

United States Government

Department of Energy
Carlsbad Area Office

memorandum



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DATE: 23 JUL 1999

REPLY TO
ATTN OF: CAO:QA:SAV:99-0884 UFC 2300.00


SUBJECT: CAO Audit Report A-99-04

TO: Christopher P. Murnane, LAAO

The Carlsbad Area Office (CAO) conducted an audit (in conjunction with an EPA inspection) of the Los Alamos National Laboratory (LANL) Waste Characterization and Certification activities between June 14-17, 1998 and June 28 to July 1, 1999. The audit team concluded that the LANL technical and QA programs were adequate in accordance with the CAO QAPD and QAPP. Except for the areas of acceptable knowledge for homogeneous solids and the analysis of RCRA metals, volatile organic compounds, and semi-volatile compounds, which were concluded to be indeterminate due to insufficient implementing information, the audit team concluded that LANL procedures were being satisfactorily implemented and the evaluated processes were effective.

Two Corrective Action Reports (CARs) and seven Observations were identified during the audit. The CARs were transmitted via separate correspondence. CAO is requesting responses to Observations 1, 6, and 7 be submitted to us by August 15, 1999.

If you have any questions or comments concerning this report, please contact Samuel Vega at (505) 234-7423.


Samuel A. Vega
Quality Assurance Manager, CAO

Attachment

cc w/attachment:
R. A. Stroud, CAO
L. Chism, CAO
D. Winters, DNFSB
S. Monroe, EPA
M. Eagle, EPA
S. Zappe, NMED
J. Channell, EEG
P. Rogers, LANL
M. Gavett, LANL
S. Kouba, WID
T. Bowden, CTAC

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U.S. DEPARTMENT OF ENERGY
CARLSBAD AREA OFFICE

AUDIT REPORT

OF THE

LOS ALAMOS NATIONAL LABORATORY

LOS ALAMOS, NEW MEXICO

AUDIT NUMBER A-99-04

JUNE 14 – JUNE 17, 1999

AND

JUNE 28 – JULY 1, 1999

TRU WASTE CHARACTERIZATION AND CERTIFICATION



Prepared By: *John Ptacek*
John Ptacek
Audit Team Leader

Date: 7/22/99

Approved By: *Samuel Vega*
Samuel Vega
CAO Quality Assurance Manager

Date: 7/23/99

1.0 EXECUTIVE SUMMARY

Carlsbad Area Office (CAO) Audit A-99-04 was conducted to evaluate the adequacy, implementation, and effectiveness of those technical and quality assurance activities related to Los Alamos National Laboratory (LANL) Transuranic (TRU) Waste Characterization and Certification that have been added since the CAO recertification audit conducted in September 1998. The U.S. Environmental Protection Agency (EPA) also conducted a concurrent inspection of these activities.

The audit was conducted at the LANL facility June 14 through 17, 1999 and June 28 through July 1, 1999. The audit team concluded that the LANL technical and Quality Assurance procedures were adequate relative to the flow down of requirements from the CAO Quality Assurance Program Document (QAPD), Quality Assurance Program Plan (QAPP), and Waste Acceptance Criteria (WAC).

The audit team concluded that the defined LANL QA Program continues to be satisfactorily implemented in accordance with the LANL Quality Assurance Project Plan (QAPJP) and implementing procedures. The following LANL technical areas evaluated by the audit team were determined to be implemented and effective: the use of three non-destructive assay systems (the High Efficiency Neutron Counter and two Tomographic Gamma Scanner instruments); the packaging of newly generated debris waste at TA-55; and the coring and sampling of homogeneous solids. A review of real-time-radiography (RTR), visual examination (VE), and WIPP Waste Information System (WWIS) activities was added into the scope of the audit at the request of EPA. The audit team determined that these three areas continue to be effectively implemented. Insufficient information was available to the audit team to fully evaluate the documentation of acceptable knowledge for homogeneous solids and the analysis of RCRA metals, volatile organic compounds and semi-volatile organic compounds. These areas were identified as indeterminate and will need to be evaluated at a later date.

The audit team identified two Corrective Action Reports (CARs) in the areas of software quality assurance and real-time radiography data handling and verification. The team identified six isolated deficiencies requiring only remedial corrective actions and that were Corrected During the Audit (CDA). Seven Observations were identified. The most significant Observation (#1) addresses troublesome resource limitations that were observed to impact the conduct of the audit, and which may jeopardize the ability of the LANL TWCP to retain their current certification and/or to "throttle up" to meet their more ambitious shipping schedules in the future. The CARs have been previously issued under separate cover and are summarized in Section 6.0. CDAs and Observations are also discussed in Section 6.0.

2.0 SCOPE

The audit team evaluated the adequacy, implementation, and effectiveness of technical and quality assurance processes related to the additional TRU Waste Characterization and Certification activities to be used by LANL.

The following Quality Assurance (QA) elements were evaluated in accordance with the CAO QAPD:

- Organization and Interface Control
- Sample Control
- Data Documentation, Control, and Validation
- Software Control

The following characterization technical elements were evaluated in accordance with the CAO QAPP:

- Nondestructive Assay – High Efficiency Neutron Counter (HENC)
- Nondestructive Assay – Tomographic Gamma Scanner (TGS)
- Sampling Design
- Sample Handling
- Sampling of Homogeneous Solids
- Real Time Radiography
- Visual Examination
- WIPP Waste Information System
- Total Volatile Organic Compound Analysis
- Total Semi-Volatile Organic Compound Analysis
- Total Metals Analysis
- Packaging of Newly Generated Debris Waste at TA-55
- Data Validation, Usability, and Reporting

Adequacy evaluation of LANL TRU Waste Characterization Program (TWCP) documents was based on current revisions of the following documents:

- CAO QAPD, CAO-94-1012
- CAO QAPP, CAO-94-1010, Revision 0 with Interim Change Notice
- Transuranic Waste Characterization Sampling and Analysis Methods Manual, DOE/WIPP-91-043, Revision 1.0
- Waste Acceptance Criteria for the Waste Isolation Pilot Plant, DOE/WIPP-069

Evaluation of the implementation and effectiveness of LANL TRU Waste Characterization Program (TWCP) was based on the current revisions of the following documents:

- LANL Transuranic Waste Quality Assurance Project Plan (QAPjP), TWCP-PLAN-0.2.3-001
- LANL Transuranic Waste Certification Quality Program Plan, TWCP PLAN-0.2.4-001
- Related LANL technical and quality assurance implementing procedures

The following procedures were removed from the scope of the audit by mutual agreement of the auditee and the audit team due to the lack of a current need for implementation:

- ANC-133, Determination of Trace Element in Water and Wastes – ICPMS
- ANC-188, Metals Analysis by Graphite Furnace Atomic Absorption –GFAA
- DTP-1.2-006, Calculation of UCL90 Values for Metals, VOCs, and SVOCs
- QP-1.1-024, Reporting Summarized Characterization Data and Waste Stream Summaries to CAO (implementation for homogeneous solids)
- QP-1.1-028, Reconciliation of Waste Stream Information (implementation for homogeneous solids)

3.0 AUDIT TEAM AND OBSERVERS

AUDITORS/TECHNICAL SPECIALISTS

Samuel Vega	Certification Manager, CAO
John Ptacek	Audit Team Leader, CTAC
Chet Wright	Auditor, CTAC
Norman Frank	Auditor, CTAC
Earl Bradford	Auditor, CTAC
Dee Scott	Auditor, CTAC
Steve Davis	Auditor, CTAC
Jerry Alletzhauser	Auditor, CTAC
Mike Brown	Technical Specialist, CAO
Alan Williams	Technical Specialist, CTAC
Jim Bresson	Technical Specialist, CTAC
William Verret	Technical Specialist, CTAC
Trey Greenwood	Technical Specialist, CTAC

INSPECTORS/OBSERVERS

James Oliver	EPA Inspector
Julie Shannahan	EPA Inspector
Patrick Kelly	EPA Inspector
Howard Finkel	EPA Inspector
James Channell	EEG Observer
Bill Weston	WID Observer

4.0 AUDIT PARTICIPANTS

LANL individuals involved in the audit process are identified in Attachment 1. A preaudit meeting was held in Technical Area (TA) 48, Building RC-29, Conference Room 118 on June 14, 1999. A daily meeting was held with LANL management and staff to discuss issues and potential deficiencies. An interim status briefing was presented on June 17, 1999 at the end of the first week of auditing. A re-introductory briefing was conducted on June 28, 1999. The audit was concluded with a postaudit meeting held in the TA-50, RAMROD Conference Room on July 1, 1999.

5.0 SUMMARY OF AUDIT RESULTS

5.1 Program Adequacy, Implementation, and Effectiveness

During LANL's recertification audit (A-98-30) in September of 1998, the audit team concluded that the overall adequacy of the LANL QA Program was satisfactory in meeting the requirements of CAO's QAPD, Revision 1, QAPP, Revision 0 and Interim Change 11/96, WAC, Revision 5 and Change Notice 1, and TRAMPAC, Revision 16. During audit A-99-04, the audit team investigated the adequacy of technical and QA program requirements relating to the characterization activities being evaluated. Except for minor concerns in the area of software quality assurance that are addressed in Corrective Action Report (CAR) 99-080, no adequacy issues were identified. The audit team concluded that the QA program was being satisfactorily implemented in the areas being evaluated. Except for the documentation of acceptable knowledge for homogeneous solids and the analysis of RCRA metals, volatile organic compounds and semi-volatile organic compounds, the LANL technical processes evaluated by the audit team were determined to be implemented and effective.

5.2 QA Program Audit Activities

The audit team evaluated the QA program interfaces with the characterization activities being evaluated. The audit team determined that implementation of QA program requirements relating to training, qualification, assessments, procurements, document control, measuring and test equipment (M&TE), nonconformances, corrective actions,

and records was satisfactory. Throughout the three organizations (ESWT, CST-9, and TA-55) and the twelve technical processes being evaluated, six minor deficiencies in the areas of document control, records, and training were identified and corrected during the audit (CDA). The audit team concluded that these were isolated conditions and did not require additional follow-up investigative or preventative actions.

The audit team investigated the organizational interfaces between ESWT and CST-9 as defined in TWCP-QP-1.1-037, Revision 3, and the interfaces between ESWT and TA-55 as defined in WM-TA55-TWID, Revision 1. No interface issues were identified during audit A-99-04, however the level of incompleteness of the CST-9 work and the TA-55 access limitations make it appropriate to revisit these interface activities during subsequent audits.

The audit team also evaluated the organizational support and resources provided for the project. The audit team identified numerous indicators that point to the possibility of insufficient attention and resource support by LANL management. These concerns are detailed in Observation #1. The identified resource and support issues impacted the conduct of the audit and, if not promptly addressed, could jeopardize the ability of the LANL TWCP to add characterization methods for new waste streams and/or to meet their more ambitious future shipping schedules. It is also possible that, if not arrested or reversed, these shortfall trends may impact the ability of LANL to continue their currently certified activities.

A summary table of audit results is provided as Attachment 2. Details of audit activities, including specific objective evidence reviewed, are contained within the audit checklists. Checklists are maintained as QA records.

5.3 Technical Activities

Evaluations of applicable LANL technical activities are summarized below. A list of procedures evaluated during the audit is provided as Attachment 3.

5.3.1 Nondestructive Assay (NDA)

The audit team evaluated three new LANL NDA systems – the High Efficiency Neutron Counter (HENC) and two Tomographic Gamma Scanner (TGS) systems (Mobile TGS and Portable TGS). The evaluation included an assessment of the adequacy and implementation of the LANL procedures applicable to these systems. Calibration data, quality assurance objective (QAO) verification data, and assay data packages were reviewed for all three systems.

The HENC and TGS operations and records were reviewed and evaluated and determined to comply with applicable LANL procedures. Assay data package records are prepared on forms that accurately reflect commitments required in the operating

and calibration procedures. The data are assembled on a batch basis, traceable to individual waste containers. Assay data packages were determined to comply with applicable WIPP reporting requirements. The audit team identified four minor concerns in the areas of: 1) robustness of the NDA technical review guidance; 2) background measurement criteria; 3) calibration point density; and 4) use of Acceptable Knowledge (AK) and RTR information for selection of assay techniques (see Observation # 3). The audit team determined that the HENC and TGS procedures were adequate and effectively implemented.

The HENC operations, calibration data, and QAO verification data were determined to be acceptable for assay of weapons grade TRU waste forms within the currently defined operating envelope, as demonstrated to the audit team. Use of the HENC to assay additional waste forms would need to be evaluated and approved by CAO.

The TGS operations, calibration data, and QAO verification data was determined to be acceptable for assay of both heat source and weapons grade TRU waste forms within the currently defined operating envelope, as demonstrated to the audit team. Use of the TGS to assay additional waste forms would need to be evaluated and approved by CAO.

5.3.2 Data Validation; Level 2, Project Level Data Review and Reporting

The data validation process was evaluated and found to be in compliance with LANL's written program. The Site Project Manager is responsible for level 2 data validation. The evaluation included examination of data packages to assure that validation reviews are occurring. The audit team determined that the written program continues to be adequate and satisfactorily implemented, and that the data validation activities for the new processes are effective.

5.3.3 Real-Time-Radiography (RTR)

LANL radiography operations records were reviewed, including data reports and batch reports. Two deficiencies were identified. The RTR miscertification rate has not been recalculated annually, as required, and several RTR batch data reports have not been submitted to the Site Project Office (SPO) within the required 28-day period. These deficiencies are documented in CAR 99-081. One isolated minor concern in the area of operator training was also identified and Corrected During the Audit. Observation #6 also notes that the LANL RTR process generates six waste material parameter categories that do not directly match the WWIS system's 14 categories, and there is not an agreed upon convention for converting from one set to the other. The audit team determined the RTR procedures to be adequate and marginally implemented. Technical RTR activities continue to be effective.

5.3.4 Visual Examination

LANL visual examination operations records were reviewed, including data reports and batch reports. Two isolated minor concerns in the areas of document control and records were identified and Corrected During the Audit. The audit team concluded that visual examination procedures continue to be adequate, satisfactorily implemented, and the technical activities continue to be effective.

5.3.5 Sample Handling and Chain-of-Custody

Activities relating to sample handling and chain-of-custody were evaluated. The evaluation verified that handling of samples and chain-of-custody are being performed in accordance with procedural requirements. In general, samples were stored correctly after receipt and are tracked as they move through the analysis processes. One exception in the area of sample storage was observed in the VOC/SVOC analytical process which is still under development and is not yet fully implemented (see Observation # 5a and Section 5.3.12). It was concluded that the written sample handling and chain-of-custody procedures continue to be adequate, satisfactorily implemented, and technical activities continue to be effective.

5.3.6 Sampling Design

The design of random selection of containers to be sampled and the calculation for determining the number of containers to be visual examined were evaluated. The written program continues to be adequate and satisfactorily implemented and technical activities continue to be effective.

5.3.7 Software

Quality assurance requirements for control of software used for processing, controlling, measurement, characterization, and status of hazardous, radioactive, and waste matrix materials were evaluated. The evaluation included a review of the implementation of processes for the development and control of software baselines, software classification, and the technical review of completed software documentation.

Software documentation and controls were evaluated for applicable software used with the new characterization activities being assessed. These included the TA-55 Waste Management System, HENC, Mobile TGS, Portable TGS, ESWT databases, and analytical and data reduction software for the instruments used in the chemical analyses of RCRA metals, Volatile Organic Compounds (VOCs), and Semi-Volatile Organic Compounds (SVOCs). Evaluation of software quality assurance identified several deficiencies in the areas of software classification, configuration management, and documentation. CAR 99-080 was issued to address these deficiencies occurring in

the newly implemented processes. The audit team concluded that the software controls in the new processes are adequate but marginally implemented and marginally effective. No deficiencies were identified in the previously established portions of the LANL software QA program, which continues to be adequate and effectively implemented.

5.3.8 WIPP Waste Information System (WWIS)

LANL WWIS operations records were reviewed and evaluated. A demonstration of the WWIS was performed to verify LANL's capability to implement the process in accordance with the procedure. One concern was identified relating to the mismatch between the WWIS and the LANL RTR categorizations for waste material parameters (see Observation #6 and Section 5.3.3). One minor isolated concern in the area of records was identified and corrected during the audit. Based on the demonstration and review of documentation, the audit team determined that LANL has appropriately implemented the WWIS and the process is effective.

5.3.9 Acceptable Knowledge

Activities related to the AK process were reviewed for the pyrochemical salts homogenous solids waste stream. This review included the evaluation of the draft *Acceptable Knowledge Summary Report for TA-55-39*. The draft report was evaluated to ensure that an independent technical review had been completed and for traceability of the roadmap and its supporting documentation. A revised draft report was also reviewed later in the audit, however a final approved document was not available prior to the end of the audit. Therefore, the audit team concluded that the AK summary report for homogeneous solids is indeterminate until a final approved document can be evaluated. Observations #1 and #2 document concerns regarding completeness and traceability of the information in the draft report.

5.3.10 Packaging of Newly Generated Debris Waste at TA-55

The audit team evaluated activities related to packaging of newly generated debris waste at TA-55. The team reviewed applicable procedures, observed waste operations, and examined the associated data packages. Some concerns were identified in the areas of procedural clarity and detail and the unusual quantity of rework (see Observation #7 and Section 5.2). The audit team concluded that the procedures are adequate and have been effectively implemented.

5.3.11 Solids Coring and Sampling

Activities related to the coring and sampling of homogeneous solids were evaluated. The audit team observed a demonstration of the coring process and reviewed associated documentation. One minor isolated concern in the area of records was

identified and Corrected During the Audit. It was concluded that the coring and sampling procedures are adequate and effectively implemented.

5.3.12 Analysis of Resource Conservation and Recovery Act (RCRA) Metals, VOCs, and SVOCs

The audit team attempted to evaluate activities related to the analysis of RCRA metals, VOCs, and SVOCs. Due to resource limitations, LANL was not able to properly prepare for the audit of these activities. The results for all analytical processes were indeterminate and will need to be re-evaluated during a future audit. Observation #1 discusses the issue of resource limitations. Evaluation of a chemical analytical process requires several sets of data, such as Performance Demonstration Program (PDP) results, Instrument Detection Limit/Method Detection Limit (IDL/MDL) data, performance sample data, MS/MDS recovery data on core samples. In most cases, one or more of these data sets were lacking. Several of the methods are new and have not yet been approved by CAO for use on the WIPP project. LANL must obtain CAO approval prior to certification of these processes. Observation #4 discusses these concerns and Attachment 4 contains a table showing the current status of each of the processes evaluated. Observation #5 addresses several concerns that should be addressed as the VOC/SVOC analytical processes are further developed and implemented. One minor isolated concern in the area of document control was identified and Corrected During the Audit.

Although these analytical methods are in the early stages of development, the audit team was encouraged by the potential benefits from these methods. While the information available to the team was limited, none of the methods appear to be technically deficient or potentially unacceptable to CAO. If properly documented and approved, these methods hold considerable promise for LANL and for the WIPP project. These methods can significantly reduce analytical costs for TRU waste, significantly enhance the laboratory As Low As Reasonably Achievable (ALARA) posture, and provide an alternative to the generation of wastes that have no path forward for disposal using currently approved analytical methods.

6.0 CARs, CDAs, and OBSERVATIONS

6.1 Corrective Action Reports (CARs)

1. **CAR 99-080** This CAR documents several software QA implementation deficiencies that were identified in the software for the characterization systems being evaluated. The deficiencies relate to lack of implementation of requirements for configuration management, approval signatures, user manuals, and lists of approved users. The most serious issue was the lack of objective evidence that the software used for Cycle 6B of the RCRA PDP is the same software being used for waste characterization. Also identified in this CAR are two minor adequacy issues relating to software classification and contents for software evaluations.

2. **CAR 99-081** This CAR documents two deficiencies relating to the RTR process: 1) the RTR miscertification rate was not recalculated annually as required; and, 2) RTR batch reports have generally not been forwarded to the SPO for project level review within the required 28 days and several RTR batches from 1998 have not yet been processed.

6.2 Deficiencies Corrected During the Audit (CDA)

Six minor deficiencies were identified in the areas of document control, records, and training. These were satisfactorily Corrected During the Audit. The audit team concluded that these were isolated conditions occurring among three different organizations and twelve separate characterization processes, and do not require additional follow-up investigative or preventative actions.

6.3 Observations

The following seven Observations were identified during the audit. Responses are required for Observations 1, 6, and 7.

1. There is concern over a potentially insufficient level of management attention and resource allocation for LANL TRU waste activities. Resource and staffing limitations were observed in many areas during this audit. Several audit activities were delayed and/or rendered indeterminate due to incomplete preparations. Examples are provided below:
 - a. Recent office space allocations appear to be fragmented among several sites and not conveniently located. Additional planned relocations appear to be imminent and seem to be even less satisfactory.
 - b. The AK summary document for homogeneous solids had not been completed and was not ready for evaluation during the audit, as was committed to during the planning phase. See also Observation #2.
 - c. RCRA PDP data has not been processed. LANL has asked for three extensions, claiming lack of resources as the reason.
 - d. Calibrations of the prototype/portable TGS system were not completed as committed to during the planning phase.
 - e. Sufficient data for the RCRA analyses (Metals/VOCs/SVOCs) was not available. See also Observation #4.
 - f. Internal software QA surveillances of the new systems (HENC, TGS, and RCRA analytical processes) had not been completed by LANL personnel prior to the audit, due to other commitments. This resulted in CAO issuing CAR 99-080 for issues that should have been identified and resolved internally.

- g. In most areas, the TWCP project has no redundancy or back-up capability. Examples identified during the audit were:
- The evaluation of VOC/SVOC analyses was delayed due to a family emergency.
 - The evaluation of three of the metals analytical processes (ANC133, ANC188, and ANC189) was affected by the absence of a single operator.
 - Deficiencies concerning the recalculation of the Visual Examination miscertification rate and the completion of data packages within the prescribed 28-day window were potentially indicative of inadequate resources. Data packages have been waiting many months to be completed (over six months in some cases).
 - If even one LANL TRU waste transportation worker takes a vacation, all waste transportation must be suspended until his/her return.
2. Acceptable Knowledge documentation needs to address the absence of Sr-90 and Cs-137 in the LANL TRU waste streams to justify the lack of assay for and reporting of these nuclides in the NDA processes. Also, the draft Acceptable Knowledge Summary (to be identified as TWCP-AK-55-39) for the TA-55 homogeneous solids waste stream from pyrochemical operations was missing information and was evaluated as indeterminate pending further revision and review. Attachment 5 contains a list of needed revisions.
3. Some minor concerns were identified during the evaluation of the LANL NDA processes (HENC and TGS). None of these are violations of requirements but are areas where refinements are appropriate to prevent potential issues in the future. LANL took action to resolve these issues during the audit.
- a. The NDA technical review should be proceduralized in more detail, with a checklist that addresses the appropriate "expert review" items necessary to ensure a complete and uniform technical review.
 - b. The criteria for taking background measurements are vague and there is no tracking and trending of the background data that is available during each operation.
 - c. NDA calibration activities have a limited number of data points and do not fully address other sources of uncertainty such as partially filled containers and different waste forms that may be encountered.
 - d. AK and RTR information should be used to assist in identifying wastes that may be more appropriately assayed using other assay techniques.
4. Sufficient data for the RCRA analyses (Metals/VOCs/SVOCs) was not available. Each of these processes were rendered indeterminate due to a lack of one or more of the following data: IDL/MDL data; performance sample data; MS/MDS recovery data; and complete PDP results. This data is needed for method evaluations. Several of the analytical processes are new and also require formal CAO acceptance prior to use. Submission of the necessary documentation packages has

not yet occurred. Refer to Attachment 4 for identification of the specific concerns for each analytical method.

5. Certain VOC and SVOC analytical practices need improvement to prevent possible deficiencies in the future.
 - a. Standards planned to be used for the indeterminate SPME/GC/MS analytical process were not properly labeled and were stored in a refrigerator without temperature monitoring.
 - b. The surrogate that was to be used in PCB analyses elutes in the range of the Arochlor peaks.
 - c. One set of MS/MSD samples were prepared at concentration levels too low for quantitation using SPME/GC/MS and GC/FID.
6. The LANL RTR process identifies six waste material parameters that do not match the fourteen waste material parameters of the WWIS system. CAO has approved the use of six categories in the LANL RTR process but has not approved a method for conversion and reporting of this data into the fourteen WWIS categories. The audit team was not confident of methods proposed by LANL for converting and reporting the data. It is recommended that further dialog take place between CAO and LANL to establish an approved conversion and reporting method.
7. TA-55 waste packaging activities raised several concerns that should be resolved before they can evolve into deficiencies.
 - a. From an external viewpoint, the TA-55 procedures lack clarity and are not sequential in nature. Any weakness in the TA-55 training process, or an unusual influx of new employees, would be an entrée for problems with the procedures as they are currently organized.
 - b. Greater detail is needed in the procedures to ensure that requirements are consistently met. An example is the language concerning the handling of nonconforming waste. In addition to "notify the supervisor" the procedure should also direct that the waste be "rejected, segregated, and the nonconformance be documented."
 - c. The audit team noted a very high level of rework attributed to relatively controllable factors such as confusion between pounds and kilograms. While efficiency and economy are not areas that the audit team normally addresses, the apparent lack of a vigorous corrective action process is of concern and should be investigated.

7.0 LIST OF ATTACHMENTS

- Attachment 1: Personnel Contacted During the Audit
- Attachment 2: Summary Table of Audit Results
- Attachment 3: Table of Procedures Audited
- Attachment 4: Status Summary of RCRA Analytical Methods

PERSONNEL CONTACTED DURING THE AUDIT

PERSONNEL CONTACTED				
NAME	ORG/TITLE	PREAUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
Allen, Garry	LANL/ESWT Project Leader	X	X	X
Baca, Tom	LANL/ESWT Division Director	X		
Baker, Michael	LANL/ESWT Staff	X	X	X
Betts, Stephen	LANL/ESWT NDA & NDE Team Leader	X	X	X
Birnbaum, Eva	LANL/CST-9 Team Leader	X	X	
DeAguero, Karen	LANL/ESWT/Comforce		X	
Dell, Larry	LANL/ESWT SPQAO	X	X	X
Fernandez, Ruby Ann	LANL/ESWT Training Specialist	X	X	X
Frost, Harold	LANL/ESWT TSM		X	X
Garcia, Louise	LANL/ESWT Records		X	
Gavett, Marji	LANL/ESWT QA Officer	X	X	X
Goyal, Kapil K.	LANL/NMT-7 Supervisor		X	X
Harper, Johnny	LANL/ESWT Deputy Group Leader		X	X
Janecky, David	LANL/SQA SCM	X	X	
Lacy, Keith	LANL/RANT	X		
Leibman, Chris	LANL/VOC & SVOC Operations Leader		X	X
Maez, Marshall	LANL/NMT-7 QA Specialist		X	
Martinez, Manuel	LANL/RMDC Team Leader		X	X
Meadows, Julie	F-RLW Facility Manager	X		

PERSONNEL CONTACTED				
NAME	ORG/TITLE	PREAUDIT MEETING	CONTACTED DURING AUDIT	POST AUDIT MEETING
Miko, David	LANL/ESWT		X	
Montoya, Andrew J.	LANL/NMT-7 Team Leader		X	X
Murnane, Christopher	DOE-LAAO-WM			X
Palmer, Phill	LANL/ESWT RCRA Metals Ops Leader	X	X	
Poths, Harold	LANL/ESWT TSM		X	X
Robbins, Scott	LANL/ESWT Training Coordinator		X	
Rogers, Pamela	LANL/ESWT SPM	X	X	X
Rokop, Don	LANL/ESWT Group Leader		X	X
Romero, Myrna	LANL/ESWT Operations Manager		X	X
Romo, Abraham	LANL/ESH-1 RCT	X		X
Roybal, Matt	LANL/ESWT Coring Ops Leader	X	X	X
Saunders, Lori	LANL/ESWT Waste Certification	X		
Souza, Larry	LANL/ESWT SPQAO	X	X	X
Sparks, Laurie	LANL/ESWT Deputy SPM	X	X	X
Vigil, Jack	LANL/ESWT NDE Ops Leader		X	X
Wander, Sandy	LANL/ESWT WCO	X	X	X
Wulff, Dennis	LANL/NMT-7 Technician		X	X

CAO Audit A-99-04 Detail Summary

Evaluation Area	Concern Classification				QA Evaluation		Effectiveness
	CARs	CDAs	Obs	Rec	Adequacy	Implementation	
QA Program Interfaces		1,2,3,4,5,6			A	S	E
Organizational Interfaces			1		A	S	E
Software QA	99-080				A	M	M
Data Validation					A	S	E
Acceptable Knowledge			2		I	I	I
NDA-HENC			3		A	S	E
NDA-TGS (mobile & portable)			3		A	S	E
TA-55 Waste Packaging			7		A	S	E
Sampling Process Design					A	S	E
Sample Handling & Control					A	S	E
Solids Coring & Sampling		[1]			A	S	E
RCRA Metals Analyses			[4]		I	I	I
RCRA VOC/SVOC Analyses		[2]	4,5		I	I	I
RTR	99-081	[3]	6		A	M	E
Visual Examination		[4,5]			A	S	E
WWIS		[6]			A	S	E
TOTALS	2	6	7	0	A	S	E

Definitions

E = Effective

S = Satisfactory

I = Indeterminate

A = Adequate

[x] = Redundant or secondary listing

CDA = Corrected During Audit

CAR = Corrective Action Report

Obs = Observation

Rec = Recommendation

LANL PROCEDURES AUDITED			
NUMBER	PROCEDURE NUMBER	REVISION	TITLE
1.	ANC-158	1	Mercury Detection Using Cold Vapor Atomic Absorption Spectroscopy
2.	ANC-187	1	Metals Analysis and Hardness Determination by ICPAES
3.	ANC-189	0	Determination of Metals by Isotope Dilution Mass Spectrometry
4.	ANC-909	0	Chain of Custody
5.	ANC-911	1	Storing of Samples in Analytical Chemistry Labs
6.	QC-15	0	Control of Analytical Chemical Standards
7.	DTP 1.2-001	6	Visual Examination Procedure for TWCP
8.	DTP 1.2-002	1	WCRRF Procedure for Video System
9.	DTP 1.2-008	5	Detailed Operating Procedure for Performing NDT Using the Mobile Real Time Radiography System
10.	DTP 1.2-011	1	Waste Assay Using the TGS
11.	DTP 1.2-013	2	Calculating the Number of Containers to Sample
12.	DTP 1.2-014	5	Random Selection of Containers and Sampling Locations for TRU Waste
13.	DTP 1.2-016	1	Calibrating the TGS System
14.	DTP 1.2-028	7	Coring and Sampling of Solid Waste
15.	DTP 1.2-040	4	VOC/SVOC Sample Preparation and Analyses
16.	DTP 1.2-047	6	Preparation of Homogeneous Waste Samples for RCRA Metals Analysis
17.	DTP 1.2-048	0	Operating the HENC
18.	DTP 1.2-049	0	Cleaning of Coring Equipment
19.	DTP 1.2-050	0	Total VOC/SVOC Batch Data Reports
20.	DTP 1.2-052	2	Calibrating the HENC
21.	DTP 1.2-054	0	Electro-chemical Analysis of RCRA Metals
22.	QP 1.1-006	7	Software Management
23.	QP 1.1-010	6	Project Level Data Validation and Verification
24.	QP 1.1-017	3	Chain of Custody
25.	QP 1.1-021	3	Acceptable Knowledge
26.	QP 1.1-034	2	WWIS Data Entry
27.	QP 1.1-035	1	Qualification of NDE Personnel
28.	QP 1.1-037	2	Metals Analyses Batch Data Reports
29.	TA55-DP-01	2	Inspection and Packaging of Combustible and Non-combustible TRU Waste
30.	TA55-DP-02	2	Disposal of Non-routine TRU Solid Waste
31.	TA55-DP-05	3	Rejected Waste Package/Data Package Investigation
32.	TA55-TWID	1	TA-55 TRU Waste Interface Document

ATTACHEMENT 4 - STATUS SUMMARY OF RCRA ANALYTICAL METHODS

ANALYTICAL PROCESS	PROCEDURE NUMBER	METHOD APPROVED	ADEQUATE	IMPLEMENTED	EFFECTIVE	Note
Metals – ICPMS – Determination of Trace Elements in Water and Wastes	ANC-133	YES	Indeterminate	Indeterminate	Indeterminate	1
Metals – CVAA – Mercury Detection Using Cold Vapor Atomic Absorption Spectroscopy	ANC-158	YES	Indeterminate	Indeterminate	Indeterminate	2,3,4
Metals – ICPAES – Metals Analysis and Hardness Determination by ICPAES	ANC-187	YES	Indeterminate	Indeterminate	Indeterminate	2,3,4
Metals – GFAA – Metals Analysis by Graphite furnace Atomic Absorption Spectroscopy	ANC-188	YES	Indeterminate	Indeterminate	Indeterminate	1
Metals – IDMS – Determination of Metals by Isotope Dilution Mass Spectrometry	ANC-189	NO	Indeterminate	Indeterminate	Indeterminate	2,3,4
Metals – Preparation of Homogeneous Waste Samples for RCRA Metals Analysis	DTP-047	NO	Indeterminate	Indeterminate	Indeterminate	4,5
Metals – Determination of Selected RCRA Metals by Electro-Chemical Analysis	DTP-054	NO	Indeterminate	Satisfactory	Effective	6
VOC/SVOC - Sample Preparation and Analysis for VOC/SVOC in Homogeneous Solids	DTP-040	NO	Indeterminate	Indeterminate	Indeterminate	4,6

1. Insufficient implementation and information available during the audit. Withdrawn from the scope of the audit by mutual agreement of the auditee and the audit team.
2. Lacking IDL/MDL data.
3. Lacking performance sample data.
4. Lacking MS/MSD recovery data on core samples.
5. Basic method is CAO approved, however, approval must be sought for the method modification (addition of isotope tracers).
6. CAO approval must be obtained for this method.