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Los Alamos NATIONAL LABORATORY EST.1943

Environment, Safety, Health Directorate

Environmental Protection Division – Environmental Compliance Programs Group

Quality Assurance Project Plan

Beryllium NESHAP Compliance

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History of Revisions

Document Number *[Include revision number, beginning with Revision 0]*	**Effective Date** *[Document Control Coordinator inserts effective date]*	**Description of Changes** *[List specific changes made since the previous revision]*
0	02/04	New Document
1	09/07	Updated to reflect organization/institutional changes. Removed TA-3-29 registered source.
2	11/08	Annual update - Derivative Classifier review added
3	03/11	Biennial Review and Revision
4	08/13	Biennial review and revision. New format implemented, organizational changes made.

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1.0 ORGANIZATION

This Quality Assurance Project Plan (QAPP) gives requirements for the management of the Air Quality Team (AQ) beryllium project within the Environmental Compliance Programs (ENV-CP) group. This document is tiered to the LANL Quality Assurance Plan (QAP), which, together with the implementing permits and procedures, provides the requirements and processes that ensure the project effectively maintains Los Alamos National Laboratory (LANL) compliance with the project's areas of responsibility within all state and federal air quality regulations governing beryllium.

This plan also describes the roles and responsibilities of other LANL organizations for beryllium compliance. This plan contains requirements as established in construction permits issued per Title 20 Environmental Protection, Chapter 2 Air Quality, of the New Mexico Administrative Code (20.2.72 NMAC) or as specified in the Title V Operating Permit No P100-R1-M3 issued to LANL on April 26, 2013.

This QAPP applies to ENV-CP and permitted beryllium operations. Existing permitted beryllium operations are identified in Section 5.1.

1.1 APPLICABLE REGULATIONS

The drivers for the development and implementation of the beryllium compliance task are:

- 40 CFR 61, Subpart C
- DOE Order 414.1D, Quality Assurance
- Beryllium Permits issued under 20.2.72 NMAC
- Title V Operating Permit No P100-R1-M3

The structure of this plan is based on and addresses the ten criteria in the Department of Energy (DOE) order. Compliance with DOE O 414.1D, *Quality Assurance*, is a DOE requirement, rather than a regulatory requirement.

1.2 PROJECT ORGANIZATION

ENV-CP provides assistance to line organizations to obtain and comply with their air quality permits.

ENV-CP is responsible for the oversight of the AQ Compliance Program. The AQ Team Leader manages the operation of the project within CP to ensure that team objectives are met. The Team members report to the AQ Team Leader, who reports to the ENV-CP Group Leader.

The main deliverable is certification of lab-wide compliance with all beryllium permits. Specific reports that result from the project include:

- Input to Annual Title V Compliance Certification Report
- Input to Operating Permit Semi-Annual Emission Reports
- Input to Operating Permit Semi-Annual Monitoring Reports

- Input to Annual Emission Report
- Quarterly Sampling Data for Permit #634 [see ENV-ES-Be BTF QAPP]

The AQ Team Leader, the OIO-DO Quality Assurance Specialist, and the ENV-CP Group Leader will approve all revisions to this plan.

1.3 IMPLEMENTATION

Who	What
AQ Team Leader	Manage the tasks and staffing of the team in order to deliver the team products. Define and document the team's planned goals and deliverables in this project plan. Track team budget, schedule, and progress. Recruit or request team members to work for the team. Plan, assign, and manage tasks to ensure: • personnel are properly trained for the task; • personnel follow prescribed work procedures, safety guidance (including P 300, Integrated Work Management), and security requirements; and • tasks are completed on schedule and budget and meet quality specifications. Communicate with staff and provide guidance, peer review, and technical problem resolution. Evaluate productivity and suitability of staff and recommend changes, as needed, to increase the productivity and skill level of staff.
AQ Team members	Accomplish the assigned work in a manner to meet quality specifications, safe work practices, security guidelines, regulatory requirements, and specified timetables. Communicate with Team Leader on progress of work assignments. Inform the AQ team of new sources, new requirements, new permits, revisions to permits, and changing conditions to ensure compliance personnel are assigned to design and implement procedures and to interact with operations personnel for each compliance program. Account for the delivery of all work assignments. Bring technical problems with work assignments to the attention of the Team Leader. Identify unsafe work conditions.

2.0 PERSONNEL DEVELOPMENT

Minimum training requirements for ENV personnel are described in the ENV Division Qualification Standards. Training for all project personnel will be performed and documented in accordance with ENV-DO-QP-115, *Personnel Training*. Personnel are required to have knowledge of the following:

- Federal and State Air Quality Regulations
- Engineering, such as Mechanical, Environmental or Chemical
- Beryllium Safety

All personnel performing team-related work are required to obtain appropriate training prior to performing work governed by a procedure. Training of personnel in other groups will be performed and documented according to each group's training procedure.

3.0 QUALITY IMPROVEMENT

Personnel assigned to perform beryllium compliance activities will provide periodic verbal or written updates to the AQ Team Leader. These updates will be used to keep group management apprised of the focus of beryllium compliance activities and any task shortcomings. These updates will address items such as:

- Audit/assessment activities relating to quality assurance of beryllium compliance activities;
- Problems or deficiencies identified during assessment activities or during routine performance of work; or
- Team accomplishments made toward beryllium compliance goals and deliverables.

3.1 PERFORMANCE REPORTING

The following personnel receive copies of project performance reports:

- ENV-CP Group Management
- ENV-CP Project and Team Leaders

3.2 CORRECTIVE ACTIONS WITHIN ENV DIVISION

Corrective actions for all ENV-CP programs and projects are initiated, tracked, corrected, and documented according to P330-6, *Nonconformance Reporting*, P322-4, *Laboratory Performance Feedback and Improvement Process*, the SD330, *Los Alamos National Laboratory Quality Assurance Program*, and Division/Group procedures.

3.3 QUALITY IMPROVEMENT RESPONSIBILITIES

The following table lists specific responsibilities for quality improvement:

Who	What
AQ Team Leader	Provide periodic written or verbal reports to the Group Leader.
Team members	Document all deviations from requirements in deficiency reports according to ENV-DO-113, Tracking Issues and Actions.

4.0 DOCUMENT CONTROL/RECORDS MANAGEMENT

The AQ Team will maintain sufficient documents and records to demonstrate compliance with Title 40, Code of Federal Regulations, Part 61, Subpart C (40 CFR 61), LANL's Title V Operating Permit, and beryllium permits issued by the New Mexico Environment Department (NMED). The type and extent of records to be maintained are determined through this plan and implementing procedures.

This document will be controlled under the organization's document control system (ENV-DO-QP-106, *Document Control*). Controlled copies of ENV documents are located on the Internet: http://int.lanl.gov/org/padops/adesh/environmental-protection/stewardship/index.shtml, all other copies are uncontrolled. The following personnel will be notified of revisions to this plan:

- ENV-CP Group Leader
- ENV-CP-AQ Team Leader
- ENV-CP-AQ Team personnel responsible for beryllium
- ADESH-OIO Quality Assurance Specialist
- Beryllium operators

Procedures will be developed as necessary and in accordance with ENV-DO-QP-105, *Preparation, Review, and Approval of Procedures*.

Phone calls, email, or fax communications will be documented and controlled if the content provides direction or results in decisions.

4.1 PROGRAM RECORDS

Documentation of beryllium compliance activities are maintained as records by ENV-CP personnel, under the direction of the ENV Records Management Program Coordinator and in accordance with ENV-DO-110, Records Management Program. These records are maintained in several series according to type of record and are usually arranged by permit and year. Records are required to be maintained for at least five years in accordance with Section B109 of the Title V Operating Permit. An index of current record storage will be maintained in the records room.

Beryllium operators will maintain records required by their beryllium permit and the LANL Title V Operating Permit. These records will be maintained at the site for at least five years and made available to NMED personnel for inspection.

All ENV-CP records will be maintained and available for auditing in the records center at ENV-CP in accordance with ENV-DO-QP-110, *Records Management*. Records will be archived in

compliance with Laboratory and DOE requirements for records retention, storage, and management.

4.2 PROGRAM RECORDS RESPONSIBILITIES

The following table lists specific responsibilities for program records management:

Who	What
AQ Team Leader	Ensure all personnel in the project are aware of the records that must be preserved.
AQ team members	Ensure all records are properly collected, filed, and preserved.
ENV-CP Records Coordinator/OIO-DO	Maintain beryllium record series and record index.
Beryllium operators	Ensure all records are generated and maintained as required by permit terms. Maintain records for at least five years.

4.3 ELECTRONIC MEDIA

The project will utilize electronic means as necessary to maintain data and perform calculations on these data. Electronic means will not replace paper copies. All records that must be maintained to meet the requirements of the permits will be kept in hard copy as the official record.

Electronic data for this task will be managed in accordance with the group policy for electronic data and back up of those data.

5.0 WORK PROCESSES

5.1 PURPOSE OF BERYLLIUM WORK PROCESSES

The AQ Team performs work to demonstrate compliance with 40 CFR 61, Subpart C, which is adopted by reference under 20.2.78, NMAC. Affected facilities at LANL have received 20.2.72 NMAC air construction permits from the NMED. Currently, there are three active beryllium air construction permits. In addition, there is one active beryllium source registered as required under 40 CFR 61.10. All regulated beryllium operations are included in the LANL Title V Operating Permit issued by NMED.

5.2 WORK PROCESSES AND REPORTING REQUIREMENTS

LANL is required to comply with the requirements of 40 CFR 61, Subpart A and Subpart C, and with the requirements of the 20.2.72 NMAC air construction permits, which are listed in LANL's Title V Operating Permit. The requirements are inconsistent among permits. The earlier permit

issued for TA-35-213 has very few conditions or record keeping and reporting requirements. The more recent permits for TA-3-141 and TA-55-PF-4 have more detailed requirements.

In accordance with Section A109 of LANL's Title V Operating Permit, LANL must submit an annual compliance certification report to NMED within 30 days of the end of every 12-month reporting period certifying the compliance status of LANL with respect to all permit terms and conditions. Beryllium compliance will use self-inspection checklists to document compliance status with all permit terms and conditions. These checklists will be completed for the time period covered by the annual certification report.

In accordance with Section A109 of LANL's Title V Operating Permit, LANL must submit semi-annual emission reports within 90 days from the end of the reporting period [January 1st to June 30th, and July 1st to December 31st]. LANL is also required to submit an annual report to the NMED in accordance with Notice of Intent (NOI) and Emissions Inventory Requirements, 20.2.73 NMAC. Semi-annual input from permitted sources is required to calculate emissions for these reports.

In accordance with Section A109 of LANL's Title V Operating Permit, LANL must submit semi-annual monitoring reports within 45 days from the end of the reporting period [January 1st to June 30th, and July 1st to December 31st]. For permitted beryllium operations, the monitoring report must include TA-3-66 logs, TA-3-141 ΔP readings, TA-55 PF-4 HEPA filter test results, and TA-55 ΔP readings. The report shall also reference the TA-3-141 BTF quarterly sample reports submitted to NMED.

Any deviations (including emergencies) from permit requirements must be submitted to NMED in the Semi-Annual Monitoring report. LANL shall communicate any excess emissions to NMED within 24 hours of the start of the first business day following the start of the occurrence. Within ten calendar days of the start of the first business day following the start of the excess emission, written notice using NMED's Excess Emissions Form will be submitted to NMED.

NMED considers a HEPA filter test challenge failure to be a deviation.

The work processes included in this section are divided into three areas:

- 40 CFR 61, Subpart C Requirements – describes the federal requirements for the National Emission Standard for Beryllium.
- Permitted Sources – describes the requirements set forth by each of the 20.2.72 NMAC beryllium air construction permits and Title V Operating permit.
- Registered Sources – describes each of the registered beryllium sources as required by 40 CFR 61.10.

In accordance with permit condition 5.f from NMED Air Quality permit 634-M2, LANL will provide NMED with a quarterly sampling report within 60 days after each calendar quarter for the TA-3-141 Beryllium Technology Facility (BTF). This report will address the facility's compliance status with the permitted emission rate using sampling data from the continuous monitoring system.
The following table details responsibilities:

Who	What
AQ team members responsible for beryllium	Provide input to AQ Team Leader for completion of annual compliance certification Provide input to semi-annual emission reports Provide input to semi-annual monitoring reports Report deviations from permit terms and excess emissions to AQ Team Leader

5.3 SUBPART C (40 CFR 61) REQUIREMENTS AND REGULATORY REVIEW

Several affected facilities at LANL are subject to the provisions of the National Emission Standards for Hazardous Air Pollutants (NESHAP) for beryllium. These regulations are promulgated under 40 CFR 61, Subpart C and have been adopted by reference in 20.2.78 NMAC.

The NESHAP for beryllium regulations are applicable to extraction plants, ceramic plants, foundries, incinerators, and propellant plants which process beryllium ore, beryllium, beryllium oxide, beryllium alloys, or beryllium containing waste.

The NESHAP for beryllium regulations are applicable to machine shops at affected facilities that process beryllium, beryllium oxides, or any alloy containing more than 5 percent beryllium by weight. [§61.30 (b)]

Foundry means a facility engaged in the melting or casting of beryllium metal or alloy.

A machine shop is a facility capable of performing cutting, grinding, turning, honing, milling, deburring, lapping, electrochemical machining, etching, or similar operations of the above described materials. [§61.31 (d)]

Emissions to the atmosphere from stationary sources subject to 40 CFR 61 Subpart C shall not exceed 10 grams (0.022 lb) of beryllium over a 24-hour period. [§61.32 (a)]

Alternatively, an ambient concentration limit on beryllium in the vicinity of the stationary source of 0.01μg/m3 (4.37x10-6 gr/ft3), averaged over a 30-day period, can be requested from the Administrator. [§61.32 (b)] Since LANL has not requested to use ambient concentration limits, this emission standard will not be addressed further.

Emissions will be tested from the source according to Method 104 of appendix B to Subpart C. Method 103 of appendix B to Subpart C is approved by the Administrator as an alternative method. [§61.33]

5.4 EVALUATION OF NEW SOURCES

Activities involving beryllium must be evaluated for regulatory applicability as defined by the beryllium NESHAP promulgated under 40 CFR 61, Subpart C and which has been adopted by reference under 20.2.78 NMAC.

The provisions of 40 CFR 61, Subpart C are applicable to the stationary sources listed in §61.30 (a) and (b) and defined in §61.31 (a) through (k). If the activity is a new beryllium operation, it should be determined whether or not the activity is a stationary source subject to the provisions of the NESHAP. If the activity is subject to the provisions of 40 CFR 61, Subpart C, the ENV-CP Team Leader will advise the potential source owner as to their responsibilities and options for implementing the proposed beryllium operation.

5.4.1 CHANGES TO SOURCES

Changes to beryllium operations at affected facilities that already have a 20.2.72 NMAC air construction permit or are included in the Title V Operating permit must be evaluated for changes in operational status and increases to the potential emission rate of the facility. Changes to beryllium operations that result in an increase to the potential emission rate of the facility will require a modification to the permit. Further, changes in the operational status (i.e. changes of equipment or equipment type, addition of new operations, etc.) may require a modification to the permit.

Certain beryllium operations have been identified at LANL as inapplicable to the beryllium NESHAP. Spot welding activities that occur at approximately 400°C do not meet the definition of a foundry as listed in 40 CFR 61.31 (f). Additionally, burning trees potentially contaminated with beryllium are not subject to the permitting requirements or the emissions standards of the beryllium NESHAP. Also, beryllium chemistry is not regulated as long as the reaction or chemical manipulation does not involve the heating of beryllium past its melting point.

The following table lists responsibilities:

Who	What
AQ team members responsible for beryllium	Review new and modified sources for compliance with the requirements of the beryllium NESHAP.

5.5 PERMITTED SOURCES

The permitted sources work process describes the requirements set forth by each of the 20.2.72 NMAC beryllium air construction permits. These requirements include the operational limitations, monitoring, and record keeping and reporting requirements.

In addition to the three active beryllium construction permits, there were three permits no longer active which were issued for beryllium operations at TA-3-39, TA-3-102 and TA-3-35.

- Beryllium operations at TA-3-39 & TA-3-102 were originally permitted on March 19, 1986 under 20.2.72 NMAC Air Construction Permits 635 and 636. Permits 635 and 636 are no longer active due to the relocation of beryllium operations to TA-3-141, which are currently regulated under 20.2.72 NMAC Air Construction Permit 634-M2.
- Beryllium operations were planned for construction at TA-3-35 with the issuance of 20.2.72 NMAC Air Construction Permit 741. However, construction never commenced and Permit 741 was subsequently surrendered.

The permitted sources work process is divided into three sub-processes that represent each of the active permitted beryllium sources at LANL. These three sub-processes are:

- 5.5.1 TA-3-141
- 5.5.2 TA-35-213
- 5.5.3 TA-55-PF-4

5.5.1 TA-3-141

TA-3-141 obtained a 20.2.72 NMAC Air Construction **Permit 634**. This air construction permit is listed in the Title V Operating Permit No P100-R1-M3 issued by NMED.

The 20.2.72 NMAC Air Construction **Permit 634** was issued by NMED on March 19, 1986.

On September 8, 1987, NMED issued **Permit 634-M1.** This modification was issued to remove the limitation on production hours and add a maximum process rate.

On October 30, 1998, NMED issued **Permit 634-M2.** This modification was issued to allow the installation of additional particulate control with a large cartridge filter system and the installation of a particulate sampling system in the exhaust stack to measure actual beryllium emissions

On June 14, 2006, NMED issued **Permit 634-2-R1**. This revision consists of an operator change from the University of California to Los Alamos National Security, LLC (LANS).

The beryllium operations at TA-3-141, including beryllium machining and foundry operation, are oriented toward research and development. Beryllium metal and beryllium formed from powders and shaped during consolidation operations is machined. Foundry operations include melting scrap beryllium into ingots in furnaces. Other activities involving beryllium, such as powder operations, joining, and coating operations, are also conducted at this facility.

Descriptions of the allowed beryllium processes and equipment and emissions points, along with the applicable permit citation, are presented below:

Process Description	Equipment and Emission Points
Machining and **foundry** operations From Application : Powder Operations, Consolidation Operations, Joining and Coating Operations, Inspection Operations From Application: Etching Process, Atomizing Process, Coating/Plating Process, Pressing Process, Welding Process, Non-Destructive Measurement Process, Near Net Shape Process, and Other Processes in support of the formation of parts.	Emissions from these processes shall be ducted through a HEPA filtration system prior to entering the atmosphere.
Powder operations other than closed glove box operations Machining operations other than the processes used in metallographic preparation	In addition to ducting through the HEPA filtration system, emissions from these operations shall also be exhausted through a cartridge filtration system.
Metallographic preparation activities	These activities shall be conducted in lubricating baths or equivalent. Emissions from these processes shall be ducted through a HEPA filtration system prior to entering the atmosphere.

Beryllium operations may operate 24 hours per day, 7 days per week and 52 weeks per year for a total of 8,760 hours per year. [Condition 1.c.]

Beryllium processing weights are limited to 10,000 pounds per calendar year and/or 1,000 pounds per day. [Condition 1.e.]

EMISSION LIMITS

The emission limits listed below set forth by the air construction permit are more stringent than those in the beryllium NESHAP in 40 CFR 61, Subpart C which limit beryllium emissions to 10 gm/ 24 hrs. The more stringent emission limits are based on emissions estimated by ENV-CP personnel in the air construction permit application for TA-3-141. [Condition 2]

Operation	Beryllium limit	
All operations at TA-3-141	0.35 gm/24 hr	3.5 gm/year

MONITORING

Facility exhaust stack will be equipped with a continuous emission monitor used to measure beryllium emissions. [Conditions 1.f. and 3]

Cartridge and HEPA filters will be equipped with differential pressure gauges that measure the differential pressure (inches of water) across the cartridge and HEPA filters while the exhaust fans are in operation. [Condition 3]

The pressure drop across the cartridge and HEPA filters will be recorded once each day while the exhaust fans are in operation and the facility is occupied. [Condition 4]

The beryllium emissions from the exhaust stack will be continuously sampled using the methods identified in a letter requesting to amend the permit application dated and received on March 19, 1998 and in accordance with the requirements stipulated in the QAPP for Beryllium Stack Monitoring at TA-3-141 (Be BTF). Sampling of the stack began within one hundred eighty (180) days of startup of the facility. [Condition 3]

Initial compliance source tests have been conducted in accordance with Condition 6 at the stack to which beryllium emissions at TA-3-141 are exhausted.

- The initial compliance source test was conducted in January 1988.
- An additional source test was conducted on June 27, 2001.

RECORD KEEPING AND REPORTING REQUIREMENTS

The following records will be maintained:

- The facility will generate and retain beryllium inventory records to demonstrate compliance with the process weight limits of 10,000 pounds of beryllium per calendar year and/or the 1,000 pounds of beryllium per day process limit. [Condition 4]
- Record pressure drop across the cartridge and HEPA filters once per day while the exhaust fans are in operation and the facility is occupied. [Condition 4]
- Record pollution control equipment maintenance and repair activities. [Condition 4]
- Record annual HEPA filter test results.
- Maintain a copy of the permit in Building 141 Administrative Offices and ENV's record room. [Condition 10]
- Maintain records for at least five years. [Title V Operating Permit Requirement]

The following reports are required:

- LANL will provide a quarterly report within 60 days after each calendar quarter of the facility's compliance status with the permitted emission rate from the continuous monitoring system. [Condition 5.f.]

- Total beryllium emissions must be included with the hazardous air pollutant emissions that are reported on an annual basis to the NMED in accordance with NOI and Emissions Inventory Requirements, 20.2.73 NMAC.
- Control system malfunctions, which would consist of HEPA filters for this facility, are to be included in the semi-annual monitoring report. If malfunctions result in excess emissions, then they must be reported promptly, in accordance with the requirements of 20.2.7 NMAC, Excess Emissions during Malfunction, Startup, Shutdown, or Scheduled Maintenance.
- Annual HEPA Filter test results are to be submitted to ENV-CP; they are not included in the semi-annual monitoring report.

IMPLEMENTATION OF TA-3-141 REQUIREMENTS

The following table gives responsibilities:

Who	What
AQ team members responsible for beryllium	Ensure that continuous emissions monitoring is performed in accordance with the QAPP for Beryllium Stack Monitoring at TA-3-141 (ES-Be-BTF). Report beryllium emissions quarterly to NMED within 60 days after each calendar quarter. When required, coordinate stack source testing and submit test reports to appropriate sections of NMED within specified period of time. Retain copies of stack source test emission results. Retain copy of the NSR and Title V Operating permit. Include beryllium emissions in the 20.2.72 NMAC annual emissions inventory report and the Title V Operating Permit semi-annual emissions reports. Include cartridge and HEPA filter ΔP readings in semi-annual monitoring reports. Complete semi-annual self-inspection checklist.
Source Operator	Notify ENV-CP prior to any change in beryllium operations. Report cartridge filter and HEPA system malfunctions to ENV-CP. Retain copy of the permit. Maintain the following records: • Generate and retain inventory records to demonstrate compliance with the beryllium process weight limits. • Record pressure drop across the cartridge and HEPA filters once per day while the exhaust fans are in operation and the facility is occupied. Provide copy of these records to ENV-CP for inclusion in semi-annual monitoring reports. • Record pollution control equipment maintenance activities and test results.

Who	What
Facility Management / Industrial Hygiene	Maintain HEPA filter maintenance and test records. Provide copy to ENV-CP.

5.5.2 TA-35-213

TA-35-213 obtained a 20.2.72 NMAC Air Construction **Permit 632**. This air construction permit is listed in the Title V Operating Permit No P100-R1-M3 issued by NMED.

The 20.2.72 NMAC Air Construction Permit 632 was issued by NMED on December 26, 1985. There have been no modifications to this permit to date. However, it was identified that a filter substitution was never made in the application. Flanders HEPA filters have been used in place of Cambridge HEPA filters since operations began.

On June 14, 2006, NMED issued Permit 632-R1. This revision consists of an operator change from the University of California to Los Alamos National Security, LLC (LANS).

Activities include machining of small quantities of classified beryllium parts.

Beryllium machining and associated cleanup activities are the allowed operations.

Beryllium operations at TA-35-213 have a maximum allowable operating schedule of 8 hours/day, 5 days/week, 4 weeks/month, and 12 months/year. The normal operating schedule is 4 hours/day, 3 days/week, 4 weeks/month, and 12 months/year.

The emission limits listed below set forth by the air construction permit are more stringent than those in the beryllium NESHAP in 40 CFR 61, Subpart C which limit beryllium emissions to 10 gm/ 24 hrs. The more stringent emission limits are based on emission rates specified by ENV-CP personnel in the air construction permit application for TA-35-213. [Condition 1] Beryllium processing weights are not limited.

Operation	Beryllium limit	
Beryllium machining and associated cleanup activities	4×10^{-7} lbs/hr 1.8×10^{-4} gm/hr	4×10^{-7} tons/year 0.36 gm/yr

All processes are exhausted through one pre-filter and one HEPA filter.

MONITORING

There are no permit requirements for ongoing pollution control equipment monitoring. However, annual HEPA filter testing is performed. Test results are not included in the semi-annual monitoring report.

A performance test was conducted on September 9, 1986. The emissions were tested within 90 days of startup. Results of the emission test were submitted to the NMED within 30 days after the completion of testing. The average emission was $<2 \times 10^{-8}$ pounds per hour, which is less than the maximum allowable of 4×10^{-7} pounds per hour.

RECORD KEEPING AND REPORTING REQUIREMENTS

Retain records of emissions test results and other data needed to determine total emissions. Other data will consist of laboratory log books specifying hours of operation and work performed. Maintain these records for at least five years. [Condition 2]

Total beryllium emissions must be included with the hazardous air pollutant emissions that are reported on an annual basis to the NMED in accordance with NOI and Emissions Inventory Requirements, 20.2.73 NMAC.

IMPLEMENTATION OF TA-35-141 REQUIREMENTS

The following table gives responsibilities:

Who	What
AQ team members responsible for beryllium	Retain copies of emission test results. Report beryllium emissions for the 20.2.73 NMAC annual emissions inventory report and the Title V Operating Permit semi-annual emissions reports. Complete semi-annual self-inspection checklist.
Source Operator	Notify ENV-CP prior to any change in beryllium operations. Provide hours of operation to ENV-CP for semi-annual emission calculations. Maintain laboratory logbook and provide hours to ENV-CP.
FM/IHS	Maintain HEPA filter maintenance and test records and provide copies to ENV-CP.

5.5.3 TA-55-PF-4

TA-55-PF-4 obtained a 20.2.72 NMAC Air Construction **Permit 1081** on November 25, 1992. This air construction permit is listed in the Title V Operating Permit No P100-R1-M3 issued by NMED.

The background for Permit 1081 includes:

- On November 25, 1992, NMED issued **Permit 1081** authorizing LANL to construct and operate a beryllium machining and processing facility. Permitted activities would include weld bead dress operations, compatibility testing, and impact testing. Emissions are permitted from both the north and south stacks.
- On July 1, 1994, NMED issued **Permit 1081-M1** allowing for the use of lubricant baths as a substitute for kerosene baths in the cutting and grinding operations. In addition, the original permit only allowed for grinding to eliminate rough edges.

This revision allows cutting or grinding. NMED issued a letter on July 28, 1994 correcting the emission limits on page 3 of the permit.

- On March 11, 1998, NMED issued **Permit 1081-M1-R1** to reflect updated pollution control equipment and control efficiencies and reduce the number of required filter challenge tests.
- On February 4, 2000, NMED issued **Permit 1081-M1-R2** to add a 77-hp diesel generator.
- On February 11, 2000, NMED issued **Permit 1081-M1-R3** to:
  - Replace beryllium emission estimates based on hours of cutting or machining beryllium with more realistic and more accurate factors based on the weight of beryllium throughput;
  - Replace the one hour emission limit with a 24-hour emission limit to reflect the emission limit from 40 CFR 61, subpart C; and,
  - Add a vacuum induction melt furnace operation.
- On November 27, 2000, NMED issued **Permit 1081-M1-R4** to retire a 77-hp diesel generator that was added in revision 2 that is no longer in use.
- On February 21, 2002, NMED issued **Permit 1081-M1-R5** to update the description of the weld bead dress operation and the emissions pollution control equipment.
- On May 12, 2006, NMED issued **Permit 1081-M1-R6** to replace the vacuum induction melt furnace with a CM Model 1712 electric furnace.
  On June 14, 2006, NMED issued Permit **1081-M1-R7**. This revision consists of an operator change from the University of California to Los Alamos National Security, LLC (LANS).

ALLOWED OPERATIONS

Activities conducted in TA-55 Plutonium Facility (PF)-4 include beryllium welding and machining, as well as metallographic specimen preparation, furnace operations, and weld bead dress operations. Non-regulated activities, such as beryllium welding/brazing, compatibility studies, and impact testing, are also conducted in TA-55-PF-4.

Beryllium machining operations regulated include weld cutting, weld bead dressing, and metallography. [Condition 1.b]

The description of the weld bead dress operation was modified in revision 5 to more appropriately describe the process.

Metallographic specimen preparation includes surface cutting along with grinding; cutting and grinding operation conducted in kerosene bath (or substitute lubricant instead of kerosene). [Condition 1.a]

Foundry operations regulated include use of a CM Model 1712 electric furnace. [Condition 1.b]

Welding/brazing, beryllium compatibility testing, and impact testing are operations not subject to 40 CFR 61, Subpart C and 20.2.78 NMAC.

Beryllium operations are authorized to operate 24 hours per day, 7 days per week and 52 weeks per year for a total of 8760 hours per year. [Condition 1.b.]

Beryllium processing weights are limited to 20 kilograms (44 pounds) for any 24-hour period, and 500 kilograms (1,100 pounds) for any given 12-month rolling average. [Condition 1.c.]

EMISSION LIMITS

The emission limits listed in the table below set forth by the air construction permit are more stringent than those in the beryllium NESHAP in 40 CFR 61, Subpart C which limit beryllium emissions to 10 gm/ 24 hrs. The more stringent emission limits are based on emissions estimated by ENV-CP personnel in the air construction permit application for TA-55-PF-4. Aluminum is included as a Toxic Air Pollutants limit. Compliance with these emissions limits is achieved by adhering to the process weight limits specified above and proper implementation and use of the emissions pollution control equipment specified below, and verified by emissions testing described below.

Operation	**Beryllium limit**		**Aluminum limit**	
	gm/24 hrs	**gm/year**	**gm/24 hrs**	**gm/year**
Machining	0.12	2.99	0.12	2.99
Foundry	3.49×10^{-5}	8.73×10^{-4}	3.49×10^{-5}	8.73×10^{-4}
Total	0.12	2.99	0.12	2.99

Weld cutting, weld dressing, metallography, and furnace operations will be controlled with 4 HEPA filters with a control efficiency of 99.95% each. [Condition 3]

- Emissions from regulated beryllium processes will be ducted through pollution control equipment and exhausted through either the north or south stack of TA-55-PF-4. [Condition 1.b.]
- The non-accessible filters [4th HEPA filter located at the source] will be replaced when the pressure drop across the filter either falls to levels indicating filter breakthrough or increases to levels indicative of excessive loading. [Condition 3]
- The metallographic specimen preparation of beryllium metal will be conducted in a lubricating bath. [Condition 3]

The weld bead dress operation lathe enclosure is connected to the facility ventilation system via ductwork and is maintained at a negative pressure, with respect to the room. The facility ventilation system is equipped with three HEPA filters, in series, and is routed to the building's south exhaust stack before being released into the ambient air. The three HEPA filters in

series are tested annually to ensure an installed efficiency of 99.95%. [Revised with R5]

MONITORING

The HEPA filtration systems will be equipped with a differential pressure gauge that measures the differential pressure (inches of water) across the HEPA filters while the exhaust fans are in operation. [Condition 11]

Daily

- filter control efficiencies will be verified by daily HEPA filter pressure drop monitoring and recording. [Condition 3]

Annually

- The control efficiencies of the HEPA filters will be verified by annual HEPA filter challenge tests of accessible filters. The non-accessible filters will be replaced when the pressure drop across the filter falls to levels indicating filter breakthrough or increases to levels indicative of excessive loading. [Condition 3]

Initial compliance source tests have been conducted in accordance with Condition 4 at each of points (north and south stacks of TA-55-PF-4) after initial startup of the following process operations: weld cutting, weld dressing, and metallography. These initial compliance source tests were conducted within 90 days of initial startup. The table below lists the dates that the source tests were completed:

- Weld Cutting: February 17-19, 1993 (South stack)
- Weld Dressing: September 26-27, 2002 (South stacks)
- Metallography: February 15, 1994 (North stack)
- Electric Furnace: Waiting start-up

RECORD AND REPORTING REQUIREMENTS

The following records will be maintained:

- Copy of the permit at TA-55 in the Operations Center. [Condition 8]
- Stack emission test results. [Condition 9]
- Facility operating parameters, including a daily record of the pressure drop measured across each appropriate HEPA filtration stage when the exhaust fans are operating. [Condition 9]
- Records of the number and weight of classified parts processed during a 24-hour period and a 12-month rolling average. [Condition 9]
- Records of the annual HEPA test and a pollution control equipment maintenance log. [Condition 3]
- A log of the filter (non-accessible filters) replacement shall be kept. [Condition 3]
- Maintain records for at least five years (Operating Permit Section B109)

The following reporting requirements must be met:

- HEPA filtration system malfunctions will be reported as a deviation in semi-annual monitoring reports. If an excess emission occurs, the event is reported as soon as possible, but not later than 24 hours after the start of the next regular business day and will also be reported in accordance with the requirements of Excess Emissions during Malfunction, Startup, Shutdown, or Scheduled Maintenance, 20.2.7 NMAC, [Condition 10.f.]
- Annual HEPA filter test reports submitted to NMED annually. [Title V Operating Permit monitoring report requirement]
- HEPA filtration ΔP readings submitted to NMED with semi-annual monitoring report.
- Notification of startup of the electric furnace and an initial compliance source test shall be conducted within 90 days of initial startup.
- Total beryllium emissions must be included with the hazardous air pollutant emissions that are reported on an annual basis to the NMED in accordance with NOI and Emissions Inventory Requirements, 20.2.73 NMAC and in the Semi-Annual emission reports.

IMPLEMENTATION OF TA-55-PF-4 REQUIREMENTS

The following table details responsibilities:

Who	What
AQ team members responsible for beryllium	Coordinate compliance source testing when required. Maintain copy of emission test results. Calculate beryllium emissions to include in the 20.2.72 NMAC annual emissions inventory report and the Title V Operating Permit semi-annual emissions reports. Include HEPA filter ΔP readings in semi-annual monitoring reports. Complete semi-annual self inspection checklist.
Source Operator	Notify ENV-CP prior to any change in beryllium operations. {AQ team leader is sufficient} Provide semi-annual input to ENV-CP for emissions calculations. Maintain the following records: • Log of the filter (non-accessible filters) replacement. [Condition 3] • Records of the number and weight of classified parts processed during a 24-hour period and a 12-month rolling average.

Who	What
Facility Operations	Report HEPA system malfunctions to ENV-CP. Maintain copy of Title V Operating permit in TA-55 Operations Center. [Condition 8] Provide annual HEPA filter tests results to ENV-ES. Maintain the following records: • HEPA filter maintenance records. • Annual HEPA filter tests. • Log of the daily pressure drop measured across each appropriate HEPA filtration stage when the exhaust fans are operating. Provide copies to ENV-CP.

5.6 REGISTERED SOURCES

The registered sources work process is used to describe each registered beryllium source as required by 40 CFR 61.10. These sources have been included into LANL's Title V Operating permit, and a description of the operational limitations, monitoring, and record keeping and reporting requirements is included in this section.

There are activities involving beryllium at LANL that existed prior to April 6, 1973, when the requirements of the NESHAP for beryllium went into effect. Because these activities were in existence prior to the effective date, they are regulated under 40 CFR 61.10, Subpart A General Provisions, Source reporting and waiver request, which is adopted under 20.2.78 NMAC. Affected facilities are registered with the NMED. A Title V Operating Permit issued by NMED governs regulated activities at registered sources. The following requirements apply to LANL registered sources:

- Operating schedule: The registered beryllium operations may operate up to 8,760 hours per year.
- Process weight limits: The registered beryllium operations are not subject to any process weight limits.
  Emission limits: Beryllium emissions from the registered beryllium operations must not exceed the beryllium NESHAP set forth in 40 CFR 61, Subpart C, which limits beryllium emissions to 10 gm/ 24 hrs.

In the past, registered beryllium operations were performed at TA-3-29 and TA-3-1819. However, during an NMED inspection in 2000, parts of TA-3-29 and TA-3-1819 had not conducted beryllium operations within the previous five years and lost their registration. In 2007, TA-3-29 Wing 2 discontinued operations and LANL surrendered its registration. For the 2009 Title V Operating Permit renewal, NMED determined that operations at TA-16-207 and TA-35-87 did not have emissions to the environment and these sources were removed from the permit.

The registered sources work process is divided into one sub-process that represents the active registered beryllium source at LANL. This sub-process is:

- 5.6.1 TA-3-66

5.6.1 TA-3-66

Three regulated activities are conducted in this facility. These activities include beryllium electroplating/chemical milling, polishing of metallographic specimens, and machining/arc melting/casting. Machining/arc melting/casting activities were relocated to this facility from TA-3-141 in 1996.

Registered beryllium operations include:

- Electroplating & chemical milling, which typically involves the removal of the surface from mechanical test specimens using acids.
- Final polishing of metallographic specimens is performed using a wheel covered with an abrasive cloth treated with propylene glycol and/or water, which prevents beryllium particles from becoming airborne. Ion beam sputtering operations are also used to remove fine layers of surface material.

Relocated permitted operations include:

- Machining and arc melting/casting activities. Machining operations are used to prepare small samples for metallographic observation using cutting and grinding methods. Melting and casting operations process small batch quantities of metal to form ingots for further mechanical and heat testing (e.g., differential thermal analysis, heat treating). These ingots may also undergo metallographic specimen preparation and other testing and quantification techniques.

  Emissions from machining and arc melting/casting operations are exhausted through a HEPA filtration system prior to entering the atmosphere.

  Polishing and electroplating/chemical milling operations are conducted in aqueous solution or lubricant bath.

RECORD AND REPORTING REQUIREMENTS

A log will be maintained during operations that show the number of metallographic specimens used in the polishing operation and the weight or volume of Be samples processed in the electroplating/chemical milling, machining, and arc melting/casting operations. Maintain this log for at least five years.

The polishing operation consists of all pieces of equipment in the process. Separate records for each piece of equipment are not required.

Total beryllium emissions from this source are negligible and are not included with the hazardous air pollutant emissions that are reported on an annual basis to the NMED in accordance with NOI and Emissions Inventory Requirements, 20.2.73 NMAC and Section A109 of LANL's Title V Operating Permit.

IMPLEMENTATION OF TA-3-66 REQUIREMENTS

The following table details responsibilities:

Who	What
AQ team members responsible for beryllium	Document semi-annual self-inspection checklist results to support annual Title V Operating Permit compliance certification.
Source Operator -- electroplating & chemical milling	Maintain a log during operations that show the weight or volume of Be samples processed in the electroplating/chemical milling operation. Provide a summary log to ENV-CP for inclusion in the semi-annual monitoring report. Notify ENV-CP prior to any change in beryllium operations. Assist ENV-CP with completion of semi-annual self-inspection checklist.
Source Operator -- metallographic specimen polishing	Maintain a log during operations that show the number of metallographic specimens used in the polishing operation. Provide a summary log to ENV-CP for inclusion in the semi-annual monitoring report. Notify ENV-CP prior to any change in beryllium operations. Assist ENV-CP with completion of semi-annual self-inspection checklist.
Source Operator -- machining and arc melting/casting	Maintain a log that show the number of metallographic specimens used in the polishing operation and the weight or volume of Be samples processed in the electroplating/chemical milling, machining, and arc melting/casting operations. Provide a summary log to ENV-CP for inclusion in the semi-annual monitoring report. Notify ENV-CP prior to any change in beryllium operations. Assist ENV-CP with completion of semi-annual self-inspection checklist.
Facility Operations	Maintain HEPA filter maintenance and test records.

6.0 DESIGN

The project requires no design activities.

7.0 PROCUREMENT

The Be-NESHAP Project will procure services from qualified persons and/or organizations as needed to accomplish project goals. Procurement of items and services will follow the Laboratory procurement process. Most items and services required for the project are commercial grade in nature and no special procurement requirements or needs are necessary. For items and all services for which special requirements are necessary, the Team Leader and project members will identify such items or services.

8.0 INSPECTION AND ACCEPTANCE TESTING

This project does not require inspection and acceptance testing. Any materials or services procured by other organizations for activities that are related to Be-NESHAP compliance will be inspected and/or tested prior to acceptance for use in monitoring. Most supplies used during performance of monitoring are commercial grade in nature and require no special acceptance practices or procedures.

9.0 MANAGEMENT ASSESSMENT

The ENV-CP Group conducts internal management assessments of projects and programs in accordance with the requirements in P328-3, *Management Assessment* and P328-4, *Management Observation and Verification*. Assessments of the program are documented and filed as records.

When deviations from requirements are found during a management assessment, a nonconformance report is initiated in accordance with P330-6, *Nonconformance Reporting* for nonconforming items. Nonconforming services or processes are tracked and documented in accordance with P322-4, *Issues and Corrective Action Management*.

Assessments of Be-NESHAP sources will be included in any periodic assessments required under the Title V Operating Permit project

10.0 INDEPENDENT ASSESSMENT

Independent assessments are those assessments conducted by organizations external to ENV-CP. As required by the SD330, *Los Alamos National Laboratory Quality Assurance Program*, this program may be assessed by outside organizations in accordance with P328-2, *Independent Assessment*.

The Be-NESHAP Compliance project will be included in any periodic audits and assessments as required under the Title V Operating Permit project.

11.0 APPENDICES

Appendix A- References

By requesting credit for this required reading I acknowledge that I have read and understand the contents of this document and I will follow and meet the requirements in this document unless it is unsafe to do so.	Click to Acknowledge

APPENDIX A - REFERENCES AND GUIDANCE DOCUMENTS

Title 40 Code of Federal Regulations Part 61, Subpart A, "General Provisions"
Title 40 Code of Federal Regulations Part 61, Subpart C, "National Emission Standard for Beryllium"
DOE O 414.1D, *Quality Assurance*

LANL Documents:

SD 330, *Quality Assurance Program*

P322-4, *Issues and Corrective Action Management*

P328-2, *Independent Assessment*

P328-3, *Management Assessment*

P328-4, *Management Observation and Verification*

P330-6, *Nonconformance Reporting*

ENV documents:

ENV-DO-QP-110, *Records Management Plan*

ENV-DO-QP-115, *Personnel Training*

ENV-DO-QP-106, *Document Control*

ENV-DO-QP-105, *Preparation, Review, and Approval of Procedures*

ENV-ES-QAPP-Be-BTF, *Quality Assurance Project Plan for Beryllium Stack Monitoring at TA-3-141*
ENV-EAQ-QAPP-OP, *Quality Assurance Project Plan for the Operating Permit Project*
ENV-ES-301, *Review of New or Modified Air Emission Sources*