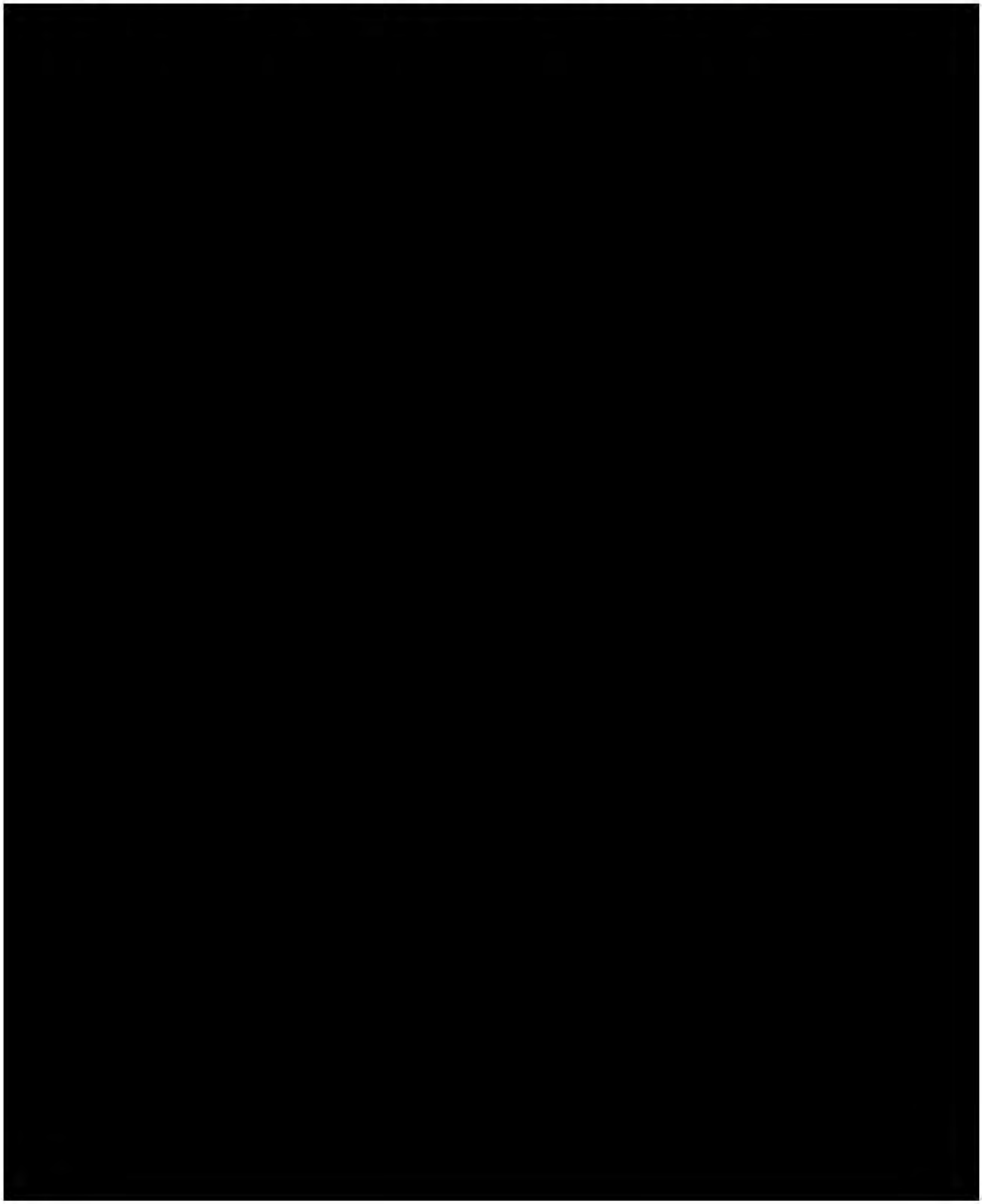
[redacted]

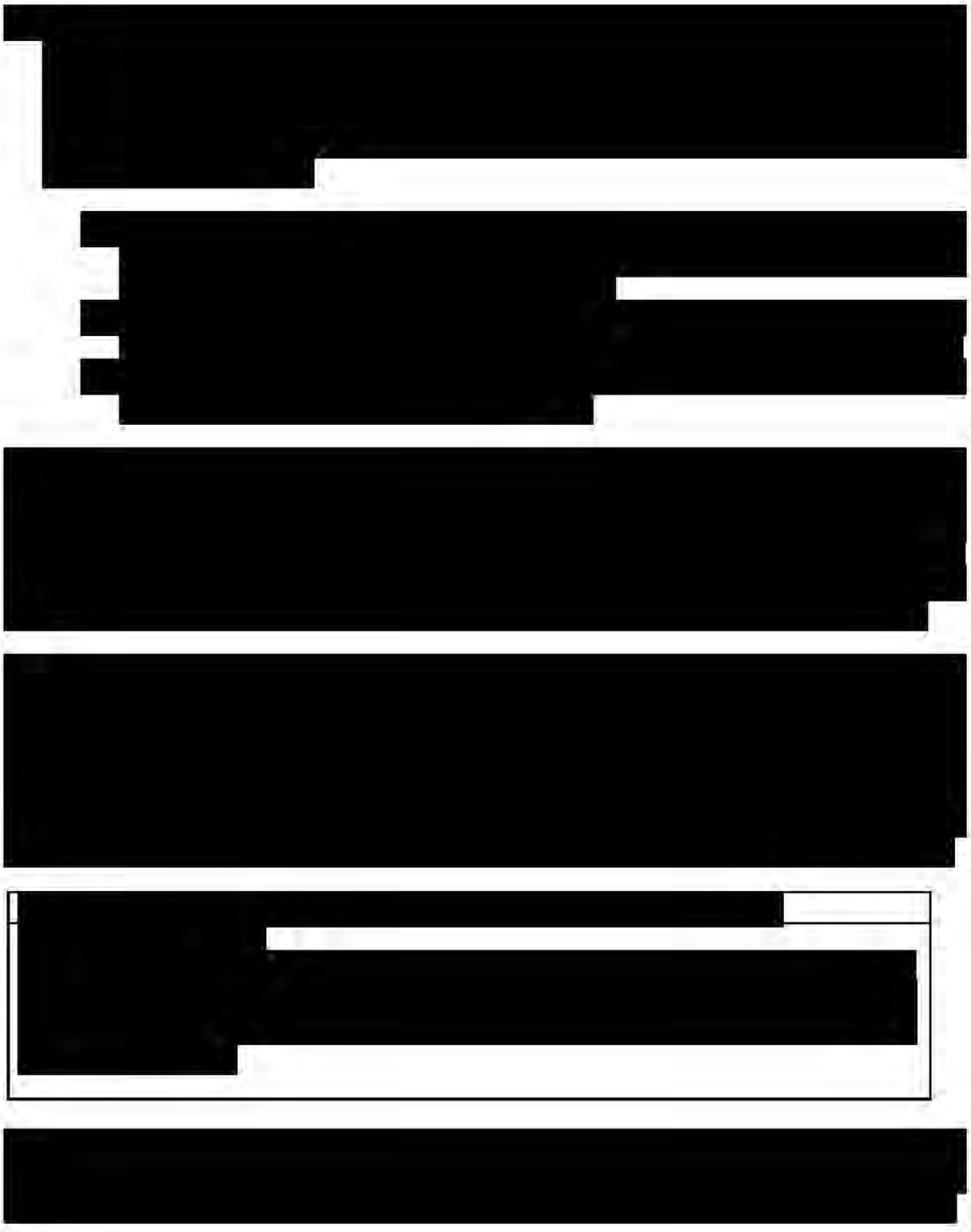
5.1 Inorganic Contaminated Debris

[redacted]

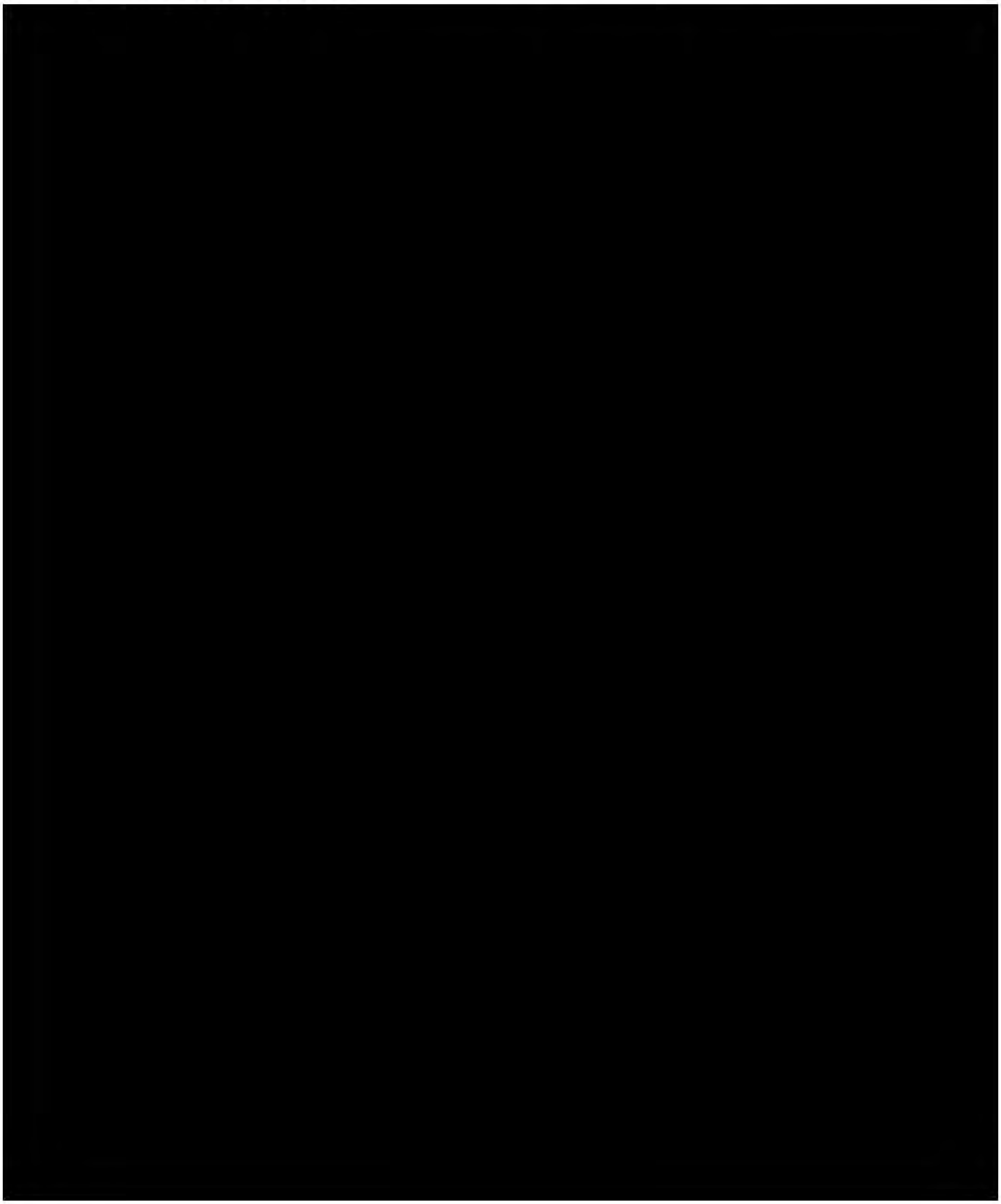


5.3 Filter Cake from Metal Finishing Pretreatment Facility





5.4 Spent Resins with Copper for Closed-Loop Low-Conductivity Cooling Water System



5.5 Acid and Alkaline Debris

5.6 Lab Clean Out Debris

6. CWC 221: Waste Oil and Mixed Oil

Site	2022 quantity (lbs.)
LLNL	27,450

[redacted]

6.1 Machining Operations Waste Oil

Site	2022 quantity (lbs.)
LLNL	27,450

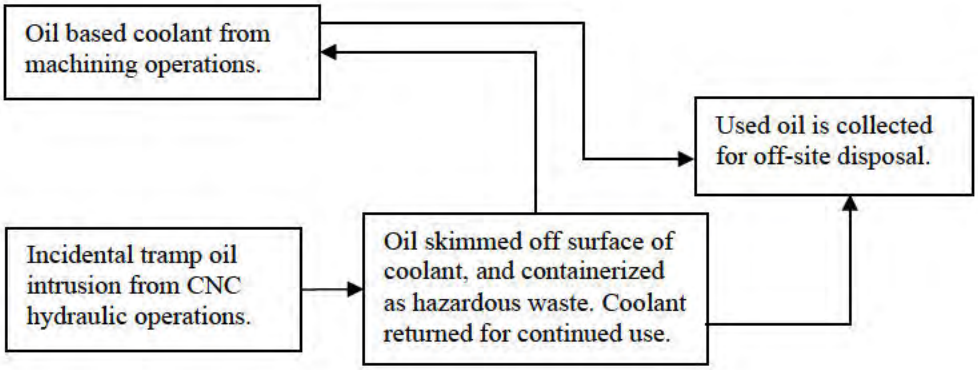
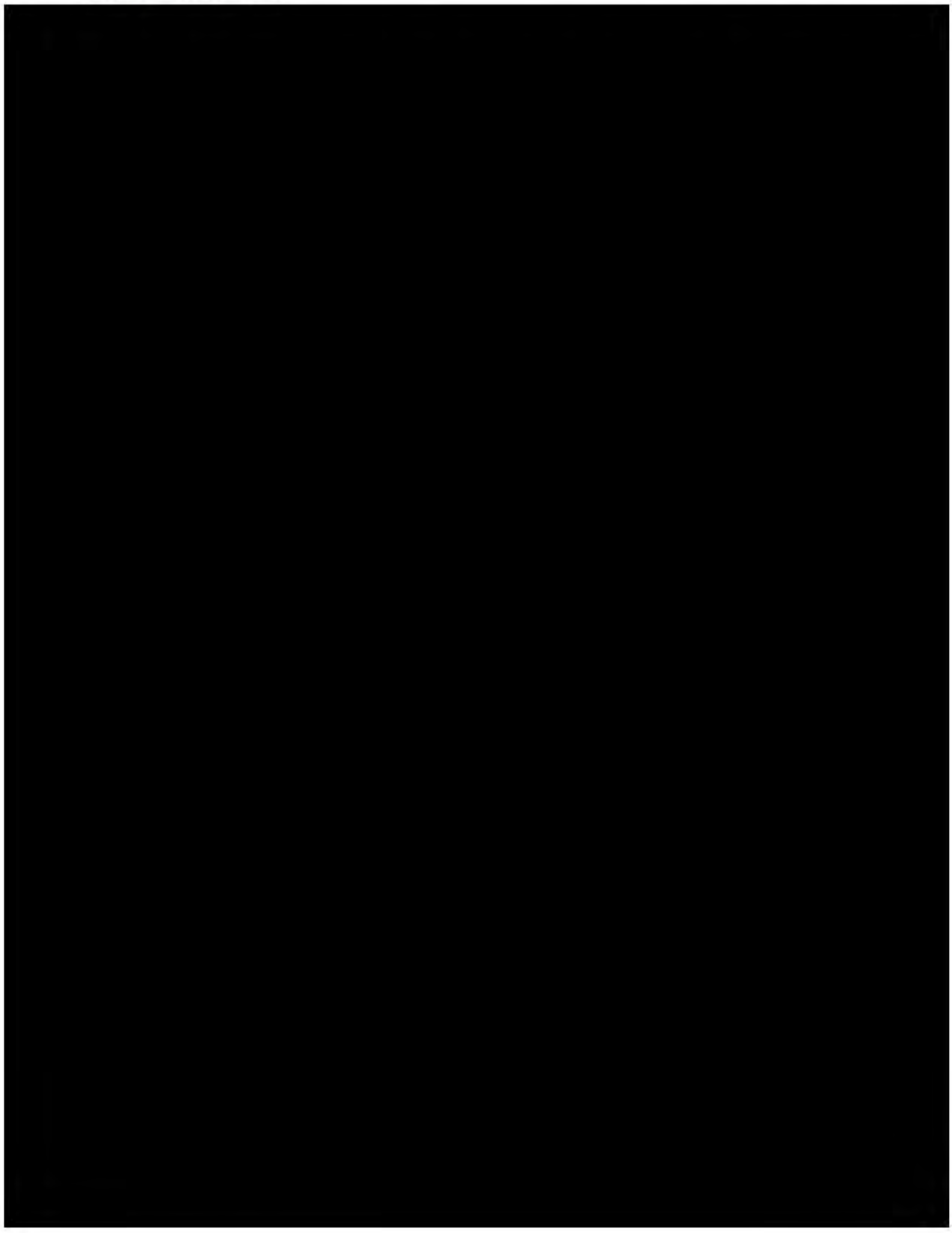


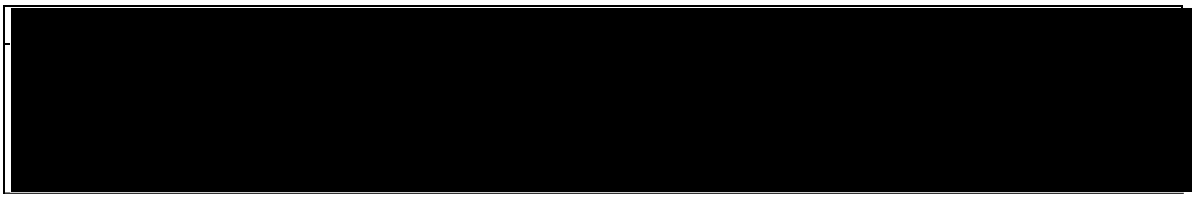
FIGURE III.6.1: WASTE OIL GENERATION PROCESS

This waste stream is generated from machining operations. Over time coolant from machining operators must be replaced often due to contamination from tramp oil and other impurities that may impact the coolant over time.

SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure: Engineering is continuously monitoring and switching to new coolant types as appropriate. Oil skimming, and coolant filtration is also used to extend the life of the coolant. These changes are anticipated to reduce coolant waste generation.

6.2 Electrical, Mechanical and Machining Equipment Oil Replacement and Maintenance





7. CWC 222: Oil/Water Separator Sludge

[redacted]

7.1 Facilities Maintenance program

[redacted]

8. CWC 223 Wastes – Unspecified Oil Containing Waste

Site	2022 quantity (lbs.)
LLNL	32,076

[redacted]

8.1 Large Capacitors, non-PCB

Site	2022 quantity (lbs.)
LLNL	32,076

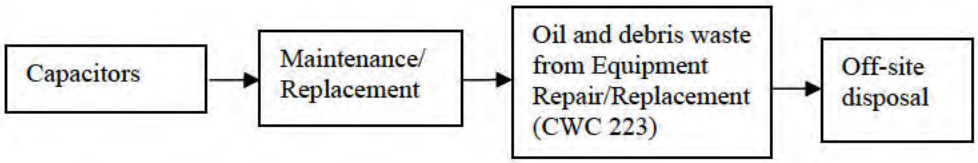
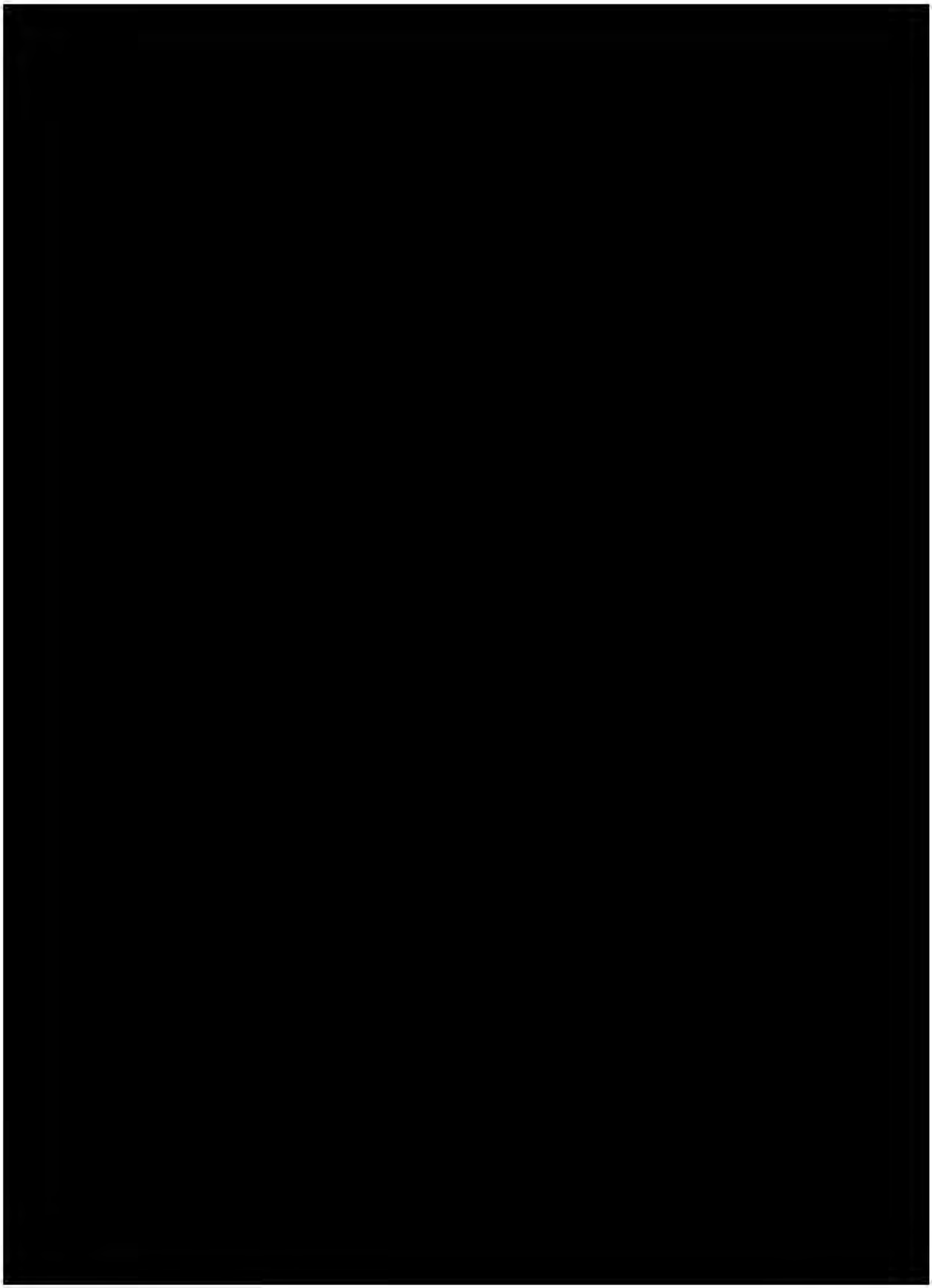


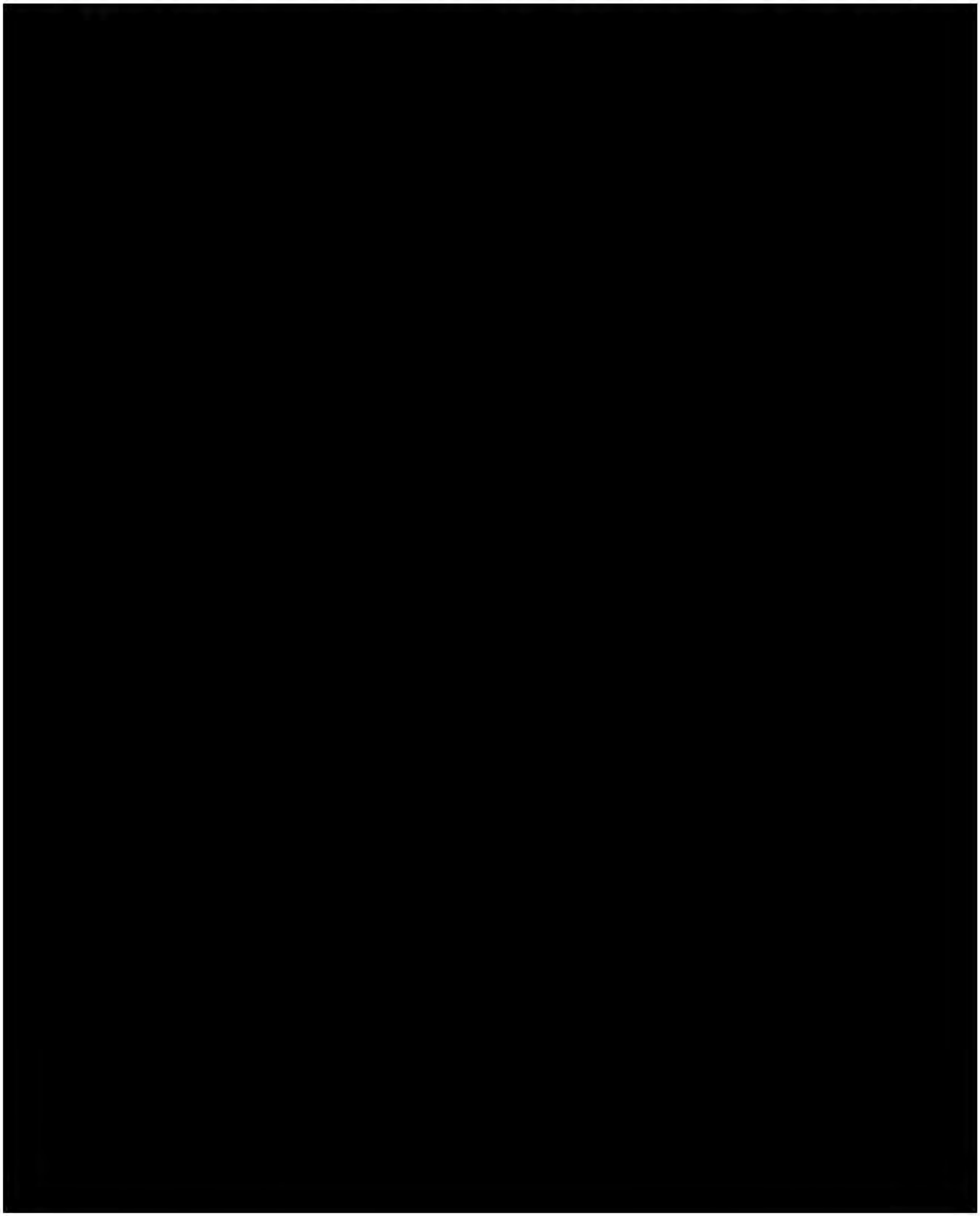
FIGURE III.8.2: CAPACITOR MAINTENANCE AND REPLACEMENT

Capacitors throughout the laboratory are routinely replaced once they reach their end-of-life. Most of the non-PCB being discarded originated from building 174. The capacitors were already out-of-service, but being retained in case they could be used elsewhere.

SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure: LLNL continues to replace capacitors with more efficient models when the existing item reaches its end of life or is no longer needed. New capacitors often represent a reduced risk of failure and need for replacement.

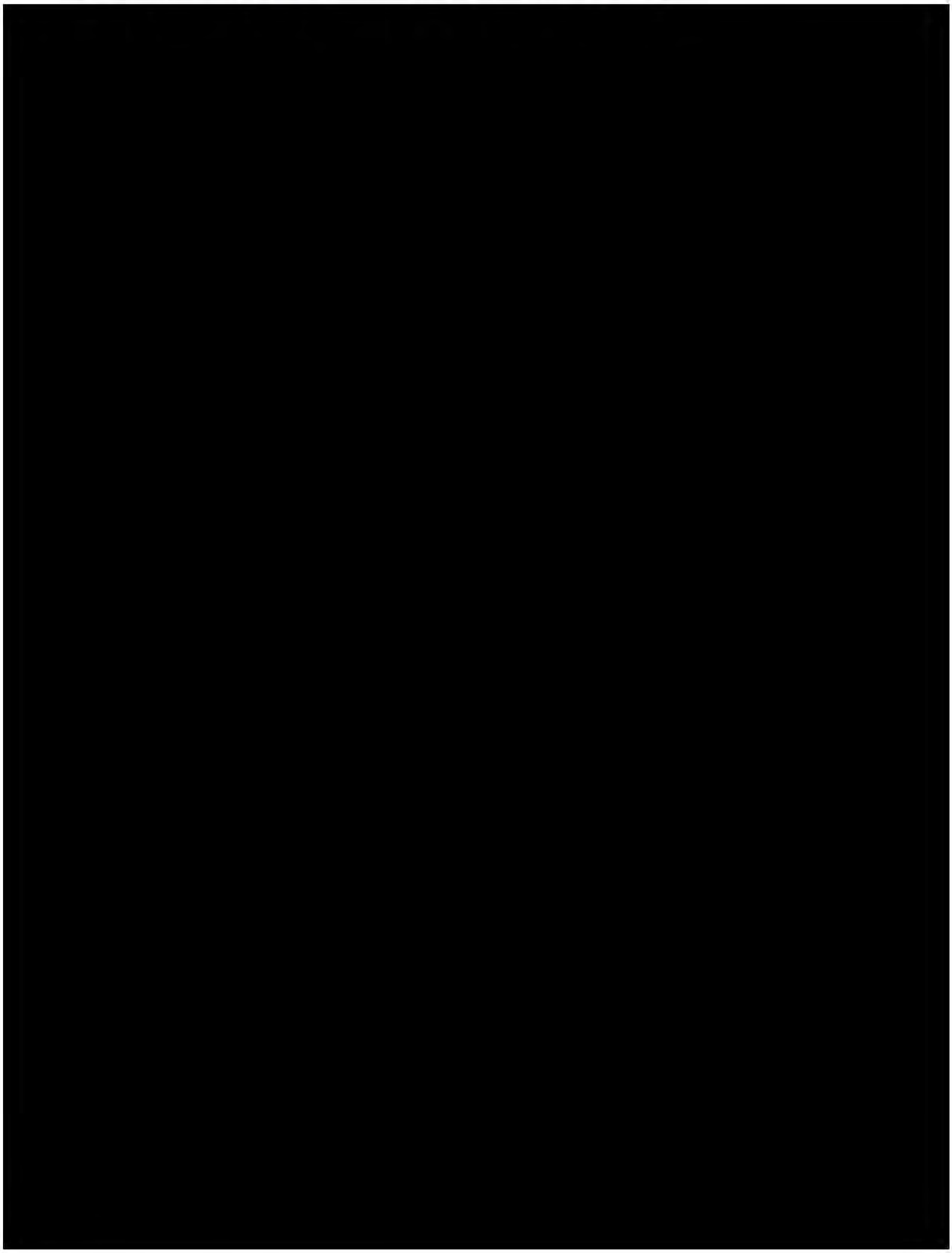


8.3 Spent Machine Coolant (Cutting Fluid) from Machining Operations

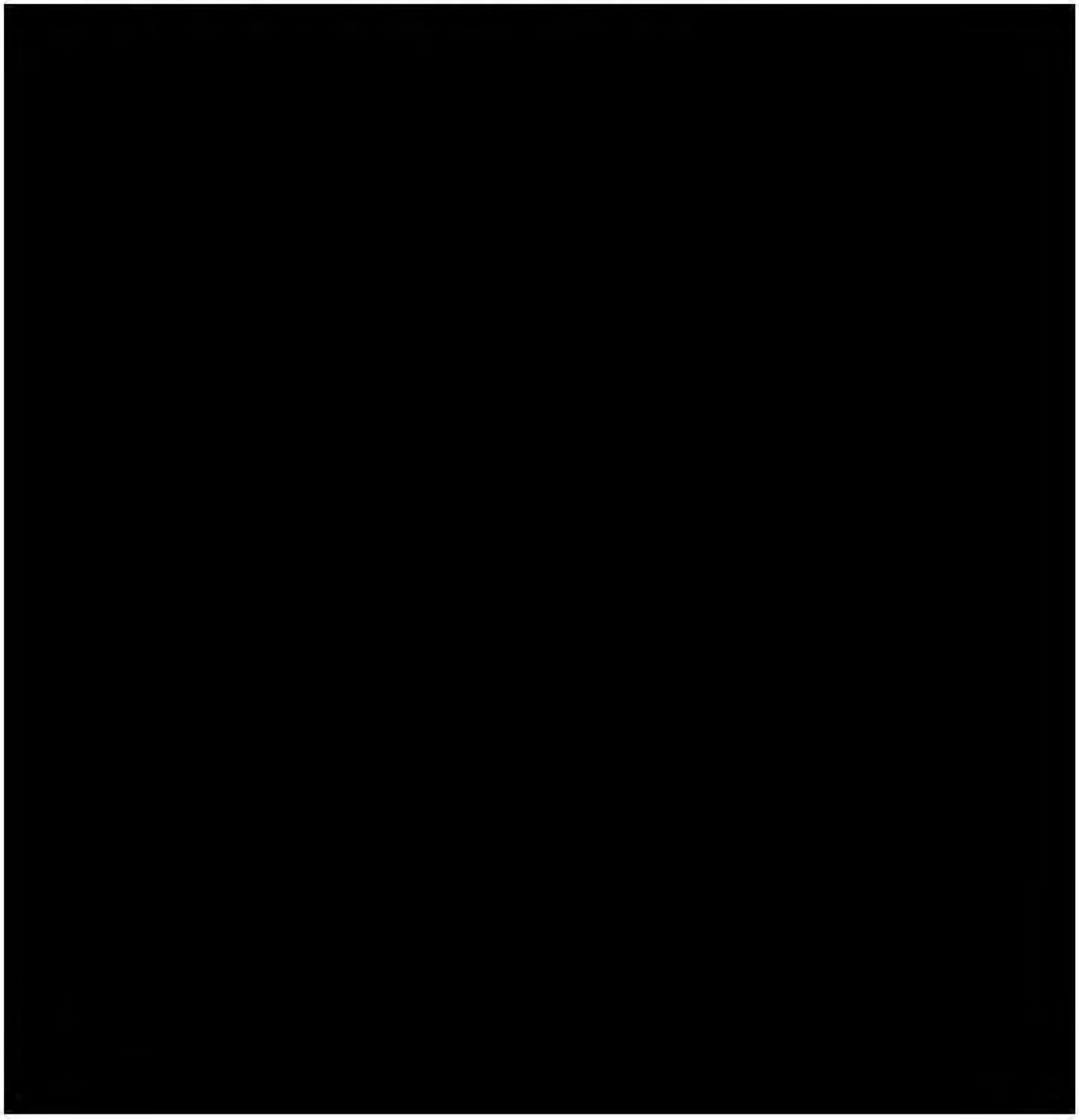


8.4 Oil/Cutting Fluid Water Waste from Maintenance/Repair of Building and Electrical Equipment

8.5 Building 914 Machine Shop coolant/oil/water



8.6 B77 Equipment Parts and Machinery Production



9. CWC 331: Off-specification, Aged or Surplus Organics

[redacted]

9.1 Off-specification, Aged or Surplus Organics from Multiple Operations

[redacted]

10. CWC 352 Wastes – Other Organic Solid

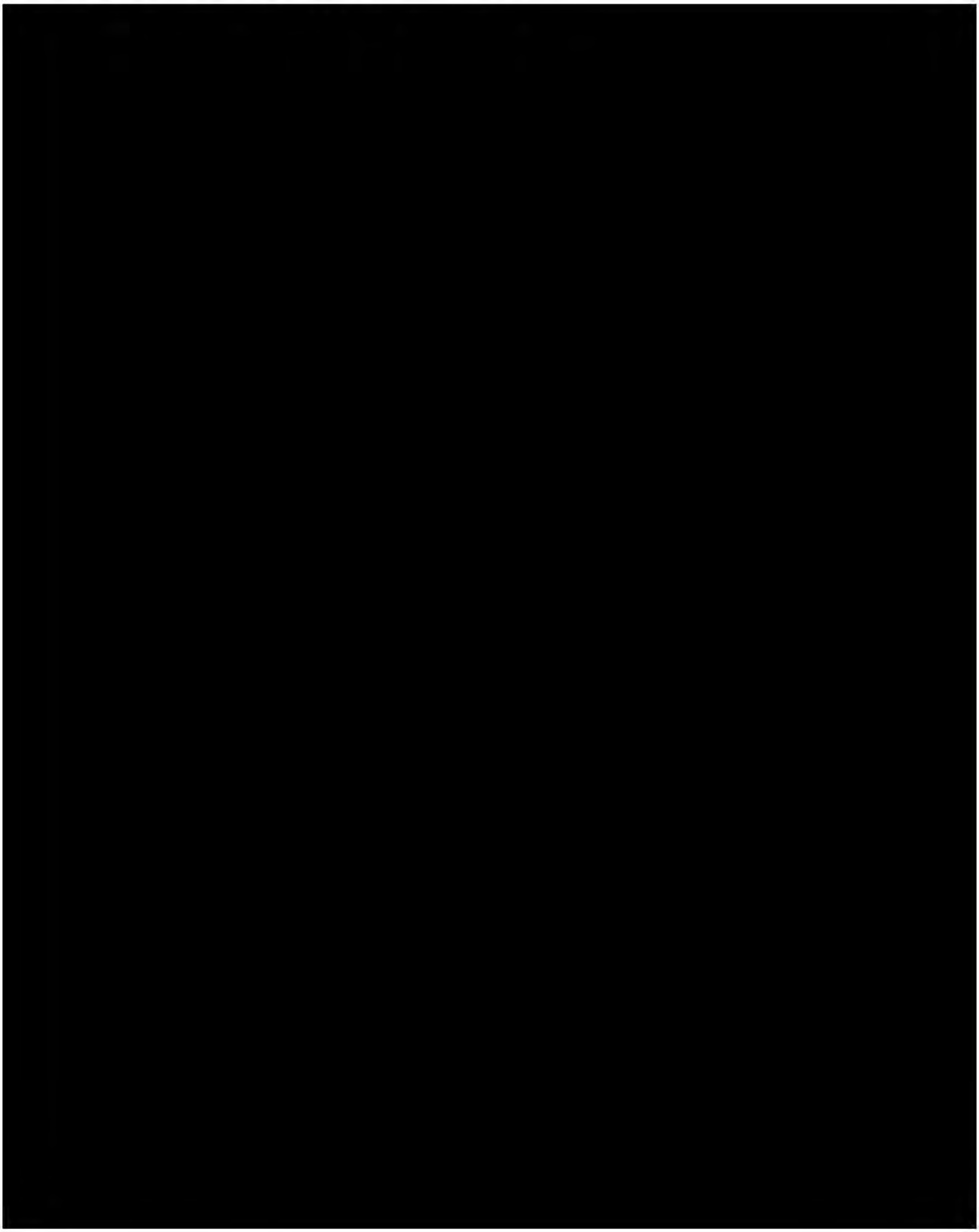
[redacted]

10.1 Oil and Solvent Debris

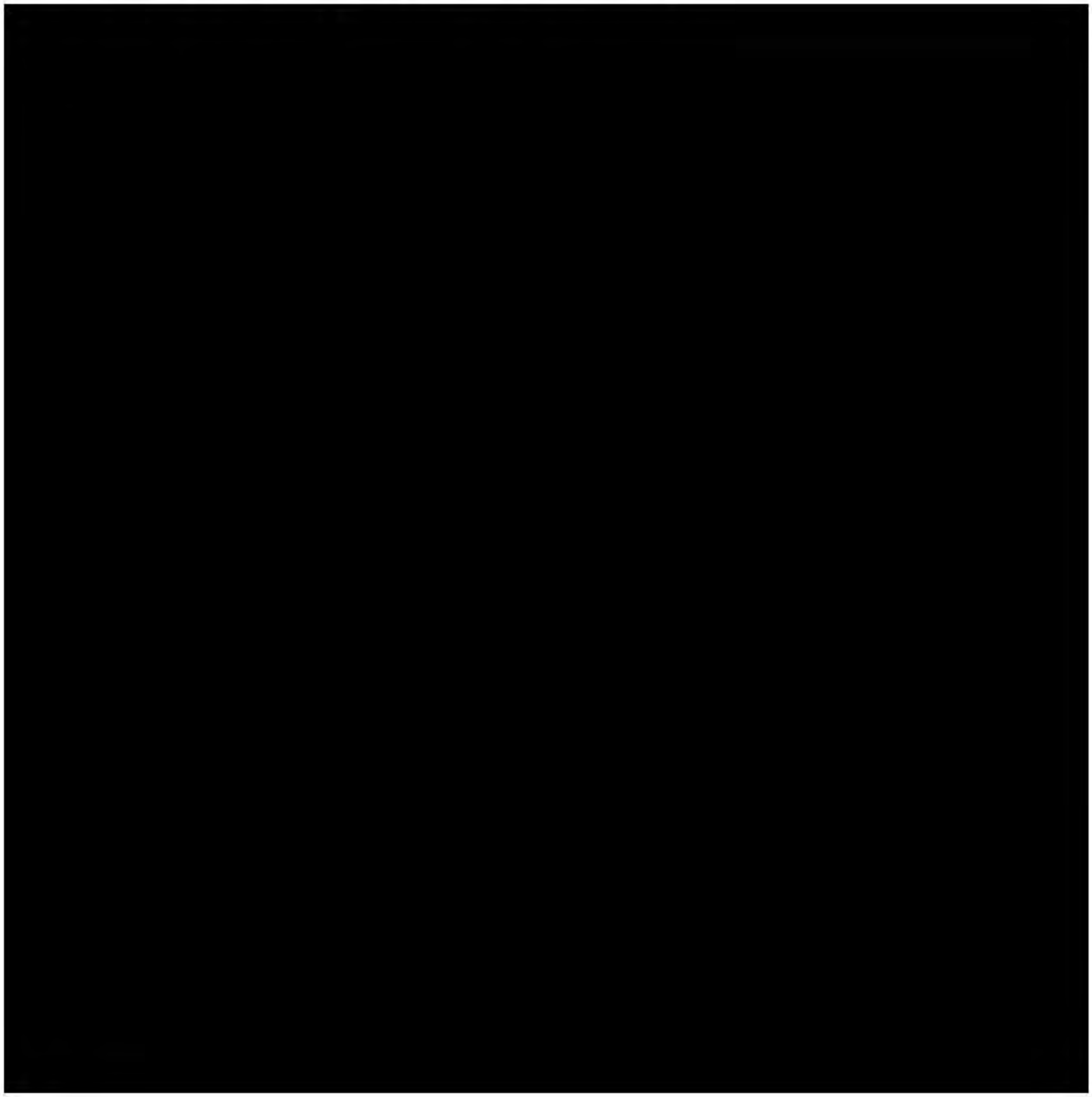
[redacted]

10.2 Contaminated Laboratory and shop trash

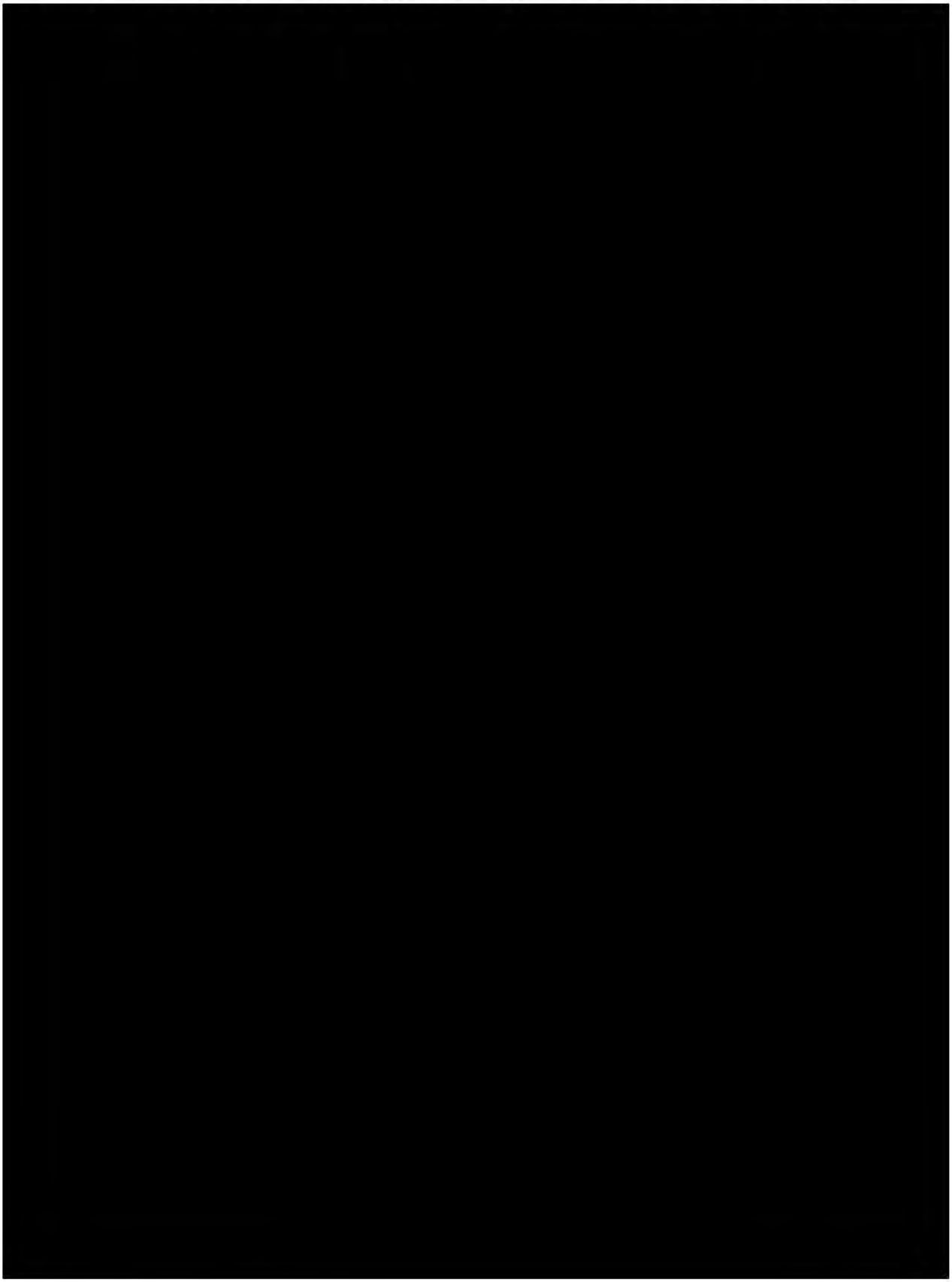
11. CWC 551: Laboratory Waste Chemicals



11.2 Laboratory Process Waste Chemicals



12. CWC 741: Liquids with Halogenated Organic Compounds (> 1000 mg/l)



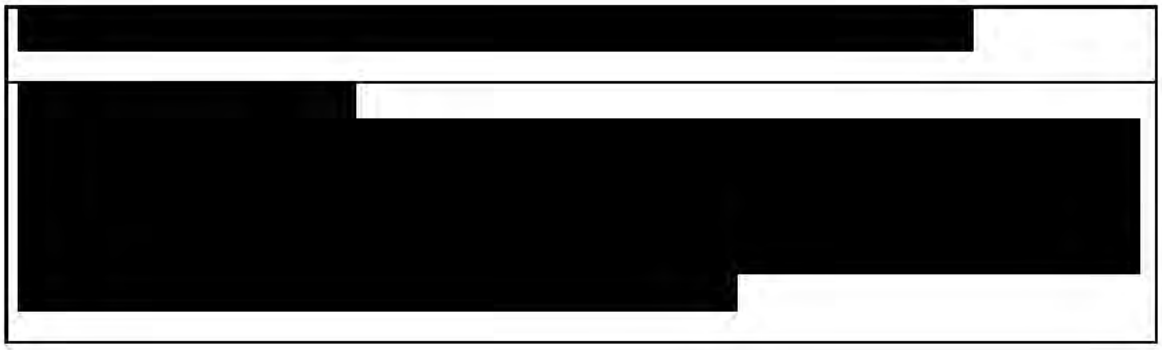
[redacted]

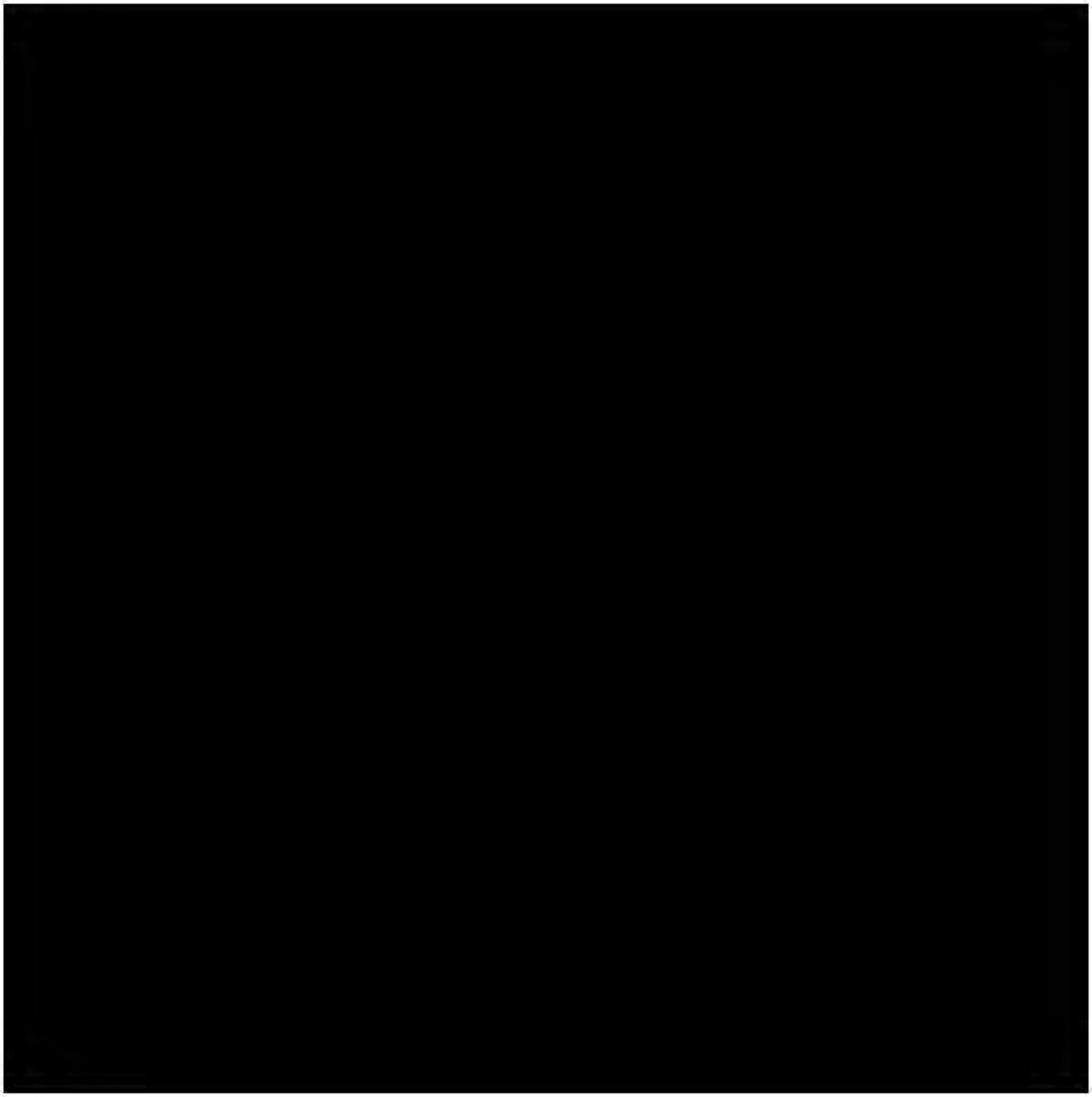
12.2 Halogenated Solvent Waste from Research Activities

[redacted]

13. CWC 792 - Liquids with pH≤2 with metals

[redacted]





IV. CATEGORY C WASTE STREAMS

Category C waste streams are defined as "Wastes that are classified as extremely hazardous wastes."

1. CWC 135: Unspecified aqueous solution

Site	2022 quantity (lbs.)
LLNL	43

1.1 B153 HF (49%) solution.

Site	2022 quantity (lbs.)
LLNL	43

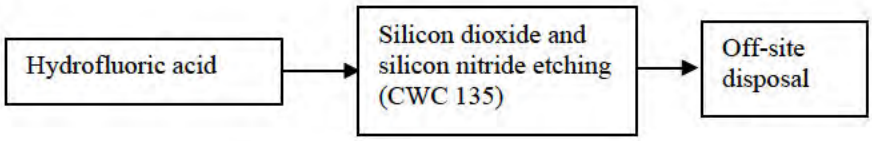


FIGURE IV.1.1: GLASS ETCHING process

This waste stream is generated in building 153 from glass etching and other routine laboratory operations.

SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure: LLNL plans to continue existing best management practices to minimize this waste stream. No other source reduction/pollution prevention measures are planned.

2. CWC 141: Off-specification, Aged, or Surplus Inorganics

Site	2022 quantity (lbs.)
LLNL	53

2.1 B151 accumulation of small amounts various liquids and solids

Site	2022 quantity (lbs.)
LLNL	53

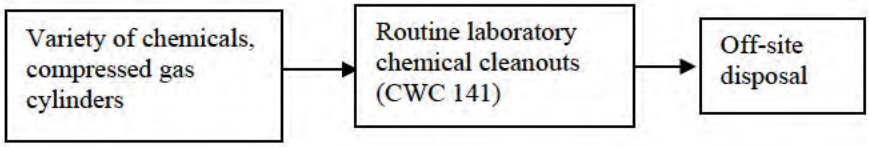


FIGURE IV.2.1: ROUTINE LABORATORY CLEANOUT PROCESS

This waste consisted of unused product, and small amounts of various liquids and solids generated through regular laboratory operations, clean-out and/or remodeling activities. The waste stream consists of labpacks from both Site 200 and Site 300.

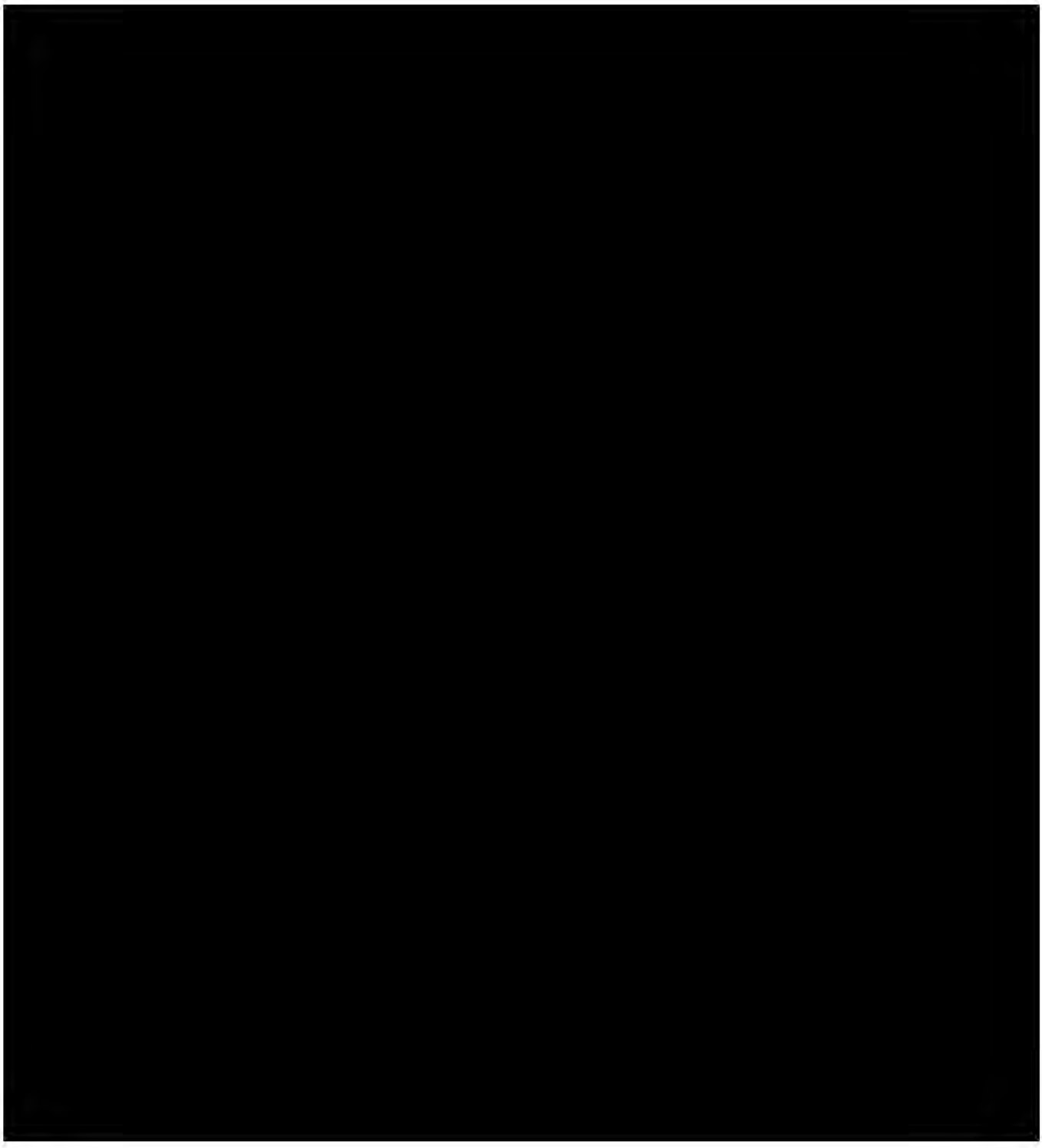
SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure: LLNL will continue to educate researchers and operations personnel on purchases of only those chemicals needed for current research, and will also continue to encourage researchers to substitute less hazardous chemicals whenever possible.

3. CWC 181: Other Inorganic Solid

[redacted]

3.1 Spent Cyanide Filters from Metal Finishing Operations

[redacted]



4. CWC 342: Organic liquids with metals

Site	2022 quantity (lbs.)
LLNL	80

4.1 Labpacks of water reactives

Site	2022 quantity (lbs.)
LLNL	80

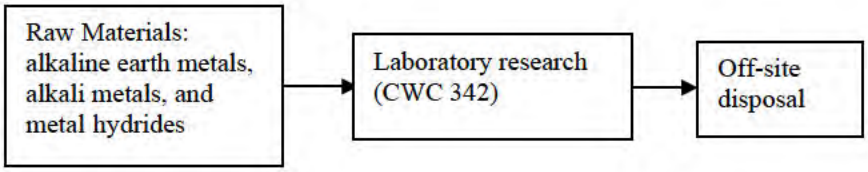


FIGURE IV.4.1: REACTIVE METAL WASTE GENERATION PROCESS

Labpacks of water reactive solids mostly comprised of alkaline earth metals, alkali metals, and metal hydrides. These materials are studied for numerous reasons and can be used as conductors, reducing agents, ingredients in batteries, and lubricating greases.

SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure: LLNL will continue to educate researchers and operations personnel on purchases of only those chemicals needed for current research and promote the use of less hazardous chemicals whenever possible.

5. CWC 551: Laboratory waste chemicals

[redacted]

5.1 Battery cell and electrolyte research

[redacted]

6. CWC 725: Liquids with mercury > 20 mg/l

Site	2022 quantity (lbs.)
LLNL	220

6.1 Lab packs containing elemental mercury

Site	2022 quantity (lbs.)
LLNL	220

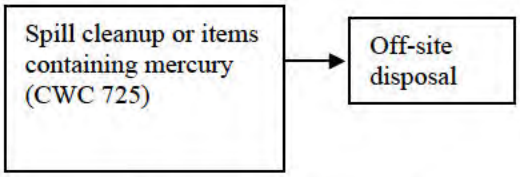
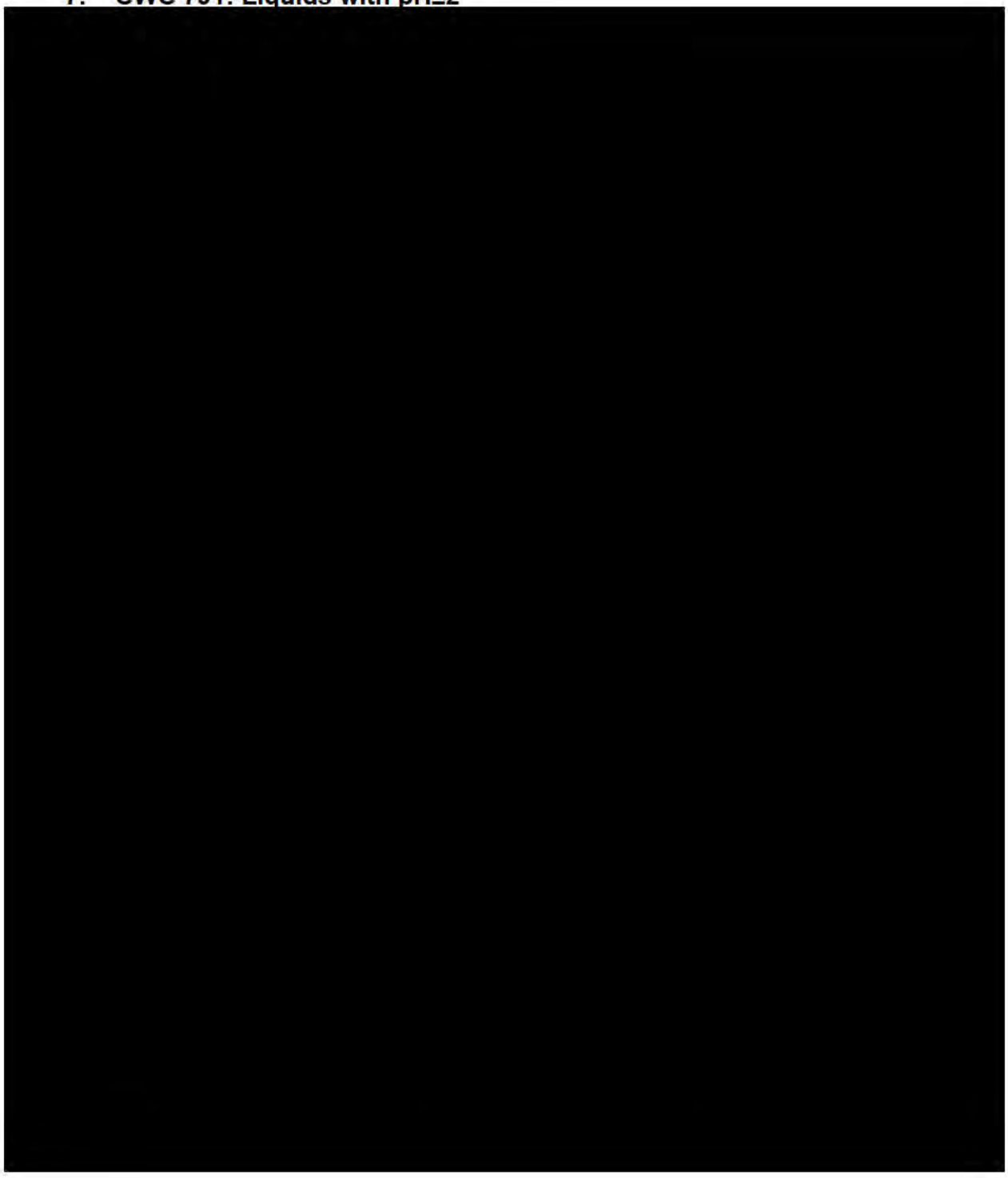


FIGURE IV.6.1: MERCURY CONTAINING WASTE

Labpacks containing elemental mercury. This waste may be generated as the result of spill cleanup from damaged mercury containing items, or elemental mercury that is no longer wanted or that is being replaced with a mercury free alternative.

SOURCE REDUCTION/POLLUTION PREVENTION EVALUATION
Description of Measure: LLNL will continue to educate researchers and operations personnel on purchases of only those chemicals needed for current research and promote the use of less hazardous chemicals whenever possible.

7. CWC 791: Liquids with pH≤2



V. CERTIFICATION STATEMENTS

Technical Certification

I certify this Source Reduction Evaluation, Review and Plan meets all of the following requirements:

1. The review and plan address each hazardous waste stream identified pursuant to section 67100.5(h), Title 22 of the California Code of Regulations.
2. The review and plan address the source reduction approaches specified in section 67100.5(j), Title 22 of the California Code of Regulations.
3. The review and plan clearly set forth the measures to be taken with respect to each hazardous waste stream for which source reduction has been found to be technically feasible and economically practicable, with timetables for making reasonable and measurable progress, and documents the rationale for rejecting available source reduction measures.
4. The review and plan does not merely shift hazardous waste from one environmental medium to another environmental medium by increasing emissions or discharges to air, water, or land.

Karin King
Name

Karin King Digitally signed by Karin King Date: 2023.08.30 16:59:31 -07'00'
Signature

Sr. Technical Advisor
Title

08 / 30 / 2023
Mo / Day / Year

Financial Certification

"I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for making false statements or representations to the Department, including the possibility of fines for criminal violations."

Karin King
Name

Karin King Digitally signed by Karin King Date: 2023.08.30 17:01:10 -07'00'
Signature

Sr. Technical Advisor
Title

08 / 30 / 2023
Mo / Day / Year

Hazardous Waste Management Performance Report

September 1, 2023

U.S. Department of Energy
Livermore Field Office
Livermore, California

Hazardous Waste Management Performance Report

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V. Certification Statements **1**

I. Introduction

The Department of Energy (DOE) is the owner and part operator of multiple facilities in Northern California. The facilities include those located at Lawrence Livermore National Laboratory (LLNL), Lawrence Berkeley National Laboratory (LBNL), Sandia National Laboratories/California (SNL/CA) and SLAC National Accelerator Laboratory (SLAC) among other sites. Through their operations, the facilities generate hazardous waste and, thereby, are subject to the requirements of Chapter 31 of the Title 22 California Code of Regulations, Waste Minimization. The Northern California sites are primarily research and development facilities in the areas relating to national security, high-energy physics, engineering, bioscience and environmental health and safety disciplines.

As mentioned above, these DOE facilities are primarily research and development facilities. The hazardous wastes generated may be associated with operations that range in size from small, bench scale R&D to major maintenance and operations waste streams. Therefore, even though this document breaks down the waste streams based on California Waste Codes (CWC), the quantities of waste within one waste code category could be from many different locations and dissimilar processes. Because of the nature of the work at the sites, it is not economically feasible to try to implement source reduction measures for every process that generates a portion of the waste stream. This document identifies the processes that generate the major portion of the waste within an identified major waste stream and reports on progress made toward source reduction. In accomplishing the mission, it is DOE's goal to eliminate waste generation and emissions giving priority to those that may present the greatest risk to human health and the environment.
Note: The COVID-19 pandemic introduced a variability to site activity and waste generation that is reflected in the data below.

The following is a brief description of the sites subject to this document.

Lawrence Livermore National Laboratory: LLNL is managed and operated by the Lawrence Livermore National Security (LLNS) for the DOE, National Nuclear Security Administration (NNSA). LLNL includes two sites, Livermore Site (Site 200) and Site 300. The Livermore Site is located in Livermore and covers approximately one square mile in Alameda County. Site 300 is approximately ten square miles and is near the City of Tracy in San Joaquin County and Alameda County. LLNL was established in 1952 and employs approximately 9,000 employees and contractors. LLNL is a large quantity hazardous waste generator and operates hazardous waste treatment, storage and disposal facilities under hazardous waste treatment and storage permits at the Livermore site and site 300. LLNL also operates a hazardous waste treatment unit at Livermore site under the California Tiered Permit Program.

Contact Person: Jonathan Blazo, Environmental Analyst
Phone Number: (925) 724-7602

EPA ID # Livermore Site: CA2890012584

Site 300: CA2890090002

The address is:
Lawrence Livermore National Laboratory (Main Site)
7000 East Avenue L-626
Livermore, CA 94550-9234
SIC Code: 8733, 9611
NAICS: 54171, 928110, 541380

Lawrence Livermore National Laboratory Site 300
Corral Hollow Road
Tracy, CA 95376
SIC: 8733, 9611
NAICS: 92811, 54171, 541380, 928110

II. Category A

1. CWC 132: Aqueous solution with metals

Site	2018 Quantity (lb)	2022 Quantity (lb)
[redacted]		
LLNL	258,464	217,805

[redacted]

[redacted]

For LLNL

1.2 Tank Farm Aqueous Solution Treatment

LLNL generated aqueous solution from its wastewater treatment operation at Building 695 located at the Decontamination and Waste Treatment Facility (DWTF). Aqueous waste generated by programmatic activities is sent to the DWTF for processing.

The volume of waste received into the Tank Farm for processing is dependent on the volume of programmatic wastes generated. The decrease may be the result of one or a combination of the following: 1) 2018 may have included all aqueous waste going to the tank farm (including non-hazardous waste), 2) a natural fluctuation in programmatic waste generation that is eligible for treatment at 695, and 3) A reduction in the overclassification of non-hazardous waste as hazardous waste. Some non-hazardous waste may be eligible for direct discharge to the POTW. LLNL is continuously evaluated waste streams that are treated and identifying those that are not hazardous wastes and can be discharged to the POTW. Additionally, by identifying a greater number of waste streams that are eligible for treatment helps reduce the total amount of hazardous waste that must be shipped to an off-site TSDF.

2. CWC 791: Liquids with pH≤2

[redacted]

For LBNL

[redacted]

III. Category B

1. CWC 122: Alkaline Solution without metals (pH>12.5)

Site	2018 Quantity (lb)	2022 Quantity (lb)
LLNL	11,755	17,708
[redacted]		

For LLNL

1.1 NIF B391 Grating Debris Shield (GDS) Optics Processing and NIF B392 Aqueous Basic Solution Rinse from Optics Cleaning Operation

For B391, this process generates two CWC 122 waste streams. First, the optics are prepared for etching by applying a photoresist coating, which is developed using an alkaline solution. An acid is then used to etch the pattern into the optics. The photoresist film is stripped from the optics using an NaOH solution and the generated rinse water is neutralized in an automated batch neutralizer. Spent developer and NaOH solution is sent for off-site disposal.

For NIF B392 Aqueous Basic Solution Rinse from Optics Cleaning Operation
This process removes surface contaminants from etched optics using an acid cleaning station. Optics to be cleaned are transferred to the station and an acid solution is introduced into the process tank. The liquid is circulated to clean the optics and the acid is then drained. NaOH is added to the tank to neutralize any remaining acid, the optics are rinsed and the solution is drained. Finally, an alkaline developer solution is added and the optics are rinsed again. The aqueous basic solution from the neutralization and developer steps is sampled and either sent out as hazardous waste or discharged to sanitary sewer, depending on the analytical results and environmental approvals.

These processes have been optimized to generate the least waste possible. Facility reuses hydroxide based rinses multiple times prior to disposal. The pH of the waste is closely monitored and disposed of as non-hazardous waste when permitted. The increase reflects increased programmatic work.

[redacted]

[redacted]

2. CWC 132: Aqueous solution with metals

Site	2018 Quantity (lb)	2022 Quantity (lb)
LLNL	24,571	43,420

2.1 Engineering (321A Main Bay) Coolant from Machining Operations

Over time coolant from machining operators must be replaced often due to contamination from tramp oil and other impurities that may impact the coolant over time. Engineering is continuously monitoring and switching to new coolant types as appropriate. Oil skimming, and coolant filtration is also used to extend the life of the coolant. These changes reduce coolant waste generation rate. Despite the reduced coolant waste generation rate, increased programmatic work resulted in the total waste to be larger than the amount generated in 2018.

3. CWC 134: Aqueous Solution with Total Organic Residues Less Than 10 Percent

Site	2018 Quantity (lb)	2022 Quantity (lb)
LLNL	852,409	639,964

3.1 B322 Plating Shop Rinse Water Recycling

Water generated from the rinsing of parts in Building 332 plating shop is typically contaminated with organic chemicals and hazardous metals used in plating operations. While the shop minimizes wastewater generation by using spray rinses rather than drag out rinsing, nearly all the water in the rinse-water is recycled using filtration, pH adjustment, and evaporation processes that are hard-plumbed into the shop's rinsewater collection and treatment system. Water processed in the evaporator is then reused as rinse water. Because this single waste stream is so large, it was excluded when calculating LLNL's Category B wastes so as not to dwarf the other waste streams of significance. The volume of this waste is dependent on workload and can vary from year to year.

4. CWC 135: Unspecified Aqueous Solution

Site	2018 Quantity (lb)	2022 Quantity (lb)
[redacted]		
LLNL	11,408	7,180

[redacted]

For LLNL

4.3 B391 HF etching solution

This waste stream is generated from NIF optics processing operations. These processes have been optimized to generate the minimal amount of waste while producing the high quality optics required. For example, optics are batched to minimize solution change out between types, and baths are reused before spent etchant must be discarded and replaced.

NIF's optics repair process is extending the life of the optics resulting in less operations to replace optics and the chemicals associated for the processing.

5. CWC 181: Other Inorganic Solid Waste

Site	2018 Quantity (lb)	2022 Quantity (lb)
LLNL	22,026	20,804
[redacted]		

For LLNL

5.1 WCI (B191) Firing Tank/Chamber Debris

This waste stream is generated from WCI experimental explosive testing in firing tanks and chambers at the High Explosives Applications Facility (HEAF). These tests conducted under well-controlled conditions with complete dynamic diagnostics are used to characterize and study the detonation and thermal ignition of explosive assemblies. Residual explosive wastes are removed and either sent to Explosive Waste Storage Facility and/or treated at the Explosive Waste Treatment Facility (EWTF). Expended explosive wastes containing metal and other inorganic solid debris are sent off-site for disposal.

While there was an overall decrease of 6% of the "Other Inorganic Solid Waste" category, the firing tank/chamber debris increased as a result of increased programmatic work.

[redacted]

6. CWC 221: Waste Oil and Mixed Oil

Site	2018 Quantity (lb)	2022 Quantity (lb)
[redacted]		
LLNL	11,762	14,866

[redacted]

For LLNL

6.3 WCI (B801) Waste water and oil

This waste stream was previously generated from operation of the WCI Flash X-Ray (FXR), trench system, containment vault and B801A tank at B801. The FXR area trench system received residual oil from the FXR during maintenance and operations, minor amounts of cooling water from FRX operation during start-up, and periodically, wash water used to clean out the trench system. The trench system would drain into B801A

tank. Incidental amounts of rainwater previously entered the containment vault where it was also directed into the B801A tank.

Adjustments have since been made to avoid oil intrusion into the water waste stream. Liquid waste stream is now being managed as non-hazardous waste.

7. CWC 223: Unspecified Oil-Containing Waste

Site	2018 Quantity (lb)	2022 Quantity (lb)
[redacted]		
LLNL	16,827	32,076
[redacted]		

[redacted]

For LLNL

7.2 Large Capacitors, non-PCB

LLNL Continues to replace capacitors with more efficient models that require less maintenance and use more environmentally friendly oils. Episodic replacement of capacitors occurs across the sites and therefore the volume of waste generated fluctuates year by year.

[redacted]

8. CWC 343: Unspecified organic liquid mixtures

Site	2018 Quantity (lb)	2022 Quantity (lb)
LLNL	9,154	12,454

For LLNL

8.1 Used Glycerine from Machine Draining

This waste stream is generated from S&T explosives press operations. An isostatic press is used to form mock explosives, explosives or inert material into solid billets using glycerine as the pressurizing medium. The glycerine is continually reused for subsequent pressing operations with exception of glycerin that is drained from the press when maintenance is required or when glycerine has been contaminated and not fit for reuse.

While the overall machining related waste streams increased as a result of greater production, glycerine waste generation is sporadic and rarely generated due to operation and maintenance than increased life span of the fluid. No glycerine was drained from the machining operations this reporting year.

9. CWC 352: Other Organic Solids

Site	2018 Quantity (lb)	2022 Quantity (lb)
[redacted]		
LLNL	10,234	11,145

[redacted]

For LLNL

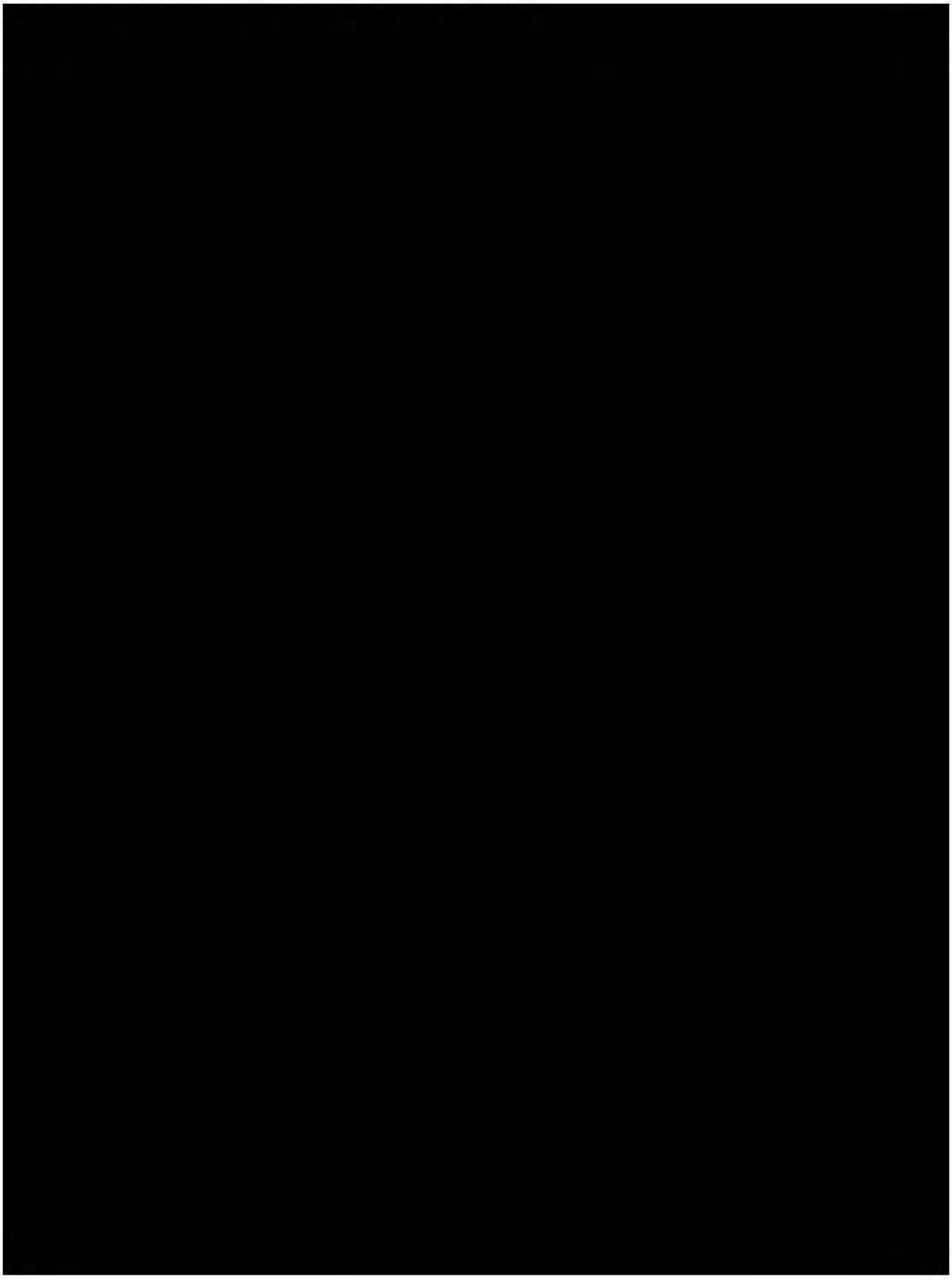
9.3 S&T (Mag38) Energetic Material

Excess energetic material that is no longer needed for further testing and evaluation is mainly treated at LLNL's Explosive Waste Treatment Facility (EWTF). Waste has only been stored in Magazine 38 during a 1-time effort in 2018 to help manage large volumes

of explosive waste that the treatment units were not able to promptly handle at the time. No hazardous waste has since been stored or managed in Magazine 38.

“Other Organic Solids” waste stream increased as a result of greater on-site explosives research activities that generates this hazardous waste stream consisting of various forms of explosive waste and contaminated lab trash.

10. CWC 551: Laboratory Waste Chemicals



[redacted]

11. CWC 741: Liquids with Halogenated Organic Compounds (≥ 1000 mg/l)

12. CWC 751: Solids or Sludges with Halogenated Organic Compounds ≥1,000 mg/kg

Site	2018 Quantity (lb)	2022 Quantity (lb)
LLNL	8,990	2,831

12.1 B438 Granular Activated Carbon

Contaminated ground water is pumped from wells throughout the site as part of ongoing environmental restoration efforts. Air strippers bubble air through grates as the water flows through to remove halogenated contaminants, such as VOCs, which are trapped in the granular activated carbon (GAC) filters through carbon adsorption. Both the air and water effluents from this process are monitored and tested regularly.

To minimize waste and extend the useful life of the filters, they are only changed out when the analytical indicates they reach saturation. Granular activated carbon (GAC) waste generation totaled approximately 8205 lbs in 2022, with only 1,714 lbs specifically generated from B438. Generally, these filters are replaced when they reach saturation. Filters that do not contain hazardous waste or meet hazardous waste criteria will be managed as non-hazardous waste.

13. CWC 792: Liquids With pH≤2 With Metals

IV. Category C

1. CWC 135: Unspecified Aqueous Solution

Site	2018 Quantity (lb)	2022 Quantity (lb)
LLNL	34	55

1.1 B153 HF (49%) Solution

This waste stream is generated from routine lab operations and is disposed of off-site. This waste may vary year to year depending on lab operations and need for an etchant.

2. CWC 141: Off-specification, Aged, or Surplus Inorganics

Site	2018 Quantity (lb)	2022 Quantity (lb)
LLNL	124	90

2.1 B151 accumulation of small amounts various liquids and solids

B151 accumulation of small amounts various liquids and solids from laboratory clean out/remodeling that occurred in four laboratories during 2018 (15 lbs).
B329 excess/unused product (compressed gas cylinders) (109 lbs).

While similar lab activities occurred in 2022, generating 90 lbs of CWC 141, these activities in B151 have not been performed since 2018.

3. CWC 181: Other inorganic solid waste

4. CWC 791: Liquids with pH≤2

Site	2018 Quantity (lb)	2022 Quantity (lb)
LLNL	73	129

4.1 B235 Aqueous and Acidic Liquids from Electrochemical Experiments

This waste was generated from electrolyte mixtures needed for electrochemical experiments focused on flow-through electrodes for energy applications (fuel cells, redox flow batteries). In 2018 and 2022, 37 lbs and 89 lbs of this waste stream were generated respectively.

This waste varies depending on the activity level of electrochemical experiments.

4.2 B153 Buffered Oxide Etch Solution

This waste is generated from glass and silica etching activities. An aqueous acid solution consisting of an ammonium fluoride buffer and hydrofluoric acid is used for fabrication of Microfluidic devices for mechanical and medical applications.

This waste may vary year to year depending on lab operations and need for an etchant.

V. CERTIFICATION STATEMENTS

Technical Certification

I certify this Hazardous Waste Management Performance Report identifies factors that affect the generation and on-site and offsite management of hazardous wastes and summarizes the effect of those factors on the generation and on-site and off-site management of hazardous wastes.

Karin King
Name

Karin King Digitally signed by Karin King Date: 2023.08.30 17:04:50 -07'00'
Signature

Sr. Technical Advisor
Title

08 / 30 / 2023
Mo / Day / Year

Financial Certification

I certify that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or the persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate and complete. I am aware that there are significant penalties for making false statements or representations to the Department, including the possibility of fines for criminal violations.

Karin King
Name

Karin King Digitally signed by Karin King Date: 2023.08.30 17:05:11 -07'00'
Signature

Sr. Technical Advisor
Title

08 / 30 / 2023
Mo / Day / Year

SUMMARY PROGRESS REPORT

TABLE 1: GENERAL INFORMATION

DATE: 9/1/2023

A hazardous waste generator subject to SB 14, is required to complete Tables 1 and 2 to the Department of Toxic Substances Control by September 1, 2023. The generator is to submit only one Table 1. However, the generator may need to submit more than one Table 2, one for each reportable waste stream.

See Summary Progress Report publication or SB 14 Guidance Manual Chapter 7, for assistance.

(1) NAME OF GENERATOR, FACILITY, or BUSINESS Department of Energy, Lawrence Livermore National Laboratory	X (1a) **MULTI-SITE**? (If this is a multi-site business, please check this box and list the primary EPA ID number under box #2 and add the remaining EPA ID numbers under "COMMENTS" below. Combine data for similar wastes from the multiple sites for the remainder of the Summary Progress Report).

(2) EPA ID NO.	(3) SIC CODE	(4) NAICS CODE
CA2890012584	9611 & 8733	54171, 928110, 541380

(5) STREET ADDRESS	(6) CITY	(7) COUNTY
7000 East Avenue	Livermore	Alameda

(8) MAILING ADDRESS	(9) CITY	(10) ZIP CODE
P.O. Box 808	Livermore	94551-9234

(11) CONTACT NAME	(12) CONTACT PHONE
Jonathan Blazo	(925) 724-7602

(13) TYPE OF BUSINESS, OPERATION, or ACTIVITY:

Research and Development government laboratory

(14) SB 14 reportable total quantities of Hazardous Waste Generated at Site, for 2018 and 2022 Reporting Years. Reportable Total Quantities include all hazardous wastes subject to SB 14. Do not include nonroutinely generated, exempted, or secondary wastes. Exempted and nonroutinely generated wastes are listed in Section 67100.2(c), Title 22, California Code of Regulations. Secondary waste is hazardous waste generated as a result of onsite treatment of HAZARDOUS waste.

Obtain information requested below from your 2018 and 2022 Plans or compliance Checklists.	2018	2022
(15) SB 14 hazardous waste processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A*) Total:	258,464 lbs	217,805 lbs
(16) All other SB 14 hazardous waste (Category B*) Total:	979,136 lbs	829870 lbs
(17) All extremely hazardous waste Total:	233 lbs	396 lbs

* Category A was previously referred to as aqueous waste. Category B was previously referred to as nonaqueous waste.

(18) COMMENTS regarding hazardous waste source reduction and recycling activities (add page if needed).

Other organizations in this multi-site report include LLNL Site 300, SLAC, Lawrence Berkeley Laboratory and Sandia National laboratory/California. Separate Table 1s will be prepared for the other laboratories except for LLNL Site 300. LLNL Site 300 EPA ID number is CA2890090002.

Please continue by clicking on the "Table 2" tab below.

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Aqueous Solutions With Reactive Anion with Metals"… This waste stream consists of various compatible aqueous waste streams from generating locations around the laboratory that are eligible for treatment (e.g. pH adjustment, metals removal) in Building 695.	CWC: 132

(23) THIS HAZARDOUS WASTE IS (please check one):

X Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)

_____ Other SB 14 hazardous waste (Category B)

_____ Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2018 Reporting Ye 258,464 pounds

Describe the source reduction measure(s) implemented since 2018 (add page if needed):

This waste stream can vary widely from year to year based on programmatic activities. The decrease waste generation is mainly due to a smaller quantity of waste coming in for treatment and to decrease waste treatment activities at the DWTF.

Estimate when this source reduction measure was implen N/A Month _____ Year

For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea

How much waste was generated in the 2022 Reporting Ye 217,805 pounds

Describe the source reduction measure selected to be implemented by 2026: (add page if neede

The volume of waste received into the Tank Farm for processing is dependent on the volume of programmatic wastes generated. LLNL is continuously evaluated waste streams that are treated and identifying those that are not hazardous wastes and can be discharged to the POTW. Additionally, by identifying a greater number of waste streams that are eligible for treatment helps reduce the total amount of hazardous waste that must be shipped to an off-site TSDF.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year

What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Alkaline Solution without metals (pH>12.5)"… This waste stream is generated from optics that are prepared for etching by applying a photoresist coating, which is developed using an alkaline solution. An acid is then used to etch the pattern into the optics. The photoresist film is stripped from the optics using an NaOH solution and the generated rinse water is neutralized in an automated batch neutralizer.	CWC: 122

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
X	Other SB 14 hazardous waste (Category B)
	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:
How much waste was generated in the 2018 Reporting Ye 11,755 pounds
Describe the source reduction measure(s) implemented since 2018 (add page if needed):

Sodium hydroxide was used for stripping is being reused for all optics processed the same day. Reusing the stripper reduces the NaOH waste generated

Estimate when this source reduction measure was implem N/A Month _____ Year
For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year
Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year
(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea
How much waste was generated in the 2022 Reporting Ye 17,708 pounds
Describe the source reduction measure selected to be implemented by 2026: (add page if needed

The facility reuses hydroxide based rinses multiple times prior to disposal. LLNL plans to continue with current source reduction measures, disposing of the aqueous waste offsite only when analytical results do not allow for discharge to sanitary sewer.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year
What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	
"Aqueous solution with metals"... This waste stream primarily consists of machine lubricant/coolant, plating and floor cleanning waste.	(22) CALIFORNIA WASTE CODE CWC: 132

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
X	Other SB 14 hazardous waste (Category B)
	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2018 Reporting Ye 24,571 pounds

Describe the source reduction measure(s) implemented since 2018 (add page if needed):

This process has been optimized to generate the least waste possible. Facility reuses hydroxide based rinses multiple times prior to disposal. The pH of the waste is closely monitored and disposed of as non-hazardous waste when permitted.

Estimate when this source reduction measure was implen N/A Month _____ Year

For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea

How much waste was generated in the 2022 Reporting Ye 43,420 pounds

Describe the source reduction measure selected to be implemented by 2018: (add page if need

LLNL plans to continue the existing source reduction measures and best management practices.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year

What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Aqueous solution with total organic residues less than 10 percent"... This waste consists primarily of Water generated from the rinsing of parts in plating shop. The waste water is typically contaminated with organic chemicals and hazardous metals used in plating operations.	CWC: 134

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
X	Other SB 14 hazardous waste (Category B)
	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2018 Reporting Ye 639,964 pounds

Describe the source reduction measure(s) implemented since 2018 (add page if needed):

The major generator for this waste stream was the plating shop and the machine shop. The rinse waters generated from the processes are reclaimed using an evaporator unit. This waste varies from year to year based on program activities.

Estimate when this source reduction measure was implen N/A Month _____ Year

For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea

How much waste was generated in the 2022 Reporting Ye 852,409 pounds

Describe the source reduction measure selected to be implemented by 2022: (add page if need

LLNL plans to continue with current best management practices and use the evaporator to reclaim rinse water and return it back to the plating shop for reuse.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year

What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Unspecified Aqueous Solution"... This waste stream is generated from NIF optics processing operations.	CWC: 135

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
X	Other SB 14 hazardous waste (Category B)
	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2018 Reporting Ye 11,408 pounds

Describe the source reduction measure(s) implemented since 2018 (add page if needed):

These processes have been optimized to generate the minimal amount of waste while producing the high quality optics required. Facility reuses hydroxide based rinses multiple times prior to disposal.

Estimate when this source reduction measure was implen N/A Month _____ Year

For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea

How much waste was generated in the 2022 Reporting Ye 7,180 pounds

Describe the source reduction measure selected to be implemented by 2022: (add page if need

LLNL plans to continue existing best management practices to minimize this waste stream. No other source reduction measures are planned at this time.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year

What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Other Inorganic Solid Waste"... This waste stream is generated from WCI experimental explosive testing in firing tanks and chambers at the High Explosives Applications Facility (HEAF). Residual explosive wastes are removed and either sent to Explosive Waste Storage Facility and/or treated at the Explosive Waste Treatment Facility (EWTF).	CWC: 181

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
X	Other SB 14 hazardous waste (Category B)
	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:
How much waste was generated in the 2018 Reporting Ye 22,026 pounds
Describe the source reduction measure(s) implemented since 2018 (add page if needed):

LLNL implements best management practices to minimize this waste stream.

Estimate when this source reduction measure was implem N/A Month _____ Year
For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year
Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea
How much waste was generated in the 2022 Reporting Ye 20,804 pounds
Describe the source reduction measure selected to be implemented by 2022: (add page if neede

LLNL plans to continue existing best management practices to minimize this waste stream. No other source reduction measures are planned at this time.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year
What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Waste Oil and Mixed Oil"... This waste stream is generated from operation of the WCI Flash X-Ray (FXR), trench system, containment vault and B801A tank at B801.	CWC: 221

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
X	Other SB 14 hazardous waste (Category B)
	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2018 Reporting Ye 11,762 pounds

Describe the source reduction measure(s) implemented since 2018 (add page if needed):

The B801A tank and containment vault are currently being upgraded to include improved lid design and other measures to prevent rainwater intrusion.

Estimate when this source reduction measure was implem N/A Month _____ Year

For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea

How much waste was generated in the 2022 Reporting Ye 14,866 pounds

Describe the source reduction measure selected to be implemented by 2022: (add page if neede

LLNL implements best management practices to minimize this waste stream. For B801, adjustments have been made to avoid oil instrusion into the water waste stream. Liquid waste stream is now being managed as non hazardous waste. The increase in quantities is due to increase in programatic work.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year

What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Unspecified oil containing waste".. Used oil from the old transformers is the source of the majority of this waste stream.	CWC: 223

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
X	Other SB 14 hazardous waste (Category B)
	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2022 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2018 Reporting Ye 16,827 pounds

Describe the source reduction measure(s) implemented since 2018 (add page if needed):

LLNL continues to replace transformers with more efficient models that require less maintenance and use more environmentally friendly oils.

Estimate when this source reduction measure was implen N/A Month _____ Year

For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2018 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea

How much waste was generated in the 2022 Reporting Ye 32,076 pounds

Describe the source reduction measure selected to be implemented by 2022: (add page if need

Additional transformers will be replaced with the more efficient models, based on mission need basis. Episodic replacement of capacitors occurs across the sites and therefore the volume of waste generated fluctuates year by year.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year

What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Unspecified organic liquid mixtures".. This waste stream is generated from S&T explosives press operations. An isostatic press is used to form mock explosives, explosives or inert material into solid billets using glycerine as the pressurizing medium.	CWC: 343

(23) THIS HAZARDOUS WASTE IS (please check one):

- ____ Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
- X Other SB 14 hazardous waste (Category B)
- ____ Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:
How much waste was generated in the 2018 Reporting Ye 9,154 pounds
Describe the source reduction measure(s) implemented since 2018 (add page if needed):

LLNL implemented best management practices to minimize this waste stream.

Estimate when this source reduction measure was implem N/A Month ____ Year
For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year
Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year
(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea
How much waste was generated in the 2022 Reporting Ye 12,454 pounds
Describe the source reduction measure selected to be implemented by 2022: (add page if neede

LLNL will continue implementing best management practices to minimize this waste stream. While the overall machining related waste streams increased as a result of greater production, glycerine waste generation is sporadic and rarely generated due to operation and maintenance than increased life span of the fluid.

Estimate when this source reduction measure will be implemented: N/A Month ____ Year
What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Other Organic Solids ".. Energetic material for testing and evaluation are stored at magazines at Site 300, such as Mag 38. Excess energetic material that is no longer needed for further testing and evaluation is mainly treated at LLNL's Explosive Waste Treatment Facility (EWTF).	CWC: 352

(23) THIS HAZARDOUS WASTE IS (please check one):

- ____ Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
- X Other SB 14 hazardous waste (Category B)
- ____ Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:
How much waste was generated in the 2018 Reporting Ye 10,234 pounds
Describe the source reduction measure(s) implemented since 2018 (add page if needed):

Waste has only been stored in Magazine 38 during a 1 time effort in 2018 to help manage large volumes of explosive waste that the treatment units were not able to promptly handle at the time. No hazardous waste has since been stored or managed in Magazine 38.

Estimate when this source reduction measure was implem N/A Month ____ Year
For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year
Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year
(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea
How much waste was generated in the 2022 Reporting Ye 11,145 pounds
Describe the source reduction measure selected to be implemented by 2022: (add page if neede

LLNL will continue implementing best management practices to minimize this waste stream.

While the "Other Organic Solids" waste strream increased as a result of greater operation and production activities, there was no explosive waste generated or stored in Mag38. Waste has only been stored in Magazine 38 during a 1 time effort in 2018 to help manage large volumes of explosive waste that the treatment units were not able to promptly handle at the time. No hazardous waste has since been stored or managed in Magazine 38.

Estimate when this source reduction measure will be implemented:	N/A	Month	Year
What is the annual projected source reduction quantity identified in the 2022 Plan?	N/A		pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Solids or Sludges with Halogenated Organic Compounds ≥1,000 mg/kg".. Spent Granular Activated Carbon (GAC) filters is generated as result groundwater remediation on site. Contaminated ground water is pumped from wells throughout the site as part of ongoing environmental restoration efforts.	CWC: 751

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
X	Other SB 14 hazardous waste (Category B)
	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:
How much waste was generated in the 2018 Reporting Ye 8,990 pounds
Describe the source reduction measure(s) implemented since 2018 (add page if needed):

LLNL implemented best management practices to minimize this waste stream.

Estimate when this source reduction measure was implem N/A Month _____ Year
For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year
Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year
(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea
How much waste was generated in the 2022 Reporting Ye 2,831 pounds
Describe the source reduction measure selected to be implemented by 2022: (add page if neede

To minimize waste and extend the useful life of the filters, they are only changed out when the analytical indicates they reach saturation. Filters that do not contain hazardous waste or meet hazardous waste criteria will be managed as non-hazardous waste.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year
What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Unspecified Aqueous Solution".. This waste stream is generated from routine lab operations.	CWC: 135

(23) THIS HAZARDOUS WASTE IS (please check one):

_____ Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)

_____ Other SB 14 hazardous waste (Category B)

X Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:
How much waste was generated in the 2018 Reporting Ye 34 pounds
Describe the source reduction measure(s) implemented since 2018 (add page if needed):

This waste stream is generated from routine lab operations and is disposed of off-site.
This waste may vary year to year depending on lab operations and need for an etchant.

Estimate when this source reduction measure was implem N/A Month _____ Year
For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year
Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year
(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2018 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea
How much waste was generated in the 2022 Reporting Ye 55 pounds
Describe the source reduction measure selected to be implemented by 2022: (add page if neede

LLNL plans to continue existing best management practices to minimize this waste stream.
This waste may vary year to year depending on lab operations.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year
What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	
"Off-specification, aged, or surplus inorganics".. This wastestream is generated primarily as a result of lab operations and clean-out activities.	(22) CALIFORNIA WASTE CODE CWC: 141

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
	Other SB 14 hazardous waste (Category B)
X	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:
How much waste was generated in the 2018 Reporting Ye 124 pounds
Describe the source reduction measure(s) implemented since 2018 (add page if needed):

This waste stream can vary in volume from year to year. Whenever laboratories are cleaned out during laboratory or researcher relocations, or projects are completed and decommissioned, there tends to be an increase in the generation of this waste stream.

Estimate when this source reduction measure was implem N/A Month _____ Year
For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year
Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year
(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea
How much waste was generated in the 2022 Reporting Ye 90 pounds
Describe the source reduction measure selected to be implemented by 2022: (add page if neede

LLNL will continue implementing best management practices to reduce this waste stream generation.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year
What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

TABLE 2: SPECIFIC WASTE STREAM INFORMATION **DATE:** 9/1/2023

Complete and submit a separate Table 2 for each major hazardous waste stream.

Complete and submit a separate Table 2 for each minor hazardous waste stream for which a source reduction measure was selected.

IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	
"Organic liquids with metals".. This wastestream consists of labpacks of water reactive solids mostly comprised of alkaline earth metals, alkali metals, and metal hydrides.	(22) CALIFORNIA WASTE CODE CWC: 343

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
	Other SB 14 hazardous waste (Category B)
X	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2018 Reporting Ye N/A pounds

Describe the source reduction measure(s) implemented since 2018 (add page if needed):

This was not a major waste stream in 2018.

Estimate when this source reduction measure was implem N/A Month _____ Year

For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea

How much waste was generated in the 2022 Reporting Ye 80 pounds

Describe the source reduction measure selected to be implemented by 2022: (add page if neede

LLNL will continue to educate researchers and operations personnel on purchases of only those chemicals needed for current research and promote the use of less hazardous chemicals whenever possible.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year

What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

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IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Liquids with mercury > 20 mg/l".. This wastestream consists of labpacks containing elemental mercury.	CWC: 725

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
	Other SB 14 hazardous waste (Category B)
X	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2018 Reporting Ye N/A pounds

Describe the source reduction measure(s) implemented since 2018 (add page if needed):

This was not a major waste stream in 2018.

Estimate when this source reduction measure was implem N/A Month _____ Year

For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea

How much waste was generated in the 2022 Reporting Ye 80 pounds

Describe the source reduction measure selected to be implemented by 2022: (add page if neede

LLNL will continue to educate researchers and operations personnel on purchases of only those chemicals needed for current research and promote the use of less hazardous chemicals whenever possible.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year

What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**

SUMMARY PROGRESS REPORT

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IDENTIFICATION

(19) NAME OF GENERATOR, FACILITY, or BUSINESS	(20) EPA ID NO.
Lawrence Livermore National Laboratory	CA2890012584
(21) HAZARDOUS WASTE STREAM DESCRIPTION	(22) CALIFORNIA WASTE CODE
"Liquid with pH<2".. This waste was generated from electrolyte mixtures needed for electrochemical experiments focused on flow-through electrodes for energy applications.	CWC: 791

(23) THIS HAZARDOUS WASTE IS (please check one):

	Processed onsite in a wastewater pretreatment unit for discharge to POTW or NPDES permit (Category A)
	Other SB 14 hazardous waste (Category B)
X	Extremely hazardous waste

ACCOMPLISHMENTS

Your 2018 SB 14 Plan, Performance Report, or Compliance Checklist, has this information.

(24) Provide the following information for this waste stream:

How much waste was generated in the 2018 Reporting Ye 73 pounds

Describe the source reduction measure(s) implemented since 2018 (add page if needed):

In early 2019, it was discovered that vanadium was a better choice for the goal of the project as well as a safer and less hazardous alternative material. The project now utilizes vanadium solutions.

Estimate when this source reduction measure was implen N/A Month _____ Year

For this measure, what source reduction quantity was projected in the 2018 Plan: N/A pounds per year

Estimate the quantity of waste reduced annually by this measure since implementation: N/A pounds per year

(See Summary Progress Report publication or SB 14 Guidance Manual Chapter 6, to help estimate hazardous waste reduced.)

PROJECTIONS

Your 2022 SB 14 Plan or Compliance Checklist has this information.

(25) Provide the following information for this waste strea

How much waste was generated in the 2022 Reporting Ye 129 pounds

Describe the source reduction measure selected to be implemented by 2022: (add page if need

LLNL will continue implementing best management practices to reduce this waste stream generation. The waste quantities increased due to increase programatic work.

Estimate when this source reduction measure will be implemented: N/A Month _____ Year

What is the annual projected source reduction quantity identified in the 2022 Plan? N/A pounds per year

*** Since the information required for Table 2 is waste stream specific, a separate Table 2 must be completed for each Major waste stream. Add additional waste streams by clicking on the "Table 2-1" through "Table 2-10 " tabs at the bottom as necessary.**