**Gas Generation Matrix Depletion
Quality Assurance Project Plan**

CST-GGMD-QAP1-002/0

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Introduction

The Los Alamos National Laboratory (LANL) contracts with Idaho National Engineering and Environmental Laboratory (INEEL) to provide the technical capability to fulfill the requirements specified in the INEL test plan, Document Number INEL-95/0360 September, 1995. LANL is to provide the necessary expertise, experience, equipment and instrumentation, and management structure to:

- Conduct the matrix depletion experiments using simulated waste for quantifying matrix depletion effects; and
- Conduct experiments on 60 cylinders containing simulated TRU waste to determine the effects of matrix depletion on gas generation for transportation.

All work for the Gas Generation Matrix Depletion (GGMD) experiment is performed according to the quality objectives established in the test plan and under this Quality Assurance Project Plan (QAPjP).

The activities and tasks delineated by LANL to fulfill the technical needs specified in the INEL test plan are sequentially listed in the LANL Work Breakdown Structure for this project. Although some of the technical activities that were initially specified as part of this project have been deferred or conditionally deleted, all the original specifications are included in this QAPjP which is designed to encompass all work conducted in accordance with test plan INEL-95/0360.

Purpose

The purpose of this QAPjP is to establish a management plan to achieve the levels of quality and operational performance to satisfy the requirements of:

- The Statement of Work,
- DOE Order 5700.6c, "Quality Assurance,"
- Applicable criteria from ASME NQA-1 (1989),
- Title 10 of the Code of Federal Regulations Part 830.120, "Quality Assurance," for any work performed in a nuclear facility, as defined by the DOE and,
- U.S. Department of Energy, Idaho Operations Office, "Quality Assurance Program Plan," INEL-95/0361.

Scope

All activities at the different LANL locations (TA-48, TA-55, TA-46, TA-3, etc.) that affect or support the quality and performance of the matrix depletion experiment's analytical or operational methodology are conducted in a manner consistent with this QAPjP.

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Definitions

Accuracy is the closeness of agreement of a measured or observed value with the true or expected value of concern; the nearness of a measurement or the mean of a set of measurements to the true value.

Assessment is reviewing, inspecting, testing, checking, conducting surveillance, auditing, or otherwise determining and documenting whether items, processes, or services meet specified requirements.

Calibration is a comparison of a measurement standard or instrument with another standard or instrument to report or eliminate by adjustment any variation (deviation) in the accuracy of the item being compared.

Conduct of Operations is a philosophy of working in a formalized, disciplined manner to achieve operational excellence. The concept is described and defined in U.S. Department of Energy Order 5480.19, *Conduct of Operations Requirements for DOE Facilities*.

Item is an all-inclusive term meaning any of the following: appurtenance, facility, sample, assembly, component, equipment, material, module, part, structure, subassembly, subsystem, system, unit, or data.

Operations are any tasks performed, such as setting up or performing an experiment, routine analytical chemistry, data collection, or report writing.

Performance Assessment is an assessment to evaluate the proficiency of an analyst or laboratory by evaluation of the results obtained on known test materials. See Criterion 9, "Management Assessment."

Precision is the agreement between a set of replicate measurements without assumption or knowledge of the true value. Precision is assessed by means of duplicate/replicate sample analysis.

Procedure is a set of systematic instructions for performing an activity, using a method of measurement, or sampling that includes all steps or operations associated with a process. GGMD procedures are controlled documents.

Process is any series of actions that achieve an end result. Any work is part of a process. A process may include multiple tasks performed simultaneously and/or sequentially.

Quality is a measure of the degree to which the activity meets or exceeds the customer's expectations. For the GGMD, quality is also measured in terms of the ability to defend the results when subjected to intense and comprehensive review by the customer and the meaningfulness of the results of this experiment in meeting the objectives of the GGMD test plan.

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Quality Assurance Project Plan (QAPjP) is the overall plan established by the participants in the GGMD to plan, document, and implement quality in the performance of all activities relating to the GGMD that affect the overall quality of the project. Implementation of this plan is executed using task-specific plans and procedures.

Quality Control is the overall system of activities whose purpose is to control the quality of a product or service so that it meets the needs of users. Quality control procedures include methods to assure that samples are controlled, managed, and traceable; analytical analyses are accurate; and that data reduction meets established data quality objectives.

Sample is a portion of a population or lot. It may consist of an individual or groups of individuals. It may refer to objects, materials, or measurements, conceivable as part of a larger group that could have been considered.

Validation is the process by which a sample, measurement method, or a data point is deemed useful for a specified purpose.

Work is any technical or non-technical process including operating equipment or systems. Examples include research and development; analysis; maintenance and repair; management and administration; software development and use; inspection; assessment; data collection reduction, and reporting; planning; and scheduling.

Worker is any Los Alamos National Laboratory employee, contractor, or employee of another group or organization doing work for the GGMD.

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*Management***Criterion 1 - Program**

Organization	The organizational team assembled to perform this project includes expertise from several different LANL organizations. The Project Leader represents the Chemical Science and Technology (CST) Division's Group CST-7. Document control and records management support is provided by CST-7. Nuclear Material Technology (NMT-9) and Engineering Science and Applications (ESA-9) provide other technical support. Benchmark Environmental Corporation provides overall quality management/quality assurance support. The charted project organization appears as Attachment #1 to this QAPjP.
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Responsibilities and Authority	The following key members of the project's team comprise the primary workers with responsibilities that affect the quality of the project's outcomes.
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Project Leader

The Project Leader (PL) for this project is responsible for the following:

- All technical and administrative activities performed to achieve the goals of the project within the time and financial constraints of the contract;
- Coordinating and managing all project work;
- Submitting annual QA/QC activity reports to the MDP coordinator;
- Planning and scheduling to meet customer requirements;
- Reporting the status, progress, and data to the INEEL;
- The management of quality for assigned tasks and ensuring that quality objectives are attained; and
- Controlling nonconforming items or processes.

The PL has the authority to:

- Make financial and schedule commitments for the project;
- Assign tasks, select workers, and require specific levels of qualification and training;
- Approve processes, plans, and procedures, and changes thereto;
- Identify, define, and document processes, and changes thereto;
- Review procedures and designs; and
- Interface with customers and make commitments relating to processes for which they are responsible.

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The PL may delegate work, including planning, accomplishing, and assessing the project to other individuals or organizations however, the PL retains the overall responsibility for the project.

Quality Management Specialist

The Quality Assurance Specialist (QAS) is responsible for the following:

- Developing nontechnical quality procedures;
- Reporting and tracking nonconformances and verifying corrective actions;
- Preparing QA/QC reports to management;
- Preparing and maintaining this QAPjP; and
- Supporting the implementation of this plan.

The QMS has the authority to:

- Review plans and procedures and identify non-technical changes to ensure the quality of the processes,
- Be the primary interface on quality management issues,
- Guide quality management direction for the project, and
- Perform quality surveillance's and assessments.

Document Control/Records Management Specialist

The Document Control/Records Management Specialist (DCRMS) works in conjunction with the QAS to implement quality procedures, control quality-affecting documents, and control and maintain quality records for the GGMD.

The DCRMS has the authority to:

- Interface directly with customers to control distribution of records and documents; and
- Recommend methods to improve the quality of records management and document control processes.

Organizational Interfaces

The PL provides the primary conduit between LANL and INEEL, although other members of the GGMD team may interface with INEEL and other technical resources, as required.

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**Planning and
Scheduling**

The Project Leader coordinates with the technical consultants for the planning and scheduling of activities according to good scientific and project management practices. Planning includes the use of NIST or other nationally recognized standards wherever possible. Costs are tracked and managed by the PL. Adherence to schedule, budget, and achievement of milestones are primary performance indicators by which the GGMD's success is measured.

Planning for technical processes is documented in the Gas Generation Matrix Depletion/Tracer Experiment Test Plan.

**Rigor of
Application**

Activities for the GGMD are evaluated against their own direct and indirect importance to the project's success, cost, safety, health, and environmental risk. Based on the result of the evaluation, the level of rigor required to attain objectives are identified and incorporated.

The critical nature of the document control, analytical processes, data collection and maintenance activities, and reporting procedures for the GGMD require rigorous application of quality standards. Quality objectives (determined by the Project Leader) are assigned to each general activity that will have an impact on the eventual results from the project.

**Resolution of
Disputes**

Differences of opinion involving technical processes are brought to the PL and, if not resolved, elevated to successively higher levels of this project's management, including INEEL management of this project, as necessary.

Differences of opinion involving quality program requirements are resolved by the PL and the QAS.

**Functional
Readiness
Reviews**

The safety of major GGMD activities is a primary consideration for LANL. Prior to the startup of any major new activities or processes, a Functional Readiness Review (FRR) is performed by independent safety and/or facility management staff to ensure that all quality, safety, and formality of operations issues have been appropriately implemented. The scope of the FRR assures that:

- Proper permits, plans, and procedures for GGMD activities are complete, verified, and implemented;
 - Technical, safe operating, and quality procedures specific to the GGMD are prepared, reviewed for adequacy and appropriateness, and approved;
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- Equipment or system design are reviewed for safety, identification of proper positioning, applicability, appropriateness, and effectiveness, and incorporates environmental and waste minimization principles;
- Inspection and testing of new equipment and processes for the GGMD is performed;
- Proper equipment, materials, and resources are available to support the needs of the GGMD;
- All GGMD workers are appropriately trained, qualified, and authorized to perform procedures assigned;
- Safety considerations and requirements supporting radiological safety, contamination control, ALARA, chemical safety, spill mitigation and clean-up, industrial and fire safety, and worker safety (OSHA) are documented, reviewed, and approved;
- Planning is complete to develop contingency measures to respond to unplanned or unexpected failures or defects in systems, equipment, or processes; and
- Emergency response procedures for personnel evacuation, facility fire, and criticality incidents are deployed in the event of a catastrophic occurrence.

The FRR is conducted during the preparatory phase or prior to startup to provide an independent evaluation of the readiness of LANL to safely achieve the quality objectives of the GGMD.

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Criterion 2 - Personnel Training and Qualification**Qualification**

The Project Leader ensures that GGMD workers have the appropriate levels of education, experience, and training and are capable of performing assigned tasks and proficiently operate equipment or systems. Workers are trained in the implementation of procedures before work guided by the procedure actually begins. Verification of qualification is performance-based. Records evidencing the qualifications of each GGMD worker are maintained in the RMDC.

Training

GGMD workers complete facility- or site-specific training required by each facility manager before having unescorted access into the facility. Prior to performing work, each GGMD worker obtains a copy of any technical procedure that he/she is performing, and successfully completes performance-based proficiency testing before independently undertaking the work guided by any technical procedure. Testing results and certification of training recorded in the GGMD quality records and the worker's personnel file.

Qualification and training is implemented according to the "GGMD Training and Qualification Procedure," CST-GGMD-QAP2-002/most recent revision.

Quality Assurance and Conduct of Operations Training

GGMD workers receive training to ensure they understand how their respective roles affect the quality of GGMD activities and the quality requirements of this plan. Included in this training are Conduct of Operations requirements that impact GGMD tasks.

The Project Leader ensures that all GGMD workers understand that they are empowered to control work processes, accountable for their work, and evaluated on performance in compliance with approved procedures, techniques, and communications. GGMD workers also understand that they are responsible for stopping work in the event of imminent danger to health, safety, or the environment, and not resume work until the dangerous condition has been eliminated or appropriately mitigated.

Training for Change

When "Lessons Learned" are shared and reviewed or issues are identified that will improve quality, correct deficiencies, or modify processes or procedures, training is provided to workers affected by the change to ensure effective implementation of the change.

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Criterion 3 - Quality Improvement**Problem
Prevention**

All GGMD workers are responsible for identifying non-conforming items, activities and processes. GGMD procedures are established to prevent problems and improve the quality of work. To that end, techniques and methods developed for the GGMD are subject to peer review and safety analysis before implementation. Work is subject to ongoing worker and supervisor assessment to assure that it is being performed according to appropriate procedures and that opportunities for quality improvement are identified. GGMD management's no-fault attitude should motivate workers to identify problems and continuously seek ways to improve processes and products.

Conditions adverse to quality are identified, documented, and reported to management. Audit findings are reported to the MDP Coordinator, and non-conformances are reported to the DOE field office. The PL, at a minimum, summarizes all relevant QA/QC activities in an annual report and submits the report to the MDP coordinator.

**Performance
Monitoring**

GGMD work is subject to routine monitoring activities by the PL. All GGMD workers monitor and assess the performance of their work and the work of peers to identify opportunities for improvement. When processes are not producing the objective results, workers consider alternatives, discuss solutions with the PL and implement change. Changes are documented, as required by the "GGMD Document Control Plan," CST-GGMD-QAP4-004/most current revision.

**Performance
Verifications**

Analytical performance is verified using blind samples prepared for the purpose of verification. Results of analyses are compared to predetermined acceptance limits. Deficiencies or problems identified are documented, communicated to the PL, corrected, and maintained in GGMD quality records at the RMDC.

**Nonconforming
Items or
Processes**

GGMD equipment exhibiting off-normal operation or signaling off-normal conditions by alarm or other warning indicator is removed from routine service and not used until the defect is corrected or determined to be insignificant to safe operations by the PL.

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Items or processes that do not meet established quality standards or requirements are identified, segregated or discontinued, documented, analyzed, resolved, and followed up to a degree commensurate with their importance or significance. Items or processes are evaluated using the graded approach. Nonconforming items or processes are controlled by the PL to prevent inadvertent use or installation. Nonconforming items and processes are documented and resolved according to the *"GGMD Corrective Action and Quality Improvement Plan,"* CST-GGMD-QAP3-003/most current revision.

**Event
Investigation**

Unusual events affecting GGMD are investigated and documented. Any occurrences requiring the generation of DOE Order 5000.3c, *"Occurrence Reporting and Processing of Operations Information"* reports are documented, thoroughly investigated, root cause(s) identified, and corrective action(s) implemented according to existing reporting procedures.

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Gas Generation Matrix Depletion's Quality Assurance Project Plan Page 11 of 21**Criterion 4 - Documents and Records****Document
Control**

Documents affecting the quality of GGMD work are prepared, reviewed, approved, and controlled according to the "*GGMD Document Control Procedure*," CST-GGMD-QAP4-004/most current revision. Documents are controlled throughout the draft, review, approval, and distribution processes. Procedures that become effective after the original startup of the process documented in the procedure include an effective date for implementation.

Records

Quality records for the GGMD are maintained according to the "*GGMD Records Management Procedure*," CST-GGMD-QAP4-005/most current revision.

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*Performance***Criterion 5 - Work Processes**

Work is performed to established, approved, and documented technical standards, under controlled conditions, using approved instructions, procedures, or drawings.

**Laboratory
Notebooks and
Logbooks**

To ensure the maintenance of appropriate records and comply with DOE Formality of Operations guidelines, Laboratory notebooks and logbooks used and maintained according to the GGMD's "*Laboratory Notebook and Logbook Maintenance Procedure*," CST-GGMD-ADM4-011.

Procedures

Procedures for technical processes are planned, reviewed, and approved by qualified workers other than those preparing the procedures. Control methods to assure the quality of results are included.

Procedures used for the GGMD that have been borrowed from other research or experimental projects are incorporated into this program, with a cover page indicating any changes or additions for GGMD, if applicable. The procedure is controlled under "*GGMD Document Control Procedure*," CST-GGMD-QAP4-004/most current revision, even though the body of the procedure may be already controlled under another project.

All GGMD work processes (analytical, operational, or administrative) is controlled using GGMD-specific procedures or other currently valid procedures that produce the desired result. Attachment 2 is list of applicable procedures in use for GGMD.

**Data
Verification**

Data are reviewed and verified by technically competent workers prior to distribution. Deficiencies are resolved and resolutions documented in quality records.

**Technical
processes**

Technical processes for this project include the following:

- The experiment is designed by choosing the matrices, the number of quantities of Pu²³⁸ and Pu²³⁹ and the chemical form of the Pu. Gas parameters and frequency of measurements are defined. Equations and constants used in deriving the final effective G-values from measurement data are established.
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For the location selected to conduct the experiments, procedures are established for cylinder loading, handling, and long-term monitoring. Additionally, measures to reduce the susceptibility to radiological sabotage, the ease of accessibility to analysis apparatus, and ALARA are implemented.

The following components are included in the design and fabrication of the test chambers and the rack to hold the chambers:

- Size
- Material
- Pressure Ratings
- Reactivity with experimental reagents
- Structural stability
- Special considerations (i.e. temperature control, vibration, etc.)

The equipment used to conduct the experiments is calibrated (see "*Calibration*"), analytical systems are defined and documented. Two analytical methods are used, the primary method is connected on-line with the hold chambers to give near real-time data. The second method is used to ensure the validity of the data on a predetermined subset of samples. The sampling system is designed to move gases from hold chambers to the "primary" analytical and "secondary subset" analytical systems. Sampling and analysis is performed according to *Sampling and Quality Control*, CST-GGMD-WKP5-003, and QC verification, sample transfer, analysis, instrument calibration, and results reporting is controlled by the *Procedure for the Analysis of QC Verification Samples by Gas Mass Spectrometry*, CST-GGMD-WPK5-004.

Data are provided to INEEL and Benchmark in a model for expected G-values based on the experiment's results, and comparison of values to INEEL and RFETS results from waste drums.

Reporting and Deliverables

Monthly status and other technical reports are prepared and provided to INEEL according to the requirements of the test plan or any subsequent verbal or written agreements as to content, date, format, etc. between LANL and INEEL.

Presentations, consultations, or participation in technical meetings or similar convocations are made according to the test plan or any subsequent verbal or written agreements between LANL and INEEL.

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Data Quality Objectives

The data quality objectives are as follows:

- With 95% accuracy, assure that the true mean effective G-values for simulated waste materials, when estimated with 10% relative error, does not exceed the experimentally derived bounding effective G-values.

Measurement and Analysis Quality Assurance Objectives

<i>Parameter</i>	<i>Precision</i>	<i>Accuracy</i>	<i>MDL</i>	<i>Completeness</i>
Hydrogen	≤ 10 RPD or %RSD	90 to 110 %R	0.05 vol%	90
Methane	≤ 10 RPD or %RSD	90 to 110 %R	0.001 vol%	90
Nitrogen	≤ 10 RPD or %RSD	90 to 110 %R	1.00 vol%	90
Oxygen	≤ 10 RPD or %RSD	90 to 110 %R	0.10 vol%	90
Carbon Monoxide	≤ 10 RPD or %RSD	90 to 110 %R	0.01 vol%	90
Carbon Dioxide	≤ 10 RPD or %RSD	90 to 110 %R	0.01 vol%	90
Argon	≤ 10 RPD or %RSD	80 to 120 %R	0.50 vol%	90
Methane	≤ 10 RPD or %RSD	90 to 110 %R	0.01 vol%	90
Temperature	+/- 5.0 F	+/- 2.0 F	N/A	90

Data Documentation, Control, and Validation

Data generated by GGMD activities are identified and traceable throughout the lifetime of the data. Data are reviewed by qualified independent reviewers with the technical skills necessary to verify and validate data against identified acceptance criteria. The review process and comment disposition is documented. The data validation and reporting process is controlled by the *Data Generation Level Validation Procedure*, CST-GGMD-QAP-030.

Existing data are qualified for use for the GGMD if:

- The data were generated under an approved QA program;
- Corroborating data with inferences drawn to corroborate the existing data have relationships that are clearly identified and justified as used;
- Confirmatory testing is performed and documented, or
- Peer review is performed and documented.

Calibration

Instruments, equipment, tools, gauges, balances, and any other measuring or test equipment used for the GGMD are controlled and calibrated according to the "*Calibration Handbook*," LALP-93-47, June 1993, or the manufacturer's instruction. Instrument calibration for QC verification samples is performed according to the *Procedure for Analysis of QC Verification Samples by Gas Mass Spectrometry*, CST-GGMD-WPK-004.

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Calibration and method performance gases are performed according to the following:

Calibration Gases (Need CL Size Cylinders, 9 Total)**Set #1 Balance gas He**

	STD1	STD2	STD3
CH ₄	100 ppm	2500 ppm	5,000 ppm
N ₂	10,000 ppm	325,000 ppm	650,000 ppm
O ₂	1000 ppm	100,000 ppm	200,000 ppm
CO	100 ppm	500 ppm	1,000 ppm
Ar	1,000 ppm	5,000 ppm	10,000 ppm
CO ₂	5,000 ppm	10,000 ppm	100,000 ppm

Set #2 Balance gas N₂

	STD1	STD2	STD3
H ₂	10 ppm	100 ppm	1,000 ppm

Set #3 Balance gas N₂

	STD1	STD2	STD3
H ₂	1,000 ppm	100,000 ppm	200,000 ppm

Method Performance Gases (Need 4 LB size)**Balance Gas N₂**

H ₂	5,000 ppm
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Each analytical method uses calibration standards or laboratory control standards to establish the accuracy of the method. When available, standards are obtained that are certified to be traceable to NIST. Other standard reference materials or standard solutions are obtained only from vendors that provide a certification of the accuracy of the standard. A log of all standard reference materials used for calibration and verification of analytical procedures and instruments and calibration records is maintained in GGMD quality records at the RMDC.

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Software

Commercially available software requires only testing for verification that it performs as expected. Any code written especially for the GGMD is validated by technically proficient workers, other than those writing the code, prior to implementation. Instrument software is validated prior to use for data collection by running known samples and comparing known results with the instrument generated results according to the *LabView Verification and Validation Plan*.

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Criterion 6 - Design

Systems, processes, or hardware designed for the GGMD are designed using sound engineering and applicable scientific principles and are based on design inputs from the test plan and INEEL procedures. Design reviews by technically competent workers, not responsible for the design, are performed and documented to validate the appropriateness and utility of the design. Designs are assessed against technical needs and any facility radiological or safety requirements or limitations. Environmental, safety, health, waste minimization, ALARA, and other regulatory considerations as well as engineering principles of fit, form, and function are part of the design and design review process. Designs are reviewed against identified criteria. Review comments and their disposition are documented. The *"GGMD Design Procedure,"* CST-GGMD-QAP6-006, is used.

"Use-as-is"

Design changes, decisions to "use-as-is," or to repair items are documented, controlled, and justified. Changes to designs are documented, identified, and reviewed in the same manner as the original design. Changes are approved by the PL by either signature or initials and date.

**Design
verification**

Design verification is conducted and documented for critical systems and instruments before purchase or implementation. Design verification is performed by a team of technically knowledgeable workers appointed by the Project Leader. Inspection and acceptance criteria for critical items or systems is defined in the design documentation and verified during the design verification process.

**Design
Documentation**

Design documentation for GGMD designs includes performance requirements and the description of any critical characteristics required for proper function, reliability, interchangeability, life-span, or safety of items.

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Criterion 7 - Procurement

Any procurement actions for the GGMD are planned and performed according to LANL's procurement procedures and "*GGMD Procurement Procedure*," CST-GGMD-QAP7-007. Critical procurements may require the vendor to be qualified prior to purchase.

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Criterion 8 - Inspection and Acceptance Testing

Inspection or testing requirements for critical instruments or equipment is defined, documented, communicated to the vendor, and performed by workers qualified to perform the inspection or testing. Inspections of equipment or systems following maintenance or testing are also performed prior to the next use. Routine inspections of equipment and systems are periodically performed to ensure that the equipment or system performs as expected. This process is performed according to "*GGMD Inspection and Acceptance Procedure*," CST-GGMD-QAP8-008.

Inspection and testing is documented and recorded in quality records and maintained at the RMDC.

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*Assessment***Criterion 9 - Management Assessment****Project
Assessments**

The GGMD PL plans and implements periodic assessments of the GGMD to ensure that activities are performed and controlled according to plans or procedures. Routine walk-through verifications performed by the PL and other GGMD workers are ongoing.

The scope and frequency of formal management assessment is directly proportional to the complexity and risk of the process being reviewed and its impact on the overall quality of the project.

Documentation of observations is completed and a written report iterating deficiencies is prepared by the worker leading the verification activities and is provided to the PL.

Conditions adverse to quality are identified, documented, and reported to management. Audit findings are reported to the MDP Coordinator, and nonconformances are reported to the DOE field office. The PL, at a minimum, summarizes all relevant QA/QC activities in an annual report and submits the report to the MDP Coordinator.

Management assessments are implemented according to the "GGMD Management Assessment Procedure," CST-GGMD-QAP9-012.

Follow-Up

The PL and QMS are responsible for reviewing and analyzing assessment findings and observations and ensuring that plans are implemented to correct deficiencies. Proposed corrective actions are evaluated as to benefit against cost to determine whether the corrective action is reasonable and sensible. On occasions when the corrective action is beyond budget limitations or does not add value, justification is documented and the corrective action postponed or tabled until funded or becomes operationally feasible and desirable. Follow-up actions are documented in GGMD quality records.

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Criterion 10 - Independent Assessment

Yearly independent assessments are scheduled through the Laboratory's Audits and Assessment organization (AA-2) and the Quality Assurance Support Group. The PL, QAS, and DCRMS will coordinate independent assessment plans with GGMD workers.

Results of independent assessments are reviewed by the PL, the QAS, and, as appropriate, the facility manager or the Safety Coordinator for the area where the activities are being performed. Responses to assessments, action plans to correct deficiencies, and follow-up on the assessment's findings are the responsibility of the QAS and the PL and are maintained in quality records.

ATTACHMENT 1

LANL ORGANIZATION FOR GGMD EXPERIMENT

LAN L Organization for GGMD Experiment - 05/01/98

ATTACHMENT 2

GAS GENERATION MATRIX DEPLETION LIST OF PROCEDURES

**GAS GENERATION MATRIX DEPLETION
LIST OF PROCEDURES**

CST-GGMD-QAP1-001/0	GGMD Quality Assurance Project Plan
CST-GGMD-QAP2-002/0	GGMD Training and Qualification Plan
CST-GGMD-QAP3-003/0	GGMD Corrective Action and Quality Improvement Plan
CST-GGMD-QAP4-004/0	GGMD Document Control Plan
CST-GGMD-QAP4-005/0	GGMD Records Management Plan
CST-GGMD-QAP6-006/0	GGMD Design Procedure
CST-GGMD-QAP7-007/0	GGMD Procurement Procedure
CST-GGMD-QAP8-008/0	GGMD Inspection and Acceptance Plan
CST-GGMD-ADM4--11/0	GGMD Notebook and Logbook Maintenance Procedure
CST-GGMD-QAP9-012/0	GGMD Management Assessment Procedure
CST-GGMD-BEC5-006/0	Verification and Validation of Labview for GGMD
CST-GGMD-BEC5-007/0	Documentation of Labview for GGMD
CST-GGMD-WPK5-001/0	Procedure for Loading Test Chambers for 238Pu and 239Pu
CST-GGMD-WPK5-004/0	Procedure for the Analysis of QC Verification Samples by Gas Mass Spectrometry
CST-GGMD-WPK5-005/0	Test Container Reload Procedure
BEC-GGMD-003/0	GGMD Cold Test Procedure