State of New Mexico
ENVIRONMENT DEPARTMENT
Hazardous & Radioactive Materials Bureau
2044 Galisteo
P.O. Box 26110
Santa Fe, New Mexico 87502
(505) 827-1557
Fax (505) 827-1544

GARY E. JOHNSON
GOVERNOR

MARK E. WEIDLER
SECRETARY

EDGAR T. THORNTON, III
DEPUTY SECRETARY

August 14, 1996

Dear Concerned Citizen:

Enclosed is a fact sheet regarding a Closure Plan for the closure of the Container Storage Unit located in Building 61, Technical Area 21 (TA-21). The New Mexico Environment Department (NMED) proposes approval of this Closure Plan in September 1996.

Copies of the Closure Plan are available for review at the offices of the NMED Hazardous and Radioactive Materials Bureau, P.O. Box 26110, 2044 Galisteo Street, Santa Fe, New Mexico 87502 between the hours of 8:00 AM and 5:00 PM and at the:

1. Española Public Library in Española, New Mexico
2. Harwood Public Library in Taos, New Mexico
3. LANL Community Reading Room in Los Alamos, New Mexico
4. Mesa Public Library in Los Alamos, New Mexico
5. Office of Environmental Affairs, Santa Clara Pueblo, NM
6. Office of the Governor, Cochiti Pueblo, New Mexico
7. Office of the Governor, Santo Domingo Pueblo, New Mexico
8. Office of the Governor, San Ildefonso Pueblo, New Mexico
9. Santa Fe Public Library in Santa Fe, New Mexico

If you wish to make comments on this Closure Plan, they must be in writing and be received, not postmarked, by the NMED Hazardous and Radioactive Materials Bureau at the address mentioned above no later than 5:00 PM, September 18, 1996.

If you have any questions regarding this Closure Plan, please contact Mr. Robert S. (Stu) Dinwiddie of my staff at (505) 827-1561 or at the Santa Fe address given above.

Sincerely,

Barbara Hoditschek
Program Manager
RCRA Permits Management Program
Hazardous and Radioactive Materials Bureau

Enclosure.
xc: File R

10253

SIGN-IN SHEET

REVIEW OF
Los Alamos National Laboratory Technical Area 21 (TA-21) Building 61
Container Storage Unit Closure Plan
(Cochiti Pueblo Copy)

PUBLIC COMMENT PERIOD
August 18, 1996 through September 18, 1996

By addition of your name to the list below the New Mexico Environment Department will be better able to track public interest and involvement concerning environmental issues. Thank you for your cooperation and interest in this revised draft permit.

1. Name: _____

   Address: _____

2. Name: _____

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    Address: _____

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PUBLIC NOTICE NUMBER 95

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS AND RADIOACTIVE MATERIALS BUREAU
Santa Fe, New Mexico 87502

August 18, 1996

NOTICE OF INTENT TO:

Approve a Closure Plan for Los Alamos National Laboratory Technical Area 21 (TA-21) Building 61 Container Storage Units

The State of New Mexico is authorized to operate a hazardous waste management program in lieu of the Federal program for those portions of the Resource Conservation and Recovery Act (RCRA) in effect prior to the enactment of the Hazardous and Solid Waste Amendments of 1984 (HSWA). The HSWA impose additional requirements on hazardous waste management facilities which will be administered jointly by the State of New Mexico for those sections of HSWA that the State received authorization for on January 2, 1996 and the U.S. Environmental Protection Agency (EPA) will administer sections that the State did not receive authorization for until the State of New Mexico receives additional authorization for those requirements.

Under authority of the New Mexico Hazardous Waste Act (Section 74-4-1 et. seq. MNSA 1978, as amended, 1989) and the New Mexico Hazardous Waste Management Regulations (20 NMAC 4.1 revised November 1, 1995), the New Mexico Environment Department (NMED) can approve or deny Closure Plans. NMED has received a **Part B Application for a Closure Plan for the Department of Energy, Los Alamos National Laboratory, EPA Identification Number NM0890010515, Technical Area 21 (TA-21) Building 61 Container Storage Units.**

Los Alamos National Laboratory is the contractor operated research facility under the administration of the Department of Energy located in Los Alamos County, New Mexico.

The administrative record for this Closure Plan consists of related correspondence, the Closure Plan, and a Fact Sheet. The administrative record and the Closure Plan may be reviewed at **NMED, Hazardous and Radioactive Materials Bureau, 2044 Galisteo Street, Santa Fe, New Mexico 87505-2100** between the hours of 8:00 AM and 5:00 PM. and at the:

1. Española Public Library in Española, New Mexico
2. Harwood Public Library in Taos, New Mexico
3. LANL Community Reading Room in Los Alamos, New Mexico
4. Mesa Public Library in Los Alamos, New Mexico

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5. Office of Environmental Affairs, Santa Clara Pueblo, NM
6. Office of the Governor, Cochiti Pueblo, New Mexico
7. Office of the Governor, Santo Domingo Pueblo, New Mexico
8. Office of the Governor, San Ildefonso Pueblo, New Mexico
9. Santa Fe Public Library in Santa Fe, New Mexico

To obtain a copy of the administrative record or any part thereof, at 35 cents per page, please contact Mr. Robert S. (Stu) Dinwiddie at the above Santa Fe address or call (505) 827-1561.

Any person who wishes to comment upon the closure plan or request a public hearing should submit written comments and requests, along with the commentor's name and address, to the above Santa Fe address. Requests for a public hearing shall state the nature of the issues proposed to be raised in the hearing. **Only comments and/or requests received by 5:00 PM September 18, 1996 will be considered.** NMED will provide a thirty day (30) notice of the public hearing, if scheduled.

NMED must ensure that the Approved Closure Plan is consistent with the New Mexico Hazardous Waste Management Regulations for Closure Plans. All written comments submitted on the Closure Plan will be considered in formulating a final decision. NMED will respond to Public Comments in writing and notify Los Alamos National Laboratory and each person who submitted a written comment during the public comment period of the final decision.

After consideration of all written comments received, NMED will approve the Closure Plan. If NMED modifies and approves the Closure Plan, then NMED shall provide Los Alamos National Laboratory with a detailed written statement of reasons for the modification to the Closure Plan which will then become the Approved Closure Plan. A copy of the Approved Closure Plan with a detailed statement of the reasons for the modifications to the amendment will be mailed to Los Alamos National Laboratory.

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DEPUTY SECRETARY

FACT SHEET

Intent to Approve Closure Plan
Public Comment Period
August 18, through September 18, 1996

for the

Los Alamos National Laboratory (LANL) Technical Area 21 (TA-21) Building 61 Container Storage Units.

Activities:	Storage of Low Level Mixed Waste in containers. Los Alamos National Laboratory has chosen to close these container storage units under the New Mexico Hazardous Waste Act.
Facility Name:	Department of Energy, Los Alamos National Laboratory
EPA I.D. No.:	NM0890010515
Location:	The Los Alamos National Laboratory is located in Los Alamos County, New Mexico, and surrounds the city of Los Alamos, New Mexico. The site is in Technical Area 21 East- Southeast of the city of Los Alamos and northwest of the city of White Rock, New Mexico.
Unit Purpose:	TA-21 lies at elevations between about 7,220 and 6,680 feet. It is located on the eastern end of South Mesa, which is bounded by DP Canyon (a branch of Los Alamos Canyon) to the north and by Los Alamos Canyon to the south.
Unit Description:	The container storage areas for which this plan is written are the indoor container storage area and the bermed area of the fenced yard outside TA-21-61. These container storage units are used to store low-level mixed waste. The waste may contain RCRA characteristic and listed wastes. The maximum inventory at TA-21-61 at any given time is 5,500 gallons, as provided in LANL's RCRA Part A Permit Application for Mixed Waste (January 25, 1991).

11. Name: _____

Address: _____

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23. Name: _____

Address: _____

24. Name: _____

Address: _____

Closure Plan Availability:

A copy of the Closure Plan is available for public review at the New Mexico Environment Department (NMED), Hazardous and Radioactive Materials Bureau (HRMB), 2044 Galisteo Street, Santa Fe, New Mexico 87502 between the hours of 8:00 AM and 5:00 PM and at the following locations:

1. Española Public Library in Española, NM
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3. LANL Community Reading Room in Los Alamos, NM
4. Mesa Public Library in Los Alamos, NM
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8. Office of the Governor, San Ildefonso Pueblo, NM
9. Santa Fe Public Library in Santa Fe, NM

Requests for public hearing should include a statement of the nature of the issues proposed to be raised in the hearing and must include the requester's name and address. **Only comments and requests for hearing received by 5:00 PM September 18, 1996 will be considered.** NMED will publish a thirty day (30) notice of a public hearing, if a hearing is scheduled.

Final Decision:

All comments received on the Closure Plan during the public comment period will be considered in reaching a final approval decision. The NMED will notify in writing, Los Alamos National Laboratory and each person who submitted a written comment, of any changes made in finalizing the Closure Plan in a Response to Public Comment Document.

Interim Status Closure Plan

TA-21, Building 61 Container Storage Units

for

Mixed Waste

at Los Alamos National Laboratory

Public Comment Copy

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CLOSURE PLAN FOR TA-21-61 MIXED WASTE CONTAINER STORAGE UNITS

1.0 INTRODUCTION

This closure plan has been prepared for the mixed waste container storage areas at Los Alamos National Laboratory (LANL), Technical Area (TA) 21, Building 61 (TA-21-61). Mixed waste contains a hazardous waste, as defined by and regulated under the Resource Conservation and Recovery Act (RCRA), and a radioactive waste. The closure activities presented in this document are written in accordance with the New Mexico Administrative Code, Title 20, Chapter 4, Part 1 (20 NMAC 4.1), as revised November 1, 1995, Subpart VI, Closure and Post-Closure.

This closure plan has been written for implementation of a partial closure (i.e., closure of one or more units), rather than final closure of the LANL facility. The plan for the mixed waste container storage areas at TA-21-61 is designed to meet the following performance standards, pursuant to 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, 265.111:
Minimize the need for further maintenance, and

Controls, minimizes or eliminates, to the extent necessary to protect human health and the environment, post-closure escape of hazardous waste, hazardous constituents, leachate, contaminated run-off, or hazardous waste decomposition products to the ground or surface waters or to the atmosphere.

When the decision to close the container storage area(s) is made, LANL will notify the Secretary, New Mexico Environment Department (NMED), at least 45 days prior to closure, pursuant to 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, 265.112(d). A copy of this closure plan will be furnished upon request to the Secretary, NMED. A copy will also be provided to NMED inspectors upon request, pursuant to 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, 265.112(a). Copies of this document are maintained by the Hazardous and Solid Waste Group (ESH-19) at LANL, and at the Department of Energy (DOE), Los Alamos Area Office (LAAO). This plan may be amended pursuant to 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, 265.112(c) prior to initiation of closure of this unit or final closure of LANL. It must be amended at least 60 days prior to changes in facility design or operation affecting the unit described, or no later than 60 days after an unexpected event that affects this plan.

1.1 FACILITY DESCRIPTION

LANL is located in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque, and 25 miles northwest of Santa Fe (Figure 1). LANL, which occupies an area

of 43 square miles, and the associated residential areas of Los Alamos and White Rock are situated on the Pajarito Plateau. The plateau consists of a series of finger-like mesas separated by deep east-west trending canyons; intermittent streams lie at the bottoms of all of the canyons. The mesa tops range in elevation from approximately 7,800 feet at the flank of the Jemez Mountains, located west of Los Alamos, to about 6,200 feet at their eastern extent, where they terminate above the Rio Grande Valley.

LANL is divided into 51 TAs; 34 of these TAs are developed. Hazardous and mixed waste is managed at a number of TAs throughout LANL (Figure 2). The container storage areas for which this plan is written are the indoor container storage area and the bermed area of the fenced yard outside TA-21-61. Figure 3 shows the location of the container storage areas. TA-21 lies at elevations between about 7,220 and 6,680 feet. It is located on the eastern end of South Mesa, which is bounded by DP Canyon (a branch of Los Alamos Canyon) to the north and by Los Alamos Canyon to the south.

1.2 WASTE INFORMATION

The maximum inventory at TA-21-61 at any given time is 5,500 gallons, as provided in LANL's RCRA Part A Permit Application for Mixed Waste (January 25, 1991). The inside container storage area at TA-21-61 has been used to store low-level mixed waste. Two containers of pentyl acetate, acetone, and paint contaminated with mercury and radioactive isotopes have been stored in addition to waste fluorescent light bulbs stored prior to recycling. The outside container storage area has never been used for the storage of mixed waste.

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2.0 CLOSURE PROCEDURE

When the decision is made to close the container storage areas, all mixed waste will be removed and placed in retrievable storage at the facility. To the extent possible, all contaminated structures and equipment will be removed and decontaminated. Any structures and equipment that cannot be decontaminated will be containerized and handled as mixed waste.

Before proceeding with any closure activities, the container storage areas and associated structures and equipment will be surveyed for radionuclide contamination. Personal protective equipment and monitoring requirements will be determined by the Health Physics Operations (HS-1) and Industrial Safety and Hygiene (HS-5) Groups following an initial field inspection.

The inside container storage area will be inspected for any cracks or conditions that would potentially lead to the loss of liquid containment in the storage area. If any defects, deterioration, damage, or hazards affecting the containment system are discovered during inspection, appropriate remedial actions including repairs, maintenance or replacement will be completed prior to further decontamination activities. The storage area will then be washed down with a solution of warm water and detergent. A sample of the unused wash down solution will be collected and analyzed for the parameters listed in Table 1 to provide a baseline for decontamination verification, and to show that the unused wash solution was not contaminated at the beginning of the process nor at the end of the process. The used wash water from the container storage area will also be collected, sampled, and analyzed for the parameters in Table 1. If sampling and analysis indicate that hazardous and/or radioactive constituents are present, the area will be washed a second time in the same manner. The wash cycles and analyses will continue until the area has been completely decontaminated. Decontamination verification is discussed further in Section 3.0.

The protective clothing, tools, and equipment used during the wash down will be cleaned with detergent and water, and scraped as necessary to remove any residue. The wash water will be collected and analyzed for the parameters in Table 1. All Rinsate and wash water will be collected and sampled for analysis to determine the presence of hazardous or radioactive constituents. If the wash water is nonhazardous and nonradioactive, the water will be discharged to the industrial waste water sewer. Otherwise, the wash water will be managed at an appropriate on-site facility, depending on the regulated constituents present. When on-site or off-site facility disposal is used documentation will be provided that indicates what was disposed of at what facility. Disposable sampling and decontamination equipment will be placed in drums and transported to TA-54, Area G, for placement in retrievable storage.

The outside container storage area has never been used for the storage of hazardous and radioactive mixed waste. The asphalt pad comprising the mixed waste storage area was used for the temporary storage of drums of materials containing PCBs and storage of bulk waste oil containing less than 50 ppm PCBs in two tanks. Documentation will be provided in the Closure Certification Report that supports the preceding two statements. Decontamination activities will include the characterization of any containers and tanks for subsequent disposal pursuant to applicable requirements.

Previous sampling on and around the outside container storage area has shown contamination to be present as a result of the PCB waste management activities. The primary contaminant of concern is PCB contaminated oil and other organic compounds. Prior to its designation as a mixed waste storage area, kerosene and petroleum based solvents were used at the storage area to rinse transformers and capacitors after they had been drained of PCB oil. As a result of this information, TA-21-61 has been identified as a solid waste management unit (SWMU) pursuant to the Solid Waste Disposal Act, as amended by RCRA, as amended (U.S.C. 6901, et seq.) and Module VIII, Special Conditions Pursuant to the 1984 Hazardous and Solid Waste Amendments to RCRA for the Los Alamos National Laboratory Hazardous Waste Permit, April 10, 1990. RCRA corrective action for remediation of the site is scheduled for the future by the Environmental Remediation Project, LANL.

Removal of the remaining equipment on the outside storage area at TA-21-61 will eliminate any potential source for further contamination of the area prior to this RCRA corrective action. Further procedures for the investigation and possible remediation of the site will proceed pursuant to HSWA because this container storage unit is also identified as a Solid Waste Management Unit (SWMU) 21-003.

2.1 SAMPLING PROCEDURE

This section describes procedures and methods for soil and liquid sampling applicable to closure activities. While the procedures and methods are specific, other applicable procedures or methods given in Test Methods for Evaluating Solid Waste, Physical/Chemical Methods (SW-846) may be used if conditions or experience shows the alternate method to be more appropriate. For example if the presence of one constituent masks or impacts quantification of another constituent acceptable procedures may be used to reduce the masking or impact. All sampling procedures actually used will be annotated in the final closure report. Sampling will be conducted in accordance with procedures given in Samplers and Sampling Procedures for Hazardous Waste Streams (EPA 600/2-80-018) or SW-846 for hazardous components, and/or LANL's Environmental Chemistry Group (EM-9) procedures for radioactive constituents.

2.1.1 Soil Sampling

The indoor container storage area is located inside a building with an impervious floor. However, if soil sampling at the indoor storage area is deemed necessary based on analytical evidence and the operational history of the unit, sampling of the area will be performed to verify that no hazardous or radioactive constituents remain upon closure. A grid will be sited over the area to be sampled, boreholes drilled through the floor material, and samples taken and analyzed to determine horizontal and vertical extent of contamination.

At the outside container storage area, soil samples will be collected according to site investigation plans pursuant to HSWA/RCRA corrective action as discussed in Section 2.0 of this closure plan. Soil sampling at the outside container storage area will utilize procedures in the Los Alamos National Laboratory, Environmental Restoration Project Standard Operating Procedures and analysis in accordance with SW846.

If applicable for the inside storage area, the sampling procedures outlined below will be used to determine the amount of hazardous material deposited on a particular area of land, or to determine the leaching rate of the material, or determine the residue level in the soil. To sample at the twelve-inch depth, samples will be collected with a Veihmeyer soil sampler. Soil sampling with a Veihmeyer sampler will proceed as follows:

- Assemble the sampler by screwing in the tip and drive head on the sampling tube.
- Insert the tapered handle (drive guide) of the drive hammer through the drive head.
- Place the sampler in a perpendicular position on the material to be sampled.
- With the left hand holding the tube, drive the sampler into the ground/material to the desired sampling depth by pounding the drive head with the drive hammer. Do not drive the tube further than the tip of the hammer's drive guide.
- Record the length of the tube that penetrated the material.
- Move the drive hammer onto the drive head. In this position, the hammer serves as a handle for the sampler.
- Rotate the sampler at least two revolutions to shear off the sample at the bottom.
- Lower the sampler handle (hammer) until it just clears the two ear-like protrusions on the drive head and rotate about 90 degrees.
- Withdraw the sampler from the material by pulling the handle (hammer) upwards. When the sampler cannot be withdrawn by hand, as in deep soil sampling, use the puller jack and grip.

- Dislodge the hammer from the sampler, turn the sampler tube upside down, tap the head gently against the hammer, and carefully recover the sample from the tube. The sample should slip out easily.
- Store the core sample in a 1,000 or 2,000 ml (1 qt or 1/2 gal) sample container. Preserve as required.
- Label the sample, affix the seals, record in the field logbook, complete the request for analysis and chain-of-custody forms, and deliver the samples to EM-9 for radiological screening and then to the laboratory for analysis.

It is important to clean the samplers after each site is sampled. An unused, disposable sampler may be presumed clean if still in a factory-sealed wrapper. Unsealed samplers will be cleaned prior to use. The samplers will be washed with a warm detergent and water solution, rinsed several times with tap water, rinsed with distilled water, drained of excess water, and air-dried or wiped dry. All rinsate will be collected and analyzed to determine proper treatment and/or disposal procedures.

If analysis shows that soil contamination exists, all contaminated soils will be excavated and removed, or a risk assessment performed to demonstrate that any contaminants remaining do not pose a threat to human health or the environment. If demonstration that no threat to human health or the environment exists cannot be made, a post-closure plan will be submitted.

2.1.2 Liquid Sampling

A Coliwasa sampler or similar device will be used to sample liquid solutions for analysis. As an alternative to the Coliwasa, glass tubes may be used to sample liquids. The primary advantage in using a glass tube is that the tube will be disposed of after each sample is collected, thus eliminating the potential for cross contamination.

Liquid sampling with a Coliwasa shall proceed as follows:

- Make sure that the Coliwasa sampler is clean.
- Assemble the Coliwasa sampler.
- Check to make sure the sampler is functioning properly. Adjust the locking mechanism, if necessary, to make sure the neoprene rubber stopper provides a tight closure.
- Wear necessary protective clothing and gear and observe required sampling precautions.
- Put the sampler in the open position by placing the stopper rod handle in the T-position and pushing the rod down until the handle sits against the sampler's locking block.

- Slowly lower the Coliwasa sampler into the liquid at a rate that permits the level of the liquid inside and outside the sampler tube to be about the same. If the level of the liquid in the sampler tube is lower than that outside the sampler, the sampling rate is too fast and will result in a nonrepresentative sample.

- When the sampler stopper hits the bottom of the liquid container, push the sampler tube downward against the stopper to close the sampler. Lock the sampler in the closed position by turning the T-handle until it is upright and one end rests tightly on the locking block.

- Slowly withdraw the sampler from the container with one hand while wiping the sampler tube with a disposable cloth with the other hand.

- Carefully discharge the sample into a sample container by slowly opening the sampler. This is done by slowly pulling the lower end of the T-handle away from the locking block while the lower end of the sampler is positioned in the sample container.

- Add preservative (if required), cap the container, attach a label and seal, place immediately in an insulated container with ice, if required, record in the field logbook, and complete the request for analysis and chain-of-custody forms.

- Unscrew the T-handle of the sampler and disengage the locking block. Clean the sampler on site or store the contaminated parts of the sampler in a plastic storage tube or bag for subsequent cleaning. Store used rags in plastic bags for subsequent disposal.

The sampler must be clean before use. An unused, disposal sampler may be presumed clean if still in a factory-sealed wrapper. Unsealed samplers will be cleaned prior to use. Samplers will be washed with a warm detergent and water solution, rinsed several times with tap water, rinsed with distilled water, drained of excess water, and air-dried or wiped dry. All rinsate will be collected and analyzed to determine proper treatment and/or disposal procedures. Sampler applications are described in Table 2.

2.2 SAMPLE HANDLING AND DOCUMENTATION

Samples will be analyzed either at LANL or at a commercial laboratory. In either case, each sample will be labeled, sealed, preserved (if required), and accompanied by a chain-of-custody and a request for analysis form. Examples of chain-of-custody and request for analysis forms are provided as Figures 4 and 5, respectively. The chain-of-custody form is necessary to trace sample possession from the time of collection to the time of disposition and must accompany every sample. The original record accompanies the shipment and the copy is retained by LANL or, if analyzed by LANL, the original will be maintained by LANL as well.

The sample container must be sealed with a gummed paper seal attached to the container in such a way that the seal must be broken in order to open the container. The seal and sample tag must be completed with a waterproof pen. The sample label is necessary to prevent misidentification of samples and shall include a unique sample number, sample collection date

and time, sample location, sample type, depth and description. An example of a sample label is shown on Figure 6.

A closure sampling field logbook will be kept and will contain all information pertinent to field surveys and sampling. The logbook shall have bound and consecutively numbered pages in 8.5 by 11-inch format. Minimum entries include:

a. Purpose of sample
b. Location of sampling (coordinates referenced to staked field points, for soil samples)
c. Name and business address of person making log entry
d. Number and volume of sample
e. Description of each sampling location, sampling methodology, equipment used, etc.
f. Date and time of sample collection
g. Sample destination and transporter's name (name of laboratory, UPS, etc.)
h. Map or photograph of the sampling site, if any
i. Field observations, if applicable (ambient temperature, sky conditions, past 24-hour precipitation, etc.)
j. Field measurements, if any (pH, flammability, conductivity, explosivity, etc.)
k. Collector's sample identification number(s), and
l. Signature of person responsible for the log entry.

Sampling situations vary widely. No general rule can be given as to the extent of information that must be entered in the logbook. A good rule, however, is to record sufficient information so that someone can reconstruct the sampling situation without relying on the collector's memory.

Documentation of sample acceptance at the laboratory must be provided to the project manager following sample screening and log-in. This documentation may consist of signed copies of the chain-of-custody, or a letter detailing the field sample numbers accepted. Corresponding laboratory sample identification numbers should be provided to the project manager. Project Managers must provide NMED with a signed and certified statement that these events meet the requirements of the QA/QC Plan/Procedure. The laboratory is required to have procedures for minimizing cross contamination of samples and securing sample custody within the laboratory.

2.3 ANALYTICAL PROCEDURE

Test methods for analysis of all samples will be performed according to procedures documented in SW-846. Recommended analytical methods, detection limits, and instrumentation are provided for metals analysis in Table 3 and organics analysis in Table 4.

Minimum calibration, operation, and quality control (bias, precision, blank and matrix effects) requirements for laboratory analyses shall be performed as listed in the individual analytical methods of SW-846. All laboratory analyst notebooks, log sheets, instrument printouts, charts,

and calculations relevant to analyses of these samples shall be identified and remain accessible. This information may be requested for independent review and validation.

3.0 DECONTAMINATION VERIFICATION

Sufficient sampling and analysis will be required to demonstrate that mixed waste residue is not present at the inside storage area after closure. Soil and wash water samples will be analyzed for parameters listed in Table 1 to verify the presence or absence of mixed waste contamination. If the extent of soil contamination at the site is such that clean closure cannot be achieved, a post-closure care plan will be prepared to address the constituents remaining at the site.

As discussed in Section 2.0, one sample will be taken of the clean wash down solution and analyzed for the parameters listed in Table 1. The analytical results from this sample will provide background data for decontamination verification. Used wash down solutions will also be analyzed for the parameters listed in Table 1. Equipment will be considered to be contaminated if the used wash water solutions show a significant increase in the analytical parameters over the clean wash solution. If subsequent wash downs are deemed necessary, an additional clean wash down solution sample will be taken for each additional wash down event. A significant increase is determined using statistical methods provided in SW-846.

Successful decontamination is defined as:

1. No detectable hazardous constituents in the final sample, or
2. Detectable hazardous constituents in the final sample are equal to or less than, at the 0.01 confidence level, their concentration in the unused wash water or background sample.

If collection of soil samples is deemed necessary, background soil samples will be collected and analyzed for the parameters listed in Table 1 to provide a baseline for decontamination verification. If analysis shows that the soil at the storage areas is contaminated, all contaminated soils will be excavated and removed, or a risk assessment will be prepared for each constituent showing a significant increase over background concentration. The risk assessment will determine the threshold concentration for each constituent that represents a significant risk to human health and the environment and will take into account all possible pathways. Soils containing levels of constituents above the threshold will be considered contaminated. A post-closure care plan will be prepared for the site as well. A copy of the completed risk assessment, along with pertinent supporting data, will be provided to NMED for review and approval.

An amendment to the Closure Plan may be proposed and justified at the time of unit closure as circumstances indicate. The Secretary, NMED, will evaluate the proposed amendment in accordance with the standards of § 265.112 and guidance then in effect and, if approved, incorporate the alternative into this closure plan.

4.0 QUALITY ASSURANCE/QUALITY CONTROL

A Quality Assurance/Quality Control (QA/QC) officer, independent of these closure activities, will assume a quality assurance function. The independent QA/QC officer is responsible for conducting quality assurance reviews and audits of field and laboratory activities and documentation of compliance with regulations, this closure plan and DOE/LANL Standard Operating Procedures.

Field quality control activities will include collection of quality control samples in addition to field documentation requirements. Quality control samples to be collected include duplicate samples, trip blanks, field blanks, and rinsate blanks. Table 5 summarizes field quality control sample requirements.

Duplicate and blank samples will be collected as described herein. Duplicate samples are two or more samples collected simultaneously into separate containers from the same source under identical conditions. One field duplicate sample will be collected for every 20 samples. Acceptance limits for field duplicate analyses are 0 to 20 relative percent difference (RPD) per analyte. Blank samples collected in the field will include trip blanks, field blanks, and equipment rinsate blanks. A trip blank is a sample container filled with organic-free, deionized water. The filled container is taken to the sampling site, remains unopened, and then is shipped to the analytical laboratory along with the samples. A trip blank is submitted whenever samples are collected for volatile organic compounds analysis. A field blank is a sample collected to assess the ambient conditions at the sampling site. It consists of a sample of organic-free, deionized water poured into a sample container under normal sampling conditions. An equipment rinsate blank is collected to assess the cleanliness of sampling equipment. The equipment is cleaned according to the procedures described in Section 2.1.1, then organic-free, deionized water is poured over the decontaminated equipment's sampling surface and collected in a sample container. Frequency of blank samples will be no less than one in 20 samples. Blank samples and duplicate samples of liquid and soil will be analyzed for total metals, total volatile organics, and total base-neutral and acid (BNA) extractables.

Instrument calibration and maintenance are field activities subject to quality control procedures. Field equipment requiring calibration will be limited to radioactivity detection devices and organic vapor monitoring. Radiation detection and organic vapor monitoring equipment are the responsibility of field personnel and will be calibrated and maintained using the manufacturer's instructions and appropriate Standard Operating Procedures (SOPs).

The analytical laboratory shall operate under a Quality Assurance Program Plan (QAPP) which meets the requirements of SW-846. Quality control procedures in the analytical laboratory are guided by the laboratory's QAPP. Laboratory quality control samples are required to establish

the accuracy and precision of analytical data in order to determine the quality of the data. Table 6 lists laboratory quality control sample procedures by analytical methods.

5.0 CLOSURE SCHEDULE

Upon final removal of waste from the container storage areas, an estimated 180 days will be required to accomplish closure procedures and reporting requirements. The year of closure of these container storage areas is 1996. Closure will proceed by the schedule below:

ACTIVITY [— Unable To Translate Graphic —]	MAXIMUM TIME REQUIRED
Notify the NMED	-90 Days
Advertise for proposals	-90 Days
Receive proposals	-30 Days
Select contractor and award contract	-10 Days
Collect background soil sample	-5 Days
Removal of wastes	Day 0
Initial soil sampling around building and storage pad	Day 30
Initial wash down of inside storage area	Day 60
Analyze samples	Day 75
Additional wash down	Day 120
Additional soil samplingDay 120	
Final cleanup	Day 130
Decontamination verification	Day 150
Submit final report to NMED	Day 180

NOTE:
The schedule above indicates calendar days from the beginning by which activities will be completed. Some activities may be conducted simultaneously.

6.0 CLOSURE CERTIFICATION

An independent, registered professional engineer and a LANL representative shall ensure that the closure follows this plan. Upon completion of closure, the engineer and a DOE representative shall prepare a letter in accordance with the provisions of § 265.115 and §265.116 certifying that the container storage areas have been closed in accordance with this plan. The letter shall be dated and signed by each party, stamped by the registered engineer, and the original copy submitted by the DOE to the Secretary, NMED. One copy shall be maintained at DOE LAAO and one copy maintained by ESH-19.

7.0 FINANCIAL REQUIREMENTS

In accordance with 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, 265.140(c), as a facility owned by the Federal government, LANL is exempt from the financial requirements of 20 NMAC 4.1, as revised November 1, 1995, Subpart VI, Section 265, Subpart H.

8.0 FINAL CLOSURE REPORT

Upon completion of the closure activities, a final closure report shall be sent to the Secretary, NMED within the time limits described in Section 5, Closure Schedule, of this Closure Plan. The report shall document the final closure and contain, at a minimum, the following:

A. The certification described in Section 6.0.

B. Any variance from the approved activities and the reason for the variance.

C. A tabular summary of all sampling results, showing:

1. Sample identification
2. Sampling location
3. The datum reported
4. Detection limit for each datum
5. A measure of analytical precision (e.g., uncertainty, range, variance)
6. Identification of analytical procedure
7. Identification of analytical laboratory.

D. A QA/QC statement on the adequacy of the analyses and the decontamination demonstration.

E. The location of the file of supporting documentation:

1. Field logbooks
2. Laboratory sample analysis reports
3. The QA/QC documentation
4. Chain-of-custody records.

F. Disposal location of all regulated and nonregulated residues.

G. A certification of accuracy of the report as required by §265.115 and § 265.116

Table 1

Analytical Parameters

Metals	**Organics**
Arsenic	Halogenated volatile organics
Barium	Nonhalogenated volatile organics
Beryllium	Acid-extractable semivolatile organics
Cadmium	Base-neutral extractable semivolatile organics
Chromium	
Lead	
Mercury	
Nickel	
Selenium	
Silver	
Thallium	

Other

pH

NOTE:
Metals and organics will be analyzed for total content. All data shall be provided in the final closure report.

Table 2

Sample Containers, Preservation, and Holding Times

	Water			Sediment/Soil/Sludge		
Analyte Group	Container	Preservative	Holding Time	Container	Preservative	Holding Time
Target Analyte Metals	1 liter P	HNO_3 to pH <2	180 days (Hg - 26 days)	8 oz. WM-G	Cool 4°C	6 months (Hg - 26 days)
Target Compound Volatile Organics	2 x 40 ml AG septa vials	HCL, Cool 4° C	14 days	2 x 120 ml G vial teflon-lined cap No headspace	Cool 4°C	14 days
Target Compound Semi-volatile Organics	2 x 1 liter AG	Cool 4° C	7 days extraction, plus 40 days for	8 oz. WM-G	Cool 4°C	7 days extraction plus 40 days for analysis
Radioactivity Screening	40 ml G vial, no septa	None	Analyze upon receipt	120 ml G vial	None	Analyze upon receipt

P - polyethylene WM-G - wide-mouth glass AG - amber glass G - glass AG-WM - amber glass, wide-mouth

Table 3

Target Detection Limits, Analytical Methods, And Instrumentation for Metals Analysis

Analyte	Target Detection[a] Limit (µg/L)	EPA SW-846 Analytical Method	Instrumentation[b]
Arsenic	10	6010, 7060	ICP, GFAA
Barium	200	6010	ICP
Beryllium	5	6010, 7091	ICP, GFAA
Cadmium	2	6010, 7131	ICP, GFAA
Chromium	10	6010, 7191	ICP, GFAA
Lead	5	6010, 7420, 7421	ICP, FAA, GFAA
Mercury	0.2	7470, 7471	CVAA
Nickel	40	6010	ICP
Selenium	5	6010, 7740	ICP, GFAA
Silver	10	6010, 7760	ICP, FAA
Thallium	10	6010, 7841	ICP, GFAA

(a) Detection limits listed are for clean water. Actual detection limits may be higher depending on sample composition and matrix type.

(b) ICP - Inductively Coupled Plasma Emission Spectroscopy
GFAA - Graphite Furnace Atomic Absorption Spectroscopy
FAA - Flame Atomic Absorption Spectroscopy
CVAA - Cold Vapor Atomic Absorption Spectroscopy

Table 4

Target Detection Limits[a], Analytical Methods, and Instrumentation for Organics Analysis

Analyte (Group)	Target Detection Limits	EPA SW-846 Analytical Method	Instrumentation
Target Compound List Volatiles + 10 Tentatively Identified Compounds (TICs)	10 µg/L water 10-120 µg/kg sediment	8240, or 8260	GC/MS
Target Compound List Semivolatiles + 20 TICs	10 µg/L water 330-50,000 µg/kg sediment	8270	GC/MS

(a) Detection limits expressed as practical quantitation limits.

Table 5

Summary of Field Quality Control Samples

QC Sample Type	Sample Matrix	Applicable Analysis	Frequency	Purpose	Acceptance Criteria	Corrective[a] Action
Trip Blank	Water	Volatiles	One set per shipping cooler containing samples	Monitor sample contamination in field and lab	(b)	Advisory--no action required
Field Blank	Water	Semivolatiles, Pesticides/PCBs, Metals, Radionuclides	One sample daily per analysis (can prepare and hold pending sample results)	Monitor field sample contamination/air contamination	(b) (c)	Advisory--no action required
Field Duplicate	Soil/Water	Volatiles	One for every 20 samples	Monitor sample variability	Analytical method criteria, if applicable	Advisory--no action required
Equipment Rinsate Blank	Water	Volatiles, Semivolatiles, Pesticides/PCBs, Metals, Radionuclides	One sample per day (can prepare and hold pending sample results)	Monitor decontamination effectiveness and sample cross contamination	(b) (c)	Advisory--no action required

(a) EPA Functional Guidelines for Data Validation may apply.

(b) For volatiles and semivolatiles analysis, if blank shows detectable levels of any common laboratory contaminant (methylene chloride, acetone, 2-butanone, toluene, any phthalate ester), sample must exhibit that contaminant at a level 10x the quantitation limit to be considered detectable. For all other contaminants, sample must exhibit the contaminant at a level 5x the quantitation level to be considered detectable.

(c) For pesticides analysis, if blank shows detectable level of any contaminant, sample must exhibit that contaminant at a level 5x the quantitation limit to be considered detectable.

Table 6

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Volatile Organics	8240 or 8260	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours of analysis time	Per method	Repeat until acceptance criteria satisfied
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels; after each instrument performance, check prior to sample analysis	Relative response factors (RRF) within method limits	Repeat calibration
		Continuing calibration	Every 12 hours of analysis time	Average RRFs < 25% difference	Repeat calibration
		Internal standards	All calibration standards, samples, and blanks	Extracted ion current profile (EICP); Δ -50% to +100% Retention time shifts < 0.50 minutes	Correct malfunction; re-analyze sample per method criteria
		Method blank	Every 12 hours of analysis time	< 5 times quantitation limit for methylene chloride, acetone, 2-butanone; all other compounds < or = to quantitation limit	Determine source of contamination, and document corrective action; re-extract and re-analyze samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Volatile Organics (cont'd)	8240 or 8260	System monitoring compounds	Every method blank, sample, matrix spike, matrix spike duplicate; matrix specific, per method limits	Check instrument and calculations; re-analyze per method criteria	
Target Compound Semivolatile Organics	8270	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours	Per method	Repeat until acceptance criteria satisfied
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels. After each performance, check prior to sample analysis	RRFs within method limits	Repeat calibration
		Continuing calibration	Every 12 hours	Average RRFs < 25% difference	Repeat calibration
		Internal standards	All calibration standards, samples and blanks	EICP Δ -50% to +100% Retention time shifts < 0.50 minutes	Correct malfunction; re-analyze sample per method criteria
		Method blank	Each group of samples of similar matrix and concentration level (soils)	< 5 times quantitation limit for phthalate esters; all other compounds < or = to quanitation limit	Determine source of contamination; document corrective action; re-extract and re-analyze samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Semivolatile Organics (cont'd)	8270	Surrogate Compounds	Each sample, blank	Matrix specific per method limits	Re-extract and re-analyze per method criteria
Organo-chlorine Pesticides	8080	GC Column Resolution	Prior to each initial calibration, or each column and instrument	Per method criteria	Change column, detector, clean system, etc.; repeat procedure
		Initial calibration	Three concentration levels calibration sequence prior to sample analysis after resolution check	Calibration factors and retention times must meet method criteria	Repeat calibration
		Continuing calibration	Every 12 hours	Calibration factors and retention times must meet method criteria	Repeat calibration
		Method blank	One per field batch, every 20 samples, every 14 days, or whenever similar extraction method used; whichever more frequent	All analytes less than quantitation limits, retention times within windows	Re-extract and re-analyze all associated samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Organo-chlorine Pesticides (cont'd)	8080	Instrument blank	First analysis every 12 hours following calibration	Less than 0.5 times quantitation limits, retention times within windows; surrogates acceptable	Correct malfunction; repeat calibration sequence, re-analyze blank, re-inject all associated samples
		Sulfur clean-up blank	Each sample set requiring sulfur clean-up	All analytes less than quantitation limits; surrogate retention times within windows	Re-extract and re-analyze all associated samples
Metals	6010	Surrogate compounds Instrument calibration Initial/continuing calibration	Each sample and blank Daily, or each setup After instrument calibration, 10% or every two hours	60% - 150% recovery 5% of true value 10% of true value	Advisory only--no action Repeat calibration Correct problem, re-calibrate and re-analyze previous ten samples
		Initial/continuing calibration blank	Every calibration, 10% or two hours	< contract required detection limits	Correct problem; re-calibrate and re-analyze all samples since last blank
		Preparation blank	Each batch of digested samples	< contract required detection limits	Re-digest and re-analyze all associated samples per method criteria
		Interference check sample	Each run or twice per eight-hour shift	20% of true value	Correct problem; re-calibrate, re-analyze all samples since last ICS

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Metals (cont'd)	6010	Duplicate sample analysis	Once per field batch per matrix	0%-20% RPD when < five times detection limit; detection limit otherwise	Flag data
		Laboratory control sample	Once per field batch or each digest group	80% - 120% percent recovery (except Ag, Sb)	Correct problem; re-digest and re-analyze all samples since last LCS
		Serial dilution analysis	Once per field batch per matrix	10% original determination	Flag data
		Instrument detection limit	Quarterly	As determined	Not applicable
		Inter-element corrections	Annually	As determined	Not applicable
		linear range analysis	Quarterly	5% of true value	Re-analyze

[a]Source: EPA Contract Laboratory Program Statement of Work for Inorganic and Organic Analysis (3/90). Not all listed procedures may be applicable to SW-846 protocols.

FIGURES

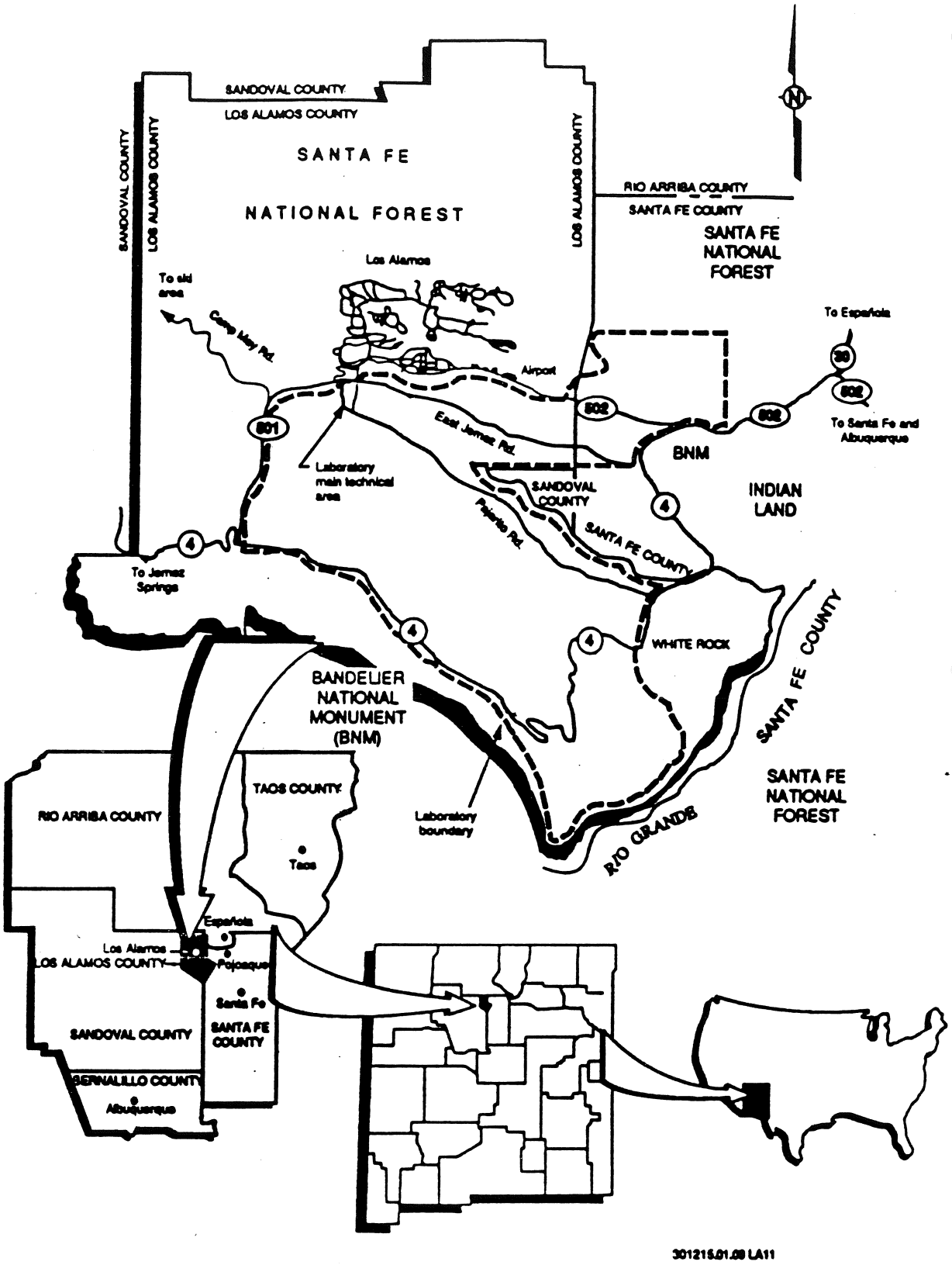

Figure 1. Regional location map of Los Alamos National Laboratory.

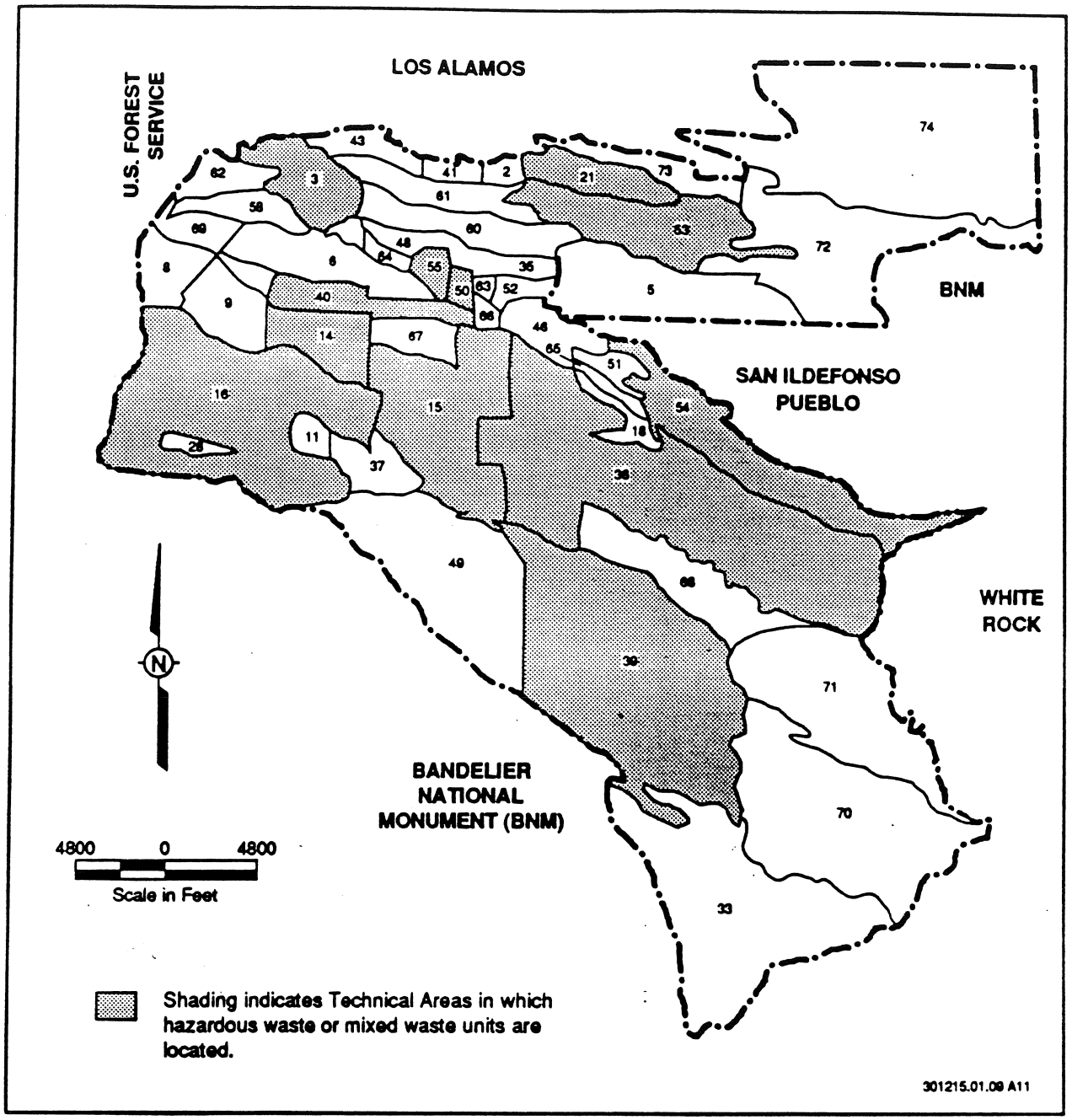

Figure 2. Location map of Los Alamos National Laboratory Technical Areas.

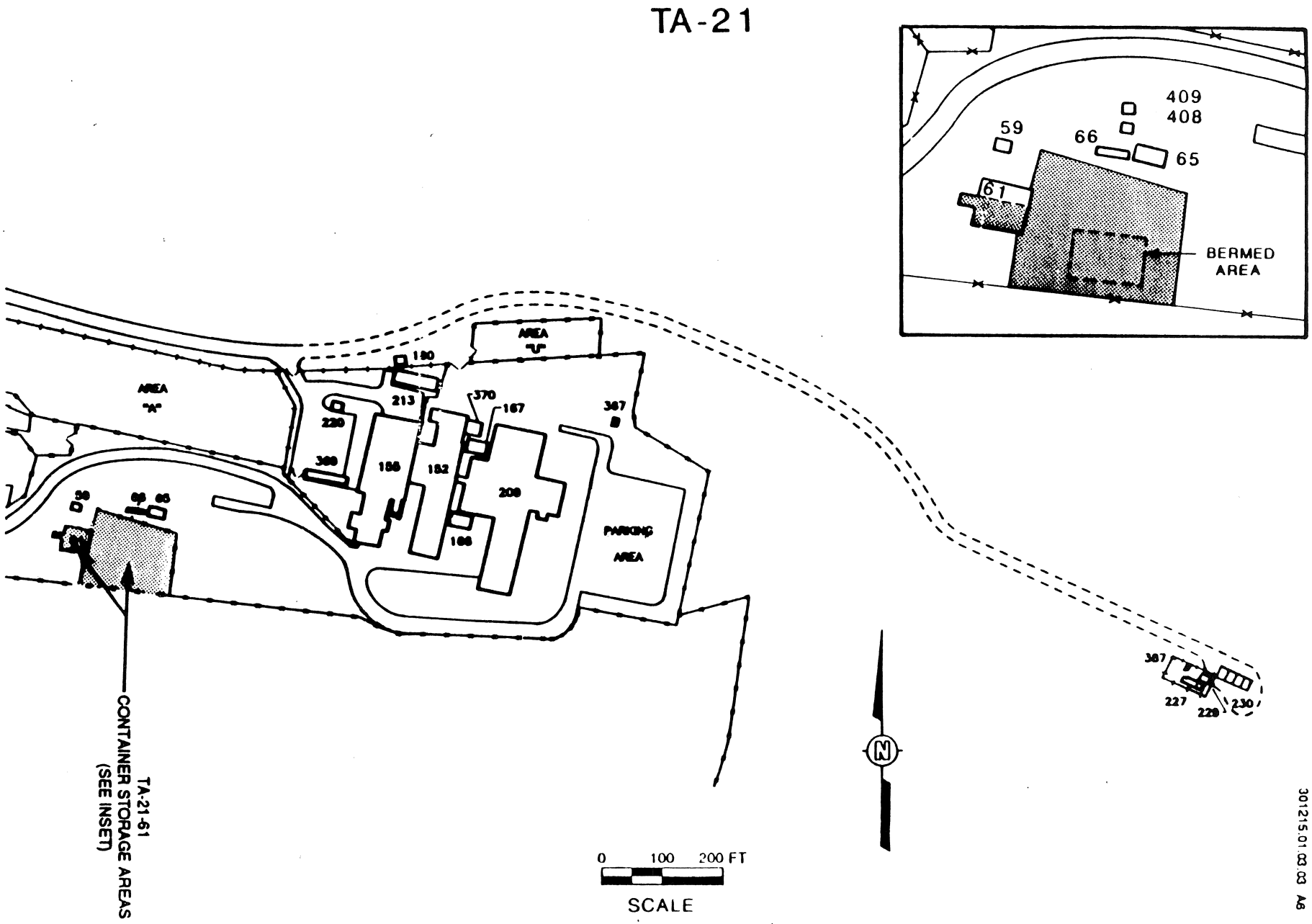

Figure 3. TA-21 site location map and container storage areas locations.

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INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. _____

C/C Control No. 158047

PROJECT NAME/NUMBER _____

LAB DESTINATION _____

SAMPLE TEAM MEMBERS _____

CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.

Special Instructions: _____

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: _____

   Received By: _____

2. Relinquished By: _____

   Received By: _____

3. Relinquished By: _____

   Received by: _____

4. Relinquished By: _____

   Received By: _____

WHITE To accompany samples
YELLOW Field copy

Figure 4. Chain-of-Custody Record.

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 207870

C/C Control No. _____

PROJECT NAME _____

PROJECT NUMBER _____

PROFIT CENTER NUMBER _____

PROJECT MANAGER _____

BILL TO _____

PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED _____

LAB DESTINATION _____

LABORATORY CONTACT _____

SEND LAB REPORT TO _____

DATE REPORT REQUIRED _____

PROJECT CONTACT _____

PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)

Normal _____ Rush _____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)

I _____ II _____ III _____ Project Specific _____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)

Non-hazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)

Return to Client _____ Disposal by Lab _____ Archive _____ (Indicate number of months.)

FOR LAB USE ONLY

Received by _____ Date/Time _____

[illegible] Original to accompany samples
[illegible] Pink copy

128A 10-85

Figure 5. Request for Analysis Form.

INTERNATIONAL TECHNOLOGY CORPORATION

F

H R

Project Name _____

Project No. _____

Sample No. _____

Collection Date/Time _____

Collector's Name _____

Sample Location _____

Sample Type/Depth/Description _____

Analyze For _____ Preservative _____

Bottle _____ of _____ _____ Filtered _____ Nonfiltered

23-8-95

Figure 6. Sample Label.

Table 1

Analytical Parameters

Metals	Organics
Arsenic	Halogenated volatile organics
Barium	Nonhalogenated volatile organics
Beryllium	Acid-extractable semivolatile organics
Cadmium	Base-neutral extractable semivolatile organics
Chromium	
Lead	
Mercury	
Nickel	
Selenium	
Silver	
Thallium	

Other

pH

NOTE:
Metals and organics will be analyzed for total content. All data shall be provided in the final closure report.

Table 2

Sample Containers, Preservation, and Holding Times

	Water			Sediment/Soil/Sludge		
Analyte Group	Container	Preservative	Holding Time	Container	Preservative	Holding Time
Target Analyte Metals	1 liter P	HNO_3 to pH <2	180 days (Hg - 26 days)	8 oz. WM-G	Cool 4°C	6 months (Hg - 26 days)
Target Compound Volatile Organics	2 x 40 ml AG septa vials	HCL, Cool 4° C	14 days	2 x 120 ml G vial teflon-lined cap No headspace	Cool 4°C	14 days
Target Compound Semi-volatile Organics	2 x 1 liter AG	Cool 4° C	7 days extraction, plus 40 days for	8 oz. WM-G	Cool 4°C	7 days extraction plus 40 days for analysis
Radioactivity Screening	40 ml G vial, no septa	None	Analyze upon receipt	120 ml G vial	None	Analyze upon receipt

P - polyethylene WM-G - wide-mouth glass AG - amber glass G - glass AG-WM - amber glass, wide-mouth

Table 3

Target Detection Limits, Analytical Methods, And Instrumentation for Metals Analysis

Analyte	Target Detection[a] Limit (µg/L)	EPA SW-846 Analytical Method	Instrumentation[b]
Arsenic	10	6010, 7060	ICP, GFAA
Barium	200	6010	ICP
Beryllium	5	6010, 7091	ICP, GFAA
Cadmium	2	6010, 7131	ICP, GFAA
Chromium	10	6010, 7191	ICP, GFAA
Lead	5	6010, 7420, 7421	ICP, FAA, GFAA
Mercury	0.2	7470, 7471	CVAA
Nickel	40	6010	ICP
Selenium	5	6010, 7740	ICP, GFAA
Silver	10	6010, 7760	ICP, FAA
Thallium	10	6010, 7841	ICP, GFAA

(a) Detection limits listed are for clean water. Actual detection limits may be higher depending on sample composition and matrix type.

(b) ICP - Inductively Coupled Plasma Emission Spectroscopy
GFAA - Graphite Furnace Atomic Absorption Spectroscopy
FAA - Flame Atomic Absorption Spectroscopy
CVAA - Cold Vapor Atomic Absorption Spectroscopy

Table 4

Target Detection Limits[a], Analytical Methods, and Instrumentation for Organics Analysis

Analyte (Group)	Target Detection Limits	EPA SW-846 Analytical Method	Instrumentation
Target Compound List Volatiles + 10 Tentatively Identified Compounds (TICs)	10 µg/L water 10-120 µg/kg sediment	8240, or 8260	GC/MS
Target Compound List Semivolatiles + 20 TICs	10 µg/L water 330-50,000 µg/kg sediment	8270	GC/MS

(a) Detection limits expressed as practical quantitation limits.

Table 5

Summary of Field Quality Control Samples

QC Sample Type	Sample Matrix	Applicable Analysis	Frequency	Purpose	Acceptance Criteria	Corrective[a] Action
Trip Blank	Water	Volatiles	One set per shipping cooler containing samples	Monitor sample contamination in field and lab	(b)	Advisory--no action required
Field Blank	Water	Semivolatiles, Pesticides/PCBs, Metals, Radionuclides	One sample daily per analysis (can prepare and hold pending sample results)	Monitor field sample contamination/air contamination	(b) (c)	Advisory--no action required
Field Duplicate	Soil/Water	Volatiles	One for every 20 samples	Monitor sample variability	Analytical method criteria, if applicable	Advisory--no action required
Equipment Rinsate Blank	Water	Volatiles, Semivolatiles, Pesticides/PCBs, Metals, Radionuclides	One sample per day (can prepare and hold pending sample results)	Monitor decontamination effectiveness and sample cross contamination	(b) (c)	Advisory--no action required

(a) EPA Functional Guidelines for Data Validation may apply.

(b) For volatiles and semivolatiles analysis, if blank shows detectable levels of any common laboratory contaminant (methylene chloride, acetone, 2-butanone, toluene, any phthalate ester), sample must exhibit that contaminant at a level 10x the quantitation limit to be considered detectable. For all other contaminants, sample must exhibit the contaminant at a level 5x the quantitation level to be considered detectable.

(c) For pesticides analysis, if blank shows detectable level of any contaminant, sample must exhibit that contaminant at a level 5x the quantitation limit to be considered detectable.

Table 6

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Volatile Organics	8240 or 8260	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours of analysis time	Per method	Repeat until acceptance criteria satisfied
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels; after each instrument performance, check prior to sample analysis	Relative response factors (RRF) within method limits	Repeat calibration
		Continuing calibration	Every 12 hours of analysis time	Average RRFs < 25% difference	Repeat calibration
		Internal standards	All calibration standards, samples, and blanks	Extracted ion current profile (EICP); Δ -50% to +100% Retention time shifts < 0.50 minutes	Correct malfunction; re-analyze sample per method criteria
		Method blank	Every 12 hours of analysis time	< 5 times quantitation limit for methylene chloride, acetone, 2-butanone; all other compounds < or = to quantitation limit	Determine source of contamination, and document corrective action; re-extract and re-analyze samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Volatile Organics (cont'd)	8240 or 8260	System monitoring compounds	Every method blank, sample, matrix spike, matrix spike duplicate; matrix specific, per method limits	Check instrument and calculations; re-analyze per method criteria	
Target Compound Semivolatile Organics	8270	Instrument performance: mass calibration/ion abundance pattern	Every 12 hours	Per method	Repeat until acceptance criteria satisfied
		Initial calibration: instrument sensitivity and linearity of response	Five concentration levels. After each performance, check prior to sample analysis	RRFs within method limits	Repeat calibration
		Continuing calibration	Every 12 hours	Average RRFs < 25% difference	Repeat calibration
		Internal standards	All calibration standards, samples and blanks	EICP Δ -50% to +100% Retention time shifts < 0.50 minutes	Correct malfunction; re-analyze sample per method criteria
		Method blank	Each group of samples of similar matrix and concentration level (soils)	< 5 times quantitation limit for phthalate esters; all other compounds < or = to quanitation limit	Determine source of contamination; document corrective action; re-extract and re-analyze samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Target Compound Semivolatile Organics (cont'd)	8270	Surrogate Compounds	Each sample, blank	Matrix specific per method limits	Re-extract and re-analyze per method criteria
Organo-chlorine Pesticides	8080	GC Column Resolution	Prior to each initial calibration, or each column and instrument	Per method criteria	Change column, detector, clean system, etc.; repeat procedure
		Initial calibration	Three concentration levels calibration sequence prior to sample analysis after resolution check	Calibration factors and retention times must meet method criteria	Repeat calibration
		Continuing calibration	Every 12 hours	Calibration factors and retention times must meet method criteria	Repeat calibration
		Method blank	One per field batch, every 20 samples, every 14 days, or whenever similar extraction method used; whichever more frequent	All analytes less than quantitation limits, retention times within windows	Re-extract and re-analyze all associated samples

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Organo-chlorine Pesticides (cont'd)	8080	Instrument blank	First analysis every 12 hours following calibration	Less than 0.5 times quantitation limits, retention times within windows; surrogates acceptable	Correct malfunction; repeat calibration sequence, re-analyze blank, re-inject all associated samples
		Sulfur clean-up blank	Each sample set requiring sulfur clean-up	All analytes less than quantitation limits; surrogate retention times within windows	Re-extract and re-analyze all associated samples
Metals	6010	Surrogate compounds Instrument calibration Initial/continuing calibration	Each sample and blank Daily, or each setup After instrument calibration, 10% or every two hours	60% - 150% recovery 5% of true value 10% of true value	Advisory only--no action Repeat calibration Correct problem, re-calibrate and re-analyze previous ten samples
		Initial/continuing calibration blank	Every calibration, 10% or two hours	< contract required detection limits	Correct problem; re-calibrate and re-analyze all samples since last blank
		Preparation blank	Each batch of digested samples	< contract required detection limits	Re-digest and re-analyze all associated samples per method criteria
		Interference check sample	Each run or twice per eight-hour shift	20% of true value	Correct problem; re-calibrate, re-analyze all samples since last ICS

Table 6, Continued

Summary of Laboratory Quality Control Procedures[a] By Analytical Method

Parameter	EPA SW-846 Analytical Method	Quality Control Check	Frequency	Acceptance Criteria	Corrective Action
Metals (cont'd)	6010	Duplicate sample analysis	Once per field batch per matrix	0%-20% RPD when < five times detection limit; detection limit otherwise	Flag data
		Laboratory control sample	Once per field batch or each digest group	80% - 120% percent recovery (except Ag, Sb)	Correct problem; re-digest and re-analyze all samples since last LCS
		Serial dilution analysis	Once per field batch per matrix	10% original determination	Flag data
		Instrument detection limit	Quarterly	As determined	Not applicable
		Inter-element corrections	Annually	As determined	Not applicable
		linear range analysis	Quarterly	5% of true value	Re-analyze

[a]Source: EPA Contract Laboratory Program Statement of Work for Inorganic and Organic Analysis (3/90). Not all listed procedures may be applicable to SW-846 protocols.

FIGURES

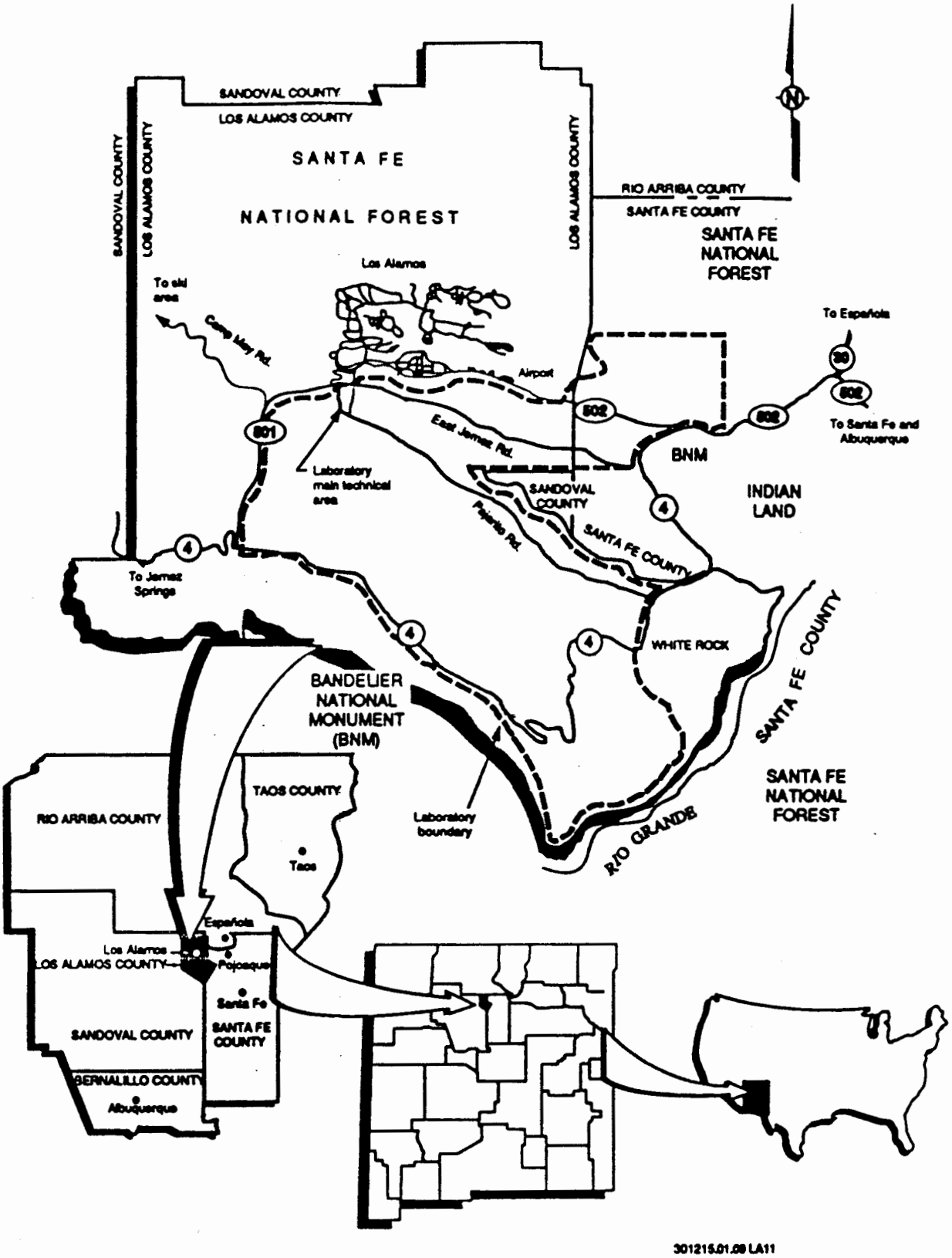

Figure 1. Regional location map of Los Alamos National Laboratory.

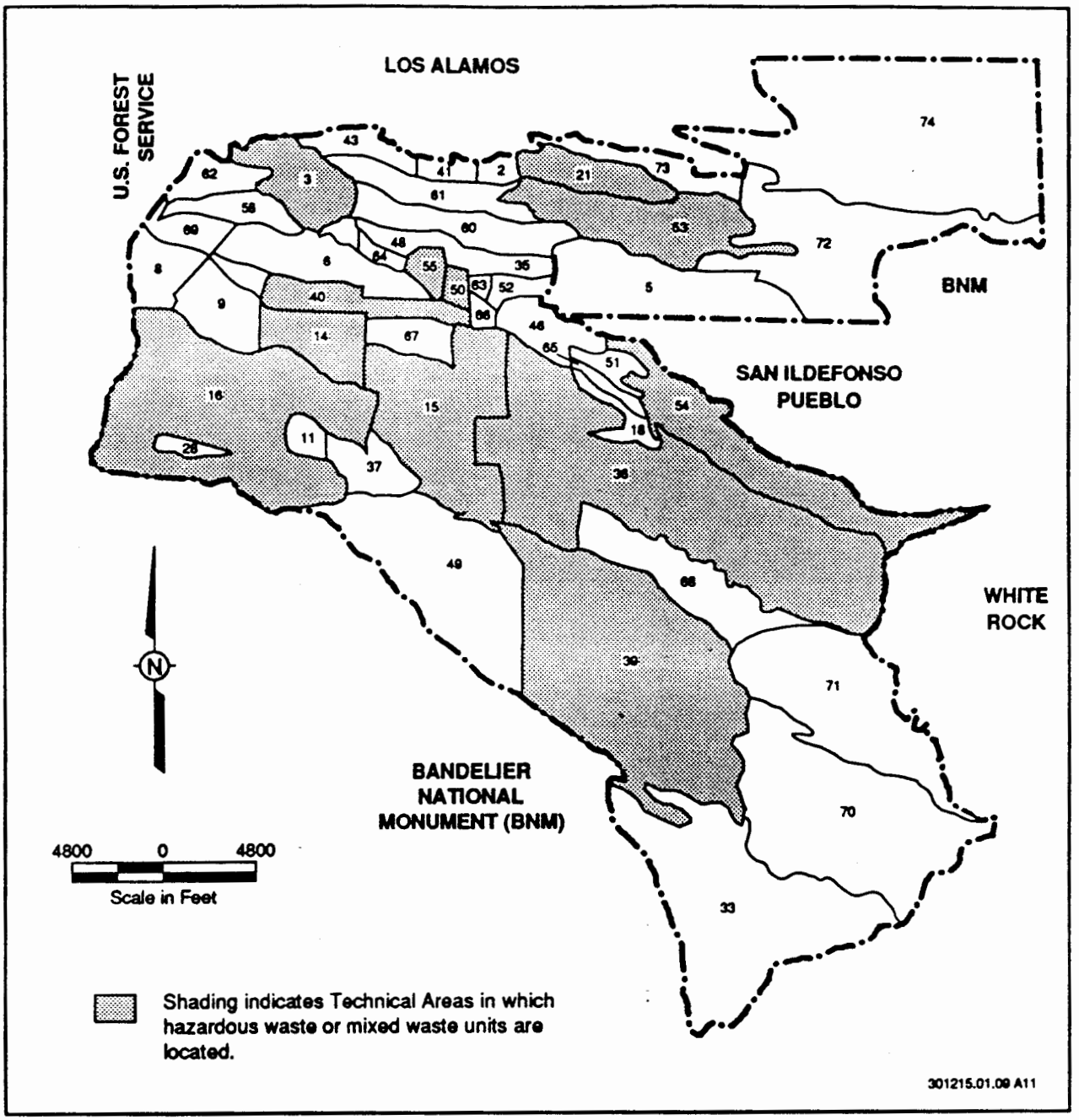

Figure 2. Location map of Los Alamos National Laboratory Technical Areas.

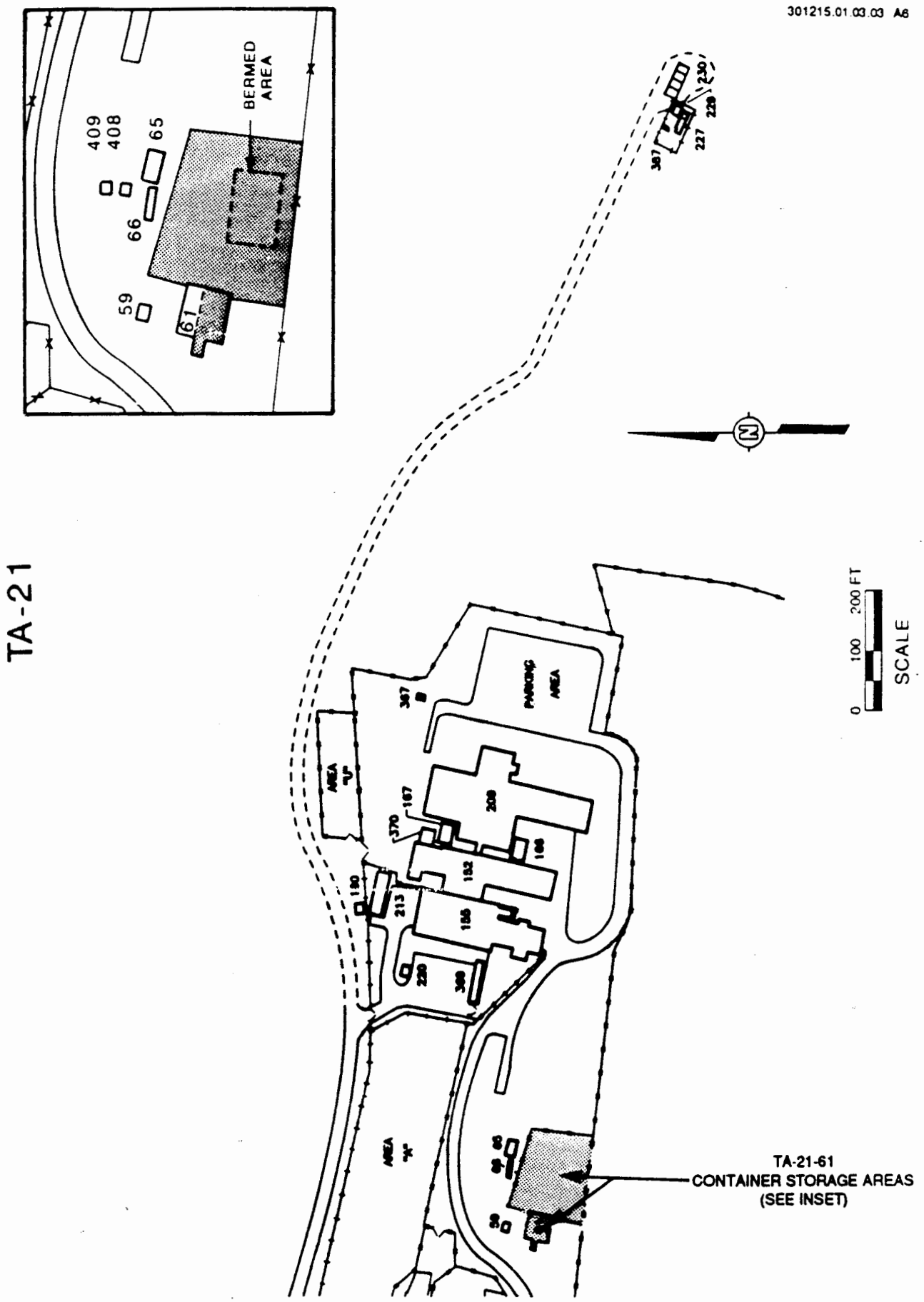

Figure 3. TA-21 site location map and container storage areas locations.

INTERNATIONAL TECHNOLOGY CORPORATION

CHAIN-OF-CUSTODY RECORD

R/A Control No. _____

C/C Control No. 158047

PROJECT NAME/NUMBER _____ LAB DESTINATION _____

SAMPLE TEAM MEMBERS _____ CARRIER/WAYBILL NO. _____

Sample Number	Sample Location and Description	Date and Time Collected	Sample Type	Container Type	Condition on Receipt (Name and Date)	Disposal Record No.

Special Instructions: _____

Possible Sample Hazards: _____

SIGNATURES: (Name, Company, Date and Time)

1. Relinquished By: _____

   Received By: _____

2. Relinquished By: _____

   Received By: _____

3. Relinquished By: _____

   Received by: _____

4. Relinquished By: _____

   Received By: _____

WHITE - To accompany samples
YELLOW - Field copy

Figure 4. Chain-of-Custody Record.

INTERNATIONAL TECHNOLOGY CORPORATION

REQUEST FOR ANALYSIS

R/A Control No. 207870

C/C Control No. _____

PROJECT NAME _____

PROJECT NUMBER _____

PROFIT CENTER NUMBER _____

PROJECT MANAGER _____

BILL TO _____

PURCHASE ORDER NO. _____

DATE SAMPLES SHIPPED _____

LAB DESTINATION _____

LABORATORY CONTACT _____

SEND LAB REPORT TO _____

DATE REPORT REQUIRED _____

PROJECT CONTACT _____

PROJECT CONTACT PHONE NO. _____

Sample No.	Sample Type	Sample Volume	Preservative	Requested Testing Program	Special Instructions

TURNAROUND TIME REQUIRED: (Rush must be approved by the Laboratory Project Manager.)

Normal _____ Rush _____ (Subject to rush surcharge.)

QC LEVEL: (Levels II and III subject to surcharge; project-specific requirements must be submitted to lab before beginning work.)

I _____ II _____ III _____ Project Specific _____

POSSIBLE HAZARD IDENTIFICATION: (Please indicate if sample(s) are hazardous materials and/or suspected to contain high levels of hazardous substances.)

Non-hazard _____ Flammable _____ Skin Irritant _____ Highly Toxic _____ Other _____ (Please Specify)

SAMPLE DISPOSAL: (Please indicate disposition of sample following analysis. Lab will charge for packing, shipping, archive and disposal.)

Return to Client _____ Disposal by Lab _____ Archive _____ (Indicate number of months.)

FOR LAB USE ONLY

Received by _____ Date/Time _____

WHITE: Original to accompany samples
YELLOW: Field copy

126A 10-85

Figure 5. Request for Analysis Form.

INTERNATIONAL TECHNOLOGY CORPORATION

F

H R

Project Name _____

Project No. _____

Sample No. _____

Collection Date/Time _____

Collector's Name _____

Sample Location _____

Sample Type/Depth/Description _____

Analyze For _____ Preservative _____

Bottle _____ of _____ _____ Filtered _____ Nonfiltered

23-8-85

Figure 6. Sample Label.