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| <i>Title:</i> | Documentation of the 2007 External Audit of the LANL Rad-NESHAP Compliance Program |
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Documentation of the 2007 External Audit
of the LANL Rad-NESHAP Compliance Program

Audit Performed by
Lochamy & Associates
Clinton, TN

Audit Dates:
March – June 2007
LANL Site Visit: April 23-26, 2007

Auditors:
Earl Allred, Certified Lead Auditor
Joe Lochamy, Certified Health Physicist

Contents of this document:

- a) This cover sheet, 1 page
- b) Narrative of events, 1 page
- c) Audit plan – LANL's desired audit focus areas (pre-audit), 1 page
- d) Assessment proposal by Lochamy & Associates, 6 pages
- e) Kickoff presentation by LANL, 11 pages (22 slides)
- f) Final Report of the Biannual External Assessment by Lochamy & Associates, 19 pages
- g) LANL response summary to audit findings, 3 pages.

Summary compiled by
David Fuehne
Rad-NESHAP Compliance Team Leader
Ecology & Air Quality Group
Feb 22, 2008

Narrative of Events
2007 Rad-NESHAP External Assessment

Under 40 CFR 61 Subpart H and the associated Quality Assurance guidance in 40 CFR 61 Appendix B, Method 114, Rad-NESHAP compliance programs are to have “periodic internal and external assessments” of their program. At LANL, we have instituted a program of bi-annual assessments by independent auditors. In 2004, an assessment took place in December, with the final report being issued in January 2005. Therefore, the next scheduled assessment time was January 2007.

In late summer 2006, we began planning for the audit. We decided to subcontract the audit through an existing task-order contract instead of trying to generate a new contract for this, due to complications of the LANL purchasing program. The existing contract to be used was the task-order contract with URS Corporation. However, in late 2006, we learned that the URS contract was being transferred to a small business, NorthWind, Inc. We still used this contract to conduct the audit, but the process was delayed.

After negotiations, the contract task was awarded in March 2007 to Lochamy & Associates. Joe Lochamy, a Certified Health Physicist, had teamed with Earl Allred, a Certified Lead Auditor, to successfully bid on the proposal. Mr. Lochamy had previous experience as a consultant with the LANL Air Quality Group, and this experience allowed the team to “hit the ground running” and make rapid progress on the assessment. LANL immediately transmitted pertinent quality program documents and a draft “audit plan” identifying desired focus areas to the audit team so they could begin preparation.

The audit team visited LANL April 23-26, 2007. Several facility visits were conducted to observe activities, and the audit team interviewed many members of the Rad-NESHAP team and its affiliates. Close-out meetings were held each day and at the end of the site visit to discuss findings.

The final audit report was delivered to LANL on June 19, 2007. Subsequent discussions with the auditors about the process and the audit observations & findings took place in July 2007. During a LANL site inspection, the EPA Region 6 Rad-NESHAP compliance officer had discussions via teleconference with the audit team, both independently and as part of the July Community Radiation Monitoring Group meeting.

The findings and observations called out in the audit are being addressed. Attached at the end of this document is the “LANL Response Plan,” which gives a status and path forward for each of the action items. For more information on the status of these LANL actions, reference the Environmental Protection division’s Action Item database.

David Fuehne, CHP
Team Leader, Rad-NESHAP Compliance
ENV-EAQ
February 22, 2008

Audit plan for 2007 Rad-NESHAP Audit

General items of interest to be reviewed by audit team, with suggestions for specific focus areas. The areas are in general order of priority; if time does not allow all areas to be addressed, the last item or two can be dropped until next time.

- 1) Implementation of procedure 610 – LANSCE Radioactive Emissions Management Plan, during elevated emissions times in 2005
 - a. Were deadlines met
 - b. Were all appropriate actions taken per the procedure
 - c. Were any other actions needed? Add to list of “appropriate” actions
- 2) LANSCE emissions calculation processes –performance & peer review of...
 - a. Stack emissions calcs (monthly)
 - b. Diffuse emissions – specifically new Isotope Production Facility
- 3) Emissions monitoring at D&D sites & legacy contamination sites
 - a. Point source monitoring vs. non-point source (Airnet)
 - b. Airnet station siting (procedure 238)
 - c. MDA-B network
 - d. Hillside 138 analysis
- 4) Follow-up on findings from 2004 external audit (Hamilton Consulting audit)
 - a. Did we incorporate all suggestions
 - b. Did we correct deficiencies
- 5) New project review process – procedures 103 & 301
 - a. Ability to capture new processes
 - b. Evaluation of requirements for notification, monitoring, upgrade
 - c. Collection of applicable sources into annual EPA report
 - d. Procedure 238 – Airnet siting adequacy for non-point sources?
- 6) Evaluation of procedure 139, technical review of analytical chemistry data.
 - a. Data V&V from analytical labs (focus on Paragon)
 - b. Acceptance or rejection of gamma data
- 7) Dose Assessment program – CAP88
 - a. General process
 - b. QA of data

One HP – Joe Lochamy

One QA person – Earl Allred

Biannual External Assessment Plan

for the

Rad-NESHAP Compliance Program

at

Los Alamos National Laboratory
(Los Alamos National Security, LLC)

administered by the

ENV-EAQ Group
Rad-NESHAP Compliance Team

Drafted by Lochamy & Associates
and delivered to LANL Rad-
NESHAP team in advance of the
site visit in April 2007.

- D Fuehne 2/22/08

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Clinton, Tennessee

This assessment is being conducted through North Wind, Inc. Subcontract No.5305S.01

with

Lochamy Associates

April 20, 2007

External Assessment Plan for the LANL ENV-EAQ Rad-NESHAP Program

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External Assessment Plan for the LANL ENV-EAQ Rad-NESHAP Program

1.0 Overview

A biannual external assessment will be conducted at Los Alamos National Laboratory (LANL) for compliance with the National Emissions Standards for Hazardous Air Pollutants—Radionuclides (Rad-NESHAP) requirements specified in 40 CFR 61, Subpart H. Compliance during 2005 and 2006 will receive primary attention. A two-person team from Lochamy Associates will conduct this assessment during April 2007.

The assessors will visit the LANL site April 23-26, 2007. To familiarize themselves with the LANL program, the assessors will review applicable documents prior to the site visit. While on site, the assessors will meet with involved LANL staff each morning to discuss plans for the day and at the end of each day to discuss the results of the day's activities. During the day, methodologies, documents, records, and other materials will be reviewed. Also, applicable individuals will be interviewed and several representative stack monitoring sites and AIRNET stations will be visited. At the end of the site visit, a close-out meeting will be conducted to summarize and discuss the results of the visit and, particularly, any findings.

Following the site visit, a draft report will be prepared and issued to LANL for a "factual accuracy" review. After that review, a final report will be issued.

This Plan is tentative. That is, the Plan may change during the assessment to accommodate LANL and assessor needs or new information identified during the assessment.

2.0 Assessment Purpose and Scope

Section 10 of the LANL ENV-EAQ Quality Assurance Project Plan (QAPP) for the Rad-NESHAP Compliance Team (ENV-EAQ-RN) specifies that an external assessment will be conducted at least once every two years. According to the QAPP, this specification is intended to comply with the requirement in 40 CFR 61, Appendix B, Method 114 for "periodic ... external audits" The purpose of this assessment is to meet that QAPP specification by monitoring LANL compliance with the Rad-NESHAP regulations, Federal Facilities Compliance Agreement (FFCA) requirements, and commitments in other LANL documents.

The scope of this assessment includes reviewing LANL Rad-NESHAP activities since the previous assessment conducted in late 2004. Thus, this assessment will cover the years 2005, 2006, and part of 2007. The status of follow-up actions resulting from the previous assessment also will be reviewed. Additional details of the assessment scope are provided in Section 5.0, Assessment Content.

3.0 Assessors

A two-person team from Lochamy Associates will conduct the assessment. The lead assessor is Mr. Earl L. Allred, a Certified Lead Auditor. The technical assessor is Mr. Joseph C. Lochamy, a Certified Health Physicist.

4.0 Assessment Schedule

This assessment began with the award of the subcontract at the end of March 2007. It is expected to end about May 15 or shortly thereafter, when the final report will be issued. However, the actual end date is

dependent upon the client's review of the draft report. According to the contract, the final report must be submitted no later than July 31, 2007.

The planned schedule is as follows:

April 1-21—Assessment team reviews LANL Rad-NESHAP QAPP and other foundational documents.
Prepares an assessment plan.

April 22—Team travels from Tennessee to LANL.

April 23-26—**Assessment team is on site at LANL**

Although the on-site schedule for the assessment team is flexible and, very probably, will change, a *likely* schedule for the week is

April 23, 8:00am—Assessment team arrives at White Rock Offices for visitor processing
, 8:30am—Kick-off meeting
, 10:00am —White Rock Facilities familiarization and work area assignment/set up
, 10:30am—Document collection, review, and interview scheduling
, 4:30pm—Meeting to summarize activities of the day

April 24, 8:00am—Staff interviews (to be arranged with the LANL staff as their schedules permit)
, 10:00am—Monitoring installation/lab visit(s)—Allred only
, 1:00pm—Additional staff interviews and document/record reviews
, 4:30pm—Meeting to summarize activities of the day

April 25, 8:00am—Additional document review
, 10:00am—Additional staff interviews
, 1:00pm—Additional document reviews
, 4:30pm—Meeting to summarize activities of the day

April 26, 8:00am—Follow-up staff interviews (as may be needed)
, 10:00am—Final document reviews, staff contacts, and preparation for close-out meeting
, 4:00pm—Close-out meeting to summarize activities of the week
, 5:00pm—Team departs site

April 27—Team returns to Tennessee

April 28-May 7—**Assessment team prepares draft assessment report** and transmits electronically to LANL for review.

May 7-11—**LANL reviews draft report** and electronically transmits comments back.

May 11-15—**Assessment Team incorporates applicable comments and transmits final report to LANL.**

5.0 Assessment Content

The RAD-NESHAP Assessment will include staff interviews, document/record and electronic media review, and field observations. Noteworthy practices, Observations, and Findings will be documented in the Assessment Report along with any recommendations for improvement noted by the assessment team.

The Assessment includes *at least* the following as the client has requested:

A. Implementation of procedure 610 – LANSCE Radioactive Emissions Management Plan, during elevated emissions times in 2005

- Were deadlines met?
- Were all appropriate actions taken per the procedure?
- Were any other actions needed that should be added to list of “appropriate” actions?

B. LANSCE emissions calculation processes –performance & peer review

- Monthly stack emissions calculations
- Diffuse emissions – specifically, new Isotope Production Facility

C. New project review process – procedures 103 & 301

- Ability to capture new processes
- Evaluation of requirements for notification, monitoring, upgrade
- Collection of applicable sources into annual EPA report
- Procedure 238 – Adequacy of AIRNET sites for non-point sources

D. Emissions monitoring at D&D sites & legacy contamination sites

- Point source monitoring vs. non-point source (Airnet)
- Airnet station siting (procedure 238)
- MDA-B network
- Hillside 138 analysis

E. New project review process – procedures 103 & 301

- Ability to capture new processes
- Evaluation of requirements for notification, monitoring, upgrade
- Collection of applicable sources into annual EPA report
- Procedure 238 – Airnet siting adequacy for non-point sources?

F. Follow-up on findings from 2004 external audit (Hamilton Consulting audit)

- Were applicable suggestions incorporated?
- Were deficiencies corrected?

G. Evaluation of procedure 139, technical review of analytical chemistry data.

- Data V&V from analytical labs (focus on Paragon)
- Acceptance or rejection of gamma data

H. Dose Assessment program – CAP88

- General process
- QA of data

The team will review other areas as they present themselves during the on-site visit.

6.0 Assessment Interviews

Interviews with, at least, the following individuals are planned:

- ENV-EAQ Group and Deputy Group Leaders
- Rad-NESHAP Project Team Leader
- Quality Assurance Officer
- Sample Collection/Maintenance Staff
- Data Processing and Review Staff
- Dose Assessment Staff
- New Source Review Material Use Staff
- Records Management Staff
- Others as may be identified

7.0 Documents and Records

To the extent needed to assess the project, the assessment team requests access to all unclassified documents and records related to the LANL Rad-NESHAP project.

8.0 Planned Monitoring Installation Observations

One member of the team plans on visiting the ES-2 stack monitoring system at LANSCE and, possibly, another convenient stack monitoring system of LANL's choice. At least one AIRNET site (probably at East Gate) will also be visited. Additionally, the laboratories where AIRNET and stack samples are prepared, handled, analyzed, or prepared for off-site analysis will be visited.

LANL's Rad-NESHAP Compliance Program

Presented to the
External Audit Team
April 23, 2007

Dave Fuehne, R-N Team Leader

This was the presentation delivered by LANL to assessment team and interested parties at the kickoff of the site visit, 4/23/07.
- D Fuehne 2/22/08



Topics of Discussion

- Introduction to LANL & ENV-EAQ

- Brief program description
 - Team functions
 - Challenges in each area

- Audit focus areas
 - Recent significant events
 - Recent changes to program
 - Issues facing the team currently
 - Routine items not recently reviewed



But First Things First...

■ **THANK YOU!**

- Audits are a valuable tool for program improvement
- Sharing knowledge, experience, ideas from other experienced folks

Introduction to LANL

Los Alamos develops and applies science and technology to ensure the safety and reliability of the U.S. nuclear deterrent; reduce the threat of weapons of mass destruction, proliferation and terrorism; and solve national problems in defense, energy, environment and infrastructure.

- Major Facilities
 - Plutonium handling & processing facility
 - Chemistry & Metallurgy Research facility
 - Tritium handling & experimentation facilities
 - Radiochemistry facility
 - High-power proton accelerator & associated experiment halls
 - Waste handling facilities
- One by-product of operations – radioactive air emissions

Organizational Structure

Associate Directorate for Environment, Safety, Health, & Quality

- “Support and Enable the Laboratory Mission...”
- Environmental Protection Division
 - Facility compliance programs
- Ecology & Air Quality Group (ENV-EAQ)
 - Regulatory compliance & facility support
 - Radioactive emissions (Rad-NESHAP)
 - Regulated pollutants – reporting & operations tracking
 - New project review & permitting

Associate Directorate for Environmental Programs

- Environmental air monitoring
- Dose assessment (CAP88)
- Meteorology



Rad-NESHAP Program Description

Regulatory Drivers

- 40 CFR 61, Subpart H
- 40 CFR 61, Appendix B, Method 114 – QA requirements, monitoring methods, etc.
- Site-wide limit of 10 millirem per year to public receptor
- Not “permit-driven;” establishes framework of operations

Associated documents

- ANSI N13.1-1999: Stack sampling requirements
- Memorandum of Understanding from 1995 (EPA & DOE)
- Federal Facility Compliance Agreement from 1996
- Various other EPA approved methods, position statements, etc.



Rad-NESHAP Program Description

Quality Program

- Lab-wide requirements
 - Procurement, hiring, etc
- Division-wide Quality Management Plan
- Group-wide Quality Management Plan
- Quality Assurance Project Plan (QAPP)
 - Describe compliance program & methods
 - Source categorization (Tier I, II, III, or IV)
 - Written to meet DOE Order 414.1C "Quality Assurance"
- Implementing Procedures
 - Group-wide & project-area-specific documents



UNCLASSIFIED



Team functions

- Sample collection & off-site analysis
 - Real-time emissions measurements
- Emissions calculations
 - Dose assessment
 - Stack engineering
- Non-point sources (diffuse emissions)
- 26 monitored stacks, 80 non-monitored stacks



UNCL



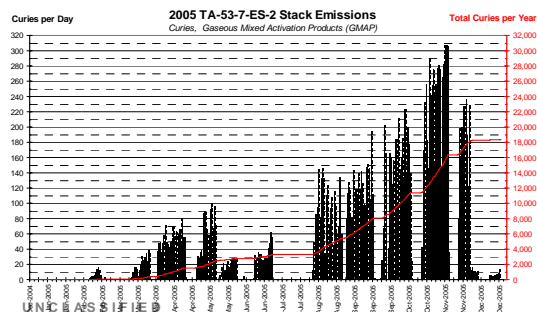
Stack Sampling

- Continuously monitor 26 stacks (28, 27?)
 - Particulates (Pu, U) – 25 stacks
 - Vapors & highly volatile compounds (germanium, mercury) – 7 stacks
 - Tritium emissions (vapor & gas forms) – 2 stacks, +1 new
 - Short-lived gases (carbon, oxygen) – 2 stacks @ LANSCE
- Samples changed weekly
- Sampling data analyzed off-site (particulate) or at LANL (tritium)
- Emissions calculated & reported to web
- Challenge – changing requirements; TA-55 new sample systems



LANSCE – Real Time Monitoring

- Radioactive gases: carbon, oxygen, nitrogen
- In-line detectors – can't "collect" sample
- Emissions cannot be filtered
- Short half-life (20 mins)
- 2005 Operations: over 6 millirem!
- Leak discovered at control system inlet
- Fixed – 2006 ops less than 0.1 millirem
- Challenge – new sources & new equipment



Stack Engineering

- Flow measurements (stack & sample flow rates)
- Pump maintenance
- Sample system inspections & cleaning
- New facility design consultation: TA-55, CMRR, WETF
- Challenge: install & test new sampling systems under ANSI N13.1-1999



Calculations

- Databases
 - Stack & sampler information
 - Flow rate calculations & data management
 - Sample field data & sample analytical data management
 - Emissions calculations
 - Track operations @ non-monitored stacks
 - Challenge – maintenance; improvements; continuity
- New project reviews
 - Division-level guidance, group-level implementation
 - Evaluate new activities
 - EPA notification timeline
 - Stack monitoring requirements
 - Sample system upgrades
 - Environmental ALARA
 - Challenge – personnel change-over

Non-monitored stacks assessment



Radioactive Materials Usage Survey

- Track operations from non-monitored sources
 - Calculate emissions
 - Estimate off-site dose
 - Ensure low-level of operations
- Evaluate operations at monitored stacks
 - Ensure monitoring systems are appropriate for operations
 - Ensure we're analyzing samples for appropriate nuclides
- Challenge – personnel resources; ensuring adequate field data

Activities in ERSS – “contracted services”

- Ambient air monitoring
 - Airnet system
 - Used for evaluating emissions from non-point sources (waste burial; contaminated soil D&D; etc.)
 - Concentrations of particulates, tritium at public receptor locations
 - “Double-counts” stack emissions – acceptable vulnerability
 - Challenge: “fenceline” cleanup activities & emissions potential
- Dose assessment
 - CAP88 PC version 3 – EPA approved code
 - Atmospheric dispersion model, calculates off-site dose from stack emissions
 - New personnel, new process
 - Challenge: Incorporate existing QA requirements into new processes
- Meteorology program – data for dose assessment

Summary of 2005 Emissions Report to EPA

- Off-site dose in 2005: 6.46 millirem
 - Max Exposed Individual – Eastgate receptor

- LANSCE emissions – 98% of dose
- Non-monitored stacks – 1.5% (*potential*, not actual!)
- Ambient measurements – <1%
- Tritium stacks – <1%
- All others – < 1%

Summary of 2006 Emissions Report to EPA

- Still in-progress; due June 30, 2007

- Anticipated off-site dose: under 0.5 mrem
 - Max Exposed Individual – either Eastgate or LA Inn
 - Complicated process when LANSCE emissions are low!

- LANSCE emissions – about 40%
- Non-monitored stacks – about 10%
- Ambient measurements – about 40%
- Tritium stacks – about 40%
- All others – < 1%

2007 External Audit

- Selection of focus areas
 - Recent significant events
 - Changes to program
 - Issues facing us now
 - New activities
 - New personnel
 - Follow-up from previous audit
- Quality assurance review
 - Are we doing what we say we'll do
- Technical review
 - Can we improve our processes
- Administrative review
 - Any "roadblocks" to success?



Audit focus areas

Recent significant events

- LANSCE elevated emissions levels in 2005
 - First time in excess of 5 millirem in 10 years
 - Emissions management plan in place – did not anticipate...
 - Ever-increasing emissions – unstable situation
 - Rapidly meeting, passing thresholds
 - Review for procedure compliance, suggestions for future
- LANL transition & associated reorganization
 - Split "ex-MAQ" functions – no longer in one organization
 - Changes to QA; deficiency reporting; training; computing



Audit focus areas

Recent changes to program

- Off-site analysis of stack samples
 - Data validation/verification (procedure 139)
 - Accept/reject gamma data
 - Effects of shipping delays on analyses
- LANSCE diffuse emissions @ IPF2
 - Gas emissions
 - Ruptured targets
- TA-55 new samplers
 - Four independent samplers on each stack
 - Data management & emissions calculations



Audit focus areas

Significant issues facing us now

- Cleanup / D&D of legacy sites [TA-21, MDA-B]
 - Track emissions from projects
 - Source monitoring vs. ambient monitoring @ receptor
- Legacy contamination near Los Alamos town site
 - Hillside 138 – high soil contamination
 - Plans for future evaluation
- Dose calculation methods – CAP88
 - New software revision from EPA
 - problems w/ implementation
 - Real-time code updates
 - Meet data review requirements in QAPP
 - Translate “mainframe” processes to PC version



Audit focus areas

Routine items

- LANSCE emissions calculation processes
 - Not reviewed in-depth in recent audits
 - Monthly gas emissions; “weekly” particulate/vapor

- New project review process
 - Capture all new activities at Lab?
 - Identify Rad-NESHAP requirements for new activities
 - Incorporate into annual report appropriately
 - Airnet siting evaluation – procedure 238

- Follow-up from 2004 external assessment (Hamilton)
 - Did we adequately address findings / deficiencies
 - Did we incorporate suggestions

Points-of-Contact

Rad-NESHAP Team

- Dave Fuehne, Team Leader
- Kevin Anderson, LANSCE
- Debra Archuleta, sample change-out, data management
- Libby Jones, database programming
- Carolyn Macdonell, sample change-out, data management
- Harold Martinez, stack engineering, sampler design
- Richard Sturgeon, non-monitored stacks evaluations, stack engineering

Group-wide

- Dianne Wilburn, Group Leader
- Dave Janecky, Deputy Group Leader
- April Baldonado, office administration
- Joanna Foster, QA & Training
- Angie Aragon, Records
- Rebecca Clark, new project review

ERSS-GS

- Bill Eisele, dose assessment
- Andrew Green, ambient air monitoring
- Mike McNaughton, dose assessment

Final Report of the Biannual External Assessment

for the

Rad-NESHAP Compliance Program

at

Los Alamos National Laboratory
(Los Alamos National Security, LLC)

administered by the

ENV-EAQ Group
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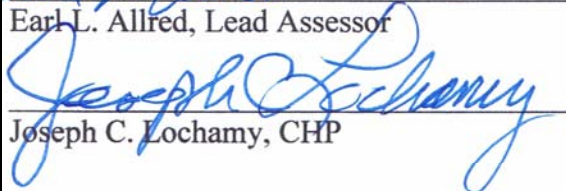
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Prepared by:



Earl L. Allred, Lead Assessor



Joseph C. Lochamy, CHP

This is the audit final report, delivered to LANL in June. Findings & observations are noted.
- D Fuehne 2/22/08

June 12, 2007
Date

June 12, 2007
Date

Final Report of the Biannual External Assessment for the Rad-NESHAP Compliance Program at Los Alamos National Laboratory

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Final Report of the Biannual External Assessment for the Rad-NESHAP Compliance Program at Los Alamos National Laboratory

1.0 Overview

During April 2007, a biannual external assessment was conducted at Los Alamos National Laboratory (LANL) for compliance with the requirements specified in 40 CFR 61, Subpart H, of the National Emissions Standards for Hazardous Air Pollutants—Radionuclides (Rad-NESHAP). Additional regulatory drivers for Rad-NESHAP compliance include:

- 40 CFR 61, Appendix B, Method 114,
- ANSI N13.1-1999,
- Memorandum of Understanding (DOE and EPA, 1995), and
- Federal Facilities Compliance Agreement (1996)

A two-person team from Lochamy Associates conducted this assessment. The organization responsible for assuring LANL compliance with these regulations is the Ecology and Air Quality Group (EAQ) Rad-NESHAP team in the Environmental Stewardship Division (ENV).

The assessment included reviewing plans, methodologies, documents, records, and other materials. Additionally, Rad-NESHAP team members, support persons, and associated management were interviewed. Several representative stack monitoring sites and AIRNET stations were visited.

The assessment began in early April 2007. To familiarize the assessment team with the LANL program, the team reviewed applicable documents prior to the planned site visit and prepared an Assessment Plan. The site visit occurred April 23-26, 2007. April 22 and 27 were travel days for the assessment team. A draft report was prepared and sent on May 23, 2007, to LANL for a factual accuracy review. After that review, this final report was completed and transmitted to LANL on June 12, 2007. Although not specified as part of the contract, follow-up activities may include assessor participation in teleconferences with interested stakeholders in Northern New Mexico and regulatory agencies seeking information on the audit process and results.

Although the assessors found areas where improvements can and, in three cases, *need* to be made, as discussed in sections 9 and 10, they conclude that the LANL Rad-NESHAP Team is effectively implementing the requirements of 40 CFR 61, Subpart H and related regulatory requirements.

2.0 Purpose and Scope

Section 10 of the LANL ENV-EAQ *Quality Assurance Project Plan (QAPP) for the Rad-NESHAP Compliance Team* (ENV-EAQ-RN) specifies that an external assessment will be conducted at least once every two years. According to the QAPP, this specification is intended to comply with the requirement in 40 CFR 61, Appendix B, Method 114 for “periodic ... external audits” The purpose of this assessment is to meet that QAPP specification by monitoring LANL compliance with the Rad-NESHAP regulations and commitments in LANL procedures and other documents.

The scope of this assessment included reviewing LANL Rad-NESHAP activities since the previous assessment conducted in late 2004. Thus, this current assessment covered activities during the years 2005, 2006, and part of 2007. Additional details of this assessment scope are provided in section 5 of this report.

3.0 Assessors

A two-person team from Lochamy Associates conducted the assessment. The lead assessor was Mr. Earl L. Allred, a Certified Lead Auditor. The technical assessor was Mr. Joseph C. Lochamy, a Certified Health Physicist. Resumes for these individuals are attached.

4.0 Schedule

During the first two weeks of April, 2007, the assessment team made initial contacts with the Rad-NESHAP Team Leader and reviewed the LANL Rad-NESHAP QAPP and other foundational documents to familiarize themselves with the program. During this period, they prepared an Assessment Plan and transmitted it to the Rad-NESHAP Team Leader. The assessment team traveled to New Mexico on April 22 and was on the LANL site through April 26. An opening meeting was held the morning of April 23 to introduce the participants and discuss the logistics of the assessment. Each morning, thereafter, the assessors met with the Rad-NESHAP Team Leader, Mr. Dave Fuehne, to discuss the assessors' plans for the day and to coordinate interviews and location visits. At the end of each day, the assessors again met with Mr. Fuehne to discuss the results of the day's activities. At the end of the site visit, a close-out meeting was conducted to summarize and discuss the results of the visit and, particularly, any findings/observations. A draft assessment report was transmitted electronically on May 23, 2007, to LANL for a factual accuracy review. This final report was transmitted electronically to LANL on June 12, 2007. As previously stated, follow-up activities may include assessor participation in teleconferences with interested stakeholders in Northern New Mexico and regulatory agencies seeking information on the audit process and results.

5.0 Areas Assessed

Section 2 above provides the overall purpose and general scope of this assessment. Within that scope, the assessment included the following major areas:

- Complying, overall, with the Rad-NESHAP program defined in the QAPP, 40 CFR 61, Subpart H, and related drivers,
- Monitoring airborne emissions to assure compliance with the 10-mrem/yr standard,
- Determining point sources that require monitoring,
- Implementing new stack design/testing,
- Collecting samples at stack and environmental air monitoring stations,
- Tracking emissions of unmonitored point sources,
- Preparing the annual compliance report, and
- Determining the status of findings from the 2004 Hamilton Consulting audit.

Additionally, special *focus* areas were identified to evaluate their Rad-NESHAP compliance implications:

- LANSCE emissions determinations and methodologies (Procedure 610),
- LANSCE emissions calculation processes and review (Several procedures in the 600 series),
- New project reviews (Procedures 103 and 301),
- Transition from mainframe CAP88 software to desktop version,
- Technical review process for analytical chemistry data (Procedure 139),
- Diffuse emissions monitoring at the Isotope Production Facility (IPF2),
- Legacy contamination near Los Alamos town site (Hill 138),
- Plans to measure and report air emissions from cleanup and D&D operations in Material Disposal Area-B and TA-21, and
- LANL reorganization and funding trends.

The LANL Rad-NESHAP team identified these focus areas as posing special challenges to the program, based on recent operations experience or anticipated near-future events. After reviewing these focus areas, the assessment team agreed that they were of interest and added them to the assessment.

A significant part of this assessment was dedicated to reviewing Rad-NESHAP compliance activities at LANSCE. The logic for this extra focus on LANSCE was that, if LANSCE operates a substantial part of the year, the LANSCE emissions historically have determined the location of the maximally exposed individual (MEI), as defined in 40 CFR 61. Furthermore, these emissions usually have contributed the largest fraction of the total LANL Rad-NESHAP dose to that MEI. During 2005 LANSCE contributed the largest annual dose in ten years to the MEI. However, with recent LANSCE design changes and emissions controls, the Rad-NESHAP impact from LANSCE is expected to diminish. Besides the potential for lowering the dose to the LANL MEI, the other result of this reduced LANSCE impact is that the location of the MEI is no longer a foregone conclusion.

This assessment included staff interviews (section 6), electronic and paper document/record review (section 7), and field observations (section 8). The results of the assessment are provided in section 9. Section 9 includes noteworthy practices, observations, findings, and recommendations for improvement.

6.0 Staff Interviews

Interviews were conducted with the following individuals (listed no particular order):

- Dianne Wilburn—ENV-EAQ Group Leader
- Dave Fuehne—Rad-NESHAP Project Team Leader
- Joanna Foster—Quality Assurance Officer for ENV-EAQ Group
- Kevin Anderson—deployed ENV-EAQ staff providing Rad-NESHAP support at LANSCE
- Libby Jones—Database programming
- Debra Archuleta—Stack sample collection/data management

- Carolyn Macdonell—Stack sample collection/data management
- Bill Eisele—Dose assessment (ERSS-GS group)
- Mike McNaughton—Dose assessment (ERSS-GS group)
- Andrew Green—AIRNET coordinator (ERSS-GS group)
- Jake Martinez—AIRNET sample collection
- Louie Naranjo—AIRNET sample collection
- Angie Aragon—Records
- George Powell—Sample shipping
- Johnny Lovato—Sample shipping
- Scott Fulton—Radiological technician

Additional short, informal contacts occurred with other Rad-NESHAP staff not specifically mentioned here.

7.0 Documents and Records

The assessment team reviewed a large number of project plans, procedures, and other documents as part of the assessment. Specifically, the following documents and records related to the LANL Rad-NESHAP project were reviewed:

| Reference | Document Title |
|--|--|
| IP 300-SD | Los Alamos National Laboratory Quality Assurance Program |
| ENV-IMP | Integrated Management Plan for the Environmental Stewardship Division |
| ENV-EAQ-RRP,R3 | Quality Assurance Project Plan for the Regulatory Review and Permitting Task |
| ENV-EAQ-RN,R4 | Quality Assurance Project Plan for the Rad-NESHAP Compliance Team |
| LA-UR-05-9285 | A Summary of LANSCE Radioactive Air Emissions during Calendar Year 2005 |
| LA-UR-07-0523 | Operations Report for the Rad-NESHAP Compliance Project, 2001-2005 |
| RAC Report No. 6-DOJ-LANL Audit-2002-FINAL | Final Report—Independent Technical Audit of Los Alamos National Laboratory for Compliance with the Clean Air Act, 40 CFR 61, Subpart H in 2001 |
| RRES-MAQ:03-070 | Responses to Observations Raised by RAC and IEER During the 2002 Rad-NESHAP Audit |
| 2004 Hamilton Audit | Final Audit Report of the ENV-MAQ Rad-NESHAP Program |
| ENV-EAQ-007,R0 | Personnel Training |
| EAQ-011,R0 | Logbook Use and Control |
| ENV-EAQ-017,R0 | Preparation, Review, and Approval of Procedures |
| EAQ-018,R1 | Project (PR-ID) Reviews for Preoperational Surveys and Ecological Risk Screening |
| ENV-EAQ-030,R0 | Document Distribution |
| RRES-MAQ-102,R4 | Radioactive Materials Usage Survey for Point Sources |
| RRES-MAQ-103,R3 | Review of New or Modified Radioactive Air Emission Sources |
| ENV-MAQ-106,R9 | Collecting Tritium Stack Bubbler Samples |
| ENV-MAQ-109,R11 | Collecting Stack Particulate Filter and Charcoal Cartridge Samples |
| ENV-MAQ-112,R6 | Tritium Stack Emission Calculation and Reporting |
| ENV-MAQ-114,R4 | Calculating Weekly Particulate and Vapor Radioactive Air Emissions from |

| | |
|-----------------|---|
| | Sampled Stacks |
| ENV-EAQ-118,R3 | Categorizing and Reporting Increased Airborne Radioactive Emissions from Sampled Stacks |
| ESH-17-119,R3 | Evaluating Radioactive Air Emissions from Sampled Stacks |
| ESH-17-121,R0 | Sampling/Monitoring Radioactive Particulates, Tritium, and Gasses from Exhaust Stacks, Vents, and Ducts |
| RRES-MAQ-126,R6 | Performing a Radioactive Materials Usage Survey Interview |
| RRES-MAQ-127,R4 | Determination of Stack Gas Velocity and Flow Rate in Exhaust Stacks, Ducts, and Vents |
| ENV-MAQ-128,R3 | Determination of the Average Cyclonic Flow Angle in Exhaust Stacks, Ducts, and Vents |
| RRES-MAQ-132,R3 | Exhaust Stack Air Monitoring System Maintenance, Repair, and Installation |
| ESH-17-137,R1 | Evaluating Potential Emissions and Potential Effective Dose Equivalent from Point Sources |
| ESH-17-138,R0 | Stack Sample System Installation and Removal |
| ENV-MAQ-139,R1 | Analytical Chemistry Data Management and Review for Rad-NESHAP Program |
| ENV-MAQ-140,R0 | Evaluating Source Term from Point Sources |
| ENV-MAQ-142,R0 | Inspecting Stack Sampling Systems |
| ESH-17-238,R0 | Evaluating New Diffuse Sources and New Receptors for AIRNET Coverage |
| ENV-EAQ-301,R3 | Review of New or Modified Air Emission Sources |
| RRES-MAQ-501,R6 | Dose Assessment Using CAP88 |
| ESH-17-502,R1 | Air Pathway Dose Assessment |
| RRES-MAQ-507,R3 | Preparation of the Annual Rad-NESHAP Report |
| RRES-MAQ-508,R1 | Radiological Dose Calculations for the Annual Environmental Surveillance Report |
| ESH-17-510,R1 | Generating Annual CAP88 Input Files for LANL Monitored Stacks |
| MAQ-511,R2 | Calculating mrem Per Ci Factors |
| ESH-17-512,R0 | Dose Factors for Non-CAP88 Radionuclides |
| ENV-EAQ-601,R10 | Collecting and Processing Stack Air Particulate and Vapor Samples from TA-53 |
| ENV-EAQ-603,R5 | Calibrating the High-Purity Germanium System Used on the Monitored Stacks at TA-53 |
| ENV-EAQ-605,R7 | Gamma Spectroscopy Data Collection for Gaseous Emissions at TA-53 Stacks |
| ENV-EAQ-607,R6 | Daily Survey of Air Monitoring Equipment |
| ENV-EAQ-608,R2 | Monthly Curie Limit Projection for LANSCE |
| ENV-EAQ-610,R3 | Radioactive Air Emissions Management Plan for LANSCE |
| ENV-EAQ-611,R3 | Analysis and Reporting of Diffuse Emissions from LANSCE |
| ENV-EAQ-612,R1 | Calculating Weekly Particulate and Vapor Radioactive Emissions from Sampled Stacks at TA-53 |
| ENV-EAQ-614,R1 | Calculating Weekly Gaseous Radioactive Air Emissions from Sampled Stacks at TA-53 |
| ENV-EAQ-616,R3 | Leak Checking LANSCE Stack Sampling Systems |
| ENV-EAQ-617,R3 | Cryogen Use at TA-53 Stack Systems |
| ENV-EAQ-618,R1 | Inspecting LANSCE Stack Sampling Systems |

As part of the document reviews, a large number of data records also were reviewed. Because of the quantity of those data records, they are not specifically listed and identified in this report.

8.0 Field Observations

To obtain a better understanding of how routine NESHAP activities are conducted, the assessment team observed the following field activities:

- Particulate and vapor sample collection at the LANSCE ES-2 stack,
- Sample preparation for shipping to the off-site analytical laboratory,
- Tritium sample collection at TA 16,
- Air sample change out from a representative AIRNET site at the LANL Fire Station, and
- Off-site laboratory analytical data package receipt, review, verification, and acceptance.

9.0 Assessment Results

The results of this assessment are detailed here. The assessors identified four noteworthy practices. Three findings were identified and, thus, need to be addressed formally. Seven observations were identified.

The results of this assessment are divided into the following discussion areas:

- Noteworthy Practices
- Quality Assurance
- Training
- Staffing and Funding
- Technical

9.1 Noteworthy Practices

The assessors reviewed the noteworthy practices listed in the 2004 Hamilton audit and concur with their opinion regarding those practices. Additionally, this assessment identified other practices or conditions that the assessors particularly liked. They include:

- Samples are color coded to help prevent sample misidentification and similar problems. Color coding is used on both AIRNET ambient air samples and stack samples to streamline the process of removing one sample set and installing another. The color coding minimizes confusion when handling large numbers of samples during each change-out. Additionally, different analyses for Rad-NESHAP samples (e.g., alpha/beta counting and gamma spectrum analysis) are all color coded differently to quickly identify analysis data within a given sample period.
- Data quality checks and surveys are integrated into numerous forms and reports at LANSCE.
- The Rad-NESHAP QAPP is very high quality and the staff are effectively implementing its requirements.
- The “required reading verification” hyperlink at the end of each new revised online procedure is very good. This verification is linked to the individual’s training plan and provides necessary documentation that the required procedures are actually read and that they are recorded in the individual’s training plan.

9.2 Quality Assurance

The ENV Division quality system was reviewed and found to be structured to meet the requirements of the ten criteria in 10 CFR 830 Subpart A, for nuclear activities, and DOE Order 414.1B, *Quality Assurance*, for non-nuclear activities. The principles of integrated management are applied to include the integration of health, safety, environmental, security, and any other requirements into all work processes. The Rad-NESHAP QAPP was compared with the requirements of NQA-1, the Code of Federal Regulations, and EPA's QA requirements and found to be effective and comprehensive.

The assessors identified one finding and two observations where quality assurance could be improved.

- FINDING 1—Accessing current online (web-based) controlled procedures was very difficult.

A long-term Rad-NESHAP data management technician was asked to retrieve a copy of a current approved online procedure and was unable to do so by the normal method. Additionally, the procedure the person was using was one revision level out of date due to a recent procedure update.

NQA-1 requires that, "The preparation, issue, and change of documents that specify quality requirements or prescribe activities affecting quality shall be controlled to assure that correct documents are being employed." "Control" was not in such a condition that the use of correct copies was "assured."

The assessors understand that this issue is already being addressed; however, a dedicated effort should be initiated to correct this condition as soon as practicable, since it could result in, as was observed, out of date procedures being used. Until the condition is corrected, a notice should be issued instructing the staff on how to assure they have the most up-to-date procedures.

- OBSERVATION 1—Incomplete or inadequate quality checklists in some procedures need improvement.
 - a. The electrometer performance test worksheet and the form for 511-meV gamma spectrum analysis vs. time at LANSCE contain a "review" signature line that does not appear to be used. Apparently, there is no independent review, since only one NESHAP staff member is at the LANSCE site. The Rad-NESHAP team should evaluate the need for these reviews and, if needed, provide for the necessary review and sign off.
 - b. The LANSCE switch-yard daily survey worksheets do not identify the person recording the data. The person taking the data should be identified on each worksheet.
 - c. The LANSCE pulse height analysis summary information data QA check for November 2006 was missing a QA check-off ("calculation steps"). This one case was the only omission found and appears to be an isolated event. No additional action is recommended.
- OBSERVATION 2—Numerous procedure revisions and updates are needed.

There is a general need to revise many procedures (some trivial and others more technical). The Rad-NESHAP team needs to continue to keep this revision task high on its priority list.

Examples of some of the procedures needing to be updated are provided in the following table:

| Procedure Number | Revision Needed | Explanation |
|---|---|---|
| RRES-MAQ-501,R6 ESH-17-510,R1 Possibly others | Complete rewrite to reflect switch from mainframe to PC version (CAP88) | Although the two current dose assessors are fully knowledgeable and competent to run the new software, the procedures do not reflect current methods. |
| ENV-EAQ-RN,R4 | Page 42, Policy, Last word "overestimated" | Should this word be "underestimated"? Pages 44, 46, 62, 65, 113, and 115 use "underestimated." |
| ENV-EAQ-RN,R4 | Appendix B numbering | Appendix B has no page 4 of 4 |
| ENV-EAQ-RN,R4 | Appendix E numbering | Appendix E has no page 2 of 2 |
| ESH-17-512,R0 | Early issue Procedure that needs revision | Organizational changes, references, etc. |
| ESH-17-510,R1 | Early issued Procedure that needs revision | Organizational changes, references, etc |
| RRES-MAQ-508,R1 | Procedure numbering | ESH-17, RRES-MAQ, ENV-MAQ, and now ENV-EAQ are organizational changes that are reflected in procedure numbering that needs to be updated. |
| ENV-EAQ-007 | Attachment 1 | This procedure has two different Attachment 1s |
| RRES-MAQ-103,R3 | Page 6 of 15, Decision Block on Flowchart: Is the stack monitored for radionuclides of concern? | It seems the directional responses are reversed. |
| RRES-MAQ-103,R3 | Attachment 1 numbering | Attachment 1 has no page 4 of 4 |
| ESH-17-121,R0 | Procedure page numbering | Page 67 and 68 of 66 |
| ESH-17-121,R0 | Attachment numbering | Attachment 17 has two different Attachment 17 pages 2 of 2 |

The assessors recognize that the Rad-NESHAP team is currently revising numerous procedures. A diligent and persistent effort will be required to complete the task on a timely schedule.

9.3 Training

The staff members all were observed to have excellent skills and knowledge to carry out their assigned responsibilities. The assessors identified one finding and no observations in this area.

- FINDING 2—At least two training plans/records (e.g., Macdonell/Archuleta) do not contain key procedures that they perform. (However, they were the original authors of these documents). In fact, training was current on these documents for both team members, but the *need* for training to these procedures was not documented appropriately.

NQA-1 requires that, “The program shall provide for indoctrination and training, as necessary, of personnel performing activities affecting quality to assure that suitable proficiency is achieved and maintained.” Since two training plans were missing key procedures (although the individuals were “suitably proficient”), it is possible that other training plans for others are incomplete or incorrect. Therefore, an expedited review of all training plans/records is needed to assure that they are accurate and up to date. Other observations were made that certain individual training requirements were, in fact, obsolete and also need to be updated.

9.4 Staffing and Funding

The assessors identified no findings and four observations in this area.

- OBSERVATION 3—Staffing quality is very good, but the assessors are quite concerned with the size of the staff. The team appears to be understaffed by at least one FTE, as evidenced by the task loads the assessors observed with the current staff. The staff and group/division management appear to recognize this problem, which is primarily driven by eroding budgets. If possible, additional staffing should be acquired.
- OBSERVATION 4—If the apparent current downward trend in staffing and funding continues, the assessors believe this otherwise excellent program will begin to lose its ability to meet its responsibilities adequately. It may be wise to document the likely consequences of such conditions as part of future staging and funding requests.
- OBSERVATION 5—Another danger of the apparent understaffing is the potential for a major disruption in project continuity and quality if any one of several team members was unavailable for work for a significant period. Assuming staffing will not increase, an example of one way to reduce or slow the impact of such a disruption would be to cross train existing staff to handle multiple responsibilities, especially the responsibilities of the Team Leader.
- OBSERVATION 6—Although the assessors would prefer that all Rad-NESHAP team members be under the same group management, it appears that the current “matrix management” structure *can* work and currently *is* working. However, this organizational structure presents special budgeting, scheduling, coordination, and management challenges.

9.5 Technical

Overall, technical implementation of the Rad-NESHAP Program was very effective. The assessors identified one finding and one observation in this area.

- 9.5.1. The assessors observed that instrument calibrations and performance tests at LANSCE were routinely done and that they were verified to be current before instruments were used. This

observed good practice is a necessary activity; otherwise, it would be considered noteworthy.

- 9.5.2. The assessors observed stack PVAP/H-3 sample collection and handling and that the collection team was efficient and knowledgeable. The same quality was observed in the collection team for AIRNET.
- 9.5.3. Examples of special and non-routine engineering decisions and problem-solving skills were reviewed regarding planned emissions monitoring for D&D and Legacy Contamination sites at TA-21 and Materials Disposal Area-B (MDA-B). Those decisions and skills were found to be sound and defensible. A summary of the assessors' discussions with LANL in these areas is provided below:
- a. These cleanup activities are located immediately adjacent to the LANL "fence-line" and close to public receptors. For example, the distance between the emissions source and receptor can be as small as 20 meters for the MDA-B cleanup operations. Although monitoring at the source emission point would provide accurate emissions information, the EPA computer models used to determine off-site doses from these emissions would neither be reliable nor accurate at such short distances between the emissions point(s) and the receptor location(s). Therefore, the assessment team and LANL agreed that measurements and dose determinations would best be made using ambient air monitoring, instead of source monitoring. Ambient air monitoring, such as is used in the AIRNET program, provides accurate measurements of actual concentrations of airborne radioactive material at receptor locations. These concentrations can be directly converted to dose impact and will eliminate the very high uncertainty of the computer models.
 - b. The assessment team reviewed the proposed sites for AIRNET stations along the MDA-B perimeter and considered the locations and spacing adequate for evaluating emissions from the MDA-B cleanup. A number of "first tier" air samplers, spaced about 100 meters apart, are located between the planned cleanup activities and the receptor locations. The assessors agreed with LANL that locating these samplers *less* than 100 meters apart would not be warranted, since the moment-by-moment variation in wind direction is large. That is, it is not reasonable to postulate that a significant fraction of a plume would be "missed" because it consistently went *between* the samplers. A second tier of samplers, located further from the emission points than the first tier, will provide additional supporting information for the first tier. The assessors agreed with LANL that, together, these two tiers of samplers will provide an effective method for measuring emissions concentrations and determining receptor off-site doses from the cleanup activities.
- 9.5.4. The assessors observed that the changes proposed in the Hamilton Assessment and the way in which they were implemented significantly improved the Rad-NESHAP program. Whereas the Hamilton audit found that only 14 % of the corrective actions for the Rad-NESHAP program had been closed successfully, this present assessment concluded that 76 of 83, or 92%, of previously identified corrective actions had been closed.

- 9.5.5. The new project review process, specified in procedures 103 and 301, was found to be good. Procedure 103 is undergoing significant revision and a detailed evaluation of the current procedure steps was not productive. However, the basic methodologies presented in the procedure are sound.
- 9.5.6. LANSCE Emissions calculation processes appeared appropriate, and records maintenance was fully adequate.
- 9.5.7. The planned emissions monitoring methods for the Isotope Production Facility were reviewed and found to be sound but, likely, difficult to implement.
- 9.5.8. The assessment team reviewed the data V&V process described in procedure 139 and found the process and implementation to be very good. An assessment team member (a gamma spectroscopist) reviewed the rationale for rejection of certain inappropriate gamma data, found it to be sound, and observed its implementation in the data review process.
- 9.5.9. The Rad-NESHAP staff has identified a number of technical issues and parameter errors in the latest approved version 3.0 of the EPA dose calculation program, CAP88-PC. Since the assessors determined that the staff knows and understands these issues and errors, the assessors believe the LANL staff will be able adequately to determine LANL compliance with the Rad-NESHAP standard for 2006. The compliance report for 2006 is due June 30, 2007. The assessors recognize that correcting CAP88 software errors and problems is not the responsibility of LANL, but that of EPA. The assessors commend LANL for not just accepting the latest version of CAP88 as accurate, *per se*, but, instead, testing and determining its adequacy. The need to revise the CAP88 procedures to reflect the change from the mainframe version to the PC version has already been identified as an observation in subsection 9.2 above.

The assessors identified one finding and one observation under the technical category.

- FINDING 3—Follow up and closeout of 2004 Hamilton Assessment recommendations and findings—All but one of the findings were addressed, closed, and appropriate evidential files were in place. However, LANL action item 495, dealing with supplier qualifications, was “closed” with a revision of ENV-MAQ-QMP, R8, but a subsequent revision of this document (ENV-DO-QMP, R0) did not include the necessary supplier qualification information. Furthermore, the Rad-NESHAP QAPP (ENV-EAQ-RN, R4) did not include this information. The assessors are bringing forward this *inadvertently* unresolved Hamilton finding to this present assessment as a new finding to assure it is addressed.
- OBSERVATION 7—Implementation of Procedure 610 during 2005. Deadlines were met. Except for one case, appropriate actions were taken: In that one case, the monthly curie limit projection did not appear to be reported formally, although the projection was done informally. The assessors did not identify any needed follow-up actions for that specific case, but increased attention to such details should be exercised in the future.

10.0 Summary of Findings

The three findings listed here are also given in section 9 above. They are being reiterated here because, as findings, LANL will need to address them formally. Observations do not require formal action.

FINDING 1—Accessing current online (web-based) controlled procedures was very difficult.

A long-term Rad-NESHAP data management technician was asked to retrieve a copy of a current approved online procedure and was unable to do so by the normal method. Additionally, the procedure the person was using was one revision level out of date due to a recent procedure update. The assessors understand that this issue is already being addressed; however, a dedicated effort should be initiated to correct this condition as soon as practicable, since it could result in, as was observed, out of date procedures being used. Until the condition is corrected, a notice should be issued instructing the staff on how to assure they have the most up-to-date procedures.

FINDING 2—At least two training plans/records (e.g., Macdonell/Archuleta) do not contain key procedures that they perform. (However, they were the original authors of these documents). In fact, training was current on these documents for both team members, but the *need* for training to these procedures was not documented appropriately.

FINDING 3—Follow up and closeout of 2004 Hamilton Assessment recommendations and findings—All but one of the findings were addressed, closed, and appropriate evidential files were in place. However, LANL action item 495, dealing with supplier qualifications, was “closed” with a revision of ENV-MAQ-QMP, R8, but a subsequent revision of this document (ENV-DO-QMP, R0) did not include the necessary supplier qualification information. Furthermore, the Rad-NESHAP QAPP (ENV-EAQ-RN, R4) did not include this information. The assessors are bringing forward this *inadvertently* unresolved Hamilton finding to this present assessment as a new finding to assure it is addressed.

11.0 Conclusion

Overall, the assessment team considered the LANL Rad-NESHAP program to be a mature program with very good implementation. The technical staff members at all levels appeared knowledgeable and motivated. Three findings and seven observations were identified, but the assessors had **no significant concerns** over whether the staff is currently able to and is adequately *determining* compliance with the 10-mrem Rad-NESHAP standard. Furthermore, the assessors observed that the staff is working well with the operating staff at each facility to help them understand, cooperate, and take actions for their operations to *control* compliance within the standard. The Rad-NESHAP staff is accomplishing this control task by persuasion without needing direct authority or control over the operations. Although the assessors found areas where improvements can and, in three cases, *need* to be made, as discussed in sections 9 and 10, they conclude that the LANL Rad-NESHAP Team is effectively implementing the requirements of 40 CFR 61, Subpart H and related regulatory requirements.

Attachment

RESUMES OF ASSESSORS

Earl L. Allred
Joseph C. Lochamy

EARL L. ALLRED**SUMMARY**

Certified NQA-1 Lead Auditor with extensive QA and engineering experience. Conducted large number of audits, assessments, readiness reviews, investigations, and other evaluations in a variety of technical areas. Have provided services as quality engineer, reliability engineer, configuration control coordinator, and mechanical engineer. Demonstrated leadership, interpersonal, and computer skills. **In**active DOE Q security clearance but clearable.

PROFESSIONAL EXPERIENCE

Consultant (July 2003 - Present). Contracts included providing engineering and quality services for Bechtel Jacobs Company in the Melton Valley Completion and Decontamination and Decommissioning Projects at Oak Ridge National Laboratory (ORNL). Prepared project engineering and quality procedures for streamlining project completion. Provided engineering review of subcontractor drawings and specifications. Prepared excavation/penetration permits for project activities. Conducted quality assurance reviews of project work plans. Assisted in the preparation of work packages for project activities. Investigated events that occurred on the projects using FMEA and Root Cause analysis and prepared event reports for management. Assigned lead point of contact for project Audits and Assessments providing Department of Energy (DOE) and external audit interface and communications. Completed occurrence reports and provided evidence for closure of corrective actions. Prepared for, conducted, and documented management assessments within this three- year period. Prepared for and conducted Readiness Reviews for the evaluation of readiness for initiation of project work. Recognized for accomplishments and exceptional performance contributions to the success of both projects.

Bechtel Jacobs Company, LLC (April 1998 - June 2003). Readiness Review Subject Matter Expert for the Company. Provided leadership, planning, and mentoring for readiness reviews conducted for the Company. Wrote the readiness review procedures and interfaced with the DOE for compliance with their regulations and reporting. Conducted readiness reviews for work initiated by the Company for engineering, waste management, and environmental projects. Conducted audits and assessments, event investigations, and corrective actions closures. Received numerous recognitions for exceptional performance.

Radiological Control Secondary Subcontractor Technical Representative for the Company. Tracked BJC radiological activities at the East Tennessee Technology Park, ORNL, Paducah, KY, and Portsmouth, OH. Assessed radiological activities for compliance with regulatory and DOE requirements. Interfaced with the Radcon subcontractor on contract submittals and funding. Prepared the monthly performance scorecard for Radcon Alliance and assisted in achieving recognition of the subcontractor for excellent performance. Conducted numerous audits and assessments of the quality performance of the engineering, waste management, maintenance, and environmental control projects. Completed improvement actions in work process control, problem prevention, and event investigation.

Lockheed Martin Energy Systems (June 1980 - April 1998). Quality Assurance Manager/Engineer and QA Manager for the Energy Systems Waste Management Organization (ESWMO). Provided leadership and direction for the Quality Assurance and Training departments for the ESWMO. Instrumental in guiding the organization to receive the Tennessee Governor's Quality Award.

QA Manager for the K-25 Plant during 1986-92. Reported to the Plant Manager to create a quality assurance program to meet the DOE quality standards. Managed the QA organization to develop quality procedures, track quality performance, and achieve company and DOE objectives.

Mechanical Engineer for the K-25 Engineering Organization. Provided design and engineering for assignments in Toxic Substance Control Act Incinerator (TSCA), Consolidated Edison Uranium Solidification, Atomic Vapor Laser Isotope Separation (AVLIS), Molecular Laser Isotope Separation, Tokomak Reactor Magnet Winding, Centrifuge, and Gaseous Diffusion.

Management and Integration Contractor for DOE during management contract transition. Transitioned to Bechtel Jacobs as a Quality Engineer.

EDUCATION

M.S., Engineering Administration from University of Tennessee.

B.S., Aerospace Engineering from Auburn University.

JOSEPH C. LOCHAMY, CHPSUMMARY

Certified Health Physicist since 1979 with over 35 years professional experience in technical and managerial health physics, program development and start up, marketing and business management. Broadly experienced in a wide variety of radiological, health, and environmental disciplines. Especially experienced in regulatory affairs, program development and evaluation, internal and external dosimetry, counting laboratories, environmental radiation, training, and radioactive waste program management. Recognized for work on one-of-a-kind radiological licenses, low-level counting statistics, and computer applications. Articulate speaker, excellent writer, intuitive, a detail person, and leads or follows as the need dictates. Self-motivated, diplomatic, people-oriented, a good salesman. Experienced in marketing, proposal development, costing, and pricing. Versatile, highly practical, adapts quickly to change, well-traveled worldwide. **Inactive DOE Q security clearance but clearable.**

PROFESSIONAL EXPERIENCE

Lochamy Associates (April 1988 - Present). Independent consultant to the nuclear and radiological industries. Recent contracts include DOE dose reconstruction support, K25 decommissioning services. Others—provided DOE, DOELAP, and nuclear power plant audits/assessments, new waste processing facility start-up assistance, extensive environmental and Rad-NESHAP support, NORM evaluations, 10 CFR 834/5 program development support, and "Tiger Team" preparation and follow-up assistance at several DOE facilities over the US. Successfully licensed the first *commercial* radioactive waste incinerator in the US. Additional activities include laboratory quality planning, design assistance for a European incinerator, radiological standards development for a prime DOE contractor, Technical Safety Appraisal (TSA) support, numerous training program presentations, study guide and lesson plan development. Also, extensive technical and QA assistance for a large TLD dosimetry program, industrial gauge licensing and training.

Scientific Ecology Group (April 1985 - April 1988). Corporate Licensing, Health, and Safety Manager for largest radioactive waste processor in US. Key involvement in initial business development, facility design, licensing/permitting, marketing, program start up, and operation of this unique company. Conceived, developed, implemented, and managed the health, safety, and environmental programs. Responsibilities included licensing, radiation protection, industrial hygiene, occupational safety, and controlling radioactive, hazardous, and mixed wastes.

Technology for Energy Corporation (May 1982 - April 1985). Various assignments including division business management, account management, product marketing, radiological computer system documentation, and training. Provided general HP consulting services to clients and assisted TEC in designing and licensing a 3300 curie Cs-137 post-accident calibration facility.

Nuclear Data Power Division (March - May 1982). Provided health physics consulting and training in gamma spectroscopy, internal dosimetry, and computer operation for counting rooms.

EG&G Ortec (May 1980 - March 1982). Provided training and technical support for sales of computer-based gamma spectroscopy systems. Became Export Systems Sales Manager, then (worldwide) Systems Sales Manager, and finally Nuclear Technology Division Market Development Manager responsible for defining new products for the nuclear industry.

Duke Power Company (December 1973 - May 1980). As a staff Health Physicist developed and presented HP training programs for technicians and general employees. Conceived, implemented, and managed a corporate TLD dosimetry service for 2500 people. Designed and managed an environmental laboratory serving

three nuclear power plants. Provided technical direction and corporate oversight of training, internal dosimetry programs, and plant counting rooms. Reviewed licensing documents for radiological concerns. Managed corporate ALARA function near end of employment.

University of Florida (May 1972 - December 1973). Engineering Associate while finishing graduate degree. Managed radiological environmental program for the Crystal River Nuclear Power Plant, did TLD research, and lectured in specialties. Also prepared environmental technical specifications for Florida Power Corporation.

PROFESSIONAL ACTIVITIES

Certified by the American Board of Health Physics since 1979. Member: Health Physics Society. Committee Member: ANSI N343 (Internal Dosimetry for Mixed Fission and Activation Products), HPS ad hoc Committee on Sectionalization, and HPS Committee for Upgrading Environmental Radiation Data.

PUBLICATIONS AND PAPERS

"The Minimum Detectable Activity Concept," presented at the NBS 75th Year Symposium, Washington, DC, 1976. Republished in 1981 as an EG&G Ortec Application Note.

"Comparison of H-3 Deposition in Precipitation to Airborne H-3 Emissions at LANL," LA-UR-01-326.

"Volume Reduction of Low-Level Radioactive Waste," presented at the National Conference of Radiation Control Program Directors, Charleston, West Virginia, 1986.

"Selected Problems in Gamma Spectroscopy" and "Low-Level Counting Statistics," presented at the ANS Exhibition, Beijing, PRC, 1981.

"Practical Implications of Regulatory Guide 4.8 Lower Limits of Detection," presented at the Annual Health Physics Society Meeting, Minneapolis, MN, 1978.

"Health Physics Training for the Oconee Unit 1 Refueling Outage," presented at the ANS-ROD Topical Meeting, Albuquerque, NM, 1975.

"A Comparison of Calcium Fluoride(Mn) and Lithium Fluoride TLD for Environmental Radiation Monitoring," EPA 520/5-73-006, 1973. Co-author.

"Determination of Stack Concentrations of Argon-41 at the University of Florida Training Reactor," Masters Thesis, 1972. Presented at the Annual Health Physics Society Meeting, 1973.

Numerous client internal procedures, reports, plans, technical evaluations and positions, and other documents.

EDUCATION

M.S., Environmental Engineering Sciences (1972, Health Physics major) from University of Florida. Public Health Service Fellowship. Elected to Sigma Xi academic honor society.

B.A., Mathematics and Physics (1970, magna cum laude) from Berry College.

**LANL Responses to 2007 Rad-NESHAP Audit Findings
(Allred/Lochamy Audit)
Status update February 22, 2008**

This is LANL's summary of the audit findings, used for in-house discussion & tracking. The column "ENV Action Item #" is the cross reference between the audit report and the LANL ENV "Action Item" database.
- D Fuehne 2/22/08

| ID # | Type | Issue | Cause | Solution | ENV Action Item # | Status | Comment |
|------|-------------------------|---|--|--|-------------------|---------------------|---------------|
| 1 | Finding (QA, #1) | Accessing on-line controlled documents was difficult. | New web page with new link paths | E-mailed proper link to staff; will revamp web page as time allows | 362 | Complete 4/27/07 | E-mailed team |
| 2 | Observation (QA, #1) | Incomplete/inadequate QA checklists in some procedures | Need to update procedures to reflect current ops & current staffing | Will fix procedures and forms as indicated [split into three Action Items] | 363 | Ongoing | P604 & P605 |
| | | | | | 364 | Ongoing | P607 |
| | | | | | 365 | Complete | GMAP Nov06 |
| 3 | Observation (QA, #2) | Procedures need revision or updating (12 specifically called out) | Staffing levels; changes to new organizations & new document control systems | Ongoing effort to maintain currency of QA program [split into 12 Action Items] | 366 | Complete | P501 |
| | | | | | 367 | Ongoing | RN-QAPP |
| | | | | | 368 | Ongoing | RN-QAPP |
| | | | | | 369 | Ongoing | RN-QAPP |
| | | | | | 370 | Complete | P512 |
| | | | | | 371 | Complete | P510 deleted |
| | | | | | 372 | Complete | P508 to EP |
| | | | | | 373 | Ongoing | EAQ-007 |
| | | | | | 374 | Complete | P103 |
| | | | | | 375 | Complete | P103 |
| | | | | | 376 | Complete | P121 |
| 377 | Complete | P121 | | | | | |

| ID # | Type | Issue | Cause | Solution | ENV Action Item # | Status | Comment |
|------|--------------------------|---|---|--|-------------------|--|--|
| 4 | Finding (QA, #2) | Incomplete training plans | Oversight by supervisor | Added to training plans; new EAQ training needs form will prevent similar occurrences | 378 | Fixed; new training plan system in-place | |
| 5 | Observation (S&F, #3) | Too few staff (1 FTE) | Budget restrictions; hiring limitations | Off-loading modeling work to ERSS; permit & report writing to other EAQ staff; engineering assistance via North Wind subcontract. HP help via student? | 379 | Complete | Situation being managed as best as possible |
| 6 | Observation (S&F, #4) | Downward trend in budget jeopardizes ability to maintain compliance functions | Budget restrictions | Document needs and capabilities in FY08 budget call | 380 | Complete | Situation being managed as best as possible |
| 7 | Observation (S&F, #5) | Staff is "one-deep" in several areas | Budget/hiring restrictions | Attempting to cross train as much as possible; team is collaborating on solutions | 381 | Complete | Cross-training; collaborate; student help |
| 8 | Observation (S&F, #6) | Matrix management poses challenges | Reorganization of compliance vs. surveillance functions | Working with ERSS is beneficial. Future risk from personnel changeover or re-assignment of ERSS folks. | 381 | Complete | QA Mgmt Assessment coming 2008; will ID vulnerabil's |

| ID # | Type | Issue | Cause | Solution | ENV Action Item # | Status | Comment |
|------|----------------------------------|--|---|--|-------------------|---------|-------------------|
| 9 | Finding <i>(Tech, #3)</i> | One finding from Hamilton Audit was not closed out. | Fix made in MAQ QMP, but not incorporated to ENV-DO QMP when the group-wide QMP was absorbed into division-wide QMP | Fix ENV-DO QMP | 383 | Ongoing | ENV-DO-QMP update |
| 10 | Observation <i>(Tech, #7)</i> | One portion of procedure 610, <i>LANSCE Emissions Management Plan</i> , not performed. | Projections done informally instead of formalized per procedure | Will evaluate process & requirements and change appropriate procedure(s) | 384 | Ongoing | P610 |