ENTERED

NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone (505) 476-6000 Fax (505) 476-6030
www.nmenv.state.nm.us

SUSANA MARTINEZ
Governor

JOHN A. SANCHEZ
Lieutenant Governor

DAVE MARTIN
Secretary

BUTCH TONGATE
Deputy Secretary

JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

September 17, 2012

Geoffrey L. Beausoleil
Manager
U. S. Department of Energy
NNSA / Sandia Site Office
P.O. Box 5400, MS 0184
Albuquerque, NM 87185-5400

Michael W. Hazen
Vice-President, Organization 04000
Sandia Corporation
P.O. Box 5800, MS 0143
Albuquerque, NM 87185

RE: NOTICE OF PUBLIC COMMENT PERIOD AND OPPORTUNITY TO REQUEST A PUBLIC HEARING ON DRAFT HAZARDOUS WASTE PERMIT FOR SANDIA NATIONAL LABORATORIES AND PROPOSED GRANTING OF CORRECTIVE ACTION COMPLETE STATUS FOR 24 SOLID WASTE MANAGEMENT UNITS/AREAS OF CONCERN

Dear Mr. Beausoleil and Mr. Hazen:

Enclosed is a **Public Notice** regarding the draft Hazardous Waste Permit for Sandia National Laboratories (SNL) and a proposal to grant corrective action complete status for 24 solid waste management units/areas of concern (SWMUs/AOCs) located at SNL. Enclosed also is a copy of the draft Permit and fact sheets.

The Public Notice provides locations where the Administrative Record, including the Permit Application, draft Permit, Fact Sheet/Statement of Basis for the draft Permit and the 24 SWMUs/AOCs, and other supporting documentation can be reviewed. The Public Notice also provides procedures for submitting comments and requesting a public hearing. Comments and requests for public hearing must be received no later than **5:00 p.m. MST on November 16, 2012**.

If you have any questions regarding this letter, please contact Mr. William Moats of my staff at (505) 222-9551.

SNL1241

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

cc: W. Moats, NMED HWB
C. Amindyas, NMED HWB
B. Grantham, NMED OGC
T Skibitski, NMED DOE OB
L. King, EPA Region 6
A. Reiser, SNL, MS 0729
D. Rast, DOE, MS 0184
J. Cochran, SNL, MS 0719
J. Weckerle, NNSA/SSO, MS 0184
File: SNL 2012 and Reading

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PUBLIC SERVICE ANNOUNCEMENT

The New Mexico Environment Department (NMED) is seeking public comment on a draft hazardous waste facility Permit for Sandia National Laboratories, located in Bernalillo County, New Mexico. NMED is also seeking public comment on a proposal to grant corrective action complete status for 24 areas designated as solid waste management units (SWMUs) or areas of concern (AOCs) at SNL. The 24 SWMUs/AOCs are sites where environmental investigations have been conducted, and the sites cleaned up where necessary to protect human health and the environment.

NMED issued a Public Notice on September 17, 2012 to announce the beginning of a 60-day comment period that will end at 5 p.m. MST on November 16, 2012. During this period, the public may comment on or request a public hearing on the draft Permit and the proposal to grant corrective action complete status for the 24 SWMUs/AOCs. For more information, including the location where the draft Permit, corrective action documents, and other supporting information may be viewed and how to make comment and request a hearing, please contact John Kieling of the Environment Department at (505) 476-6000.

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Director
Resource Protection Division

September 17, 2012

SUBJECT: NOTICE OF PUBLIC COMMENT PERIOD AND OPPORTUNITY TO REQUEST A PUBLIC HEARING ON A DRAFT HAZARDOUS WASTE PERMIT FOR SANDIA NATIONAL LABORATORIES AND GRANTING OF CORRECTIVE ACTION COMPLETE STATUS FOR SOLID WASTE MANAGEMENT UNITS/AREAS OF CONCERN

Dear Interested Person:

Enclosed is a **Public Notice** regarding a draft Hazardous Waste Permit for Sandia National Laboratories (SNL) and granting corrective action complete status for solid waste management units/areas of concern at SNL. SNL is owned by U. S. Department of Energy (DOE) and is operated by Sandia Corporation, a subsidiary of Lockheed Martin (collectively, the Applicants). The Applicants requested a permit to perform hazardous and mixed waste treatment and storage activities at SNL. SNL is located within the boundaries of Kirtland Air Force Base, south of and adjacent to Albuquerque in Bernalillo County, New Mexico. Sandia Corporation is located at the following address: 1515 Eubank Boulevard SE, Albuquerque, NM 87123. The Sandia Site Office of the U. S. Department of Energy (DOE) is located at KAFB-East at the intersection of Pennsylvania and H Streets, P.O. Box 5400, Albuquerque, NM 87185. The Applicant's primary contact for this action is: Mr. David Rast, DOE/NNSA, P.O. Box 5400, MS 0184, Albuquerque, NM 87185.

The enclosed Public Notice provides locations where the Administrative Record, including the Permit Application, draft Permit, Fact Sheet, and supporting documentation, for this action can be reviewed, and provides procedures for submitting comments and requesting a public hearing. Comments and requests for public hearing must be received no later than **5:00 p.m. MST** on **November 16, 2012**.

Any person seeking additional information regarding this notice may contact:

Mr. William P. Moats
New Mexico Environment Department
Hazardous Waste Bureau
5500 San Antonio, NE
Albuquerque, New Mexico 87109

Email: William.Moats@state.nm.us
Telephone: (505) 222-9551
Fax: (505) 222-9510

Sincerely,

John E. Kieling
Chief
Hazardous Waste Bureau

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PUBLIC NOTICE Number 12-02

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS WASTE BUREAU
SANTA FE, NEW MEXICO 87505
September 17, 2012

NOTICE OF PUBLIC COMMENT PERIOD AND OPPORTUNITY TO REQUEST A PUBLIC HEARING ON A DRAFT HAZARDOUS WASTE PERMIT AND GRANTING OF CORRECTIVE ACTION COMPLETE STATUS FOR SOLID WASTE MANAGEMENT UNITS/AREAS OF CONCERN FOR SANDIA NATIONAL LABORATORIES
EPA ID NUMBER NM5890110518

The New Mexico Environment Department (NMED, or the Department) is issuing for public comment a revised draft Hazardous Waste Facility Permit (draft Permit) which would authorize the United States Department of Energy and Sandia Corporation (the Applicants) to manage, treat and store hazardous and mixed waste at Sandia National Laboratories (SNL, or the Facility). The Department is also seeking public comment on a proposal to grant corrective action complete status for areas designated as solid waste management units (SWMUs) or areas of concern (AOCs) at SNL. Today's draft Permit replaces in full the draft issued for public comment on August 20, 2007, which was not finalized.

Sandia National Laboratories is located within the boundaries of Kirtland Air Force Base south of and adjacent to the city of Albuquerque in Bernalillo County, New Mexico. SNL is a multi-purpose engineering and science laboratory owned by the U. S. Department of Energy (DOE) and operated by Sandia Corporation, a subsidiary of Lockheed Martin. The DOE and Sandia Corporation are collectively referred to as the "Permittees" in the draft Permit.

The mailing address for Sandia Corporation is 1515 Eubank SE, Albuquerque, New Mexico 87123. The Sandia Site Office of the U. S. Department of Energy (DOE)/ National Nuclear Security Administration (NNSA) is located at KAFB-East, Pennsylvania and H Street, P.O. Box 5400, Albuquerque, NM 87185. The Facility's primary contact for this action is: Mr. David Rast, DOE/NNSA, P.O. Box 5400, Albuquerque, NM 87185.

SNL designs components for the nation's nuclear weapons, designs and tests conventional military weapons, performs a wide variety of energy research and development projects, and works on assignments that respond to national security threats. As a result of its testing and research activities, SNL generates solid wastes and hazardous, radioactive, and mixed wastes (those wastes containing both

hazardous and radioactive components). From 1945 to 1988, hazardous, mixed, and solid wastes were disposed of at SNL at numerous locations which have been classified by the Department as SWMUs or AOCs. The SWMUs and AOCs include landfills, drainfields and seepage pits, outfalls, waste piles, and test areas. Some of these SWMUs/AOCs have released contaminants into the environment.

SNL generates wastes that are regulated under the federal Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act (HWA) and its implementing regulations, the New Mexico Hazardous Waste Management Regulations at 20.4.1 NMAC. The Department is charged with issuing a permit that will ensure that SNL's hazardous waste operations are conducted in a manner protective of human health and the environment.

REVISED DRAFT PERMIT

The draft Permit addresses the storage (generally for periods longer than 90 days) and treatment of hazardous and mixed waste at eight container storage units, including two units where waste may be treated by stabilization/solidification, macroencapsulation, chemical or thermal deactivation, amalgamation, or by physical means; one unit where open burning of explosive wastes would be conducted; and one unit where post-closure care must be conducted. The Applicants do not seek, and the Department is not issuing, a permit for disposal of hazardous or mixed waste. The permitted units where waste treatment and storage would occur include the Hazardous Waste Handling Unit (storage), the Thermal Treatment Unit (treatment), the Radioactive and Mixed Waste Management Unit (storage and treatment), Manzano Storage Bunkers (storage in five bunkers), and the Auxiliary Hot Cell Unit (treatment and storage). The draft Permit also requires post-closure care of the Corrective Action Management Unit (CAMU), which contains remediation waste generated from the excavation of the Chemical Waste Landfill. The draft Permit, when finalized, would also require the Applicants to conduct any corrective action activities not covered under the April 29, 2004, Compliance Order on Consent (Consent Order) such as in response to any releases from permitted units and any new releases from SWMUs or AOCs discovered after the future termination of the Consent Order.

The draft Permit is a proposed renewal of a permit that was first issued to the Applicants in August 1992. The Department currently enforces the 1992 permit, which covers only the Hazardous Waste Handling Unit and Facility-wide corrective action requirements (the latter requirements have generally been superseded by the Consent Order). The other units mentioned in the above paragraph, except the CAMU, are currently regulated as interim status units under 20.4.1.600 NMAC incorporating 40 C.F.R. Part 265.

The Department originally released for public comment a draft renewal Permit on August 20, 2007. With extensions granted by the Department, the public comment period for that version of the draft Permit ended on February 8, 2008, and the Department received public comments and requests for a public hearing. As required by 20.4.1.901.A (4) NMAC, the Department, in conjunction with the Applicants, attempted to resolve the issues giving rise to the opposition to the first version of the draft Permit. The draft Permit now being released for comment reflects the Department's attempts to resolve the issues giving rise to opposition and requests for a hearing.

The Department hereby withdraws the version of the draft Permit issued August 20, 2007. Comments and requests for hearing concerning the August 20, 2007 version of the draft Permit are moot, will not be considered by the Department in finalizing the draft Permit, and will not be addressed by the Department's response to comments on today's draft permit.. If a person who commented or requested a hearing on the August 20, 2007 version of the draft Permit wishes to comment or request a hearing on today's draft Permit, he or she must do so according to the procedures described below under the heading of *Public Review of Draft Permit and Corrective Action Documents*. In other words, comments and requests for hearings regarding the 2007 draft must be resubmitted in order to be considered.

"CORRECTIVE ACTION COMPLETE" DETERMINATIONS

In addition to the August 2007 draft permit, on December 10, 2007, the Department issued a public notice proposing to grant Corrective Action Complete status for 26 SWMUs/AOCs through a Class 3 modification of the 1992 permit. The public comment period for this action also ended February 8, 2008, and the Department received public comments and a request for a public hearing. The Department did not make a final decision on the permit modification request and did not hold a hearing. As required by 20.4.1.901.A (4) NMAC, the Department, in conjunction with the Applicants, attempted to resolve the issues giving rise to opposition to granting Corrective Action Complete status for the majority of these SWMUs/AOCs.

Most, but not all, of the 26 SWMUs/AOCS addressed by the December 10, 2007, public notice are again included in the current proposal to grant Corrective Action Complete status. NMED has decided that three of the 26 SWMUs/AOCs will require additional characterization work, and thus, these particular SWMUs/AOCs are not included. Additionally, some SWMUs/AOCs in the current proposal require administrative and physical controls which are addressed in the draft Permit; examples of such controls include posting signage, conducting inspections, restricting future land use, and annual reporting. Controls proposed in the past for a few SWMUs/AOCs are to be changed under the current proposal based on new information that has become available to the Department. Attachment K to the proposed permit contains tables listing which SWMUs/AOC are proposed to be deemed Corrective Action Complete With Controls and which SWMUs/AOC are proposed to be deemed Corrective Action Complete Without Controls.

Persons who provided public comment by the February 8, 2008 deadline do not need to resubmit their comments, and may submit additional comments concerning any of the 27 SWMUs/AOCs currently being proposed for Corrective Action Complete status. However, those who requested a public hearing by the February 8, 2008, deadline must request a hearing again in accordance with the procedures described below under the heading *Public Review of Draft Permit and Corrective Action Documents* if they still desire that a public hearing be held concerning one or more of the SWMUs/AOCs currently proposed for Corrective Action Complete status.

Anyone who has not previously submitted comments during the comment period ending February 8, 2008, may submit comments or request a hearing regarding the 27 SWMUs/AOCs currently being proposed for Corrective Action Complete status by following the procedures under the heading *Public Review of Draft Permit and Corrective Action Documents* to.

Since December 2007, the Applicants have requested that an additional six SWMUs/AOCS be considered for Corrective Action Complete status. The Department has not previously issued a notice for public comment concerning these six SWMUs/AOCs. Of the six SWMUs/AOCs, four are included in the current proposal to grant Corrective Action Complete status. (The other two will be addressed by a separate action in the future.) The four SWMUs/AOCs are identified in a Fact Sheet which can be obtained by following the procedures under the heading *Public Review of Draft Permit and Corrective Action Documents* below. Anyone wishing to comment on these four SWMUs/AOCs or request a hearing in relation to these sites must follow the procedures under the heading *Public Review of Draft Permit and Corrective Action Documents* in order to comment or make the hearing request.

AVAILABILITY OF DRAFT PERMIT AND FACT SHEET

The Department announces, for public comment, the availability of the proposed draft Permit and Fact Sheet providing the basis for NMED's proposed actions to finalize the draft Permit and to grant Corrective Action Complete status for 27 SWMUs and AOCs. The Fact Sheet provides the significant factual, legal, and policy issues considered in preparing the draft Permit, and summarizes the corrective action activities completed and their results for the 27 SWMUs/AOCs.

PUBLIC REVIEW OF DRAFT PERMIT AND CORRECTIVE ACTION DOCUMENTS

The Administrative Record for this proposed action consists of the Permit application, the draft Permit, this Public Notice, Fact Sheets, and supporting documentation. The Administrative Record may be reviewed, with prior appointment, at the following location during the public comment period.

NMED - Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone: (505) 476-6000
Monday – Friday: 8:00 a.m. to 5:00 p.m.
Contact: Pam Allen

In addition, the draft Permit and Fact Sheets may be reviewed, with prior appointment, at the following location during the public comment period.

NMED - Hazardous Waste Bureau
District 1
5500 San Antonio Drive, NE
Albuquerque, New Mexico 87109
Phone: (505) 222-9551
Mondays - Fridays from 8:00 a.m. to 5:00 p.m.
Contact: William Moats

Copies of the draft Permit, this Public Notice, and Fact Sheets are also available on the NMED website at: http://www.nmenv.state.nm.us/HWB/snlperm.html at the link for *SNL Draft Permit*. To obtain a copy of the Administrative Record or a portion thereof, please contact Ms. Pam Allen at (505) 476-6000, or at the address given above. NMED will provide copies, or portions thereof, of the Administrative Record at a cost to the requestor.

NMED issues this public notice on **September 17, 2012**, to announce the beginning of a 60-day comment period that will end at **5:00 p.m. MST, November 16, 2012**. Any person who wishes to comment on the draft Permit or the granting of Corrective Action Complete status for one or more of the 27 SWMUs/AOCs or request a public hearing must submit written or electronic mail (e-mail) comment(s) with the commenter's name and address to the respective address below. Only comments and requests received before **5:00 p.m. MST** on **November 16, 2012** will be considered.

John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
(505) 476-6000
E-mail: john.kieling@state.nm.us
Ref: SNL Draft Permit

Written comments should include, to the extent practicable, all referenced factual materials. Documents in the Administrative Record need not be re-submitted if expressly referenced by the commenter. Requests for a public hearing shall provide: (1) a clear and concise factual statement of the nature and scope of the interest of the person requesting the hearing; (2) the name and address of all persons whom the requestor represents; (3) a statement of any objections to the draft Permit, including specific references to any conditions being addressed; and (4) a statement of the issues which the commenter proposes to raise for consideration at the hearing. Written comment and requests for public hearing must

be filed with Mr. John Kieling on or before **5:00 p.m. MDT, November 16, 2012**. NMED will provide a thirty (30) day notice of a public hearing, if scheduled.

NMED must ensure that the approved draft Permit is consistent with the New Mexico Hazardous Waste Management Regulations. All written comments submitted will be considered in formulating a final decision and may cause the draft Permit to be modified. The Department will respond in writing to all public comments. This response will specify which provisions, if any, of the draft Permit have been changed in the final decision and the reasons for the changes. All persons presenting written comments or who requested notification in writing will be notified of the decision by mail. These responses will also be posted on the Department's website.

After consideration of all written public comments received and all data, views, and arguments presented at the public hearing, if one is held, NMED will issue, or modify and issue, the Permit. The Applicants shall be provided by mail a copy of any relevant modified documents and a detailed written statement of reasons for the modifications.

The Secretary of the New Mexico Environment Department will make the final decision publicly available and shall notify the Applicants by certified mail. The Secretary's decision shall constitute a final agency decision and may be appealed as provided by the HWA (Chapter 74, Article 4 NMSA 1978).

ARRANGEMENTS FOR PERSONS WITH DISABILITIES

Persons having a disability and requiring assistance or auxiliary aid to participate in this process should contact Connie Joseph at the New Mexico Environment Department, Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502, telephone number: (505) 827-9769. TDY users please access her number via the New Mexico Relay Network at 1-800-659-8331.

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JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

17 de Septiembre 2012

ASUNTO: AVISO DEL PLAZO DE COMENTARIO PÚBLICO Y OPORTUNIDAD DE SOLICITAR UNA AUDIENCIA PÚBLICA SOBRE UN PERMISO PRELIMINAR DE DESECHOS PELIGROSOS PARA EL LABORATORIO NACIONAL SANDIA Y LA DESIGNACIÓN DE ESTADO DE ACCIÓN CORRECTIVA COMPLETA PARA UNIDADES/+AREAS DE MANEJO DE DESECHOS SÓLIDOS

Estimado interesado:

Le anexo a la presente copia de un **Aviso Público** referente a un Permiso Preliminar de Desechos Peligrosos para el Laboratorio Nacional Sandia (SNL por sus siglas en inglés) y para la designación de estado de acción correctiva completa para unidades/áreas de manejo de desechos sólidos de interés en SNL. SNL es dependencia del Departamento de Energía de los Estados Unidos (DOE por sus siglas en inglés) y es administrado por la corporación Sandia, una división de Lockheed Martin (colectivamente, los Solicitantes). Los Solicitantes han solicitado el otorgamiento de un permiso para llevar a cabo el tratamiento y almacenamiento de desechos peligrosos y mixtos en SNL. SNL se encuentra situado en la Base de la Fuerza Aerea Kirtland, al sur y adyacente a la ciudad de Albuquerque, Condado de Bernalillo, Nuevo México. La corporación Sandia está ubicada en esta dirección: 1515 Eubank Boulevard SE, Albuquerque, NM 87123. La oficina del sitio Sandia del Departamento de Energía de los Estados Unidos (DOE) se encuentra en KAFB-East en el cruce de las calles Pennsylvania y H, P.O. Box 5400, Albuquerque, NM 87185. El contacto principal de los Solicitantes para esta acción es el Sr. David Rast, DOE/NNSA, P.O. Box 5400, MS 0184, Albuquerque, NM 87185.

El Aviso Público anexo señala los sitios donde se puede revisar las Actas Administrativas, incluso la Solicitud de Permiso, el Permiso preliminar, la Hoja de Datos y los documentos que la fundamentan, y detalla los procedimientos para la entrega de comentarios y la solicitud de una audiencia pública. Se establecen las **5:00 p.m. DST del 16 de noviembre de 2012**, como fecha y hora límites para la entrega de los comentarios y la solicitud de una audiencia pública.

Para mayores informes, comuníquese con:

Sr. William P. Moats
New Mexico Environment Department
Hazardous Waste Bureau
5500 San Antonio NE
Albuquerque, New Mexico 87109

Correo electrónico: William.Moats@state.nm.us
Teléfono: (505) 222-9551
FAX: (505) 222-9510

Atentamente,

John E. Kieling
Chief
División de Desechos Peligrosos

NEW MEXICO ENVIRONMENT DEPARTMENT

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AVISO PÚBLICO Número 12-02

DEPARTAMENTO DE PROTECCIÓN AMBIENTAL DE NUEVO MEXICO
DIVISIÓN DE DESECHOS PELIGROSOS
SANTA FE, NUEVO MEXICO 87505
17 de Septiembre 2012

AVISO DEL PLAZO DE COMENTARIO PÚBLICO Y OPORTUNIDAD DE SOLICITAR UNA AUDIENCIA PÚBLICA SOBRE UN PERMISO PRELIMINAR DE DESECHOS PELIGROSOS PARA EL LABORATORIO NACIONAL SANDIA Y LA DESIGNACIÓN DE ESTADO DE ACCIÓN CORRECTIVA COMPLETA PARA UNIDADES/ÁREAS DE MANEJO DE DESECHOS SÓLIDOS NUMERO DE IDENTIFICACIÓN EPA NM5890110518

El Departamento de Protección Ambiental de Nuevo México (NMED por sus siglas en inglés, o el Departamento) expide para comentario público un nuevo Permiso preliminar para una Instalación de Desechos Peligrosos (Permiso preliminar) que le otorgará autorización al Departamento de Energía de los Estados Unidos y a la corporación Sandia (los Solicitantes), para el manejo, el tratamiento y el almacenamiento de desechos peligrosos y mixtos en el Laboratorio Nacional Sandia (SNL por sus siglas en inglés, o la Instalación). El Departamento tambien solicita comentario del público sobre una propuesta para la designación de estado de acción correctiva completa para las áreas señaladas como unidades de manejo de desechos sólidos (SWMUs por sus siglas en inglés) o áreas de interés (AOC por sus siglas en inglés) en SNL. El Permiso preliminar actual le sustituye al permiso que se expidió para comentario del público el 20 de agosto, 2007, y que no fue finalizado.

El Laboratorio Nacional Sandia se ubica dentro de los límites de la Base de la Fuerza Aérea Kirtland al sur y adyacente a la ciudad de Albuquerque, Condado de Bernalillo, Nuevo México. SNL es un laboratorio de uso múltiple de ingeniería y ciencia que es dependencia del Departamento de Energía de los Estados Unidos (DOE) y es operado por la corporación Sandia, una división de Lockheed Martin. El DOE y la corporación Sandia se designan con el nombre de "Concesionarios" en el Permiso preliminar.

La dirección de la corporación Sandia es 1515 Eubank SE, Albuquerque, New Mexico 87123. Las oficinas del sitio Sandia del Departamento de Energía de los Estados Unidos (DOE)/ Administración Nacional de Seguridad Nuclear (NNSA por sus siglas en inglés) están ubicadas en KAFB-East, Pennsylvania y H Street, P.O. Box 5400, Albuquerque, NM 87185. El contacto principal para esta acción es: Sr. David Rast, DOE/NNSA, P.O. Box 5400, Albuquerque, NM 87185.

SNL diseña componentes para las armas nucleares de la nación, diseña y pone a prueba armas militares convencionales, lleva a cabo múltiples proyectos de investigación y desarrollo de energéticos, y desempeña su cargo de responder a amenazas de seguridad nacional. Como consecuencia de sus actividades de investigación y

debe seguir los lineamientos señalados a continuación en la sección *"Revisión Pública del Permiso Preliminar y Documentos de Acción Correctiva"*. En otras palabras, para una consideración de los comentarios y las solicitudes de una audiencia pública para el documento del 2007, se tendrán que entregar de nuevo.

DETERMINACIONES DE "ACCION CORRECTIVA COMPLETA"

Aparte del permiso preliminar de agosto, 2007, el Departamento expidió el 10 de diciembre, 2007, un aviso público en que proponía el otorgamiento de estado Acción Correctiva Completa para 26 SWMU/AOC por medio de una modificación Clase 3 del permiso de 1992. El periodo de comentarios del público para esa acción tambien se cerró el 8 de febrero, 2008, y el Departamento recibió comentarios del público y una solicitud de una audiencia pública. El Departamento no tomó una decisión definitiva sobre la solicitud de una modificación del permiso ni se llevó a cabo una audiencia. Conforme con la ley 20.4.1.901.A (4) NMAC, el Departamento y los Solicitantes intentaron resolver las cuestiones que ocasionaron oposición a la designación del estado de Acción Correctiva Completa para la mayoría de las 26 SWMU/AOC.

La mayoria de las 26 SWMU/AOC, pero no todas, que son el sujeto del aviso del 10 de diciembre, 2007, están incluídas de nuevo ahora en la propuesta actual para el otorgamiento de estado Acción Correctiva Completa. El NMED ha decidido que tres de las 26 SWMU/AOC requieren obras de caracterización adicionales y, por lo tanto, las mismas no se han incluído. Asimismo, algunas de las SWMU/AOC en la propuesta actual requieren controles administrativos y físicos de que se hacen referencia en el Permiso preliminar, por ejemplo la colocación de señalización, la programación de inspecciones, la restricción de uso del terreno en el futuro, y la presentación de informes anuales. Algunos de los controles que se propusieron en el pasado para algunas de las SWMU/AOC se cambiarán con la nueva propuesta, ya que el Departamento ha recibido nueva información. El Anexo K para el propuesto Permiso contiene tablas que indican cuáles son las SWMU/AOC que se designarán en estado de Acción Correctiva Completa con controles y cuáles son las SWMU/AOC que se designarán en estado de Acción Correctiva Completa sin controles.

Las personas que proporcionaron su comentarios públicos antes de la fecha límite del 8 de febrero, 2008, no tienen que volver a entregar su comentario, pero podrán entregar nuevos comentarios con respecto a cualquiera de las 27 SWMU/AOC que han recibido la propuesta designación de estado de Acción Correctiva Completa. No obstante, los que pidieron una audiencia pública antes del 8 de febrero, 2008, tendrán que solicitar de nuevo una audiencia conforme con los lineamientos indicados en la sección de *"Revisión Pública del Permiso Preliminar y Documentos de Acción Correctiva"* si es que todavía desean que se lleve a cabo una audiencia pública referente a una o más de las SWMU/AOC que han recibido la propuesta designación de estado de Acción Correctiva Completa.

El que no haya entregado anteriormente sus comentarios durante el periodo que terminó el 8 de febrero, 2008, podrá entregar comentarios o solicitar una audiencia con referencia a las 27 SWMU/AOC que han recibido la propuesta designación de estado de Acción Correctiva Completa, ésto de acuerdo con los lineamientos establecidos en la sección de *"Revisión Pública del Permiso Preliminar y Documentos de Acción Correctiva"*.

Desde diciembre, 2007, los Solicitantes han pedido que otras seis SWMU/AOC reciban la designación de estado de Acción Correctiva Completa. El Departamento no había expedido un aviso para comentarios del público para estas seis SWMU/AOC. De las seis SWMU/AOC, cuatro se incluyen en la propuesta actual para una designación de estado de Acción Correctiva Completa. (Las otras dos serán sujetas de otra acción en el futuro.) Las cuatro SWMU/AOC han sido identificadas en una Hoja de Datos, la cual se obtiene de acuerdo con los lineamientos establecidos en la sección de *"Revisión Pública del Permiso Preliminar y Documentos de Acción Correctiva"*. El que desee comentar sobre estas cuatro SWMU/AOC o que desee solicitar una audiencia al respecto, tendrá que seguir los lineamientos establecidos en la sección de *"Revisión Pública del Permiso Preliminar y Documentos de Acción Correctiva"*.

ensayo, SNL genera desechos sólidos y peligrosos, radioactivos, y mixtos (desechos que contienen componentes tanto radioactivos como peligrosos). Desde 1945 hasta 1988, se eliminaban los desechos peligrosos, mixtos y sólidos en varios sitios de SNL que el Departamento ha clasificado como SWMU o AOC. Las SWMU y las AOC incluyen rellenos sanitarios, fosas de lixivación y filtración, desagües, basureros, y áreas de estudio. Algunas de estas SWMU/AOC han permitido el escape de contaminantes al medio ambiente.

SNL genera desechos que han sido designados para reglamentación conforme con la Ley de Conservación y Recuperación de Recursos (RCRA) y la Ley de Desechos Peligrosos de Nuevo México (HWA) y su reglamento correspondiente, la Reglamentación de Manejo de Desechos Peligrosos de Nuevo México, 20.4.1 NMAC. El Departamento tiene a su cargo la expedición de un permiso que servirá para asegurar que el manejo de desechos peligrosos por SNL se haga de manera que proteja la salud humana y del medio ambiente.

NUEVO PERMISO PRELIMINAR

El Permiso preliminar rige el almacenamiento (generalmente por periodos mayores de 90 días) y el tratamiento de desechos peligrosos y mixtos en ocho unidades de almacenamiento cerrado, incluso dos unidades en las cuales los desechos serán tratados con estabilización/solidificación, macroencapsulación, desactivación química o térmica, amalgamación o por medios físicos; una unidad en que se llevará a cabo la quema de desechos explosivos; y una unidad en que se llevará a cabo el cuidado posterior a confinamiento. Los Solicitantes no piden, ni se ha expedido un permiso para la eliminación de desechos peligrosos ni mixtos. Las unidades en las cuales se llevará a cabo el tratamiento y el almacenamiento de desechos incluyen la unidad de Manejo de Desechos Peligrosos (almacenamiento), la unidad de Tratamiento Térmica (tratamiento), la unidad de Manejo de Desechos Radioactivos y Mixtos (almacenamiento y tratamiento), las bodegas subterráneas Manzano (almacenamiento en cinco bodegas subterráneas), y la unidad de Célula Caliente Auxiliar (tratamiento y almacenamiento). El Permiso preliminar también requiere la clausura de la unidad de Manejo de Acción Correctiva (CAMU) que contiene desechos de remediación que se generaron con la excavación del relleno sanitario de desechos químicos. Al finalizarse, el Permiso preliminar requerirá que los Solicitantes lleven a cabo cualquier acción correctiva que no se había especificado en la Orden de Consentimiento de Cumplimiento (Orden de Consentimiento) de 29 de abril, 2004, las cuales podrían ser en respuesta a cualquier emisión de las unidades reglamentadas por permisos o de nuevas emisiones de las SWMU o las AOC que se descubran después de la terminación futura de la Orden de Consentimiento.

El Permiso preliminar es una propuesta para la renovación de un permiso expedido inicialmente a los Solicitantes en agosto, 1992. El Departamento actualmente hace cumplir el permiso de 1992, el cual abarca los requisitos de acción correctiva de la unidad de Manejo de Desechos Peligrosos y de la Instalación Entera (estos requisitos por lo general han sido reemplazados por la Orden de Consentimiento). Las otras unidades a que se hizo referencia en el párrafo anterior, con excepción de la CAMU, han sido designadas de estado interino por la ley 20.3.1.600 NMAC con lo previsto por 40 C.F.R. Part 265.

El Departamento publicó un nuevo Permiso preliminar para comentario público el 20 de agosto, 2007. El plazo para el comentario público para esa versión, con extensiones otorgadas por el Departamento, se cerró el 8 de febrero, 2008, y el Departamento recibió comentarios del público y solicitudes de una audiencia pública. Por lo previsto por la ley 20.4.1.901.A (4) NMAC, conjuntamente con los Solicitantes el Departamento quiso resolver las inquietudes que provocaron la oposición a la primera versión del Permiso preliminar. El nuevo Permiso preliminar que se publica para comentario incluye las medidas tomadas por el Departamento con el fin de resolver las dudas que provocaron la oposición y las solicitudes de una audiencia pública.

Por este medio el Departamento retira la versión del Permiso preliminar que se expidió el 20 de agosto, 2007. Los comentarios y las solicitudes de una audiencia pública con respecto a la versión del Permiso preliminar del 20 de agosto, 2007, se consideran nulos y no se tomarán en cuenta en la determinación de finalizar el nuevo Permiso preliminar ni se considerarán en la respuesta del Departamento a los comentarios para el actual Permiso preliminar. Si una persona que hizo comentario sobre la versión del 20 de agosto, 2007, o que solicitó una audiencia pública con respecto al mismo, desea comentar o pedir una audiencia referente al Permiso preliminar actual, esa persona

DISPONIBILIDAD DEL PERMISO PRELIMINAR Y LA HOJA DE DATOS

El Departamento anuncia para comentario público, la disponibilidad del propuesto Permiso preliminar y la Hoja de Datos que establecen el fundamento para las propuestas acciones del NMED para finalizar el Permiso preliminar y para otorgar el estado de Acción Correctiva Completa para 27 SWMU y AOC. La Hoja de Datos presenta los temas de índole legal, política y de los hechos que se consideraron en la preparación del Permiso preliminar y presenta en resumen las actividades de acción correctiva que se han completado y sus resultados con respecto a las 27 SWMU/AOC.

REVISIÓN PÚBLICA DEL PERMISO PRELIMINAR Y DOCUMENTOS DE ACCIÓN CORRECTIVA

El acta administrativa para la propuesta acción es constituída de la solicitud del Permiso, el Permiso preliminar, este Aviso Público, las Hojas de Datos, y los documentos que las fundamentan. Previa cita se puede revisar el acta administrativa en este sitio durante el periodo de comentario público:

NMED - Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Tel: (505) 476-6000
De lunes a viernes: 8:00 a.m. a 5:00 p.m.
Contacto: Pam Allen

Asimismo, previa cita se puede revisar el acta administrativa en este sitio durante el periodo de comentario público:

NMED - Hazardous Waste Bureau, District 1 Office
5500 San Antonio Drive NE
Albuquerque, New Mexico 87109
Tel: (505) 222-9551
De lunes a viernes: 8:00 a.m. a 5:00 p.m.
Contacto: William Moats

También se puede obtener copia del Permiso preliminar, este Aviso Público y las Hojas de Datos en el sitio web del NMED en: http://www.nmenv.state.us/HWB/snlperm.html en el enlace para *SNL Draft Permit.* Para obtener una copia del Acta Administrativa, comuníquese con la Srta. Pam Allen al (505) 476-6000 o en la dirección indicada antes. El NMED proporcionará copia del Acta Administrativa o partes de la misma a costo para el solicitante.

El NMED expide este aviso el **17 de septiembre 2012**, para anunciar el inicio de un periodo de comentario público que se cerrará a las **5:00 p.m. MST del 16 de noviembre 2012**. El que desee comentar sobre el Permiso preliminar o la designación de estado de Acción Correctiva Completa para una o más de las 27 SWMU/AOC o que desee solicitar una audiencia pública debe entregar por escrito o por correo electrónico sus comentarios con su nombre y dirección a la dirección que se indica a continuación. Solamente se dará consideración a los comentarios o las solicitudes que se reciban antes de las **5:00 p.m. MST del 16 de noviembre 2012**.

John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
(505) 476-6000
Correo electrónico: john.kieling@state.nm.us
Ref: SNL Draft Permit

En lo posible, todo comentario por escrito debe incluir referencia a los materiales informativos. No es necesario volver a entregar documentos incluídos en el Acta Administrativa cuando el que hace el comentario se refiere a los mismos directamente. La solicitud de una audiencia pública proporcionará: (1) una declaración clara y concisa con base en los hechos de la índole y el alcance del interés de la persona que solicita la audiencia; (2) el nombre y la dirección de toda persona que el solicitante represente; (3) una declaración de las objeciones al Permiso preliminar y que incluye referencia específica a cualquier condición que se debata; y (4) una declaración de los temas que el solicitante propone plantear para su consideración en la audiencia. Los comentarios escritos y la solicitud de una audiencia pública deben de entregarse al Sr. John Kieling antes de las **5:00 p.m. MST del 16 de noviembre de 2012**. El NMED publicará un aviso de audiencia pública con 30 días de anticipación en caso de programarse.

El NMED tiene a su cargo establecer que el Permiso preliminar al aprobarse se conforme con el Reglamento de Nuevo México para el Manejo de Desechos Peligrosos. Todo comentario escrito que se entregue será considerado en la formulación de una decisión final y podrá ocasionar modificación al Permiso preliminar. El Departamento responderá por escrito a todo comentario del público. La respuesta especificará cuáles disposiciones del Permiso preliminar se han modificado en la decisión final y presentará la explicación del cambio. Toda persona que presente comentario escrito o que pida aviso por escrito será notificada de la decisión por correo. Asimismo, se publicarán las respuestas en el sitio web del Departamento.

Previa consideración de todos los comentarios públicos escritos que se reciben y todos los datos, opiniones, y argumentos que se presentan en la audiencia pública, el NMED expedirá, o modificará y expedirá, el Permiso. Los Solicitantes recibirán por correo copia de cualquier documento modificado y una declaración pormenorizada por escrito que explica lo que ha ocasionado las modificaciones.

El Secretario del Departamento de Protección Ambiental de Nuevo México expondrá la decisión definitiva en forma pública y les notificará a los Solicitantes por correo certificado. La decisión del Secretario constituirá la decisión definitiva de la agencia y es susceptible a apelación por lo previsto en HWA (Capítulo 74, Artículo 4 NMSA 1978).

ACOMODACIÓN PARA PERSONAS INCAPACITADAS

Toda persona incapacitada y que requiere asistencia o ayuda para participar en este proceso deba comunicarse con Connie Joseph en el New Mexico Environment Department, Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502, teléfono: (505) 827-9769. Los usuarios de TDY podrán tener acceso a su número por el New Mexico Relay Network al 1-800-659-8331.

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Date on Correspondence	From	To	Subject	AR Number
01/26/2009	NMED/Kieling	SNL/Davis	Extension Request Approval for NOD Response Issued August 1, 2008 for Tijeras Arroyo GW IR, November 2005	SNL1184
02/26/2009	SNL/Davis	NMED/Bearzi	Submittal: NOD Response for the Tijeras Arroyo GW IR	SNL1185
03/27/2009	NMED/Bearzi	Citizen Action/McCoy	Draft Hazardous Waste Facility Permit	SNL1186
08/12/2009	NMED/Bearzi	SNL/Davis	NOD: Responses to NMED's NOD for CMV Report for TA V GW, July 2005	SNL1187
10/15/2009	NMED	File	Hazardous Waste Permit	SNL1188
01/19/2010	SNL/Wagner	NMED/Bearzi	NOD Response for Tijeras Arroyo GW IR, February 2009	SNL1189
06/24/2010	SNL/Wagner	NMED/Bearzi	Response to Comments on the Class 3 Permit Modification for 26 SWMUs	SNL1055
09/20/2010	SNL/Wagner	NMED/Bearzi	Extension Request for the Burn Site CME Report	SNL1190
09/23/2010	SNL/Wagner	NMED/Bearzi	Response to Comments on SWMU 68 & 8-58 GW Characterization WPs	SNL1125
10/04/2010	NMED/Bearzi	SNL/Wagner	Approval: Time Extension Request for Submittal of the Burn Site CME Report	SNL1191
12/21/2010	NMED/Bearzi	SNL/Wagner	Approval with Modifications; Response to April 8, 2010 Letter GW Monitoring Plan for SWMUS 149 & 154	SNL1126
01/03/2011	SNL/Pellegrino	NMED/Kieling	Submittal: OB Permit Number 11-0007 Issued by the City of albuquerque	SNL1192
05/10/2011	SNL/Wagner	NMED/Kieling	SWMUs 8 & 58 Proposed GW Monitoring Well Location Adjustment	SNL1193
06/02/2011	NMED/Kieling	SNL/Wagner	Approval: SWMUS 8 & 58, Proposed GW Monitoring Well Location Adjustment, May	SNL1194
08/03/2011	NMED/Kieling	SNL/Wagner	Extension Request Approval to complete Well Installation Report for GW Monitoring Wells at SWMUs 8, 58, & 68, June 27, 2011	SNL1195
08/03/2011	NMED/Kieling	SNL/Wagner	Notice of approval CME WP, Burn site GW, March 2008	SNL1196
05/03/2012	SNL/Beausoleil	NMED/Kieling	Submittal: Long Term Monitoring and Maintenance Plan for SWMUs and Technical and Administrative Corrections and Updates to Comprehensive Part B Permit Request	SNL1197

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09/13/2005	SNL/wagner	NMED/Bearzi	VCA Plan for SWMU 105	SNL1164
10/25/2005	SNL/Wagner	NMED/Kieling	Enclosed Information Consists of Updates to the Comprehensive Part B Permit	SNL1165
11/02/2005	NMED/Bearzi	SNL/Wagner	Notice of Approval: SWMUs 52, 233 & 234; NOD: SWMUs 4 & 5 ER Project Supplemental Risk Document, June 2005	SNL1116
12/14/2005	SNL/Wagner	NMED/Bearzi	SI Request Response for SWMU 4, Liquid Waste Disposal System Surface	SNL1117
12/29/2005	NMED/Bearzi	SNL/Wagner	Notice of Approval: General Part A (Revision 8.0) Class I Permit Modification Request,	SNL1166
01/10/2006	SNL/Zamora	NMED/Kieling	Open Burn Permit Issued by the city of Albuquerque	SNL1167
01/27/2006	NMED/Kieling	SNL/WAgner	Approval: Permit Application for Administrative Completeness	SNL1018
02/02/2006	NMED/Bearzi	SNL/Wagner	Notice of Approval: Phase 2 VCA Plan for 105, Bldg 6536, December 2005	SNL1168
02/06/2006	NMED/Kieling	SNL/Wagner	CAMU Survey Plat and Deed Restrictions	SNL1019
02/20/2006	NMED/Bearzi	SNL/Wagner	Notice of Approval and Certification of completion: SWMU 5 LWDS Drainfield , Responses to SI Request for SWMU 4, LWDS Surface Impoundments, January 2006	SNL1118
02/20/2006	NMED/Bearzi	SNL/Wagner	Notice of Approval and Certificate of completion: Response to SI Request and NOD for SWMU 196, October 2005	SNL1119
03/01/2006	NMED/Bearzi	SNL/Wagner	Notice of Approval: SI Response and NOD, October 2005	SNL1120
03/07/2006	SNL/Langkopf	NMED/Kieling	26 Justification Binders for the March 2006 Class 3 Permit Modification Request, Status Map Binder & Legal Ad for Modification	SNL1169
07/20/2006	SNL/Wagner	NMED/Bearzi	Proposals for CA Complete for SWMU 105	SNL1121
10/04/2006	NMED/Kieling	SNL/Wagner	Approval of Closure of Manzano Bunkers 37063 & 37078	SNL1170
10/26/2006	NMED/Bearzi	SNL/Wagner	Approval: Proposal for Corrective Action Complete SWMU 105, Mercury Spill, July	SNL1122
11/27/2006	SNL/Wagner	NMED/Bearzi	Collection of Stormwater Samples below Site 28-2	SNL1123
03/15/2007	SNL/Wagner	NMED/Kieling	Quantities of Haz Waste Managed at the Haz Waste Mangement Facility in 2006	SNL1171
03/22/2007	SNL/Wagner	NMED/Kieling	Technical and Administrative Updates to Permit Request for RCRA-Regulated Waste	SNL1066
08/20/2007	NMED/Bearzi	Interested Citizen	Notice of Public Comment Period and Opportunity to Request a Public Hearing on a Draft Operating Permit	SNL1025
08/20/2007	NMED/Bearzi	SNL/Wagner	Notice of Public Comment Period and Opportunity to Request a Public Hearing on a Draft Operating Permit	SNL1026
09/07/2007	SNL/Wagner	NMED/Kieling	Request for Extension to 60-Day Public Comment Period for Draft Operating Permit	SNL1172
10/16/2007	NMED/Kieling	SNL/Wagner	Approval: Extension Request of the Public Comment Period and Opportunity to Request a Public Hearing on the Draft Permit	SNL1028
10/16/2007	NMED/Kieling	Interested Person	Extension of the Public Comment Period on the Draft Haz Waste Permit	SNL1029
11/19/2007	DOE/Gould	NMED/Bearzi	Email: Documents for Comment on 48, 135, 148, 152 & 276	SNL1173
11/19/2007	SNI/Wagner	NMED/Bearzi	Public Comment Letter	SNL1174
12/10/2007	NMED/Kieling	SNL/Wagner	Public Notice: Petitions for Corrective Action Complete (NFA) for 26 SWMUs/AOCs,	SNL1124

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12/13/2007	NMED/Kieling	SNL/Wagner	2nd Extension Request of the Public Comment Period and opportunity to Request a Public Hearing on the Draft Permit	SNL1035
12/13/2007	NMED/Kieling	Interested Person	2nd Extension Request of the Public Comment Period and opportunity to Request a Public Hearing on the Draft Permit	SNL1036
12/17/2007	NMED/Kieling	Interested Person	Correction - Notice of Public Comment Period and Intent to Approve a Class 3 Permit Modification to the Permit	SNL1175
01/07/2008	SNL/Wgner	NMED/Bearzi	Class 3 Permit Modification for the Designation of 4 SWNUs and 1 AOC as Approved for NFA in Table A.2	SNL1176
01/14/2008	SNL	NMED	Public Notice Meeting for class 3 Permit Modification	SNL1177
01/17/2008	CARD/Greenwald	NMED/kieling	Email: Public Comment Letter for Draft Permit	SNL1037
01/17/2008	CARD/Greenwald	NMED/kieling	Email: Extension Request for Draft Permit Comment Peroid	SNL1038
01/17/2008	Dave McCoy	NMED/Kieling	Email: Extension Request Draft Permit comment Period	SNL1039
01/17/2008	SNL/Pellegrino	NMED/Kieling	Comments on Draft Permit	SNL1067
01/18/2008	NMED/Kieling	Interested Person	3rd Extension of the Public Comment Period on the Draft Haz Waste Permit	SNL1040
01/18/2008	NMED/Kieling	SNL/Wagner	3rd Extension of the Public Comment Period and Opportunity to Request a Public Hearing on the Draft Permit	SNL1041
01/27/2008	Geraldine Amato	NMED/Kieling	Fax: Public Comment letter on ther Draft Permit	SNL1042
02/04/2008	NMED/Kieling	Dave McCoy	Email: Regarding SNL Comments	SNL1044
02/07/2008	SNL/Wagner	NMED/Kieling	Comments on the Decision to Designate SWMUs 46, 52, 68, 234 & AOC 1090 as Corrective Action Complete with controls	SNL1045
02/08/2008	Dave McCoy	NMED/Kieling	Email: Request for RCRA Part B Comment Period Extension	SNL1046
02/08/2008	DOE/Gould	NMED/Kieling	Email; Final Comments on NMED Decision for SWMUs 46, 52, 68, 234 & AOC 1090	SNL1047
02/08/2008	CARD/Greenwald	NMED/Kieling	Email: Regrding Permit Extension	SNL1048
02/08/2008	Dave McCoy	NMED/Kieling	Email: Comments for 26 SWMUs for NFA	SNL1049
02/12/2008	NMED/Bearzi	Dave McCoy	Extension Request for Public comment on Draft Permit	SNL1050
02/13/2008	Citizen Action/McCoy	NMED/Curry	Decision not to have an Informal Public Presentation of the Part B Draft Permit	SNL1051
02/19/2008	NMED/Goldstein	Citizen Action/McCoy	Request for Public Meeting on Draft Hazardous Waste Faciity Permit	SNL1052
02/20/2008	NM District Court	File	Plaintiff NMED's Motion to Dismiss Defendant's 2nd Claim for Relief	SNL1053
02/21/2008	NMED/Kieling	SNL/Wagner	Final Permit Decision, Class 3 Permit Modification for NFA Status for 28 SWMUs	SNL1054
03/20/2008	SNL/Wagner	NMED/Kieling	Quantities of Haz Waste Managed at Haz Waste Managment Facility i 2007	SNL1178
04/09/2008	SNL/Wagner	NMED/Bearzi	Burn Site GW Current Conceptual Model	SNL1179
04/09/2008	SNL/Wagner	NMED/Bearzi	Burn Site GW CME WP	SNL1180
12/22/2008	NMED/Bearzi	SNL/Davis	CAMU Vadose Zone Monitoring System Annual Monitoring Results Report,	SNL1181
01/13/2009	SNL/Agogino	NMED/Kieling	Submittal: OB Permit Issued to DOE/SNL by City of Albuquerque	SNL1182
01/14/2009	SNL/Davis	NMED/Bearzi	Extension Request for NOD Response to the Tijeras Arroyo GW IR	SNL1183

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04/17/2002	DOE/Zamorski	NMED/Bearzi	Electronic copy of Sandia/DOE comprehensive Part B Permit request and Transmittal	SNL1129
05/06/2002	DOE/Zamorski	NMED/Kieling	Regarding Extended Storage for Remediation Wastes Staged at CAMU	SNL1130
05/10/2002	NMED/Kieling	DOE/Zamorski	Notice of Renewal Application Submittal	SNL1000
05/10/2002	NMED/Kieling	Concerned Citizen	Notice of Renewal Application Submittal	SNL1131
05/10/2002	Albuquerque Journal	NMED/Sandoval	Affidavit of Publication: Notice of Permit Renewal Application	SNL1132
05/17/2002	DOE/Zamorski	NMED/Kieling	Quarterly RPT for CAMU (Jan - March 2002)	SNL1133
05/17/2002	NMED/Moats	DOE/Zamorski	Hazardous Waste Storage Extension: CAMU	SNL1134
05/28/2002	DOE/Zamorski	NMED/Kieling	Revised General Part A Permit Request	SNL1069
07/19/2002	DOE/Zamorski	NMED/Kieling	ER Quarterly Report for March 2002 - May 2002	SNL1135
09/24/2002	NMED/D'Antonio	DOE/Zamorski	NMED Extension of the Public Comment Period an Additional 30 Days	SNL1136
09/24/2002	DOE/Zamorski	NMED/Kieling	Transmittal of Quarterly Report for the Corrective Action Management Unit April	SNL1137
10/10/2002	NMED/Bearzi	DOE/Zamorski	Notice of Deficiency Permit Application for Renewal	SNL1001
12/06/2002	DOE/Zamorski	NMED/Bearzi	Extension Request to the 60 day Response Deadline Specified in NOD	SNL1002
12/09/2002	DOE/Zamorski	NMED/Bearzi	Response to Comments 509 thru 524 of the NOD	SNL1003
12/11/2002	DOE/Zamorski	NMED/Kieling	Regarding Intent to Close CAMU	SNL1138
12/12/2002	NMED/Kieling	DOE/Zamorski	Approval: Extension Request of Deadline for Response to NOD	SNL1004
12/13/2002	NMED/Kieling	DOE/Zamorski	Approval: Extension Request of Deadline for Response to NOD Revised	SNL1005
02/14/2003	SNL/Boardman	NMED/Bearzi	NOD Responses to 358 of the Comments	SNL1017
03/04/2003	NMED/Kieling	DOE/Boardman	Time Extension Request Approval: Concerning Storage of Waste Military Munitions at the Manzano Storage Bunkers	SNL1139
03/13/2003	NMED/Kieling	DOE/Boardman	Extension of Deadline for Response to NOD Comments	SNL1006
04/14/2003	SNL/Boardman	NMED/Bearzi	NOD Responses to 151 Comments (included is 2 attachments & 2 binders)	SNL1020
04/21/2003	DOE/Zamora	NMED/Kieling	Multiple Event Open Burning Permit	SNL1140
07/15/2003	SNL/Krauss	OGC/Hughes	Regarding Disclosure Statement	SNL1141
08/04/2003	SNL/Boardman	NMED/Martin	Response to NMED letter of May 2, 2003 NOD	SNL1142
08/05/2003	SNL/Boardman	NMED/Kieling	Temporary Unit (TU) Operations Closure Certification that documents closure activities for the soil stabilization unit at CAMU	SNL1143
09/09/2003	NMED/Martin	SNL/Boardman	Second NOD; Administrative and Technical Completeness Permit Renewal	SNL1007
09/10/2003	NMED/Abeyta	SNL/Boardman	Invoice for Fee Assessment: Permit Renewal Application for a Haz Waste Facility, the	SNL1008
09/17/2003	SNL/Boardman	NMED/Kieling	NOD Responses to 151 Comments (Comment #450)	SNL1009
11/07/2003	SNL/Boardman	NMED/Martin	Responses to 64 Comments included in 2nd NOD	SNL1010
11/12/2003	NMED/Montoya	SNL/Boardman	Reciept of Check for the Permit Renewal Application for the Subpart X TTF	SNL1011
11/17/2003	SNL	DOE OB/Voorhees	Regarding Omitted Pages from the Responses to 64 Comments included in 2nd NOD	SNL1012
01/16/2004	SNL/Boardman	NMED/Martin	Regarding Responses to 64 Comments, Sending Revised Figure D-8 in Appendix D	SNL1013
01/21/2004	SNL/Boardman	NMED/Kieling	Extension Request to the Response Time for the NOD: Post Closure Care Plan for	SNL1144

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Date on Correspondence	From	To	Subject	AR Number
01/23/2004	NMED/Moats	SNL/Boardman	NOD Responses for 230, 231, 232, 233, and 234 NFA Proposals, Dated 6/95 (2nd round) and 8/97 (8th round), Dec 2002; Supplemental Risk Doc Supporting Class III	SNL1145
01/28/2004	NMED/Kieling	SNL/Boardman	Approval: Time Extension Request for NOD for Post Closure Care Plan for the CAMU,	SNL1146
02/09/2004	SNL/Boardman	NMED/Kieling	DOE is Requesting that Manzano Bunkers 37063 and 37078 be Withdrawn from the Comprehensive Part A & B Permit Request	SNL1014
03/10/2004	SNL/Wagner	NMED/Kieling	Submittal: New Information Regarding the Operational History of SWMU 28-2, a Mine	SNL1113
03/10/2004	SNL/Zamora	NMED/Kieling	Copy of Permit Issued by the City of Albuquerque	SNL1147
04/28/2004	NMED/Kieling	SNL/Wagner	Notice of Adminstrative Completeness Request for Class III Modification to Approve NFA Status for 18 SWMUs	SNL1148
06/25/2004	NMED/Bearzi	SNL/Wagner	NOD #3 Permit Renewal Application	SNL1149
06/30/2004	SNL/Wagner	NMED/Bearzi	VCA Plan for SWMU 91	SNL1150
06/30/2004	SNL	NMED	Justification Binders for the SWMUs and AOCs that are included in the July 2004 Class 3 Permit Modification Request	SNL1151
07/12/2004	NMED/Bearzi	SNL/Wagner	2nd NOD: Response to Comments on 12/17/2003 NMED NOD, Post-Closure Care Plan for the CAMU, TA 3	SNL1152
07/12/2004	SNL/Wagner	NMED/Bearzi	Extension Request for the 60-day Response Deadline Specified in NOD #3	SNL1153
07/14/2004	SNL/Wagner	NMED/Bearzi	Extension Request for SI Request Concerning SWMUs 96, 187, & 226	SNL1154
07/28/2004	SNL/Wagner	NMED/Bearzi	Regarding Signatories to Permit Applications and Reports	SNL1015
07/29/2004	NMED/Kieling	SNL/Wagner	Extension Request Approval: Deadline to the June 25, 2004 NOD	SNL1016
08/31/2004	SNL/Wagner	NMED/Bearzi	2nd NOD Response to Comments, Post-Closure Care Plan for CAMU	SNL1155
09/14/2004	NMED/Bearzi	SNL/Wagner	3rd NOD: Response to Comments on July 12, 2004 NMED NOD, Post-Closure Care Plan for CAMU, TA 3	SNL1156
10/12/2004	SNL/Wagner	NMED/Bearzi	VCA at SWMU 68, Old Burn Site	SNL1157
11/08/2004	SNL/Wagner	NMED/Bearzi	NOD Response: Response to Comments on July 12, 2004 NOD, Post-Closure Care	SNL1158
11/18/2004	SNL/Wagner	NMED/Bearzi	Responses to 83 Comments included in 3rd NOD	SNL1043
04/18/2005	SNL/Wagner	NMED/Kieling	Changes to the Contingency Plan	SNL1159
05/02/2005	SNL/Wagner	NMED/Bearzi	SI Response: ER Project Supplemental and NFA for Various SWMUs, dated 10/04	SNL1114
05/26/2005	NMED/Kieling	SNL/Wagner	Contingency Plan Amendment for Interim Status Units: Radioactive Waste Management Facility, High Bay Waste Storage Facility, and Manzano Storage Bunkers 37034, 37045, 37055, 37057, 37078, and 37118, April 18, 2005	SNL1160
06/03/2005	SNL/Wagner	NMED/Kieling	Withdrawal of a Proposed Modification (dated 3/24/05) to the Operating Permit for	SNL1161
06/16/2005	SNL/Wagner	NMED/Bearzi	Supplemental Residential Risk Screening Results for SWMUs 4, 5, 52, 233, & 234	SNL1162
07/26/2005	SNL/Wagner	NMED/Kieling	Technical Corrections and Updates to the Comprehensive Part B Permit Request for RCRA Regulated Waste Storage and Treatment Operations	SNL1163
08/30/2005	SNL/Wagner	NMED/Bearzi	SI Response to ER Project Supplemental and NFA Information for SWMUs 46 & 196,	SNL1115

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Date on Correspondence	From	To	Subject	AR Number
08/25/1995	NMED/Aker	NMED/Garcia	Memo: SNL's Sampling and Analysis Plan for Environmental Restoration Site 22, Storage Burn, OU 1334	SNL1056
11/09/1995	SNL/Cox	DOE/Jackson	Letter Report on Reapplication Pickup of Steel Test Stands at ER Site 68.	SNL1057
11/16/1995	DOE/Weber	NMED/Garcia	SNL OU 1334 RFI Work Plan	SNL1058
12/04/1995	DOE/OB/Weber	NMED/Garcia	SNL OU 1334 RFI Work Plan	SNL1059
12/13/1995	NMED/Aker	NMED/Garcia	SNL OU 1334 RFI Work Plan	SNL1060
12/15/1995	SNL/Aker	NMED/Garcia	Draft Memorandum re SNL OU 1334 RFI Work Plan	SNL1061
12/21/1995	SNL/Aker	NMED/Garcia	Memo: review of Central Coyote Test Area OU 1334 RFI WP	SNL1062
02/08/1996	DOE/Zamorski	NMED/Garcia	Response to EPA's NOD on OU 1334 Central Coyote Test Area	SNL1063
03/25/1996	EPA/Neleigh	NMED/Garcia	Recommendation of approval of the Foothills Test Area RFI Workplan	SNL1064
04/01/1996	DOE/Zamorski	NMED/Garcia	RFI WP OU 1335, Southwest Test Area (2 volumes) (One volume is appendices and annexes) (One volume is Work Plan)	SNL1065
04/03/1996	NMED/Conover	NMED/Kruse	Technical Comments on SNL April 1995 RFI WP for OU 1332 Foothills Test Area	SNL1022
04/10/1996	NMED/Conover	NMED/Kruse	Tech comments SNLs April 1995 RCRA RFI WP for OU 1332 Foothills Test Area	SNL1021
05/24/1996	NMED/Kruse	NMED/Conover	SNL OU 1332 (Foothills Test Area) RFI WP: Comments	SNL1023
05/29/1996	NMED/Kruse	TCP/Conover	Memo: SNL OU 1332 Foothills Test Area RFI WP: Comments	SNL1024
06/12/1996	NMED/Conover	NMED/Kruse	Memo: Tech comments on SNLs April 1995 RFI WP for OU 1332 Foothills Test Area	SNL1027
06/20/1996	NMED/Haaigan	NMED/Garcia	SNL, OU 1334, RFI Work Plan	SNL1030
07/01/1996	NMED HRMB	DOE AB	NOD: RCRA Facility Investigation Work Plan for OU 1332.	SNL1031
07/17/1996	NMED/Kieling	NMED/File	Memo: Tour of Southwest Test Area, OU 1335 - 14, 85, 91, 103, 117, 38, 6, 6A and	SNL1032
08/09/1996	EPA/Neleigh	NMED/Garcia	RFI WP OU 1335 Technical Review, Southwest Test Area	SNL1033
10/22/1996	DOE OB/Kieling	DOE OB/Kern	Results Review: TA 03 & 05 RFI, OU 1306, June 1996	SNL1034
03/06/1997	NMED/Dinwiddie	DOE/Zamorski	SI Request: RCRA Facility IWP, OU1332, Foothills Test Area. NMED request changes on specific replacement pages to the original Work Plan.	SNL1071
03/24/1997	DOE/Zamorski	NMED/Dinwiddie	Extension Request: 60 day on OU 1332, Foothills Test Area	SNL1072
05/30/1997	NMED/Kruse	SNL/Byrd	Memo: Notice of Deficiency; August 1995 Proposals for No Further Action (3rd	SNL1073
06/09/1997	DOE OB	DOE/Oms	DOE OB Comments on OU 1306, Results of TA 3 & 5 RFI	SNL1074
06/27/1997	DOE/Zamorski	NMED/Garcia	NOD Response: NFA Proposals 3rd submission	SNL1075
08/18/1997	DOE/Zamorski	NMED/Garcia	60 Day Extension Request to NOD for RFI RPT for TA 03 & 05	SNL1076
08/18/1997	NMED/Dinwiddie	DOE/Zamorski	SI Request: RFI WP for OU 1333, Canyons Test Area, Volumes I & II, September	SNL1077
08/26/1997	NMED/Dinwiddie	DOE/Zamorski	SI Request: Central Coyote Test Area OU 1334 RFI WP	SNL1078
09/02/1997	DOE/Zamorski	NMED/Dinwiddie	Extension Request: OU1334 WP	SNL1079
09/04/1997	NMED/Dinwiddie	DOE/KZamorski	Approval: RCRA Facility Investigation Work Plan Operable Unit 1332	SNL1080
09/09/1997	NMED/Moats	NMED/Kruse	ER Site 28-02	SNL1081
09/22/1997	NMED/Dinwiddie	DOE/Zamorski	Extension Request for SI Response: OU 1335 RFI WP Southwest Test Area	SNL1082

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09/26/1997	DOE/Zamorski	NMED/Dinwiddie	SI Request: OU 1335 RFI WP	SNL1083
10/22/1997	NMED/Dinwiddie	DOEZamorski	Time extension Approval: SI Response OU1334	SNL1084
10/23/1997	NMED/Dinwiddie	DOE/Zamorski	Time extension Approval: SI Response OU1335	SNL1085
10/30/1997	DOE/Zamorski	NMED/Garcia	NOD Response: TA 05 & 03 RFI RPT	SNL1086
11/04/1997	NMED/Dinwiddie	DOE/Zamorski	Extension Request Approval: SI Response OU 1307	SNL1087
11/25/1997	NMED/Dinwiddie	DOE/Zamorski	SI Response RFI RPT OU 1307	SNL1088
11/26/1997	DOE/Zamorski	NMED/Dinwiddie	SI Response for OU 1334 RFI WP	SNL1089
12/04/1997	NMED/Moats	File	Memo: OU 1334 RFI WP	SNL1090
12/09/1997	DOE/Zamorski	NMED/Dinwiddie	RSI: OU 1335 RFI WP	SNL1091
01/20/1998	NMED/Dinwiddie	DOE/Zamorski	Request for Supplemental Information OU 1307 RFI Report	SNL1092
02/13/1998	NMED/Dinwiddie	DOE/Zamorski	Sampling/Inspection Notification ER Site 28-2	SNL1093
02/20/1998	SNL/Young	NMED/Moats	Fax: SAP; 28-02	SNL1094
03/09/1998	DOE/Lasker	NMED/Dinwiddie	Regarding Sampling ER Site 28-02	SNL1095
03/27/1998	NMED/Garcia	DOE/Zamorski	2nd NOD: Results of TA 03 & 05 RFI	SNL1096
03/31/1998	NMED/Garcia	DOE/Zamorski	NOD: OU 1334 RFI WP	SNL1097
03/31/1998	NMED/Garcia	DOE/Zamorski	NOD: OU 1333 RFI WP	SNL1098
04/02/1998	NMED/Dinwiddie	DOE/Zamorski	SI Response: OU 1335 RFI WP Southwest Test Area	SNL1099
04/10/1998	DOE/Zamorski	NMED/Garcia	Non-significant Rev. to RFI WP OU1333	SNL1100
04/15/1998	DOE/Lasker	NMED/Garcia	Independent Sampling Event for 28-2	SNL1101
04/23/1998	DOE/Zamorski	NMED/Dinwiddie	Extension Request: NOD for the RSI Canyons Test Area (OU 1333) WP	SNL1102
04/23/1998	DOE/Zamorski	NMED/Dinwiddie	Extension Request: NOD Concerning SI Request for OU 1334 Central Coyote Test	SNL1103
04/23/1998	DOE/Zamorski	NMED/Dinwiddie	Extension request to respond to NMED's NOD for TA 03 & 05 RFI Report	SNL1104
04/30/1998	NMED/Hoines	NME/Kruse	Fax: ER Site 28-2 Chronology and OT Form	SNL1105
07/03/1998	DOE/Zamorski	NMED/Garcia	NOD Response: TA 05 & 03 (2 volumes)	SNL1106
07/06/1998	DOE/Zamorski	NMED/Garcia	NOD Response: OU 1334 RFI WP	SNL1107
01/15/1999	DOE/Zamorski	NMED/Garcia	Letter regarding TA 03 & 05 RFI RPT, submitting a Groundwater Data RPT	SNL1108
04/08/1999	DOE/Zamorski	NMED/Garcia	March 99 Summary Report of GW Investigations at TA V, OU 1306 & 1307, Vol. 1 & 2	SNL1109
06/08/1999	NMED/kieling	DOE/Zamorski	Summary Report GW Investigations at TA 05, OU 1306 & 1307 Administrative Completeness Letter & Fee Assessment	SNL1110
08/27/1999	NMED/Dinwiddie	DOE/Zamorski	Ground Water Summary RPT TA 05, OU 1306 & 1307, Vols. 1 & 2	SNL1111
06/30/2000	NMED/Moats	DOE/Zamorski	Extension Request Approval: SI Request TAs 03 & 05 RFI RPT, Dated June 1996	SNL1112
01/31/2002	DOE/Zamorski	NMED/Bearzi	General Part A Permit Request	SNL1068
02/04/2002	DOE/Zamorski	NMED/Bearzi	Comprehensive Part B Permit Request, 3 Binders Containing Five Parts	SNL1070
03/22/2002	NMED/Bearzi	DOE/Zamorski	General Part A Permit Application Modification Request	SNL1127
03/27/2002	DOE/Zamorski	NMED/Bearzi	Regarding Submission of General Part B Permit Request for Waste Management	SNL1128

RESOURCE CONSERVATION AND RECOVERY ACT FACILITY OPERATING PERMIT

EPA ID No. NM5890110518

issued to the

U.S. DEPARTMENT OF ENERGY/SANDIA CORPORATION

for the

SANDIA NATIONAL LABORATORIES
HAZARDOUS AND MIXED WASTE TREATMENT AND STORAGE UNITS AND POST-CLOSURE CARE OF THE CORRECTIVE ACTION MANAGEMENT UNIT

located in

BERNALILLO COUNTY, NEW MEXICO

prepared by the

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS WASTE BUREAU
2905 RODEO PARK DRIVE EAST, BUILDING 1
SANTA FE, NEW MEXICO 87505

September 2012

NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
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www.nmenv.state.nm.us

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Secretary

BUTCH TONGATE
Deputy Secretary

JAMES H. DAVIS, Ph.D.
Director
Resource Protection Division

PUBLIC NOTICE Number 12-02

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS WASTE BUREAU
SANTA FE, NEW MEXICO 87505
September 17, 2012

NOTICE OF PUBLIC COMMENT PERIOD AND OPPORTUNITY TO REQUEST A PUBLIC HEARING ON A DRAFT HAZARDOUS WASTE PERMIT AND GRANTING OF CORRECTIVE ACTION COMPLETE STATUS FOR SOLID WASTE MANAGEMENT UNITS/AREAS OF CONCERN FOR SANDIA NATIONAL LABORATORIES
EPA ID NUMBER NM5890110518

The New Mexico Environment Department (NMED, or the Department) is issuing for public comment a revised draft Hazardous Waste Facility Permit (draft Permit) which would authorize the United States Department of Energy and Sandia Corporation (the Applicants) to manage, treat and store hazardous and mixed waste at Sandia National Laboratories (SNL, or the Facility). The Department is also seeking public comment on a proposal to grant corrective action complete status for areas designated as solid waste management units (SWMUs) or areas of concern (AOCs) at SNL. Today's draft Permit replaces in full the draft issued for public comment on August 20, 2007, which was not finalized.

Sandia National Laboratories is located within the boundaries of Kirtland Air Force Base south of and adjacent to the city of Albuquerque in Bernalillo County, New Mexico. SNL is a multi-purpose engineering and science laboratory owned by the U. S. Department of Energy (DOE) and operated by Sandia Corporation, a subsidiary of Lockheed Martin. The DOE and Sandia Corporation are collectively referred to as the "Permittees" in the draft Permit.

The mailing address for Sandia Corporation is 1515 Eubank SE, Albuquerque, New Mexico 87123. The Sandia Site Office of the U. S. Department of Energy (DOE)/ National Nuclear Security Administration (NNSA) is located at KAFB-East, Pennsylvania and H Street, P.O. Box 5400, Albuquerque, NM 87185. The Facility's primary contact for this action is: Mr. David Rast, DOE/NNSA, P.O. Box 5400, Albuquerque, NM 87185.

SNL designs components for the nation's nuclear weapons, designs and tests conventional military weapons, performs a wide variety of energy research and development projects, and

works on assignments that respond to national security threats. As a result of its testing and research activities, SNL generates solid wastes and hazardous, radioactive, and mixed wastes (those wastes containing both hazardous and radioactive components). From 1945 to 1988, hazardous, mixed, and solid wastes were disposed of at SNL at numerous locations which have been classified by the Department as SWMUs or AOCs. The SWMUs and AOCs include landfills, drainfields and seepage pits, outfalls, waste piles, and test areas. Some of these SWMUs/AOCs have released contaminants into the environment.

SNL generates wastes that are regulated under the federal Resource Conservation and Recovery Act (RCRA) and the New Mexico Hazardous Waste Act (HWA) and its implementing regulations, the New Mexico Hazardous Waste Management Regulations at 20.4.1 NMAC. The Department is charged with issuing a permit that will ensure that SNL's hazardous waste operations are conducted in a manner protective of human health and the environment.

REVISED DRAFT PERMIT

The draft Permit addresses the storage (generally for periods longer than 90 days) and treatment of hazardous and mixed waste at eight container storage units, including two units where waste may be treated by stabilization/solidification, macroencapsulation, chemical or thermal deactivation, amalgamation, or by physical means; one unit where open burning of explosive wastes would be conducted; and one unit where post-closure care must be conducted. The Applicants do not seek, and the Department is not issuing, a permit for disposal of hazardous or mixed waste. The permitted units where waste treatment and storage would occur include the Hazardous Waste Handling Unit (storage), the Thermal Treatment Unit (treatment), the Radioactive and Mixed Waste Management Unit (storage and treatment), Manzano Storage Bunkers (storage in five bunkers), and the Auxiliary Hot Cell Unit (treatment and storage). The draft Permit also requires post-closure care of the Corrective Action Management Unit (CAMU), which contains remediation waste generated from the excavation of the Chemical Waste Landfill. The draft Permit, when finalized, would also require the Applicants to conduct any corrective action activities not covered under the April 29, 2004, Compliance Order on Consent (Consent Order) such as in response to any releases from permitted units and any new releases from SWMUs or AOCs discovered after the future termination of the Consent Order.

The draft Permit is a proposed renewal of a permit that was first issued to the Applicants in August 1992. The Department currently enforces the 1992 permit, which covers only the Hazardous Waste Handling Unit and Facility-wide corrective action requirements (the latter requirements have generally been superseded by the Consent Order). The other units mentioned in the above paragraph, except the CAMU, are currently regulated as interim status units under 20.4.1.600 NMAC incorporating 40 C.F.R. Part 265.

The Department originally released for public comment a draft renewal Permit on August 20, 2007. With extensions granted by the Department, the public comment period for that version of the draft Permit ended on February 8, 2008, and the Department received public comments and requests for a public hearing. As required by 20.4.1.901.A (4) NMAC, the Department, in

conjunction with the Applicants, attempted to resolve the issues giving rise to the opposition to the first version of the draft Permit. The draft Permit now being released for comment reflects the Department's attempts to resolve the issues giving rise to opposition and requests for a hearing.

The Department hereby withdraws the version of the draft Permit issued August 20, 2007. Comments and requests for hearing concerning the August 20, 2007 version of the draft Permit are moot, will not be considered by the Department in finalizing the draft Permit, and will not be addressed by the Department's response to comments on today's draft permit.. If a person who commented or requested a hearing on the August 20, 2007 version of the draft Permit wishes to comment or request a hearing on today's draft Permit, he or she must do so according to the procedures described below under the heading of *Public Review of Draft Permit and Corrective Action Documents*. In other words, comments and requests for hearings regarding the 2007 draft must be resubmitted in order to be considered.

"CORRECTIVE ACTION COMPLETE" DETERMINATIONS

In addition to the August 2007 draft permit, on December 10, 2007, the Department issued a public notice proposing to grant Corrective Action Complete status for 26 SWMUs/AOCs through a Class 3 modification of the 1992 permit. The public comment period for this action also ended February 8, 2008, and the Department received public comments and a request for a public hearing. The Department did not make a final decision on the permit modification request and did not hold a hearing. As required by 20.4.1.901.A (4) NMAC, the Department, in conjunction with the Applicants, attempted to resolve the issues giving rise to opposition to granting Corrective Action Complete status for the majority of these SWMUs/AOCs.

Most, but not all, of the 26 SWMUs/AOCS addressed by the December 10, 2007, public notice are again included in the current proposal to grant Corrective Action Complete status. NMED has decided that three of the 26 SWMUs/AOCs will require additional characterization work, and thus, these particular SWMUs/AOCs are not included. Additionally, some SWMUs/AOCs in the current proposal require administrative and physical controls which are addressed in the draft Permit; examples of such controls include posting signage, conducting inspections, restricting future land use, and annual reporting. Controls proposed in the past for a few SWMUs/AOCs are to be changed under the current proposal based on new information that has become available to the Department. Attachment K to the proposed permit contains tables listing which SWMUs/AOC are proposed to be deemed Corrective Action Complete With Controls and which SWMUs/AOC are proposed to be deemed Corrective Action Complete Without Controls.

Persons who provided public comment by the February 8, 2008 deadline do not need to resubmit their comments, and may submit additional comments concerning any of the 27 SWMUs/AOCs currently being proposed for Corrective Action Complete status. However, those who requested a public hearing by the February 8, 2008, deadline must request a hearing again in accordance with the procedures described below under the heading *Public Review of Draft Permit and*

Corrective Action Documents if they still desire that a public hearing be held concerning one or more of the SWMUs/AOCs currently proposed for Corrective Action Complete status.

Anyone who has not previously submitted comments during the comment period ending February 8, 2008, may submit comments or request a hearing regarding the 27 SWMUs/AOCs currently being proposed for Corrective Action Complete status by following the procedures under the heading *Public Review of Draft Permit and Corrective Action Documents* to.

Since December 2007, the Applicants have requested that an additional six SWMUs/AOCS be considered for Corrective Action Complete status. The Department has not previously issued a notice for public comment concerning these six SWMUs/AOCs. Of the six SWMUs/AOCs, four are included in the current proposal to grant Corrective Action Complete status. (The other two will be addressed by a separate action in the future.) The four SWMUs/AOCs are identified in a Fact Sheet which can be obtained by following the procedures under the heading *Public Review of Draft Permit and Corrective Action Documents* below. Anyone wishing to comment on these four SWMUs/AOCs or request a hearing in relation to these sites must follow the procedures under the heading *Public Review of Draft Permit and Corrective Action Documents* in order to comment or make the hearing request.

AVAILABILITY OF DRAFT PERMIT AND FACT SHEET

The Department announces, for public comment, the availability of the proposed draft Permit and Fact Sheet providing the basis for NMED's proposed actions to finalize the draft Permit and to grant Corrective Action Complete status for 27 SWMUs and AOCs. The Fact Sheet provides the significant factual, legal, and policy issues considered in preparing the draft Permit, and summarizes the corrective action activities completed and their results for the 27 SWMUs/AOCs.

PUBLIC REVIEW OF DRAFT PERMIT AND CORRECTIVE ACTION DOCUMENTS

The Administrative Record for this proposed action consists of the Permit application, the draft Permit, this Public Notice, Fact Sheets, and supporting documentation. The Administrative Record may be reviewed, with prior appointment, at the following location during the public comment period.

NMED - Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone: (505) 476-6000
Monday – Friday: 8:00 a.m. to 5:00 p.m.
Contact: Pam Allen

In addition, the draft Permit and Fact Sheets may be reviewed, with prior appointment, at the following location during the public comment period.

NMED - Hazardous Waste Bureau
District 1
5500 San Antonio Drive, NE
Albuquerque, New Mexico 87109
Phone: (505) 222-9551
Mondays - Fridays from 8:00 a.m. to 5:00 p.m.
Contact: William Moats

Copies of the draft Permit, this Public Notice, and Fact Sheets are also available on the NMED website at: http://www.nmenv.state.nm.us/HWB/snlperm.html at the link for *SNL Draft Permit*. To obtain a copy of the Administrative Record or a portion thereof, please contact Ms. Pam Allen at (505) 476-6000, or at the address given above. NMED will provide copies, or portions thereof, of the Administrative Record at a cost to the requestor.

NMED issues this public notice on **September 17, 2012**, to announce the beginning of a 60-day comment period that will end at **5:00 p.m. MST, November 16, 2012**. Any person who wishes to comment on the draft Permit or the granting of Corrective Action Complete status for one or more of the 27 SWMUs/AOCs or request a public hearing must submit written or electronic mail (e-mail) comment(s) with the commenter's name and address to the respective address below. Only comments and requests received before **5:00 p.m. MST** on **November 16, 2012** will be considered.

John E. Kieling, Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
(505) 476-6000
E-mail: john.kieling@state.nm.us
Ref: SNL Draft Permit

Written comments should include, to the extent practicable, all referenced factual materials. Documents in the Administrative Record need not be re-submitted if expressly referenced by the commenter. Requests for a public hearing shall provide: (1) a clear and concise factual statement of the nature and scope of the interest of the person requesting the hearing; (2) the name and address of all persons whom the requestor represents; (3) a statement of any objections to the draft Permit, including specific references to any conditions being addressed; and (4) a statement of the issues which the commenter proposes to raise for consideration at the hearing. Written comment and requests for public hearing must be filed with Mr. John Kieling on or before **5:00 p.m. MDT, November 16, 2012**. NMED will provide a thirty (30) day notice of a public hearing, if scheduled.

NMED must ensure that the approved draft Permit is consistent with the New Mexico Hazardous Waste Management Regulations. All written comments submitted will be considered in formulating a final decision and may cause the draft Permit to be modified. The Department will respond in writing to all public comments. This response will specify which provisions, if any, of the draft Permit have been changed in the final decision and the reasons for the changes. All persons presenting written comments or who requested notification in writing will be notified of the decision by mail. These responses will also be posted on the Department's website.

After consideration of all written public comments received and all data, views, and arguments presented at the public hearing, if one is held, NMED will issue, or modify and issue, the Permit. The Applicants shall be provided by mail a copy of any relevant modified documents and a detailed written statement of reasons for the modifications.

The Secretary of the New Mexico Environment Department will make the final decision publicly available and shall notify the Applicants by certified mail. The Secretary's decision shall constitute a final agency decision and may be appealed as provided by the HWA (Chapter 74, Article 4 NMSA 1978).

ARRANGEMENTS FOR PERSONS WITH DISABILITIES

Persons having a disability and requiring assistance or auxiliary aid to participate in this process should contact Connie Joseph at the New Mexico Environment Department, Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502, telephone number: (505) 827-9769. TDY users please access her number via the New Mexico Relay Network at 1-800-659-8331.

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Deputy Secretary

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Director
Resource Protection Division

FACT SHEET

INTENT TO ISSUE A HAZARDOUS AND MIXED WASTE FACILITY PERMIT UNDER THE NEW MEXICO HAZARDOUS WASTE ACT TO U. S. DEPARTMENT OF ENERGY AND SANDIA CORPORATION FOR SANDIA NATIONAL LABORATORIES

EPA ID NUMBER: NM5890110518

September 17, 2012

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A. GENERAL BACKGROUND

The New Mexico Environment Department (Department or NMED) intends to issue a hazardous and mixed waste Permit to the U. S. Department of Energy (DOE) and Sandia Corporation for Sandia National Laboratories (SNL, or the Facility) to store and treat hazardous and mixed waste in accordance with the New Mexico's Hazardous Waste Act (HWA) and its associated regulations. The DOE and Sandia Corporation are the "Applicants." The action to be taken by the Department would renew and combine three existing permits and add several additional existing units into one comprehensive permit. The Department is charged with issuing a permit that will ensure that SNL's hazardous and mixed waste operations are properly managed to protect human health and the environment. The Department also intends to grant corrective-action-complete status for 24 sites that have been investigated for releases of contaminants and remediated where necessary. A separate fact sheet, also known as a Statement of Basis, has been prepared to address these 24 sites and is available for public review and comment.

The draft Permit is a renewal of the permit that was first issued in August of 1992. The Department currently enforces the 1992 Permit. As mentioned in the preceding paragraph, the draft Permit includes additional waste management units not covered by the original Permit. Units added to the draft Permit include former "interim status" units, which are units that: (1) existed when the hazardous waste regulations took effect, (2) were not permitted by the Department or the U. S. Environmental Protection Agency (EPA) in the past, and (3) were used to manage mixed wastes under the interim status provisions of the regulations.

Prior to issuing a permit, the Department is required by regulation to release a draft of the permit for public comment. The Department is also required to issue a fact sheet which serves two functions: 1) to facilitate public review of that draft permit; and 2) to provide the basis for any requirements in the permit. This is that Fact Sheet.

Sections A through O of this Fact Sheet describes the general background for the draft Permit, including; a physical description of SNL, its hazardous and mixed waste activities, and how the public may be involved in the permitting process. Section P explains the technical and regulatory basis for the permit conditions.

Sandia National Laboratories

SNL is located within the boundaries of Kirtland Air Force Base (KAFB) on land owned by the DOE, the U. S. Department of Defense, and the U. S. Forest Service (USFS). Collectively, these lands are situated south of Albuquerque in north-central New Mexico. The Facility is divided into five smaller geographical areas known as technical areas (TAs) and several large remote test areas (Foothills Test Area, Central Coyote Test Area, Southwest Test Area, and Canyons Test Area). The Facility occupies 2,820 acres (4.4 square miles). The administrative offices of SNL are located at the following mailing addresses: Sandia Corporation, 1515 Eubank Boulevard SE, Albuquerque, New Mexico, 87123; and the DOE Sandia Site Office at KAFB-East, Pennsylvania & H Street, Albuquerque, New Mexico 87116. The Applicants' primary contact and address for this action is: Mr. David Rast, NNSA/Sandia Site Office, DOE, Post Office Box 5400, Albuquerque, New Mexico 87185.

SNL is an engineering and science laboratory owned by the DOE and operated by Sandia Corporation (a subsidiary of Lockheed Martin, Incorporated). The DOE and Sandia Corporation

are collectively referred to as the "Permittees" in the draft Permit and as "the Permittees" or "the Applicants" in this Fact Sheet.

During the late 1940's, the final assembly of nuclear weapons was conducted at SNL. Since 1949, SNL has been dedicated to research, development, and testing. SNL currently employs approximately 9,300 people. The primary mission of SNL is to provide engineering and testing support for nuclear weapons components and related systems. The Facility conducts a variety of research and development programs and develops technologies and procedures to sustain, modernize, and protect the nuclear arsenal, prevent the spread of weapons of mass destruction, defend against terrorism, protect national infrastructures, ensure stable energy and water supplies, and provide new capabilities to the U. S. armed forces.

As a result of such activities, the Applicants have generated and continue to generate hazardous, radioactive, mixed (those wastes containing both hazardous and radioactive components), and solid wastes. From 1945 to 1988 most of these wastes were disposed of at SNL at numerous locations, which have been classified by the Department as solid waste management units (SWMUs) or areas of concern (AOCs). The SWMUs and AOCs include landfills, septic system drainfields and seepage pits, outfalls, waste piles, and test areas. Past waste management activities at SNL have caused the release of hazardous and radioactive contaminants into the environment.

The Permit would address both hazardous waste and mixed waste. Congress has adopted separate laws for regulating hazardous wastes and radioactive materials. The Resource Conservation and Recovery Act (RCRA) covers the management of hazardous wastes; The Atomic Energy Act (AEA) provides for the management of radioactive materials at DOE facilities. NMED regulates mixed waste only with respect to its hazardous properties under RCRA, while the National Nuclear Safety Administration within DOE regulates mixed waste with respect to its radioactive properties under the AEA.

Permit Contents

The Permit would address the storage (generally for periods longer than 90 days) and treatment of hazardous and mixed waste. The Permit would authorize hazardous and mixed waste management at eight container storage units (including two units where waste may be treated), one other unit where the Applicant's would be authorized to treat (through open burning) explosive wastes, and one other unit where post-closure care would be conducted. The Applicants do not seek a permit for hazardous or mixed waste disposal.

The draft Permit includes eight Permit Parts and 13 Permit Attachments (A through M). The Permit Parts address how the Applicants are to adhere to specific hazardous and mixed waste treatment and storage procedures, how they are to terminate use of the treatment and storage facilities (referred to as "closure" of a unit), and how they are to conduct cleanup of contaminated soil, surface water, or groundwater (referred to as "corrective action"). The Permit Parts also include general requirements common to all hazardous waste permits throughout New Mexico (*e.g.,* duration of a permit); and general requirements that apply to SNL as a facility (*e.g.,* characterization of waste).

The Permit would authorize the Applicants to receive certain limited types of hazardous and mixed wastes from outside the Facility ("off-site" sources). First are wastes that were generated by SNL, shipped off-site to be treated, and returned to SNL as treatment residues. Second are

wastes from an SNL cleanup site not located at SNL. The final type is wastes from SNL operations outside the Facility but located within the Albuquerque metropolitan area.

The Permit Attachments consist primarily of certain plans, including a waste analysis plan for determining which wastes are hazardous, a contingency plan for emergency responses, an inspection plan, a personnel training plan, and unit-specific closure plans for the 10 units proposed for permitting. The Permit Attachments also include a list of units that are to be permitted, and several lists of numerous sites where corrective action is currently underway or has been completed.

If the Permit is issued as proposed, site investigation and cleanup of contaminated soil, surface water, and groundwater, referred to as "corrective action," at SNL would be governed by one of two documents, the Permit or the April 29, 2004 Compliance Order on Consent (Consent Order). The Department's intent in establishing these two enforceable documents is to address all possible situations where corrective action would be necessary to ensure protection of human health and the environment and to establish a clear regulatory process by distinguishing which situations are addressed in which document. The relationship between the Permit and the Consent Order is discussed in this Fact Sheet in Section P under the discussion for Permit Section 8.1.1.

The Permit would require the Applicants to implement an emergency response plan when there is a fire, explosion, or release of waste at a permitted hazardous or mixed waste management unit that may endanger human health or the environment. This plan is called the Contingency Plan. Terms of the Permit would include required emergency equipment, testing and maintenance of emergency equipment, communication and alarm systems, emergency response procedures, establishment of a chain of command, and post-emergency procedures. The Applicants would have to notify the Department of emergencies. Although the Department does not take part in directing or managing emergency responses, the Department would be available for consultation to resolve an emergency.

The Permit would also addresses how DOE would sell, donate, or otherwise "transfer" property within its boundary to other entities. The Department has an obligation to ensure that transferees are aware of environmental risks associated with the land. Further, because the Applicants are obligated under the regulations to notify and cooperate with the Department regarding the release of any hazardous constituents within the Facility's boundaries, the Department must be aware of those boundaries and any environmental problems associated with the land known at the time of transfer.

The Permit would also require the Applicants to maintain a program that minimizes the amount of wastes generated at the Facility and reduces the toxicity of those wastes.

Finally, the Permit would require the Applicants to establish a community relations plan, in order to foster community understanding and involvement in SNL's environmental programs. The Permit would also require the Applicants to establish an "information repository," where Permit-related documents, including the Permit, may be viewed. Furthermore, the Applicants would be required to issue e-mail notices to the public of the filing of specific documents that are of interest to the public. Interested persons are to be allowed to add their e-mail address to a list maintained by the Applicants. When specified documents are submitted to the Department, the Applicants are to provide notice within 30 days to those on the list.

Public Participation

The New Mexico Hazardous Waste Management Regulations (HWMR) require an opportunity for public involvement any time there is a modification to change a permit, or issue a new or renewal permit. That process involves public notices and includes an opportunity for public comment on major permit modifications or permit issuance or rejection. Public notices are provided in local newspapers and are included with letters to individuals on the facility mailing list. The facility mailing list is maintained by the Department and any interested person may request to be placed on it to be informed of such actions.

The Department first released a draft renewal Permit for public comment on August 20, 2007. After extensions, the public, comment period ended on February 17, 2008. The Department received public comment and requests for public hearing on the 2007 version of the draft Permit. As required under the rules, the Department in conjunction with the Applicants and other members of the public attempted to resolve the issues giving rise to opposition to the draft 2007 Permit. As a result of this effort, the current 2012 version of the draft Permit has been prepared and is the subject of this Fact Sheet. The 2007 version of the draft Permit is hereby withdrawn. Comments and requests for hearing on the 2007 draft Permit are also therefore moot. The public may submit comments and request a hearing on the current draft Permit following the procedures in Section B of this Fact Sheet.

There are significant opportunities for the public to learn about and become involved in the regulation of hazardous and mixed waste at SNL, including the corrective action requirements. Documents pertinent to permitting and corrective action activities submitted to or issued by the Department are available for public review in the Administrative Record maintained by the Department at 2905 Rodeo Park Drive East, Building 1, Santa Fe, New Mexico. This Fact Sheet is in part an effort to involve the public, and in Section B of this Fact Sheet describes how the public may comment on the draft Permit.

B. PUBLIC REVIEW OF THE DRAFT PERMIT

The Administrative Record for this proposed action consists of the Permit Application, the draft Permit, the Public Notice, this Fact Sheet, numerous corrective action-related documents, and supporting documentation. The Administrative Record may be reviewed, with prior appointment, at the following location during the public comment period.

NMED - Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Phone: (505) 476-6000
Monday – Friday: 8:00 a.m. to 5:00 p.m.
Contact: Pam Allen

In addition, the draft Permit and the Fact Sheet may be reviewed, with prior appointment, at the following location during the public comment period.

NMED - Hazardous Waste Bureau
District 1 Office
5500 San Antonio Avenue, NE
Albuquerque, New Mexico 87109
Phone: (505) 222-9551
Mondays - Fridays from 8:00 a.m. to 5:00 p.m.
Contact: William Moats

A copy of the draft Permit, the Public Notice, and this Fact Sheet, are also available on the Department website at: www.nmenv.state.nm.us/HWB/snlperm.html under *SNL Draft Permit*. To obtain a copy of the Administrative Record or a portion thereof, please contact Ms. Pam Allen at (505) 476-6000, or at address given above. The Department will provide copies, or portions thereof, of the Administrative Record at a cost to the requestor.

The Department issues this public notice on **September 17, 2012**, to announce the beginning of a 60-day comment period that will end at **5:00 p.m. MST, November 16, 2012**. Any person who wishes to comment on the draft Permit or request a public hearing should submit written or electronic mail (e-mail) comments with the commenter's name and address to the respective address below. Only comments and/or requests received before **5:00 p.m. MST** on **November 16, 2012** will be considered.

John E. Kieling, Chief
Hazardous Waste Bureau - New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
(505) 476-6000
E-mail: john.kieling@state.nm.us
Ref: SNL Draft Permit

Written comments must include, to the extent practicable, all referenced factual materials. Documents in the Administrative Record need not be re-submitted if expressly referenced by the commenter. Requests for a public hearing shall provide: (1) a clear and concise factual statement of the nature and scope of the interest of the person requesting the hearing; (2) the name of all persons whom the requestor represents; (3) a statement of any objections to the draft Permit, including specific references to any conditions being addressed; and (4) a statement of the issues which the commenter proposes to raise for consideration at the hearing. Written comment and requests for Public Hearing must be filed with Mr. John Kieling on or before **5:00 p.m. MST, November 16, 2012**. The Department will provide a thirty (30) day notice of a public hearing, if scheduled.

All comments submitted will be considered in formulating a final decision and may cause the draft Permit to be modified. The Department will respond in writing to the comments. This response will specify which provisions, if any, of the draft Permit have been changed in the final

decision and the reasons for the changes. All persons who have submitted written comments or who requested notification of the final decision will be notified of the decision by mail. These responses will also be posted on the Department's website.

After consideration of all written public comments received, the Secretary of the New Mexico Environment Department may issue a final Permit. The Secretary will make the final decision publicly available and will notify the Applicants by certified mail. All persons that submitted written comments, requested a hearing, or requested notification of the final decision will be notified of the decision by first class regular mail. The Secretary's decision will constitute a final agency decision and may be appealed as provided by the HWA (Chapter 74, Article 4 NMSA 1978).

C. ARRANGEMENTS FOR PERSONS WITH DISABILITIES

Persons having a disability and requiring assistance or auxiliary aid to participate in this process should contact Connie Joseph at the New Mexico Environment Department, Human Resources Bureau, P.O. Box 26110, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502, telephone number: (505) 827-9769. TDY users please access her number via the New Mexico Relay Network at 1-800-659-8331.

D. REGULATORY BACKGROUND

In 1976 the Resource Conservation and Recovery Act (RCRA) was passed by the U.S. Congress to regulate "cradle to grave" management of hazardous waste. RCRA was enacted as an amendment to the Solid Waste Disposal Act of 1965, and mandates the development of regulations governing the actions of owners or operators of facilities that generate, transport, treat, store, or dispose of solid and hazardous wastes.

On November 19, 1980, the RCRA regulations became effective, and it became unlawful under certain conditions to treat, store, or dispose of hazardous waste without having, or having applied for, a permit. For then-existing treatment, storage, or disposal facilities (TSDFs), the requirement to submit a permit application was satisfied by submitting the "Part A" portion of the application; the "Part B" portion could be submitted at a later time. The roles of these application parts are clarified in 40 CFR §§ 270.1(b) and 270.10.

The United States Environmental Protection Agency (EPA) has authorized the State of New Mexico (the State) to implement and enforce hazardous waste management requirements, including corrective action requirements, under its own hazardous waste management program. The State's authority for the program is the Hazardous Waste Act (HWA), which: (1) authorizes the State's Environmental Improvement Board (EIB) to adopt hazardous waste management regulations; and (2) authorizes the Department to implement and enforce regulations issued under the HWA. These regulations are known as the New Mexico Hazardous Waste Management Regulations (HWMR).

The EIB has adopted regulations concerning hazardous waste management and the issuance of hazardous waste permits. These regulations incorporate by reference pertinent sections of the Code of Federal Regulations (CFR) – 40 CFR Parts 260 through 270, 273, and 280 – and are codified in the HWMR, 20.4.1 NMAC.

Whenever the Permit cites a provision of 20.4.1 NMAC or Title 40 Code of Federal Regulations (40 CFR) the Permit is meant to incorporate the citation by reference, including all subordinate

provisions of the cited provision, and make binding the full text of the cited provision. Hazardous waste management regulations are frequently cited throughout the Permit. The federal hazardous waste management regulations, 40 CFR Parts 260 through 273, are generally cited rather than the HWMR. The federal regulations are cited because only the federal regulations set forth the detailed regulatory requirements; the State regulations incorporate by reference, with certain exceptions, the federal regulations in their entirety. Citing only the federal regulations also serves to avoid encumbering each citation with references to two sets of regulations. However, it is the State regulations that are legally applicable and enforceable. Therefore, for the purpose of the draft Permit, and enforcement of its terms and conditions when finalized, all references to provisions of federal regulations that have been incorporated into the State regulations are to be deemed to include the State incorporation of those provisions. The same method of citation of the regulations apply to this Fact Sheet -- the federal hazardous waste management regulations, 40 CFR Parts 260 through 273, are generally cited rather than the HWMR.

The HWA and HWMR require each person owning or operating an existing facility or planning to construct a new facility for the treatment, storage, or disposal of hazardous waste to have a HWA permit (*see* 42 U.S.C. 6925 and 20.4.1.900 NMAC (incorporating 40 CFR § 270.1)). A TSDF in existence on or before November 19, 1980 is eligible for "interim status" (IS). Interim status authorizes an existing facility to operate, subject to the interim status standards set forth in 20.4.1.600 NMAC, incorporating 40 CFR Part 265, until the Department issues or denies a HWA permit or until interim status is otherwise terminated. SNL was eligible for interim status in November of 1980, and some of SNL's mixed waste management units proposed for permitting still retain and will retain that status until such time that a final decision on the draft Permit is made.

Under the HWMR, if a permit application is withdrawn for a given unit, the unit loses interim status and is required to close. On November 8, 1985, RCRA mandated the termination of interim status for land disposal units that had been granted interim status before November 8, 1984, unless the owner/operator had submitted a Part B portion of an application and had submitted certification of compliance with the groundwater monitoring and financial responsibility requirements. At SNL, only the Chemical Waste Landfill (CWL) fell within this category of units; a post-closure care plan was issued by the Department as a stand-alone Permit for the CWL in 2009.

The HWA and HWMR require corrective action for all releases of hazardous waste or hazardous constituents, regardless of when waste was placed in such a unit, from any solid waste management unit (SMWU) at a facility seeking a permit. (42 U.S.C. § 6924(u); NMSA 1978 § 74-4-4.2(B); 20.4.1.500 NMAC, incorporating 40 CFR § 264.101(a)). RCRA facilities must also conduct corrective action at areas of concern (AOCs). An AOC is any area that may have had a release of a hazardous waste or hazardous constituents, which is not a SWMU. Corrective action is required to be conducted beyond the facility boundary (42 U.S.C. § 6924(v); 20.4.1.500 NMAC, incorporating 40 CFR § 264.101(c)) where necessary to protect human health or the environment.

On January 26, 1983, "units" managing and disposing of hazardous waste became subject to the closure and post-closure standards of 40 CFR Part 264, Subpart G and Part 265, Subpart G, requiring a post-closure care permit in some circumstances.

On January 25, 1985, the State of New Mexico received authorization from the EPA to implement its hazardous waste program under the HWA. *See* 50 Fed. Reg. 1515 (Jan. 11, 1985). Subsequent program revisions were approved effective on April 10, 1990; July 25, 1990; December 4, 1992; August 23, 1994; December 21, 1994; July 10, 1995; January 2, 1996; March 10, 1997; July 13, 1998; October 9, 2001; and October 16, 2007.

On July 25, 1990, the State received from EPA authorization to expand its hazardous waste program under the HWA, including the authority to regulate the hazardous component of mixed waste. *See* 55 Fed. Reg. 28397 (July 11, 1990).

On January 2, 1996, the State received authorization from the EPA to implement a corrective action program under the HWA. *See* 60 Fed. Reg. 53708 (Oct. 17. 1995); 61 Fed. Reg. 2450 (Jan. 26, 1996).

E. PERMIT APPLICATION REQUIREMENTS

Owners or operators of hazardous and mixed waste management facilities, including interim status facilities, are required to submit a comprehensive permit application covering all aspects of design, operation, maintenance, and closure of their facilities. A permit application consists of Parts A and B; Part A is a standard form that requires the name and location of the owner/operator, a list of the types of wastes managed, a facility layout diagram, and the activities requiring a permit. Part B is an extensive document submitted in a narrative, tabular, and schematic format that includes general and specific information for all hazardous and mixed waste management units at a facility. The Part B also includes information necessary to establish corrective action requirements for releases from SWMUs and AOCs.

F. SNL PERMIT HISTORY

On November 19, 1980 the DOE and Sandia Corporation submitted to the EPA a Part A Application to qualify for interim status under the Resource Conservation and Recovery Act (RCRA).

The first Part B Application was requested by EPA on December 29, 1983. On April 23, 1984, the Department, then the Environmental Improvement Division of the New Mexico Department of Health, requested a Part B from the Permit Applicants, for joint review with EPA. As stated in the 1984 letter, the request was in anticipation of the Department receiving authorization for RCRA Subtitle C in January, 1985. Once the authorization was assigned by EPA, the Department would assume primary responsibility for permitting hazardous and mixed waste facilities in New Mexico.

On November 3, 1988, the Applicants submitted to the Department a Part B Application, which addressed a hazardous waste management facility (HWMF), a proposed waste storage tank, and the open burn unit at the Thermal Treatment Facility (TTF). Following review, the Part B was declared administratively complete on April 3, 1989 with the stipulation that the TTF would not be included in the technical review until the Department received authorization from EPA to regulate units and waste types covered under RCRA Subpart X at 40 CFR §§ 600-603.

On October 28, 1991, the Applicants submitted to the EPA a revised Part A and Part B Application for the Facility. The Applicants also sent a copy of the Part A Application to the NMED. The Application covered hazardous waste treatment and storage activities at TA-II, TA-III, and TA-V, and included many hazardous waste types. The Applicants have revised the Part

A Application several times since it was first submitted, including, among other things, to notify the Department that the Applicants would not seek a permit for hazardous waste disposal activities.

On August 6, 1992 the Department issued a Hazardous Waste Facility Permit (the Permit currently in force) to the DOE and Sandia Corporation to operate a hazardous waste storage unit at SNL pursuant to Section 74-4-4.2 of the HWA. The Permit covered a hazardous waste container storage area near TA-II -- the Hazardous Waste Management Unit (now referred to as the Hazardous Waste Handling Unit in the draft Permit).

The 1992 Permit, which was due to expire in August 2002, was administratively extended pursuant to 20.4.1.900 NMAC (incorporating 40 CFR § 270.51) because the Applicants submitted a Part B Application in February of 2002 in compliance with the regulations. The 1992 permit in modified form remains in effect until a final decision for the draft Permit is made by the Department Secretary. The most recent Part A and Part B Applications were submitted on June 7, 2012.

The Thermal Treatment Unit and the Corrective Action Management Unit were issued separate Permits for operation and post-closure care, respectively, on November 4, 1994, and September 26, 1997. The Permits for both units are incorporated into the draft Permit.

G. THE CONSENT ORDER

The Compliance Order on Consent (Consent Order), dated April 29, 2004, is an enforceable document pursuant to 40 CFR § 270.1(c)(7). The Consent Order requires the Applicants to conduct corrective action at all solid waste management units (SWMUs) and areas of concern (AOCs) at the Facility to fulfill the requirements of 40 CFR § 264.101. The relationship between the Permit and the Consent Order are discussed in this Fact Sheet in Section P under the discussion for Permit Section 8.1.1.

H. PART A APPLICATION

On February 6, 2002, the Applicants timely submitted to the Department a Part A Application concurrently with their Part B Application for renewal of the operating Permits for the Hazardous Waste Handling Unit, the Thermal Treatment Unit, and for a Post-Closure Care Permit for the Corrective Action Management Unit. Additionally, seven units that are currently under interim status were included in the Part A and B Applications. The Part A Permit Application is the Department's basis for the list of hazardous and mixed waste management units to be permitted at the Facility, the waste management processes the Applicants propose to utilize at those units, and the waste types to be managed at those units. The Part A Permit Application contains information on the hazardous and mixed waste treatment and storage units and the unit undergoing post-closure care, as listed in Section K of this Fact Sheet.

I. PART B APPLICATION

On February 6, 2002, the Applicants also submitted, in a timely manner, their Part B Application for renewal of their current Permits for the Thermal Treatment Unit, the Hazardous Waste Management Unit), and the Corrective Action Management Unit, and information concerning corrective action for the Facility's SWMUs and AOCs. Information on the seven operating interim status units is also included in the Part B Application. The Part B Application addresses the requirements that apply to hazardous and mixed waste treatment and storage facility

operations at the Facility and contains a description of the Facility and its various operating plans (*i.e.,* waste analysis, inspection, personnel training, contingency, closure, and post-closure).

In December 2005, following response to a Notice of Deficiency issued by the Department, the Applicants submitted an updated version of their Part B Application, Revision 6.0.

In August 2007, the Department issued for public comment a draft Permit based upon the Part A and Part B Applications. During the public comment period the Department received extensive comments from the DOE/Sandia Corp., the EPA, and other interested parties including the Citizens for Alternatives to Radioactive Dumping (CARD), the Albuquerque Center for Peace and Justice, and Citizen Action, New Mexico. Several of the commenters requested an extension of the public comment period, and a public hearing on the 2007 draft Permit. The comment period was extended through January 17, 2008. Additionally, when a draft permit is issued and a timely written notice of opposition to the permit and a request for a public hearing are received, the Department and the applicant are required to respond to the request in an attempt to resolve the issues giving rise to the opposition. If the issues are resolved, the opponent may withdraw the request for a hearing. (20.4.1.901.A.4 NMAC).

On July 15, 2008 the Department issued an invitation to meet and confer with the Department and the Applicants. The invitation was sent to persons who had commented on the draft Permit or had requested a hearing. The meeting was held in an attempt to resolve issues giving rise to opposition of the 2007 draft Permit. The Department determined that it would not be possible to resolve all issues that gave rise to opposition to the permit. Instead, the Department decided to issue a revised draft permit. The Department convened over 30 meetings with the commenters, the Applicants, or both, beginning in August 2008 and concluding in May 2012. Based on the discussions in these meetings, the Department developed a revised draft Permit, and is now issuing it for public comment. Any member of the public may comment and request a hearing on the revised draft Permit, regardless of whether he or she commented on the 2007 version of the draft Permit. The 2007 version of the draft Permit is withdrawn, and the comments and the hearing requests submitted for the 2007 version is now moot.

The Applications, correspondence between the Department and the Applicants, and additional materials submitted by the Applicants, and relevant materials reviewed by the Department together comprise the Administrative Record ("AR"). The AR is the basis for the Department's action on the Application. The AR is available for review by members of the public during business hours as explained in Section B of this Fact Sheet.

J. TYPES OF HAZARDOUS AND MIXED WASTES MANAGED AT THE FACILITY

The Applicants manage "D", "U", "F", "P", and "K" wastes, which are categories of hazardous waste found at 40 CFR §§ 261.20-261.33, as described below.

The criteria for establishing a waste as a hazardous waste are provided in 40 CFR Part 261, incorporated in 20.4.1.200 NMAC. A waste is considered hazardous if it meets the definition of a solid waste as described in 40 CFR § 261.2; is not exempted by 40 CFR § 261.4; and exhibits any of the characteristics of hazardous waste identified in 40 CFR Part 261, Subpart C; or is listed in 40 CFR Part 261, Subpart D. Specifically: (1) D hazardous waste numbers (codes) denote the characteristics of ignitability (D001), corrosivity (D002), reactivity (D003), and toxicity (D004- D043); (2) F codes signify wastes from non-specific sources; (3) K codes signify

wastes from specific sources; and (4) P and U codes denote discarded commercial chemical products, off-specification species, container residues, and spill residues thereof, with the P codes signifying acutely hazardous wastes and the U codes signifying toxic wastes.

Hazardous waste types may be of uniform physical composition (*i.e.,* homogeneous) or of dissimilar or diverse composition (*i.e.,* heterogeneous). Homogeneous waste contains only one material, substance, or waste, and when a sample of the waste is collected, it represents the entire waste type. Homogeneous waste types can be either solids or liquids. Heterogeneous waste contains multiple components that differ in density, specific gravity, or other physical properties, are located in different places within the waste, or are discrete and different particles. Representative samples are often difficult to obtain for heterogeneous wastes (*e.g.,* debris).

K. TYPES OF UNITS TO BE PERMITTED

The Permit would authorize the Permittees:

1. To store hazardous and mixed wastes in containers in the following units:

   Hazardous Waste Handling Unit *(HWHU)* (TA II): Buildings 958 and Building 959, Modular Buildings 958B and 958C (19,386 Gallons total);

   Radioactive and Mixed Waste Management Unit *(RMWHU)* (TA III): Buildings 6920, 6921, 6925, 6926, Modular Storage Buildings, and Outdoor Waste Storage Area (52,388 Gallons total);

   Auxiliary Hot Cell Unit *(AHCU)* (TA V): Buildings 6597, and Building 6597 Storage Silos (589 Gallons total);

   Manzano Storage Bunkers *(MSBs)* (Manzano Base): bunkers 37034, 37045, 37055, 37057, and 37118 (28,930 Gallons total);

   (Note – waste quantities specified in gallons denote volumes, but the wastes are not necessarily in a liquid state).

2. To treat by stabilization/soldification, chemical deactivation, thermal deactivation, macroencapsulation, amalgamation, or to conduct physical treatment of hazardous and mixed wastes at the following units:

   Radioactive and Mixed Waste Management Unit (TA III): Buildings 6920, 6921, 6925, 6926;

   Auxiliary Hot Cell Unit (TA V) Building 6597 and Building 6597 Storage Silos;

3. To treat by open burning and otherwise safely manage high explosive (ignitable and reactive) hazardous wastes at the following unit:

   Thermal Treatment Unit (TTU) (TA-III)*: Building 6715*; and

4. To conduct post-closure care at the following unit used to contain remediation waste:

   Corrective Action Management Unit (CAMU) (TA III).

L. PERMIT organization

The draft Permit comprises Permit Parts (1-8) and Permit Attachments (A-M). The Parts contain requirements that the Applicants would have to adhere to while treating and storing hazardous

and mixed waste, conducting post-closure care, and conducting corrective action at the Facility (where corrective action is required under the Permit and not the Consent Order).

Permit requirements are established to ensure compliance with New Mexico's HWA and HWMRs and are derived from applicable regulatory requirements, the Applicants' commitments, or additional facility or unit specific requirements established by the Department to ensure adherence with the regulations or to protect human health or the environment as provided at 20.4.1.900 NMAC, incorporating by reference 40 CFR § 270.32(b)(2).

This Fact Sheet and the draft Permit generally refer to regulations by citing the federal hazardous waste management regulations, 40 CFR Parts 260 through 273, rather than the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC, which incorporate by reference the federal regulations, with some exceptions. In some cases, the New Mexico HWMR are cited directly.

M. PERMIT PARTS: Each draft Permit Part is briefly described below.

Permit Part 1: General Permit Conditions contains permit conditions that apply to all hazardous and mixed waste management units at all facilities, most of which are based upon mandatory permit conditions set forth at 40 CFR Parts 264 and 270.

Permit Part 2: General Facility Requirements contains permit conditions for operation of hazardous and mixed waste management facilities set forth at 40 CFR Part 264, Subparts B through E. Permit Part 2 references Permit Attachments that provide more information regarding the Facility, as described in Section N below.

Permit Part 3: Storage of Hazardous and Mixed Waste contains the regulatory requirements that the Applicants would have to follow when managing and storing hazardous and mixed wastes at the Hazardous Waste Handling Unit, the Radioactive and Mixed Waste Management Unit, the Auxiliary Hot Cell Unit, and the five Manzano Storage Bunkers. The Applicants would be authorized to manage, treat and store at the storage units only those hazardous and mixed wastes listed in Permit Attachment B (*Authorized Wastes*). Permit Part 3 addresses the requirements for managing hazardous and mixed waste in containers in accordance with 40 CFR Part 264, Subpart I. Requirements and general descriptions of the permitted units and their locations, and the management, storage, and treatment, of hazardous and mixed waste at the permitted units are provided in Attachment A (*Facility Description)* of the Permit. The Waste Analysis Plan is described in Attachment C (*Waste Analysis Plan*) of the Permit.

Permit Part 4: Treatment of Hazardous and Mixed Wastes contains requirements for treatment of hazardous and mixed wastes at the RMWMU, and the AHCU. Also presented is information on treatment processes. The treatment processes include:

1. Chemical deactivation to eliminate the hazardous waste characteristics of ignitability, corrosivity, and reactivity;
2. Thermal deactivation to eliminate the hazardous waste characteristic of reactivity in reactive wastes, including explosives;
3. Amalgamation to immobilize elemental mercury into a solid, leach-resistant form;
4. Stabilization/solidification to immobilize hazardous waste toxicity characteristic metals or eliminate free liquids, or both;

5. Macro-encapsulation to immobilize hazardous constituents; and
6. Physical treatment to change the physical character of the waste in order to make it more amenable to subsequent treatment or storage, or to reduce waste volume.

Once the permit is issued, the Applicants could treat at the treatment units only the amounts shown, by treatment type, in Permit Attachment J (*Hazardous and Mixed Waste Management Units), Table J.1-2.*

Permit Part 5: Treatment by Open Burning contains the requirements for treatment of reactive and ignitable wastes at the Thermal Treatment Unit (TTU). The Applicants would be authorized to treat at the TTU only silver acetylide/silver nitrate (SASN) and SASN mixed with only the solid and hazardous wastes identified in Part 5, Table 5-1 of the Permit, and only such wastes generated by the Facility operations in Building 6715. More detailed information on the treatment by open burning at the TTU can be found in Permit Attachment A (*Facility Description*). Authorized wastes are burned using propane in a steel box with dimensions of 2.5 by 2.5 by 0.5 feet.

Permit Part 6: Closure Requirements contains the requirements for final closure of the Permitted Units under 40 CFR §§ 264.110 through 264.116, 264.178 and 264.601 as applicable, and refers to the procedures described in the Permitted Unit-specific closure plans in Attachment G (*Closure Plans*). Closure is the permanent discontinuation of storage and treatment of hazardous or mixed wastes at a Permitted Unit. Closure involves the removal of all hazardous or mixed wastes from the Unit, the decontamination or removal of contaminated structures and equipment, and, if necessary, corrective action of contaminated environmental media, such that the Unit is left in a condition that is protective of human health and the environment.

Permit Part 7: General Provisions for Post-Closure Care contains the post-closure care requirements of 40 CFR Part 264, Subpart G, which apply to the CAMU. Provisions of Part 7 include information on the types of wastes disposed of in the CAMU; the length of post-closure care; planned monitoring and maintenance activities; a sampling and analysis plan; personnel training; a contingency plan, and other aspects of post-closure care. Further description of the post-closure care procedures for the CAMU is presented in Attachment H of the Permit.

Permit Part 8: Corrective Action would require the Applicants to implement corrective action as necessary to protect human health and the environment for all releases pursuant to 42 U.S.C. § 6924(u) and (v), and 40 CFR § 264.101, Subparts F and S. Requirements include the procedures for implementing corrective action, cleanup levels, general methods and procedures for conducting field activities, laboratory procedures, general procedures for conducting risk assessments and determining background levels, general requirements for drilling and well installations, and requirements for reporting on corrective action activities conducted under the Permit. The relationship between Permit Part 8 and the Consent Order is described in this Fact Sheet in Section P under the discussion for Permit Section 8.1.1.

N. PERMIT ATTACHMENTS

Attachment A, *Facility Description*, contains unit descriptions based on information included in the permit application, including unit dimensions, materials of construction, security procedures, and emergency equipment.

Attachment B, ***Authorized Wastes,*** identifies the EPA Hazardous Waste Numbers (waste codes) authorized to be managed at each permitted hazardous and mixed waste management unit.

Attachment C, ***Waste Analysis Plan,*** fulfills the requirement contained in 40 CFR § 264.13(c) for a written waste analysis plan describing the procedures the Applicants will carry out to obtain a chemical and physical analysis of representative samples of waste. At a minimum, an analysis must provide all the information that must be known to treat, store, or dispose of the waste in accordance with 40 CFR Parts 264 and 268. Other conditions would authorize use of various published data to characterize waste fully or in part and require that an analysis be repeated as necessary to ensure accuracy.

The waste analysis plan specifies:

1. Parameters for which wastes will be analyzed and the rationale for choosing such parameters,
2. Test methods,
3. Sampling methods, and
4. Frequency with which the initial analysis will be reviewed or repeated.

Attachment D, ***Contingency Plan,*** is required by 40 CFR §§ 264.51 and 264.52. Under 40 CFR § 264.52, the contingency plan must describe the actions facility personnel will take in response to a fire, explosion, or any release of hazardous and mixed waste or hazardous constituents to air, soil, surface water, or groundwater at the Facility that pose a threat to human health or the environment. The plan must describe arrangements with local first responders, list emergency coordinators, list emergency equipment, and include an evacuation plan. (40 CFR § 264.52).

Attachment E, ***Inspection Plan,*** responds to the regulatory requirement that the "owner or operator must develop and follow a written schedule for inspecting stored waste, monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment (such as dikes and sump pumps) that are important to preventing, detecting, or responding to environmental or human health hazards." 40 CFR § 264.15(b)(1). *See also* 40 CFR § 270.14(b)(5).

Attachment F, ***Personnel Training Plan,*** is required to meet the terms of 40 CFR § 264.16(d)(3), which calls for a written description of the type and amount of both introductory and continuing training that will be given to each person filling a position related to hazardous and mixed waste management.

Attachment G, Closure Plans, contains the unit-specific closure plans for the permitted hazardous and mixed waste storage and treatment units. Closure plans must address the closure performance standards at § 264.111, the specific contents at § 264.112(b), the schedule at § 264.113, the container-specific requirements under § 264.178, and applicable requirements under § 264.601 (Environmental Performance Standards, Miscellaneous Units).

Attachment H, Post-Closure Care for the CAMU, contains the post-closure care plan for the Corrective Action Management Unit. The plan addresses the post-closure activities that are to be performed at the CAMU by the Applicants. The CAMU is used for the containment of hazardous and toxic wastes that were generated during remediation of at the Chemical Waste Landfill (CWL), located adjacent to the CAMU. The CWL is regulated under a stand-alone Post-Closure Care Permit.

The CAMU post-closure care plan incorporates the requirements of 40 CFR § 264.117 through § 264.120 and § 264.552(e)(6). Post-closure care of the CAMU began on October 15, 2003, and is to continue for 30 years after that date, unless the 30-year period is shortened or extended, as specified in Part 7 of the Permit. Additional information on post-closure practices to be conducted at the CAMU, and a description of the Unit is provided in Permit Attachment A (*Facility Description*).

Attachment I, *Reserved*, is reserved for future use. No future use is currently planned by the Department or the Applicant.

Attachment J, *Hazardous Waste Management Units*, lists the hazardous and mixed waste management units (HWMUs) at the Facility. The Attachment includes several tables: 1) Tables J-1.1 and J-1.2 show the active portion of the Facility, listing units for treating and storing wastes, 2) Table J-2 shows permitted units in post-closure care, listing units that are not active, and have completed closure 3) Table J-3 shows the closed portion of the Facility, listing units that are not active, have completed closure, and are not subject to post-closure care.

Attachment K, *Solid Waste Management Units and Areas of Concern*, comprises four lists of SWMUs and AOCs: (a) Table K-1 is a listing of SWMUs/AOCs requiring corrective action under the Consent Order, Table K-2 is a listing of SWMUs/AOCs/HWMUs requiring corrective action under the Permit (currently none), (c) Table K-3 is a listing of SWMUs/AOCs/HWMUs where corrective action is complete with controls, and (d) Table K-4 is a listing of SWMUs/AOCs/HWMUs where corrective action is complete without controls.

Attachment L, *Figures*, contains figures referenced elsewhere in the Permit.

Attachment M, *Long-Term Monitoring and Maintenance Plan for SWMUs and AOCs Granted Corrective Action Complete with Controls*, contains long-term maintenance and monitoring plans for SWMUs and AOCs with controls in place after corrective action is complete.

O. GENERAL CONSIDERATIONS

Important general issues concerning the Permit are as follows:

Relation of Permit to Consent Order: Corrective action to clean up releases of hazardous and mixed wastes at SNL has proceeded since April 29, 2004 under a Consent Order that addresses contamination throughout the SNL Facility. The Permit would not change any part of the Consent Order and the Consent Order remains in effect (more information concerning the relationship between the Permit and the Consent order in this Fact Sheet is found in Section P under the discussion for Permit Section 8.1.1).

The cleanup levels set forth in the Permit follow the Department's general standard of human health target risk level of 10^{-5} for carcinogens and a Hazard Index of 1.0 for non-carcinogens. Similar standards are contained in the Consent Order (§ VI.K). In case of impracticability of achieving these standards, the Applicants may seek a variance from the cleanup standards. The Consent Order has a similar provision § VI.L. Permit Part 8 would closely follow §§ III.M-III.Y, and IV-X of the Consent Order.

The Department requires the Applicants to adhere to the schedules included in the Consent Order unless an extension of time is granted for submittal of a corrective action document as provided for in Consent Order § III.J.2. The Applicants are subject to enforcement action under Consent

Order § III.G if the Applicants do not comply with the Consent Order schedule. Such enforcement action may include requirements to complete additional investigation, monitoring and remediation to mitigate deficiencies with work already completed.

One category of circumstances where the Permit would regulate corrective action, when finalized, is the implementation of controls for any SWMUs or AOCs that have been listed as having corrective action complete with controls. The Department will include such SWMUs and AOCs in Attachment K (*Listing of SWMUs and AOCs*), Table K-3 (*SWMUs, AOCs, and HWMUs for which Corrective Action is Complete with Controls*). The specific controls associated with the sites are to be specified in the documents associated with the completion of the corrective action and in Permit Attachment K, Table K-3.

Financial assurance: Regulations under the HWA require an applicant to provide financial assurance for closure and post-closure care of hazardous and mixed waste management units. (40 CFR §§ 264.143, 264.145); however, government facilities, such as SNL, are exempt from these regulations.

Department regulation of mixed waste: The Department regulates the Applicants under the New Mexico Hazardous Waste Act. That statute regulates "hazardous waste" which, by definition, does not include radioactive materials that are classified as source, special nuclear, or byproduct materials under the 1954 Atomic Energy Act (AEA). 74-4-3(M) NMSA 1978. These radioactive materials are regulated by DOE as authorized by Congress. Some of the waste managed at SNL is "mixed waste" which contains substances that are hazardous and regulated under the Hazardous Waste Act and also radioactive and regulated under the AEA. Various court decisions hold that by the AEA, state efforts to regulate the radiological threats of mixed waste on human health and the environment are invalid. *See, e.g., Pacific Gas & Electric Co. v. State Energy Resources Conservation & Development Commission*, 461 U.S. 190 (1983). Thus, the Department only regulates the hazardous component of mixed waste.

Congress addressed the interplay between the AEA and RCRA. Congress has said that solid waste does not include source, special nuclear, or byproduct materials (42 USC § 6903(27)) and that RCRA shall not apply to activities or substances that are subject to the AEA to the extent that such application is "inconsistent with the requirements of" the AEA (42 USC § 6905(a)). Congress has, simultaneously, waived sovereign immunity with regard to hazardous waste regulation and has directed that hazardous waste permits shall include terms "necessary to protect human health and the environment." (42 USC § 6925(c)(3); 40 CFR § 270.32(b)(2)).

Based on this direction from Congress, EPA and DOE have concluded that a RCRA permit may regulate the hazardous component of mixed waste. *See*, EPA, Clarification of Interim Status Qualification Requirements for the Hazardous Components of Radioactive Mixed Waste, 53 Fed. Reg. 37045 (Sept. 23, 1988); EPA, State Authorization to Regulate the Hazardous Components of Radioactive Mixed Waste under the Resource Conservation and Recovery Act, 51 Fed. Reg. 24504 (July 3, 1986). DOE expressly supports a reading of the law that "affords the greatest scope to the RCRA regulatory scheme, consistent with the requirements of the AEA." 52 Fed. Reg. 15937, 15939 (May 1, 1987). DOE has observed that "RCRA was intended to have some applicability to materials that were already regulated under the AEA" and supports "complementary regulation under both statutes of substances that under prior law might have been regulated exclusively by the AEA." (*id.* 15940 n.9). EPA reviewed NRC regulations to identify inconsistencies between RCRA and AEA-based regulations. "No inconsistencies

were identified as a result of this comparison although RCRA was more prescriptive in some instances and differences in stringency were observed. Differing or more stringent requirements do not necessarily constitute inconsistent requirements." (53 Fed. Reg. at 37048). Only in case of direct conflict with AEA requirements must a RCRA permit cede to the AEA.

Subpart X Open Burn (OB) Units: Open burning is the destruction of reactive and ignitable hazardous wastes, by self-sustained combustion after being ignited, to remove the characteristics of ignitability and reactivity. Such burning t produces air contaminants that are directly emitted into the atmosphere without first passing through a stack or chimney from an enclosed chamber. The Thermal Treatment Unit (TTU) at the Facility burns chiefly silver acetalide silver nitrate (SASN) wastes and SASN contaminated wastes in a steel pan designed to withstand high temperatures. The purpose of this kind of treatment is to destroy the explosive component of the waste, which is considered hazardous. The Applicants are prohibited by the U.S. Department of Transportation from shipping this type of waste off site due to the potential for the waste to ignite or react. Furthermore, while there are certain requirements the Applicants must adhere to in order to ensure the protection of human health and the environment; they would be authorized by New Mexico statute and regulation to treat these wastes so long as they do so in accordance with a hazardous waste facility permit.

Open Burn units, such as the TTU, are considered RCRA miscellaneous units, which are regulated by 40 CFR Part 264, Subpart X.

The Department understands that a small amount of the high explosives treated at the TTU Unit contains plastics that are capable of generating dioxins and furans. Thus, the Department has required in the Permit that the Applicants sample soil for dioxins, furans, and other substances to determine if these substances are detectable in the soil, and if so, to ensure that the concentrations of contaminants in soil would not exceed levels that would pose a threat to human health.

Waste to be treated by open burning at the TTU have special characterization requirements, certain wastes are prohibited, and for all wastes treated at the TTU annual and batch limits are imposed. The conditions regarding treatment by open burning are in Permit Part 5 (*Treatment by Open Burning*). Open burning may not be conducted during electrical storms or high winds. The Permit prescribes operating procedures and time limits for open burning and several more operational safety precautions.

Regulations at 40 CFR § 264.601(c) require that the operation of miscellaneous units be protective of air quality by preventing any release that may have adverse effects on human health or the environment. Both the Department and the Applicants have conducted air modeling for the TTU. Such modeling is an assessment of the migration of waste constituents produced by the open burning process and released into the air. The primary objective of the air modeling is to assess adverse effects to human health and the environment. The models show that risks to a hypothetical resident located at the nearest fence lines to the TTU were acceptable for both exposure to soil and air borne contaminants, and that ecological risks were acceptable for both on site and fence-line receptors.

Offsite waste: Under the Permit, the Applicants would not be allowed to receive waste from off site, with specific exceptions that are intended to ensure that the Facility's waste inventory is not enlarged by the addition of new wastes for which no off-site disposal pathway exists. Exceptions

are noted under Section 2.2.3 of the Permit and are summarized in Section Q of this Fact Sheet under PS 2.2.3. Further, the Applicants would need to confirm that any off-site waste received at the Facility meets the conditions of Permit Section 2.2.3 at the time the Applicants examine the shipping manifest, and that any discrepancy for an off-site waste is to be resolved.

Relation of Permit to Federal Facility Compliance Order: The Federal Facility Compliance Act (FFCA) was enacted in 1992 to require federal facilities to comply with waste treatment requirements and the storage prohibition of the Land Disposal Restrictions (LDR) under RCRA for mixed waste. The FFCA makes penalties imposed under state hazardous waste statutes hazardous and mixed waste enforceable against federal entities. Under the FFCA, the Department reached agreement with the Applicants in 1995 which was later memorialized as the SNL Federal Facility Compliance Order (FFCO). The Site Treatment Plan (STP) Compliance Plan Volume (CPV), prepared under the FFCO, identify specific volumes of and types of mixed wastes, and dates for shipping mixed waste off-site for treatment or treatment and disposal. The primary purpose of the FFCO is to compel the Applicants to treat and dispose of mixed waste that in general has been in storage for many years. However, newly generated mixed waste can be covered under the FFCO subject to certain conditions.

Permit Section 2.3 would prohibit the storage of hazardous waste beyond one year from the date that the wastes were first placed into storage at a permitted unit. That storage would be exempt from the requirement if the Applicants demonstrate to the Department that such storage is solely for the purpose of accumulating such quantities of hazardous waste as are necessary to facilitate proper recovery, treatment, or disposal. The FFCO addresses mixed waste where a storage exemption cannot be demonstrated, and treatment or disposal options are not available at an offsite TSDF. The STP is revised occasionally to show wastes that enter and leave the waste inventory. Currently, only a single radioactive source remains in inventory under the provisions of the FFCO, as all other mixed waste previously covered under the FFCO prior to 2010 has been treated in compliance with the storage prohibition in 40 CFR Part 268.

Seismic location standard: Proposed new or enlarged units are subject to the requirement to show compliance with the seismic location standard at 40 CFR §§ 264.18(a) and 270.14(b)(11)(ii). These regulations prohibit location of a new facility closer than 200 feet to a fault that has had displacement in Holocene time. The regulations are applicable only to a "new facility" and are not applicable to currently permitted or interim status units.

Based on information transmitted in the Part B Application for the Facility, the Department has determined that there are no Holocene faults within 200 feet of any of the units proposed for permitting, and furthermore, none of the units to be permitted is a new unit.

Omnibus provision: Under 40 CFR Section 270.32(b) a RCRA permit may contain terms that are more specific than the regulations. As EPA has explained, the intent of Section 270.32(b) is to implement Congress's intent to allow specific tailoring of permit conditions:

> "Congress amended § 3005(c) to provide that each RCRA permit issued shall contain such terms as the Administrator (or the State) determines necessary to protect human health and the environment. The accompanying legislative history indicates a Congressional intent to authorize the Administrator to add permit conditions beyond those specified in the regulations. S. Rep. No. 284, 98th Cong., 1st Sess. 31 (1983). The

> Agency is today implementing this amendment by adding a new subsection to the RCRA regulations, concerning the establishment of permit conditions, § 270.32(b)(2)."
>
> Improvements and changes in control and measurement technology are factors that Congress intended the Administrator to take into account when adding permit terms and conditions as necessary to protect human health and the environment. *Id.* Accordingly, the Administrator has the authority under section 3005(c) to add conditions necessary to protect human health and the environment when reviewing an application for permit renewal. In addition, the Administrator shall consider any changes that may have occurred in operation of the facility since the permit was issued, and other information concerning the impact of the facility on human health and the environment. Section 3005(c) provides that each RCRA permit issued under section 3005(c) shall contain such terms as the Administrator deems necessary to protect human health and the environment. The Congressional intent underlying this amendment is to authorize the Agency to impose permit conditions beyond those mandated by the regulations, such as new or better technologies or other new requirements. S. Rep. No. 284, 98th Cong., 1st Sess. 31 (1983)." EPA, 50 Fed Reg. at 20702, 20722-23 (July 15, 1985).

Additionally, EPA has stated:

> "[O]ne of the most useful purposes of issuing a permit is to prescribe with specificity the requirements that a facility will have to meet, both so that the facility can plan and operate with knowledge of what rules apply, and so that the permitting authority can redirect its standard-setting efforts elsewhere." 45 Fed. Reg. 33290, 33312 (May 19, 1980) (Discussing an earlier, similar provision at 40 CFR § 122.8).

Closure: Closure, under Part 6 of the Permit, would require the Applicants to remove all hazardous wastes from a unit undergoing closure and to ensure that contaminated media (*e.g.,* soils) do not contain concentrations of hazardous constituents greater than cleanup levels specified in Part 8. If the Applicants cannot comply with these conditions, they would have to carry out site-specific controls and post-closure care at the unit.

Land disposal restrictions: The Land Disposal Restrictions (LDRs) are part of the HWMRs. The LDRs prohibit the land disposal of certain hazardous and mixed wastes unless they have been treated to meet regulatory standards. They also prohibit the storage of LDR-prohibited wastes for more than one year unless treatment standards have been met or other exceptions apply. These restrictions are included in the draft Permit. Further, regulations require the waste generator to accompany each shipment of hazardous and mixed waste with a certification as to the characterization of the waste under LDR requirements.

Emergency response: The draft Permit contains a Contingency Plan (Attachment D) which would require the Applicants to implement emergency response when there is a fire, explosion, release of waste that may endanger human health or the environment. The Permit would also require the Applicants to notify the Department of any emergency that calls for implementation of the Contingency Plan.

Permit-as-shield: The permit shield provision in draft Permit Section 1.4, authorized by 40 CFR § 270.4, applies only to activities specifically authorized or addressed by the Permit. This approach means that any waste management not fully disclosed by the permit application, and thus not mentioned in the Permit, will not escape enforcement action if the waste management

activity is in violation of the HWMR. *See* the explanatory OSWER Directive at 1987 WL 417946 (Nov. 19, 1987), calling for limitation of permit shield terms to "those management practices specifically authorized by this permit."

Land conveyance and transfers: The Permit contains conditions that would need to be met before land subject to the requirements of the Permit may be conveyed or transferred. The Applicants would have to give notice, if possible, before the planned conveyance or transfer and describe the status of any investigation or remediation. The Department would then determine whether closure, post-closure, or corrective action efforts are sufficiently protective in light of the intended use of the land and, if not, what further efforts are needed. DOE may be required to restrict future use of the land to those uses consistent with its cleanup level (*e.g.,* industrial use only). A change in the Facility boundary would also require a modification to the Permit. Requirements for conveyance or land transfer are covered under Permit Section 1.20.

Regulation of SNL as a waste generator: SNL generates most of the waste that would be regulated under this Permit at numerous sites throughout the Facility. The process of waste generation is regulated separately from treatment or storage, and a permit to generate hazardous waste is not required Thus, 40 CFR Part 262 regulates hazardous and mixed waste generators, requires the generator to make a hazardous waste determination, and generally limits the duration of storage of waste without a permit to no more than 90 days. It also allows accumulation for longer than 90 days of up to 55 gallons of hazardous or mixed waste or one quart of acutely hazardous or mixed waste at a location near the point of generation. (40 CFR).

§ 262.34. Title 40 CFR Part 263 regulates transporters and requires that any transporter of hazardous or mixed waste must clean up any discharge that occurs during transportation. (40 CFR § 263.31).

Community relations plan: The Permit would direct the Applicants to establish and carry out a community relations plan to inform the nearby communities and members of the public of permit-related activities. In addition, the plan would provide the public a means to give feedback and input to the Applicants.

Information repository: The Permit would require the Applicants to establish an information repository (IR) containing specific documents concerning the issuance and operation of the Permit. The Department considers an electronic index of the IR available through the internet to be more readily accessible and therefore likely to be more utilized. The Department considers the requirement to include particular documents in an electronic index to be easier to enforce because the Department can access an internet-based repository at any time. In any event, the Department maintains a physical copy of information in the IR in its Administrative Record. Content of the IR is specified in the draft Permit in Section 1.17.

E-mail notification: The Permit would require the Applicants to issue e-mail notification of the filing of specified documents that will be of interest to members of the public. Interested persons may enter their e-mail address in a list maintained by the Applicants. When documents are filed, the Applicants will give notice within 30 days to those on the list.

Administrative Record: The Department maintains the Administrative Record (AR) supporting issuance of the Permit. The Administrative Record consists of the Application and all other documents and data considered by the Department in determining whether to issue the Permit

and the terms and content of the Permit. This Record is available for review by any member of the public as provided for in Section B of this Fact Sheet.

P. PART SPECIFIC CONDITIONS

PART 1 -- GENERAL PERMIT REQUIREMENTS

Part 1 contains the following provisions. (Many of these provisions follow the form contained in EPA's model permit for RCRA regulation. *See* **http://www.epa.gov/epawaste/hazard/tsd/permit/sample.htp**).

Permit Section (PS) 1.1 – Authority: The section refers to the statutory authority underlying the Permit, namely: the Hazardous Waste Act (HWA), the Hazardous Waste Management Regulations (HWMR), and the Resource Conservation and Recovery Act (RCRA).

PS 1.2 – **Permittees and Permitted Activity:** This section identifies the Applicants, who would become the Permittees, as the United States Department of Energy (DOE) and Sandia Corporation. It recites that the activities regulated are hazardous and mixed waste management, storage and treatment, closure and post-closure care, and corrective action.

PS 1.3 – **Permit Citations:** This section explains how references to the regulations are generally made throughout the draft Permit. The draft Permit generally cites federal regulations incorporated into the HWMR by reference.

PS 1.4 – **Effect of Permit:** This section contains a permit-shield provision, providing that compliance with the Permit shall constitute compliance with RCRA and HWA as to activities specifically authorized or addressed by the Permit, except for requirements becoming effective by statute after the Permit is issued. The section also states that compliance with the Permit, once effective, does not provide a defense to any order or action brought to enforce the HWA or RCRA and does not constitute an authorization to infringe the rights of others nor relieve the Applicants from their responsibility to comply with all applicable laws. This provision follows the form contained in EPA's model permit for RCRA regulation. (*See* **http://www.epa.gov/epawaste/hazard/tsd/permit/sample.htp**).

PS 1.5 – **Severability:** This section states that if any permit provision is found invalid, the remainder shall not be affected.

PS 1.6 – **Definitions**: Defined terms are stated in this section.

PS 1.7 – **Effect of Inaccuracies in Permit Application:** The section states that the Permit is based upon information in the Part A and B Applications and that any inaccuracies may be grounds for termination, revocation and reissuance or modification of the Permit. Applicants

PS 1.8.1 - **Duration of Permit**: The Permit is effective for a fixed term of ten years. This section is based upon 40 CFR § 270.50(a).

PS 1.8.2 – **Permit Modification**: Modifications are required to comply with the applicable regulations, 40 CFR §§ 270.41 through 270.43.

PS 1.8.3 – **Permit Suspension, Termination and Revocation and Re-Issuance**: The revised draft Permit in this Section refers to applicable regulations concerning suspension, termination, and revocation and reissuance of a permit for cause. *See* 40 CFR §§ 270.41, 270.43.

PS 1.8.4 – **Permit Re-Application**: This section calls for submission of any renewal application at least 180 days before the expiration date of the Permit. This section is based upon 40 CFR § 270.10(h)(1).

PS 1.8.5 – **Continuation of Expiring Permit**: This section states that a timely renewal application maintains the expiring permit in effect until a new permit is effective, on stated conditions. This section is based upon 40 CFR § 270.51.

PS 1.9.1 – **Duty to Comply:** This section would require the Applicants to comply with all conditions in this Permit, except to the extent and for the duration noncompliance is authorized in a temporary emergency permit pursuant to 40 CFR § 270.61.

PS 1.9.2 – **Transfer of Permit**: This section requires Department approval for any transfer of the Permit. Transfer requires modification or revocation and re-issuance. The requirement is supported by 40 CFR § 270.30(l)(3). The transfer of a Facility permit may require filing of a disclosure statement pursuant to 74-4-4.7 NMSA 1978.

PS 1.9.3 – **Need to Halt or Reduce Activity Not a Defense**: This section states that it is no defense to an enforcement action that the Applicants would need to halt or reduce permitted activities in order to comply with the Permit. The requirement is supported by 40 CFR § 270.30(c).

PS 1.9.4 – **Duty to Mitigate**: This section states that in event of noncompliance, the Applicants would need to take all reasonable steps to minimize releases and to prevent adverse effects on health and the environment. The requirement is supported by 40 CFR § 270.30(d).

PS 1.9 – **Proper Operation and Maintenance**: This section states that the Applicants would need to properly operate and maintain all facilities, including effective performance; adequate funding, staffing, and training, and adequate laboratory and process controls. The requirement is supported by 40 CFR § 270.30(e).

PS 1.9.6 - **Duty to Provide Information**: The Applicants would be required to furnish to the Department within a reasonable time any relevant information that the Department may request regarding compliance with or determining possible modification, suspension, termination, or revocation and re-issuance of the Permit. The requirement is supported by 40 CFR § 270.30(h).

PS 1.9.7– **Inspection and Entry**: The Applicants would be required to allow Department representatives to have access to and inspect any facilities regulated under the Permit, to provide records required under the Permit, and to sample and monitor. Access to regulated facilities is subject to reasonable limitations based on protection of human health or the environment Photographs taken by the SNL personnel and provided to the Department within a reasonable time will be considered by the Department to satisfy the requirement to allow the Department to take photographs. The requirement is supported by 40 CFR § 270.30(i).

PS 1.9.8 – **Representative Sampling**: This section would require that all samples and measurements taken by the Applicants under the Permit shall be representative of the medium, waste, or material being sampled. The requirement is supported by 40 CFR § 270.30(j)(1).

PS 1.9.9.1– **Reporting Planned Changes**: This section would require the Applicants to give written notice to the Department of planned physical changes or additions to any permitted unit. The requirement is supported by 40 CFR § 270.30(l)(1).

PS 1.9.9.2 – **Reporting Anticipated Noncompliance**: This section would require the Applicants to give advance written notice of any planned changes or activity that may result in noncompliance with the Permit. The requirement is supported by 40 CFR § 270.30(l)(2).

PS 1.9.9.3 – **24 Hour and Subsequent Reporting**: The Applicants would be required to report to the Department, orally and in writing, any noncompliance that may endanger human health or the environment. The first report is due within 24 hours. The requirement is supported by 40 CFR § 270.30(l)(6).

PS 1.9.9.4– **24 Hour Oral Report**: The Applicants would be required to make an initial report within 24 hours of becoming aware of a noncompliance Elements of the report are stated. The requirement is supported by 40 CFR § 270.30(l)(6).

PS 1.9.9.5 – **5 Day Written Report**: This section would require the Applicants to make a written report within five days after becoming aware of a noncompliance. Elements of the report are stated. If the report is made by e-mail, the same or an updated report is to be submitted within 15 days. The requirement is supported by 40 CFR § 270.30(l)(6)(iii).

PS 1.9.9.6 – **Reports required by the Contingency Plan**: This section would require reporting of information about any implementation of the Contingency Plan pursuant to the reporting requirements required by 40 CFR § 264.56(i), Permit Section 2.13.5.3, and the Contingency Plan.

Emergencies are to be reported as follows:

1. If an assessment indicates that evacuation of local areas may be advisable, he or she are to immediately notify the appropriate local and tribal authorities and are to be available to assist appropriate officials in deciding whether local areas should be evacuated (*see* 40 CFR § 264.56(d)(1)); and
2. Immediately notify the New Mexico Department of Public Safety dispatcher (1-505-827-9329), and the National Response Center (1-800-424-8802) (*see* 40 CFR § 264.56(d)(2)).

PS 1.9.9.7 – **Reports of Other Noncompliance**: This section requires an annual report of all instances of noncompliance not reported under any other section of the Permit. The requirement is supported by 40 CFR § 270.30(l)(10).

PS 1.9.9.8 - **Manifest Discrepancy Report:** This section requires that if a significant discrepancy in a manifest is discovered, the Applicants are to attempt to reconcile the discrepancy. If not resolved within 15 calendar days, the Applicants are to submit a letter report, including a copy of the manifest to the Department. (*See* 40 CFR § 264.72 and 40 CFR § 270.30(l)(7)).

PS 1.9.9.9 - **Unmanifested Waste Report:** This section requires that if the Facility accepts for treatment, or storage unmanifested hazardous or mixed waste from an off-site source, the Applicants are to meet the reporting requirements of 40 CFR § 264.76. (*See* 40 CFR § 270.30(l)(8)).

PS 1.9.9.10 - **Biennial Report:** This section would require the Applicants to submit a biennial report by March 1 of each even numbered calendar year. The report must cover Facility activities during the previous calendar year in accordance with the requirements of 40 CFR § 264.75. (*See* 40 CFR § 270.30(l)(9)).

PS 1.10 - **Admissibility of Data:** This section would require that in any administrative or judicial action to enforce a condition of the Permit, the Applicants are to waive any objection to the admissibility as evidence of any data generated pursuant to the Permit.

PS 1.11 – **Other Information**: This section would require that whenever the Applicants become aware that they failed to submit any relevant facts in a Permit Application, or submitted incorrect information in a Permit Application, or in any report to the Department, the Applicants shall promptly submit such facts or correct information in writing to the Department. (40 CFR § 270.30(l)(11)).

PS 1.12 – **Signatory Requirement**: This section would require signing and certification of submissions. The requirement is supported by 40 CFR §§ 270.11 and 270.30(k).

PS 1.13 – **Compliance Schedule**: The section would direct the Applicants to adhere to the compliance schedules in the Permit. Compliance schedules are authorized by 40 CFR § 270.33(a).

PS 1.14.1 – **Information Submittal**: This section contains directions as to making submissions to the Department.

PS 1.14.2 – **Approval of Submittals**: This section provides that upon the Department's written approval, all submittals and associated schedules shall become enforceable as part of this Permit in accordance with the terms of the Department's written approval (74-4-10(A) NMSA 1978). Such documents, as approved, are to control over any inconsistent requirements of this Permit. This section also states that the document approval process shall be performed in accordance with 20.4.2 NMAC.

PS 1.14.3 – **Extensions of Time**: This section would allow the Applicants to seek an extension of time to comply with a permit requirement. It is supported by the authorization to adopt a compliance schedule. (40 CFR § 270.33).

PS 1.15 – **Confidential Information**: This section would authorize the Applicants to claim that any information submitted to the Department is confidential and should not be made public. This provision is supported by 74-4-4.3(D) and (F) NMSA 1978 and 40 CFR §§ 260.2 and 270.12. However, most information provided under the Permit will be available for public review as required by law.

PS 1.16 – **Reserved**: This section is reserved.

PS 1.17 – **Information Repository**: This section would require that the Applicants establish an information repository. The section lists the documents to be included in the repository, which are important documents relating to the issuance and operation of the Permit. The establishment of an information repository is in accordance with 40 CFR §§ 124.33(c) through (f) and 270.30(m). Section 124.33(c) states "the information repository shall contain all documents, reports, data, and information deemed necessary by the Director to fulfill the purposes for which the repository is established." The documents are to be indexed, and the index searchable. New documents are to be added within 30 days after their submittal to the Department. There are provisions for informing the public of the availability of the repository.

PS 1.18 – **Community Relations Plan**: This section would require the Applicants to set up a community relations plan to inform communities and interested members of the public about permit actions, to seek to minimize disputes, and to receive feedback from communities and

members of the public. This requirement is imposed under the Department's omnibus authority, 40 CFR § 270.32(b)(2).

PS 1.19 – **Dispute resolution**: Permit Sections 1.19.1 through 1.19.4 would provide a process to resolve a dispute concerning the Department's decision on a submittal. Within 30 days after receiving the Department's decision, the Applicants may serve notice of disagreement, with an explanation of the reasons. The parties then have 30 days to meet to resolve the issue. In the absence of agreement, the Department Secretary will issue a final decision on the issue.

The dispute resolution process is not intended to modify a permit but to address a Permittee's concerns about a Department's response to a submittal. Thus, disputes may involve differences in opinion on technical or regulatory matters about reports, plans, proposals, and other submittals and that do not call into question conditions of the Permit. A dispute resolution will not by itself modify the Permit and will not bypass the permit modification procedures.

PS 1.20 – **Real Property Conveyance and Transfer**: The draft Permit contains conditions that must be met in order for land subject to the requirements of the Permit to be conveyed or transferred. The land conveyance/transfer requirements in the Permit apply only to properties within the permitted units. There is a provision in the Consent Order (§ III.Y) that applies to other Facility property.

Under the Permit, the Applicant would give notice before the planned conveyance or transfer and describe the status of any investigation or remediation. The notice must describe the property to be conveyed or transferred, the new owner, and the location on the property of any unit subject to the Permit, including existing solid waste management units or areas of concern that may have undergone corrective action. It must also describe the presence of any known or suspected contaminants (hazardous waste, hazardous constituents) and the status of investigation or remediation. A notice on conveyance must comply with CERCLA § 120(h), 42 USC § 9620(h), and indicate any restrictions on future use of the property.

PS 1.20.1.1 – **Determination of Need for Further Action**: This section states that the Department will determine whether closure, post-closure or corrective action efforts are sufficiently protective in light of the intended use of the property and, if not, what further efforts are needed. The Applicants must advise the new owner of any future obligations as to the property. A permit modification is required to update the new boundary of the Facility.

PS 1.20.1.2 – **Restricted Use**: If cleanup has achieved less than residential-use levels, DOE would be required to include a deed restriction to limit future use of the land to those uses consistent with its cleanup level (*e.g.,* industrial use only).

PS 1.20.1.3 – **Enforceability Against Subsequent Owners**: This section states that the deed covenant required by CERCLA § 120(h)(3)(A)(ii), which warrants that all necessary remedial action has been taken and any further such action shall be taken by the United States, and the deed restriction calling for restricted use, shall be an obligation of the transferee enforceable by the Department and the transferor.

PS 1.20.1.4 – **EPA Institutional Controls Tracking System**: This section states that EPA Region 6 is to be advised of any conveyance of any property subject to the Permit.

PS 1.20.2 – **Transfer of Facility Property to Another Federal Agency**: This section would provide for notice before any transfer of operational control of land subject to the Permit to another federal agency.

PS 1.20.2.1 – **Notice and Meeting:** This Section would require appropriate representatives of DOE to meet with representatives of the Department and the transferee federal entity.

PS 1.20.2.2 – **Department's Determination**

This Section would require that within 60 days after the meeting required under Section 1.20.2.1, the Department will determine whether the closure, post-closure, and any corrective actions implemented by the Applicants with respect to the transferred property are protective of human health and the environment in light of the transferee entity's intended use of the property.

PS 1.20.2.3 – **Contrary Land Use**

This Section would provide that if the Department determines that the transferee entity plans to use, or is using, the subject property in a manner contrary to the use(s) discussed at the meeting described under Permit Section 1.20.2.1, the Department will notify DOE and the transferee entity in writing and arrange a meeting to discuss the issues. The Department reserves the right to take any administrative or judicial action to address the contrary land use.

PART 2 -- GENERAL FACILITY REQUIREMENTS

PS 2.1 - **Design, construction, maintenance and operation**: This section requires that the design, construction, maintenance and operation of each permitted unit be conducted in a manner to minimize the possibility of fire, explosion, or any sudden or nonsudden release. This condition is supported by 40 CFR § 264.31.

PS 2.2.1 – **Permitted Waste**: Permit Section 2.2 limits the Applicants to management of only those wastes listed in Permit Parts 3-5 and Attachment B. No waste is to be managed at the CAMU except waste generated by post-closure care activities.

PS 2.2.2 – **Hazardous and Mixed Waste from Foreign Sources:** This Section would prohibit the Applicants from accepting for storage, treatment, or otherwise managing hazardous and mixed wastes from foreign sources.

PS 2.2.3 – **Hazardous and Mixed Waste from Off-Site Sources**: Permit Section 2.2.3 identifies off-site sources that the Applicants may accept, treat, or otherwise manage waste from at the Facility, specifically:

1. Treatment-derived waste or residues from wastes generated at the Facility, sent off site for treatment at off-site facilities, and subsequently returned to the Facility prior to final disposition off-site.
2. Waste generated by the Applicants as a result of investigation or remediation of a solid waste management unit (SWMU) or area of concern (AOC) listed in Attachment K, Table K-1 (*SWMUs and AOCs Requiring Corrective Action*).
3. Wastes from SNL operations located within the metropolitan Albuquerque area.

PS 2.2.4 – **Restrictions on PCB-Contaminated Waste**: This section would prohibit storage of liquid hazardous or mixed wastes containing PCBs in excess of 50 parts per million, unless such

storage is in compliance with 40 CFR § 761.65(b)(*see* 40 CFR § 268.50(f)) and is for less than one year.

PS 2.3.1 – **Prohibition on Dilution or Aggregation as a Substitute for Treatment**: Section 2.3.1 would prohibit the dilution of waste that is subject to the land disposal restrictions, or its residual, as a substitute for treatment pursuant to 40 CFR § 268.3. It would also prohibit dilution by addition of a solid waste and ineffective treatment that fails to destroy, remove, or immobilize hazardous constituents. It also states that aggregating or mixing wastes in a legitimate treatment process is not prohibited. RCRA § 3004(m) requires that hazardous constituents be destroyed, removed, or immobilized before land disposal. Cases hold that hazardous constituents are not destroyed, removed, or immobilized by simple dilution. *Chemical Waste Management v. EPA,* 976 F.2d 2, 16-20 (D.C. Cir. 1992), *cert. denied,* 507 U.S. 1057 (1993).

PS 2.3.2 – **Documentation of Exclusion or Exemption**: Permit Section 2.3.2 would require that the Applicants place a one-time notice in the Operating Record for any LDR prohibited wastes that the Applicants determine are excluded from the definition of hazardous or solid waste or exempted under 40 CFR §§ 261.2-261.6 after generation. The applicable regulation, 40 CFR § 268.7(a)(7), requires that a generator who determines that he is managing a LDR-prohibited waste that is excluded or exempted after generation must place a one-time notice describing the generation and exclusion or exemption of the waste in the facility's files. Potential exemptions include, for example, (a) addition of adsorbents in containers, (b) wastewater treatment unit, (c) elementary neutralization unit, (d) emergency response, (e) closed recycling unit, evaporator bottoms, among others. Nearly all of the waste managed by the Applicants is generated on site, so that, although the Permit would authorize storage and treatment, the Applicants are also generators, subject to § 268(a)(7), and obligated to make the one-time notice. The notice must be specific to the waste involved and explain the circumstances said to give rise to an exclusion or exemption. Further, since the exemption may arise from events well after generation, it is appropriate to impose the requirement upon the Applicants under their storage and treatment permit. Under this provision, on-site files include files created by Applicants as generator. This permit condition is included to ensure that the Applicants are accurately and comprehensively documenting exemptions.

PS 2.4.1 – **General Waste Characterization Requirements**: This section contains general waste characterization requirements. The Applicants' waste characterization would need to follow (a) 40 CFR § 264.13 (b), Part 2 of the Permit, (c) Attachment C, Waste Analysis Plan, and (d) the requirements of 40 CFR Parts 264 and 268 with respect to information needed to treat, store, or otherwise manage a hazardous and mixed waste. Specific elements of characterization are enumerated as follows to manage and treat waste:

1. EPA hazardous waste numbers;
2. Characterization needed to determine LDR status;
3. Characterization needed to comply with compatibility rules, to prevent impairment of containers, and to prevent ignition or reaction of wastes;
4. Whether the waste contains free liquids; and
5. A description of the waste generation process.

The basis for each of the above 5 elements of characterization are as follows, enumerated in the same order.

1. EPA hazardous waste numbers are required to determine whether the waste is authorized under the Permit.
2. Characterization to determine LDR status is required by 40 CFR § 268.7 as to generators and treatment facilities, and records kept. Characterization for LDR purposes must identify any underlying hazardous constituents for characteristic wastes.
3. Characterization for compatibility purposes is necessary to comply with rules applicable to storage of incompatible wastes for the purpose of safe management such as 40 CFR §§ 264.17, 264.172, 264.177, 264.193(c)(1), 264.199. Characterization to prevent ignition and reaction is necessary to comply with rules applicable to storage of ignitable and reactive wastes for the purpose of safe management such as 40 CFR §§ 264.17, 264.177, 264.198.5.
4. Characterization for free liquids is necessary to comply with rules applicable to storage of wastes containing free liquids in an effort to prevent releases, such as 40 CFR § 264.175(a) and (b).6.
5. Description of the waste generation process is necessary to properly assign hazardous waste numbers and to ensure compliance with the LDR regulations.

Permit Section 2.4.1 would also require use of Department-approved sampling and analysis methods – generally those specified in SW-846, acceptable knowledge, or a combination of the two methods as needed to properly characterize a waste. SW-846 methods are those described in the EPA publication, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (U.S. EPA Publication SW-846), which contains characterization methods that have been approved through a public process. Numerous RCRA provisions call for application of methods contained in SW-846. *See, e.g.,* 40 CFR § §§ 260.11(c)(3), 261.22, 261.24, 268.7. The use of acceptable knowledge is conditioned upon the Applicants' determination that such information provides the data called for by items (1) – (6) above. If such information is insufficient, sampling and analysis would need to be conducted to complete characterization.

Permit Section 2.4.1 would also require that all waste characterization information be kept in the Operating Record as proof that the waste has been or is being properly managed.

PS 2.4.2 – **Sampling and Analysis for Hazardous and Mixed Wastes**: Permit Section 2.4.2 would require that sampling and analysis follow Department-approved procedures, including methods contained in SW-846 and those specified in Permit Attachment C. SW-846 methods are approved by EPA. The requirements that samples be representative of the nature and of the entire volume of a waste, that sampling procedures preserve the original physical form and composition of a waste, and that prevention of contamination and changes in concentration are fundamental principles for obtaining high quality and representative samples.

Permit Section 2.4.2 would also require a quality assurance/quality control (QA/QC) program in accordance with SW-846. The Applicants must retain records of QA/QC procedures and information for purposes of verification and enforceability of this requirement. The condition to analyze method blanks, trip blanks, field blanks, duplicates, and various spike samples identifies specific tests designed to measure the quality of laboratory analysis being conducted under a QA/QC program.

The requirement that any independent contract laboratory operate in accordance with the Permit waste analysis requirements seeks to ensure consistency in characterization methods and quality. Furthermore, Permit Section 2.4.2 would direct, once finalized, the Applicants to submit a written request for permission to use a characterization method other than a SW-846 method in advance of the proposed use in accordance with 40 CFR § 260.21. This requirement is designed to afford the Department the opportunity to analyze the proposal and to compare its effectiveness with the methods already approved.

PS 2.4.3 – **Acceptable Knowledge**: Permit Section 2.4.3 would authorize the Applicants to use acceptable knowledge for waste characterization in addition to, or in place of, sampling and analysis. Such practice is supported by EPA guidance on waste characterization. *Waste Analysis at Facilities That Generate, Treat, Store, and Dispose of Hazardous Wastes—A Guidance Manual*; U.S. Environmental Protection Agency, Research Triangle Park, NC, 1994; EPA-OSWER 9938.4-03. The Permit Section requires acceptable knowledge documentation to include background information assembled and used in the characterization process relevant to the decision to use acceptable knowledge. Further, the Permit Section requires documentation of resolution of any data discrepancies between different sources of acceptable knowledge. Some wastes (*e.g.,* heterogeneous debris) are not amenable to characterization by sampling and are best characterized by acceptable knowledge. Acceptable knowledge is also widely used to characterize explosives wastes. Further, the acceptable knowledge record is to be maintained in form suitable for audit.

PS 2.4.4 – **Waste Characterization Review**: This section would require the Applicants to ensure that the initial characterization of any hazardous or mixed waste is reviewed or repeated according to the frequency established in Permit Attachment C (*Waste Analysis Plan*) to verify that characterization is accurate and up-to-date, as required by 40 CFR § 264.13(b)(4).

PS 2.4.5 – **Wastes Received from Off-Site**: Permit Section 2.4.5 would require that the Applicants obtain from any off-site source that sends waste to SNL characterization information of the waste; the characterization information shall include any acceptable knowledge documentation. Such information is necessary to enable the Applicants to store, treat, or otherwise manage the waste. If Acceptable knowledge is used for the characterization of waste received from off-site, the Applicants would need to require the off-site facility to provide all acceptable knowledge documentation used to characterize the waste. Permit Section 2.4.5 would also require the Applicants to ensure that the waste matches the identity of the waste described in accompanying shipping documents.

PS 2.4.6 – **Treatment-Derived Waste**: Permit Section 2.4.6 would require the Applicants to characterize treatment-derived waste generated onsite. Such requirement is supported by 40 CFR § 268.7(b). Further, the notification and recordkeeping requirements of 40 CFR § 268.7(b)(3)(ii) and the general characterization requirements of Permit Section 2.4.1 would also apply.

PS 2.4.7 – **Procedures to Ensure Compliance with LDR Requirements:** This section would require the Applicants to comply with LDR requirements for wastes through compliant management of wastes subject to LDR storage prohibitions, and through characterization of treated waste for LDR compliance, and preparing applicable LDR certifications and notifications for such treated wastes.

PS 2.4.8 – **Waste Characterization for Compliance with Land Disposal Restrictions**: Permit Section 2.4.8 would require characterization of treatment-generated wastes to meet the Land Disposal Restrictions. The purpose of characterization is to identify any underlying hazardous constituent in a characteristic waste and to ensure compliance with the one-year storage prohibition at 40 CFR § 268.50 and the waste dilution prohibition at 40 CFR § 268.3.

The Applicants would also be required to characterize treatment-derived waste to meet the notification and recordkeeping requirements of 40 CFR § 268.7(b)(3)(ii), the one-time notice rule. Such requirements are directly supported by the regulations. Similarly, the requirement to characterize treatment-derived waste against the criteria in 40 CFR §§ 268.40, 268.45, 268.48, 268.49, 268.7(b)(3)(ii), and 268.2(i) comes directly from the regulations.

PS 2.4.9 – **Waste Characterization for Compliance with RCRA Air Emission Requirements**: Permit Section 2.4.9 would require waste characterization in compliance with 40 CFR Part 264 Subpart CC. It requires a determination of average VOC concentration. The Permit would require annual redetermination of the VOC content and allows use of § 264.1083(a) procedures or acceptable knowledge to determine VOC content. The use of acceptable knowledge to determine VOC concentration is supported by the Department's omnibus authority, 40 CFR § 270.32(b), because in this case there will be many containers that are known to come from waste-generation processes that involve no VOCs. Furthermore, there are exemptions as provided by the regulations:

1. Containers that store mixed waste. (40 CFR § 264.1080(b)(6)).
2. Containers storing wastes with a total capacity of less than 0.1 cubic meters. (40 CFR § 264.1080(b)(2)).

The Applicants would not be required to determine average VOC concentration if pollution control is achieved using container construction specifications and operating requirements of 40 CFR § 264.1086(b).

PS 2.5 – **Waste Minimization Program**: This section would require a waste minimization program to be implemented to reduce the volume and toxicity of hazardous and mixed wastes generated at the Facility as specified at40 CFR § 264.73(b)(9). The requirements are taken from the U.S. EPA's model RCRA Permit, HSWA Module (*see* U.S. EPA letter, Honker to Garcia July 7, 1995), and are similar to requirements in the Applicants' current hazardous waste Permit, under "HSWA module" (Module VIII, Section B.1).

PS 2.6 – **Dust Suppression:** This section would prohibit the Applicants from using waste or used oil or any other material, which is contaminated with dioxin, PCBs, or any other hazardous or mixed waste (other than a waste identified solely on the basis of ignitability), for dust suppression or road treatment (*see* 40 CFR § 266.23(b)).

PS 2.7.1 – **Security**: This section contains security requirements, the purpose of which is to prevent the unknowing entry and minimize the possibility of unauthorized entry of persons or livestock onto permitted units, based on 40 CFR § 264.14(a). Pursuant to 40 CFR § 264.14(b), the section requires a 24-hour surveillance system, or controlled access via gates stations, or other means.

PS 2.7.2 – **Warning Signs**: This section would require warning signs, in accordance with 40 CFR 264.14(c). Signs are to be bilingual in English and Spanish, which exceeds the requirement

of 40 CFR § 264.14(c) (requiring Spanish-language signs for facilities in counties that border Mexico).

PS 2.8 – **General Inspection Requirements**: This section contains general inspection requirements. The first paragraph is taken from 40 CFR § 264.15(a). The next to last paragraph directs implementation of Attachment E (*Inspection Plan*).

PS 2.8.1 – **Inspection Schedule**: This section would require the Applicants to conduct inspections often enough to correct problems before they cause harm to human health or the environment. This requirement comes from 40 CFR § 264.15(a).

PS 2.8.2 – **Repair of Equipment and Structures**: This section would require the Applicants to remedy any deterioration or malfunction of equipment or structure that may cause a hazard. This requirement is taken from 40 CFR § 264.15(c).

PS 2.8.3 – **Inspection Logs and Records**: This section would require inspection logs and records of any remedial actions taken. The language of this section is largely from 40 CFR § 264.15(d). This Permit Section would also require that errors found in an inspection record are crossed out with a single line, initialed, and dated by the individual making the correction. The Department includes this condition to ensure the accuracy of inspection records and to improve enforceability. The requirement to record the results of inspections at § 264.15(d) implies a requirement to keep an accurate record. Identifying changes to that record must include an attribution of the change. The Permit would emphasize the need to rely on the inspection logs at closure to identify past spills or releases. To increase confidence that the log or record is accurate, the Permit must contain specific procedures for altering the log or record.

The section also requires that other actions be recorded in the Operating Record, namely: preventive maintenance, malfunctions of equipment or structure, errors potentially affecting waste containment or Permit compliance, cracks or gaps in floors or base material, discharges of hazardous or mixed wastes, hazardous constituents or fire suppression system, and any occurrences causing or exacerbating contamination.

PS 2.9 – **Personnel Training**: This section imposes the requirements of 40 CFR § 264.16 and refers to Attachment F (*Personnel Training Plan*).

PS 2.10 – **Special Requirements for Ignitable, Reactive, Incompatible Waste**: This section reflects the requirements for the management of ignitable, reactive, and incompatible wastes. The first paragraph refers to 40 CFR §§ 264.17, 264.176, and 264.177, which are applicable regulations. The requirement that containers with ignitable or reactive wastes be located 15 meters from the fence restricting access by non-unit personnel, and at the HWHU, 15 meters from the fence along the facility property line reflects the requirement in 40 CFR § 264.176. The Department believes that the intent of 40 CFR § 264.176 is to ensure that persons unaware of the existence or proximity of ignitable or reactive wastes are kept a safe distance from that waste. In the case of Sandia National Laboratories, the boundaries of a permitted unit indicate limits beyond which personnel and members of the public may be present who are likely to be unfamiliar with the risks presented by the wastes within the unit. Thus, the 15 meter buffer zone should apply generally at the boundary of the permitted units to protect human health and the environment. Listed requirements (1) through (7) are based on 40 CFR § 264.17(b).

PS 2.10.1 – **Ignitable and Reactive Waste Precautions**: This Permit Section calls for several precautions in handling ignitable or reactive wastes to prevent accidental ignition or reaction. Requirements include fire response, clearance around hydrants; inspection, testing and monitoring of fire protection equipment; and compatibility of fire suppression equipment. The Permit Section would also require that the Applicants ensure that appropriate lightning protection is provided. The Department includes this permit condition to better ensure protection of human health and the environment.

PS 2.10.2 – **Incompatible Waste Precautions**: This section contains rules for the separation of incompatible wastes. The first paragraph is based on 40 CFR § 264.177(c). The second paragraph requires that incompatible wastes not be stored within or on the same secondary containment. The presence of incompatible wastes in containers that contain free liquids which may leak or spill into the same secondary containment would create an undue risk. The section also prohibits storage of cyanides with acids if a mixture will generate hydrogen cyanide and storage of corrosive (class 8) liquids near flammable (class 4) or oxidizing (class 5) wastes, except where it is known that mixing would not cause danger fire or dangerous evolution of heat or gas.

PS 2.10.3 - **Presence of Liquids in Containers:** This section would require the Applicants to ensure that containers with free liquids are stored in areas equipped with secondary containment.

PS 2.11.1 – **Required equipment**: This section contains the requirement to maintain equipment for emergency response. The equipment to be maintained is specified in Attachment D (*Contingency plan*). The requirement is a specific application of the provisions at 40 CFR § 264.32 to this facility.

PS 2.11.2 – **Testing and maintenance of equipment**: This section would require testing and maintenance of emergency response equipment. The Applicants are required to test equipment listed in Attachment D, to ensure proper functionality. Such requirement is in accordance by 40 CFR § 264.33. Regular inspections pursuant to Attachment E (Inspection Plan) are required by 40 CFR § 264.15. The Department has added the requirement that nonfunctioning equipment be promptly repaired, consistent with 40 CFR § 264.15(c), which requires repair of any deterioration or malfunction.

PS 2.11.3 – **Access to communications or alarm system:** This section follows 40 CFR § 264.34 and requires that during hazardous and mixed waste management, all personnel must have access to an alarm or emergency communication device.

PS 2.12.1 – **Preventing Hazards in Loading and Unloading:** This section would require the Applicants to operate in safe manner in loading and unloading areas to protect human health.

PS 2.12.2 – **Preventing Runoff or Flooding:** This permit section would require the Applicants to prevent the spread of contamination by preventing run-on and runoff contaminated with hazardous or mixed waste or constituents.

PS 2.12.3 – **Preventing Contamination of Water Supplies**: This section would require the Applicants to clean up hazardous or mixed waste releases promptly. Releases occurring outside buildings shall be contained promptly.

PS 2.12.4 – **Mitigating Effects of Equipment Failure and Power Outages:** This section would require the Applicants, in the event of a power loss or equipment failure at a Permitted

Unit, to place the affected equipment in a safe state, close or cover open containers of hazardous or mixed wastes that are present and to stop operations until power is restored, or take measures to ensure the failure or outage does not affect human health or the environment.

PS 2.12.5 – **Preventing Undue Exposure**: This section would require the Applicants to make provisions for Facility personnel and visitors at Permitted Units and SWMUs/AOCs undergoing corrective action to use appropriate PPE to protect themselves from hazards.

PS 2.12.6 – **Arrangements with Local Authorities**: The section would direct the Applicants to maintain agreements with local emergency response authorities and medical facilities. Requiring such arrangements is authorized by 40 CFR § 264.37.

PS 2.13.1 – **Implementation of Contingency Plan:** This section would direct the Applicants to implement the Contingency Plan (*Attachment D*) on the occurrence of:

1. a release of a hazardous or mixed waste or hazardous constituent that poses a threat to human health or the environment;
2. an explosion; or
3. a fire.

The conditions for implementing the contingency plan do not require that there be a threat to persons off the site of the Facility. The circumstances calling for implementation of the contingency plan parallel those contained in 40 CFR § 264.52(a) and are clearly supported by the regulation.

PS 2.13.2 – **Distribution**: This section requires that copies of the Contingency Plan be kept at each permitted unit, the Emergency Management and Response Office, and in the Operating Record. The Contingency Plan and all revisions and amendments must also be maintained with the entities which the Applicants have mutual assistance agreements. The Department requires complete and up to date versions of the Contingency Plan be kept at each of these locations to better ensure protection of human health and the environment. The Department believes that protection is enhanced and confusion is reduced if each entity reliant upon the Plan is required to have identical versions. This permit section requires dissemination of the Contingency Plan within 15 days of the effective date of the Permit and within 15 days of receipt of any Department approval to a modification of the Contingency Plan. This permit section also requires that all copies of the Contingency Plan distributed outside the Facility be sent by mail or e-mail and to ensure distribution, that a record of compliance with this requirement be maintained in the Facility Operating Record. This permit section also requires evacuation routes for a permitted unit to be prominently posted at each permitted unit.

PS 2.13.3 – **Amendments to plan:** This section requires a review and amendment, if necessary, of the Contingency Plan. Consistent with 40 CFR § 264.54, the Applicants are to review the Contingency Plan and amend the Plan, if necessary, whenever:

1. The Permit is revised;
2. The Contingency Plan fails during an emergency;
3. The Applicants modify a Permitted Unit in either its design, construction, operation, maintenance, or other circumstances in a manner that materially increases the potential for fires, explosions, or releases of hazardous or mixed wastes or hazardous waste constituents;

4. A change in the Permitted Unit design or operation affects the response necessary in an emergency;
5. The Applicants modify the list of Emergency Coordinators;
6. The Applicants modify the list of emergency response equipment; or
7. The Applicants review and evaluate their emergency response resources and capabilities with respect to hazardous or mixed waste management and find deficiencies.

PS 2.13.4 – **Emergency Coordinator:** This section incorporates the requirements of 40 CFR § 264.55, as to the emergency coordinator, who is to be responsible for coordinating emergency response measures relating to hazardous and mixed waste. Further, the Applicants would be required to inform the Department of changes to the Emergency Coordinator designations. Thus, the Applicants would need to keep an up-to-date list of persons designated as Emergency Coordinators. This requirement is imposed under 40 CFR § 264.52(d), which states that the contingency plan must include a list of persons qualified to act as emergency coordinator and this list must be kept up to date.

PS 2.13.5.1 - **Immediate Notifications**: This section implements parts of 40 CFR § 264.56. Building or area personnel are designated to activate the alarm, since the Emergency Coordinator may be at a distant location. Notice to local first responders follows 40 CFR § 264.56(a)(2).

PS 2.13.5.2 - **Hazard assessment**: This permit section states that the Emergency Coordinator is to, in the event of a fire, explosion, or release:

1. As soon as practicable, identify the character, source, amount, and areal extent of any released materials. Possible methods are by observation, review of facility records, or by chemical analysis (*see* 40 CFR § 264.56(b)); and
2. Assess possible hazards to human health or the environment that may result from the release, fire, or explosion, considering both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water runoff from water or chemical agents used to control fire and heat induced explosions). (*See* 40 CFR § 264.56(c)).

PS 2.13.5.3 – **Reporting Emergencies:** This section is based on 40 CFR §§ 264.56(d). The specific matters to be reported follow the list in 40 CFR § 264.56(d)(1) – (2).

In the event that the Emergency Coordinator determines that there has been a release, fire, or explosion that may threaten human health or the environment outside the boundaries of the Facility, he or she is to report the emergencies as follows:

1. If an assessment indicates that evacuation of local areas may be advisable, he or she is to immediately notify the appropriate local and tribal authorities and is to be available to assist appropriate officials in deciding whether local areas should be evacuated (*see* 40 CFR § 264.56(d)(1)); and
2. Immediately notify the New Mexico Department of Public Safety dispatcher (1-505-827-9329), and the National Response Center (1-800-424-8802) (*see* 40 CFR § 264.56(d)(2)).

PS 2.13.5.4 – **Mitigative Measures:** This section is based on 40 CFR § 264.56(e) and states that when the Contingency Plan is implemented under Permit Section 2.13.5, the Emergency

Coordinator is to take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other hazardous or mixed wastes at the Facility. These measures are to include, where applicable, stopping processes and operations, collecting and containing released wastes, and removing or isolating containers.

PS 2.13.5.5 – **Monitoring:** The permit section requires that during an emergency, the Emergency Coordinator utilize available air monitoring resources, as appropriate, to measure and characterize any air emissions caused by a fire, explosion, or release. The Department includes this requirement to improve protection.

In the event that the Facility stops operations in response to a fire, release, or explosion, the Emergency Coordinator is to monitor for leaks, pressure buildup, gas generation, or ruptures in containers, valves, pipes, or other equipment as appropriate.

PS 2.13.6 – **Post-Emergency Procedures:** This section provides that immediately after an emergency in which the Contingency Plan was implemented, the Emergency Coordinator is to provide for the treatment, storage, or disposal of recovered wastes, contaminated soils or surface water, or any other material or contaminated environmental media that resulted from the fire, explosion, or release at the Facility (*see* 40 CFR § 264.56(g)).

The Emergency Coordinator is to ensure that in the affected areas of the Facility:

1. No waste that may be incompatible with the released material is treated, stored, or disposed of in the impacted area until cleanup procedures are completed; and
2. All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed

(*See* 40 CFR § 264.56(h)).

PS 2.13.7 – **Need for Further Corrective Action:** This section states the Department's authority to determine whether a contaminated area has been entirely remediated and whether corrective action is required pursuant to the requirements under Permit Part 8.

PS 2.13.8 – **Notification and Record Keeping**: This section states that the Applicants would need to notify the Department of implementation of the Contingency Plan pursuant to 40 CFR § 264.56(i) and that the conditions of Permit Section 2.13.6 have been met before operations resume.

PS 2.14 – **Record Keeping and Reporting:** This section would require compliance with all record keeping and reporting requirements contained in the Permit and in 40 CFR § 264.73, which contains a list of items to be placed in the Facility Operating Record.

PS 2.14.1 – **Manifest Systems**: This section incorporates the manifest requirements of 40 CFR §§ 264.71, 264.72, and 264.76.

PS 2.14.2 – **Operating Record:** This section requires maintenance of a Facility Operating Record for each permitted unit until the Department has approved closure or, if the unit is subject to post-closure care, the termination of post-closure care Contents of the Operating Record are also specified in this permit section and largely follow 40 CFR § 264.73(b).

PS 2.14.3 – **Availability of Facility Operating Record**: This section would require that the Facility Operating Record and other records will be reasonably made available by the Applicants

for inspection by the Department. This is based upon 40 CFR § 264.74(a) and NMSA 1978 § 74-4-4.3.

PS 2.14.4 – **Record Retention:** This section requires retention of all records during the pendency of any unresolved enforcement action. *See* 40 CFR § 264.74(b).

PART 3 – GENERAL CONDITIONS AND STORAGE PROHIBITIONS

PS 3.1 – PS 3.1.1: The container storage provisions would require, overall, that the Applicants comply with 40 CFR Part 264, Subpart I - Use and Management of Containers and Attachment A, Description. Storage of hazardous and mixed waste containers is limited to the units and capacities shown in draft Attachment J, Table J-1.1, and further limited to those waste numbers listed in Attachment B.

PS 3.2 – **Condition of Containers**: This permit section requires that hazardous and mixed waste containers be in good condition and that waste must be transferred from a container in bad condition to a sound container in accordance with 40 CFR § 264.171.

PS 3.3 – **Acceptable Containers**: This section would limit the Applicants to use storage containers that comply with Subpart I of 40 CFR Part 264.

PS 3.4 – **Compatibility of Waste With Containers**: This permit section requires use of containers or containers with liners that are not incompatible with the wastes stored therein, based upon 40 CFR § 264.172.

PS 3.5 – **Management of Containers**: This permit section provides that:

1. The Applicants are to ensure that containers are kept closed during storage except when waste is added to or removed from the container or when a container's contents need to be repackaged (*see* 40 CFR § 264.173(a)), except as provided in 40 CFR § 264.1086(c)(3). The Applicants are not to open, handle, or store a container holding hazardous or mixed waste in a manner that may rupture the container or cause the container to leak. (*See* 40 CFR § 264.173(b)).
2. The Applicants are to mark containers either with the words "Hazardous Waste" or with other words that identify the contents of the containers.

The Applicants are to ensure that when waste containers are moved during storage, the location of each hazardous or mixed waste and the quantity at each location is documented in accordance with Permit Section 2.12.

PS 3.5.1 – **Storage Configuration and Required Aisle Space:** This section would require the Applicants to maintain adequate aisle space at all times to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment within the permitted units.

PS 3.5.2 - **Outdoor Storage:** This section would require the Applicants to ensure that hazardous and mixed waste containers that are stored outdoors and are not being actively managed are protected from degradation caused by precipitation using weather protective equipment (*e.g.*, secured tarp) or are protected by the design of the equipment.

PS 3.6.1 – **Containers with Free Liquids**: This section provides requirements regarding management of containers holding free liquids, particularly those concerning secondary containment pursuant to 40 CFR § 264.175.

PS 3.6.2 – **Containers that do not Contain Free Liquids:** For containers that do not contain free liquids the Applicants would be required to ensure that the containers are stored in storage areas that are sloped or otherwise designed and operated to drain and remove liquid resulting from precipitation or other liquids (*see* 40 CFR § 264.175(c)(1)).

PS 3.7 – **Inspections:** This section requires inspection of the permitted units for evidence of leaks or deterioration in containment systems, safety equipment, and condition of containers. The requirement follows the language of 40 CFR § 264.174.

PS 3.8 – **Air Emissions**: This section directs that air emissions from containers be controlled in accordance with 40 CFR Subpart CC.

PART 4 -- TREATMENT OF HAZARDOUS AND MIXED WASTES

The purpose of Permit Part 4 is to provide for safe and proper treatment of hazardous and mixed wastes in accordance with the applicable requirements of 40 CFR Parts 264 and 268.

PS 4.1 – **General Conditions**: This section would require the Applicants to conduct treatment of hazardous and mixed waste only at the permitted units identified as utilizing waste process code T04 and specified in Attachment J (*Hazardous Waste Management Units*), Table J-1.2 (*Active Portion of the Facility*), where treatment by a permit is required. The Applicants would be authorized to treat only those hazardous and mixed wastes identified by EPA Hazardous Waste Numbers (*Waste Codes*) listed in Attachment B (*Authorized Wastes*). The Applicants could not treat hazardous or mixed waste in excess of the maximum capacities identified in Attachment J, Table J-1.2.

PS 4.2 – **Department Approval:** This section would direct the Applicants that prior to treatment by any method not specified in this Permit, the Applicants must submit to the Department for its review and approval a detailed treatment plan. The treatment plan is to describe the wastes to be treated, the volume, or weight, of the wastes, the method of treatment, and how treatment efficacy will be verified. Such treatment plans are not to include treatment using tanks, incinerators, boilers, industrial furnaces, surface impoundments, or land treatment unless such plans are submitted as a request to modify the Permit.

PS 4.3 – **Containment Systems:** This section directs the Applicants that containers in which treatment is conducted under this Permit Part 4 shall be subject to the requirements of Permit Section 3.6 (*Containment Systems*).

PS 4.4 – **Physical Treatment:** This section states that hazardous and mixed wastes may be treated physically at the RMWMU and AHCU to reduce waste volume and change the physical character of the waste to make it more amenable to subsequent treatment or storage, or both. This section also states the types of physical treatment that would be allowed.

PS 4.5 – **Macroencapsulation**: This section would authorize the Applicants to perform macroencapsulation in containers. Macroencapsulation consists of completely encasing waste within a polymer coating or concrete, or within a jacket of inert inorganic materials to immobilize wastes by completely surrounding the waste with a leach-resistant coating. Solid

hazardous and mixed waste items, including debris, are treated by macroencapsulation at the RMWMU and AHCU to immobilize hazardous waste constituents.

PS 4.6 – **Stabilization and Solidification**: This section would authorize the Applicants to perform stabilization at the RMWMU and AHCU in containers. Treatment is to take place within a fume hood when possible. Stabilization consists of binding hazardous metals so that the metals become chemically a part of the matrix or are physically bound within the matrix to immobilize toxicity characteristic metals.

PS 4.7 – **Waste Treated by Chemical Deactivation**: This section would authorize the Applicants to perform chemical deactivation of hazardous and mixed wastes at the RMWMU and the AHCU to remove the hazardous waste characteristics of ignitability, corrosivity, and/or reactivity.

PS 4.8 – **Waste Treated by Thermal Deactivation**: This section would authorize the Applicants to treat hazardous and mixed wastes by thermal deactivation. Such wastes are treated to remove the hazardous waste characteristic of reactivity.

PS 4.9 – **Waste Treated by Amalgamation**: This section would authorize the Applicants to treat mixed waste consisting of liquid elemental mercury by amalgamation at the RMWMU to immobilize elemental mercury into a solid, leach-resistant form that has minimal potential for emission of mercury vapor.

PART 5 – TREATMENT BY OPEN BURNING

PS 5.1 – **Authorization of the TTU:** The Permit would authorize the Applicants to treat by open burning hazardous waste at the Thermal Treatment (TTU) located at the northern part of TA-III in accordance with Permit Part 5, 40 CFR Part 264, Subparts X and BB, and 40 CFR § 268.7(b) and the current Open Burn Permit issued by the City of Albuquerque Environmental Health Department.

The Applicants are to provide the Department a copy of its open burn permit issued by the City of Albuquerque by February 1st of each year or within 30 days of receipt of the permit.

The Applicants would be authorized to treat at the TTU only silver acetylide/silver nitrate (SASN) and SASN mixed with only the solid and hazardous wastes identified in Table 5-1 of this Permit Part, and only if these wastes are generated by the Facility operations in Building 6715. Wastes that are not mixed with SASN at the point of generation cannot be mixed with SASN for the purpose of generating a hazardous waste that is authorized for treatment at the TTU.

A burn event encompasses the duration of a burn, and begins upon ignition of the propane fuel that is used to sustain a burn at the TTU, and ends upon deliberate extinguishment of the flame regardless of whether the flame is a result of the burning of propane, waste or both. More than one burn event may take place during treatment operations, and more than one burn event may take place during a given day, subject to the requirements of the Permit.

Treatment operations may last more than one working day, and include all waste management and other activities required to prepare for a burn event(s), the burn event(s), and all waste management and other activities that must be conducted following the burn event(s) to comply with the requirements of the Permit. Treatment operations occur periodically and are initiated when wastes requiring treatment at the TTU are generated in Building 6715. For each treatment

operation, burn events are to be conducted to treat all waste, kick-out, and treatment residues generated during that operation as expeditiously as practicable.

PS 5.2 – **Waste Prohibited From Treatment At The TTU:** This section would limit the Applicants to treat only the waste types contained in Attachment B and Table 5-1 of Permit Part 5. The waste types and amounts are shown in Table 5-1 of Permit Part 5.

PS 5.3 – **Maximum Quantity of Waste to be Treated**: This section describes the maximum amounts of waste to be treated at the TTU per burn event, as shown in Table 5-1 of the Permit. It also indicates the maximum amount of waste that can be treated in a calendar year.

PS 5.4 – **Preventing Exposure:** This section would require the Applicants to conduct treatment on the day waste is loaded at the TTU, subject to the requirements of the Permit. If any conditions arise that prohibit commencement of treatment operations on the day waste is loaded at the TTU, treatment operations shall begin as soon as conditions allow for treatment in compliance with the Permit.

1. Treatment operations are to be conducted on the day waste is loaded at the TTU, subject to the requirements of Permit Part 5. If any conditions arise that prohibit commencement of treatment operations on the day waste is loaded at the TTU, treatment operations shall begin as soon as conditions allow for treatment in compliance with this Permit Part.
2. When wastes are present in the burn pan, the Applicants are to keep the burn pan closed by lowering the lid, except when wastes are being loaded into or unloaded from the pan or when treatment is occurring.
3. The TTU is to be operated remotely during burn events from a control console inside Building 6715. Operating personnel are to observe burn events using a video camera.
4. The TTU is to have a warning bell or buzzer. The sound produced by the warning bell or buzzer shall be louder than the TTU propane burners. Building 6715 or the TTU shall be equipped with a warning light in a visible location for personnel that are hearing impaired.

PS 5.5.1—**Pre-Burn Operations**: This section specifies the activities that are to take place prior to beginning treatment operations. The Applicants are to notify their Emergency Management & Response organization personnel and the Kirtland Air Force Base Fire Department of anticipated treatment operations. Before treatment operations begin, the Applicants are to inspect the TTU burn pad and pan, and its associated equipment, within 24 hours preceding a burn event; inspect the camera located in Building 6715 to ensure it is functional before waste is transferred to the TTU for a burn event; check the area in the vicinity of the TTU immediately preceding burn events to ensure that no unauthorized personnel are present in or around the TTU; ensure that vegetation and other combustible substances within a 50-feet radius of the Burn Pan are removed before conducting any burn events, including keeping the grounds and berms within the perimeter fence clear of dry or dead weeds, or any other combustible substances; and are not to store waste at the TTU prior to treatment operations for longer than 24 hours, except as provided under Section 5.4.1(1) of the Permit.

PS 5.5.2.1 – **General Requirements** (for Treatment Operations): This section requires that no person shall be permitted to enter the TTU fenced area during a burn event, and a minimum of two people shall be present during burn events. Additionally:

1. Gates within the perimeter fence that surrounds the TTU are to be closed and locked during burn events and for a four-hour cool-down period after each burn event to prevent the entry of unauthorized personnel into the area.
2. A sign indicating that a burn event is underway is to be placed on the Building 6715 access gate. The sign is to be on the gate prior to the start of burn events and remain during burn events and during the four-hour cool down period following burn events.
3. A minimum of four hours must elapse between burn events before reuse or inspection of the burn pan.
4. The TTU burn pan is to be covered with the lid except during burn events, during loading or unloading of wastes or treatment residues, or when inspections, maintenance, or repairs are taking place.
5. Only non-sparking tools are to be utilized at the TTU when waste is present.
6. Following a burn event, the TTU Operator is responsible for determining whether or not it is safe to approach the burn pan area. The TTU is to be closed for a minimum of four hours after a burn event before anyone is permitted to approach the burn pan area.
7. All wastes are to be treated on the same day waste is placed into the TTU burn pan, provided that if any conditions arise that prohibit commencement of a burn event, the burn event shall begin as soon as conditions allow for treatment.
8. No fuel other than propane is to be used to support open burning of waste.
9. Treatment operations are not to be conducted if there is an uncontrolled range fire within one mile from the TTU.

PS 5.5.2.2 – **Solid Items**: This section describes how solid items should be handled at the TTU. Authorized solid items, saturated (i.e., wetted or submerged) in water shall be containerized and carried to the TTU burn pan by personnel trained and qualified to manage the waste.

PS 5.5.2.3 – **Liquids**: This section describes how liquids are to be handles at the TTU. It requires that authorized liquids to be transferred to the burn pan through the waste transfer system or hand carried to the burn pan. The operator at the control console in Building 6715 shall operate the pump remotely.

PS 5.5.2.4 – **Hours of Operation:** This permit section requires that burn events at the TTU be initiated only during the time period beginning one hour after astronomical sunrise and ending one hour before astronomical sunset. Burn events may continue beyond sunset as necessary to complete treatment already in progress.

PS 5.5.2.5 – **Weather Conditions:** This permit section requires that Burn events at the TTU shall not be initiated when an electrical storm (with or without precipitation) exists within 10 miles of the TTU, or the following inclement weather conditions;1) sustained winds greater than 20 mph; 2) wind gusts exceeding 35 mph; 3) tornado watches or warnings; 4) snowstorms with visibility less than 2000 feet; 5) rain with accumulation rates greater than 0.3 inches per hour; and 6) hail, sleet, or ice storms.

PS 5.5.3 – **Post-Burn Operations**: The section specifies the activities that are to take place at the conclusion of treatment operations. This section would require that the Applicants operate

the burners for at least 30 minutes after observing evidence that all wastes have been completely combusted. It also describes removal of treatment residues.

PS 5.5.4 – **Management of Treatment Residues** : This section would require that the Applicants clean the burn pan, lid and other waste containment devices of any treatment residues within one working day of a burn event unless another burn event is to take place within one day, or one or more adverse weather conditions as defined in Section 5.5.2.2 is present. It also describes what procedures to follow to handle any untreated waste or waste residue.

PS 5.5.5 – **Alternative Treatment Assessment**: This section requires that the Applicants submit an open burn alternative treatment assessment report to the Department no later than the eighth anniversary of the effective date of the Permit.

PS 5.6.1 – **Accumulated Precipitation:** This section requires that if the burn pan lid is open during precipitation, any standing water in the burn pan is to be removed within one business day of a precipitation event, containerized, characterized in accordance with Permit Attachment C, and managed accordingly. It also requires a hazardous waste determination of water drained from the pad.

PS 5.6.2 – **Mitigation of Spills**: This section would require that spills of solid items on the ground or on the TTU pad be wetted as needed to stabilize any unreacted explosive. Spills of solid or liquids are to be wiped or scooped up and placed in the burn pan or containerized for treatment and disposal.

PS 5.6.3 – **Maintenance and Repair Activities**: This section would require that the Applicants check the surfaces of the burn cage, the pad, and the surrounding area with a portable propane burner before maintenance and repair activities that involve hot work or friction (e.g., cutting, welding, or grinding) to ensure that residual or untreated waste, treatment residue requiring further treatment at the TTU, or kick-out are not present to cause a hazard to workers.

PS 5.7 – **Waste Analysis Plan**: This section would require the Applicants to comply with the requirements of Section 2.4 of Permit Part 2 and Permit Attachment C (*Waste Analysis Plan*) for characterizing wastes to be treated at the TTU.

PS 5.8 – **Run-On and Run-Off Controls**: This section would also require the Applicants to inspect the TTU monthly, and on the day of and prior to treatment, and maintain as necessary, the surface water run-on and runoff control features

PS 5.9 – **Soil Monitoring Requirements**: This section requires a soil sampling and analysis program to monitor for hazardous constituents released to soils during treatment events. The Department requires soil sampling to establish a specific and enforceable application of the 40 CFR § 264.601(b) requirement to prevent any releases that may have an adverse effect to soils or surface waters. The Department also requires this soil sampling to establish existing contaminant levels to use as a basis for future measurements (baseline) and to determine whether conditions constitute acceptable human health. This section requires soil monitoring for the following constituents; silver, SVOCs, polyaromatic hydrocarbons and dioxin/furan compounds.

PS 5.9.1 – **Sampling and Analysis**: This section would require the Applicants to collect soil samples no later than August 1 of each year sampling is required, beginning no later than the first August after the effective date of this Permit. Samples are also to be collected no later than August 1 of the next year (year two) and of years four, seven, and nine after the effective date of

the Permit. Results of the soil sampling are to be compared to the Department's soil screening levels for industrial land use.

PS 5.9.2 – **Reporting of Sampling Results and Risk Assessment**: This section would require the Applicants to apply the risk assessment screening method outlined in the most current New Mexico Soil Screening Guidance (NMED 2012 or current) for assessing the risks to human health. Results are to be reported to the Department by October 1 of each year that sampling occurs.

PART 6 -- CLOSURE

PS 6.1 – **Introduction**: This section contains a general description of the regulatory framework for closure. For the purpose of closure, Permitted Units may consist of structures, equipment, outdoor storage pads and driving surfaces, and environmental media. During closure activities these components of a Permitted Unit are to undergo decontamination and verification sampling unless they are removed from the site at closure.

PS 6.2 – **Closure Performance Standards**: This section states the closure performance standards that are required to be achieved at closure. Permit Section 6.2.1 states the criteria for "clean closure." Permit Section 6.2.1(1) states that all hazardous and mixed waste must be removed to attain closure. Permit Section 6.2.1(2) would require that the Applicants ensure that contaminated environmental media (*i.e.,* soils, groundwater) do not contain concentrations of hazardous waste or constituents greater than the cleanup levels established in accordance with Permit Section 8.4 and 8.5. These cleanup levels address both human health and ecological risk. For soils the human health cleanup levels are to be established based on residential use. For clean closure, the Applicants will also need to demonstrate that there is no potential to contaminate groundwater. Such demonstration requires showing that leaching of contaminants from the vadose zone to groundwater is not going to occur to levels that could exceed a water quality standard.

PS 6.2.2 – **Inability to Achieve Clean Closure**: Further requirements apply in the event that the Applicants are not able to attain clean closure. If the Applicants are unable to achieve clean closure of a Permitted Unit under the provisions of Permit Section 6.2.1, they are to implement post-closure care pursuant to Permit Part 7 and comply with 40 CFR §§ 264.117-264.120. The Applicants are also required to prepare a post-closure care plan and submit the plan to the Department within 90 days from the date that the Applicants or the Department determine that clean closure will not be or has not been achieved. Additionally, prior to the commencement of the post closure period, the Closure Plan is to be amended to implement the procedures that are necessary to meet all of the closure performance standards under Permit Section 6.2.

PS 6.3.1 – **Notification of Closure**: This section would require the Applicants to initiate closure by notifying the Department in writing that a Permitted Unit will undergo closure.

PS 6.3.2 – **Time Allowed for Closure**: This section provides that the Applicants are to complete all closure activities no later than 180 days after initiating closure. However, the time allowed for closure may be extended if an extension is approved by the Department (*see* 40 CFR § 264.113(b)(1) and (2)) or it is necessary to amend the closure plan in accordance with Permit Section 6.6. If a closure plan is to be amended, the Applicants are to complete all closure activities in accordance with the schedule in the Department-approved closure plan, including all amendments.

PS 6.3.3 – **Closure Schedule**: Closure of each Permitted Unit is to comply with the schedule presented in Permit Part 6, Table 6.1 (*Closure Schedule*) and the additional requirements in each Unit-specific closure plan in Permit Attachment G.

PS 6.3.4 – **Removal of Waste**: This section provides that within 90 days of initiating closure at a permitted unit, the Applicants are to remove from the unit all hazardous and mixed waste. This condition is based upon 40 CFR § 264.113(a).

PS 6.3.5 – **Records Review and Structural Assessment**: This section provides that the Applicants are to conduct a records review for and a structural assessment of each permitted unit prior to closure, as follows.

Records Review: The Applicants are to review the permitted unit's Facility Operating Record and as a result of the review, update the list of hazardous constituents in the sampling and analysis plan (SAP), as necessary, to accurately reflect at the time of closure the constituents of concern managed at the unit. In this review, the Applicants are to determine whether any spills or releases, defects, deterioration, or damage has occurred. If the records indicate any such incidents, the Applicants are to include the locations of the incidents for sampling via an updated SAP. This review is necessary as there may be incidents that reflect possible releases to the unit that were not covered in the initial SAP. In addition, operations at the permitted units will continue after the closure plans are submitted; therefore, a full records review must be conducted to evaluate whether a release, or possible release, has occurred since their submission and whether different hazardous waste were stored or treated at the unit since operations began. Such occurrences should be included in an updated SAP, which forms part of the closure plan and is subject to public comment in the amendment process.

Structural Assessment: This section states that a structural assessment is to be conducted to evaluate a permitted unit's physical condition at closure. The Applicants shall notify the Department at least 30 days prior to conducting the assessment to provide the Department the opportunity to participate in the unit's assessment If the assessment reveals any evidence of a release (*e.g.*, stains) or damage (*e.g.*, cracks, gaps), the Applicants are to incorporate their locations for sampling in an updated SAP.

PS 6.3.6 – **Decontamination and Removal of Structures and Equipment**: This section provides that the Applicants are to decontaminate or remove all contaminated structures and equipment. To protect human health and the environment, 40 CFR § 264.114 contemplates appropriate disposal or decontamination of equipment, structures, and soils. In addition, 40 CFR § 264.112(b)(4) also requires that the closure plan contain a detailed description of the steps needed to remove or decontaminate all hazardous waste residues and contaminated containment system components, equipment, structures, and soils. The Department deems the requirements of this Permit Section necessary to effectuate decontamination and disposal and to satisfy the closure performance standards in Permit Section 6.2.

Decontamination: This section provides that the Applicants are to decontaminate by pressure-washing or steam-cleaning the floor, walls, windows, doors, and ceiling (up to 11 feet from the floor) at the unit undergoing closure. The Department's basis for this requirement is found in 40 § CFR 264.112(b)(4). The height of 11 feet was determined based on the historical and permitted practices as to container stacking heights. The height of two 55-gallon drums including two pallets equals approximately eight feet. To ensure the protection of human health

and the environment, an extra 3 feet were added to account for any possible splashing of waste if containers were to fall or otherwise be disturbed. Thus the Department finds the height of 11 feet to be practical and protective.

This section also covers decontamination of equipment and small tools.

Removal: This section states that the Applicants are to ensure that structures and related equipment that cannot be decontaminated are removed. The requirement is supported by 40 CFR § 264.114.

PS 6.3.7 – **Verification Sampling of Structures and Equipment**: The Applicants are to, after decontamination, collect samples to verify that the surfaces of structures and equipment to remain in place at a Permitted Unit have been decontaminated to meet the clean closure criteria specified at Permit Section 6.2.1. The Applicants are to collect the type and quantity of samples at the locations required under Permit Part 6 and as specified in the sampling and analysis plans (SAPs) in the Unit-specific closure plans in draft Attachment G.

Wet-wipe sampling is to be used to verify surface decontamination of structures and equipment and is to be conducted in accordance with Permit Section 6.3.10.1. For all constituents of concern, the clean closure criteria will be considered achieved when wet-wipe sample analyses demonstrate constituent concentrations do not exceed background levels or are shown by risk assessment under a variance (see Permit Section 6.7) that the level of decontamination accomplished is protective of human health and the environment.

If the first-time decontamination verification analysis associated with structures and equipment reveals concentrations that fail to meet the aforementioned criteria, the Applicants are to again decontaminate the associated component and again verify that decontamination. If after two attempts to decontaminate a particular component, verification analysis still fails to meet the aforementioned criteria, the Applicants may petition the Department for a variance under Permit Section 6.7, remove the component from the Facility, or comply with Permit Section 6.2.2.

Except as provided below for volatile organic compounds (VOCs), decontamination verification samples shall be collected and analyzed for all of the constituents of concern listed in the SAP for each of the Permitted Unit-specific closure plans.

To verify decontamination for VOCs, the Applicants may decontaminate the surfaces of structures and equipment a minimum of two times in lieu of conducting sampling and analysis for VOCs.

PS 6.3.8 – **Sampling of Soil and Base Material**: This section states that at closure the Applicants are to sample native soils to determine the presence and concentrations of constituents of concern. Base materials associated with (*i.e.*, located above) a soil sample found to be contaminated are to be considered contaminated, except as provided for asphalt pavement.

Soils are to undergo laboratory analysis to determine concentrations of constituents of concern relative to the clean closure criteria of Permit Section 6.2.1 for environmental media.

Base materials found to be contaminated with constituents of concern are subject to the clean up levels and risk assessment procedures for soil specified at Permit Sections 8.4.3, 8.4.4, and 8.4.5, to determine if they should be removed or otherwise remediated to protect human health and the environment.

If a release of hazardous or mixed waste or a hazardous constituent is discovered in soil or base materials, the Applicants are to abide by the release notification requirements at Permit Section 8.3.3 and the closure plan amendment requirements of Permit Section 6.6.

PS 6.3.9 – **Removal of Contaminated Soil or Base Materials:**

The Applicants are to ensure that soils and base materials that are contaminated with constituents of concern that pose an unacceptable risk to human health or the environment based on the closure performance standards in Permit Section 6.2 are removed. The complete removal of such soil and base materials is to be verified by sampling and analysis.

If removal of the contaminated soil or other environmental media that pose an unacceptable risk to human health or the environment is impracticable, the soil or other environmental media will be subject to corrective action under Permit Section 6.8 and Permit Part 8.

PS 6.3.10 – **Other Methods and Procedures:** This section would require the Applicants to collect and analyze wet-wipe and soil samples and document soil sampling by the procedures described therein.

PS 6.4 – **Closure Plans:** The Unit-specific closure plans are located in Permit Attachment G (*Closure Plans*). Closure plans for the Permitted Units are to include the steps necessary for each Unit to be closed in accordance with Permit Part 6 and 40 CFR §§ 264.112(b)(4), 264.114, 264.178 as applicable, and 264.601 through 264.603 as applicable. Closure Plans are to contain the information specified at 40 CFR § 264.112(b).

PS 6.5 – **Sampling and Analysis Plans**: This section provides the required contents for a sampling and analysis plan (SAP). Each SAP is to verify that all structures and equipment have been decontaminated and whether a release of hazardous waste or constituents to environmental media has occurred. All SAPs are required to include 1) A list of hazardous and mixed waste or hazardous constituents to be sampled and analyzed for; 2) the Site Plan for Decontamination Verification and Soil Samples; 3) The type of samples to be collected (*e.g.*, wipe, soil) at each sampling location; 4) the sampling and analytical methods; 5) the quality assurance and quality control (QA/QC) procedures to be used; 6) A description of methods for decontamination of re-usable sampling equipment; and 7) A description of the management of waste derived from the sampling activities. SAPs are to be designed to obtain representative samples and measurements as required under Permit Section 1.9.8 and 40 CFR § 270.30(j)(1).

PS 6.6 – **Amendment to Closure Plan**: This section states that the Applicants are to submit a permit modification request to seek authorization of a change in the approved closure plan upon the occurrence of events listed in 40 CFR §§ 264.112(c)(2). Amendment is required when new hazardous constituents or sampling locations are to be added to the sampling and analysis plan of the closure plan, or if clean closure cannot be achieved.

PS 6.7 – **Petition for a Variance to Clean Closure Criteria:** This section would authorize the Applicants to seek a variance to the decontamination requirements for organic and inorganic constituents of concern. The purpose is to account for sampling results that are biased high because a substance in the materials used to produce structures or equipment is contributing to the concentrations found in the samples. The Department would consider a risk-based demonstration of attainment if the level of risk for organic and inorganic constituents of concern is based on an unrestricted human exposure scenario.

PS 6.8 – **Corrective Action:** This section would provide that if after removal of contaminated soil or base materials the Applicants find the soil or other materials (*e.g.*, base materials) continue to pose an unacceptable risk to human health and the environment, the Applicants must initiate and conduct corrective action in accordance with Permit Section 8.8.5, and are to amend the applicable closure plan in accordance with Permit Section 6.6 to describe the proposed corrective action.

PS 6.9 – **Waste Generated During Closure**: This section would require that the Applicants manage any structures, equipment, soil, or base materials in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

PS 6.10 – **Closure Report and Certification**: This section would require that the Applicants submit a certification that is signed by them and by an independent New Mexico licensed professional engineer (*see* 40 CFR § 264.115). A closure report and the certification are to be submitted to the Department within 60 days after completion of closure. The report is required to include information on all investigations, the management of remediation waste, decontamination, verification sampling, and results of all chemical analyses and characterization activities. Any variance from the closure plan is to be noted.

PART 7 – POST-CLOSURE CARE

PS 7.1 – **General Provisions for Post-Closure Care:** Permit Part 7 would regulate post-closure care at units that cannot be clean closed or are closed with waste in place. Part 7 principally follows the regulations at 40 CFR §§ 264.117 through 264.120.

PS 7.1.1 – **Post-Closure Care Plan**: This section specifies the content of the post-closure care plan, in accordance with 40 CFR 264.118. The Applicants are to ensure that the post-closure plan identifies all the activities after closure of each Permitted Unit for which clean closure is not achieved, and the frequency of these activities, including but not limited to:

1. A description of the planned monitoring activities and frequencies at which they will be performed to comply with 40 CFR Part 264, Subparts F, N, S, and X;
2. A description of the planned maintenance activities, and frequencies at which they will be performed to ensure, at a minimum:
    a. the integrity of the cap and final cover or other containment systems, if applicable, in accordance with the requirements of 40 CFR Part 264, Subparts F, N, S, and X;
    b. the function of the monitoring equipment in accordance with the requirements of 40 CFR Part 264, Subparts F, N, S, and X;
3. The name, address and phone number of the person(s) or office to contact regarding the unit during the post-closure care period;
4. Sampling and analysis of waste, contaminated media, or both, during the post-closure period;
5. Security requirements during the post-closure period;
6. Inspection requirements, including schedules;
7. Alternative requirements, if any, under 40 CFR § 264.110(c), that apply to the closed unit, or a reference to the enforceable document containing those requirements; and

8. Post-closure plans are to define the beginning date and duration of post-closure care in accordance with this Permit Section 7.1.

PS 7.1.2 – **Amendment of Post-Closure Plan**: At any time during the post-closure care period, the Applicants may submit a written request to the Department to approve a permit modification to amend the requirements of Permit Part 6 or the requirements of an approved post-closure plan. The Applicants are to shall submit a written request for such a permit modification whenever modifications are needed because of changes in regulatory requirements or if modifications are needed to ensure protection of human health or the environment.

The Permittees are to submit a request for a permit modification in accordance with 40 § CFR 264.118(d). The written request is to include a copy of the proposed amended post-closure plan for review and approval by the Department. Such terms directly follow the language of 40 § CFR 264.118(d).

PS 7.2.1 – **Notification Requirements**: This section would require the Applicants to maintain copies of documentation submitted to the local zoning authority. Under 40 CFR § 264.119 the owner or operator must submit to the local zoning authority and to the Department a record of the type, location, and quantity of hazardous waste and hazardous constituents remaining at the permitted unit

PS 7.2.2 – **Record Requirements**: This section would require the Applicants to maintain documentation of closure of the Permitted Units. This section would also require recording of a deed notation or other instrument that is normally examined during a title search that will notify any potential new owners in perpetuity that the land has been used for hazardous waste management, its use is restricted under RCRA regulations, and the survey plat and records of waste management has been filed with the Department. This requirement is supported by 40 CFR § 264.119(b).

PS 7.2.3 – **Completion of Post-Closure Care Requirements**: This section would require the Applicants to submit to the Department, no more than 60 days after completion of post-closure care, a certification that post-closure care was performed in accordance with the post-closure care plan. Supporting documentation is required. This requirement is supported by 40 CFR § 264.120 and 270.32(b)(2).

PS 7.3 – **Post-Closure Care of the CAMU:** This section would require the Applicants to comply with the requirements at 40 CFR § 264.552(e)(6)(v) as well as those in Permit Part 7. As part of the requirements, the Applicants are to conduct the following activities at the CAMU to protect human health and the environment:

1. Maintain the integrity and effectiveness of the final cover by making repairs as necessary to correct the effects of settling, subsidence, erosion, plant or animal intrusion, or other events that compromise the final cover;
2. Maintain and monitor the LCRS and the VZMS as specified herein;
3. Use engineering controls to minimize erosion damage to the final cover from run-on and run-off of surface water;
4. Maintain fencing, security signs, and locks;
5. Maintain training, operating, inspection and monitoring, and other required records; and
6. Submit an annual report to the Department in accordance with Permit Attachment H, Section H.9.

PART 8 - CORRECTIVE ACTION

PS 8.1 – **Corrective Action Requirements under the Consent Order:** This section recites that the Department and the Applicants have agreed to a Compliance Order on Consent (Consent Order) dated April 29, 2004, which is an enforceable document pursuant to 20.4.1.500 NMAC incorporating 40 CFR § 264.90(f), and 20.4.1.900 NMAC incorporating 40 CFR § 270.1(c)(7). The Consent Order requires the Applicants to conduct corrective action at all solid waste management units (SWMUs) and Areas of Concern (AOCs) at the Facility to fulfill the requirements of 40 CFR § 264.101.

PS 8.1.1 – **Integration with Consent Order:** This section would require the Applicants to conduct corrective action under the Permit (or other enforceable document) rather than the Consent Order, in the following circumstances:

1. New releases and newly discovered releases of hazardous waste or hazardous waste constituents from hazardous waste management units at the Facility;
2. At units undergoing closure and post closure care;
3. Implementation of the controls, including long-term monitoring, for any Solid Waste Management Unit (SWMU), Area of Concern (AOC), or hazardous management unit on Attachment K, Table K-3;
4. Releases of hazardous or hazardous constituents that occur or are discovered after the date on which the Consent Order terminates.

(See § III.W.1 of the Consent Order)

The Applicants would be required to conduct corrective action as necessary to protect human health and the environment from any releases of hazardous waste or hazardous waste constituents pursuant to the Permit and in accordance with §§ 74-4-4(A)(5)(h) and (i) and 74-4-4.2(B) of the HWA and Section 3004(u) and (v) of RCRA, 42 U.S.C. § 6924(u) and (v) and 40 C. F. R. Part 264, Subparts F and G. Corrective action for releases from hazardous waste management units that commingle with releases originating from other sources undergoing corrective action under the Consent Order are to be conducted under the Consent Order. Any SWMU or AOC for which corrective action is required that is not subject to corrective action under the Consent Order is to be subject to corrective action under Permit Part 8 and 40 CFR §§ 264.100 and 264.101

PS 8.2.1 – **Identification and status of SWMUs, AOCs and Hazardous and Mixed Waste Management Units:** This section refers to Attachment K, Table K-1 which lists the SWMUs and AOCs at the Facility for which corrective action is required under the Consent Order; and Attachment K, Table K-2 which identifies the SWMUs, AOCs, and hazardous and mixed waste management units for which corrective action is required under the Permit. Table K-1 will be modified as appropriate to include any newly identified SWMUs, AOCs, and releases from management units for tracking purposes. Attachment K, Table K-3 lists the SWMUs, AOCs, and hazardous waste management units for which corrective action is complete with controls. Permit Attachment K, Table K-4 provides a listing of the SWMUs, AOCs, and hazardous waste management units for which corrective action is complete without controls.

PS 8.3.1 – **Corrective Action Beyond the Facility Boundary**: This section would direct the Applicants to conduct corrective action beyond the Facility boundary as necessary to protect human health and the environment. Such action is authorized by 40 CFR § 264.101(c).

PS 8.3.2 – **Off-site Access**: This section would require the Applicants to use their best efforts to obtain access for themselves and for the Department to off-site property that should be subject to corrective action. The requirement for the Applicant is supported by 40 CFR § 264.101(c).

PS 8.3.3 – **Newly Discovered Releases**: This section would require notice to the Department of any newly discovered release of hazardous waste or hazardous constituents. Such notice will enable the Department to determine whether further investigation or corrective action is needed. (*See* EPA Proposed Rule, Corrective Action for Solid Waste Management Units, 55 Fed. Reg. 30789, 30804, 30849 (July 27, 1990 (Subpart S)).

PS 8.3.4 – **Field Activities**: This section would require the Applicants to notify the Department no fewer than15 days in advance of any field activities, such as sampling, so that the Department may participate. Such notice is supported by the draft 40 CFR Part 264 Subpart S at 30810 (calling for a "high level of interaction between the Applicants and the agency").

PS 8.3.5 – **Health and Safety Plans**: This section requires all field activities to be covered by a health and safety plan.

PS 8.3.6 – **Recordkeeping:** This section would require retention of any data assembled in the course of investigating and carrying out corrective action for a minimum period of three years after the end of the operating life of the Facility or of the post-closure care period of any unit affected by the corrective action.

PS 8.4 – **Cleanup Levels**: This section contains the cleanup levels specified by the Department as targets for the conduct of corrective action. The overall human health target risk levels are 10^{-5} for carcinogens and a Hazard Index of 1.0 for non-carcinogens. (See Subpart S at 30825-28). In addition, ecological risk is to be measured in accordance with the Department's published guidance.

PS 8.4.1 – **Groundwater Cleanup Levels**: Contaminant cleanup levels are based, where possible, upon:

1. WQCC groundwater quality standards, 20.6.2.3103 NMAC.
2. Toxic pollutant cleanup levels in 20.6.2.7.WW of 20.4.2 NMAC.
3. Maximum Contaminant Levels (MCLs) adopted by EPA under the Safe Drinking Water Act, 42 USC 300f to 300j-26 or the New Mexico Environmental Improvement Board (EIB), 20.7.10 NMAC.

These cleanup standards are all contained in regulations issued pursuant to public process. See Subpart S at 30800.

The most recent version of the Department's Tap Water Screening Levels listed in Table A-1 of *Technical Background Document for Development of Soil Screening Levels* (as updated) is to be used to establish the cleanup level if either a WQCC standard or an MCL has not been established for a specific substance. In the absence of a Department tap water screening level, the EPA *Regional Screening Levels for Chemical Contaminants at Superfund Sites* (RSLs) for tap water is to be used. If no WQCC groundwater standard or MCL has been established for a

contaminant for which toxicological information is published, the Applicants are to use a target excess cancer risk level of 10^{-5} for carcinogenic substances and a HI of 1.0 for non-carcinogenic substances as the basis for proposing a cleanup level for the contaminant. If the background concentration of an inorganic constituent exceeds the standard then the cleanup level is the background concentration for that specific substance. Any cleanup level based on a risk assessment is to be submitted to the Department for review and approval.

PS 8.4.2 – **Soil and Sediment**: This section specifies that the cleanup level for soils and sediments are to be the levels established under Section 8.4.3 of the Permit. Further, it provides that if the Applicants are unable to attain the stated cleanup levels, they are to conduct a risk assessment pursuant to PS 8.10.4 and 8.10.5.

PS 8.4.3 – **Soil Cleanup Levels:** This section provides that the soil cleanup levels are the soil screening levels specified by the Department based on the risk levels cited in Section 8.4. Where some migration of contaminants may have occurred, the Department may call for use of a dilution-attenuation factor of one, which attributes no impact to dilution or attenuation. Based on the future land use, cleanup may be based on a risk assessment using the risk levels cited in Permit Section 8.4.

PS 8.4.4 – **Cleanup Levels for Polychlorinated Biphenyls**: This section contains the requirement for the Applicants to use as a cleanup level a default concentration of 1 mg/kg total PCBs or the Department's *Risk-based Remediation of Polychlorinated Biphenyls at RCRA Corrective Action Sites* (as updated)).

PS 8.4.5 – **Surface Water Cleanup Levels**: Permit Section 8.4.5 would require the Applicants to comply with the surface water quality standards outlined in the Clean Water 20 Act (33 U.S.C. §§ 1251 to 1387), the New Mexico WQCC Regulations (20.6.2 NMAC), and the State of New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC). The Consent Order contains the same requirement in Section VI.K.3.

PS 8.5 – **Ecological Risk Evaluation**: This section requires that screening for ecological risk is to be conducted using U.S. EPA's ECO-SSLs with the Department approval. The Applicants are to derive a screening level using the methodology in the Department's Guidance for Assessing Ecological Risks Posed by Chemicals: Screening-Level Ecological Risk Assessment (as updated). Ecological risk at each site is to be evaluated in a manner consistent with the Department's Guidance for Assessing Ecological Risks Posed by Chemicals: Screening-Level Ecological Risk Assessment (as updated) and, if appropriate, Assessing Ecological Risks Posed by Radionuclides: Screening-Level Radioecological Risk Assessment (as updated). Provided that any changes to the document are approved in advanced by the Department, procedures in the document Predictive Ecological Risk Assessment Methodology, Environmental Restoration Project, Sandia National Laboratories, NM, developed by SNL may be used instead of the ecological screening levels cited in the guidance above. If no scientifically valid toxicological studies exist for a particular receptor or contaminant, the contaminant and receptor combination are to be addressed using qualitative methods.

PS 8.6 – **Variance from Cleanup Levels**: This section governs applications for variances from cleanup levels.

PS 8.6.1 – **Water Quality Standards**: This section states that the Applicants may seek an alternative abatement standard pursuant to the WQCC regulations, 20.6.2.4103.E and F NMAC.

PS 8.6.2 – **Other Cleanup Levels**: This section provides that the Applicants may present a case to the Department, showing that the attainment of a cleanup level is impracticable. Proposed alternative cleanup levels must be based on a showing of a proposed action and a site-specific risk assessment. Risk assessments are discussed further in Permit Section 8.10.4 through 8.10.6.1.

PS 8.7 – **Permit Modification for Corrective Action Complete**: This section states that the Applicants may seek to move a unit from the listing of "corrective action required" to "corrective action complete", using a Class 3 permit modification.

PS 8.7.1 – **Long-term Monitoring and Maintenance of SWMUs and AOCs**: This section provides that when a SWMU or AOC is classified as Corrective Action Complete with Controls, the Applicants are to present for approval as part of the Class 3 permit modification required by Section 8.7 of the Permit a plan for long-term maintenance and monitoring. Such a plan is to describe any future on-site efforts required, such as maintenance of engineered controls, maintenance of access controls, or continued environmental monitoring of media. The requirement to submit a plan for long-term maintenance and monitoring applies to SWMUs and AOCs undergoing corrective action both under the Permit and under the Consent Order. All long-term maintenance and monitoring plans will be included in the Permit at Attachment M.

PS 8.8 – **Corrective Action Procedures**: This section lays out the procedure for conducting corrective action at sites where a release has occurred. The process includes the following steps:

1. Release assessment report (Permit Section 8.8.1.1).
2. Requirement to Proceed by the Department (Permit Section 8.8.1.2)
3. Interim Measures, where necessary to minimize or prevent migration of hazardous constituents (Permit Section 8.8.2)(see Subpart S at 30838-40).
4. Emergency Interim Measures, where necessary to address an immediate threat of harm (Permit Section 8.8.3; 8.8.4, 8.8.4.1.i - iii).
5. Corrective Action Investigations (Permit Section 8.8.5 through 8.8.5.3)(see Subpart S at 30810-12).
6. Corrective Measures Evaluation (Permit Section 8.8.6 through 8.8.6.7). These provisions require an evaluation of remedy alternatives based upon four threshold criteria:

    a. be protective of human health and the environment;
    b. attain media cleanup standards;
    c. control the source of releases so that further releases are reduced or eliminated to the extent practicable; and
    d. comply with standards for waste management.

    (See Subpart S at 30823). In addition, each remedy alternative is to be evaluated by a balancing approach under the following criteria:

        i. long-term reliability and effectiveness.
        ii. reduction of toxicity, mobility, or volume.
        iii. short-term effectiveness.
        iv. implementability
        v. cost.

(See Subpart S at 30824). The Corrective Measures Evaluation is supported by the EPA draft regulation on corrective measures studies, Subpart S at 30813-14, 30821-23, 30875-77. The Department will select a remedy, publish a Statement of Basis, and receive public comment on a proposed remedy. A public hearing may be held.

7. Corrective Measures Implementation (Permit Section 8.8.7 through 8.8.7.4)(see Subpart S at 30834-36).
8. Remedy Completion (Permit Section 8.8.8 through 8.8.8.1)(see Subpart S at 30837-38).
9. Accelerated Cleanup Process (Permit Section 8.8.9 through 8.8.9.2). The Permit refers in Permit Section 8.8.9 to "presumptive remedies" to be accomplished through an accelerated corrective measures process. "Presumptive remedies are preferred technologies for common categories of sites, based on historical patterns of remedy selection and EPA's scientific and engineering evaluation of performance data on technology implementation." (61 Fed. Reg. at 19430-40)(May 1, 1996). Section 8.8.9 further narrows the application of such remedies to small-scale and relatively simple sites where groundwater contamination is not an issue. The Department would expect that "presumptive remedies" will be used where there is not likely to be any dispute and where the remedy is fully effective and promptly resolves the contamination. See EPA's Guidance documents, *Presumptive Remedies: Policies and Procedures; Presumptive Remedy for CERCLA Municipal Landfill Sites; Presumptive Remedies: Site Characterization and Technology Selection for CERCLA Sites with Volatile Organic Compounds in Soils;* and *Presumptive Remedies for Soils, Sediments and Sludges at Wood Treating Sites.*

PS 8.8.10 – **Well Completion Report**: This section requires well completion reports for each monitoring well or piezometer completed under the Permit. The report is to be submitted to the Department within 90 days of completing installation, and is to include a construction log and diagram, a boring log, and a development log. The construction log and diagram and the boring log are to contain at a minimum the information required under Permit Section 8.11.

PS 8.9 – **Approval of Submittals**: This section references Permit Section 1.14, which provides that all documents required are to be subject to the review and approval procedures described in Permit Section 1.14.

PS 8.10 – **Methods and Procedures**: This section specifies the requirements of work plans, reports and submittals used in conducting corrective action. The site-specific work plans are to include the methods to be used to conduct all activities at each site or unit and are to be prepared in accordance with the format described in the Permit Section 8.12 (*Reporting Requirements*). The Applicants are to provide notification to the Department of field activities a minimum of 15 days prior to commencing the activity.

The methods used to conduct investigation, remediation, and monitoring activities are to be sufficient to fulfill the requirements of the Permit and to provide accurate data for the evaluation of site conditions, the nature and extent of contamination and contaminant migration, and for remedy selection and implementation, where necessary. The methods presented are minimum requirements for environmental investigation and sampling, and are not intended to include all methods that may be necessary to fulfill the requirements of the Permit. In cases where alternative methods are required due to site conditions, such methods are to be specified in a site-specific work plan or other plan approved by the Department. The methods for conducting investigations,

corrective actions, and monitoring at the Facility are to be determined based on the conditions and contaminants that exist at each site or unit.

PS 8. – **Monitoring Well Construction Requirements**: This section discusses the installation and abandonment of monitoring wells. Permit Section 8.11 follows Consent Order § VIII (Monitoring Well Construction Requirements). The overall requirement is that the drilling method allow for the collection of representative groundwater samples.

PS 8.12 – **Reporting Requirements**: This section outlines the requirements for Applicants to provide reports that contain detailed information concerning the results of investigations, corrective actions, monitoring, risk assessments, and corrective measures evaluations using the formats contained in Permit Section 8.12.

NEW MEXICO ENVIRONMENT DEPARTMENT

Hazardous Waste Bureau

2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
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FACT SHEET / STATEMENT OF BASIS
Sandia National Laboratories
Proposal for Corrective Action Complete Status

for

24 Solid Waste Management Units / Areas of Concern

(RCRA Permit No. NM5890110518)

September 17, 2012

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ACRONYMS AND ABBREVIATIONS

AOC	Area of Concern
AT&T	American Telephone and Telegraph
bgs	below ground surface
CAC	Corrective Action Complete
CEARP	Comprehensive Environmental Assessment and Response Program
COA	City of Albuquerque
COC	constituent of concern
COPECs	constituents of potential ecological concern
cy	cubic yard(s)
DCG	derived concentration guidelines
DOE	U.S. Department of Energy
DSS	drain and septic systems
EB	equipment blank
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
FPTS	Flyer Plate Test Site
ft	foot (feet)
gpd	gallon(s) per day
GS	Gore-Sorber™
HE	high explosives
HI	hazard index
HQ	hazard quotient
HSWA	Hazardous and Solid Waste Amendments
HWB	Hazardous Waste Bureau
J	estimated value
KAFB	Kirtland Air Force Base
kg	kilogram(s)
L	liter(s)
LECS	Liquid Effluent Control System
LWDS	Liquid Waste Disposal System
MDA	minimum detectable activity
MDL	method detection limit
mg/kg	milligram(s)/kilogram
mrem/yr	millirem(s)/year
µg/kg	microgram(s)/kilogram(s)
NFA	no further action
NMAC	New Mexico Administrative Code
NMSA	New Mexico Statutes Annotated
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
NOD	Notice of Deficiency
P1VCA	Phase 1 Voluntary Corrective Action
P2VCA	Phase 2 Voluntary Corrective Action
PCB	polychlorinated biphenyl

pCi	picocurie(s)
pCi/g	picocurie(s)/gram
ppbv	parts per billion by volume
PSL	Physical Science Laboratory
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RMMA	Radiological Materials Management Area
RPSD	Radiation Protection Sample Diagnostics
RSI	Request for Supplemental Information
SAP	Sampling and Analysis Plan
SEM	scanning electron microscope
SERF	Sandia Engineering Reactor Facility
SNL	Sandia National Laboratories
SVOC	semivolatile organic compound
SWMU	Solid Waste Management Unit
TA	Technical Area
TAG	Tijeras Arroyo Groundwater
TB	trip blank
TCE	trichloroethene
TCLP	toxicity characteristic leaching procedure
TDD	telecommunications device for the deaf
TEDE	total effective dose equivalent
TPH	total petroleum hydrocarbons
TTY	telephone typewriter or teletypewriter
UCL	upper confidence limit
USFS	U.S. Forest Service
UXO	unexploded ordnance
VCM	voluntary corrective measure
VOC	volatile organic compound
XRF	x-ray fluorescence
yd	yard(s)

FACT SHEET / STATEMENT OF BASIS

Proposal for Corrective Action Complete Status for

24 Solid Waste Management Units / Areas of Concern

Sandia National Laboratories, EPA ID No. NM5890110518

Under the authority of the New Mexico Hazardous Waste Act, NMSA 1978, § 74-4-1 et seq., and the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC, the New Mexico Environment Department (Department) may approve or deny hazardous waste permits, closure plans, permit modifications, and amendments. Pursuant to this authority the Department intends, pending public input, to approve corrective action complete (CAC) status for 24 Solid Waste Management Units (SWMUs)/Areas of Concern (AOCs) at the Sandia National Laboratories Facility (SNL or the Facility). Each of the SWMUs/AOCs proposed for CAC status was addressed in one or more of the following permitting requests from the U.S. Department of Energy (DOE) and Sandia Corporation (Permittees): a March 14, 2006, permit modification request regarding 26 SWMU/AOCs; a January 7, 2008 request regarding 5 additional SWMUs/AOCs; and a March 16, 2012 request regarding one additional SWMU. (The number of SWMUs/AOCs involved in this present permitting action does not total 32 because three have been acted on separately as explained below, and five are undergoing additional characterization requested by the Department). These permit modification requests are subject to 20.4.1.900 NMAC, incorporating 40 CFR 270.42(c), and 20.4.1.901 NMAC. The SWMUs/AOCs are listed in the Hazardous and Solid Waste Amendments (HSWA) Corrective Action Module IV, which is part of the Permittees' current Resource Conservation and Recovery Act (RCRA) Hazardous Waste Facility Permit (NM5890110518) issued in 1992.

The Department is also issuing for public comment on this same date a revised draft Hazardous Waste Facility Permit (draft Permit) which, when finalized, would authorize the Permittees to manage, treat and store hazardous and mixed waste at the Facility. A fact sheet concerning the draft Permit is available separately from the Department through the contact procedures indicated in Sections D and H of this Fact Sheet/Statement of Basis. The draft Permit, when finalized, will replace in full the Hazardous Waste Facility Permit for SNL issued in 1992. Approval or disapproval of CAC status for the 24 SWMUs/AOCs will be tracked in the new Hazardous Waste Facility Permit (specifically, in Attachment K of that permit).

On December 10, 2007, the Department issued a public notice proposing to grant CAC status for 26 SWMUs/AOCs through a Class 3 modification of the 1992 permit. The public comment period for this action ended February 8, 2008, and the Department received public comments and a request for a public hearing. The Department granted CAC status for three SWMUs/AOCs on July 27, 2012, which were not opposed by the public, but has not made a final decision for the other SWMUs/AOCs which may be subject to a public hearing. As required by 20.4.1.901.A (4) NMAC, the Department, in conjunction with the Permittees, has attempted since February 2008 to resolve the issues giving rise to opposition to granting CAC status for the other 23 SWMUs/AOCs.

Twenty of the 26 SWMUs/AOCS addressed by the public notice of December 10, 2007, are again included in the current proposal to grant CAC status. NMED has determined that three

SWMUs/AOCs will require additional characterization; therefore those three SWMUs/AOCs are not included in the current proposal.

Persons who provided public comment by the February 8, 2008 deadline do not need to resubmit their comments, and may submit additional comments concerning any of the 24 SWMUs/AOCs currently being proposed for CAC status. However, those who requested a public hearing by the February 8, 2008, deadline must request a hearing again in accordance with the procedures described below in Section F under the heading *Public Participation* if they still desire that a public hearing be held concerning one or more of the SWMUs/AOCs currently proposed for CAC status.

Anyone who has not previously submitted comments during the comment period ending February 8, 2008, may submit comments or request a hearing regarding the 24 SWMUs/AOCs currently being proposed for CAC status by following the procedures under the heading *Public Participation.*

Since December 2007, the Permittees have requested that an additional six SWMUs/AOCS be considered for CAC status. The Department has not previously issued a notice for public comment concerning these six SWMUs/AOCs. Of the six SWMUs/AOCs, four are included in the current proposal to grant CAC status; these are SWMUs 28-2, 105, LTES-1 and AOC 1101 (two of the six are among the five SWMUs/AOCs for which the Department has requested additional site characterization). Anyone wishing to comment on these four SWMUs/AOCs or request a hearing in relation to these sites must follow the procedures under the heading *Public Participation.*

The Department is proposing that for some of the SWMUs/AOCs that the Permittees be required to maintain administrative and physical controls (Corrective Action Complete with Controls). Those SWMUs/AOCs will be addressed in Attachment M of the draft Permit mentioned above, once that Permit becomes effective. Examples of such controls include posting signage, conducting inspections, restricting future land use, and annual reporting. One SWMU (SWMU 52) was originally categorized in error as requiring an industrial land use control in the December 2007 public notice but is now listed in the draft Permit as not requiring any controls. Additionally, the Department proposes that the Permittees will no longer have to conduct annual groundwater monitoring at SWMUs 49 and 116 (required by the NMED as a control in a letter of April 8, 2010) because definitive evidence of groundwater contamination was not detected in eight quarters of monitoring. Thus, a groundwater control requirement will not be found for SWMUs 49 and 116 in Attachment M of the draft Permit.

All of the AOCs subject to this permit modification request are also properly classified as SWMUs. The AOC designation in some of the names of the SWMUs is retained in this document as a matter of maintaining consistency with the names listed in the Facility's current Permit tables.

A. Facility Description

Sandia National Laboratories is located within the boundaries of Kirtland Air Force Base south of and adjacent to the city of Albuquerque in Bernalillo County, New Mexico. SNL is a multi-purpose engineering and science laboratory owned by the U. S. Department of Energy (DOE) and operated by Sandia Corporation, a subsidiary of Lockheed Martin. The DOE and Sandia Corporation are collectively referred to as the "Permittees".

SNL designs components for the nation's nuclear weapons, designs and tests conventional military weapons, performs a wide variety of energy research and development projects, and works on assignments that respond to national security threats. As a result of its testing and research activities, SNL generates solid wastes and hazardous, radioactive, and mixed wastes (those wastes containing both hazardous and radioactive components). From 1945 to 1988, hazardous, mixed, and solid wastes were disposed or released of at SNL at numerous locations which have been classified by the Department as SWMUs or AOCs. The SWMUs and AOCs include landfills, drainfields and seepage pits, outfalls, waste piles, and test areas.

The mailing address for Sandia Corporation is 1515 Eubank SE, Albuquerque, New Mexico 87123. The Sandia Site Office of the U. S. Department of Energy (DOE)/ National Nuclear Security Administration (NNSA) is located at KAFB-East, Pennsylvania and H Street, P.O. Box 5400, Albuquerque, NM 87185. The Facility's primary contact for this action is: Mr. David Rast, DOE/NNSA, P.O. Box 5400, Albuquerque, NM 87185.

B. Background

Under the 1984 Hazardous and Solid waste Amendments (HSWA), the U.S. Environmental Protection Agency (EPA) issued Module IV to Permittee's RCRA Hazardous Waste Facility Permit, effective August 26, 1993. Module IV required investigation and corrective action at approximately 200 Environmental Restoration (ER) sites (referred to as SWMUs/AOCs in the Permit and draft Permit). On January 2, 1996, the Department received authorization from the EPA for corrective action and became the administrative authority for this action.

This Statement of Basis describes 24 SWMU/AOCs for which the Permittees are seeking CAC status. Table 1 lists the SWMU/AOCs included in the current proposal to grant CAC status. Some SWMUs/AOCs are referred to as ER Sites in older documentation.

Currently, Table A.1 of Module IV of the Permittees' Hazardous Waste Facility Permit lists SWMU/AOCs where corrective action is necessary to characterize and/or remediate past releases of hazardous wastes or hazardous waste constituents. Additionally, in the current Hazardous Waste Facility Permit Module IV, Table A.2 lists SWMU/AOCs for which corrective action is not required. Table A.1 corresponds to Table K-1 of Attachment K of the draft Permit. Table A.2 has been replaced by Tables K-3 and K-4 in the draft Permit. Table K-3 lists SWMUs/AOCS where corrective action is complete with controls; Table K-4 lists SWMUs/AOCS where corrective action is complete without controls. (Table K-2 is reserved for SWMUs/AOC requiring corrective action under the permit, of which there are currently none). As indicated above, controls for each SWMU/AOC for which controls are required are found in Attachment M of the draft permit.

If approved in full, the proposed modification would grant CAC Status for the 24 SWMU/AOCs. Based on public comment, it is possible that CAC status will not be approved for some of the SWMU/AOCs. If any SWMU/AOCs are not approved for CAC status, their names will remain listed on Table K-1. If some or all of the 24 SWMU/AOCs are approved for CAC status, the listings of the approved SWMU/AOCs would be transferred to Tables K-3 and K-4.

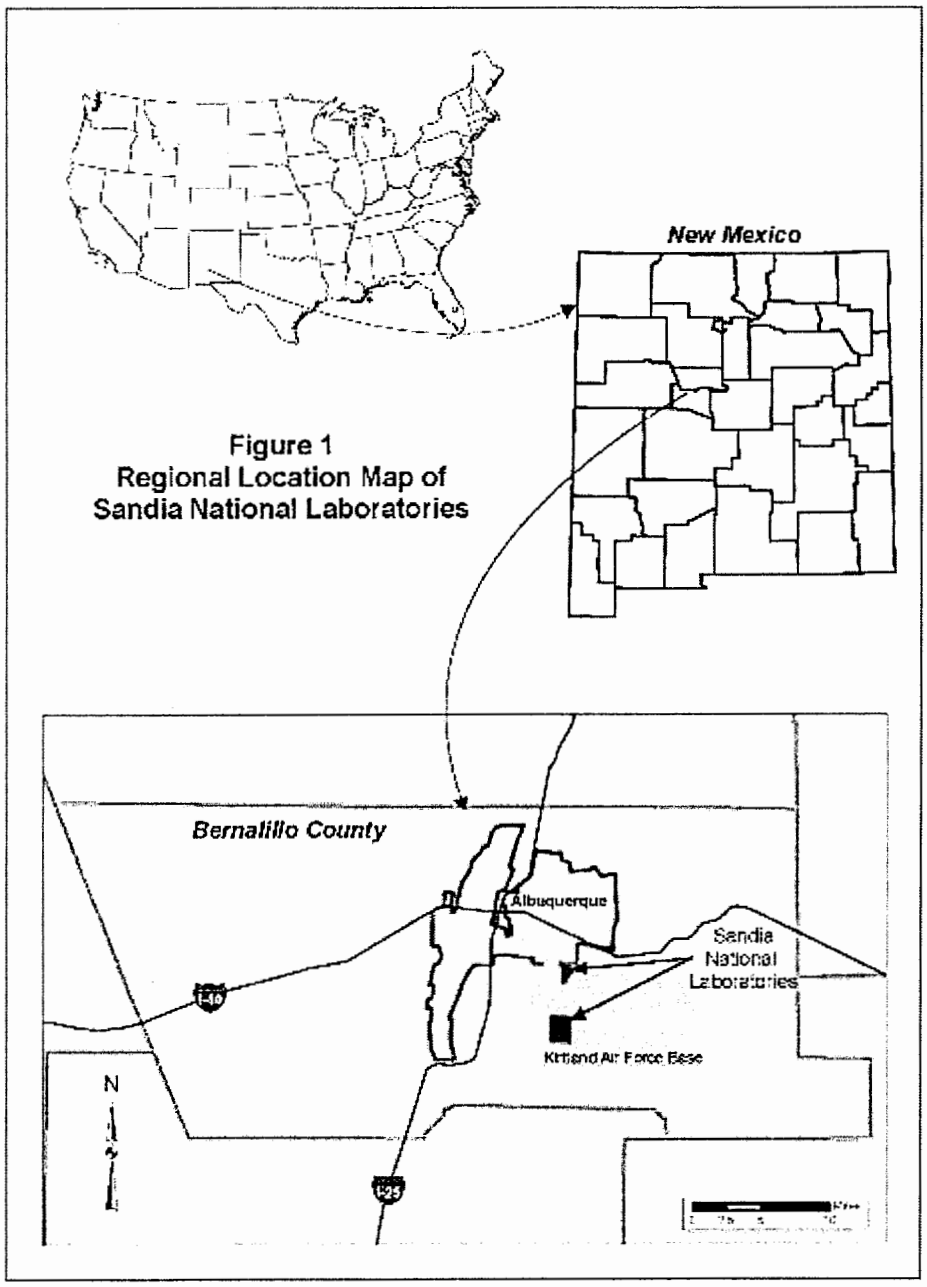


Figure 1
Regional Location Map of
Sandia National Laboratories

Table 1
List of SWMUs/AOCs

Index No.	SWMU/ AOC Number	OU
1	4	1307
2	5	1307
3	28-2	1332
4	46	1309
5	49	1295
6	52	1307
7	91	1335
8	101	1295
9	105	1306
10	116	1295
11	138	1295
12	140	1295
13	147	1295
14	150	1295
15	161	1295
16	196	1306
17	1090	1295
18	1094	1295
19	1095	1295
20	1101	1295
21	1114	1295
22	1116	1295
23	1117	1295
24	LTES 1	1306

Section I, below, briefly describes the location, history, evaluation of relevant information and the basis for determination for each of the 24 SWMU/AOCs proposed for CAC. More detailed descriptions of the particulars for each SWMU/AOC can be found in the original RCRA Facility Investigation Report or other reports for each SWMU/AOC.

C. Investigation and Remediation

The Department has developed CAC criteria that are used during the investigation and remediation (if necessary) of SWMU/AOCs and that are used to determine the appropriateness of proposing CAC for any particular SWMU/AOC. In this case, it was determined that each of the SWMU/AOCs were characterized and remediated (if necessary) in accordance with current applicable state and/or federal regulations, and confirmatory data indicate that any remaining contaminant concentrations pose acceptable levels of risk to human health and the environment under current and projected future land uses (Criterion 5, see Section E below).

D. Administrative Record

The Administrative Record for this proposed action consists of the three SNL Permit modification requests, this Fact Sheet/Statement of Basis, the Public Notice, RCRA Facility Investigation Report and other reports for each SWMU/AOC, Tables A.1 and A.2 of the current Permit, and Attachments K and M of the draft Permit. The complete Administrative Record may be reviewed at the following location during the public comment period with prior appointment:

NMED – Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
(505) 476-6000
Monday - Friday from 8:00 a.m. to 5:00 p.m.
Contact: Pam Allen

A copy of this Fact Sheet/Statement of Basis, the Public Notice, and Attachments K and M of the draft Permit are available electronically on the NMED website at: www.nmenv.state.nm.us/HWB/snlperm.html under No Further Action or may be reviewed at the following location during the public comment period with prior appointment:

NMED-District 1 Albuquerque Office
5500 San Antonio NE
Albuquerque, New Mexico 87109
(505) 222-9551
Monday - Friday from 8:00 a.m. to 5:00 p.m.
Contact: William Moats

Any person seeking additional information may also contact:

Mr. John E. Kieling, Chief
Hazardous Waste Bureau - New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg 1
Santa Fe, New Mexico 87505-6303
E-mail: john.kieling@state.nm.us
Telephone: (505) 476-6000
Fax: (505) 476-6030

To obtain a copy of the Administrative Record or a portion thereof, please contact Ms. Pamela Allen at (505) 476-6000, or at the Santa Fe address given above. NMED will provide copies, or portions thereof, of the Administrative Record at a charge to the requestor.

E. Corrective Action Complete Criteria

CAC status may be proposed based upon one or more of the following: field surveys, historical records, aerial photographs, employee interviews and/or confirmatory sampling results that indicate that there has not been a release of hazardous wastes or constituents to the environment or that the release does not pose a significant risk to human health or the environment. The criteria to propose a SWMU/AOC for CAC are:

1. The SWMU/AOC cannot be located, does not exist, is a duplicate SWMU/AOC, or is located within—and, therefore, investigated as part of—another SWMU/AOC.
2. The SWMU/AOC has never been used for the management (that is, generation, treatment, storage, or disposal) of RCRA solid or hazardous wastes and/or constituents or other Comprehensive Environmental Response, Compensation and Liability Act hazardous substances.
3. No release to the environment has occurred nor is likely to occur in the future. The term "release" includes any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping or disposing of hazardous wastes (including hazardous constituents) into the environment.
4. There was a release but the site was characterized and/or remediated under another authority that adequately addressed corrective action, and documentation such as a closure letter is available.
5. The SWMU/AOC has been characterized or remediated in accordance with current applicable state and/or federal regulations and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

F. Public Participation

NMED issues this public notice on **September 17, 2012** to announce the beginning of a 60-day comment period that will end at **5:00 p.m. MST, November 16, 2012**. Any person who wishes to comment on this action or request a public hearing should submit written or electronic mail (e-mail) comment(s) with the commenter's name and address to the respective address below. Only comments and/or requests received on or before **5:00 p.m. MST, November 16, 2012** will be considered.

John E. Kieling, Chief
Hazardous Waste Bureau - New Mexico Environment Department
2905 Rodeo Park Drive East, Bldg 1
Santa Fe, NM 87505-6303
Ref: SNL – CAC Status 2012
E-mail: john.kieling@state.nm.us
Ref: Draft SNL Permit

Written comments should include, to the extent practicable, all referenced factual materials. Documents in the Administrative Record need not be re-submitted if expressly referenced by the commenter. Requests for a public hearing shall provide: (1) a clear and concise factual statement of the nature and scope of the interest of the person requesting the hearing; (2) the name and address of all persons whom the requestor represents; (3) a statement of any objections to the draft Permit, including specific references to any conditions being addressed; and (4) a statement of the issues which the commenter proposes to raise for consideration at the hearing. Written comment and requests for public hearing must be filed with Mr. John Kieling on or before **5:00 p.m. MST, November 16, 2012**. NMED will provide a thirty (30) day notice of a public hearing, if scheduled.

Persons having a disability and requiring assistance or auxiliary aid to participate in this process should contact Connie Joseph at the New Mexico Environment Department, Human Resources Bureau, P.O. Box 5469, 1190 St. Francis Drive, Santa Fe, New Mexico, 87502, telephone number: (505) 827-9769. TDY users please access her number via the New Mexico Relay Network at 1-800-659-8331.

G. Next Steps

All written comments submitted will be considered in formulating a final decision and may be cause for revisions. The Department will respond in writing to all public comments. This response will specify which provisions, if any, have been changed in the final decision and the reasons for the changes. All persons presenting written comments or who requested notification in writing will be notified of the decision by mail. The response will also be posted on the Department's website.

After consideration of all written public comments received and all data, views, and arguments presented at the public hearing, if one is held, NMED will issue, or modify and issue, the Permit indicating which SWMUs/AOCs have been approved for CAC status. The Permittees shall be provided by mail a copy of any relevant modified documents and a detailed written statement of reasons for the modifications.

The Secretary of the New Mexico Environment Department will make the final decision publicly available and shall notify the Permittees by certified mail. The Secretary's decision shall constitute a final agency decision and may be appealed as provided by the HWA. *See* NMSA 1978, § 74-1-14.

The final decision will become effective thirty (30) days after service of the decision to the Permittees, unless a later date is specified or review is requested under the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC, Section 901.F, *Hearings*.

H. Contact Person for Additional Information

For additional information, contact:

John E. Kieling, Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Ref: SNL – CAC Status 2012
Email: john.kieling@state.nm.us
Telephone: (505) 476-6000
Fax: (505) 476-6030

I. Description of SWMUs and AOCs Proposed for CAC

SWMU 4, LWDS Surface Impoundments/Liquid Disposal System

Site Location

SWMU 4, the Liquid Waste Disposal System (LWDS) Surface Impoundments, is located northwest of TA-V (Figure 2). The LWDS consisted of three individual SWMUs including SWMU 52, the Holding Tanks; SWMU 5, the Drainfield; and SWMU 4, the Surface Impoundments (Figure 3).

Evaluation of Relevant Information

SWMU 4 site investigation began in 1992 and included a surface radiation survey, organic vapor surveys and extensive surface soil sampling. A 10- by 10-yard (yd) grid was established and surface soil samples were collected from the center of each 10- by 10-yd square. Additional samples were collected from the surface and at a depth of 1 foot (ft) at the drainage outfalls. Soil samples were analyzed at an off-site laboratory for volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), PCBs, metals and radionuclides.

In 1992 five soil boreholes (LWDS-04-BH01 through LWDS-04-BH05) were advanced from 85 to 100 ft below ground surface (bgs) around the surface impoundments. In 1994 four more soil boreholes (LWDS-04-BH09, LWDS-04-BH10, LWDS-04-BH17 and LWDS-04-BH18) were advanced within the surface impoundments. Continuous core was collected from all the boreholes. Soil samples were collected at approximately 5-ft intervals and analyzed for metals, VOCs, SVOCs, PCBs, tritium and radionuclides by gamma spectroscopy.

In 1992, groundwater monitor well LWDS-MW2 was installed north of the impoundments to a total depth of 531 ft bgs and screened between 506 to 526 ft bgs. This monitor well is part of the TA-III/V monitor well network and is sampled on a regular basis. Continuous core was collected from the borehole for the monitor well. Soil samples were collected at approximately 5-ft intervals and submitted for laboratory analysis for VOCs, SVOCs, metals and radionuclides.

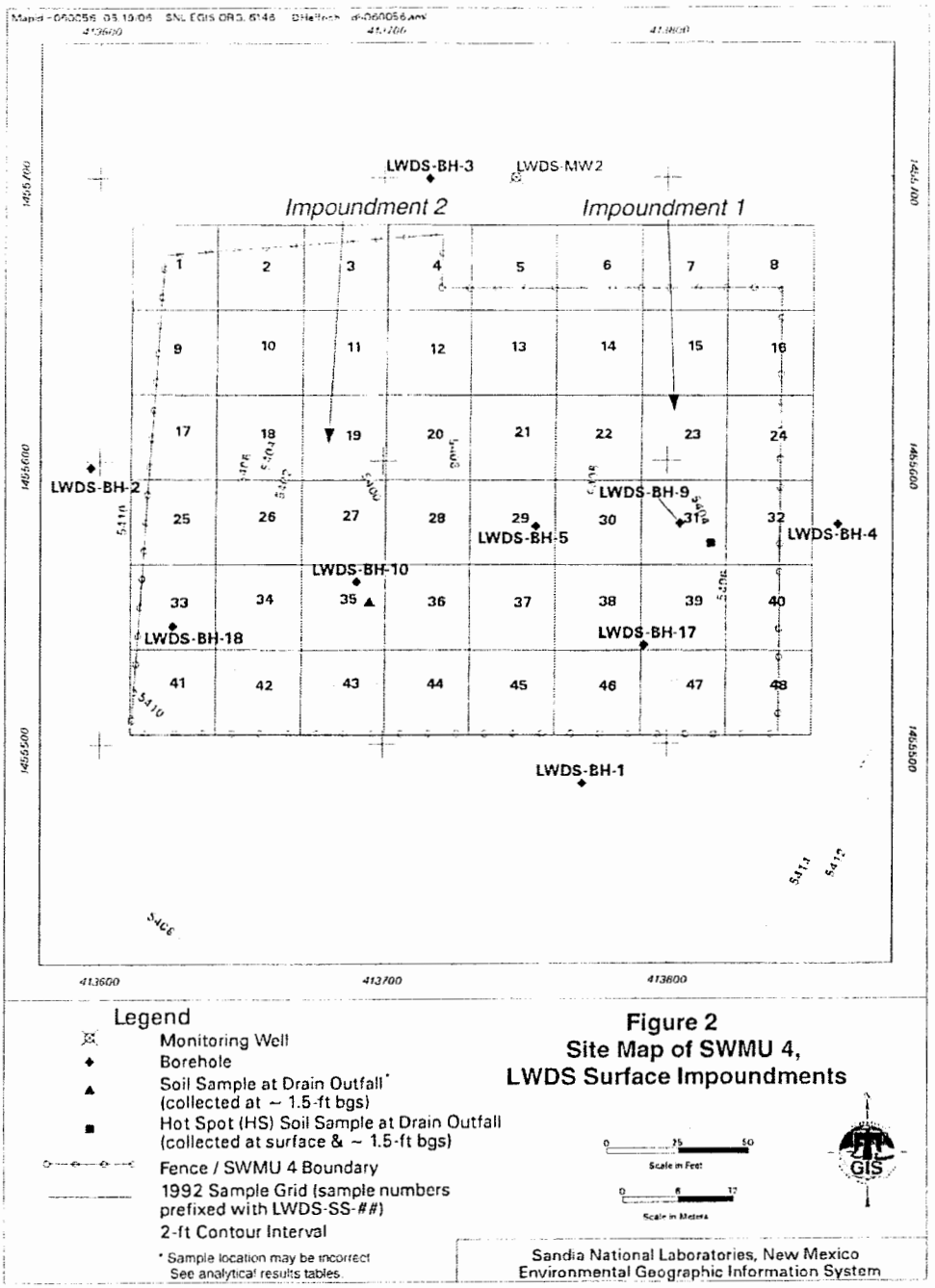
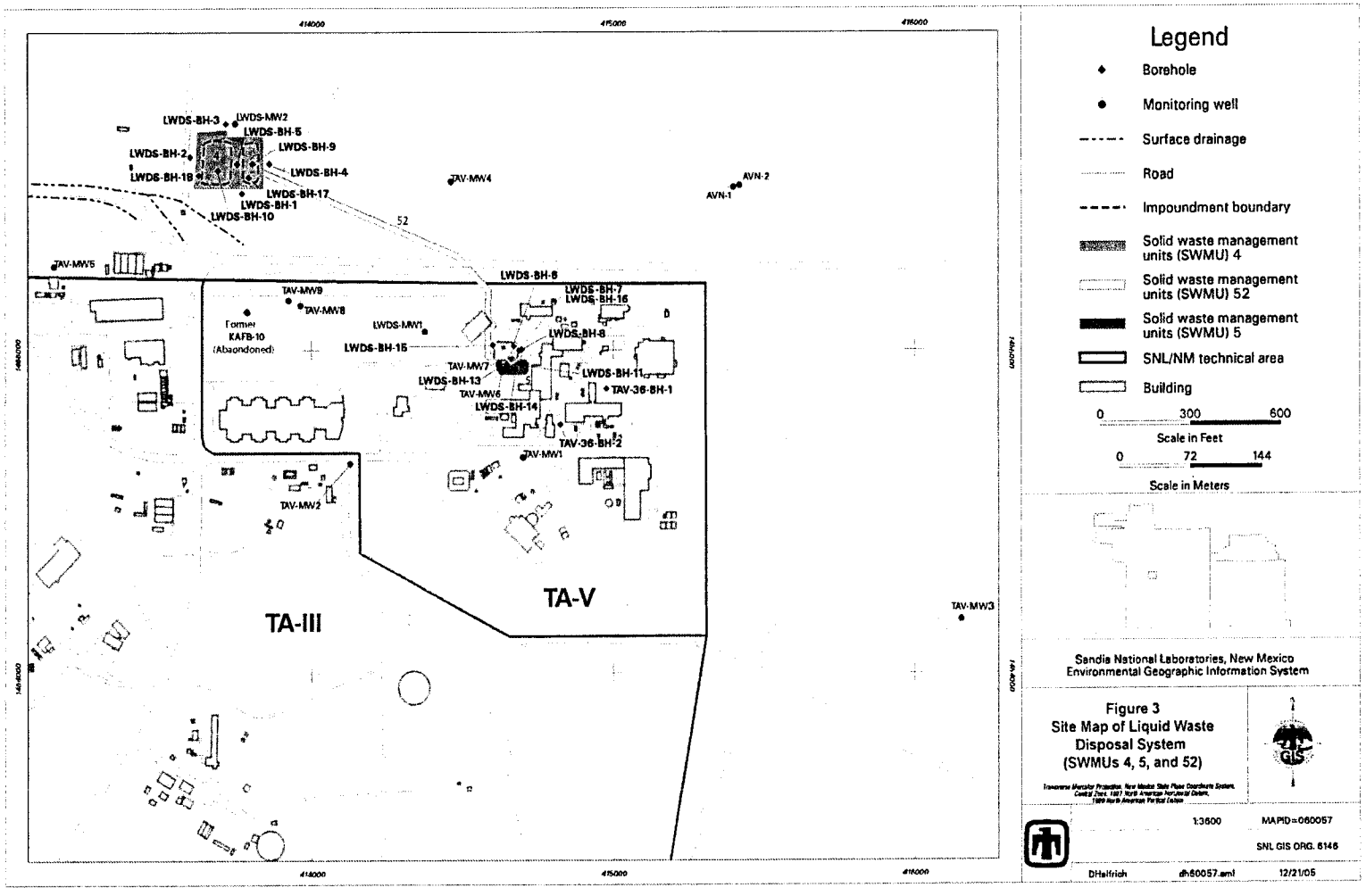


Figure 2
Site Map of SWMU 4,
LWDS Surface Impoundments


414000
415000
416000
LWDS-BH-3
LWDS-MW2
LWDS-BH-5
LWDS-BH-9
LWDS-BH-2
LWDS-BH-19
LWDS-BH-4
LWDS-BH-17
LWDS-BH-1
LWDS-BH-10
TAV-MW4
AVN-2
AVN-1
52
TAV-MW5
LWDS-BH-6
TAV-MW9
TAV-MW8
LWDS-BH-7
LWDS-BH-16
Former
KAFB-10
(Abandoned)
LWDS-MW1
LWDS-BH-8
LWDS-BH-15
TAV-MW7
LWDS-BH-11
LWDS-BH-13
TAV-36-BH-1
TAV-MW6
LWDS-BH-14
TAV-36-BH-2
TAV-MW1
TAV-MW2
TA-V
TA-III
TAV-MW3
1480000
1480500
Legend
Borehole
Monitoring well
Surface drainage
Road
Impoundment boundary
Solid waste management units (SWMU) 4
Solid waste management units (SWMU) 52
Solid waste management units (SWMU) 5
SNL/NM technical area
Building
0
300
600
Scale in Feet
0
72
144
Scale in Meters
Sandia National Laboratories, New Mexico
Environmental Geographic Information System
Figure 3
Site Map of Liquid Waste
Disposal System
(SWMUs 4, 5, and 52)
1:3600
MAPID=060057
SNL GIS ORG. 6146
DHalfrich
dh60057.aml
12/21/05

Results of the soil samples revealed 17 metals (antimony, arsenic, barium, beryllium, cadmium, total chromium, chromium VI, cobalt, copper, lead, mercury, nickel, selenium, silver, thallium, vanadium and zinc) that were detected above background values. One PCB (aroclor-1260) was detected in a surface sample at 0.071 mg/kilogram (kg). Nine VOCs (acetone, benzene, 2-butanone, 2 hexanone, methylene chloride, 4-methyl-2-pentanone, styrene, tetrachloroethene and toluene) and seven SVOCs (benzo(a)anthracene, benzo(b)fluoranthene, bis(2-Ethylhexyl) phthalate, chrysene, fluoranthene, phenanthrene and pyrene) were detected. Five (5) radionuclides (cesium-137, radium-226, thorium-232, uranium-235 and tritium) were detected above background activities. Cobalt-60 and lead-210 were detected, but there are not background activities for comparison. There was a detection of uranium-238 that equaled the background activity.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects in the industrial and residential land-use scenarios. For the industrial land-use scenario, the total hazard index (HI) and the estimated excess cancer risk are acceptable (Table 2). For the residential land-use scenario, the total HI and excess cancer risk are unacceptable (Table 2).

In this case, average concentrations are thought to be more representative of actual site conditions. Using the upper confidence limit (UCL) of the mean concentrations for the main contributors to risk (arsenic, cadmium and phenanthrene), the total HI and estimated excess cancer risk were reduced to 2.10 and 2E-6, respectively. None of the individual hazard quotients (HQs) for noncarcinogens exceed 1.0 under these conditions. Although the excess cancer risk under the residential scenario is acceptable, the HI is unacceptable.

For the radiological COCs (cesium-137, cobalt-60, lead-210, radium-226, thorium-232, tritium, uranuim-235 and uranium-238) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 1.7E+1 millirem (mrem)/year (yr). The estimated excess cancer risk is 2.3E-4. Most of the dose is due to short-lived radionuclides that will quickly decay away. In August 2003, the DOE approved unrestricted radiological release for the site, using 25 mrem/yr as the threshold guidance.

Ecological risks associated with SWMU 4 were estimated through a risk assessment that incorporated site-specific information when available. Overall, risks to ecological receptors are expected to be low because predicted risks associated with exposure to constituents of potential ecological concern (COPECs) are based upon calculations using maximum detected values and (for the burrowing owl) the assumed area use factor of 1.0. Application of the area use factor of 0.023 reduces all HQs for the burrowing owl to values less than 1. The UCL concentrations of arsenic and barium are within the background range. HQs based upon the UCLs of cobalt, copper, lead, and acetone result in no HQs greater than unity. All other HQs (based upon UCL concentrations) are less than 10 with the exception of total chromium (HQ of 28 for plants) based upon a chromium VI plant benchmark, and all HQs greater than 2.6 are limited to plants. Based upon this final analysis, ecological risks associated with SWMU 4 are expected to be low.

In conclusion, human health and ecological risks are acceptable under an industrial land-use scenario.

Table 2
Risk Assessment Values for SWMU 4 Nonradiological COCs

COC	Maximum Concentration /UCL Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Antimony	9.3	0.02		0.31	
Arsenic	7.6/**2.7**	0.03/ **Below Background[b]**	5E-6 /**Below Background[b]**	0.35/**Below Background[b]**	2E-5/**Below Background[b]**
Barium	849	0.01		0.16	
Beryllium	4.9	0.00	2E-9	0.03	5E-9
Cadmium	154/**11.1**	0.30/**0.02**	5E-8/**4E-9**	3.95/**0.28**	1E-7/**8E-9**
Chromium, total	97.7	0.00		0.00	
Chromium VI	11.2	0.00	2E-8	0.05	5E-8
Cobalt	42.2	0.00	2E-8	0.03	5E-8
Copper	239	0.01		0.08	
Mercury	0.61	0.00		0.03	
Nickel	173	0.01		0.11	
Selenium	10	0.00		0.03	
Silver	90.5	0.02		0.24	
Thallium	1.2	0.02		0.24	
Vanadium	52.7	0.01		0.10	
Zinc	198	0.00		0.01	
Organic					
Acetone	4.3	0.00		0.00	
Benzene	0.01	0.00	7E-9	0.00	2E-8
Benzo(a)anthracene	0.35	0.00	2E-7	0.00	6E-7
Benzo(b)fluoranthene	0.46	0.00	2E-7	0.00	7E-7
bis(2-Ethylhexyl) phthalate	5.9	0.00	3E-8	0.00	1E-7
2-Butanone	0.17	0.00		0.00	
Chrysene	0.36	0.00	2E-9	0.00	6E-9
Fluoranthene	0.85	0.00		0.00	
2-Hexanone	0.024	0.00		0.00	
Methylene chloride	0.046	0.00	3E-7	0.00	6E-7
4-Methyl-2-pentanone	0.02	0.00		0.00	
Phenanthrene	0.71/**0.34**	0.26/**0.12**		0.84/**0.39**	
Pyrene	0.75	0.00		0.00	
Styrene	0.0025	0.00		0.00	
Tetrachloroethene	0.0085	0.00	2E-9	0.00	6E-9
Toluene	0.012	0.00		0.00	
Total		0.71/**0.24**	6E-6/**6E-7**	6.58/**2.10**	2E-5/**2E-6**

Note: UCLs are calculated only for risk drivers. UCL concentrations and associated risk are in **bold**.
[a]EPA 1989.
[b]UCL concentration was below background screening level. Therefore risk was not calculated.

Basis for Determination

SWMU 4 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use (industrial).

SWMU 5, LWDS Drainfield/Liquid Disposal System

Site Location

SWMU 5, the LWDS drainfield, covers 0.11 acres and is located in TA-V. TA-V is a fenced, secured research and testing area located in the northeast corner of TA-III. The surface of the site is paved and situated in a flat area west of Building 6580 (Figure 4).

Operational History

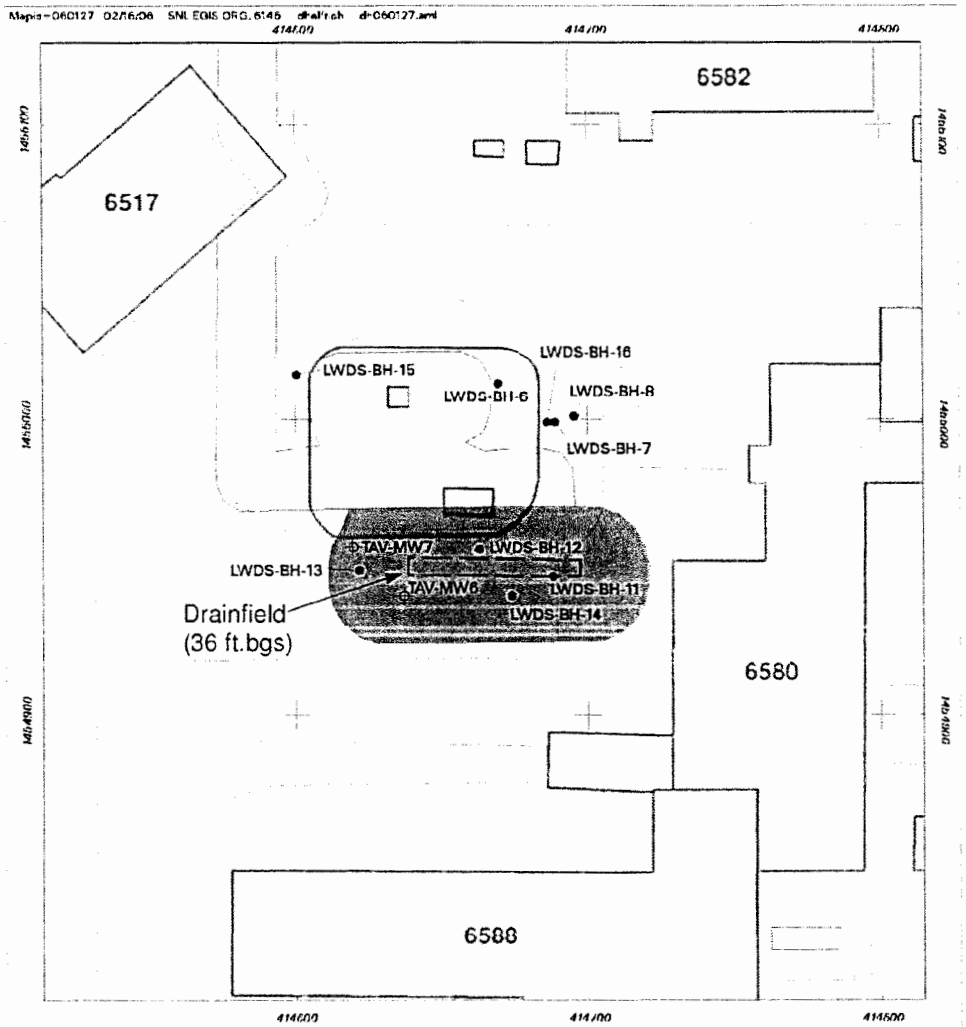
The LWDS was designed to receive, monitor and discharge radioactive effluent from the Sandia Experimental Reactor Facility in TA-V. The LWDS consists of three holding tanks (SWMU 52), a drainfield (SWMU 5), and two surface impoundments (SWMU 4). The drainfield, also known as Tank 3 of the system, is constructed of a horizontal concrete conduit filled with gravel and is buried approximately 30 ft below grade.

The SERF operated from 1962 to 1967. Effluent from the SERF was released to the holding tanks to allow short-lived radionuclides to decay before discharge to the Drainfield. The drainfield collapsed in 1967 and the unlined Surface Impoundments (SWMU 4) were built to receive effluent from the SERF. The COCs include metals, VOCs, SVOCs and radionuclides

Evaluation of Relevant Information

In March 1994 four soil boreholes (LWDS-05-BH11 through LWDS-05-BH14) were advanced and samples collected at approximately 5-ft intervals starting at about 25 ft bgs to depths of 50 to 70 ft bgs. Soil samples were analyzed by an off-site laboratory for VOCs, SVOCs, metals and radionuclides by gamma spectroscopy. Five VOCs (acetone, 2-butanone, methylene chloride, toluene and trichlorethene) and two SVOCs [bis (2-Ethyhexyl) phthalate and di-n-butyl phthalate] were detected. Eleven metals (antimony, barium, cadmium, chromium, cobalt, lead, mercury, nickel, silver, thallium, vanadium and zinc) were detected above background values. In addition, four metals in one sample (arsenic, beryllium, selenium and thallium) had method detection limits (MDLs) that exceeded the background value. Cesium-137, thorium-232 and tritium had activities above background values. Cobalt-60 was detected in one sample.

In 2001, the monitor well TAV-MW6 was installed within the boundaries of SWMU 5. Soil samples were collected at 20 ft bgs and at 20-ft intervals from 80 to 500 ft bgs. Soil samples were analyzed for VOCs and metals by an off-site laboratory and for radionuclides by gamma spectroscopy by an on-site laboratory. The soil samples collected at 20 ft bgs and from 120 to 500 ft bgs were also analyzed for tritium by an off-site laboratory. Nine metals (arsenic, beryllium, cadmium, chromium, cobalt, nickel, selenium, thallium and vanadium) had concentrations that exceeded background values. Five VOCs (acetone, 2-butanone, 4-methyl-2-pentanone, methylene chloride and toluene) were detected. One sample had a tritium activity that exceeded the background value. Three radionuclides (radium-226, thorium-232 and uranium-235) had activities that exceeded background values. Also, several of the soil samples had MDAs for uranium-235 that exceeded the background value.



Legend

- Monitoring Well
- Borehole
- Road
- Other SWMU Boundary
- Underground Drainfield
- Building / Structure
- SWMU 5

Figure 4
Site Map of SWMU 5
LWDS Drainfield

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Table 3
Risk Assessment Values for SWMU 5 Nonradiological COCs

COC	Maximum Concentration /UCL Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Antimony	15[c]/**5.34**	0.04	–	0.49/**0.17**	–/–
Arsenic	5.39/**3.89**	0.02/ **Below Background[c]**	3E-6/ **Below Background[c]**	0.25/**Below Background[c]**	1E-5/**Below Background[c]**
Barium	258	0.00		0.05	
Beryllium	0.735	0.00	3E-10	0.00	7E-10
Cadmium	51.1/**9.85**	0.10/**0.02**	2E-8/**3E-9**	1.31/**0.25**	4E-8/**7E-9**
Chromium, total[b]	42.4/**18.18**	0.02/**0.01**	9E-8/**3E-8**	0.19/**0.08**	2E-7/**8E-8**
Cobalt	9.87 J	0.00	5E-9	0.01	1E-8
Copper	24.2	0.00		0.01	
Mercury	0.85	0.00		0.04	
Nickel	16	0.00		0.01	
Selenium	1.27	0.00		0.00	
Silver	3.7 J	0.00		0.01	
Thallium	3.89/**1.09**	0.06/ **Below Background[c]**	–/ **Below Background[c]**	0.77/**Below Background[c]**	–/ **Below Background[c]**
Vanadium	35.7	0.01		0.07	
Zinc	67.3	0.00		0.00	
Organic					
Acetone	0.0130	0.00		0.00	
2-Butanone	0.0107	0.00		0.00	
Di-n-butyl phthalate	46 J	0.00		0.01	
bis(2-Ethylhexyl) phthalate	1.6	0.00	8E-9	0.00	4E-8
Methylene chloride	0.0096	0.00	6E-10	0.00	1E-7
4-Methyl-2-pentanone	0.00218	0.00		0.00	
Toluene	0.051	0.00		0.00	
Trichloroethene	0.0038 J	0.00	4E-10	0.00	9E-8
Total		0.26/**0.08**	3E-6/**5E-8**	3.23/**0.73**	1E-5/**4E-7**

Note: UCLs are calculated only for risk drivers. UCL concentrations and associated risk are in **bold**.

[a]EPA 1989.

[b] Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).

[c]UCL concentration was below background screening level. Therefore risk was not calculated.

COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
J = Concentration was qualified as an estimated value.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For the industrial land-use scenario, the total HI and the estimated excess cancer risks were acceptable (Table 3). For the residential land-use scenario, the total HI is unacceptable (Table 3).

Average concentrations are thought to be more representative of actual site conditions. Using the UCL of the mean concentrations for the main contributors to excess cancer risk and hazards, the total HI and estimated excess cancer risk are reduced to 0.73 and 4E-7, respectively (Table 3). Thus, using these concentrations in the risk calculations, both the total human health HI and estimated excess cancer risk are acceptable for the residential land-use scenario.

For the radiological COCs (cesium-137, cobalt-60, thorium-232, tritium and uranuim-235) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 5.5E-6 millirem (mrem)/year (yr). The estimated excess cancer risk is 1.2E-10.

The exposure pathway analysis established that no complete ecological pathway exists for exposure of ecological species to contaminants at SWMU 5. All COCs are located at depths greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Basis for Determination

SWMU 5 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

SWMU 28-2, Mine Shaft

Site Location

SWMU 28-2, Mine Shaft, is one of 10 mines identified as SWMU 28 Mine Shafts in the Foothills Test Area. SWMU 28-2 is situated in the USFS Withdrawn Area near the southeast corner of KAFB (Figure 5).

Operational History

SWMU 28-2 is an abandoned mine where activities took place in the early to mid-1900s. Based on interviews of SNL personnel, it was used for experimental testing and possible disposal activities.

Depleted uranium was found immediately beneath the ground surface outside the mine when a barrier was being installed in 2001 to secure the opening of the mine shaft from entry.

The COCs include metals, HE, and radionuclides.

Depth to Groundwater

The depth to groundwater at the site is not known, as there are no wells in the immediate vicinity, but it is likely to be greater than 100 ft bgs (based on drilling at this site).

Evaluation of Relevant Information

In April 1998, 12 soil samples were collected from inside the mine as part of the RCRA Facility Investigation (RFI). The soil samples were analyzed for the COCs.

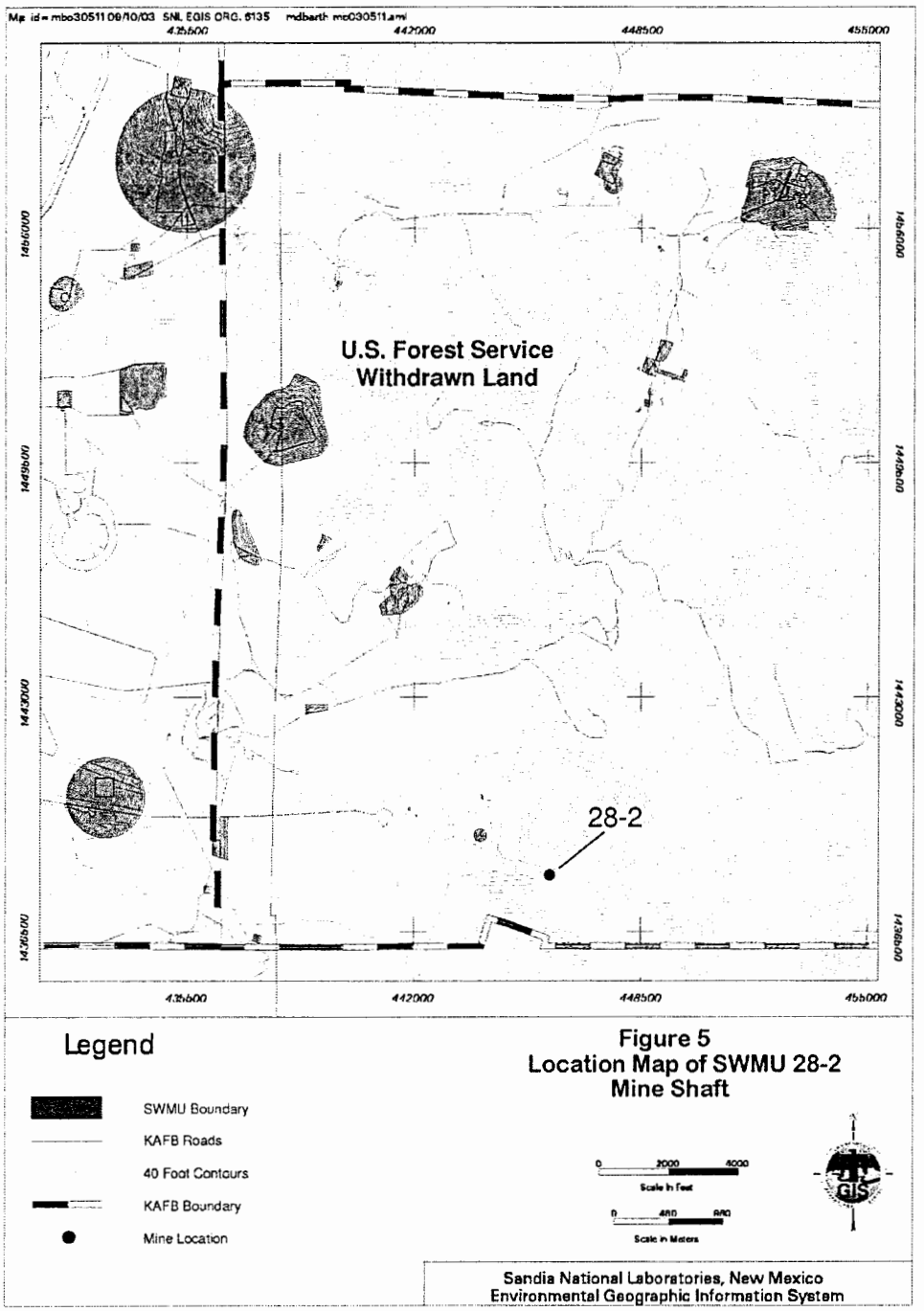


Figure 5
Location Map of SWMU 28-2
Mine Shaft

In December 2001, while installing a barrier to the entrance, depleted uranium was found outside of the mine entrance. In July 2002, a Voluntary Corrective Action (VCA) was conducted to remove the depleted uranium. An initial radiation walkover survey was conducted to identify anomalies. The anomalies and surrounding contaminated soil were removed. A confirmatory radiation walkover survey was conducted to verify that the site was successfully remediated.

Following the confirmatory radiation survey, five in situ soil gamma spectroscopy measurements were taken, and eight confirmatory soil samples plus one duplicate were collected and analyzed for the COCs. The in situ gamma spectroscopy measurements revealed activities for uranium-238, the indicator radionuclide, in the remaining soil are slightly above or consistent with the background level of 2.31 picocuries/gram (pCi/g).

Twenty soil samples plus one duplicate collected in 1998 and 2002 were used in the risk assessment for SWMU 28-2.

HE was detected in all of the samples collected in 1998. Ten samples contained 1,3,5 trinitrobenzene at concentrations ranging from 140 J to 200 micrograms/kilogram (µg/kg). Six samples contained hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) at concentrations ranging from 150 J to 220 J µg/kg. No detectable levels of HE were found in the VCA confirmatory samples collected in 2002.

Arsenic was detected above the background concentration in two samples collected in 1998 and in two samples collected in 2002 at concentrations ranging from 10.1 to 20.5 mg/kg. Beryllium was detected above the background concentration in all of the samples collected in 2002 at concentrations ranging from 0.863 to 1.23 mg/kg. Beryllium was not detected above the background concentration in any of the samples collected in 1998. Barium was detected above the background concentration in two samples collected in 1998 and in eight samples collected in 2002 at concentrations ranging from 274 to 1,880 mg/kg. Chromium was detected above the background concentration in two samples collected in 2002 at a maximum concentration of 22.2 mg/kg. Chromium was not detected above the background concentration in any of the samples collected in 1998. Lead was detected above the background concentration in all samples collected in 1998 and 2002 at concentrations ranging from 74.8 J to 484 mg/kg. Eleven samples collected in 1998 contained detectable mercury above the background concentration, and all the samples collected in 2002 contained elevated mercury at concentrations ranging from 0.0601 to 1.02 mg/kg. Silver was detected above the background concentration in two samples collected in 2002 with a maximum value of 1.78 mg/kg, but was not detected in any of the samples collected in 1998.

Uranium-238 had an MDA above background activity levels in two samples collected in 1998; six samples collected in 2002 had activities ranging from 2.4 to 452 pCi/g which are above the background activity. Thorium-232 was detected above background activity levels in three samples collected in 1998 and in all of the samples collected in 2002 with activities ranging from 1.08 to 1.77 pCi/g. All cesium-137 activities for samples collected in 1998 and 2002 were below the NMED-approved background activity level. All of the samples collected in 2002 contained uranium-235 activities or MDAs above the approved background activity level, with MDAs ranging from 0.228 to 7.12 pCi/g; all of the samples collected in 1998 had associated MDAs above the approved background activity levels with MDAs ranging from 0.232 to 0.349 pCi/g.

A risk screening assessment was performed for this site, initially using maximum COC concentrations, to evaluate the potential for adverse health effects in recreational and residential land-use scenarios.

The maximum concentration value for lead was 484 mg/kg. The EPA does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. The NMED guidance for lead screening concentrations for construction and industrial land-use scenarios are 750 and 1,500 mg/kg, respectively. The EPA screening guidance value for a residential land-use scenario is 400 mg/kg. The maximum concentration for lead at this site is greater than the residential screening value. However, using the 95% UCL of the mean lead concentration (259.6 mg/kg) is lower than all the screening values; therefore, lead was eliminated from further consideration in the human health risk assessment. For the recreational land-use scenario, the total human health HIs and the estimated excess cancer risks were less than NMED guidelines for risk (Table 4). For the residential land-use scenario, the total human health HIs and excess cancer risks exceeded NMED guidelines for risk

.

Table 4
Risk Assessment Values for SWMU 28-2 Nonradiological COCs

COC Name	Maximum Concentration/UCL Concentration (mg/kg)	Recreational Land-Use Scenario (Maximum Concentration)		Residential Land-Use Scenario (Maximum Concentration)		Residential Land-Use Scenario (UCL Concentration)	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic							
Arsenic	20.5/**10.3**	0.02	1.E-06	0.95	5.E-05	**0.48**	**3.E-05**
Barium	1880	0.01	--	0.36	--	0.36	--
Beryllium	1.23	0	4.E-11	0.01	1.E-09	0.01	1.E-09
Chromium, total[a]	22.2	0	4.E-09	0.1	1.E-07	0.1	1.E-07
Mercury	1.02	0	--	0.04	--	0.04	--
Silver	1.78	0	--	0	--	0	--
Organic							
1,3,5-Trinitrobenzene	0.2 J	0	--	0	--	0	--
RDX	0.22 J	0	1.E-09	0	5.E-08	0	5.E-08
Total		**0.03**	**1.E-06**	**1.46**	**5.E-05**	**1**	**3.E-05**

Note: UCLs are calculated only for risk drivers. UCL concentrations and associated risk are in **bold**.
[a]Chromium, total considered to be chromium VI in risk calculations (most conservative)
COC = Constituent of concern.
mg/kg = Milligram(s) per kilogram.
RDX = hexahydro-1, 3, 5-trinitro-1, 3, 5-triazine

The total human health HI calculated for nonradiological COCs is 1.46 for a residential land-use scenario, which is greater than the NMED guideline of 1. The total estimated excess cancer risk is 5E-5 for a residential land-use scenario, which exceeds the NMED guideline of 1E-5.

Although both the HI and estimated excess cancer risk exceed NMED guidelines for a residential land-use scenario, maximum concentrations were used in the risk calculations. Using the 95% UCL of the mean concentration of the main contributor to risk (arsenic), the HI and excess cancer risk are reduced to 1 and 3.E-5, respectively. The estimated excess cancer risk still exceeds the NMED guidelines for a residential land-use scenario; however, the main risk driver is arsenic. SWMU 28-2 is an abandoned mine that exploited an ore deposit containing metals in addition to fluorspar. Higher background levels of arsenic at this site are likely to be present due to natural conditions, and not testing activities. Other mines in the area that do not show evidence of testing activities are likely also to exhibit higher background concentrations of metals given that the deposits contain galena (lead sulfide), barite (barium sulfate) and chalcopyrite (copper iron sulfide). Because the arsenic at SWMU 28-2 is likely present due to natural conditions, controls will not be imposed for the site.

Based on maximum concentrations, both the HI and estimated excess cancer risk are less than the NMED guidelines for risk under a recreational land-use scenario, indicating acceptable risk under this scenario no matter the source of arsenic.

The human health incremental TEDE under a recreational land-use scenario is 1.8 mrem/yr, which is less than the EPA numerical guidance of 15 mrem/yr. The human health incremental TEDE under a residential land-use scenario is 3.2E-1 mrem/yr, which is significantly less than the numerical guidance of 75 mrem/yr.

Using the SNL ecological risk assessment methodology, the ecological risk for SWMU 28-2 is predicted to be low.

In conclusion, human health risk and ecological risks are acceptable per NMED guidance.

Basis for Determination

SWMU 28-2 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk.

SWMU 46, Old Acid Waste Line Outfall

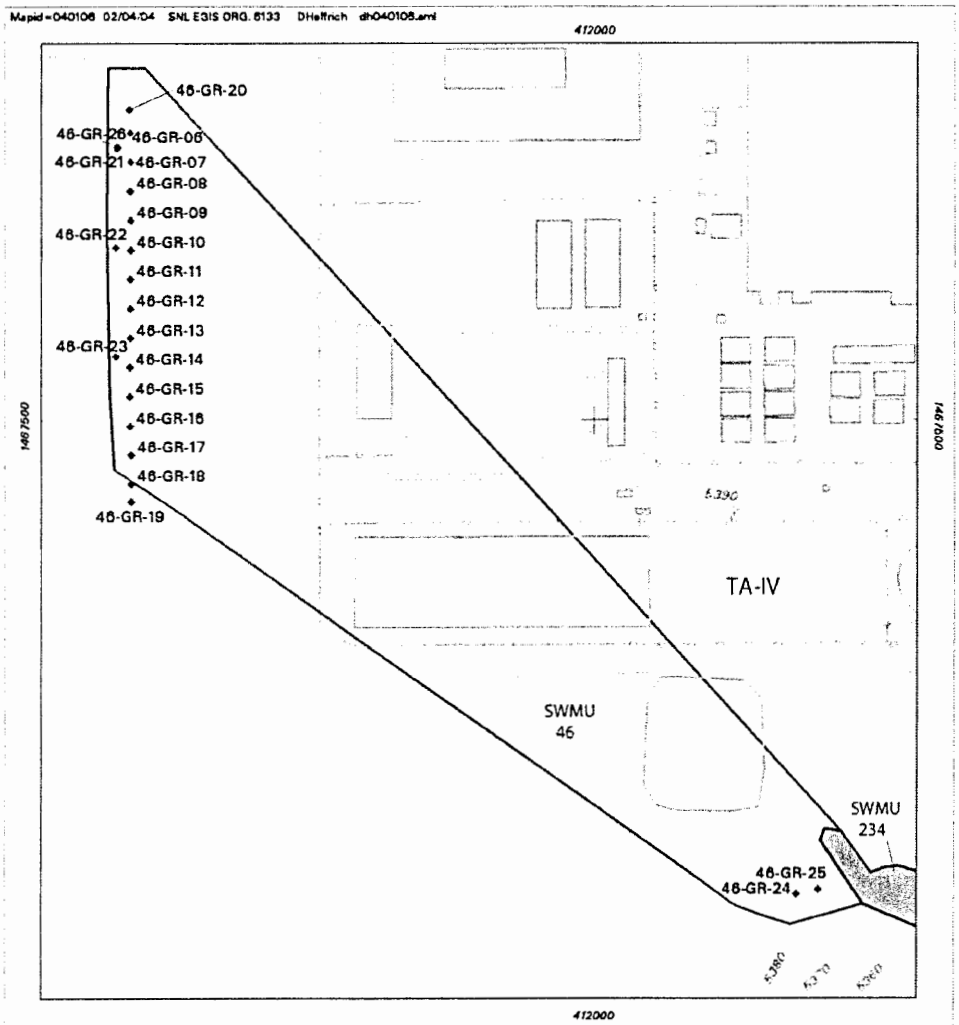
Site Location

SWMU 46 is at the southwest corner of TA-IV (Figure 6). The site covers approximately 2.25 acres on the northern rim of the Tijeras Arroyo. The site consists of the inactive outfall (discharge point) for the Old Acid Waste Line (SWMU 226). The wastewater from SWMU 226 discharged into three shallow, nearly parallel, earthen outfall ditches. Each outfall ditch measured approximately 700 ft long. The confluence of these three outfall ditches is still present on the northern rim of the Tijeras Arroyo.

Operational History

From about 1948 through late 1974, SWMU 46 was the discharge point for the Old Acid Waste Line (SWMU 226) that was connected to several TA-I buildings containing research laboratories, machine shops, a paint shop, an electroplating shop, a foundry and a photographic processing laboratory. In the late 1960s, an estimated 130,000 gpd of TA-I wastewater was discharged at the SWMU 46 outfall ditches.

The COCs include metals, HE compounds, VOCs, SVOCs, PCBs and radionuclides.



Legend

- Soil Sample Location
- Fence
- Pavement / Unpaved Road
- Building / Structure
- SWMU 46
- SWMU 234

Figure 6
Site Map of SWMU 46
Old Acid Waste Line Outfall

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Evaluation of Relevant Information

In September 1994, soil samples were collected from a nearby storm-water ditch. A review of historical aerial photographs conducted in 2000 determined that this ditch had been constructed in 1977 for storm water runoff from TA-IV. Therefore, the soil samples were not associated with the acid waste line discharge and the results of this sampling were not used in the risk assessment.

In 1994 and 2001, SWMU 46 was surveyed for unexploded ordnance (UXO), HE and radiological material; none were found.

In August 1998, soil-vapor samples were collected from four Geoprobe boreholes. Samples were collected at depths of 10, 20, and 30 ft bgs. Low concentrations of 16 VOCs were detected in soil-vapor samples collected near the confluence of the outfall ditches. Trichlorethene (TCE) had a maximum concentration of 55 parts per billion by volume (ppbv). VOCs were not detected in boreholes BH-1 and BH-2, which were located approximately 700 and 300 ft south of the confluence, respectively.

In October 1999, passive soil-vapor samples were collected. The sampling area covered approximately 7 acres and focused on the surface-water ditch, which at the time was the suspected waste-water discharge location. After being buried for 30 days at shallow depths ranging from approximately 0.5 to 1 ft bgs, the collectors were retrieved and analyzed for VOCs and total petroleum hydrocarbon (TPH). Low concentration levels of 17 VOCs were detected.

In 2000, a historical review of aerial photographs from 1951 to 1993 and personnel interviews identified three outfall ditches that had been located at SWMU 46. None of these ditches was determined to be the storm-water ditch that had been sampled in 1994. The first outfall ditch was constructed about 1948. The ditch was approximately 700 ft long and extended from the waste-line outfall to the arroyo rim. A parallel ditch was constructed about 1950, and a third ditch was constructed in the mid-1960s. Each of the three outfall ditches were unlined (earthen) ditches approximately 3 ft deep and 5 ft wide. Nearly the entire length of each outfall ditch was filled with soil during TA-IV construction in the mid-1980s.

In July 2000, a field investigation found that 60-ft-long segments for two of the outfall ditches were still present on the steep northern rim of the arroyo. In addition, a 110-ft-long segment of the old acid waste line (SWMU 226) was found at the northern end of the site. The waste line was composed of 8-inch diameter vitrified clay pipe.

From April 2001 through March 2002, soil-vapor samples were collected from monitor wells 46-VW-01 and 46-VW-02 for five quarters. The sampling ports for monitor well 46-VW-01 were set at 15, 65, 115, 165, 215 and 265 ft bgs, and the sampling ports for monitor well 46-VW-02 were set at 46, 96, 146, 196, 246 and 296 ft bgs. For the five quarters, the maximum TCE concentration from monitor well 46-VW-01 was 46,000 ppbv, which was collected from a depth of 115 ft bgs; the maximum TCE concentration at the lowest sampling port, a depth of 265 ft bgs, was 350 ppbv. Monitor well 46-VW-02 had a maximum TCE concentration of 650 ppbv at 96 ft bgs, and the maximum TCE soil-vapor concentration near the bottom of hole, at 246 ft bgs, was 480 ppbv.

In January 2001, a deep borehole, TJA-6, near the south end of the site was completed as a groundwater monitoring well. Soil samples were collected at 45, 95, 145 and 245 ft bgs. In March 2001, a second deep borehole, 46-VW-01, was developed as a monitoring well and samples were collected at 45, 95, 145, 195, 245 and 295 ft bgs. The samples were analyzed for

metals, VOCs, SVOCs, PCBs, HE compounds and radionuclides. Five metals (beryllium, cadmium, chromium, selenium and thallium) were detected with concentrations above background values. Four VOCs (acetone, 2-butanone, methylene chloride and toluene) and two SVOCs [bis(2-Ethylhexyl) phthalate and phenol] were detected. The radionuclide, thorium-232 was detected above background value and U-235 had two samples with MDAs greater than the background value. No PCBs or HE compounds were detected. The monitoring well, TJA-6, is part of the TAG monitoring well system and is routinely sampled.

In April 2001, soil samples were collected from three locations at the northern end of the site and one at the southeast end of the site. The samples were analyzed for VOCs, SVOCs, PCBs, HE compounds, metals and radionuclides. Two of the samples had PCB concentrations above 1 mg/kg, and several metals had concentrations above background values. This area was included in the August 2003 VCA. None of the April 2001 samples were used in the risk assessment.

In June 2001, soil samples were collected from two locations at the southeastern end of SWMU 46 as part of the characterization of SWMU 234, but were applicable to SWMU 46. Samples were collected at the surface and 5 ft bgs (with a backhoe) and analyzed for metals, VOCs, SVOCs and radionuclides. Two metals (chromium and silver) were detected slightly above background values. No VOCs were detected above MDLs. Seventeen SVOCs were detected. No radionuclides were detected above background activities.

In August 2001, a Geoprobe was used to collect soil samples from 11 boreholes (a 12th borehole was started but abandoned with no sampling) to a depth of 18 ft near the visible portion of the acid waste line at the northern end of the site. The soil samples were analyzed for VOCs, SVOCs, PCBs, metals, cyanide, HE compounds and radionuclides. Nine metals had concentrations that exceeded background values. Total PCBs greater than 1 mg/kg were not detected. Cyanide was detected. Four VOCs (acetone, 2-butanone, methylene chloride and toluene) and 26 SVOCs were detected. One HE compound (2-nitrotoluene) was detected in one soil sample. Two radionuclides (uranium-235 and uranium-238) were detected at activities above background values.

In August 2003, a VCA was conducted to remove soil that contained total PCBs in excess of 1 mg/kg (EPA screening level). A 275-ft long trench was excavated at the northern end of the site. The trench was 2.5 ft wide with a depth of 0.8 to 2 ft becoming shallower at the southern end. Approximately 50 cubic yards (cy) of contaminated soil and pieces of the waste line were shipped to an off-site disposal facility. Confirmatory soil samples were collected from the floor of the trench, from four undisturbed areas outside the trench and at the confluence of Outfalls 1 and 2. The samples were analyzed for PCBs, metals, chromium VI, VOCs and SVOCs. The maximum sample depth was 10 ft bgs. None of the soil samples contained total PCB concentrations greater than 1 mg/kg. Eleven metals were detected at concentrations above background values. Three VOCs and 14 SVOCs also were detected; most were J-qualified.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For the industrial land-use scenario, the total HI and the estimated excess cancer risks were acceptable (Table 5). For the residential land-use scenario, the total HI and excess cancer risks were unacceptable (Table 5).

Table 5
Risk Assessment Values for SWMU 46 Nonradiological COCs

COC	Maximum Concentration /UCL Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	5.23/**2.8**	0.02/ **Below Background[b]**	3E-6/ **Below Background[b]**	0.24/ **Below Background[b]**	1E-5/ **Below Background[b]**
Barium	572	0.01		0.11	
Beryllium	0.891	0.00	4E-10	0.01	8E-10
Cadmium	213/**40.6**	0.42/**0.08**	7E-8/**1E-8**	5.46/**1.03**	1E-7/**1E-7**
Chromium VI	2.08	0.00	4E-9	0.01	1E-8
Chromium-total	120	0.00		0.00	
Copper	133 J	0.00		0.05	
Mercury	0.0766	0.00		0.00	
Nickel	379/**87.5**	0.02/**0.00**		0.25/**0.03**	
Selenium	1.28	0.00		0.00	
Silver	16.2	0.00		0.04	
Thallium	2.19/**1.1**	0.03/**0.02**		0.44/**0.22**	
Vanadium	46.5	0.01		0.09	
Zinc	149 J	0.00		0.01	
Cyanide-total	12.7	0.00		0.01	
VOCs					
Acetone	0.0132	0.00		0.00	
2-Butanone	0.107	0.00		0.00	
Methylene chloride	0.00385 J	0.00	3E-8	0.00	5E-8
Toluene	0.017	0.00		0.00	
SVOCs					
Acenaphthene	0.00626 J	0.00		0.00	
Acenaphthylene	0.00406 J	0.00		0.00	
Anthracene	0.0212 J	0.00		0.00	
Benzo(a)anthracene	0.258	0.00	1E-7	0.00	4E-7
Benzo(a)pyrene	0.435/**0.06**	0.00/**0.00**	2E-6/**3E-7**	0.00/**0.00**	7E-6/**1E-6**
Benzo(b)fluoranthene	0.506	0.00	2E-7	0.00	8E-7
Benzo(ghi)perylene	0.309/**0.05**	0.00/**0.00**	1E-6/**2E-7**	0.00/**0.00**	5E-6/**8E-7**
Benzo(k)fluoranthene	0.471	0.00	2E-8	0.00	8E-8
Butylbenzylphthalate	0.0565 J	0.00		0.00	
Carbazole	0.0182 J	0.00	1E-10	0.00	6E-10
2-Chlorophenol	0.00835 J	0.00		0.00	
Chrysene	0.435	0.00	2E-9	0.00	7E-9
Di-n-butylphthalate	0.0495 J	0.00		0.00	
Di-n-octylphthalate	0.0102 J	0.00		0.00	
Diethylphthalate	0.0877 J	0.00		0.00	
Dibenzofuran	0.0094 J	0.00		0.00	

1,2-Dichlorobenzene	0.00451 J	0.00		0.00	
1,3-Dichlorobenzene	0.00486 J	0.00		0.00	
Diphenylamine	0.0073 J	0.00		0.00	
bis(2-Ethylhexyl) phthalate	2.04	0.00	1E-8	0.00	5E-8
Fluoranthene	0.450	0.00		0.00	
Fluorene	0.014 J	0.00		0.00	
Hexachlorobenzene	0.0057 J	0.00	5E-9	0.00	2E-8
Indeno(1,2,3-c,d)pyrene	0.345 J	0.00	2E-7	0.00	6E-7
Naphthalene	0.00345 J	0.00		0.00	
Phenanthrene	0.139	0.00		0.00	
Phenol	1.59	0.00		0.00	
Pyrene	0.603	0.00		0.00	
HE Compound					
2-Nitrotoluene	0.0152	0.00		0.00	
Total		0.52/**0.13**	7E-6/**1E-6**	6.72/**1.61**	3E-5/**4E-6**

Note: UCLs are calculated only for risk drivers. UCL concentrations and associated risk are in **bold**.

[a]EPA 1989.

[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).

Using the UCL of the mean concentrations for the main contributors to risk [arsenic, cadmium, nickel, thallium, benzo(a)pyrene and benzo(ghi)perylene], the total HI and estimated excess cancer risk are reduced to 1.61 and 3.86E-6, respectively. In addition, only cadmium had an individual HQ for noncarcinogens that exceed 1.0 under these conditions. The cadmium HQ (1.03) was only slightly greater than 1.0. Thus, using these concentrations in the risk calculations, the total human health HI is still unacceptable for residential land-use scenario while the estimated excess cancer risk is acceptable.

For the radiological COCs (thorium-232, uranuim-235 and uranium-238) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 2.1 millirem (mrem)/year (yr). The estimated excess cancer risk is 2.7E-5 which is acceptable for an industrial land-use scenario. Ecological risks associated with SWMU 46 were estimated through a screening assessment that incorporated site-specific information when available. Initial calculations of HQs indicated a potential for risk for 12 inorganic and 9 organic COPECs. However, based upon the analysis of uncertainties associated with these HQs, the actual potential for risk to ecological receptors are expected to be low. This is primarily due to the use of maximum detected values as the exposure point concentrations for these HQs. Predicted risks from exposures based upon the UCL concentrations are significantly lower. All HQs based upon the UCLs were less than 5 and/or were attributable to conservative toxicity benchmarks or conservative assumptions of bioavailability. Based upon this final analysis, ecological risks associated with SWMU 46 are expected to be low.

In conclusion, human health and ecological risks are acceptable under an industrial land-use scenario.

Basis for Determination

SWMU 46 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use (industrial).

SWMU 49, Building 9820 Drains, Lurance Canyon

Site Location

SWMU 49, the Building 9820 Drains, is located in Lurance Canyon within the boundaries of the USFS Withdrawn Area controlled by KAFB and permitted to the DOE. SWMU 49 consists of a surface discharge area associated with a former trailer used as a darkroom and the area around a drainpipe outfall from Building 9820. Waste fluids from photo processing in the trailer may have been discharged to the ground surface. The drainpipe outfall lies approximately 90 ft southwest of Building 9820 and received effluent from five floor drains and a sink in the building (Figure 7).

Operational History

Available information indicates that Building 9820 was constructed in 1958. The remote location of the building prevented connection to a piped water supply and bottled water was used for drinking. Nonpotable water was trucked to a 1,000-gallon storage tank at the facility. The building has not been occupied since 1988. The trailer had been removed prior to the sampling in 1994. In November 1995, the distal end of the Building 9820 drainpipe was sealed with mortar.

The COCs include VOCs, SVOCs, RCRA metals, hexavalent chromium, cyanide, HE residues and radionuclides.

Evaluation of Relevant Information

Five different assessment investigations have been conducted at this site. In November 1993, a surface radiological survey was conducted (Investigation 1). A geophysical survey was performed in November 1994 to locate areas of high moisture content (Investigation 2). In June 1994 a passive soil-vapor survey was conducted to identify potential releases of VOCs and SVOCs (Investigation 3). In October 1994, confirmatory soil sampling was conducted in the vicinity of the drain outfall and in May 1995 at the darkroom trailer surface discharge location (Investigation 4). In August 2001, groundwater monitor well CYN-MW5 was installed. This was one of four DSS sites selected by the Department for groundwater monitoring (Investigation 5). These investigations are discussed in the following sections.

Investigation 1 – Surface Radiological Survey

A surface radiological survey conducted by RUST Geotech in November 1993 did not detect any point or area anomalies above background levels within SWMU 49.

Investigation 2 – Geophysical Survey

A geophysical survey performed in November 1994 was intended to identify any subsurface areas with high moisture content which might indicate a contaminant plume from past releases. The results of the geophysical survey were inconclusive, with no definitive indications of high moisture concentrations even in the area of reeds at the end of the drainline. Therefore, the geophysical survey results were not used as a guide in the soil sampling effort.

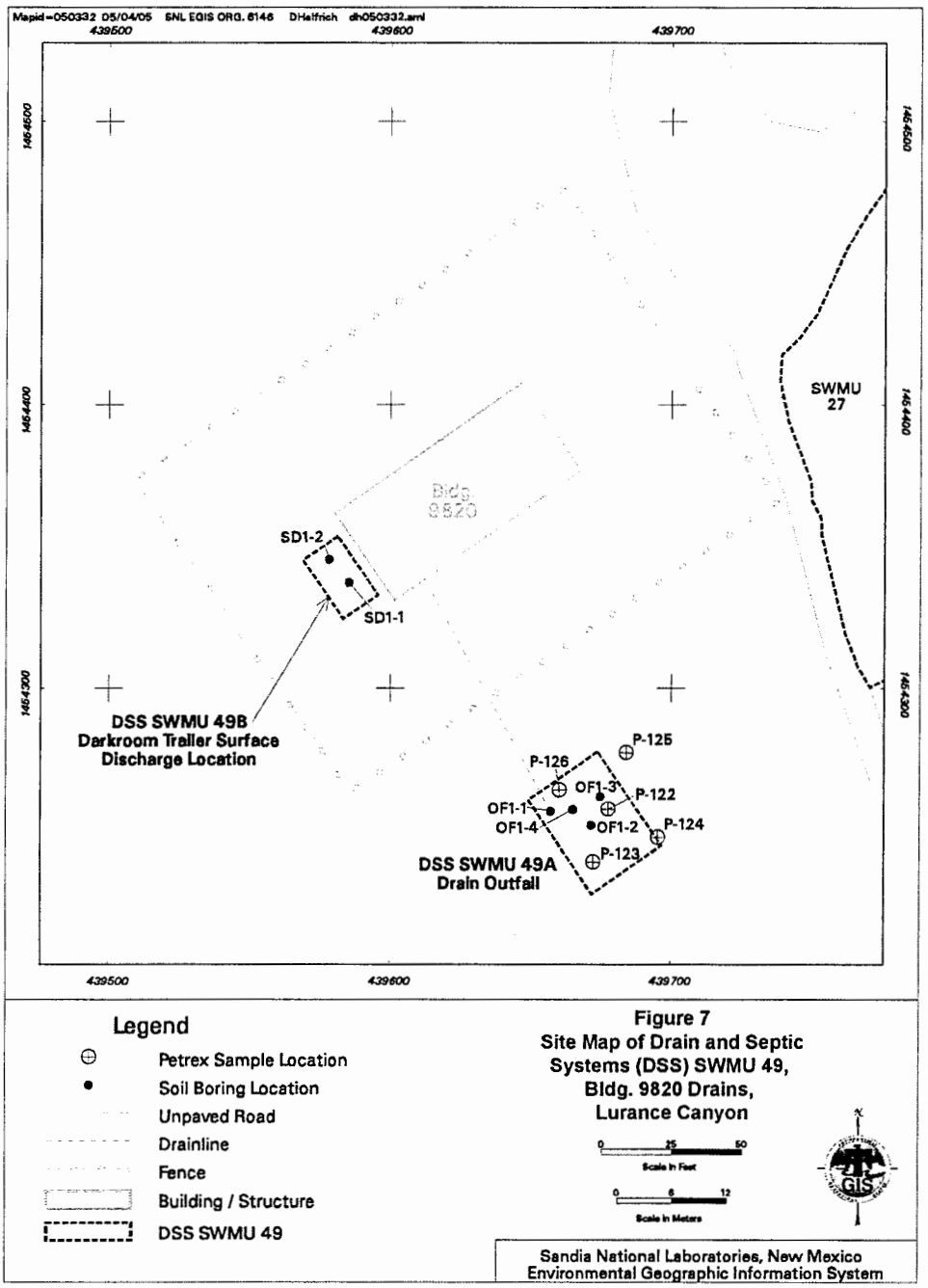


Figure 7
Site Map of Drain and Septic Systems (DSS) SWMU 49, Bldg. 9820 Drains, Lurance Canyon

Investigation 3 – Passive Soil-Gas Survey

The passive soil-gas survey conducted in June 1994 used PETREX™ sampling tubes to attempt to identify any releases of VOCs and SVOCs to the drain outfall. A PETREX™ tube soil-gas survey is a semi-quantitative screening procedure that can be used to evaluate the presence or absence of many VOCs and SVOCs. A PETREX™ sampler was placed at five locations around the drain outfall at this site. Aliphatic compounds (C4-C11 cycloalkanes) were identified at a concentration above the PETREX™ technique detection limit on the single sample wire that was analyzed in sampler P-123, and on the duplicate wire that were analyzed in sampler P-126 (Figure 7). No other VOCs or SVOCs were found in detectable quantities in the other four PETREX™ tubes placed around the drain outfall at this site. Subsequent laboratory analysis of soil samples collected in the immediate vicinity of the PETREX™ sample locations did not detect organic contaminants in the material.

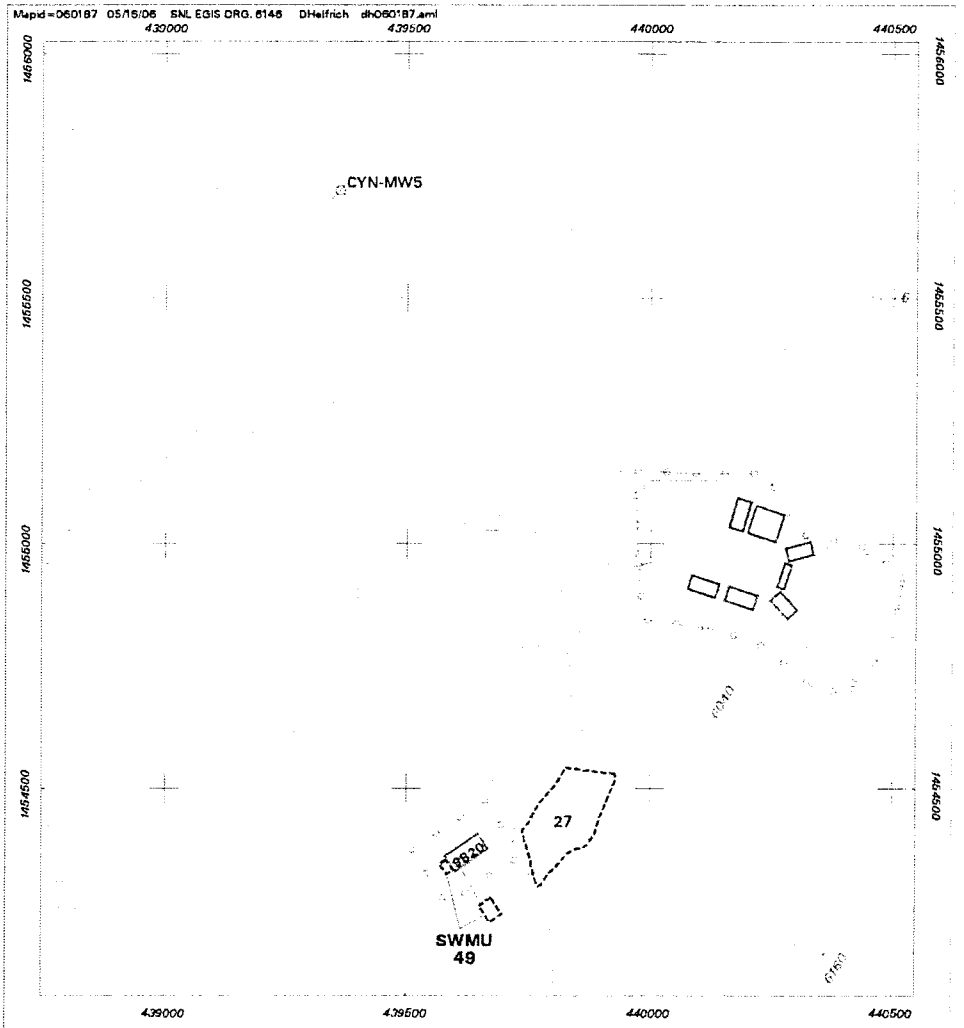
Investigation 4 – Soil Sampling

Confirmatory soil sampling was conducted in October 1994 from the area immediately around the drain outfall and in May 1995 at the darkroom trailer surface discharge location. Soil samples were collected from one boring immediately under the drain outfall, and from three borings located down slope of the outfall in October 1994 (Figure 7). In three of the four borings, two depth intervals were sampled; the first started at one foot bgs, and the second at 10 feet below the top of the first sampling interval (or 11 feet bgs). Samples were collected only from the shallow interval in OF1-2, as auger refusal repeatedly occurred at seven feet bgs at that location. Soil samples were also collected at the darkroom trailer surface discharge location in May 1995 from two locations on the southwest side of Building 9820 (Figure 7). Soil samples were collected from these boreholes at the same depths below the surface as in the outfall boreholes. The first (or shallow) surface discharge location sampling interval also started at 1 foot bgs and the deep interval started at 11 feet bgs.

Results for the soil samples collected in October 1994 and May 1995 are summarized in this paragraph. Two VOCs, (methylene chloride and toluene) were detected in the soil samples collected at this site. These compounds were detected in the associated trip blank (TB) or equipment blank (EB) samples. One SVOC [bis(2-Ethylhexyl) phthalate] was detected in the soil samples collected at this site. No cyanide or HE compounds were detected in any of the samples collected from the boreholes. Two RCRA metals (mercury and silver) were detected above Department-approved background concentrations. All other metal concentrations were below the corresponding Department-approved background concentrations. One radionuclide (uranium-235) exceeded the background activity in three samples.

Investigation 5 – Groundwater Monitoring

Monitor well CYN-MW5 was installed using an air rotary-casing hammer drill rig in August 2001. The monitoring well location is shown on (Figure 7). The borehole for the well was drilled to 170 feet bgs and backfilled to 160 feet bgs. The monitor well was subsequently installed with the screened interval from 135 to 155 feet bgs and a sump from 155 to 160 feet bgs. Depth to groundwater was 106.9 feet bgs in January 2005. Monitor well CYN-MW5 was sampled on a quarterly basis from July 2002 to May 2004 to acquire eight quarters of groundwater data. The eight quarters of groundwater samples were analyzed for VOCs, SVOCs, HE compounds, RCRA metals, hexavalent chromium, and gross alpha/beta activity.



Legend

- Groundwater Monitoring Well
- Unpaved Road
- 20-ft Contour
- Drainline
- Fence
- Other SWMU
- Building / Structure
- SWMU 49

Figure 8
Location of Groundwater Monitoring Well CYN-MW5 at Drain and Septic Systems SWMU 49, Bldg. 9820 Drains Lurance Canyon

0 150 300
Scale in Feet

0 36 72
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Results for the eight quarters of groundwater samples collected from monitor well CYN-MW5 (Figure 8) are summarized in this paragraph. One VOC (acetone) was detected in the groundwater sample collected in July 2002. Bromodichloromethane, bromoform and dibromochloromethane were detected in the March 2004 EB sample associated with this well. No VOCs were detected in any of the trip blanks associated with this well. There are no EPA MCLs established for any of the VOCs that were detected. One SVOC [bis(2-Ethylhexyl) phthalate] was detected in the sample collected in April 2004. The concentration detected was below the EPA MCL of 6.0 micrograms per liter (Title 40, Code of Federal Regulations 141.11) for drinking water. No other SVOCs were detected in samples collected from this well. No HE compounds were detected in any groundwater sample collected from this well. One RCRA metal (barium) slightly exceeded the Department-approved background concentration for all eight quarters of sampling. All other metal concentrations were below Department-approved background concentrations or other promulgated regulatory limits. Hexavalent chromium exceeded the Department-approved background concentration in the first sample collected in July 2002. All other hexavalent chromium concentrations were below the Department-approved background or other promulgated regulatory limits. NPN was not detected at concentrations above any promulgated regulatory limit. Fluoride concentrations did not exceed the regulatory or background limits in any sample collected. No regulatory or background limits have been established for bromide, calcium, chloride, magnesium, potassium, sodium or sulfate in groundwater. The concentrations measured for these individual anions and cations were similar and fairly consistent for the eight quarters of sampling. All gross alpha/beta activity levels were below the EPA MCLs for drinking water.

Annual groundwater monitoring at SWMU 49 (required by the NMED as a control in its letter of April 8, 2010) is to be discontinued as no definitive evidence of groundwater contamination was detected in eight quarters of monitoring. Inorganic constituents are considered to be at background levels.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total HIs and estimated excess cancer risks were acceptable (Table 6).

For the radiological COCs (uranuim-235 and uranium-238) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 0.23 millirem (mrem)/year (yr). The estimated excess cancer risk is 2.3E-6.

Ecological risks associated with SWMU 49 are estimated through a risk assessment that incorporates site-specific information when available. HQs slightly greater than unity were predicted. However, closer examination of the exposure assumptions reveals an overestimation of risk primarily attributed to:

- conservative toxicity benchmarks,
- the use of maximum concentrations, maximum bioavailability, and maximum area use to estimate exposure.

Analysis of the uncertainties associated with these predicted values indicate that they are more likely to overestimate actual risk rather than underestimate it. Based upon this final analysis, the potential for ecological risks associated with SWMU 49 is expected to be low.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Table 6
Risk Assessment Values for SWMU 49 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Recreational Land-Use Scenario[a,b]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Chromium VI	0.025[c]	0.00	4E-12	0.00	1E-10
Cyanide	0.5[c]	0.00		0.00	
Mercury	0.077 J	0.00		0.00	
Silver	1.7	0.00		0.00	
Organic					
Bis(2-Ethylhexyl) phthalate	0.19 J	0.00	1E-10	0.00	4E-9
Methylene chloride	0.0033 J	0.00	2E-9	0.00	5E-8
Toluene	0.0025[b]	0.00		0.00	
Total		**0.00**	**2E-9**	**0.00**	**5E-8**

[a]EPA 1989.
[b]Industrial land-use scenario results presented in error previously; this site has a designated land use of recreational.
[c]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).
COC = Constituent of concern.
J = Concentration was qualified as an estimated value.

Basis for Determination

SWMU 49 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

SWMU 52, Liquid Waste Disposal System (LWDS) Holding Tanks

Site Location

The LWDS Holding Tanks at SWMU 52 encompasses approximately 0.6 acre in TA-V. TA-V is a fenced, secured, research and testing area located in the northeast corner of TA-III. The holding tank portion of the site is paved and situated in a flat area west of Building 6580. The piping portion of the site extends out of TA-V to the surface impoundments (Figure 9).

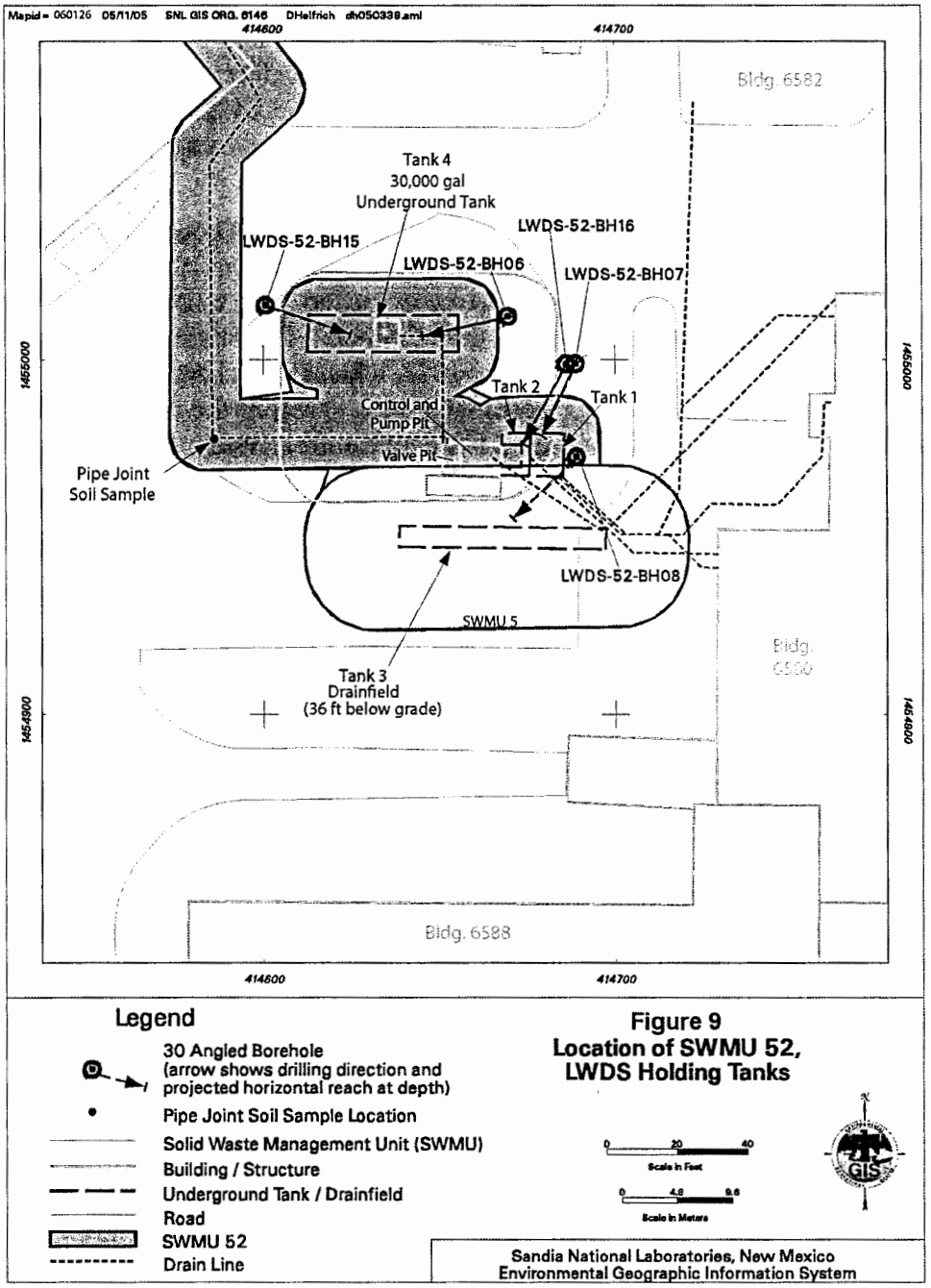


Figure 9
Location of SWMU 52, LWDS Holding Tanks

Operational History

The LWDS was designed to receive, monitor and discharge radioactive effluent from the Sandia Experimental Reactor Facility (SERF). The LWDS consists of the holding tanks and piping (SWMU 52), a drainfield (SWMU 5) and two surface impoundments (SWMU 4) (Figure 3). The three holding tanks, a series of two concrete tanks (Tanks 1 and 2) and one steel tank (Tank 4), were designed to allow short-lived radionuclides to decay before discharging to the LWDS drainfield (referred to as Tank 3). The two concrete tanks (Tanks 1 and 2) have capacities of 2,000 and 6,000 gallons, respectively. The steel tank (Tank 4) has a capacity of approximately 30,000 gallons.

The SERF reactor operated from 1962 to 1971. The tanks received liquid wastes from the SERF during this entire period. Since the decommissioning of the SERF in 1971, nonradioactive discharges from various buildings in TA-V have continued to drain to the holding tanks. The tanks were periodically pumped to the LWDS drainfield until its collapse in 1967 and later pumped to surface impoundments until October 1992, when all discharges to the impoundments were stopped. During this time, no logs were maintained to record the frequency of operation and activity measurements. In 1994, a Liquid Effluent Control System (LECS) was constructed to manage all future TA-V liquid discharges. The LECS receives all process water from TA-V, including liquids previously discharged to the holding tanks. This system allows for the water to be held and sampled prior to discharging it to the City of Albuquerque (COA) publicly-owned treatment works.

The COCs include RCRA metals, HE compounds, VOCs, SVOCs and radionuclides.

Evaluation of Relevant Information

In 1992, the contents of the accessible tanks, Tanks 2 and 4 were sampled. The internal tank sampling results identified the presence of several solvents and radionuclides slightly above the detection limit. This level of RCRA-regulated constituents was acceptable for discharge to the COA sanitary sewer system.

In September 1992, a 90-degree joint coupling in the pipe on the down-flow side of the Holding Tanks was disassembled. Swipe samples were collected from inside the pipe and a soil sample was collected immediately below the disassembled joint.

Also in September 1992, three angled boreholes (LWDS-BH06 through LWDS-BH08) were advanced in the vicinity of the LWDS Holding Tanks and Drainfield. Two additional angled boreholes (LWDS-BH15 and LWDS-BH16) were completed in 1994.

Soil samples were collected from the surface to a maximum depth of 43 and 50 ft during the drilling activities in 1992 and 1994, respectively. The five boreholes drilled and sampled were located as closely as possible and adjacent to the holding tanks. Therefore, these soil samples are considered to be representative of the soil directly adjacent to and below the holding tanks. The 1992 and 1994 soil samples were analyzed for VOCs, SVOCs, metals and radionuclides by an off-site laboratory. Eight metals (arsenic, barium, beryllium, cadmium, total chromium, copper, nickel and vanadium) exceeded background values. Three VOCs (acetone, 2-butanone and methylene chloride) and two SVOCs [bis(2-ethylhexyl) phthalate and di-n-butyl phthalate] were detected in the soil samples. One sample had a Th-232 activity above background levels and four samples had a tritium activity above the background level.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For the industrial land-use scenario, the total HI and estimated excess cancer risks were acceptable (Table 7). For the residential land-use scenario, the total HI was acceptable while the estimated excess cancer risk was unacceptable (Table 7).

Although the estimated excess cancer risk is unacceptable for the residential land-use scenario, maximum concentrations were used in the risk calculation. Using the UCL of the mean concentration for the main contributor to excess cancer risk (arsenic), excess cancer risk was reduced to 4E-7. In this situation, both the human health total HI and estimated excess cancer risk are acceptable.

For the radiological COCs (thorium-232 and tritium) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 1.7 millirem (mrem)/year (yr). The estimated excess cancer risk is acceptable for residential land use.

Table 7
Risk Assessment Values for SWMU 52 Nonradiological COCs

COC	Maximum Concentration /UCL Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	6.7/**3.2**	0.03/ **Below Background[b]**	4E-6/ **Below Background[b]**	0.31/**Below Background[b]**	2E-5/**Below Background[b]**
Barium	412	0.01		0.08	
Beryllium	1.2	0.00	5E-10	0.01	1E-9
Cadmium	1.3	0.00	4E-10	0.03	9E-10
Chromium, total[c]	28.2	0.01	6E-8	0.13	1E-7
Copper	18.4	0.00		0.01	
Mercury	0.05[d]	0.00		0.00	
Nickel	15.5	0.00		0.01	
Selenium	0.57	0.00		0.00	
Silver	0.76 J	0.00		0.00	
Vanadium	28.2	0.00		0.05	
Organic					
Acetone	0.15	0.00		0.00	
2-Butanone	0.016	0.00		0.00	
Di-n-butyl phthalate	0.051 J	0.00		0.00	
bis(2-Ethylhexyl) phthalate	1.3	0.00	7E-9	0.00	3E-8
Methylene chloride	0.024	0.00	2E-7	0.00	3E-7
Total		0.05/**0.03**	4E-6/**2E-7**	0.63/**0.32**	2E-5/**4E-7**

Note: UCLs are calculated only for risk drivers. UCL concentrations and associated risk are in **bold**.

[a]EPA 1989.

[b]UCL concentration was below background screening level. Therefore risk was not calculated.

[c]Chromium, total assumed to be chromium VI (most conservative).

[d]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).

SWMU 91, Lead Firing Site

Site Location

SWMU 91 occupies approximately 20 acres located 1.6 miles west of the Solar Tower Facility and 0.6 miles southwest of TA III, south of Magazine Road. It is in the immediate vicinity of five other SWMUs including the 19-foot diameter Shock Tube (SWMU 89), the General Purpose Heat Source Test Area (SWMU 194), the Gas Cylinder Disposal Pit (SWMU 6), the Scrap Yards/Open Dump (SWMU 17) and the Old Thunderwells (SWMU 56) (Figure 10).

Operational History

The operational name formerly used by the Permittees for SWMU 91 was the Flyer Plate Test Site (FPTS). The flyer plate tests were conducted to determine whether impact fuses in a high-velocity re-entry vehicle (warhead) would activate before the critical firing components were destroyed by vehicle impact. Beginning in 1962, these tests were conducted in a cross-shaped test trench at SWMU 91. The cross-shaped trench was approximately 6 to 8 ft deep at the center point and tapered upwards to local grade at each end. Flyer plates were fired toward a stationary target using TNT and RDX as propellants. After each test, debris in and around the trench was salvaged for reuse, removed from the site and disposed of, or shallowly buried in an area north of the test trench.

In 1979, cast iron barrels were developed to house the explosive and the flyer plate. At a later date, steel-jacketed lead barrels were used. Each barrel was placed inside a corrugated pipe that was buried in the trench where the testing occurred. The barrel was destroyed during each test, and fragmented lead was released to the environment.

Although other explosive tests were performed at SWMU 91 during the flyer plate testing program conducted from 1962 through the late 1980s, the tests involving lead barrels produced the most significant adverse environmental impact because of the large mass of lead released as part of these tests.

The COCs include metals, HE compounds and radionuclides.

Evaluation of Relevant Information

SWMU 91 has been characterized in multiple investigations including two VCMs and a VCA.

In 1992, surface-soil sampling was conducted on a large scale at the site to determine the extent of lead and other metal contamination. Lead detections ranged from 17.44 to 2,790 mg/kg.

From 1993 to 1996, a detailed site background investigation was conducted including personnel interviews and a review of historical aerial photographs.

From 1993 to 1994, surface radiological surveys and a UXO / HE survey were conducted.

In 1995, scoping soil samples were collected in 5 ft intervals from 0 to 20 ft bgs in three boreholes. The boreholes were placed in areas of known elevated surface lead concentrations in order to determine the vertical extent of contamination. Soil samples were analyzed for metals and radionuclides by both on-site and off-site laboratories. Most of the samples had MDLs that exceeded the background values for arsenic, beryllium, cadmium, selenium and silver. Barium, chromium and lead were detected above background values. The maximum lead value was 17

mg/kg. The MDAs for U-235 and some for U-238 and Cs-137 exceeded background activities. Th-232 exceeded the background activity in two soil samples.

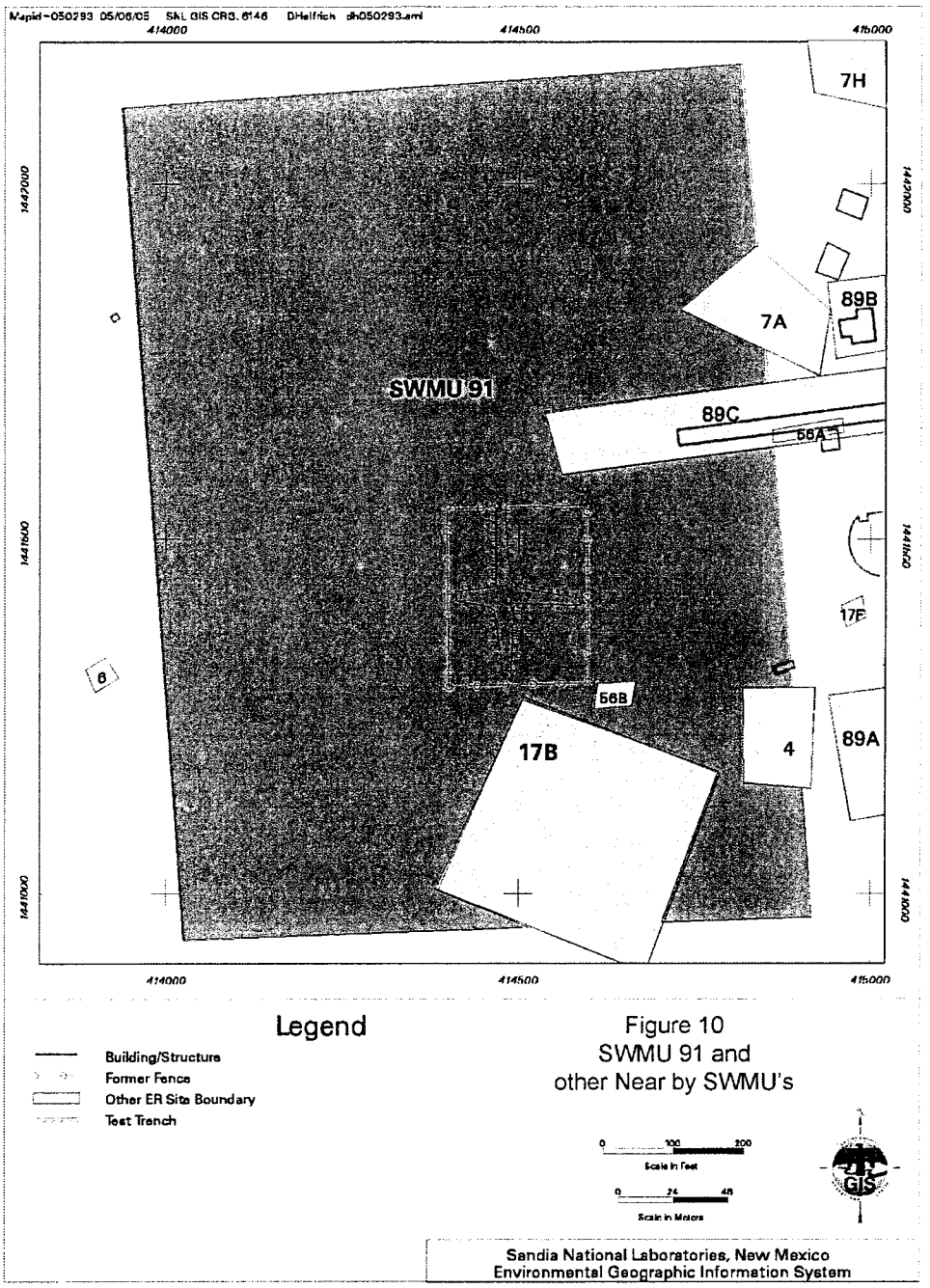


Figure 10
SWMU 91 and
other Near by SWMU's

In 1996, shallow subsurface samples were collected at 22 locations. The samples were analyzed for metals, HE compounds and radionuclides by both on-site and off-site laboratories. No HE compounds were detected. Arsenic, barium, beryllium and lead were detected above background values. Most of the samples had MDLs that exceeded the background values for arsenic, silver, cadmium and selenium. The maximum lead value was 8,900 mg/kg. Cs-137, U-235 and U-238 were detected above background activities. The MDAs for Th-232, U-238 and U-235 exceeded background activities.

In 1996, a VCM was conducted that addressed the radiation anomalies identified during the surface radiological surveys conducted in 1993 and 1994. Ten point source anomalies were identified and remediated. Three soil samples were collected and analyzed for radionuclides to confirm that remediation was complete.

A second VCM was conducted from 1996 to 1997 that addressed the lead contamination at the site. Extensive soil sampling and analysis using a field-based XRF laboratory, geophysical survey and confirmatory soil sampling were conducted to clean up specific areas at the site with lead concentrations greater than 2,000 mg/kg in the surface soil. However, after review and evaluation of the XRF results, it was determined that XRF data were not a reliable indicator of lead contamination. A revised approach was developed with Department input and concurrence that involved excavation / scraping of areas greater than 1,400 mg/kg lead based on laboratory analytical results of soil samples that were mainly collected in 1992 and 1996. Sixteen areas of soil contamination were excavated / scraped generating 450 cy of soil of which 276 cy were disposed of off-site and 173 cy remained on-site after characterization sampling of the soil indicated it passed risk criteria. Soil samples were collected and analyzed for metals and HE compounds. No HE compounds were detected. Many samples had cadmium and selenium MDLs above the background values. Barium, beryllium, lead, mercury, selenium, and silver were detected above the background values. Six areas in the northern part of the site were excavated to investigate geophysical anomalies, but significant excavation and removal of shallowly buried debris was not performed. This VCM approach did not adequately address either the fine elemental lead contamination or shallowly buried test debris that included larger fragments of lead.

From 1997 through 2004, reassessment activities were performed, the conceptual site model was revised and the final VCA was designed. The geophysical surveys were used to divide SWMU 91 into the following three areas, referred to as "burial areas" due to the presence of buried test debris (including lead fragments):

- The Test Trench Burial Area (TTBA) consisted of the test trench feature and the immediate vicinity. This area was the most highly contaminated area.
- The Southern Burial Area (SBA) consisted of the area that surrounded the TTBA. This area was the area of lowest contamination.
- The Northern Burial Area (NBA) was the largest of the three areas, located north of the TTBA and SBA. Buried debris was most concentrated in the NBA, as test debris that were not removed from the site were shallowly buried in the NBA as part of routine test clean-up activities. This area was considered to have moderate contamination.

The final VCA approach targeted the areas with larger lead fragments and a higher density of lead fragments in the soil. The clean-up goal for lead in the soil was 750 mg/kg.

In 1999, soil samples were re-collected at eleven locations originally sampled in 1996. The samples collected were analyzed for metals to address sampling results with elevated (relative to background) arsenic and selenium concentrations. Barium, beryllium and lead were detected at concentrations above background values. Arsenic was detected above background levels in four of the samples. There were no detections of selenium.

In 2004, the final VCA was conducted to address the lead contamination at SWMU 91. Soil was excavated and lead fragments and other test debris greater than ½ inch in diameter were mechanically separated from the soil. A total of 16,690 cy of soil was excavated and screened. Approximately 18.8 tons of lead fragments and 100 cy of metal test debris were separated from other debris and managed for recycling. The screened soil was put into piles and soil samples were collected from the piles and analyzed for lead. Approximately 340 cy of soil exceeded the lead clean-up goal of 750 mg/kg and was disposed of as hazardous waste at an off-site facility. The remaining 16,350 cy of soil was below the clean-up goal and was used as fill material and/or left on the site. All other test debris (approximately 42 cy) was disposed of as non-hazardous waste at an off-site facility. A total of 60 confirmatory soil samples were collected from the floor and sidewalls of the areas that were excavated, and were analyzed for lead. The UCL of the mean lead concentrations for each of the three areas was below the clean-up goal of 750 mg/kg.

A human health risk screening assessment was initially performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For the industrial land-use scenario, the total HI was acceptable. The HI for the residential land-use scenario was not acceptable (Table 8). The estimated excess cancer risk was not acceptable for both the residential and industrial land-use scenarios.

Table 8
Risk Assessment Values for SWMU 91 Nonradiological COCs

COC	Maximum Concentration /UCL Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	86 J/**14.5**	0.34/**0.06**	5E-5/**9E-6**	3.97/**0.67**	2E-4/**4E-5**
Barium	250	0.00		0.05	
Beryllium	3.1	0.00	1E-9	0.02	3E-9
Cadmium	5[b]	0.01	2E-9	0.13	3E-9
Chromium, total	17	0.00		0.00	
Mercury	5.4	0.02		0.24	
Selenium	55 J	0.01		0.14	
Silver	5.4	0.00		0.01	
Total		0.38/**0.10**	5E-5/**9E-6**	4.57/**1.26**	2E-4/**4E-5**

Note: UCLs are calculated only for risk drivers. UCL concentrations and associated risk are in **bold**.

[a]EPA 1989.

[b] Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).

COC = Constituent of concern.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.

Maximum concentrations were used in the risk calculation. Using the UCL of the mean concentration for arsenic in the risk analysis reduces the industrial total excess cancer risk value to 9E-6. In this situation, the estimated excess cancer risk is acceptable for the industrial land-use scenario. However, the total human health HI and excess cancer risk are not acceptable for the residential land-use scenario.

For the radiological COCs (cesium-137, thorium-232, uranuim-235 and uranium-238) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 2.7 millirem (mrem) /year (yr). The estimated excess cancer risk is 2.8E-5 which is not acceptable for residential land use.

Ecological risks associated with SWMU 91 were estimated through a risk assessment that incorporated site-specific information when available. Analysis of the uncertainties associated with these predicted values indicate that they are more likely to overestimate actual risk rather than underestimate it. Based upon this final analysis, the potential for ecological risks associated with SWMU 91 is expected to be low.

In conclusion, human health and ecological risks are acceptable under an industrial land-use scenario.

Basis for Determination

SWMU 91 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use (industrial).

SWMU 101, Building 9926 Explosive Contaminated Sumps and Drains

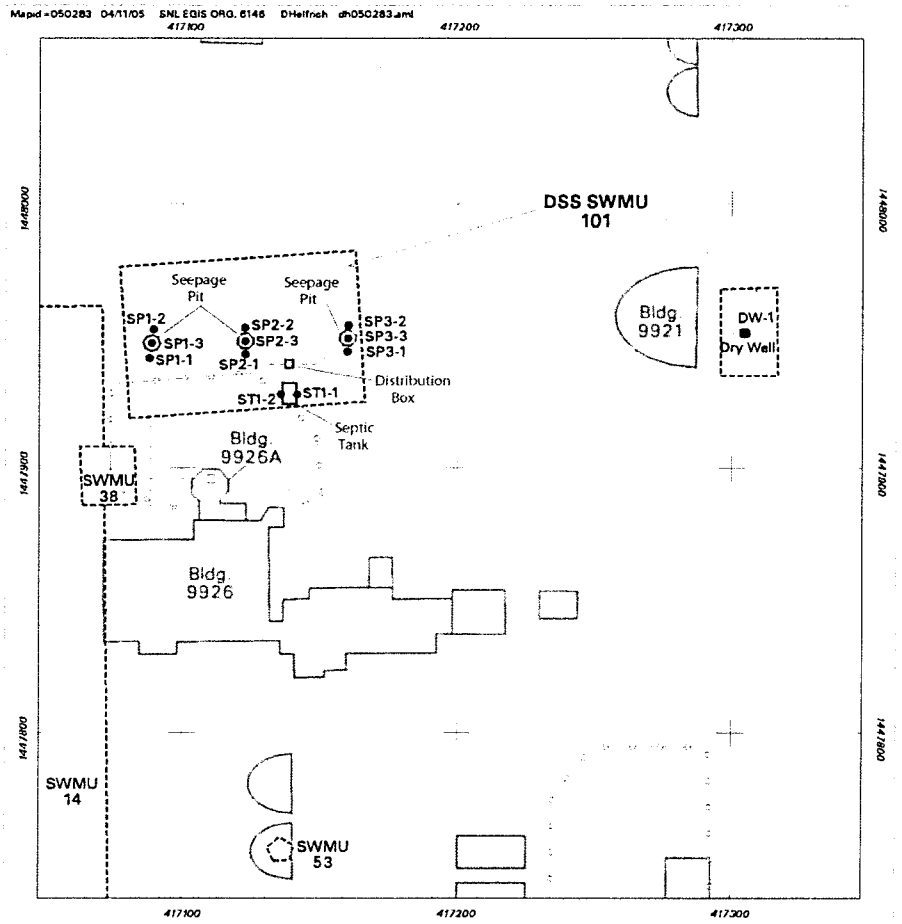
Site Location

SWMU 101, the Building 9926 Explosive Contaminated Sumps and Drains, is located in the Coyote Test Field area on federally owned land controlled by KAFB and permitted to the DOE. The abandoned system consisted of an 850-gallon septic tank and distribution box connected to two seepage pits that serviced Building 9926, the Shock Wave Studies Laboratory, one seepage pit that serviced Building 9926A, and a drywell that serviced both Building 9921 and an explosives storage igloo (Figure 11).

Operational History

Available information indicates that Building 9926 was constructed in 1960 and was expanded in 1967 with the addition of the Shock Wave Studies Laboratory and the semi-attached explosive room, designated Building 9926A. It is assumed that the septic system was also constructed during this time period. By June 1991, the septic system discharges were routed to the COA sanitary sewer system. The old septic system line was disconnected and capped, and the system was abandoned in place concurrent with this change. Waste in the septic tank was removed. The empty and decontaminated septic tank was inspected by the Department in December 1995, and a closure form was signed. The septic tank was then backfilled with clean, native soil from the area in late 1995 or early 1996.

The COCs include RCRA metals, hexavalent chromium, cyanide, HE compounds, VOCs, SVOCs and radionuclides.



Legend

- Soil Boring Location
- Unpaved Road
- Fence
- Septic Tank, Dry Well
- Drainline, Sanitary Sewerline
- Building / Structure
- Other SWMU Boundary
- DSS SWMU 101

Figure 11
Site Map of Drain and Septic Systems (DSS) SWMU 101, Bldg. 9926 Explosive Contaminated Sumps and Drains, Coyote Test Field

0 25 50
Scale in Feet

0 6 12
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Evaluation of Relevant Information

Five different assessment investigations have been conducted at this site. In August 1992, April 1994 and November 1994, waste characterization samples were collected from the septic tank (Investigation 1). A geophysical survey was performed at the site in March 1994 to locate the Building 9921 drywell (Investigation 2). In June and July 1994, a passive soil-vapor survey was conducted to identify potential releases of VOCs and SVOCs from the seepage pits (Investigation 3). In September and October 1994 and in January 1995, soil samples were collected from boreholes drilled adjacent to the septic tank and seepage pits, and from a borehole drilled through the center of the drywell. In January 1998, additional soil samples were collected from boreholes drilled through the center of the three seepage pits (Investigation 4). In January 1995, a backhoe was used to determine the location of the Building 9921 drywell (Investigation 5). These investigations are discussed in the following sections.

Investigation 1 — Septic Tank Sampling

A sludge sample was collected from the septic tank in August 1992 and was analyzed for selected radionuclide constituents. The brief narrative report for that sample indicated that "...no parameters were detected that exceeded U.S. Department of Energy [DOE] derived concentration guidelines [DCG] or the investigation levels established during this investigation."

A second round of septic tank sludge samples was collected for waste characterization purposes in April 1994 and analyzed for VOCs, explosives, cyanide, and RCRA total and TCLP metals. Trace concentrations of seven VOC compounds were identified in the material. Explosive compounds and cyanide were not detected. All eight RCRA metals were detected in two separate samples of the sludge, but only one out of eight metals was detected in the TCLP-derived leachate from two samples of the same material.

A third round of waste characterization sludge samples was collected in November 1994 and analyzed for SVOCs, isotopic uranium and tritium. No SVOCs were detected. Low activity levels of the three isotopic uranium radionuclides and tritium were detected in the material.

Investigation 2 – Geophysical Survey

A geophysical survey using a magnetic locator was performed in March 1994 to locate the Building 9921 drywell. An area approximately 20 ft south of Building 9921 was identified as the possible location of the unit, but the actual location was later located with a backhoe and was found to be east of the building. No attempt was made to use geophysical techniques to identify areas with high moisture content.

Investigation 3 – Passive Soil-Gas Survey

The passive soil-gas survey conducted in June and July 1994 used PETREX™ sampling tubes to identify any releases of VOCs and SVOCs that may have occurred from the seepage pit. Thirty-four PETREX™ tube samplers were placed in a grid pattern that covered the area around the seepage pits and septic tank, and also covered the area between the seepage pits and the unpaved site access road which lies about 30 feet north of the seepage pits. Aliphatic and/or BTEX compounds at potentially detectable concentrations were identified in soil gas at 6 of the 34 sampling locations. Five of six locations were in or next to the access road, and the sixth location was between the road and the central seepage pit. PCE was also identified in soil-gas above 100,000 ion counts in one of the five roadway locations.

Investigation 4 — Soil Sampling

During September and October 1994 and January 1995, soil samples were collected using a Geoprobe™ from boreholes drilled adjacent to the septic tank and seepage pits, and from a borehole drilled through the center of the drywell. The seepage pit sampling depth intervals started at 12 and 22 feet bgs in the west seepage pit boring, and at 16 and 26 feet bgs in the middle and east seepage pit borings. The septic tank borehole sampling intervals started 9 feet bgs, and the drywell sampling interval started at 4 and 14 feet bgs.

During the 1994 sampling event, soil samples were analyzed for VOCs, SVOCs, RCRA metals, hexavalent chromium, cyanide, isotopic uranium and radionuclides by gamma spectroscopy from the seepage pit and septic tank areas. In January 1995 soil samples were collected and analyzed for VOCs, SVOCs, RCRA metals, tritium, isotopic uranium and radionuclides by gamma spectroscopy from the drywell area. Samples were also screened for trinitrotoluene (TNT) at an on-site laboratory. No TNT was detected.

In January 1998, as part of a five site sampling comparison study required by the Department, additional samples were collected from boreholes drilled through the center of the three seepage pits. Samples were collected at 12 and 22 feet bgs in the west seepage pit borehole and at 16 and 26 feet bgs in the east seepage pit borehole. Only one soil sample, at 16 feet bgs, was collected in the middle seepage pit borehole. No deep (26-foot) sample was collected at this borehole due to subsurface refusal that prevented the Geoprobe™ sampler from reaching this depth. These samples were analyzed for VOCs, HE compounds, RCRA metals, cyanide and radionuclides by gamma spectroscopy.

Analytical results for the soil samples are discussed in this section. Four VOCs (acetone, chloromethane, methylene chloride and toluene) were detected in the soil samples collected at this site. All but chloromethane were also detected in the associated TB or EB samples. Two SVOCs (chrysene and phenanthrene) were detected in the soil samples collected at this site. Cyanide was detected in two samples. The RCRA metals, total chromium, silver and selenium, were detected above the Department-approved background level. All other metal concentrations were below the corresponding Department-approved background levels. For radionuclides, with the exception of tritium, no activities above background activities were detected in any of the samples analyzed. However, although not detected, the MDA for all of the uranium-235 and uranium-238 analyses exceeded their respective background activity.

Investigation 5 – Backhoe Excavation

In January 1995, a backhoe was used to determine the precise location, dimensions, and depth of the Building 9921 drywell, which had no surface expression. In January 1995, after this small drywell was located, soil samples were collected directly beneath it from a single borehole located in the center of the unit.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total human health HIs and estimated excess cancer risks were acceptable (Table 9).

For the radiological COCs (tritium, uranuim-235 and uranium-238) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 0.27 millirem (mrem)/year (yr). The estimated excess cancer risk is 2.7E-6.

Table 9
Risk Assessment Values for SWMU 101 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Chromium, total	23.6	0.00		0.00	
Cyanide	1.2	0.00		0.00	
Selenium	1.3	0.00		0.00	
Silver	2.34	0.00		0.00	
Organic					
Acetone	0.014	0.00		0.00	
Chloromethane	0.0083	0.00	3E-9	0.00	7E-9
Chrysene	0.165[b]	0.00	8E-10	0.00	3E-9
Methylene Chloride	0.0088 J	0.00	6E-8	0.00	1E-7
Phenanthrene	0.165[b]	0.00		0.00	
Toluene	0.011	0.00		0.00	
Total		0.00	6E-8	0.00	1E-7

[a]EPA 1989.
[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).
COC = Constituent of concern.
EPA = U.S. Environmental Protection Agency.
J = Concentration was qualified as an estimated value.
mg/kg = Milligram(s) per kilogram.
SWMU = Solid Waste Management Unit.

Ecological risks associated with SWMU 101 are estimated through a risk assessment that incorporates site-specific information when available. All HQ and HI values predicted for the COPECs at this site are found to be less than unity. Analysis of the uncertainties associated with these predicted values indicate that they are more likely to overestimate actual risk rather than underestimate it. Based upon this final analysis, the potential for ecological risks associated with SWMU 101 is expected to be low.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Basis for Determination

SWMU 101 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

SWMU 105, Building 6536, Mercury Spill

Site Location

The Mercury Spill (Building 6536), SWMU 105, is an approximately 3,600 square ft site located in Technical Area-III (Figure 12).

Operational History

The main part of Building 6536 was built in 1967. Room 113 was added in 1983. The facility was used to simulate many types of high-heat environments. Several releases of mercury from equipment inside the building were reported in the 1970s and 1980s. Mercury was found in Room 113 during the building demolition activities. In June 2005, a subsurface release of mercury to the environment was found outside the foundation wall of Room 113. The outside area had been trenched to remove utilities servicing the building; it was during the trenching activities that the release was discovered.

The COC for this site is mercury.

Depth to Groundwater

The regional aquifer is approximately 500 ft bgs.

Evaluation of Relevant Information

In the early 1990s, the initial investigation determined that the mercury releases at SWMU 105 did not impact the environment and that all releases had been within the building and were cleaned up at the time. In 1995, an administrative no further action was issued by the EPA for SWMU 105.

In June 2005, the discovery of the subsurface release to the environment prompted a VCA in order to characterize the release and remove the contaminated soil.

In September 2005, a Phase 1 Voluntary Corrective Action (P1VCA) was initiated. Six discrete subsurface soil samples collected from the release area for metals analysis revealed mercury contamination at a maximum of 39.6 mg/kg. Following the complete removal of Building 6536, a mercury soil-vapor survey beneath the former Room 113 slab indicated that contamination may have been more widespread than expected. Areas with positive vapor readings were found in the soil beneath the former Room 113 slab. Due to the results of the soil-vapor survey, the P1VCA was suspended and a Phase 2 Voluntary Corrective Action (P2VCA) plan was developed to address the new concerns. Mercury contaminated soil was removed from the trench area during the P1VCA and disposed of.

In January to March 2006, the P2VCA activities included the collection of 574 discrete soil samples in order to characterize the vertical and horizontal extent of contamination (Figure 12A).

The sampling area included the footprint of Room 113, the perimeter of Room 113, and the trench area. Samples were collected at approximately 2 ft depth intervals: maximum depth in trench area was approximately 11 ft, maximum depth under the Room 113 slab was approximately 8 ft, and maximum depth around the perimeter of Room 113 was approximately 4 ft. The sampling area was extended northwest of the trench in order to define the horizontal extent of contamination, as elevated mercury results were revealed in that area. The mercury contamination was found at and northwest of the release point in the trench area.

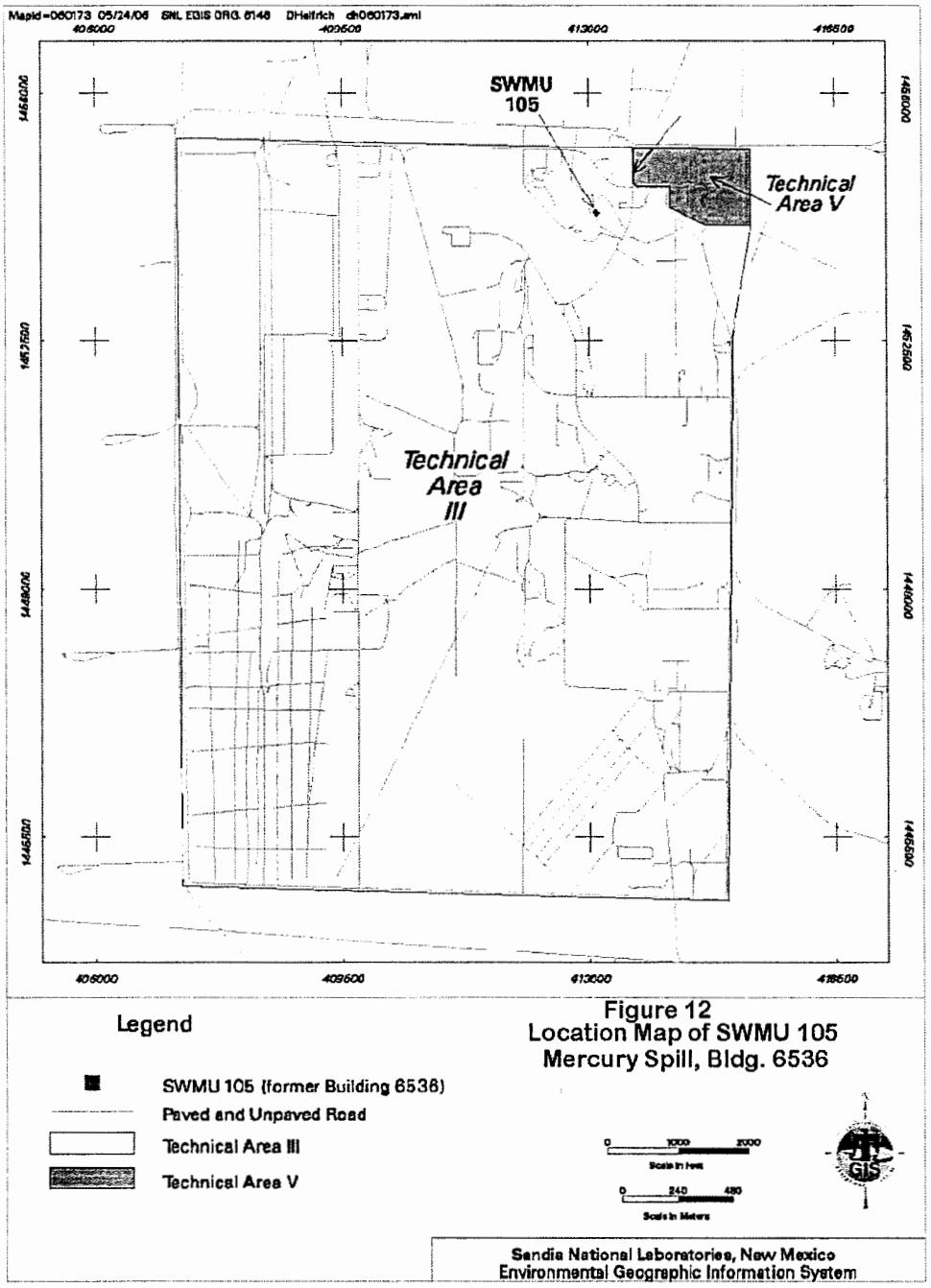


Figure 12
Location Map of SWMU 105
Mercury Spill, Bldg. 6536

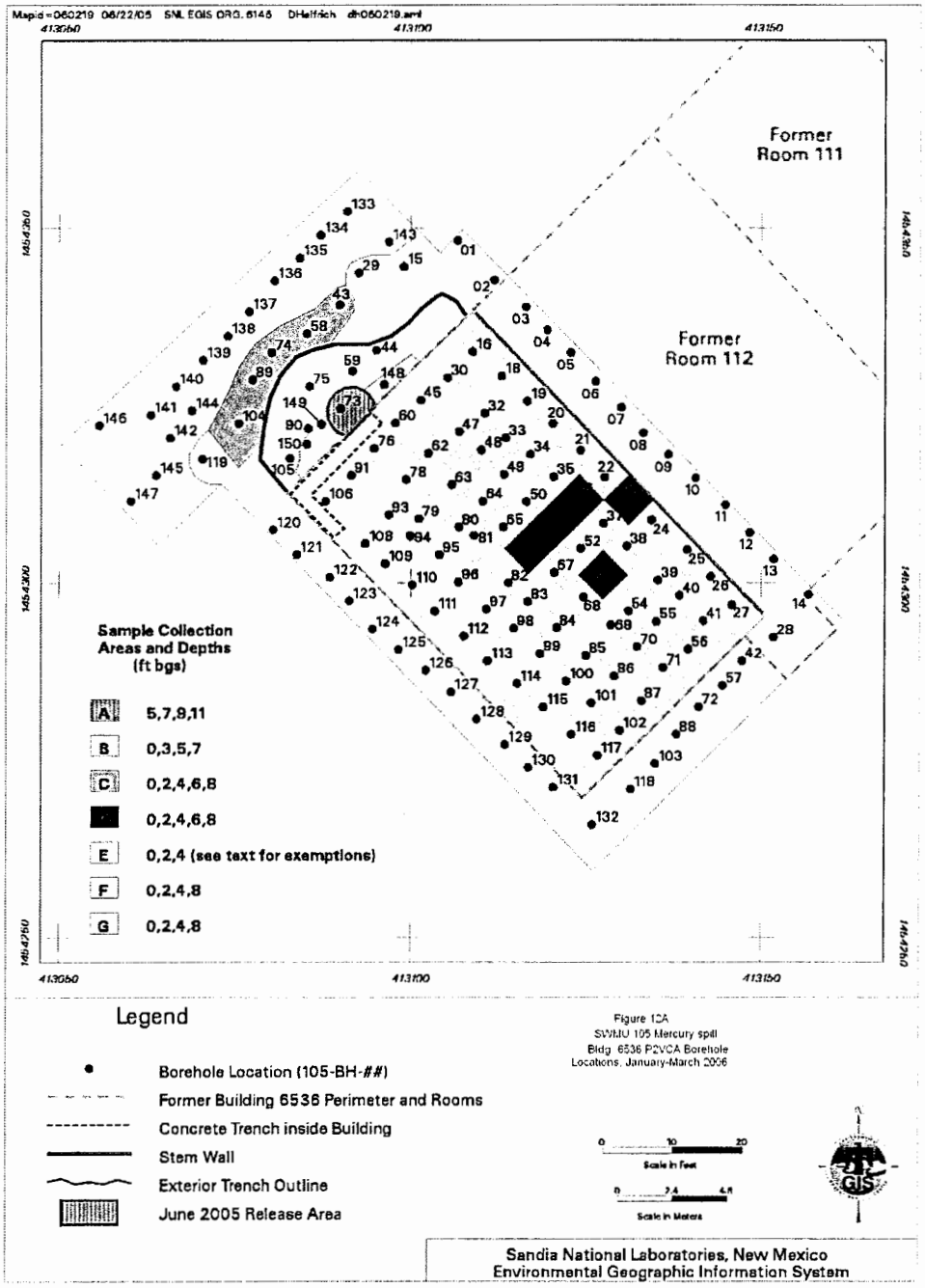


Figure 12A. SWMU 105 Soil Sample Locations

The analytical results of the P2VCA sampling effort revealed 38 samples that exceeded the mercury background value of less than 0.25 mg/kg for surface samples with a maximum of 339 mg/kg, and 73 samples that exceeded the mercury background value less than 0.1 mg/kg for subsurface samples with a maximum value of 342 mg/kg. With the exception of the two samples with the maximum values, the remainder of the sample results ranged from no detection above the method detection limit (MDL) to 147 mg/kg.

Approximately 1 cubic yard of mercury-contaminated soil was removed during the P2VCA and disposed of.

All soil analysis data collected from the P1VCA and the P2VCA were used in the characterization of SWMU 105 and in the risk analyses.

A risk screening assessment was performed for this site, initially using maximum COC concentration, to evaluate the potential for adverse health effects in recreational and residential land-use scenarios.

The distribution of mercury contamination at SWMU 105 could be divided into two sections of the site: the entire site with very little contamination (entire data set), and the trench and adjacent area with mercury contamination (limited data set). As a result, SNL performed two risk analyses. This provided an overall assessment for the entire site, and a conservative assessment for the portion of the site with the highest levels.

Using maximum COC concentrations for the **entire data set**, the total human health HI was 1.19 for the industrial land-use scenario, and the total human health HI was 15 for the residential land-use scenario, both which exceeded the NMED guideline of 1 (Table 10). However, when the UCL of the mean is used in the risk assessment; for the industrial land-use scenario the total human health HI is 0.03, and that for the residential land-use scenario is 0.34; the total human health HI for both the residential and industrial land-use scenario is less than the NMED guideline of 1.

Using maximum COC concentrations for the limited data set, the total human health HI for both the residential and industrial land-use scenario exceeds the NMED guideline of 1 (Table 10A).

Using the UCL of the mean concentration for mercury for the limited data set reduces the total HI to 0.11 for the industrial land-use scenario which is less than the NMED guideline of 1, and to 1.34 for the residential land-use scenario which exceeds the NMED guideline of 1.

Table 10
Risk Assessment Values for SWMU 105 Nonradiological COCs
Entire Data Set

COC[a]	Maximum Concentration/UCL (All Samples) (mg/kg)	Industrial Land-Use Scenario		Residential Land-Use Scenario	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Mercury	342/**7.8**	1.19/**0.03**	–	15.0/**0.34**	–
	Total	1.19/**0.03**	–	15.0/**0.34**	–

Bold values represent UCLs and calculations with UCLs.
[a]Maximum concentration exceeded background value.
– = Information not available.

Table 10A
Risk Assessment Values for SWMU 105 Nonradiological COCs
Limited Data Set

COC[a]	Maximum Concentration/UCL (Limited Set) (mg/kg)	Industrial Land-Use Scenario		Residential Land-Use Scenario	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Mercury	342/**30.5**	1.19/**0.11**	–	15.0/**1.34**	–
	Total	1.19/**0.11**	–	15.0/**1.34**	–

Bold values represent UCLs and calculations with UCLs.
[a]Maximum concentration exceeded background value.
– = Information not available.

Ecological risks associated with SWMU 105 were estimated through a screening assessment that incorporated site-specific information. Using this methodology, the ecological risk for SWMU 105 is expected to be low.

In conclusion, human health and ecological risk are acceptable per NMED guidance under an industrial land-use scenario. Thus, the entire site boundary of SWMU 105 is proposed for CAC with institutional controls.

Basis for Determination

SWMU 105 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use (industrial).

SWMU 116, Building 9990 Septic System

Site Location

SWMU 116, the Building 9990 Septic System, is located in the Coyote Test Field on federally owned land controlled by KAFB and permitted to the DOE (Figure 13). The abandoned system consisted of two drain systems. The septic system for Building 9990 consisted of one 750-gallon septic tank connected to a distribution box that in turn emptied to four seepage pits. A fifth seepage pit received wastewater from a darkroom sink and floor drains on the west side of the building.

Operational History

Available information indicates that Building 9990 was constructed in 1971, and it is assumed that the septic system was constructed at the same time. No significant activity has occurred at Building 9990 since 1994, and the septic tank was last pumped in the spring of 1989. Waste in the septic tank was removed. The systems were reportedly abandoned in the early 1990s but the building was not connected to the COA sanitary sewer system. Residual sludge remaining in the tank after the 1989 pumping was removed in December 1995. The empty and decontaminated septic tank was inspected by the Department in December 1995 and a closure form was signed. The septic tank and five seepage pits were then backfilled with clean, native soil from the area in early 1996.

The COCs include RCRA metals, hexavalent chromium, cyanide, PCBs, HE compounds, VOCs, SVOCs and radionuclides.

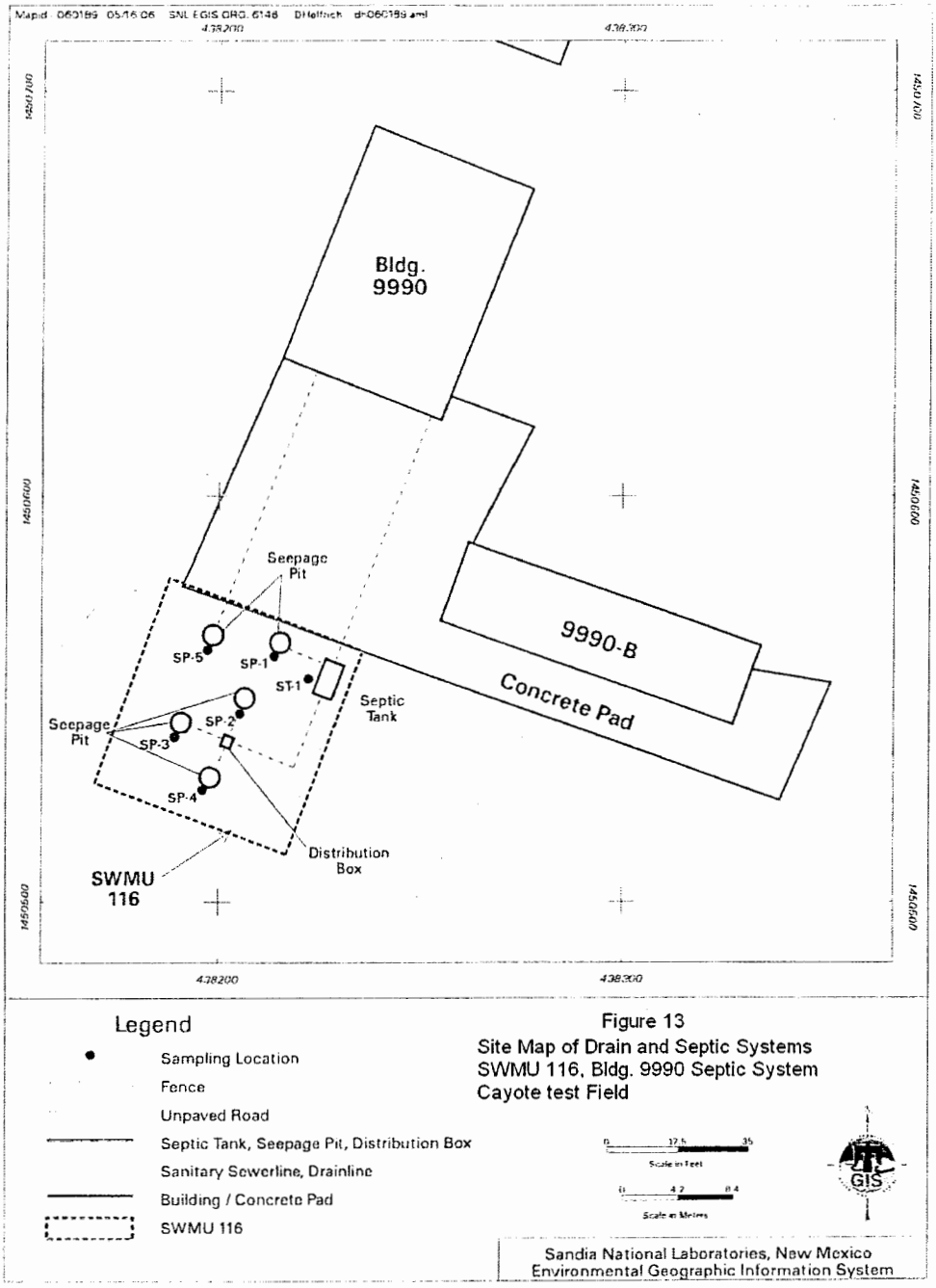


Figure 13
Site Map of Drain and Septic Systems
SWMU 116, Bldg. 9990 Septic System
Cayote test Field

Evaluation of Relevant Information

Five assessment investigations have been conducted at this site. In June 1992, May 1994 and January 1995, waste characterization samples were collected from the septic tank (Investigation 1). A geophysical survey was performed in February 1994 to help locate areas of high moisture content (Investigation 2). In May and June 1994 and November 1994 passive soil-vapor surveys were conducted to identify releases of VOCs and SVOCs (Investigation 3).

In January 1995, soil samples were collected from backhoe excavation next to each of the five seepage pits and from one excavation next to the septic tank. In 2002 soil samples were collected from boreholes in the vicinity of two of the seepage pits (Investigation 4). In August 2001, monitoring well CTF-MW1 was installed, and eight quarters of groundwater samples were collected and analyzed. This was one of four DSS sites selected by the Department for groundwater monitoring (Investigation 5). These investigations are discussed in the following sections.

Investigation 1 — Septic Tank Sampling

Aqueous and sludge samples were collected from the septic tank in June 1992 and were analyzed for various organic, inorganic and radionuclide constituents. VOCs, SVOCs, metals, phenolic compounds and several miscellaneous organic compounds were detected in the liquid and/or sludge. Gross alpha, gross beta and individual radionuclide analyses were also performed on the material.

Although some radionuclides were detected, the brief narrative report summarizing the analytical results for those samples stated that "During review of the radiological data, no parameters were detected that exceed U.S. DOE derived concentration guideline (DCG) or the investigation levels established during this investigation."

A second round of septic tank sludge samples was collected for waste characterization purposes in May 1994; the samples were analyzed for TCLP-list VOCs, SVOCs, metals, hexavalent chromium, cyanide and PCBs. No free liquid remained in the tank when these samples were collected. No VOC or SVOC compounds, and only barium were detected in the TCLP-derived leachate from the sludge. Cyanide and the PCB compound aroclor-1260 were identified in the material; hexavalent chromium was not detected.

A third round of waste characterization sludge samples was collected in January 1995 and the sludge samples analyzed for isotopic uranium by an offsite commercial laboratory and for other radionuclides using SNL in-house gamma spectroscopy. Low activity levels of the three isotopic uranium constituents, and a limited number of other radionuclides were detected in the material.

Investigation 2 – Geophysical Survey

A geophysical survey using a Geonics™ EM-38 conductivity meter was performed at the site in February 1994 in an attempt to locate moist areas around the seepage pit. The results of the survey were inconclusive, and were not used to as a guide in determining soil sampling locations at this site.

Investigation 3 – Passive Soil-Gas Survey

A passive soil-gas survey was conducted in two phases. Phase 1 was conducted in May and June 1994 and included 11 sampling locations. The second phase of sampling at seven additional locations was completed in November 1994. This survey used PETREX™ sampling tubes to identify any releases of VOCs and SVOCs from the seepage pits and septic tank. BTEX and

aliphatic compounds at potentially detectable concentrations were identified in two samplers. These two locations were located in the northern edge of the seepage pit area, downgradient from a parking area.

Investigation 4 — Soil Sampling

An attempt was made in October 1994 to collect soil samples with Geoprobe™ sampling equipment but the effort was unsuccessful because of subsurface refusal of the Geoprobe™ sampling device and problems obtaining adequate sample volumes. Thus, in January 1995, samples were collected from backhoe excavations next to each of the five seepage pits and from one excavation next to the septic tank. It was determined that the depth to the natural bedrock subsurface ranged from 3 to 6.5 bgs, and that an excavation into bedrock to a depth of 13 feet bgs had been dug to accommodate the five 13-foot deep seepage pits. The base of the septic tank was also placed in the same bedrock excavation, at 8.5 feet bgs.

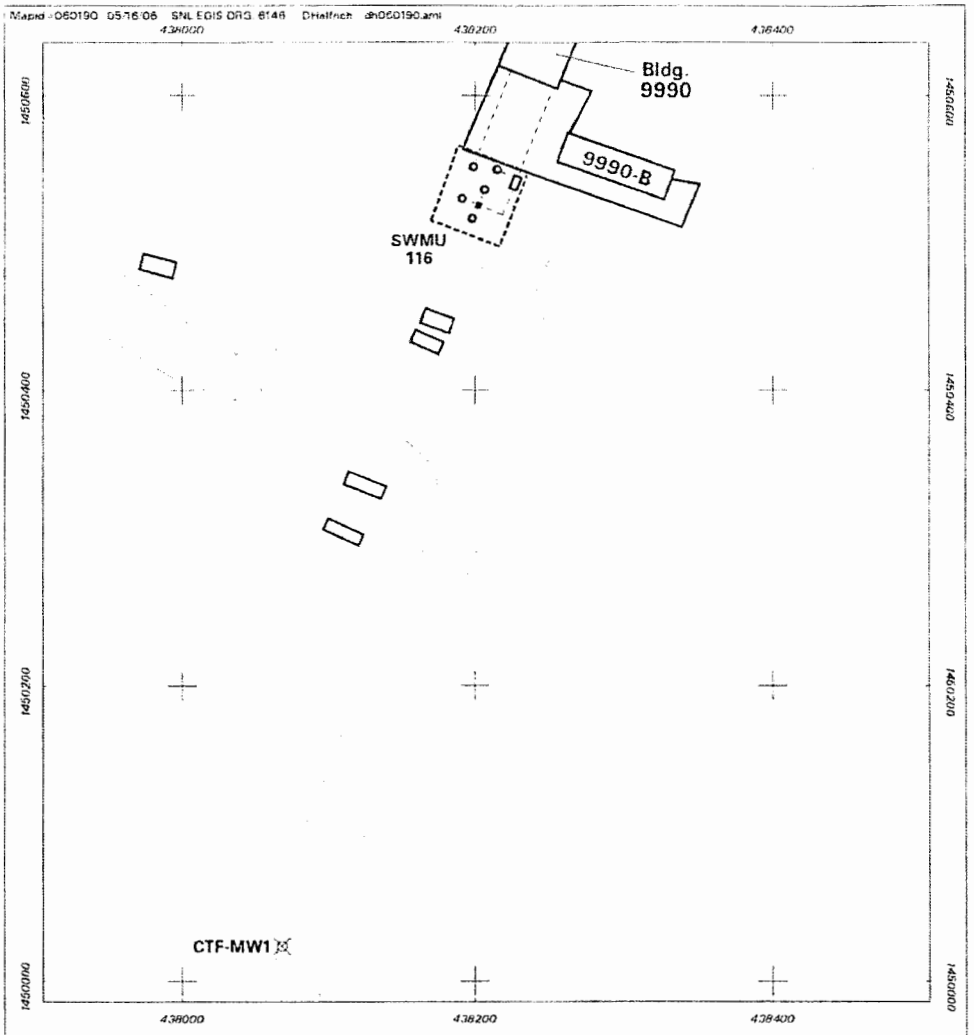
Results for the soil samples from January 1995 are as follows. Six VOCs (acetone, carbon disulfide, 2-hexanone, methylene chloride, methyl isobutyl ketone and xylenes) were detected in the soil samples. Acetone and methylene chloride were detected in the associated TB sample. No SVOCs were detected in any of the samples. One PCB (aroclor-1260) was detected in the soil sample near the septic tank. Cyanide was detected in three of the soil samples. One RCRA metal (silver) was detected above the Department-approved background level. All other metal concentrations were below the Department-approved background concentrations. For radionuclides, no activities above background levels were detected in any of the samples analyzed. However, although not detected, the MDA for the uranium-235 gamma spectroscopy analysis exceeded the background activity.

In October 2002, two additional samples for HE compounds were collected at two locations specified by the Department (locations SP-3 and SP-5, (Figure 13). Boreholes were drilled adjacent to the two seepage pits, and samples for HE analysis were collected at the greatest depth interval reached, 8 feet bgs, using a Geoprobe™ sampler inside the drill rig augers. No HE compounds were detected.

Investigation 5 – Groundwater Monitoring

Groundwater monitor well CTF-MW1 was installed with an air-rotary casing hammer (ARCH) drilling rig in August 2001 at a location agreed upon by the Department and the Permittees. Monitor well CTF-MW1 is 265 feet deep and is screened between 240 and 260 feet bgs. Depth to groundwater was 234 feet bgs in January 2005 (Figure 14).

Results for the eight quarters of groundwater samples collected from monitor well CTF-MW1 are summarized in this paragraph. One VOC (acetone) was detected in the groundwater sample collected in July 2002, but not in the associated TB. No VOCs were detected in subsequent groundwater, TB or EB samples. No HE compounds were detected in any groundwater sample collected. The RCRA metal selenium was detected in seven of the eight groundwater samples at concentrations above the Department-approved background concentration. All other metal concentrations were below the Department-approved background levels or other promulgated regulatory limits. No cyanide was detected in any sample collected. NPN detections exceeded the background value in every sampling round. Fluoride detections were all below the corresponding established regulatory and/or background levels. No regulatory or background limits have been established for bromide, calcium, chloride, magnesium, potassium, sodium or sulfate in groundwater.



Legend

- Groundwater Monitoring Well
- Unpaved Road
- Septic Tank, Seepage Pit, Distribution Box
- Sanitary Sewerline, Drainline
- Building / Concrete Pad
- SWMU 116

Figure 14

Location of Groundwater Monitoring Well CTF-MW1 at Drain and Septic Systems SWMU 116, Bldg. 9990 Septic System, Coyote Test Field

Scale in Feet: 0 50 100

Scale in Meters: 0 12 24

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Annual groundwater monitoring at SWMU 116 (required by the NMED as a control in its letter of April 8, 2010) is to be discontinued as no definitive evidence of groundwater contamination was detected in eight quarters of monitoring. Inorganic constituents are considered to be at background levels.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total human health HIs and estimated excess cancer risks are acceptable (Table 11).

Table 11
Risk Assessment Values for SWMU 116 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Chromium VI	0.05[b]	0.00	5E-11	0.00	1E-10
Cyanide	3.7	0.00		0.00	
Silver	1.7	0.00		0.00	
Organic					
Acetone	0.011	0.00		0.00	
Carbon disulfide	0.005[b]	0.00		0.00	
2-Hexanone	0.005[b]	0.00		0.00	
Methylene chloride	0.003 J	0.00	2E-8	0.00	4E-8
Methyl isobutyl ketone	0.005[b]	0.00		0.00	
Total xylenes	0.0025	0.00		0.00	
Total		0.00	2E-8	0.01	4E-8

[a]EPA 1989.
[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).

For the radiological COC (uranuim-235) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 5.0E-2 millirem (mrem)/year (yr). The estimated excess cancer risk is 4.8E-7.

The exposure pathway analysis established that no complete ecological pathway exists for exposure of ecological species to contaminants at SWMU 116. All COCs are located at depths greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Basis for Determination

SWMU 116 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

SWMU 138, Building 6630 Septic System

Site Location

SWMU 138, the Building 6630 Septic System, is located in TA-III on federally owned land controlled by KAFB and permitted to the DOE. SWMU 138 consists of a 600-gallon septic tank that discharged to four, approximately 110-ft-long drain lines (Figure 15).

Operational History

Available information indicates that Building 6630 was constructed in 1959 and it is assumed that the septic system was constructed about the same time. In 1991, septic system discharges were routed to the COA sanitary sewer system. The septic system line was disconnected and capped, and the system was abandoned in place concurrent with this change. The empty and decontaminated septic tank was inspected by the Department in November 1995, and a closure form was signed. The septic tank was backfilled with clean, native soil from the area in late 1995.

The COCs include RCRA metals, HE compounds, VOCs, SVOCs and radionuclides.

Evaluation of Relevant Information

Five assessment investigations have been conducted at this site. In May 1994 and in January 1995, waste characterization samples were collected from the septic tank, and in January 1996 the distribution box was sampled (Investigation 1). A geophysical survey was performed in June 1994 to help locate areas of high moisture content (Investigation 2). In June and November 1994, passive soil-vapor surveys were conducted to identify potential releases of VOCs and SVOCs (Investigation 3). A backhoe was used to locate the drainfield (Investigation 4). In December 1994 soil samples were collected from boreholes within the drainfield, and from either side of the septic tank (Investigation 5). These investigations are discussed in the following sections.

Investigation 1 — Septic Tank and Distribution Box Sampling

Septic tank sludge samples were collected in May 1994 and January 1995 for waste characterization purposes and were analyzed for VOCs, SVOCs, total and TCLP RCRA metals, isotopic uranium, PCBs, tritium and gamma spectroscopy radionuclides. The septic system was not used after 1990, and the sludge in the tank was dry. Concentrations of a number of RCRA metals were detected. However, only barium and cadmium were detected in the TCLP analysis, and concentrations of both were below regulatory levels. The SVOC analysis identified a phthalate above the detection limit and trace quantities of 11 other SVOCs in the sludge. The PCB analysis detected aroclor-1254 in the sludge. The VOC analysis detected methylene chloride, acetone and 2-butanone in the sludge. Analysis of the septic tank sludge detected a uranium-238 anomaly.

The distribution box had a small amount of sludge that was sampled in January 1996 for RCRA metals, tritium, isotopic uranium and gamma spectroscopy radionuclides. The metal concentrations were all lower than those in the septic tank sludge as expected because of the

precipitation mechanism in the tank. No radiological anomalies were evident, and there was no detectable tritium.

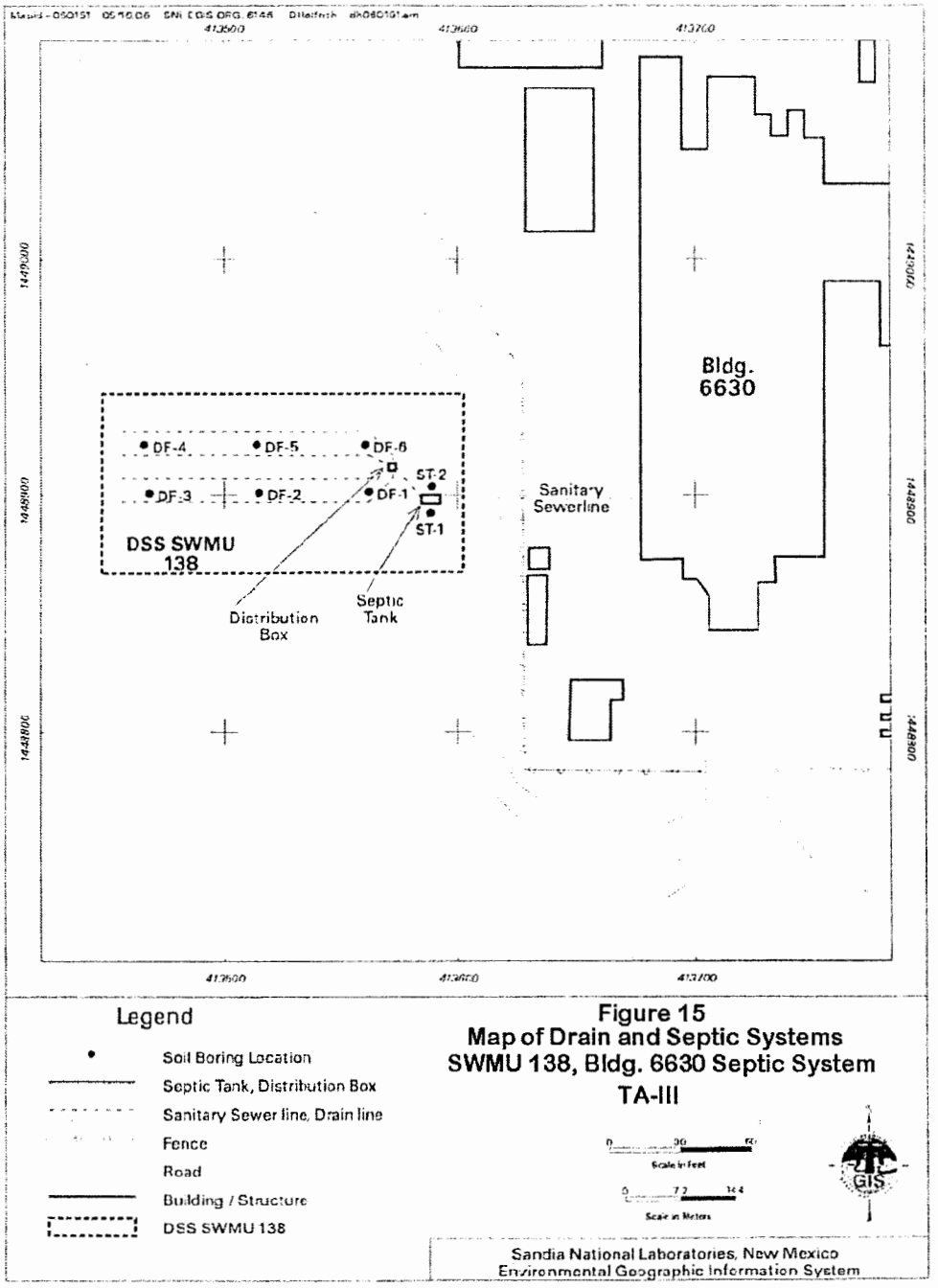


Figure 15
Map of Drain and Septic Systems
SWMU 138, Bldg. 6630 Septic System
TA-III

Investigation 2 – Geophysical Survey

A geophysical survey using a Geonics™ Model EM-38 ground conductivity meter was performed in June 1994 to attempt to locate the drainfield. The technique was not successful in delineating the drainfield or finding areas of higher moisture concentrations.

Investigation 3 – Passive Soil-Gas Survey

The passive soil-gas survey conducted in the area of the drainfield in June and November 1994 used PETREX™ sampling tubes to identify any releases of VOCs and SVOCs from the drainfield. Fifty-five PETREX™ tube samplers were placed, in two phases, in a grid pattern that covered the drainfield and septic tank area. The soil gas survey detected tetrachloroethene, TCE, BTEX and aliphatic compounds at several locations in and around the drainfield. However, at one of the sample locations where TCE was detected, an additional overlapping PETREX sample did not detect TCE. Also, subsequent confirmatory soil samples that were collected near some of the PETREX sample locations in the drainfield and analyzed for VOCs and SVOCs did not detect any of these constituents.

Investigation 4 — Backhoe Excavation

A backhoe was used in September 1994 to determine the location, dimensions and depth of the ER Site 138 drainfield, which had no surface expression.

Investigation 5 — Soil Sampling

In December 1994, soil samples were collected from boreholes within the drainfield, and from either side of the septic tank. Sampling intervals started at 6.5 and 16.5 feet bgs in each of the six drainfield boreholes, and at 10 feet bgs in the two boreholes adjacent to the septic tank. The soil samples were analyzed for VOCs, SVOCs, PCBs, RCRA metals plus nickel, total cyanide, isotopic uranium, tritium and radionuclides by gamma spectroscopy.

Results for the soil samples are discussed in this section. Three VOCs (acetone, methylene chloride and toluene) were detected in the soil samples. All but toluene were also detected in the associated TB or EB samples. Three SVOCs [bis(2-ethylhexyl) phthalate, 2-chloronaphthalene and phenol] were detected in the soil samples. No PCBs or cyanide were detected in any of the samples collected from the boreholes. Three RCRA metals (barium, nickel and silver) were detected above the Department-approved background levels in all three boreholes. All other metal concentrations were below the corresponding Department-approved background concentrations. For radionuclides, no activities above background levels were detected in any of the samples analyzed. However, although not detected, the MDA for tritium analyses exceeded its respective background activity.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total human health HIs and estimated excess cancer risks are acceptable (Table 12).

Table 12
Risk Assessment Values for SWMU 138 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Barium	497	0.01		0.09	
Cyanide	0.25[b]	0.00		0.00	
Nickel	108	0.01		0.07	
Silver	11.9	0.00		0.03	
Organic					
Acetone	0.0079 J	0.00		0.00	
2-Chloronaphthalene	0.2 J	0.00		0.00	
bis(2-Ethylhexyl) phthalate	0.165[b]	0.00	9E-10	0.00	4E-9
Methylene Chloride	0.0039 J	0.00	3E-8	0.00	5E-8
Phenol	0.165[b]	0.00		0.00	
Toluene	0.0025[b]	0.00		0.00	
Total		**0.02**	**3E-8**	**0.20**	**6E-8**

[a]EPA 1989.
[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).
COC = Constituent of concern.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.

For the radiological COC (tritium) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 3.6E-5 millirem (mrem)/year (yr). The estimated excess cancer risk is 4.0E-11.

The exposure pathway analysis established that no ecological pathway exists for exposure of ecological species to contaminants at SWMU 138. All COCs are located at depths greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Basis for Determination

SWMU 138 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

SWMU 140, Building 9965 Septic System, Septic Tanks, and Drainfields

Site Location

SWMU 140, the Building 9965 Septic System, is located in the Thunder Range test area on federally owned land controlled by KAFB and permitted to the DOE. SWMU 140 consists of two abandoned drain systems. The septic system on the southwest side of Building 9965 consisted of a septic tank connected to a single seepage pit. The second drain system discharged to a drywell on the north side of the building (Figure 16).

Operational History

Available information indicates that Building 9965 was constructed in 1965, and it is assumed that the septic system and drywell were also constructed at that time. By 1991, the septic system discharges were routed to the COA sanitary sewer system, and the drywell was deactivated in the early 1990s. The old septic system line was disconnected and capped, and the system was abandoned in place concurrent with this change. Waste in the septic tank was removed. The empty and decontaminated septic tank was inspected by the Department on December 15, 1995, and a closure form was signed. The septic tank was then backfilled with clean, native soil from the area in late 1995 or early 1996.

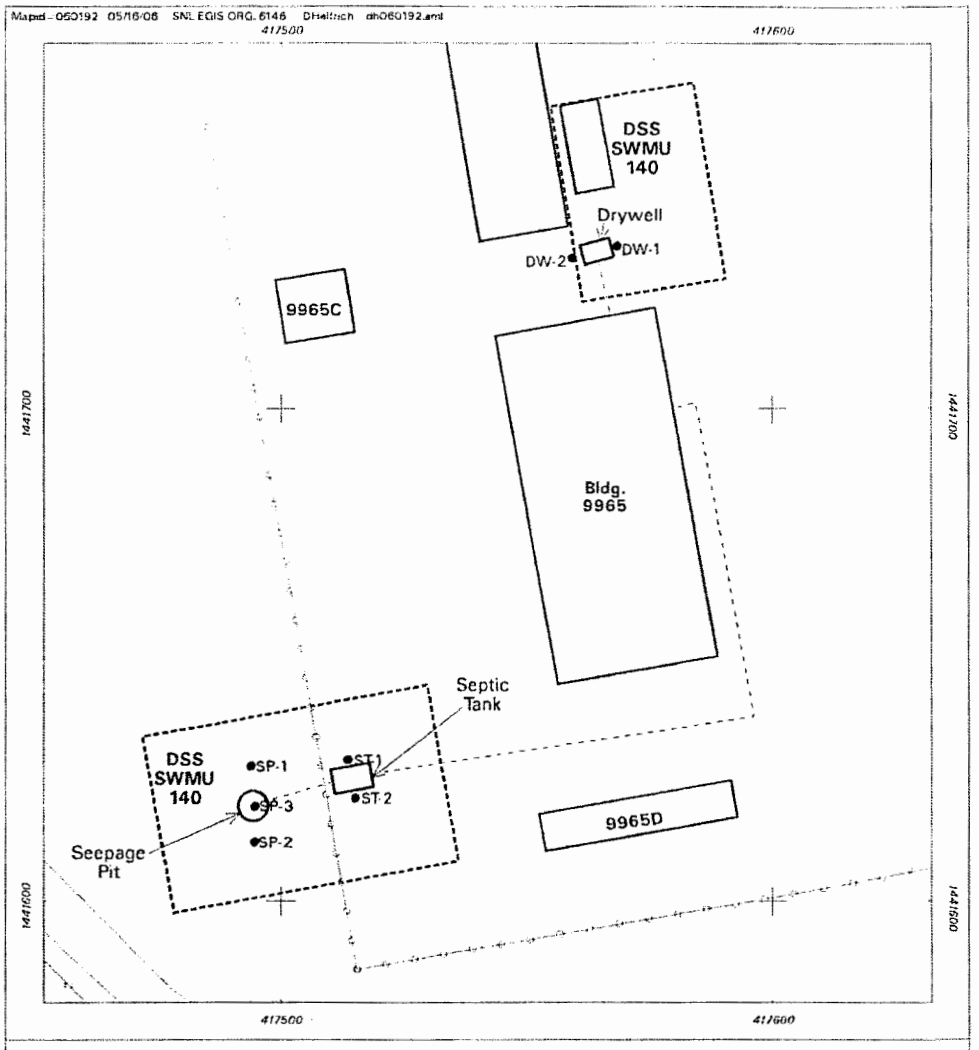
The COCs include RCRA metals, hexavalent chromium, cyanide, VOCs, SVOCs and radionuclides.

Evaluation of Relevant Information

Four assessment investigations have been conducted at this site. In July 1992, April 1994, and November 1994, waste characterization samples were collected from the septic tank (Investigation 1). A geophysical survey was performed in June 1994 to locate the two drywells thought to exist north of Building 9965 (Investigation 2). In June and July 1994, a passive soil-vapor survey was conducted to identify potential releases of VOCs and SVOCs that could have occurred from seepage pit, septic tank, and drywell (Investigation 3). In September 1994, November 1994, January 1995 and September 2003, soil samples were collected from boreholes on opposite sides of the seepage pit, septic tank and drywell and through the center of the seepage pit (Investigation 4). A backhoe excavation was conducted in January 1995 to determine the cause of the resistance when sampling near the seepage pit (Investigation 5). These investigations are discussed in the following sections.

Investigation 1 — Septic Tank Sampling

Sludge and aqueous samples were collected from the septic tank in July 1992. The aqueous sample was analyzed for VOCs, SVOCs, pesticides, PCBs, metals, selected radionuclide constituents and several miscellaneous analytes. One VOC (TCE) was identified. The pesticides beta-BHC, 4,4-DDD and 4,4-DDE were detected. Several RCRA metals and radionuclides were detected as well as phenolic compounds, nitrates/nitrites, formaldehyde, fluoride, cyanide and oil and grease. No PCBs were detected. The sludge sample was analyzed for heavy metals and selected radionuclide constituents. Several metals and radionuclides were detected.



Legend

- Soil Boring Location
- Fence
- Road
- Building / Structure
- Sewerline / Drain Line
- Septic Tank, Seepage Pit, Drywell
- DSS SWMU 140

Figure 16
Site Map of Drain and Septic Systems
SWMU 140, Bldg. 9965 Septic System,
Thunder Range

0 15 30
Scale in Feet

0 3.6 7.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

A second round of septic tank sludge samples was collected for waste characterization purposes in April 1994 and analyzed for VOCs and RCRA TCLP metals. Concentrations of eight VOC compounds (acetone, benzene, 2-butanone, carbon disulfide, ethyl benzene, methylene chloride, toluene and total xylenes) were identified in the material. Two RCRA TCLP metals (barium and mercury) were detected in the sludge.

A third round of waste characterization sludge and liquid samples was collected in November 1994 and were analyzed for SVOCs, isotopic uranium, gamma spectroscopy radionuclides and tritium. No SVOCs were detected. Several radionuclides were detected.

Investigation 2 – Geophysical Survey

A geophysical survey was conducted in June 1994 using a Schonstedt 52B magnetic locator. The purpose of this survey was to locate the two drywells thought to exist north of Building 9965. The active drywell generated a distinct magnetic signature and was located with high confidence. Another feature west of the active drywell generated a weak magnetic signature and was thought to be the second drywell. However, because the second feature had such a poor magnetic signature, it was thought that what was identified as a second drywell might actually be a magnetic anomaly due to other buried metal.

Investigation 3 – Passive Soil-Gas Survey

A passive soil-gas survey was conducted in June and July 1994 used PETREX™ sampling tubes to identify any releases of VOCs and SVOCs that may have occurred from the seepage pit, septic tank and drywell. Six PETREX™ tube samplers were placed in a grid pattern surrounding the seepage pit and septic tank, and another six were placed in a grid pattern surrounding the drywell.

Investigation 4 — Soil Sampling

Soil samples were collected from borings located on opposite sides of the seepage pit, septic tank and drywell in September and November 1994, and January 1995 respectively (Figure 16). Sampling around the seepage pit was started at 11 ft bgs. The Geoprobe ™ met resistance at about 14 ft bgs at all locations around the seepage pit. This difficulty meant that the shallow samples had to be collected from six separate closely-spaced locations. Four of the locations were north of the seepage pit within two ft of the SP-1 location, and two were south of the seepage pit within two ft of the location of SP-2 shown on (Figure 16). The four tries are thus identified as SP-1 and the two tries SP-2. Also, because of the refusal at 14 ft bgs, a deep sample was not obtained. In November 1994, one soil sample was collected from each of the two septic tank borings, the depth interval for the sample started at a depth level with the bottom of the septic tank which was measured to be 7 ft bgs. Finally, in January 1995 soil samples were collected from two different intervals in boreholes near the drywell. The shallow sampling interval started at the bottom of the drywell at 8 ft bgs and the deeper interval started at 10 feet below the top of the upper interval, or 18 ft bgs. Subsurface refusal problems of the Geoprobe ™ sampler were not encountered in either of the two drywell boreholes. The soil samples were analyzed for VOCs, SVOCs, hexavalent chromium, cyanide, nitrate, RCRA metals, tritium, isotopic uranium and radionuclides by gamma spectroscopy.

Results for the soil samples are discussed in this paragraph. Four VOCs (acetone, methylene chloride, methyl ethyl ketone and methyl isobutyl ketone) were detected in the soil samples. These compounds were detected in one or more of the associated TB or EB samples. No SVOCs or hexavalent chromium were detected. Cyanide was detected in three of the samples. Nitrate

was detected in five of the samples. Three RCRA metals (arsenic, barium and selenium) were detected above Department-approved background concentrations. All other metal concentrations were below the Department-approved background concentrations. For radionuclides, no activities above background levels were detected in any of the samples analyzed. However, although not detected, the MDA for all of the uranium-235 and uranium-238 analyses exceeded the corresponding background activity.

In September 2003, a truck-mounted auger drill rig was used to collect two additional soil samples for VOC analysis and four soil samples for total cyanide analysis from a borehole drilled through, and beneath, the seepage pit. The VOC samples were collected at depths of 11 and 16 feet bgs and the total cyanide samples were collected at depths of 11, 16, 21 and 26 feet bgs at the SP-3 seepage pit borehole location (Figure 16). One VOC (acetone) was detected only in the EB associated with these samples. Low concentrations of toluene were detected in the two VOC soil samples but not in the TB or EB associated with these samples. Cyanide was not detected in any soil sample or in the EB associated with these samples.

Investigation 5 — Backhoe Excavation

A backhoe excavation was conducted in January 1995 to determine the cause of the resistance when sampling near the seepage pit. The excavation uncovered two caliche layers at this site. One layer was 0.5 to 1.0 ft thick at 8 to 9 ft bgs. The other layer started at about 13 ft bgs and could not be penetrated with a backhoe.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total HI and estimated excess cancer risk are acceptable (Table 13).

For the radiological COCs (uranuim-235and uranium-238) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 0.13 millirem (mrem)/year (yr). The estimated excess cancer risk is 1.1E-6.

The exposure pathway analysis established that no complete ecological pathway exists for exposure of ecological species to contaminants at SWMU 140. All COCs are located at depths greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Basis for Determination

SWMU 140 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Table 13
Risk Assessment Values for SWMU 140 Nonradiological COCs

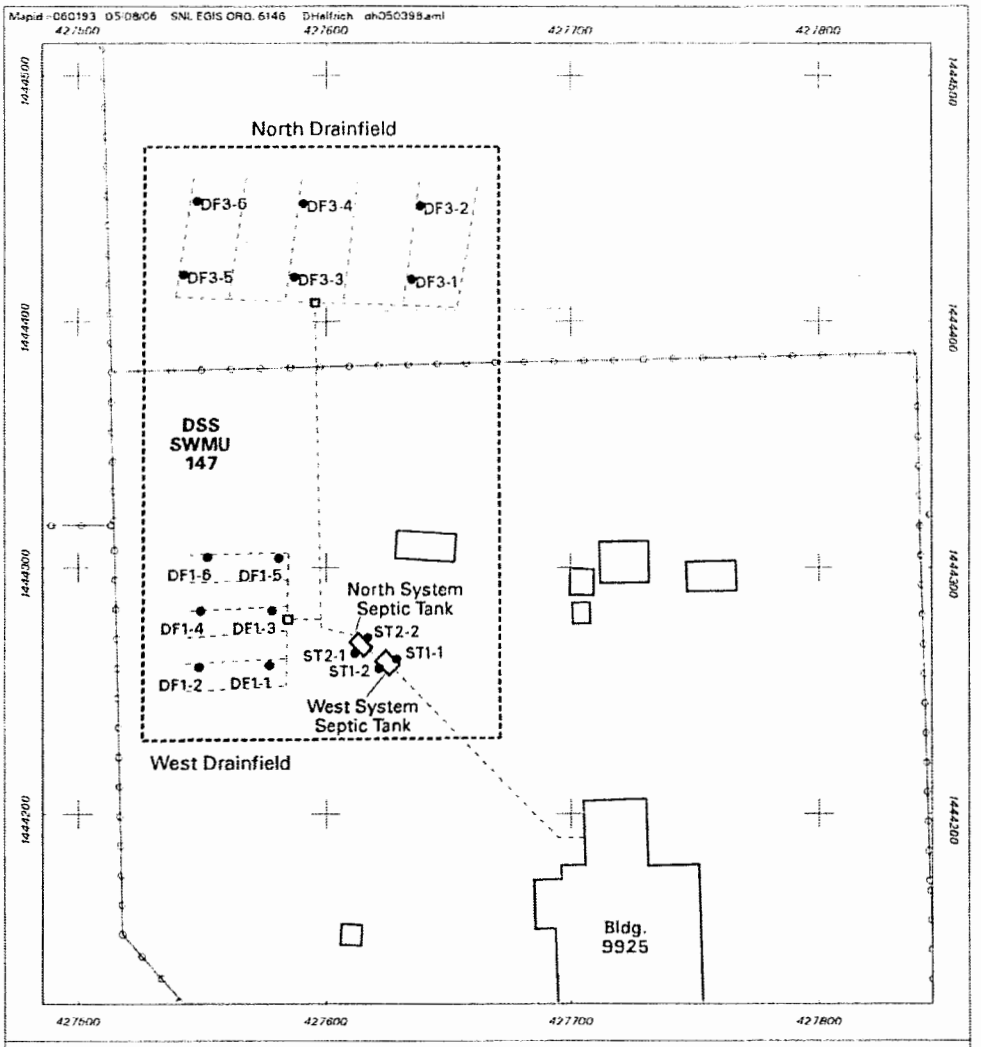
COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	5.7	0.02	4E-6	0.26	1E-5
Barium	254	0.00		0.05	
Cyanide	1.8	0.00		0.00	
Nitrate	3.9	0.00		0.00	
Selenium	4.6	0.00		0.01	
Organic					
Acetone	0.016	0.00		0.00	
Methylene chloride	0.0038 J	0.00	2E-8	0.00	5E-8
Methyl ethyl ketone	0.026	0.00		0.00	
Methyl isobutyl ketone	0.005[b]	0.00		0.00	
Toluene	0.0025[b]	0.00		0.00	
Total		**0.03**	**4E-6**	**0.33**	**1E-5**

[a]EPA 1989.
[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).
COC = Constituent of concern.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.

SWMU 147, Building 9925 Septic System, Septic Tanks, and Drainfields

Site Location

SWMU 147, the Building 9925 Septic System, is located in the Coyote Test Field area on federally owned land controlled by KAFB and permitted to the DOE. Building 9925 had three septic systems. The west septic system consisted of a 1,500-gallon septic tank that discharged to a drainfield with six, approximately 40-ft-long drain lines. The west drainfield was abandoned and replaced by the north system consisting of a drainfield with six, approximately 50-ft-long drain lines. The west system septic tank was connected to a second 1,500-gallon septic tank when the west drainfield was abandoned (Figure 17). The south septic system consisted of a 750-gallon septic tank that discharged to a drainfield with two, approximately 60-ft-long drain lines (Figure 18).



Legend

- Soil Boring Location
- Fence
- Road
- Building
- Sewerline, Drain Line
- Septic Tank, Distribution Box
- DSS SWMU 147

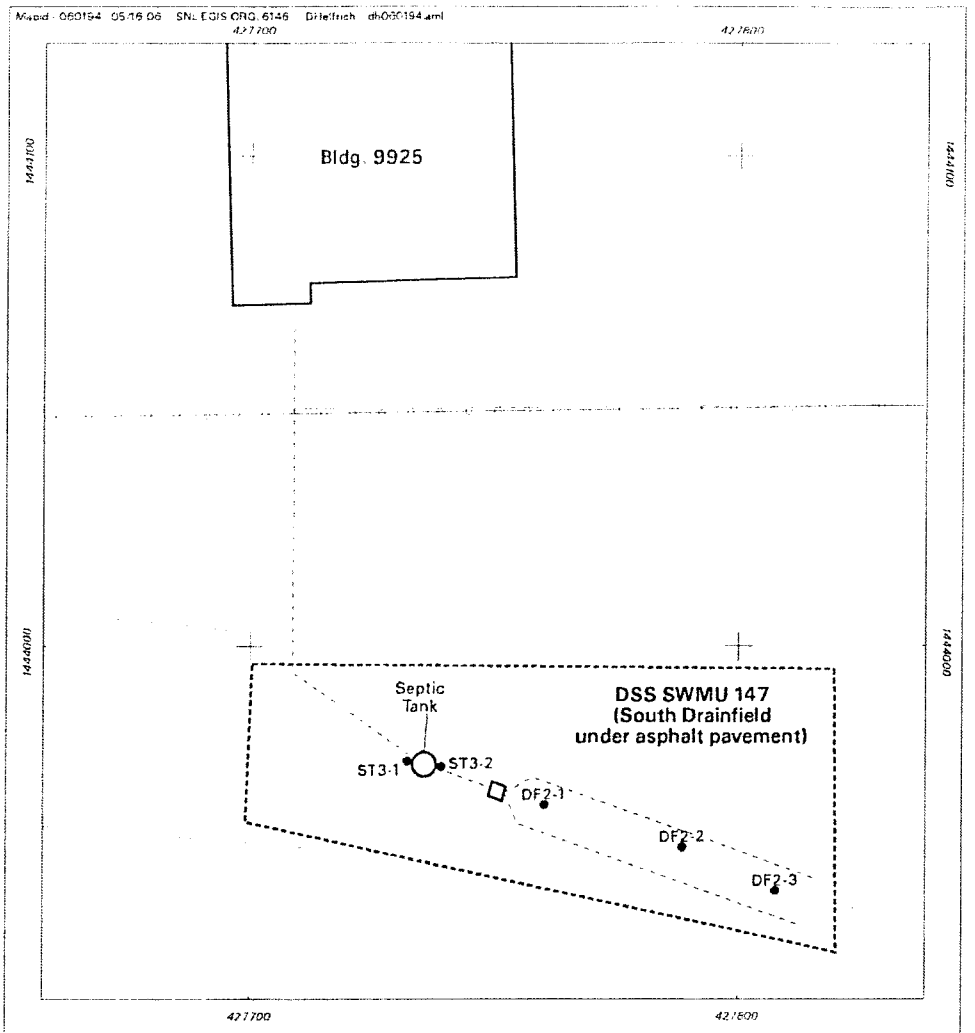
Figure 17

Site Map of North and West Drainfields at Drain and Septic Systems SWMU 147, Bldg. 9925 Septic Systems, Coyote Test Field

Scale in Feet

Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System



Legend

- Soil Boring Location
- Fence
- Edge of Pavement
- Septic Tank, Distribution Box
- Sewerline, Drain Line
- Building
- DSS SWMU 147

Figure 18

Site Map of South Drainfield at Drain and Septic Systems SWMU 147, bldg. 9925 Septic Systems, Coyote Test Field

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Operational History

Available information indicates that Building 9925 was constructed in 1959, and it is assumed that the south septic system was also constructed at that time. The west system, which was constructed around 1965 to 1966, was replaced by the north system in the late 1980s. By 1991, all septic system discharges were routed to the COA sanitary sewer system. The old septic system lines were disconnected and capped and the systems were abandoned in place concurrent with this change. Waste in the north and west system septic tanks was removed. The empty and decontaminated septic tanks were inspected by the Department on January 26, 1996, and a closure form was signed. The septic tanks were then backfilled with clean, native soil from the area in early 1996. The south system septic tank had been abandoned in place prior to 1994.

The COCs include RCRA metals, HE compounds, VOCs, SVOCs and radionuclides.

Evaluation of Relevant Information

Five assessment investigations have been conducted at this site. In May 1994 and January 1994, waste characterization samples were collected from the west septic tank, and in January 1995, from the north septic tank (Investigation 1). A geophysical survey was performed in late 1993 to early 1994 to locate areas of moist soils around these systems (Investigation 2). In June and November 1994, passive soil-vapor surveys were conducted to identify potential releases of VOCs and SVOCs from the septic systems (Investigation 3). In September 1994, a backhoe was used to locate the north system drainfields (Investigation 4). In January 1995, soil samples were collected from boreholes in the drainfields (Investigation 5). These investigations are discussed in the following sections.

Investigation 1 — Septic Tank Sampling

Septage samples were collected from the SWMU 147 north and west system septic tanks for waste characterization purposes.

West System Septic Tank Samples

Waste characterization liquid and sludge samples were collected from the west system septic tank in May 1994. The liquid samples were analyzed for phenolic compounds, RCRA metals, isotopic uranium, tritium and additional radionuclides using gamma spectroscopy screening. A low concentration of barium and below-reporting limits concentrations of arsenic and silver were identified in the liquid samples. The sludge samples were analyzed for VOCs, SVOCs, phenolic compounds, RCRA TCLP metals, explosive compounds and radionuclides using gamma spectroscopy screening. Explosives compounds were selected as an analyte for the west tank because it was in service from the late 1960s through the early 1980s when it was likely that explosives were used at the Test Field. Below-reporting-limit concentrations of two VOCs, seven SVOCs, and phenolic compounds were identified in the material. No explosive compounds were detected, and low activity levels of seven radionuclides were identified in the gamma spectroscopy screening.

A waste characterization sludge sample was collected from the west system tank in January 1995 and was analyzed for isotopic uranium. Low activity levels of uranium isotopes were detected in the sludge.

North System Septic Tank Samples

A second round of liquid and sludge waste characterization samples was collected from the north system septic tank in January 1995. The liquid samples were analyzed for SVOCs, explosive compounds, RCRA metals, isotopic uranium and tritium. Explosive compounds were selected as an analyte for the north tank liquid only because the two tanks are in series, and the line to the drainfield is connected to the north tank. SVOCs and explosive constituents were not detected, and low concentrations of two metals (barium and lead) were identified in the liquid. Low activity levels of isotopic uranium were detected, but tritium was not identified in the liquid. The sludge samples were analyzed for VOCs, SVOCs, RCRA metals, uranium isotopes and for additional radionuclides using gamma spectroscopy. Five VOCs, one SVOC, seven of the eight RCRA metals and low activity levels of uranium isotopes were detected in the samples. A number of additional radionuclides were also identified in the gamma spectroscopy screening of the sludge.

Investigation 2 – Geophysical Survey

Several geophysical surveys using Geonics™ Model EM-31 and EM-38 ground conductivity meters were performed in the area of the west and south systems in late 1993 and early 1994 to attempt to locate areas of moist soils around these systems, and to identify locations of pipe runs. The EM-31 instrument was used for deeper surveys (up to 18 ft bgs), and the EM-38 was employed for shallower work (within 5 ft of the surface). A possible moist area was identified north of the west drainfield. Geophysical techniques were unable to determine the locations of the drainlines in the west and south drainfields; the actual drainline locations were later determined using a backhoe.

Investigation 3 – Passive Soil-Gas Surveys

Two separate passive soil-gas surveys were conducted in the south and west system areas in June 1994. A third survey was conducted in the north system drainfield area in November 1994. PETREX™ sampling tubes were used to identify any releases of VOCs and SVOCs that occurred via the septic systems. Eighteen PETREX™ tube samplers were placed in a grid pattern that covered the north system drainfield area. Twenty-four PETREX™ samplers were placed in a grid pattern that covered the west system drainfield area, and also covered the area around the north and west system septic tanks. Finally, twelve more samplers were placed in a grid arrangement that covered the south system septic tank and drainfield area under the Optical Range Road pavement. Seven of the twelve south system PETREX™ samplers were inserted through small boreholes drilled through the asphalt paving and installed in soil immediately beneath the pavement. Four other samplers were placed in an unpaved area on the south side of the road, and the twelfth sampler was installed in the center of the soil-filled septic tank manhole. All of the PETREX™ samplers were analyzed for two individual constituents (PCE and TCE) and two groups of compounds (BTEX and aliphatic compounds). Potentially significant levels of PCE, BTEX and aliphatic compounds in soil gas were detected at a number of the south system PETREX™ samplers located beneath the pavement, while significant levels were not detected in soil gas at any of the five samplers placed at unpaved locations. However, no VOCs were detected except for those that could be laboratory-introduced contaminants in the follow-up soil samples collected from around the south system septic tank and drainfield. Potentially significant levels of PCE, BTEX and aliphatic compounds were detected in soil gas at a number of the PETREX™ sampling locations in the west system drainfield area, and in the vicinity of the west and north septic tanks. However, the locations with higher ion counts were somewhat randomly scattered and did not appear to correspond to the configuration of the drainfield, and also were not in the immediate area of the two septic tanks. VOCs were not detected in any of

the soil samples collected from boreholes in the west system drainfield, or around the two septic tanks. Finally, potentially significant levels of BTEX or aliphatic compounds in soil gas were identified at two of the eighteen PETREX™ sampling locations in the north system drainfield area. Except for those that could be laboratory-introduced compounds, VOCs were not detected in any of the soil samples collected from the north system drainfield boreholes.

Investigation 4 — Backhoe Excavation

A backhoe was used in September 1994 to determine the location, dimensions and depths of the west and north system drainfields, which have no surface expressions. A faint organic-type odor was noted in some of the soil excavated in the west drainfield. No visible evidence of soil discoloration, staining, or odors indicating residual contamination was observed when the north drainfield was being located. Also, no odors or other evidence of contamination was noted when soil samples were collected from the three drainfield areas and around the three septic tanks in January 1995, or in soil excavated from around the north and west system septic tanks as part of septic tank waste removal and decontamination operation in January 1996.

Investigation 5 — Soil Sampling

In January 1995, soil samples were collected from boreholes drilled in the drainfields and adjacent to the septic tanks using a Geoprobe™. The 1995 drainfield sampling intervals started at 9 feet bgs in the boreholes next to the north system septic tank, at 9 and 19 feet bgs in the north system drainfield boreholes, 9 feet bgs in the boreholes next to the west system septic tank, at 5 and 15 feet bgs in the west system drainfield boreholes, and 10 feet bgs in the boreholes next to the south system septic tank, and at 5 and 15 feet bgs in the south system drainfield boreholes. The soil samples were analyzed for VOCs, SVOCs, RCRA metals, isotopic uranium, tritium and radionuclides by gamma spectroscopy. The samples were also screened for TNT.

Analytical results for the January 1995 soil samples are discussed in this section. Six VOCs (acetone, 2-hexanone, methylene chloride, methyl ethyl ketone, methyl isobutyl ketone and toluene) were detected in the soil samples. These compounds were detected in some of the associated TB or EB samples. Three SVOCs (di-n-butyl phthalate, bis(2-Ethylhexyl) phthalate and phenol) were detected in the soil samples collected at this site. Two RCRA metals (barium and lead) were detected above the Department-approved background concentrations. All other metal concentrations were below the Department-approved background concentrations. There was no TNT detected in the screening samples. One radionuclide (tritium) was detected at a maximum activity of 0.0225 pCi/g which is above the background activity of 0.021 pCi/g. With the exception of tritium no activities were detected above background levels in any of the samples analyzed. However, although not detected, the MDA for most of the uranium-235 and uranium-238 gamma spectroscopic analyses exceeded the background activity.

In October 2002, additional soil samples were collected for HE compound analysis at five previously sampled locations in the three drainfields at Building 9925. Samples were collected from boreholes DF3-1 and DF3-6 in the north drainfield (Figure 17) from boreholes DF1-1 and DF1-6 in the west drainfield (Figure 17) and from borehole DF2-2 in the south drainfield (Figure 18). The samples were collected from a depth of 9 ft bgs in boreholes DF3-1 and DF3-6 in the north drainfield and from a depth of 5 ft bgs in boreholes DF1-1, DF1-6, and DF2-2 in the west and south drainfields (Figure 17 and 18). No HE compounds were detected in any of the five soil samples collected.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total human health HIs and estimated excess cancer risks are acceptable (Table 14).

For the radiological COCs (tritium, uranuim-235and uranium-238) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 0.11 millirem (mrem)/year (yr). The estimated excess cancer risk is 1.1E-6.

The exposure pathway analysis established that no complete ecological pathway exists for exposure of ecological species to contaminants at SWMU 147. All COCs are located at depths greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Basis for Determination

SWMU 147 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Table 14
Risk Assessment Values for SWMU 147 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Barium	355	0.01		0.07	
Organic					
Acetone	0.047	0.00		0.00	
Di-n-butylphthalate	0.165[b]	0.00		0.00	
bis(2-Ethylhexyl) phthalate	0.165[b]	0.00	9E-10	0.00	4E-9
2-Hexanone	0.011	0.00		0.00	
Methylene chloride	0.0033 J	0.00	2E-8	0.00	5E-8
Methyl ethyl ketone	0.0062 J	0.00		0.00	
Methyl isobutyl ketone	0.005[b]	0.00		0.00	
Phenol	0.165[b]	0.00		0.00	
Toluene	0.0025[b]	0.00		0.00	
Total		**0.01**	**2E-8**	**0.07**	**5E-8**

[a]EPA 1989.

[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).

COC = Constituent of concern.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.

SWMU 150, Building 9939/9939A Septic System, Septic Tanks, and Drainfields

Site Location

SWMU 150, the Building 9939/9939A Septic System, is located in the Coyote Test Field area on federally owned land controlled by KAFB and permitted to the DOE (Figure 19). The abandoned system includes a 750-gallon septic tank and two 5-ft-diameter, 8-ft-deep seepage pits southeast of Building 9939, and a drainfield north of Building 9939A that consists of two 12-ft-long drain lines.

Operational History

Available information indicates that Building 9939 was constructed in 1974 and Building 9939A in 1982, and it is assumed that the septic and drain systems were constructed at those respective times. The floor drains in Building 9939A that discharged to the drainfield were sealed sometime in the early 1990s. By 1993, the septic system discharges were routed to the COA sanitary sewer system. The old septic system line was disconnected and capped, and the system was abandoned in place concurrent with this change. Waste in the septic tank was removed. The empty and decontaminated septic tank was inspected by the Department in January 1996, and a closure form was signed. The septic tank was then backfilled with clean, native soil in early 1996.

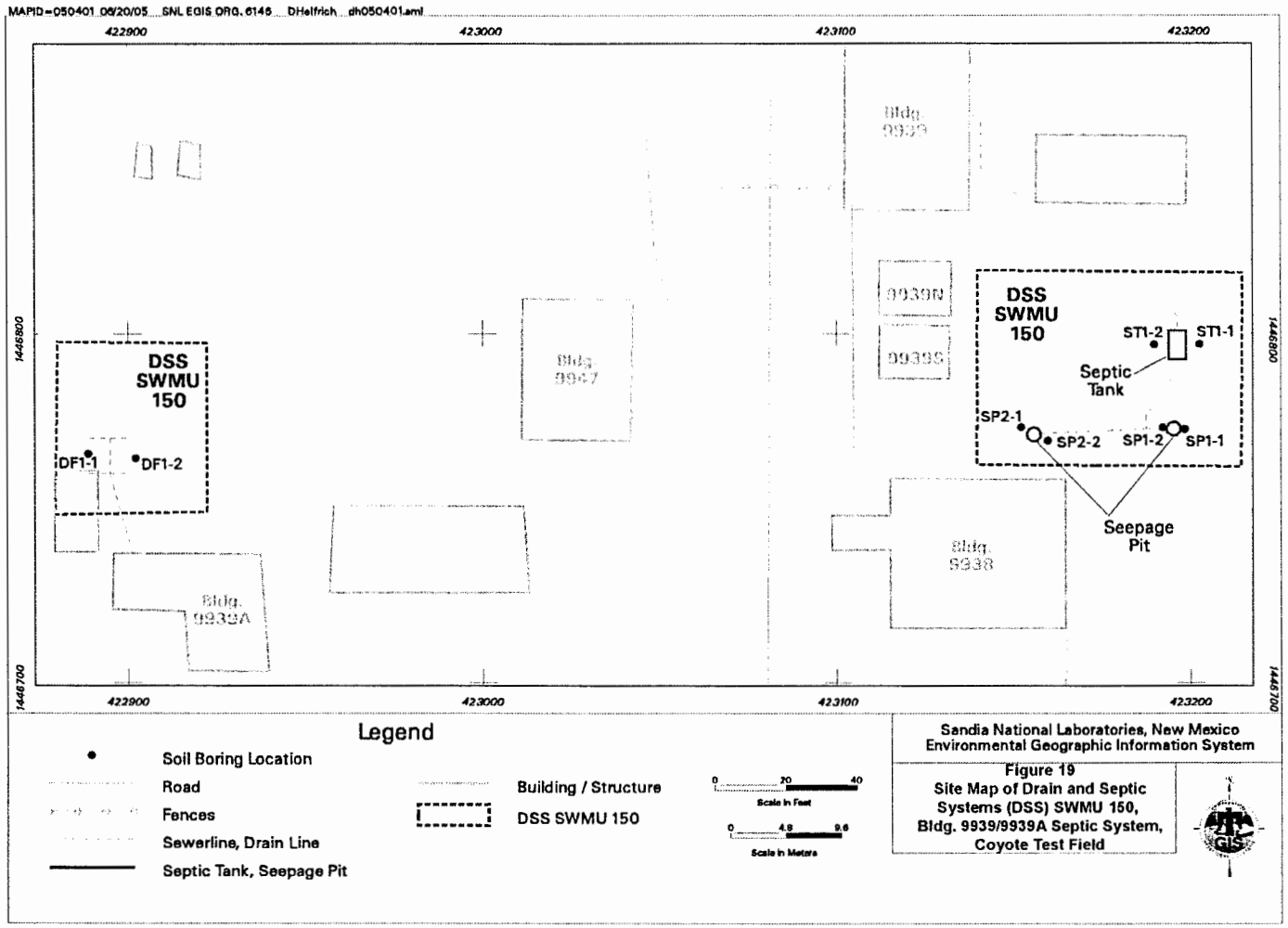
The COCs include RCRA metals, PCBs, VOCs, SVOCs and radionuclides.

Evaluation of Relevant Information

Four assessment investigations have been conducted at this site. In June 1992, September 1992 and May 1994, waste characterization samples were collected from the septic tank (Investigation 1). A geophysical survey was performed in February 1994 to locate areas of high moisture content (Investigation 2). In May 1994, a passive soil-vapor survey was conducted to identify potential releases of VOCs and SVOCs (Investigation 3). In January 1995, a backhoe was used to locate the cause of borehole resistance near the seepage pit and to locate the drainfield. Soil samples were collected near the seepage pit using the backhoe and a geoprobe was used to collect samples from within the drainfield (Investigation 4). These investigations are discussed in the following sections.

Investigation 1 — Septic Tank Sampling

Sludge and aqueous samples were collected from the septic tank in June and September 1992. The sampling report indicated that there was a primary and a secondary chamber to the septic tank. Removal of the septage waste in 1996 revealed that the tank consisted of only one chamber instead of two. The discussion of the survey results presented here follows the original sampling report as though there were samples from two separate chambers. The aqueous samples were analyzed for VOCs, SVOCs, pesticides, PCBs, total metals, selected radionuclide constituents and several miscellaneous analytes. Two VOCs were identified in both aqueous samples (TCE and 1,2-dichloroethene), and a third VOC (acetone) was identified in one of the samples. One SVOC (4-methylphenol) was identified in both samples and a second SVOC (benzoic acid) was identified in one of the samples. No pesticides, cyanide, or PCBs were detected. Phenolic compounds and fluoride were detected in both samples. Oil and grease were detected in one of the samples.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DF1-2
Bldg. 9939A
Bldg. 9947
Bldg. 9939
9939N
9939S
Bldg. 9938
DSS SWMU 150
ST1-2
ST1-1
Septic Tank
SP2-1
SP2-2
SP1-2
SP1-1
Seepage Pit
Legend
Soil Boring Location
Road
Fences
Sewerline, Drain Line
Septic Tank, Seepage Pit
Building / Structure
DSS SWMU 150
0 20 40
Scale in Feet
0 4.8 9.6
Scale in Meters
Sandia National Laboratories, New Mexico
Environmental Geographic Information System
Figure 19
Site Map of Drain and Septic Systems (DSS) SWMU 150, Bldg. 9939/9939A Septic System, Coyote Test Field

Several metals and radionuclides were detected. The sludge samples were analyzed for gross alpha and beta and selected radionuclide constituents. Several radionuclides were detected.

Septic tank sludge samples were collected in May 1994 for waste characterization purposes and were analyzed for VOCs, SVOCs, TCLP RCRA metals, isotopic uranium, and other radionuclides by gamma spectroscopy. Two VOCs (TCE and 1,2-dichloroethene) and two SVOCs (phenol and 4-methylphenol) were detected. Barium was detected in the TCLP RCRA metal analysis and in the laboratory blank. Uranium isotopes were detected in the isotopic uranium analysis. Several radionuclides were identified in the gamma spectroscopy analysis.

Septic tank liquid samples were collected in May 1994 for waste characterization purposes. They were analyzed for VOCs, isotopic uranium and tritium. Two VOCs (1,2-dichloroethene and TCE) were detected. Uranium isotopes were detected in the isotopic uranium analysis, and tritium was also identified.

Investigation 2 – Geophysical Survey

A geophysical survey using Geonics™ Model EM-31 and EM-38 ground conductivity meters was performed north of Building 9939A and in the vicinity of the seepage pits and septic tank near Building 9939 in February 1994. An area of high electromagnetic conductivity was found at each of the survey locations. The high area near Building 9939A originally was interpreted to be the location of the drainfield and indicative of shallow and deep septic infiltration. However, this information was not considered to be reliable and was not used to determine sample locations; instead, backhoe excavation was used to locate the drainfield lines and determine sample locations. At the other survey location, the area of high electromagnetic conductivity was found trending to the southeast from the eastern seepage pit. It was thought that this could be a septic leachate plume.

Investigation 3 – Passive Soil-Gas Survey

A passive soil-gas survey was conducted in the area of the septic tank and seepage pits in May 1994 using PETREX™ sampling tubes to identify any releases of VOCs and SVOCs that occurred from the septic tank and seepage pit. Sixteen PETREX™ tube samplers were placed in a grid pattern that covered the area surrounding the septic tank and two seepage pits. The soil gas survey detected BTEX and aliphatics at four locations in the grid pattern surrounding the septic tank and seepage pits. Two of the locations were near one of the concrete pads adjacent to Building 9939N and 9939S. The other two locations were within 15 ft of the seepage pits. Subsequent confirmatory soil samples collected immediately adjacent to the septic tank and seepage pits were analyzed for VOCs and SVOCs. No BTEX or aliphatics were detected in the soil samples. No PCE or TCE were found in detectable amounts in the passive soil-gas survey or subsequent soil samples.

Investigation 4 — Soil Sampling and Backhoe Excavation

In October 1994, a Geoprobe™ was used to try to obtain soil samples near the septic tank and seepage pits. The Geoprobe™ met refusal at six different locations ranging from 6.5 to 9 ft bgs, which is the approximate depths at the bottom of these units. In January 1995, a backhoe was used to determine the cause of the borehole refusal problems at the septic tank and seepage pits. From this backhoe work, it was determined that there was a surface of caliche or cemented conglomerate with rock fragments up to 6 inches in diameter at 7 to 8.5 ft bgs. Because this shallow caliche/cemented conglomerate surface prevented any Geoprobe™ sampling, soil samples near the septic tank and seepage pits were collected with the backhoe. Shallow interval

confirmatory soil samples were collected on either side of the septic tank and on either side of each of the seepage pits on top of the caliche/cemented conglomerate surface. As part of the backhoe work at this site, the configuration of the small drainfield north of Building 9939A was verified. The Geoprobe™ was used to obtain soil samples from two locations in the drainfield, one on the eastern side and the other on the western side. Soil samples were collected easily from the shallow depth interval of 4 to 8 feet at the eastern location, but four tries were necessary to obtain the sample for the shallow depth interval at the western location. Again, the caliche cemented conglomerate surface prevented deep interval soil sampling in the drainfield.

Results for the soil samples from January 1995 are discussed in this paragraph. Four VOCs (acetone, methylene chloride, methyl ethyl ketone and toluene) were detected in the soil samples. No SVOCs or PCBs were detected in any of the samples collected from the boreholes. All of the RCRA metals were detected below the Department-approved background concentrations. No radionuclides had activities above background levels in any of the samples analyzed. However, although not detected, the MDA for all of the uranium-235 and uranium-238 gamma spectroscopic analyses exceeded the corresponding background activity.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total HIs and estimated excess cancer risks are acceptable (Table 15).

For the radiological COCs (uranuim-235and uranium-238) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 0.16 millirem (mrem)/year (yr). The estimated excess cancer risk is 1.6E-6.

Ecological risks associated with SWMU 150 are estimated through a risk assessment that incorporates site-specific information when available. All HQ values predicted for the COPECs at this site are found to be less than unity. Analysis of the uncertainties associated with these predicted values indicate that they are more likely to overestimate actual risk rather than underestimate it. Based upon this final analysis, the potential for ecological risks associated with SWMU 150 is expected to be low.

Basis for Determination

SWMU 150 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Table 15
Risk Assessment Values for SWMU 150 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Acetone	0.0084 J	0.00		0.00	
Methylene chloride	0.0028 J	0.00	2E-8	0.00	4E-8
Methyl ethyl ketone	0.005[b]	0.00		0.00	
Toluene	0.0025[b]	0.00		0.00	
Total		**0.00**	**2E-8**	**0.00**	**4E-8**

[a]EPA 1989.
[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).
COC = Constituent of concern.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.

SWMU 161, Building 6636 Septic System

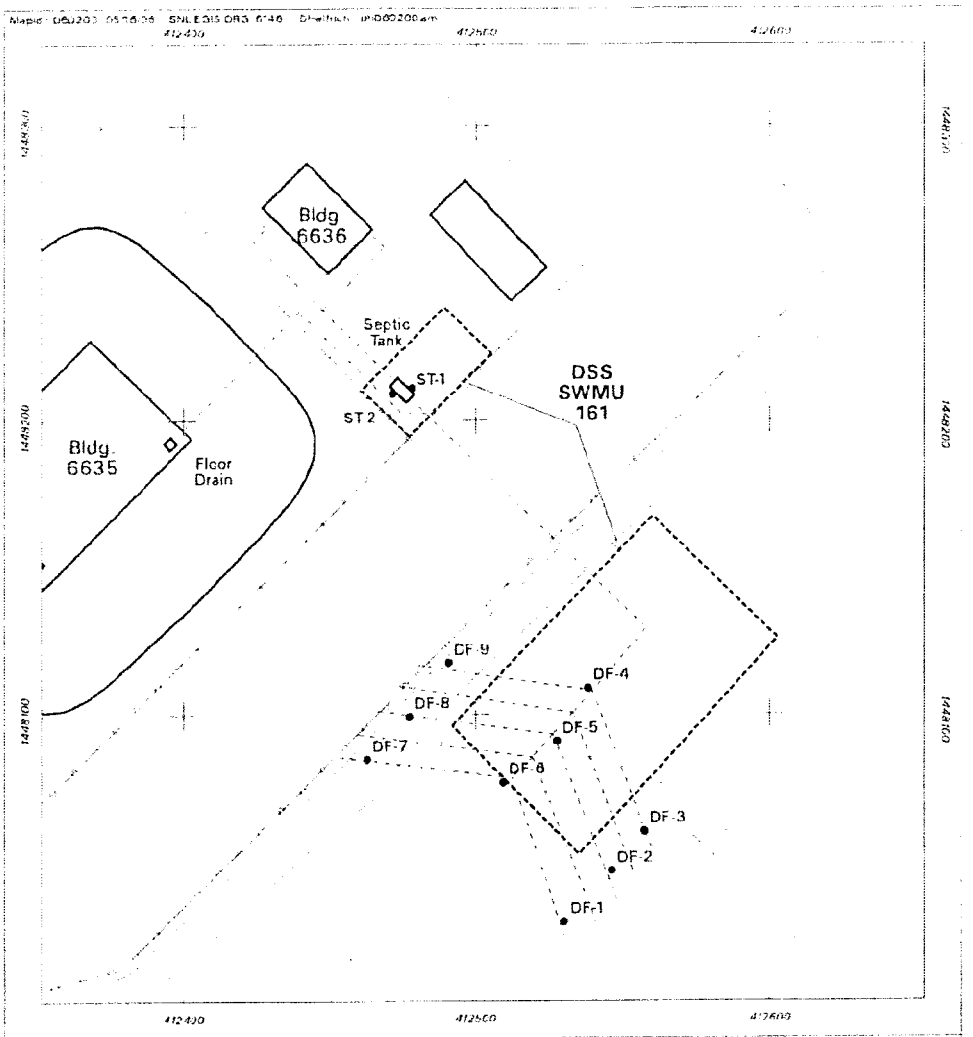
Site Location

SWMU 161, the Building 6636 Septic System, is located in TA III on federally owned land controlled by KAFB and permitted to the DOE. The abandoned septic system consisted of a 750-gallon septic tank connected to a drainfield consisting of 10, 60-ft-long, 4-inch-diameter, perforated clay pipe drain lines. In addition, Building 6635, located immediately southwest of Building 6636, contains floor drains in the east and west corners of the building that also discharge to the drainfield (Figure 20).

Operational History

Available information indicates that Buildings 6635 and 6636 were constructed in 1971, and it is assumed that the septic system was also constructed at that time. By 1993, discharges from the buildings were routed to the COA sanitary sewer system. The old septic system lines were disconnected and capped, and the system was abandoned in place concurrent with this change. Waste in the septic tank was removed. The empty and decontaminated septic tank was inspected by the Department in January 1996, and a closure form was signed. The septic tank was backfilled with clean, native soil in early 1996.

The COCs include RCRA metals, hexavalent chromium, cyanide, VOCs, SVOCs and radionuclides.



Legend

- Soil Boring Location
- Fence
- Road
- Septic Tank, Floor Drain
- Sanitary Sewerline, Drainfield, Drain line
- Building / Structure
- DSS SWMU 161

Figure 20
Site Map of Septic Systems
SWMU 161, Bldg. 6636 Septic System

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Evaluation of Relevant Information

Four assessment investigations have been conducted at this site. In August 1992 and May 1994, waste characterization samples were collected from the septic tank (Investigation 1). A geophysical survey was performed in June 1994 to locate areas of high moisture content (Investigation 2). In November and December 1994, a passive soil-vapor survey was conducted to identify potential releases of VOCs and SVOCs (Investigation 3). In September 1994 soil samples were collected from boreholes drilled in the drainfield and adjacent to the septic tank (Investigation 4). These investigations are discussed in the following sections.

Investigation 1 — Septic Tank Sampling

A sludge sample was collected from the SWMU 161 septic tank in August 1992 and was analyzed for selected radionuclide constituents. The brief narrative report for that sample indicated that "...no parameters were detected that exceed U.S. DOE derived concentration guidelines (DCG) limits or the investigation levels (IL) established during this investigation."

A second round of septic tank sludge samples and a sample of the liquid fraction were collected for waste characterization purposes in May 1994 and were analyzed for total and TCLP VOCs, total and TCLP RCRA metals, hexavalent chromium, cyanide, isotopic uranium, tritium and gamma spectroscopy radionuclides. Trace concentrations of three VOC compounds were identified in the liquid, but none was found in the sludge. One RCRA metal (barium) was detected in the liquid fraction.

Seven total RCRA metals were identified in the sludge, but only one of these metals (barium) was detected in the TCLP-derived leachate from the same material. Hexavalent chromium was not detected in the sludge and cyanide was not identified in either the liquid or sludge. Anomalous activity levels of isotopic uranium, tritium, or other radionuclides analyzed by gamma spectroscopy were not found in the liquid or sludge.

Investigation 2 – Geophysical Survey

A geophysical survey using a Geonics™ Model EM-38 ground conductivity meter was performed in June 1994 to locate the drainfield. An area southeast of Building 6636 and between the two perimeter fences was identified as the possible location of the unit, but the actual location was later determined with a backhoe to be outside of the outer fence.

Investigation 3 – Passive Soil-Gas Survey

The passive soil-gas survey conducted in the drainfield area in November and December 1994 used PETREX™ sampling tubes to identify any releases of VOCs and SVOCs from the drainfield. Twenty-five PETREX™ tube samplers were placed in a grid pattern that covered the drainfield area. PCE or TCE compounds were not detected in soil gas at any of the twenty-five PETREX™ sampling locations, and BTEX and/or aliphatic compounds at potentially significant concentrations were identified at 3 of the 25 locations. However, significant concentrations of VOCs and SVOCs were not detected in confirmatory soil samples collected within 7 to 15 ft of these three PETREX™ locations, or in any of the other soil samples.

Investigation 4 — Soil Sampling

In September 1994, soil samples were collected from boreholes drilled in the drainfield and adjacent to the septic tank using a Geoprobe™. The 1994 drainfield sampling intervals started at 10 and 20 feet bgs in each of the drainfield borings. The septic tank borehole sampling intervals

started at 7.5 feet bgs; a depth equal to the base of the septic tank. The soil samples were analyzed for VOCs, SVOCs, RCRA metals, hexavalent chromium, cyanide, tritium and radionuclides by gamma spectroscopy.

Four VOCs (acetone, methylene chloride, methyl ethyl ketone and methyl isobutyl ketone) were detected in the soil samples from September 1994. All but methyl isobutyl ketone were detected in the associated TB or EB samples. No SVOCs were detected in any of the samples. Two RCRA metals (chromium and silver) were detected above Department-approved background concentrations. All other metal concentrations were below Department-approved background concentrations. Cyanide was detected. For radionuclides, no activities above the background levels were detected in any of the samples analyzed. However, although not detected, the MDA for one of the uranium-235 analyses exceeded the respective background activity.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total HIs and estimated excess cancer risks are acceptable (Table 16).

For the radiological COC (uranuim-235) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 1.0E-2 millirem (mrem)/year (yr). The estimated excess cancer risk is 9.6E-8.

The exposure pathway analysis established that no complete ecological pathway exists for exposure of ecological species to contaminants at SWMU 161. All COCs are located at depths greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Basis for Determination

SWMU 161 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Table 16
Risk Assessment Values for SWMU 161 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Chromium	22	0.00		0.00	
Cyanide	0.0006	0.00		0.00	
Silver	40.8	0.01		0.11	
Organic					
Acetone	0.017	0.00		0.00	
Methylene chloride	0.0035 J	0.00	2E-8	0.00	5E-8
Methyl ethyl ketone	0.0058 J	0.00		0.00	
Methyl isobutyl ketone	0.005[b]	0.00		0.00	
Total		**0.01**	**2E-8**	**0.11**	**5E-8**

[a]EPA 1989.

[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).

SWMU 196, Building 6597 Cistern

Site Location

SWMU 196, the Building 6597 Cistern, is approximately 1,600 sq ft (0.037 acre) area located in the central portion of TA-5. The Cistern is a concrete-walled tank (open bottom) approximately 25 ft in diameter, vertically-oriented, concrete cylinder that extends approximately 22 ft bgs with an unlined earthen bottom. The concrete cylinder also extended approximately 3 ft above the ground surface. The Cistern is located approximately 37 ft west of Building 6597 (Figure 21).

Operational History

Building 6597 housed the PROTO 1 facility used to test radiation effects on weapons and instruments. From 1978 to 1989, the Cistern received insulation oil and wash water from the PROTO 1 facility. The Cistern also served as an emergency catch basin for the series of underground storage tanks (SWMU 37) previously connected to the PROTO 1 facility. No records of discharges to the Cistern were maintained. No discharges to the Cistern have occurred since 1989 when the PROTO 1 facility was closed. The Cistern was not connected to any surface or storm water systems.

The COCs include TPH, VOCs, SVOCs, metals and radionuclides.

Evaluation of Relevant Information

During sampling activities at the bottom of the Cistern in 1994, it was determined that there was not a concrete bottom to the Cistern, as previously thought. The bottom of the Cistern is native soil and is open to the ground beneath it. In June 1994, a grab sample was collected from the

bottom surface of the Cistern. It was analyzed at an off-site laboratory for VOCs, PCBs, TPH and metals. Five metals (cadmium, copper, lead, nickel and silver) had concentrations above background values. No VOCs, PCBs or SVOCs were detected above the MDLs. The TPH concentration was 60,500 mg/kg.

In April 1995, two composite soil samples were collected from the bottom of the Cistern for radionuclide analyses. There was a detection of U-235 slightly above the background value. Tritium exceeded its background value. The MDAs for U-235 and U-238 exceeded background levels.

In May 1995, 21 soil samples plus one duplicate were collected from three locations from the surface to 3 ft below the bottom of the Cistern in 0.5 ft intervals. These samples were analyzed for selected metals using a field-screening method. These field-screening results were not used in the final risk assessment.

In March 1996, an 8-ft deep trench was excavated in the bottom of the Cistern and 12 soil samples plus one duplicate were collected using a hand auger from one location within the trench and two locations outside the trench to a maximum depth of 13 ft below the bottom of the Cistern. The samples were analyzed for VOCs and TPH at an off-site laboratory. No VOCs were detected. A maximum TPH concentration of 40,000 mg/kg was detected in a sample collected at 12 ft below the Cistern bottom.

In September 1999, a drill rig was employed to collect soil samples from the subsurface at SWMU 196. As it was not possible to place the drill rig in the Cistern, borehole locations were placed as close to the Cistern as possible. Two angled boreholes were advanced to obtain soil samples from beneath the Cistern and one vertical borehole was placed approximately 5 ft west of the Cistern wall. The first attempted angled borehole was unsuccessful at obtaining samples and was plugged and abandoned. Auger refusal was encountered in the second angled borehole at a depth of 75 linear ft along the borehole, although soil samples were collected. The vertical borehole was advanced to 100 ft bgs. Nineteen samples plus duplicates were collected in the boreholes and analyzed at an off-site laboratory for VOCs, SVOCs, TPH and RCRA metals plus beryllium. A maximum TPH concentration of 25,300 mg/kg was detected in the last sample from the angled borehole. Five VOCs (carbon disulfide, ethylbenzene, methylene chloride, toluene and xylene) were detected. Two samples in the angled borehole had barium concentrations that exceeded the background value. The presence of insulating oil in the soil caused matrix interference and many of the analytical results were rejected in the data validation process.

Due to problems encountered in 1999 (refusal and rejected data), additional characterization was needed and a larger drill rig was employed to collect soil samples. A sampling plan was devised that consisted of advancing another borehole and collecting soil samples for TPH analysis until two consecutive, field-screened samples had concentrations of less than 100 mg/kg TPH. In June 2003, the vertical borehole was located approximately 20 ft west of the Cistern wall and was advanced to a total depth of 300 ft.

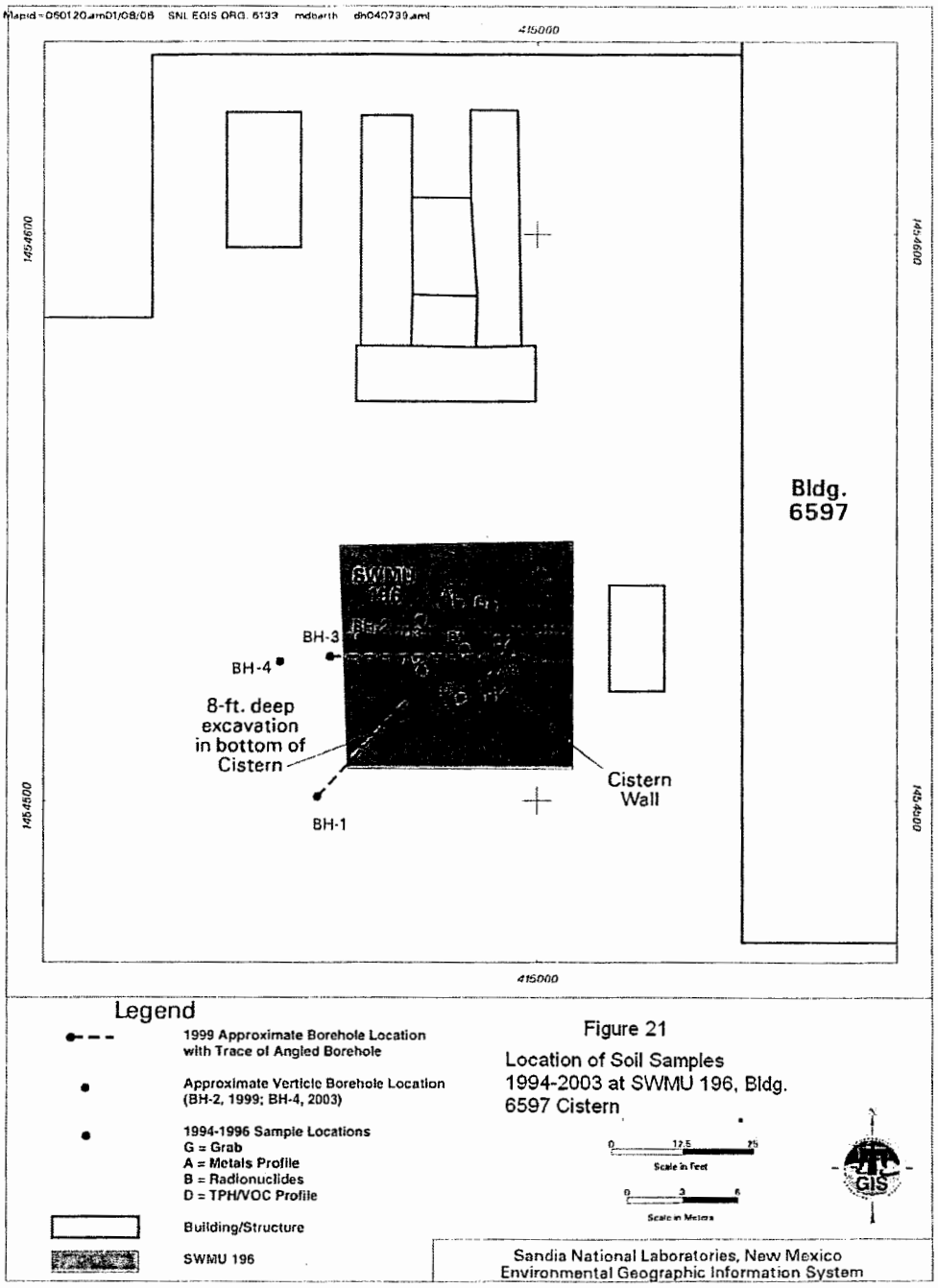


Figure 21
Location of Soil Samples 1994-2003 at SWMU 196, Bldg. 6597 Cistern

Nineteen soil samples were collected at intervals beginning at 100 ft to a maximum depth of 300 ft. Each soil sample was split; one fraction was used for screening and the other for confirmation. The screening fraction was analyzed for TPH by a local off-site laboratory. The confirmatory fraction was analyzed by an off-site laboratory for VOCs, SVOCs and TPH. Nine VOCs (1,1,1-trichloroethane, 1,1-dichloroethene, 1,2-dichloroethane, 1,2-dichloropropane, 2-butanone, chloromethane, methylene chloride, tetrachloroethene, toluene and trichloroethene) and six SVOCs (chrysene, pyrene, diethylphthalate, bis(2- Ethylhexyl) phthalate, fluoranthene and phenanthrene) were detected in the soil samples, most with J codes.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total HIs and the estimated excess cancer risks were acceptable (Table 17). However, the high concentration of total petroleum hydrocarbons in the soil precludes future use of the site without controls.

The Cistern was backfilled as requested by the Department in September 2005.

For the radiological COCs (tritium, uranuim-233, uranium-235 and uranium-238) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 1.2E-1 millirem (mrem)/year (yr). The estimated excess cancer risk is 1.0E-6.

Ecological risks associated with SWMU 196 were estimated before the Cistern was backfilled through a risk assessment that incorporated site-specific information when available. Initial predictions of potential risk to plants from exposure to several metals were based upon maximum measured soil concentrations, highly conservative plant toxicity benchmarks, and assumptions of high bioavailability. Actual risk to this receptor is expected to be low based upon more realistic exposure assumptions. All of the remaining receptor HQs were less than unity. Based upon this final analysis, the potential for ecological risks associated with SWMU 196 was expected to be low before it was backfilled.

Since the Cistern was backfilled, no complete ecological exposure pathway exists for exposure of ecological species to contaminants at SWMU 196. All COCs are now located at depths greater than 5 feet bgs. Therefore, no COCs are considered to be COPECs.

In conclusion, human health and ecological risks are acceptable under an industrial land-use scenario.

Basis for Determination

SWMU 196 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use (industrial).

Table 17
Risk Assessment Values for SWMU 196 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Barium	286	0.00		0.05	
Cadmium	2.5	0.00	8E-10	0.06	2E-9
Copper	213	0.01		0.08	
Nickel	17.8	0.00		0.01	
Silver	2.9	0.00		0.01	
Organic					
2-Butanone	0.5[b]	0.00		0.01	
Carbon disulfide	0.0043 J	0.00		0.00	
Chloromethane	0.5[b]	0.00	2E-7	0.01	4E-7
Chrysene	0.086 J	0.00	4E-10	0.00	1E-9
1,2-Dichloroethane	0.25[b]	0.00	3E-7	0.01	7E-7
1,1-Dichloroethene	0.25[b]	0.00	2E-7	0.00	4E-7
Diethylphthalate	0.39	0.00		0.00	
Ethyl benzene	0.25[b]	0.00	2E-8	0.00	4E-8
bis(2-Ethylhexyl) phthalate	0.43	0.00	2E-9	0.00	1E-8
Fluoranthene	0.33	0.00		0.00	
Methylene chloride	0.25[b]	0.00	1E-8	0.00	3E-8
Phenanthrene	0.14 J	0.00		0.00	
Pyrene	0.22 J	0.00		0.00	
1,1,1-Trichloroethane	0.25[b]	0.00		0.00	
Tetrachloroethene	0.25[b]	0.00	7E-8	0.00	2E-7
Toluene	0.25[b]	0.00		0.00	
Trichloroethene	0.25[b]	0.00	2E-6	0.02	5E-6
Xylene	0.25[b]	0.00		0.00	
Total		**0.03**	**3E-6**	**0.27**	**6E-6**

[a]EPA 1989.

[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).

COC = Constituent of concern.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.

AOC 1090, Building 6721 Septic System

Site Location

AOC 1090 is located in TA-III on federally owned land controlled by KAFB and permitted to the DOE. The site is located approximately 2,400 ft west of the entrance to TA-III. The abandoned septic system consisted of a 1,000-gallon septic tank and distribution box that emptied to three branching laterals, each approximately 60 ft long (Figure 24). The drainfield laterals were determined to be composed of bituminous (tar) fiber pipe. Construction details are based upon engineering drawings, site inspections, and backhoe excavations of the system. The system received discharges from Building 6721, approximately 100 ft to the northeast.

Operational History

Available information indicates that Building 6721, currently known as the control facility for Building 6720 (the Explosive Loading Facility), was constructed in 1959, and it is assumed the septic system was constructed at the same time. By the early 1990s, the septic system discharge was routed to the COA sanitary sewer system. The old septic system line would have been disconnected, capped, and the system abandoned in place concurrent with this change. The septic tank has been backfilled but the exact date is unknown; it may have been backfilled in the mid 1990s.

The COCs include RCRA metals, hexavalent chromium, cyanide, HE compounds, VOCs, SVOCs, PCBs and radionuclides.

Evaluation of Relevant Information

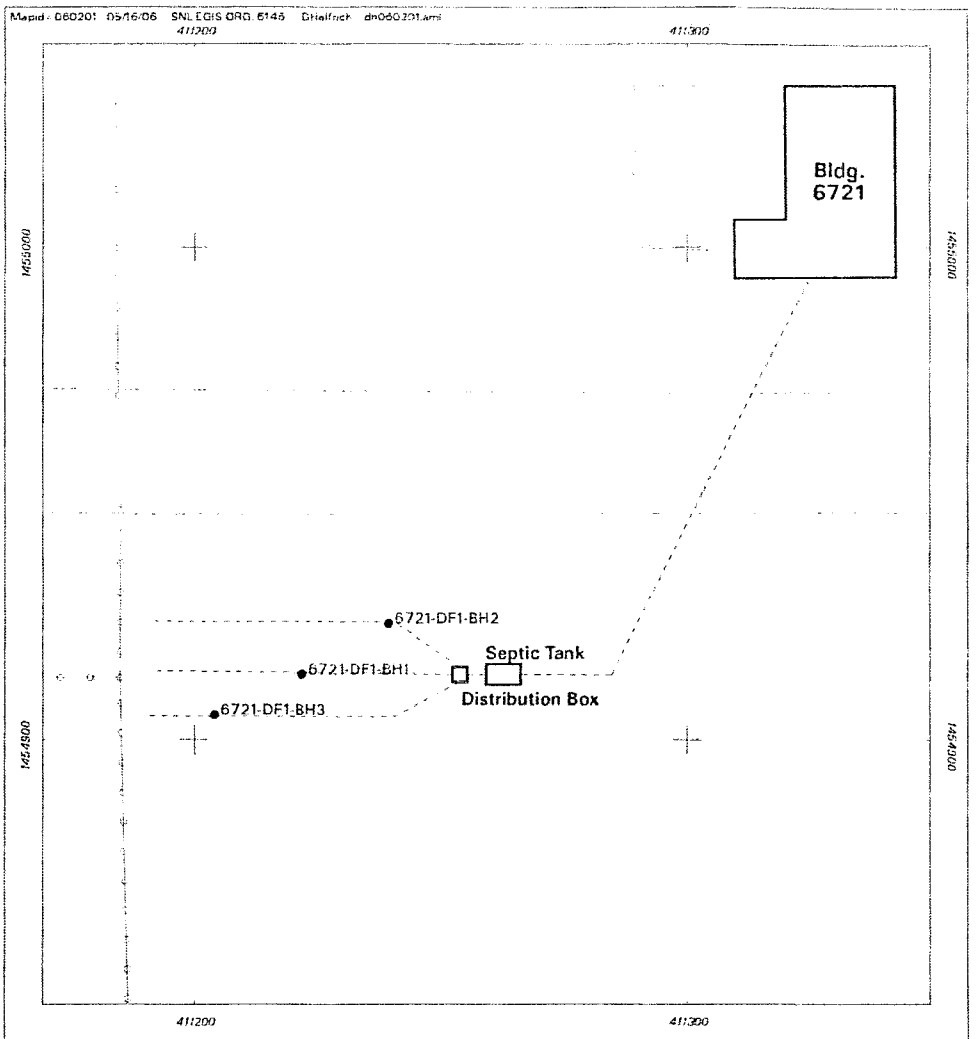
Three assessment investigations have been conducted at AOC 1090. In December 1990 or January 1991 and in July 1995, waste characterization samples were collected from the septic tank (Investigation 1). In March 2002, a backhoe was used to physically locate the buried drainfield drain lines (Investigation 2). In September 2002 and August 2005, subsurface soil samples were collected from three borings drilled in the drainfield area (Investigation 3).

Investigation 1 — Septic Tank Sampling

Investigation 1 consisted of sampling efforts to characterize the waste contents for chemical and radiological contamination. The primary goal of the sampling was to identify types and concentrations of potential contaminants in the waste within the tank so that the appropriate waste disposal and remedial activities could be planned.

In December 1990 or January 1991 and again in July 1995, as part of the SNL Septic System Monitoring Program, aqueous and sludge samples were collected from the Building 6721 septic tank. Aqueous samples collected in 1990/1991 were analyzed at an off-site laboratory for VOCs, SVOCs, oil and grease, PCBs, total metals, phenolic compounds, nitrates/nitrites, total cyanide, gross alpha/beta activity, isotopic uranium, plutonium, tritium and radionuclides by gamma spectroscopy. An aqueous sample collected in July 1995 was analyzed at an off-site laboratory for VOCs, SVOCs, pesticides, PCBs, metals, formaldehyde, fluoride, nitrate/nitrite, oil and grease, total phenol, and gross alpha/beta activity, isotopic uranium, tritium and radionuclides by gamma spectroscopy.

In February 1996, the residual contents, approximately 825 gallons of waste and added water, were pumped out.



Legend

- Soil Boring Location
- Septic Tank / Distribution Box
- Drain Line
- Building / Structure
- Fence
- Paved Road

Figure 24
Site Map of Drain and Septic Systems AOC 1090, Bldg 6721
Septic System

Scale in Feet

Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Investigation 2—Backhoe Excavation

In March 2002, a backhoe was used to determine the location, dimensions and average depth of the drainfield system. The drainfield was found to have three laterals composed of bituminous fiber piping, arranged as shown on Figure 27, with an average drain line depth of approximately 3 ft bgs. The distribution box was also located, but it appeared that the septic tank had been removed some time after February 1996 when buried electrical utilities were installed in the area of the former septic tank location. No visible evidence of stained or discolored soil or odors indicating residual contamination was observed during the excavation. No samples were collected during the backhoe excavation.

Investigation 3—Soil Sampling

In September 2002, soil samples were collected from three drainfield boreholes. Soil boring locations are shown on Figure 24. An auger drill rig was used to sample all boreholes at two depth intervals. In drainfields, the top of the shallow interval started at the bottom of the drain line, as determined by the backhoe excavation, and the lower (deep) interval started at 5 feet below the top of the upper sample interval.

Results for the six soil samples and one duplicate soil sample collected are presented and discussed in this section. One VOC (2-butanone) was detected in all the samples. Acetone was detected in the 4-ft bgs samples from boreholes BH1 and BH3 and in the 9-ft bgs sample from borehole BH2. These compounds were not detected in the associated TB. Fourteen SVOCs were detected in the 4-ft bgs deep sample from BH2. Twelve of the fourteen SVOCs were also detected in the duplicate sample collected from the 4-ft bgs depth interval in BH2 as well as in the 4-ft bgs sample collected from BH3. The compounds detected are polycyclic aromatic hydrocarbons commonly found in asphalt and may indicate the presence in samples of fragments of the bituminous fiber pipe used to construct the drainfield. The almost total absence of SVOCs in the three deepest samples collected at this site also suggests a shallow SVOC source (such as bituminous pipe fragments). No PCBs or HE compounds were detected in any of the soil samples collected. One RCRA metal (arsenic) was detected above the Department-approved background concentration in the duplicate sample collected from BH2. Barium was detected above background concentration in the 4-ft bgs samples from BH1 and BH2 as well as in the duplicate sample collected from BH2. Cyanide was detected in all but the 9-ft bgs sample in BH1. Uranium-235 was detected above the background activity in the 4-ft-bgs sample from borehole BH1. In addition, although not detected, the MDA for five other uranium-235 analyses exceeded the corresponding background activity because the standard gamma spectroscopy count time for soil samples (6,000 seconds) was not adequate to achieve a lower and more appropriate MDA. Regardless, the MDA was sufficiently low that the Department accepts the sampling results. Elevated gross beta activity was measured in the 9-foot bgs sample in borehole BH2. However, no gross alpha or beta activity was detected greater than an order-of-magnitude above background levels in any of the samples.

In August 2005, additional SVOC soil samples were collected from the same three shallow sampling intervals from which samples were collected in September 2002 (Figure 24). At each of the three previous sampling locations, a short 4-ft deep trench was excavated with a backhoe to remove any potentially contaminated soil above the sampling interval, and an auger drilling machine was then positioned over the trench. The base of the auger was lowered to the bottom of the trench and a 3-ft long sample was collected from 4 to 7 ft bgs. The three trenches were

backfilled to grade upon completion of the sampling. SVOCs were not detected in any of the four additional shallow interval soil samples.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total HIs were acceptable (Table 18).

SVOCs were the main risk drivers. SVOCs at high concentrations were detected in only one of the seven SVOC soil samples collected. The sample was located in the shallow (4-ft interval) soil sample in borehole BH2. The SVOC compounds detected in this sample are suggestive of bituminous pipe fragments. This area was resampled and no SVOCs were detected. In addition, no significant VOC or metal contamination, with the exception of arsenic slightly above background, was detected in any of the samples. The estimated excess cancer risk for the industrial land-use scenario is 3E-6 which is acceptable for an industrial land-use scenario. The estimated excess cancer risk for the residential land-use scenario is 4E-5 which does not meet Department requirements for a residential land-use scenario.

For the radiological COC (uranuim-235) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 9.9E-3 millirem (mrem)/year (yr). The estimated excess cancer risk is 8.4E-8.

Ecological risks associated with AOC 1090 were estimated through a risk assessment that incorporates site-specific information when available. Initial predictions of potential risk to omnivorous and insectivorous deer mice from exposures to seven SVOCs (benzo[a]anthracene, benzo[a]pyrene, benzo[b]fluoranthene, benzo [g,h,i] perylene, chrysene, indeno[1,2,3-cd]pyrene and phenanthrene) can be attributed to conservative toxicity benchmarks, as well as the assumption of 100-percent bioavailability and the use of maximum detected concentrations to estimate exposure. In addition, initial predictions of potential risk to omnivorous and insectivorous deer mice from exposures to two metals (arsenic and barium) can be attributed to conservatisms used in the modeling of risk. For arsenic and barium the contribution to risk due to background accounts for the majority (89 and 82 percent, respectively) of the HQ values. Based upon this final analysis, the potential for ecological risk associated with AOC 1090 is acceptable.

In conclusion, human health and ecological risks are acceptable under an industrial land-use scenario.

Basis for Determination

AOC 1090 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future (industrial) land use.

Table 18
Risk Assessment Values for AOC 1090 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Arsenic	4.96 J	0.02	3E-6	0.23	1E-5
Barium	260	0.00		0.05	
Cyanide	0.278	0.00		0.00	
Organic					
Acenaphthene	0.14	0.00		0.00	
Acetone	0.00535	0.00		0.00	
Anthracene	0.519	0.00		0.00	
Benzo(a)anthracene	1.17	0.00	6E-7	0.00	2E-6
Benzo(a)pyrene	0.848	0.00	4E-6	0.00	1E-5
Benzo(b)fluoranthene	1.49	0.00	7E-7	0.00	2E-6
Benzo(g,h,i)perylene	0.466	0.00	2E-6	0.00	8E-6
2-Butanone	0.0365	0.00		0.00	
Carbazole	0.403	0.00	3E-9	0.00	1E-8
Chrysene	1.13	0.00	5E-9	0.00	2E-8
Dibenzofuran	0.063 J	0.00		0.00	
Fluoranthene	2.13	0.00		0.00	
Fluorene	0.179	0.00		0.00	
Indeno(1,2,3-cd)pyrene	0.511	0.00	2E-7	0.00	8E-7
Phenanthrene	2.05	0.00		0.00	
Pyrene	1.8 J	0.00		0.00	
Total		**0.02**	**1E-5**	**0.28**	**4E-5**

[a]EPA 1989.

AOC 1094, Live Fire Range East Septic System, Lurance Canyon

Site Location

AOC 1094 is located in Lurance Canyon within the boundaries of the USFS Withdrawn Area on federally owned land controlled by KAFB and permitted to the DOE. The site is located on Coyote Springs Road approximately 3.6 miles east of its intersection with Lovelace Road. The active septic system septic tank is located approximately 50 ft southeast of the perimeter fence around the maintenance building and trailer complex that support the Live Fire Range activities (Figure 25). The system consists of a 1,000-gallon septic tank that empties to a drainfield with

two 110-ft long, parallel drain lines. Construction details are based upon engineering drawings, site inspections and backhoe excavations of the system. The system is still active and receives discharges from the Live Fire Range support building and trailer complex, approximately 50 ft to the northwest.

Operational History

Although no precise construction information is available, records indicate that the Live Fire Range support building complex was in operation and discharging to the septic system by about

1983. The system is still active and receives discharges from the support buildings associated with Live Fire Range operations. The COCs include RCRA metals, hexavalent chromium, cyanide, HE compounds, VOCs, SVOCs, PCBs and radionuclides.

Evaluation of Relevant Information

Three assessment investigations have been conducted at this site. In August 1999, a backhoe was used to physically locate the buried drainfield drain lines (Investigation 1). In September 1999 and April 2005, subsurface soil samples were collected from three borings in the drainfield (Investigation 2). In May 2002, a passive soil-vapor survey was conducted to determine whether areas of VOC contamination were present in the soil around the drainfield (Investigation 3). These investigations are discussed in the following sections.

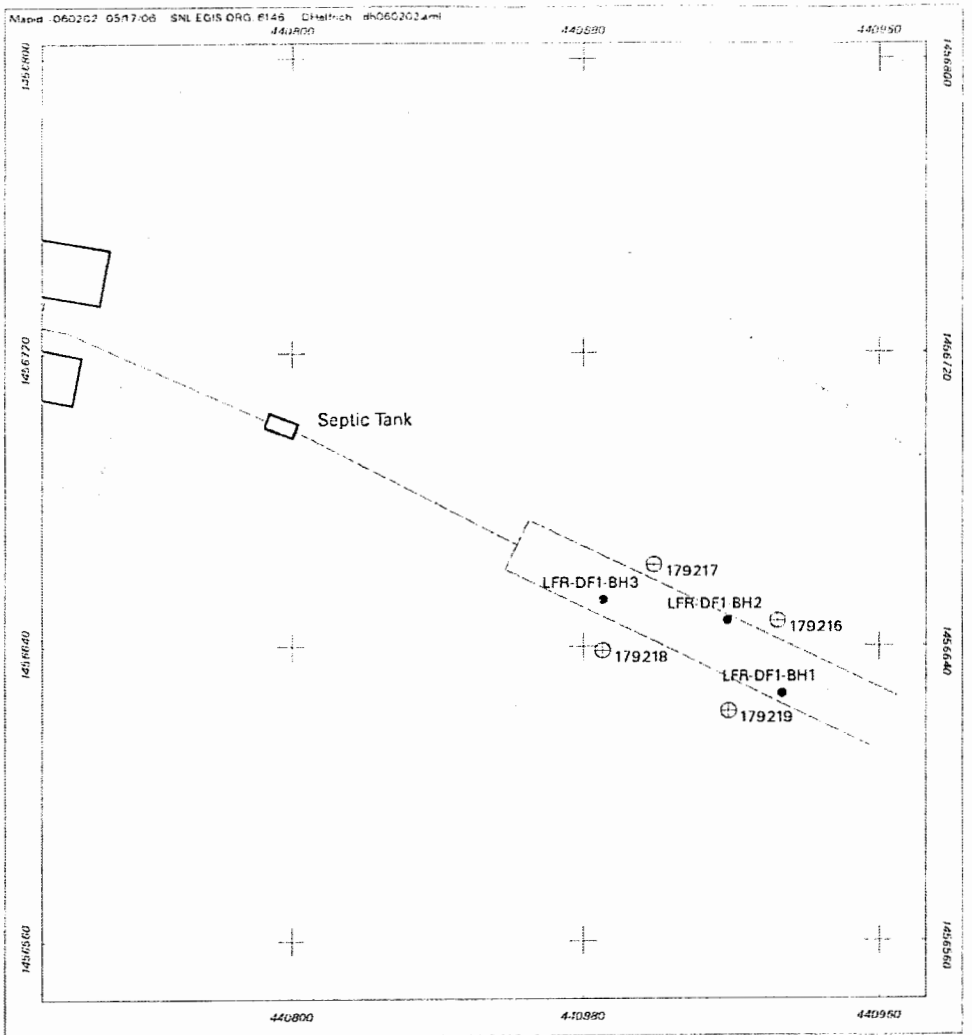
Investigation 1—Backhoe Excavation

In August 1999, a backhoe was used to determine the location, dimensions and average depth of the drainfield system. The drainfield was found to have two laterals, constructed of 4-inch diameter, polyvinyl chloride pipe with an average drain line trench depth of 7 ft bgs. Although damp soil was observed beneath the east ends of the two drain lines, no visible evidence of stained or discolored soil or an odor indicating residual contamination was observed during the excavation. No samples were collected during the backhoe excavation, and care was taken not to damage the drain lines of this still-active system.

Investigation 2— Soil Sampling

Once the system drain lines were located, soil sampling was conducted. In September 1999, soil samples were collected from three drainfield boreholes. An auger drill rig was used to sample all boreholes at two depth intervals. The top of the shallow interval started at the bottom of the drain line, as determined by the backhoe excavation, and the lower (deep) interval started at 7 feet below the top of the upper sample interval.

AOC 1094 was one of five shallow groundwater DSS sites that had 2-butanone concentrations above the 10 μg/kg VOC trigger level specified in the DSS sampling and analysis plan, and therefore required additional sampling. The samples collected at these five sites were all analyzed at the same time, and the laboratory reported detections of the same three VOCs (2-butanone, methylene chloride and toluene) in generally similar concentrations for all five sites. After meeting with the Department, it was decided to resample DSS Site 1094 and the other four sites for VOCs only, at the original 1999 locations and depths, and to collect additional samples at 5 and 10 feet below the original sample depths at AOC 1094 and some of the other sites, as specified by the Department. The VOC resampling at AOC 1094 was conducted in April 2005.



Legend

- Soil Boring Location
- Gore-Sorber™ Sample Location
- Septic Tank
- Fence
- Unpaved Road
- Building / Structure
- Sewerline, Drain Line

Figure 25
Site Map of Drain and Septic Systems AOC 1094, Live Fire Range East Septic System, Lurance Canyon

Scale in Feet

Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

However, subsurface refusal prevented the collection of the deeper, 17- and 22-foot bgs samples at the DF1-BH-1 location (Figure 25). Only toluene was detected in the April 2005 samples at a maximum concentration of 6.63 µg/kg. It was concluded that the 1999 VOC samples were affected by laboratory contamination. Therefore, the 1999 VOC data were replaced with the 2005 VOC analytical results in the risk assessment.

Analytical results for the ten soil samples and one duplicate collected in September 1999 and April 2005 from the three drainfield boreholes are presented and discussed in this section. Because of the laboratory contamination concerns regarding the 1999 VOC data, and because the site was resampled, the original 1999 VOC data were replaced with the 2005 VOC analytical results in the data tables and in the risk assessment. Two VOCs were detected in the soil samples collected in April 2005. Low concentrations of toluene were detected in every sample collected, while a trace of xylene was detected only in the 17-ft bgs sample from borehole BH2. No SVOCs, PCBs, cyanide or HE compounds were detected in any of the samples collected from the boreholes. One RCRA metal (silver) was detected above Department-approved background in all three boreholes. All other metal concentrations were below Department-approved background concentrations. For radionuclides, no activities above background levels were detected in any of the samples analyzed. However, although not detected, the MDA for some of the uranium-235 analyses exceeded the respective background activity because the standard gamma spectroscopy count time for soil samples (6,000 seconds) was not adequate to achieve a lower and more appropriate MDA. Regardless, the MDA was sufficiently low that the Department accepts the sampling results. No gross alpha or beta activity above background levels was detected in any of the samples.

Investigation 3— Passive Soil-Vapor Sampling

In May 2002, a passive soil-vapor survey was conducted in the Live Fire Range East Septic System area. This survey was conducted to determine whether significant VOC contamination was present in the soil at the site. Four Gore-Sorber™ (GS) passive soil-vapor samplers were placed in the drainfield area on May 1, 2002, and were retrieved on May 16, 2002. The GS samplers were analyzed for a total of 30 individual or groups of VOCs including TCE, BTEX, tetrachloroethene and cis- and trans-dichloroethene. Low to trace-level (but quantifiable) amounts of 18 individual or groups of VOCs were detected in the GS samplers installed.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the recreational and residential land-use scenarios. For both the recreational and residential land-use scenarios, the total HIs and estimated excess cancer risks are acceptable (Table 19).

For the radiological COC (uranuim-235) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 1.9E-3 millirem (mrem)/year (yr) for the recreational land-use scenario and 4.8E-3 mrem/yr for the residential scenario. The estimated excess cancer risk is 1.6E-8 for the recreational land-use scenario and 4.6E-8 for the residential scenario.

The exposure pathway analysis established that no complete ecological exposure pathway exists for exposure of ecological species to contaminants at AOC 1094. All COCs are located at depths greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs.

Table 19
Risk Assessment Values for AOC 1094 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Recreational Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Chromium VI	0.159 J	0.00	3E-11	0.00	7E-10
Cyanide	0.0695[b]	0.00		0.00	
Silver	0.602 J	0.00		0.00	
Organic					
Toluene	0.00663	0.00		0.00	
Total xylenes	0.00129	0.00		0.00	
Total		**0.00**	**3E-11**	**0.00**	**7E-10**

[a]EPA 1989.
[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).
J = Estimated concentration.

In conclusion, human health and ecological risks are acceptable under both a residential and a recreational land-use scenario.

Basis for Determination

AOC 1094 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

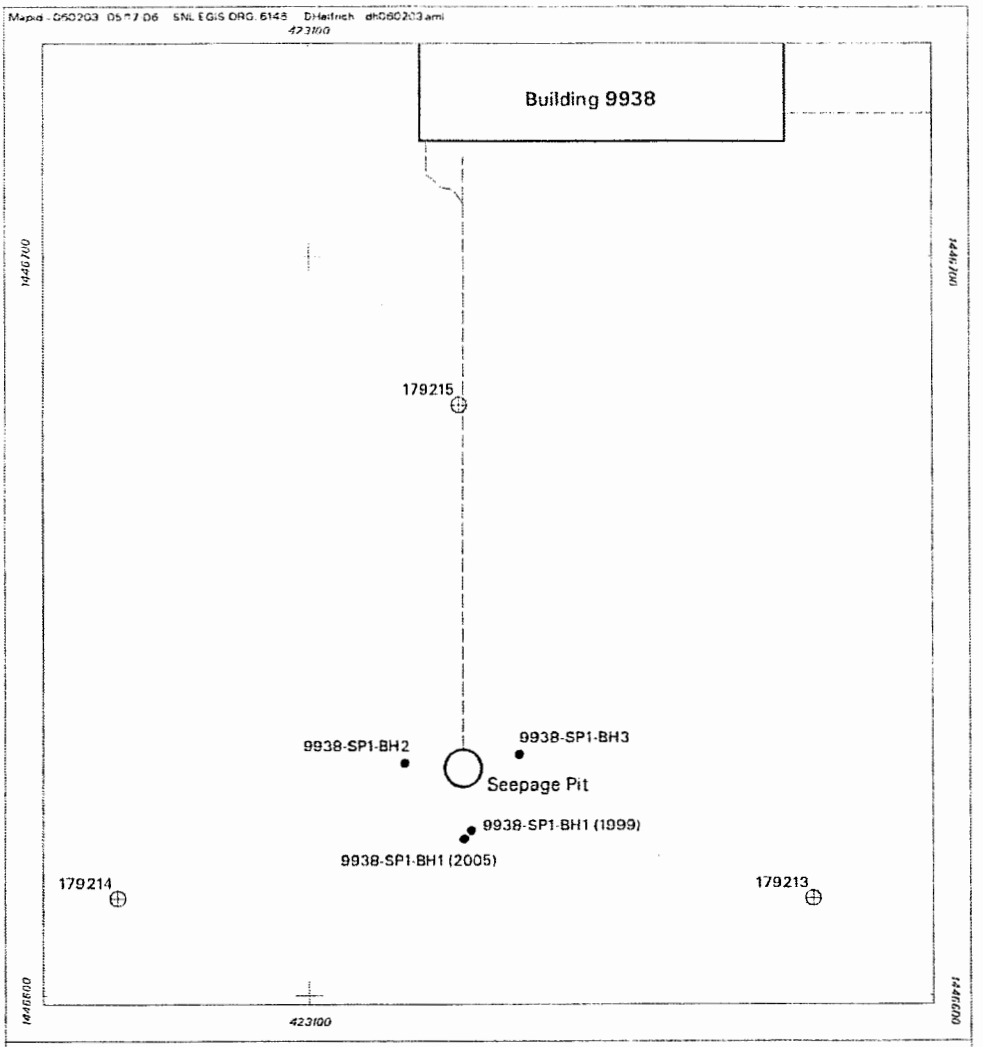
AOC 1095, Building 9938 Seepage Pit (Coyote Test Field)

Site Location

AOC 1095 is located in the Coyote Test Field area on federally owned land controlled by KAFB and permitted to the DOE. The seepage pit on the south side of Building 9938 was constructed by excavating a 9- to 10-ft diameter hole down to bedrock, approximately 9.5 ft bgs, placing a 4-ft diameter section of steel culvert vertically inside the hole, and filling the culvert and annular space with gravel. Construction details are based upon engineering drawings and a site inspection of the system. The system received discharges from Building 9938, approximately 85 ft to the north (Figure 26).

Operational History

Available information indicates that Building 9938 was constructed in 1971 and it is assumed the seepage pit was constructed at the same time. Building 9938 is currently a support building at the Large Melt Facility. The facility is currently inactive and the seepage pit was removed and the excavation backfilled in accordance with 20.7.3.410 NMAC in August 2005.



Legend

- Soil Boring Location
- Gore-Sorber™ Sample Location
- Seepage Pit
- Unpaved Road
- Building 9938
- Septic Drain Line

Figure 26
Site Map of Drain and Septic Systems AOC 1095, Bldg. 9938 Seepage Pit, Coyote Test Field

Scale in Feet

Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

The COCs include RCRA metals, hexavalent chromium, cyanide, HE compounds, VOCs, SVOCs, PCBs and radionuclides.

Evaluation of Relevant Information

Two assessment investigations were conducted at this site. In August 1999, subsurface soil samples were collected from one boring adjacent to the seepage pit. In April 2005, additional subsurface soil samples were collected for VOCs from three borings adjacent to the seepage pit (Investigation 1). In May 2002, a passive soil-vapor survey (Investigation 2) was conducted to determine whether areas of VOC contamination were present in the soil around the drainfield.

Investigation 1— Soil Sampling

Soil sampling was conducted in August 1999. It was determined at that time, that the seepage pit rested directly on bedrock and the soil samples had to be collected from one borehole adjacent to, and on the south side of the seepage pit. In April 2005, additional samples for VOCs only were collected from three boreholes adjacent to the seepage pit.

AOC 1095 was one of five shallow groundwater DSS sites that had 2-butanone concentrations above the 10 μg/kg VOC trigger level specified in the SAP and therefore required additional sampling. The samples collected at these five sites were all analyzed at the same time, and the laboratory reported detections of the same three VOCs (2-butanone, methylene chloride and toluene) in generally similar concentrations for all five sites. After meeting with the Department, it was decided to resample AOC 1095 and the other four sites for VOCs only. At AOC 1095, it was agreed that additional VOC samples would be collected from the original 1999 location and depth, and additional samples would be collected from the same depth at two additional borehole locations equidistant from the seepage pit (Figure 26). The VOC resampling at AOC 1095 was conducted on April 12, 2005. However, due to subsurface refusal, the April 2005 sample from borehole BH1 had to be collected approximately 2 feet away from the August 1999 location.

Because no VOCs were detected in the April 2005 samples, it was concluded that the 1999 VOC samples were probably affected by laboratory contamination. Therefore, the 1999 VOC data were replaced with the 2005 VOC analytical results in the data tables and in the risk assessment.

An auger drill rig was used to sample each borehole at one depth interval. In the boreholes drilled adjacent to the seepage pit, the sample interval started at the estimated base of the gravel aggregate in the seepage pit and seepage pit excavation.

Discussed in this paragraph are the results for the soil sample that was collected in August 1999 and analyzed for SVOCs, PCBs, cyanide, RCRA metals, HE compounds and radionuclides, and the results for three soil samples and one duplicate that were collected in April 2005 and analyzed for VOCs. No VOCs, SVOCs, PCBs, cyanide or HE compounds were detected. All RCRA metal concentrations were below the Department-approved background values. Hexavalent chromium was detected at a concentration of 0.112 mg/kg J. For radionuclides, no activities above background levels were detected in any sample analyzed. However, although not detected, the MDA for uranium-235 analyzed by the off-site laboratory exceeded the background activity. No elevated readings of gross alpha/beta activity were detected in any of the samples.

Investigation 2— Passive Soil-Vapor Sampling

In May 2002, a passive soil-vapor survey was conducted in the Building 9938 seepage pit area. This survey was conducted to determine whether VOC contamination was present in soil.

Three GS passive soil-vapor samplers were placed in the seepage pit area on May 1, 2002, and were retrieved on May 16, 2002. The GS samplers were analyzed for a total of 30 individual or groups of VOCs, including TCE, tetrachloroethene, cis- and trans-dichloroethene and BTEX. Twelve individual or groups of VOCs were detected in the GS samplers.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total human HIs and estimated excess cancer risks were acceptable (Table 20).

For the radiological COC (uranuim-235) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 1.9E-3 millirem (mrem)/year (yr). The estimated excess cancer risk is 1.9E-8.

The exposure pathway analysis established that no complete ecological exposure pathway exists for exposure of ecological species to contaminants at AOC 1095. All COCs are located at depths greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Table 20
Risk Assessment Values for AOC 1095 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Industrial Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Chromium VI	0.12 J	0.00	3E-11	0.00	6E-10
Cyanide	0.0695[b]	0.00		0.00	
Total		**0.00**	**3E-11**	**0.00**	**6E-10**

[a]EPA 1989.; [b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).
COC = Constituent of concern.

Basis for Determination

AOC 1095 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

AOC 1101, Building 885 Septic System

Site Location

AOC 1101 is located on the north side of SNL Technical Area 1 on federally owned land controlled by KAFB and permitted to the DOE (Figure 27). An SNL Facilities Engineering drawing indicates that the Building 885 septic system was situated approximately 100 ft north of the northwest corner of Building 885.

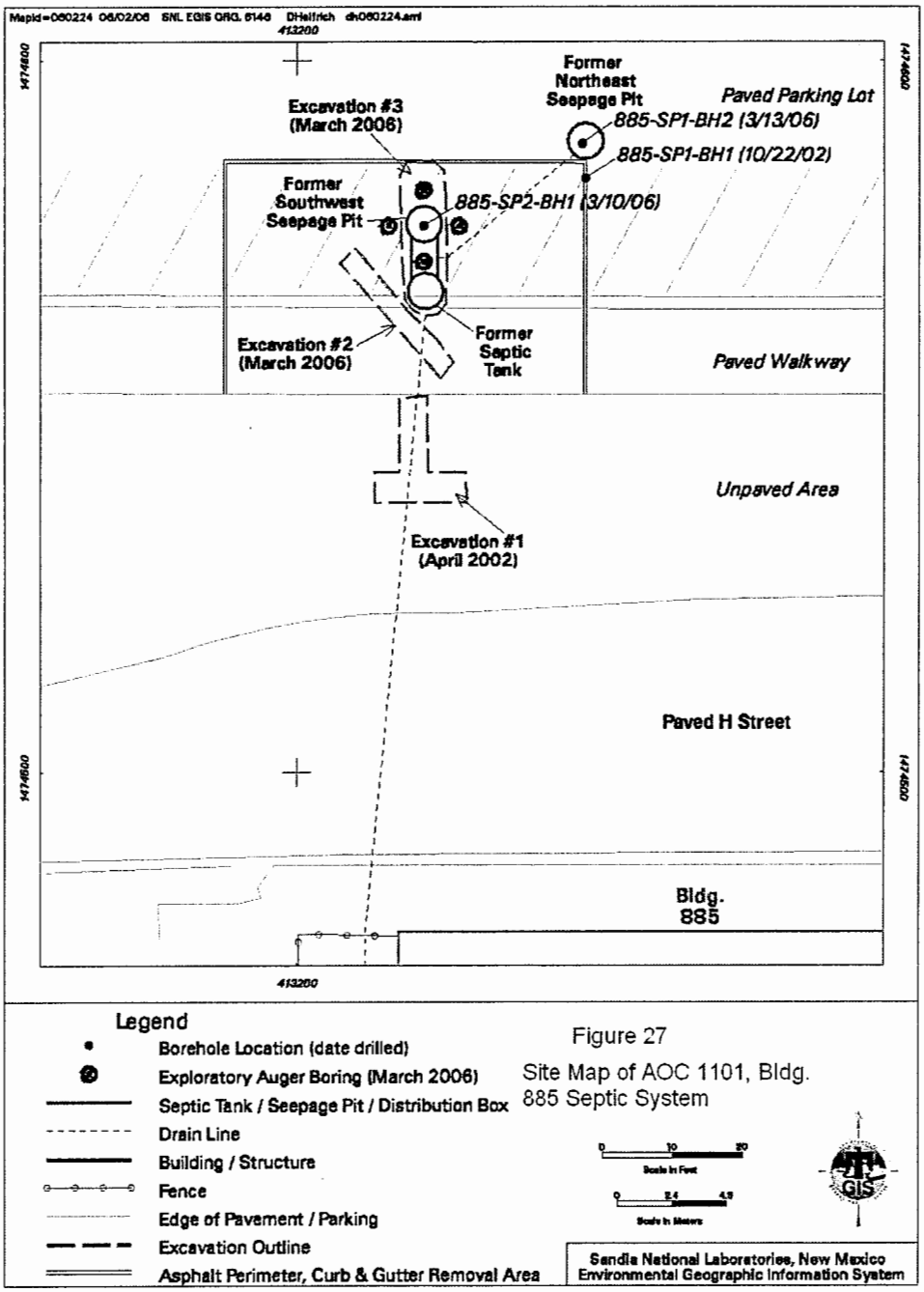


Figure 27

Site Map of AOC 1101, Bldg. 885 Septic System

Operational History

Bldg. 885 was constructed as a building materials warehouse in 1953, and it is assumed that the septic system (septic tank and one or two seepage pits) was also constructed at that time.

A June 1980 SNL Facilities Engineering drawing indicates that the Building 885 septic system was situated approximately 100 ft north of the northwestern corner of Building 885. The drawing shows that the abandoned septic system consisted of a septic tank and distribution box that emptied to a 5-ft diameter by an estimated 25-ft deep seepage pit (referred to as the northeast seepage pit). An older drawing (1963) indicates that a second seepage pit (referred to as the southwest seepage pit) may have been located approximately 3 ft north of the septic tank. This location is now beneath a large asphalt parking lot. In 1988, Building 885 was connected to the City of Albuquerque sanitary sewer system. It is assumed that the septic system was abandoned and paved over at about that time.

COCs for the site include VOCs, SVOCs, polychlorinated biphenyls (PCBs), HE compounds, RCRA metals, hexavalent chromium, total cyanide, and radionuclides.

Depth to Regional Groundwater

The shallow groundwater system and regional aquifer are approximately 310 and 560 ft beneath the site, respectively.

Evaluation of Relevant Information

In March 2002, an initial backhoe excavation attempted to locate the old drain line shown in the engineering drawings to run north from Building 885 to the septic tank. The line was located at an average depth of 5 ft bgs and was followed north until it passed under the asphalt walkway and parking lot. The excavation was stopped in order to avoid damaging the walkway.

In June 2002, a ground penetration radar survey was conducted at the apparent location of the septic system beneath the parking lot. The results of the survey were inconclusive; no definitive remains of the buried system were identified.

In October 2002, an initial borehole (885-SP1-BH1) was drilled in the center of the northeast seepage pit as shown on the 1980 drawing. At a depth of 23 ft bgs, a subsurface obstruction caused auger refusal and was assumed at the time to be the remains of the northeast seepage pit.

To avoid a lodged auger string due to the obstruction, a second borehole was drilled 5 ft south of the first boring.

Soil samples were successfully collected from the 2002 borehole from both an upper interval (approximately 25 ft bgs) and from a deeper interval (approximately 30 ft bgs). Soil samples were analyzed for VOCs, SVOCs, PCBs, HE compounds, RCRA metals and hexavalent chromium, total cyanide, radionuclides, and gross alpha/beta activity.

In March 2006, a section of the parking lot was removed and two additional excavations were completed to determine if remains of the tank or southwest seepage pit were still present at the site. No indication, or remains, of a septic tank, seepage pit, seepage pit aggregate, or a northeast-trending drain line was found. It was concluded that the system components had been completely removed from the site before the parking lot and walkway were constructed. Also in March 2006, four exploratory borings were drilled around the center of the southwest seepage pit as it was shown on the 1980 drawing. No buried aggregate or seepage pit remains were detected.

Two additional soil borings were advanced at the site during the March 2006 activities. The first borehole (885-SP2-BH1) was advanced in the theoretical center of the southwest seepage pit and the second (885-SP1-BH2) was advanced in the theoretical center of the northeast seepage pit. Soil samples were collected from the two 2006 boreholes at 25 ft bgs and 30 ft bgs. The soil samples were analyzed at off-site laboratories for VOCs, SVOCs, PCBs, HE compounds, RCRA metals, hexavalent chromium, cyanide, and gross alpha/beta activity, and at an on-site laboratory for radionuclides by gamma spectroscopy.

A total of 6 soil samples were collected during the 2002 and 2006 sampling events. The analytical results from both sampling events were used for the CAC justification. No VOCs were detected above the MDL in any of the soil samples. Low J-value concentrations of six SVOCs were detected in the two 2002 soil samples collected from the northeast seepage pit. There were no SVOCs detected in the 2006 soil samples. No PCBs and no HE compounds were detected in any of soil samples collected in 2002 and 2006. There were no RCRA metals detected above NMED-approved background concentrations in any of the soil samples from 2002 and 2006. Hexavalent chromium was detected at 0.0844 J mg/kg in one soil sample collected from the southwest seepage pit in 2006. Cyanide was detected at 0.184 J mg/kg in one 2002 soil sample collected from the northeast seepage pit. No activities above NMED-approved background levels for the four representative radionuclides were detected in any of the samples. However, although not detected, the MDAs for two of the uranium-235 and one of the uranium-238 samples collected in March 2006 exceeded their representative background activities. Gross alpha/beta results for the 2002 and 2006 soil samples collected did not exceed the background activities.

A risk screening assessment was performed for this site using maximum COC concentrations to evaluate the potential for adverse health effects in industrial and residential land-use scenarios. For the industrial and residential land-use scenarios, the total and incremental human health HIs and the estimated excess cancer risks were less than NMED guidelines for risk (Table 21).

The human health industrial and residential land use incremental doses for radiological COCs were below the EPA and numerical guidelines. In conclusion, human health and ecological risks were acceptable per NMED guidance.

Basis for Determination

AOC 1101 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Table 21
Risk Assessment Values for AOC 1101 Nonradiological COCs

COC Name	Maximum Concentration (mg/kg)	Residential Land Use Scenario[a]	
		Hazard Index	Cancer Risk
Inorganics			
Chromium VI	0.0844 J	0.00	4E-10
Cyanide	0.184 J	0.00	--
Mercury	0.00459 J	0.00	--
Selenium	0.613 J	0.00	--
Silver	0.0487[b]	0.00	--
Organics			
Acenaphthene	0.0107 J	0.00	--
2-Chlorophenol	0.0169 J	0.00	--
Chrysene	0.0185 J	0.00	3E-10
Di-n-octylphthalate	0.15 J	0.00	--
Bis (2-ethylhexyl) phthalate	0.182 J	0.00	4E-9
Fluoranthene	0.0174 J	0.00	--
Fluorene	0.0104 J	0.00	--
Total		**0.00**	**5E-9**

[a]EPA 1989.
[b]Nondetected concentration (i.e., one-half the maximum detection limit is greater than the maximum detected concentration).
COC = Constituent of concern.
J = Concentration was qualified as an estimated value.
mg/kg = Milligram(s) per kilogram.
– = Information not available

AOC 1114, Building 9978 Drywell

Site Location

AOC 1114 is located in the Coyote Test Field on federally owned land controlled by KAFB and permitted to the DOE. The site is located approximately 1,700 ft east of the intersection of Optical Range Road with Lovelace Road. The drywell is southeast of Building 9978 and consists of a vertically buried piece of metal culvert, 3 ft in diameter and 5.5 ft deep, filled with aggregate to within 1.5 ft of the surface. Construction details are based upon engineering drawings, site inspections, and a backhoe excavation of the system. The system is still active and receives discharges from a sink and water fountain in Building 9978, approximately 21 ft to the northwest (Figure 28).

Operational History

Available information indicates that Building 9978 was constructed in 1971, and it is assumed the drywell was constructed at the same time. Building 9978 is currently used as a shop and

storage facility to support the ER Project field operations. The system is still active and receives discharges from a sink and water fountain inside Building 9978.

The COCs include RCRA metals, hexavalent chromium, cyanide, HE compounds, VOCs, SVOCs, PCBs and radionuclides.

Evaluation of Relevant Information

Two assessment investigations have been conducted at this site. In March 2002, a backhoe was used to physically locate the buried drywell (Investigation 1). In September 2002, subsurface soil samples were collected from a boring drilled through the center of, and beneath, the drywell (Investigation 2).

Investigation 1—Backhoe Excavation

On March 22, 2002, a backhoe was used to determine the location, dimensions and depth of the drywell. The drywell was found to consist of a vertically buried piece of metal culvert, 3 ft in diameter, 5.5 ft deep, and filled with aggregate to within 1.5 ft of the surface. No visible evidence of stained or discolored soil or odors indicating residual contamination was observed during the excavation. No samples were collected during the backhoe excavation.

Investigation 2—Soil Sampling

In September 2002, soil samples were collected from a borehole drilled through the center of, and beneath, the drywell. An auger drill rig was used to sample the borehole at two depth intervals. The shallow sample interval started at the estimated base of the gravel aggregate in the drywell bottom, and the lower (deep) interval started at 5 feet below the top of the upper sample interval.

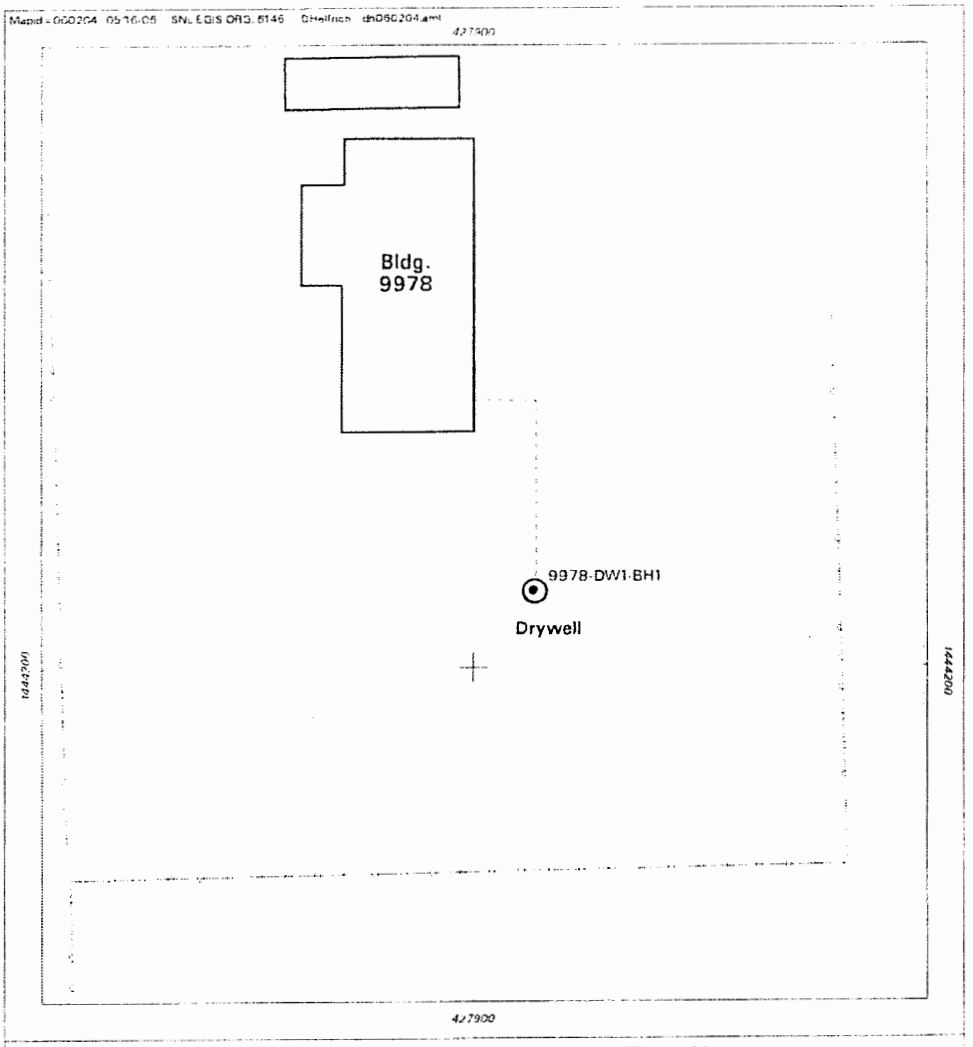
Two VOCs (2-butanone and toluene) were detected in the 11-ft-bgs sample. Only 2-butanone was detected in the 6-ft-bgs sample. Acetone and 1,2-dichloropropane were detected in the TB associated with these samples. No SVOCs, PCBs or HE compounds were detected. No RCRA metal concentrations detected exceeded the Department-approved background concentrations. Cyanide was detected in the 6-ft-bgs sample. For radionuclides, no activities above background levels were detected in any sample analyzed. However, although not detected, the MDA for uranium-235 exceeded the background activity because the standard gamma spectroscopy count time for soil samples (6,000 seconds) was not adequate to achieve a lower and more appropriate MDA. Regardless, the MDA was sufficiently low that the Department accepts the sampling results. No gross alpha or beta activity was detected above background levels in any of the samples.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total HIs and estimated excess cancer risks were acceptable (Table 22).

For the radiological COC (uranuim-235) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 1.1E-2 millirem (mrem)/year (yr). The estimated excess cancer risk is 1.1E-7.

The exposure pathway analysis established that no complete ecological exposure pathway exists for exposure of ecological species to contaminants at AOC 1114. All COCs are located at depths

greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs. In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.



Legend

- Borehole Location
- Drywell
- Drain Line
- Building / Structure
- Unpaved Road
- Fence

Figure 28
Site Map of Drain and Septic Systems AOC 1114, Bldg. 9978 Drywell, Coyote Test Field

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Table 22
Risk Assessment Values for AOC 1114 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Chromium VI	0.0271[b]	0.00	6E-11	0.00	1E-10
Cyanide	0.0713 J	0.00		0.00	
Organic					
2-Butanone	0.00856	0.00		0.00	
Toluene	0.00038 J	0.00		0.00	
Total		**0.00**	**6E-11**	**0.00**	**1E-10**

[a]EPA 1989.
[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).
COC = Constituent of concern.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.

Basis for Determination

AOC 1114 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

AOC 1116, Building 9981A Seepage Pit

Site Location

AOC 1116 is located at the Solar Tower Testing Complex on federal land controlled by KAFB and permitted to the DOE. The site is located approximately 1,500 ft northeast of the solar tower. The seepage pit is on the south side of Building 9981A and was constructed by excavating a 6-ft-diameter hole to a depth of approximately 8.5 ft bgs, placing a 4-ft diameter section of steel culvert vertically in the hole with the upper end at the ground surface, and filling the annular space and lower 3.5 ft of the culvert with gravel aggregate (Figure 30). Construction details are based upon engineering drawings, and a site inspection.

Operational History

Available information indicates that Building 9981A was constructed in 1981 and it is assumed the seepage pit was constructed at the same time. Building 9981A is currently known as the flux gauge calibration station. Discussions with Solar Tower Complex personnel in September 2004 confirmed that the seepage pit was still active and receives cooling water from occasional tests conducted in Building 9981A. There are no current plans to abandon and backfill this unit.

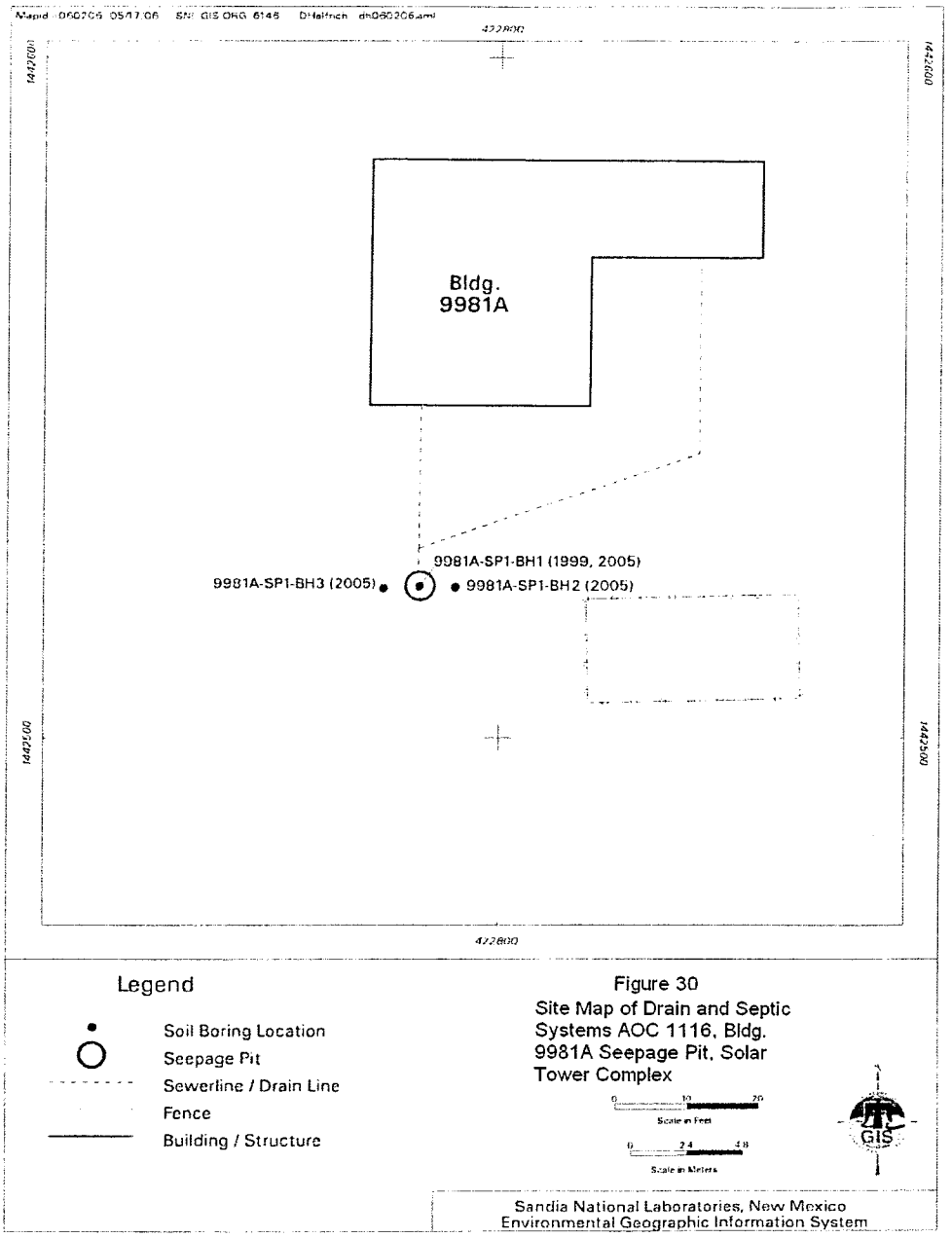


Figure 30
Site Map of Drain and Septic Systems AOC 1116, Bldg. 9981A Seepage Pit, Solar Tower Complex

The COCs include RCRA metals, hexavalent chromium, cyanide, HE compounds, VOCs, SVOCs, PCBs and radionuclides.

Evaluation of Relevant Information

In August 1999, soil samples were collected from one borehole drilled through the center of, and beneath the seepage pit. In April 2005, additional samples for VOC analysis only were collected from the approximate center of, and beneath, the seepage pit and, because of subsurface refusals, from two additional boreholes adjacent to the seepage pit. An auger drill rig was used to sample all boreholes at two depth intervals. In boreholes drilled through the center of, and adjacent to the seepage pit, the shallow sample interval started at the estimated base of the gravel aggregate in the seepage pit bottom, and the lower (deep) interval started at 5 feet below the top of the upper sample interval.

AOC 1116 was one of five shallow groundwater DSS sites that had 2-butanone concentrations above the 10 μg/kg VOC trigger level specified in the DSS SAP, and therefore required additional sampling. The samples collected at these five sites were all analyzed at the same time, and the laboratory reported detections of the same VOCs (2-butanone, methylene chloride and toluene) at similar concentrations for all five sites. After meeting with the Department, it was decided to resample AOC 1116 and the other four sites for VOCs only. At AOC 1116, it was agreed that the additional VOC samples would be collected at the original 1999 sample location and depth, and additional samples would be collected at 5 and 10 feet below the original sample depths. The VOC resampling was conducted in April 2005. Repeated attempts to collect the additional VOC soil samples below the two original 1999 depths in the center seepage pit boring were unsuccessful due to shallow bedrock. Therefore, the additional VOC samples were collected at the two original 1999 depths in the center boring, and from the two step-out borings on either side of the seepage pit (Figure 30). Only toluene was detected in the April 2005 samples at a maximum concentration of 6.65 μg/kg. It was concluded that the 1999 VOC samples were probably affected by laboratory contamination. Therefore, the 1999 VOC data were replaced with the 2005 VOC results in the data tables and in the risk assessment. VOC results for the six soil samples collected in April 2005 from the three boreholes documented one VOC toluene in the 8-ft bgs sample from borehole BH2.

No SVOCs, PCBs, cyanide or HE compounds were detected in any of the soil samples collected in August 1999. None of the RCRA metal concentrations detected in the samples exceeded the Department-approved background concentrations. Thorium-232 was detected at an activity slightly above background activity in the 8-ft bgs sample from borehole BH1. Although not detected, the MDA for one uranium-235 analysis exceeded the background activity. Although the MDA is elevated, the MDA is low, and the risk assessment is not significantly impacted by its use. No gross alpha or beta activity above background levels was detected in any of the samples.

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total HIs and estimated excess cancer risks were acceptable (Table 23).

For the radiological COCs (thorium-232 and uranuim-235) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 6.4E-2 millirem (mrem)/year (yr). The estimated excess cancer risk is 7.4E-7.

The exposure pathway analysis established that no complete ecological exposure pathway exists for exposure of ecological species to contaminants at AOC 1116. All COCs are located at depths greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Basis for Determination

AOC 1116 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

Table 23
Risk Assessment Values for AOC 1116 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Chromium VI	0.16 J	0.00	3E-10	0.00	7E-10
Cyanide	0.069[b]	0.00		0.00	
Organic					
Toluene	0.00067 J	0.00		0.00	
Total		**0.00**	**3E-10**	**0.00**	**7E-10**

[a]EPA 1989.
[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).
COC = Constituent of concern.
J = Estimated concentration.
mg/kg = Milligram(s) per kilogram.

AOC 1117, Building 9982 Drywell, Solar Tower Complex

Site Location

AOC 1117 is located at the Solar Tower Testing Complex on federally owned land controlled by KAFB and permitted to the DOE. The site is located approximately 1,300 ft northwest of the solar tower (Figure 31).

The abandoned drywell is at the northwest corner of Building 9982 and consisted of a gravel-filled hole approximately 4 ft in diameter and 11 ft deep. Construction details are based upon engineering drawings, site inspections and auger drilling during sample collection. The system received discharges from floor drains in Building 9982, approximately seven ft to the south.

Operational History

Available information indicates that Building 9982 was constructed in 1980 and it is assumed the drywell was constructed at the same time. Building 9982 is currently known as the 5 MW Solar

Assembly Building. A site inspection in August 1999 determined that the Building 9982 floor drains that discharged to the drywell had been plugged with concrete.

The COCs include RCRA metals, hexavalent chromium, cyanide, HE compounds, VOCs, SVOCs, PCBs and radionuclides.

Evaluation of Relevant Information

In August 1999, soil samples were collected from a borehole drilled through the center of, and beneath the drywell. In April 2005, additional samples for VOC analysis only were collected from the approximate original borehole location through the center of, and beneath, the drywell and, because of subsurface refusals, from two additional boreholes adjacent to the seepage pit. An auger drill rig was used to sample the boreholes at two depth intervals. In the borehole drilled through the center of the drywell, the shallow sample depth interval started at the estimated base of the gravel aggregate at the drywell bottom, and the lower (deep) interval started at 5 feet below the top of the upper sample interval.

AOC 1117 was one of five shallow groundwater DSS sites that had 2-butanone soil sample concentrations above the 10 μg/kg VOC trigger level specified in the DSS SAP, and therefore required additional sampling. The samples collected at these five sites were all analyzed at the same time, and the laboratory reported detections of the same three VOCs (2-butanone, methylene chloride and toluene) at similar concentrations for all five sites. It was decided to resample the five sites for VOCs only. At AOC 1117, it was agreed that additional VOC samples would be collected at the 1999 sample location and depth, and additional samples would be collected at 5 and 10 feet below the original sample depths. The resampling was conducted in April 2005. However, due to subsurface refusals below the original sample depths, some of the April 2005 samples had to be collected from two additional step-out boreholes approximately 2.5 and 4 feet away, respectively, from the sides of the drywell.

Figure 31 shows the locations of the three boreholes drilled at AOC 1117. Because no VOCs were detected in the April 2005 samples, it was concluded that the 1999 VOC samples were probably affected by laboratory contamination. Therefore, the 1999 VOC data were replaced with the 2005 VOC results in the data tables and in the risk assessment. The four samples and one duplicate collected in April 2005 were analyzed for VOCs. There were no detections of VOCs.

The two soil samples and one duplicate collected in August 1999 were analyzed for SVOCs, PCBs, cyanide, HE compounds, RCRA metals, hexavalent chromium and radionuclides. No VOCs, SVOCs, PCBs, cyanide or HE compounds were detected in any of the soil samples. For RCRA metals and hexavalent chromium, none of the metals were greater than the Department-approved background concentrations. For radionuclides, no activities above background levels were detected in any sample analyzed. However, although not detected, the MDA for one uranium-235 analysis exceeded the background activity because the standard gamma spectroscopy count time for soil samples (6,000 seconds) was not adequate to achieve a lower and more adequate MDA. Regardless, the MDA was sufficiently low that the Department accepts the sampling results. No gross alpha or beta activity above the background levels was detected in any of the samples.

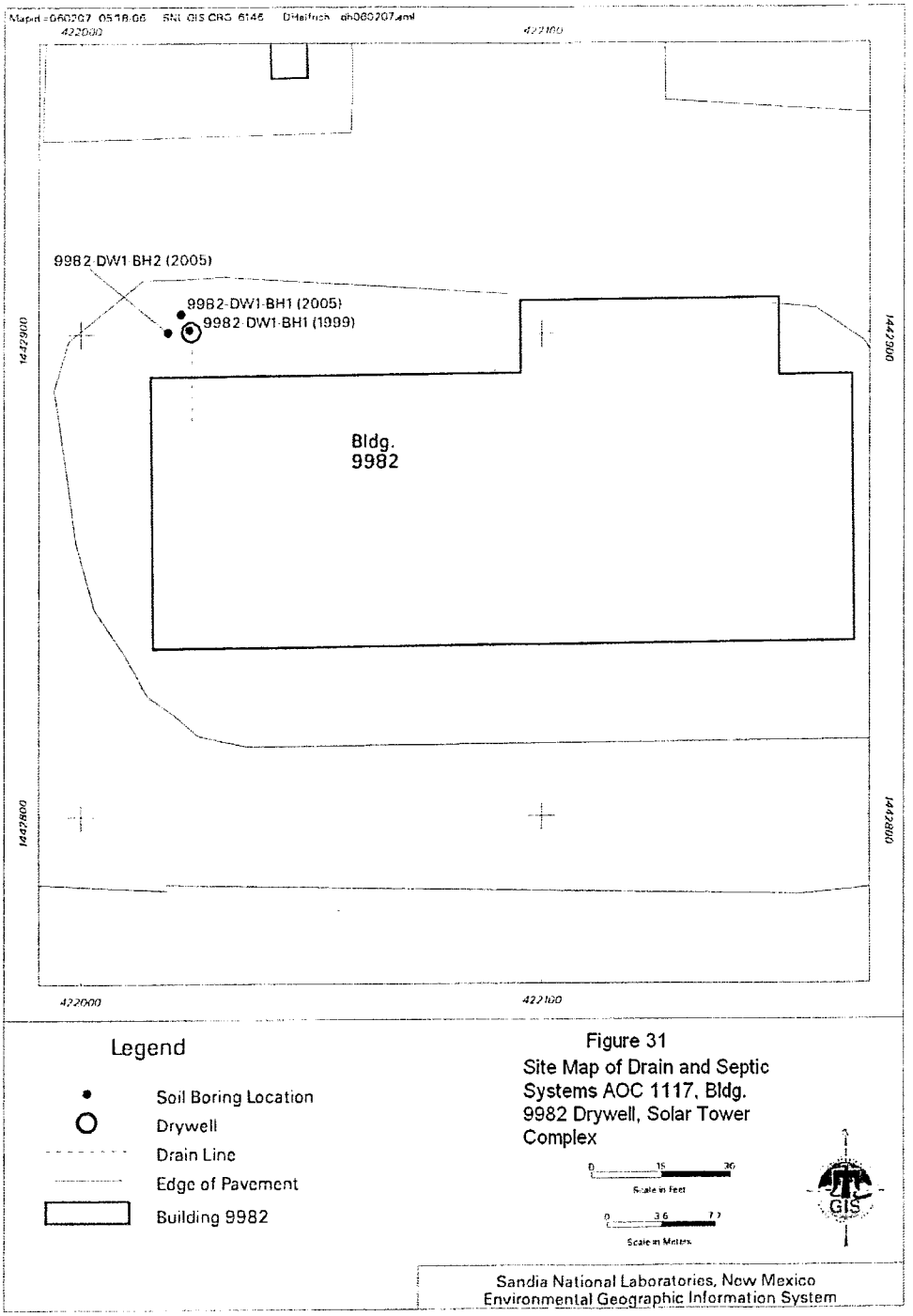


Figure 31
Site Map of Drain and Septic Systems AOC 1117, Bldg. 9982 Drywell, Solar Tower Complex

A human health risk screening assessment was performed to evaluate the potential for adverse health effects for the industrial and residential land-use scenarios. For both the industrial and residential land-use scenarios, the total HIs and estimated excess cancer risks were below Department guidelines (Table 24).

For the radiological COC (uranuim-235) a total effective dose equivalent (TEDE) was calculated that results in a TEDE of 5.3E-2 millirem (mrem)/year (yr). The estimated excess cancer risk is 5.3E-7.

Table 24
Risk Assessment Values for AOC 1117 Nonradiological COCs

COC	Maximum Concentration (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a]	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Inorganic					
Chromium VI	0.105 J	0.00	2E-10	0.00	5E-10
Cyanide	0.069[b]	0.00		0.00	
Total		**0.00**	**2E-10**	**0.00**	**5E-10**

[a]EPA 1989.
[b]Nondetected concentration (concentration listed is one-half of the maximum detection limit, used for a conservative risk assessment).
COC = Constituent of concern.
J = Estimated concentration.

The exposure pathway analysis established that no complete ecological exposure pathway exists for exposure of ecological species to contaminants at AOC 1117. All COCs are located at depths greater than 5 ft bgs. Therefore, no COCs are considered to be COPECs.

In conclusion, human health and ecological risks are acceptable under a residential land-use scenario.

Basis for Determination

AOC 1117 has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use.

SWMU LTES-1, Cable Debris Site

Site Location

The Cable Debris Site is an approximately 1.3 acre site located in Technical Area (TA)-III (Figure 32).

Operational History

The complete operational history at the LTES 1 is unknown. However, based on the available information, this location has never been an active site and the contamination is limited to the surface debris (i.e., solid waste) that was probably transported to the area from various test areas.

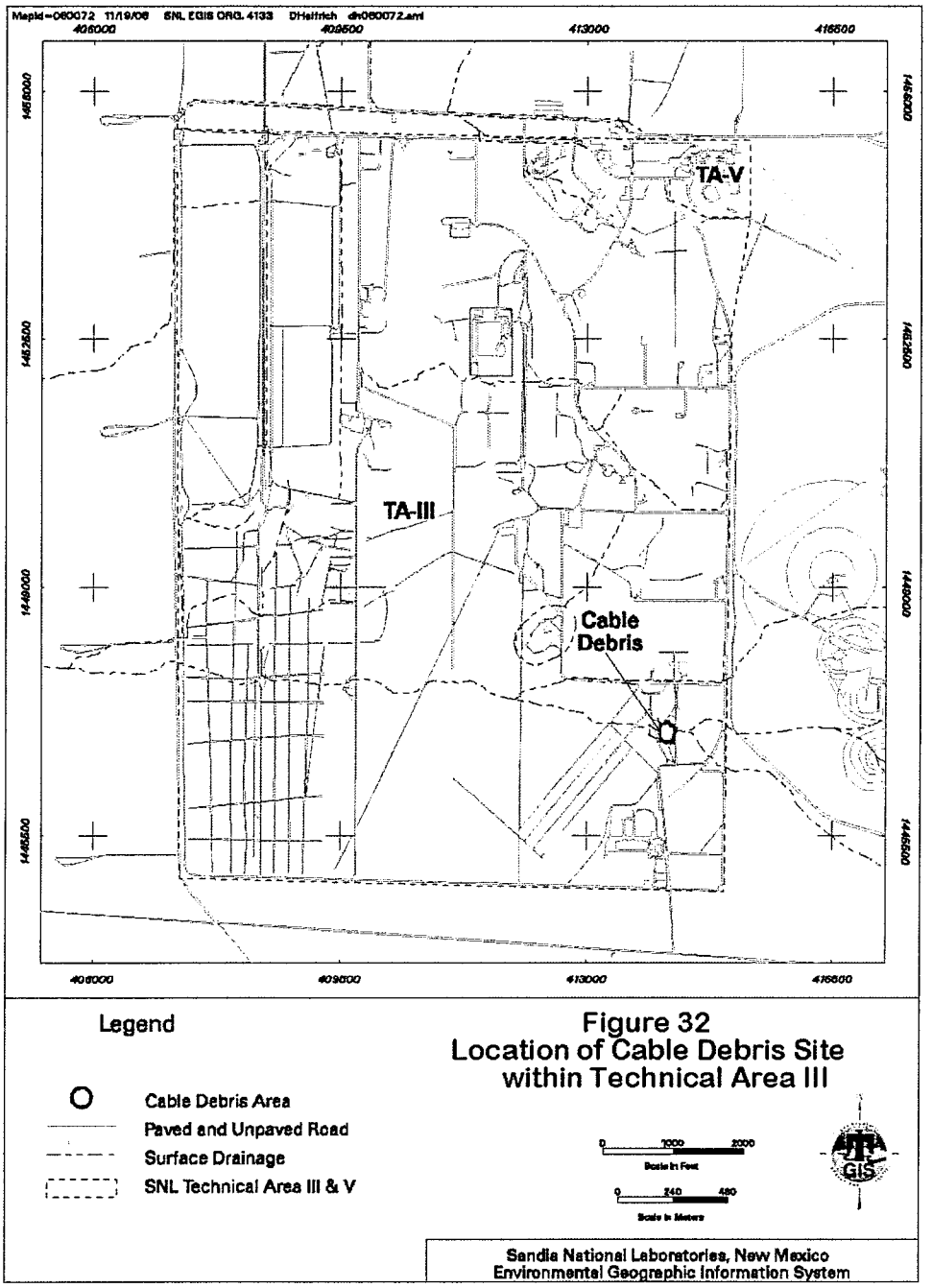


Figure 32
Location of Cable Debris Site within Technical Area III

However, prior to 1995, no information is available and the precise origin of the debris is unknown.

A Voluntary Corrective Action (VCA) was completed for the site in January 2009 (SNL March 2009). The VCA focused on debris segregation, sizing, and final disposition. The debris was processed to a manageable size, segregated based on material types (metal, concrete, and other assorted solid wastes) and disposed of either through recycling or waste disposal paths.

The site consisted of surface debris piles located primarily within a surge basin, with some minor debris located outside the surge basin in the general vicinity. A surge basin is a hole or depression that is part of a drainage system that provides additional storage and retention of water during heavy rainfall or flood events. The surge basin at the LTES Site 1 is a circular depression approximately 1.3 acres in size.

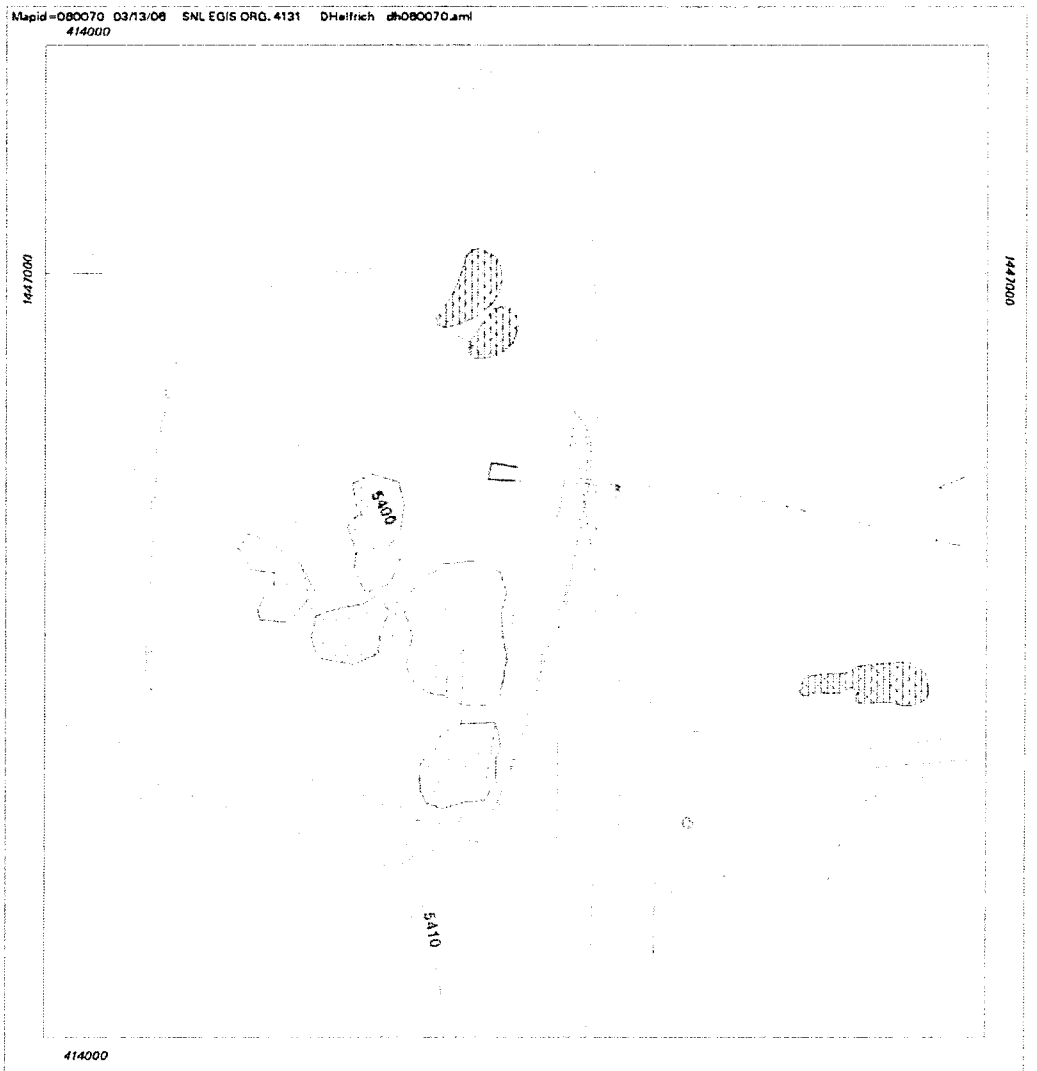
Three of the debris piles were primarily comprised of metal cables with other metal debris, including rebar, steel pipe, tubes, weldments, welded steel fixtures, spent rocket motors and powder actuated cable cutters. The remaining two piles in the surge basin comprised primarily concrete rubble and rebar; one of these piles is located on the edge of the basin. In addition, there are five smaller debris piles directly east of the surge basin which are primarily composed of small cobbles, fill dirt and some minor solid waste that includes paper, plastic, and small metal debris (Figure 33).

Based upon visual inspection, there was no indication that these piles contained anything other than minor solid waste because no soil staining or other signs of contamination were observed. The area surrounding the surge basin is part of the east mesa and generally flat with a gentle slope to the southwest (i.e., towards the Rio Grande). No major arroyo channels occur in the area. Precipitation is low in the region (approximately 8 inches per year) and surface runoff is minimal, except during major precipitation events. The area has been previously disturbed and vegetation primarily consists of desert grasses, cacti, tumbleweeds, and other annual species typical of disturbed areas of the east mesa ecosystem. The two primary waste types were metals and concrete. In addition, assorted solid waste was generated during the sorting and segregation process. All three of these waste types are discussed below.

Metal

Segregation and sizing of the metal debris was conducted using a shear attachment on an excavator. Once sized, all metal was placed into roll-off containers for recycling. A large round steel target filled with concrete was dismantled during the metal segregation. The concrete was removed from the steel target casing using a hammer attachment on the excavator, and the resulting debris was then separated into its respective debris waste types. The Unexploded Ordnance Safety Officer performed an initial visual inspection on the metal debris piles for potential Unexploded Ordnance (UXO) debris. Potential UXO items found included six powder actuated cable cutters, and several spent rocket motors and rocket motor casings. These items were placed in a segregated staging area. None of the rocket motors were live. Of the 6 powder actuated cable cutters found onsite, only one of the cutters was potentially "live", and was taken by KAFB Explosive Ordnance Disposal (EOD) before disposal.

An SNL Radiation Control Technician (RCT) performed radiological surveys of approximately 10% of metal debris. No radioactive contamination was detected as part of these confirmatory surveys. Metal debris staged in roll-off containers was transported and recycled offsite by a SNL contractor.



Legend

Unpaved Road
10-ft. Countour
Surface Drainage
Edge of Depression
Outfall (buried portion dashed)
Gravel / Fill Mix Debris Pile
Metal Mix Debris Pile
Concrete Rubble Debris Pile

Figure 33
Cable Debris Area Site Map

0 40 80
Scale in Feet

0 9.6 19.2
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Concrete

Concrete debris piles were mechanically screened using a Screen-All Plant. The Screen-All Plant was fitted with a 2-inch screen deck to segregate the concrete from soil. Concrete for recycling was required to meet the size specification of approximately 2-feet, by 2-feet, by 2-feet maximum dimensions. Concrete determined to be greater than this size specification, after screening, was sized using a hammer attachment on the excavator. A water truck was used to spray water on the concrete debris piles to control dust throughout the screening activities. A front-end loader with a bucket attachment was used to place the concrete debris onto the screen deck. The concrete and other potential debris (metal, wood, and solid waste) was then segregated from soil. The screened concrete was stockpiled directly on the ground surface and later loaded and transported to the existing SNL concrete recycling area in TA- III. The screened soil was stockpiled in the bottom of the retention basin and confirmation soil samples were collected.

Specific debris items, including a poly-lined 55-gallon drum full of stained soil, a burlap wrangler bag containing activated carbon, and a lead acid battery were placed in a segregated staging area. The lead acid battery was disposed of as hazardous waste through the SNL Hazardous Waste Handling (HWHF). In addition, several fragments of lead were found along the east slope of the storm water retention basin. The lead fragments were separated from the soil and other debris using the Screen-All Plant, screened for radiological contamination, and re-used through the SNL Lead Bank.

The UXOSO performed an initial visual inspection on the concrete debris piles. As this work progressed the UXOSO continually inspected both the initial concrete debris piles and the screened debris piles generated by the Screen-All Plant operations for any potential UXO debris or items. No UXO debris or items were present in the initial or screened debris piles.

An SNL RCT performed radiological surveys of approximately 10% of the concrete debris. No radioactive contamination was detected as part of these confirmatory surveys. All concrete debris was processed for re-use through the SNL concrete recycling program in TA-III.

Solid Waste

A small volume of solid waste was generated during the concrete screening process. The solid waste was segregated into the following three primary waste types; general solid waste (including metals, plastics, some construction debris, and trash), electrical cable of various sizes, and wood. The quantity and disposition of the solid waste is summarized in Table 25.

Once the debris was sized, segregated, and stock piled; confirmatory soil sampling was conducted in accordance with the technical approach, requirements, and procedures in the VCA Plan (SNL, 2008). On September 4 and September 9, 2008, surface soil samples were collected from 25 locations, including four samples collected from the screened soil stockpile that will remain onsite for use as fill material (Figure 34). Samples CDS-A1-0006-SS, CDS-A1-0006D-SS, CDS-A1-0022-SS, and CDS-A1-0025-SS characterize the screened soil stockpile.

All 25 confirmatory soil samples (plus the three duplicates for a total of 28 samples) that represent post-VCA site conditions were analyzed for metals and HE. In addition, five of the 25 soil samples were also analyzed for radionuclides.

Analytical results revealed elevated levels of 10 metals, no detections of HE, and the presence of Cesium-137 above the NMED approved background value. The NMED issued a Notice of

Deficiency (NOD) due to the elevated metals (cadmium and thallium) and Cesium-137 values stating that additional samples were required.

A review of the confirmatory sampling results revealed an analytical laboratory error in the reporting of the cadmium and thallium results. The responses to the NOD detailed the error and presented the corrected information. The cadmium detection limits were significantly below the soil screening level and the thallium values were below corresponding background values. The Cesium-137 value for the subsurface sample did exceed the subsurface background value, but was well within the range of overall background values. The NMED accepted the NOD comments and did not require any further action at the site. Following all the VCA activities, the site was graded and reseeded.

Risk assessment results for the residential scenario are calculated per NMED risk assessment guidance in 2003 as presented in the "Supplemental Risk Document Supporting Class 3 Permit Modification Process" (SNL 2003).

Table 25
SWMU LTES-1, Cable Debris Site
Quantity and Disposition of General Debris

Debris Type	Approximate Quantity	Unit	Disposition
Metal	5	30 cubic yard roll off container	Recycled Offsite
Concrete Rubble	150	Tons	Recycled
Lead Fragments	1000-1500	Pounds	SNL Lead Bank
General Solid Waste	10	Cubic yards	Sanitary Landfill via the SNL Solid Waste Transfer Facility
Wood	400	Pounds	Recycled
Electrical Cable	400	Pounds	Recycled

SNL = Sandia National Laboratories/New Mexico.

Because COCs were present in concentrations or activities greater than background-screening levels or because constituents were present that did not have background-screening levels, it was necessary to perform a risk assessment for the site. The risk assessment analysis evaluated the potential for adverse health effects for the residential land-use scenario.

The maximum concentration value for lead was 2,000 milligrams per kilogram (mg/kg); this value exceeds the background value. The EPA does not provide any human health toxicological data on lead; therefore, no risk parameter values could be calculated. However, the NMED guidance for lead screening concentrations for construction and industrial land use scenarios is 800 mg/kg. The EPA screening guidance value for a residential land use scenario is 400 mg/kg. The 95% upper confidence level (UCL) of the mean concentration for all three land use

scenarios at the site are less than the screening values; therefore, lead is eliminated from further consideration in the human health risk assessment.

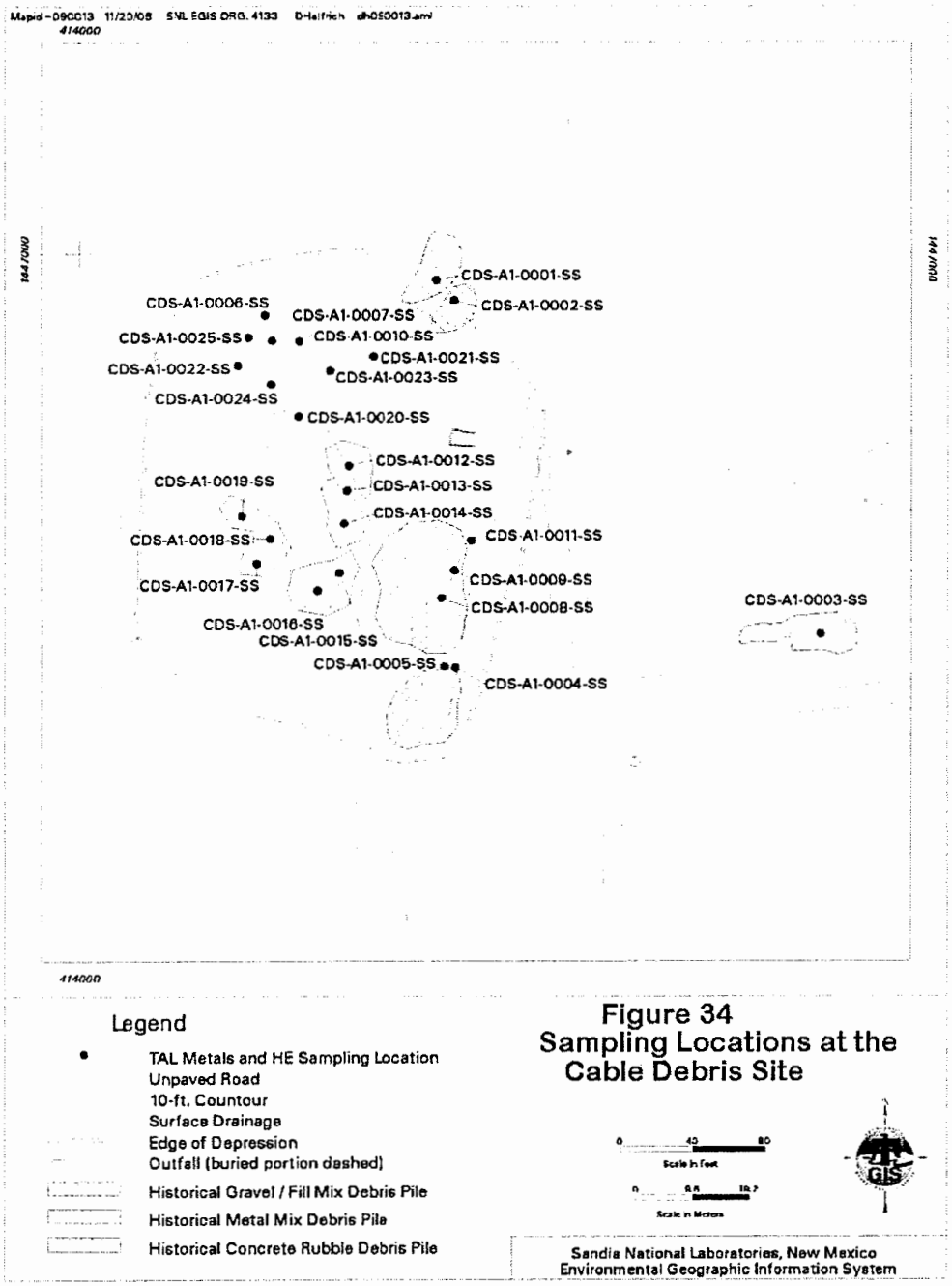


Figure 34
Sampling Locations at the Cable Debris Site

The results of the risk assessment are provided in Table 26. The total human health hazard index (HI) was 0.08 for the industrial land-use scenario, which is less than the NMED guideline of 1. The total estimated excess cancer risk was 4E-6 for the industrial land-use scenario, which is less than the NMED guideline of 1E-5.

The total human health HI was 1.01 for the residential land-use scenario, which is greater than the NMED guideline of 1. The total estimated excess cancer risk was 2E-5 for the residential land-use scenario, which is greater than the NMED guideline of 1E-5. Using the UCLs of the mean concentrations for the main contributors to risk (arsenic and iron), the total HI was reduced to 0.5 and the total estimated excess cancer risk was reduced to 1.1E-8.

Depth to Groundwater

The regional aquifer is approximately 500 feet below ground surface.

Table 26
Risk Assessment Values for LTES 1 Nonradiological COCs

COC	Maximum Concentration (All Samples) (mg/kg)	Industrial Land-Use Scenario[a]		Residential Land-Use Scenario[a] (Maximum Concentration)		Residential Land-Use Scenario[a] (UCL Concentration)	
		Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Arsenic	6.06 J/**3.8**	0.02	3.8E-6	0.28	1.6E-5	Below Background[b]	Below Background[b]
Barium	245	0.00	–	0.02	–	0.02	–
Beryllium	1.13	0.00	4.9E-10	0.01	1.0E-9	0.01	1.0E-9
Chromium, total	22.6 J	0.00	–	0.00	–	0.00	–
Cobalt	8.91	0.00	4.5E-9	0.01	9.6E-9	0.01	9.6E-9
Copper	261	0.01	–	0.09	–	0.09	–
Iron	26900/**14830**	0.04	–	0.49	–	0.27	–
Nickel	20.3	0.00	–	0.01	–	0.01	–
Vanadium	33.2	0.00	–	0.06	–	0.06	–
Zinc	816	0.00	–	0.04	–	0.04	–
Total		0.08	3.8E-6	1.01	1.6E-5	**0.50**	**1.1E-8**

[a]EPA 1989.

[a]UCL concentration was below background and therefore risk was not calculated.

J = Concentration was qualified as an estimated value.

Basis for Determination

The Cable Debris Site (LTES 1) has been characterized or remediated in accordance with current applicable state and/or federal regulations, and the available data indicate that contaminants pose an acceptable level of risk under current and projected future land use (residential).

J. References

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RESOURCE CONSERVATION AND RECOVERY ACT FACILITY OPERATING PERMIT

PARTS 1 THROUGH 8

EPA ID No. NM5890110518

issued to the

U.S. DEPARTMENT OF ENERGY/SANDIA CORPORATION

for the

SANDIA NATIONAL LABORATORIES
HAZARDOUS AND MIXED WASTE TREATMENT AND STORAGE UNITS AND POST-CLOSURE CARE OF THE CORRECTIVE ACTION MANAGEMENT UNIT

located in

BERNALILLO COUNTY, NEW MEXICO

prepared by the

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS WASTE BUREAU
2905 RODEO PARK DRIVE EAST, BUILDING 1
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PERMIT PART 1 GENERAL PERMIT CONDITIONS

1.1 AUTHORITY

This Permit is issued pursuant to the authority of the New Mexico Environment Department (Department) under the New Mexico Hazardous Waste Act (HWA), NMSA 1978, §§ 74-4-1 through 74-4-14, in accordance with the New Mexico Hazardous Waste Management Regulations (HWMR), 20.4.1 NMAC.

Pursuant to the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §§ 6901 to 6992k, and 40 CFR Part 271 and Part 272 Subpart GG, the State of New Mexico, through the Department, is authorized to administer and enforce the state hazardous waste management program under the HWA in lieu of the federal program.

This Permit contains terms and conditions that the Department has determined are necessary to protect human health and the environment. (*See* 40 CFR § 270.32(b)(2)).

Any violation of a requirement in this Permit may subject the Permittees or their officers, employees, successors, and assigns to: 1) a compliance order under § 74-4-10 of the HWA or § 3008(a) of RCRA (42 U.S.C. § 6928(a)); 2) an injunction under § 74-4-10 of the HWA or § 3008(a) of RCRA (42 U.S.C. § 6928(a)), or § 7002(a) of RCRA (42 U.S.C. § 6972(a)); 3) civil penalties under §§ 74-4-10 and 74-4-10.1 of the HWA or §§ 3008(a) and (g) of RCRA (42 U.S.C. §§ 6928(a) and (g)), or § 7002(a) of RCRA (42 U.S.C. § 6972(a)); 4) criminal penalties under § 74-4-11 of the HWA or §§ 3008(d), (e), and (f) of RCRA (42 U.S.C. §§ 6928(d), (e), and (f)); or 5) some combination of the foregoing. The list of authorities in this paragraph is not exhaustive and the Department reserves the right to take any action authorized by law to enforce the requirements of this Permit.

1.2 PERMITTEES AND PERMITTED ACTIVITY

The Secretary of the New Mexico Environment Department issues this Permit for hazardous and mixed waste management at the Sandia National Laboratories (SNL) to the United States Department of Energy (DOE), the owner of SNL, and Sandia Corporation, operator of SNL (EPA ID Number NM5890110518).

This Permit authorizes DOE and Sandia Corporation (the Permittees) to manage, store, and treat hazardous and mixed waste at SNL, and establishes the general and specific standards for these activities, pursuant to the HWA and the HWMR. This Permit also establishes standards for closure and post-closure care of permitted units at SNL, and corrective action pursuant to the HWA and HWMR.

1.2.1 Scope of Permit

This Permit authorizes the storage of hazardous and mixed wastes at the HWHU, treatment of hazardous waste at the TTU, the treatment and storage of hazardous and mixed wastes at the RMWMU and the AHCU, and the storage of hazardous and mixed waste at the MSB, as identified in Section 1.4 of this Permit Part. Storage or treatment of hazardous or mixed wastes that requires a permit is not authorized at any other location at the Facility. This Permit also requires the Permittees to conduct post-closure care of the CAMU and corrective actions at solid waste management units and areas of concern facility-wide.

1.3 PERMIT CITATIONS

Whenever the Permit cites a provision of 20.4.1 NMAC or Title 40 Code of Federal Regulations (40 CFR) the Permit shall be deemed to incorporate the citation by reference, including all subordinate provisions of the cited provision, and make binding the full text of the cited provision.

Hazardous waste management regulations are frequently cited throughout this Permit. The federal hazardous waste management regulations, 40 CFR Parts 260 through 273, are generally cited rather than the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC. The federal regulations are cited because only the federal regulations set forth the detailed regulatory requirements; the State regulations incorporate by reference, with certain exceptions, the federal regulations in their entirety. Citing only the federal regulations also serves to avoid encumbering each citation with references to two sets of regulations. However, it is the State regulations that are legally applicable and enforceable. Therefore, for the purpose of this Permit, and enforcement of its terms and conditions, all references to provisions of federal regulations that have been incorporated into the State regulations shall be deemed to include the State incorporation of those provisions.

1.4 EFFECT OF PERMIT

As to those activities specifically authorized or otherwise specifically addressed under this Permit, compliance with this Permit during its term shall constitute compliance, for purposes of enforcement, with Subtitle C of RCRA and the HWA, and the implementing regulations at 40 CFR Parts 264, 266, and 268 to the extent, and with the exceptions, provided by 40 CFR § 270.4.

Compliance with this Permit shall not constitute a defense to any order issued or any action brought under: §§ 74-4-10, 74-4-10.1, or 74-4-13 of the HWA; §§ 3008(a), 3008(h), 3013, 7002(a)(1)(B), or 7003 of RCRA; §§ 104, 106(a), or 107 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), 42 U.S.C. §§ 9601 to 9675; or any other federal, state or local law providing for protection of public health or the environment.

This Permit does not convey any property rights of any sort or any exclusive privilege, nor authorize any injury to persons or property, any invasion of other private rights, or any infringement of state or local laws or regulations. Compliance with this Permit does not relieve Permittees from the responsibility of complying with all applicable state or federal laws and regulations. (*See* 40 CFR §§ 270.4, 270.30(g)).

1.5 SEVERABILITY

The provisions of the Permit are severable, and if any provision of this Permit, or any application of any provision of this Permit to any circumstance is held invalid, the application of such provision to other circumstances and the remainder of this Permit shall not be affected thereby.

1.6 DEFINITIONS

Terms used in this Permit shall have the same meanings as those in the HWA, RCRA, and their implementing regulations unless this Permit specifically provides otherwise. Where a term is not defined in the HWA, RCRA, implementing regulations, or this Permit, the meaning of the term

shall be determined by a standard dictionary reference, EPA guidelines or publications, or the generally accepted scientific or industrial meaning of the term.

"Area of Concern" (AOC) means any area that may have had a release of a hazardous waste or hazardous constituents, which is not a solid waste management unit.

"Consent Order" means the April 29, 2004 Compliance Order on Consent issued to the Permittees pursuant to the HWA and the New Mexico Solid Waste Act (SWA), NMSA 1978, § 74-9-36(D), and any subsequent modifications thereof.

"Corrective Action" means all corrective action necessary to protect human health and the environment for all releases of hazardous or mixed waste or hazardous constituents from any Solid Waste Management Unit (SWMU) or Area of Concern (AOC) at the Facility, regardless of the time at which waste was placed in the Unit, as required under HWA § 74-4-4.2(B) and 40 CFR § 264.101. Corrective Action may address releases to air, soil, sediment, surface water or groundwater.

"Corrective Action Complete" means the requirements for corrective action have been satisfied by the Permittees as determined by the Department.

"Days" refers to calendar days unless specified otherwise in this Permit.

"Department" means the New Mexico Environment Department and any successor or predecessor agencies.

"DOE" means the United States Department of Energy, and any successor departments or predecessor agencies.

"EPA" means the United States Environmental Protection Agency and any successor or predecessor agency.

"Facility" means the Sandia National Laboratories including all contiguous land, and structures, other appurtenances, and improvements on the land. The Facility includes five Technical Areas (TAs) located within Kirtland Air Force Base (KAFB) and several remote test areas located on KAFB and the adjacent lands withdrawn from the U.S. Forest Service: Foothills Test Area, Central Coyote Test Area, Southwest Test Area, and Canyons Test Area. Within KAFB and the adjacent lands withdrawn from the U.S. Forest Service, the Facility comprises approximately 15,054 acres (23.5 square miles).

For the purpose of implementing corrective action under 40 CFR § 264.101, RCRA Section 3008(h), or the HWA, NMSA 1978, § 74-4-10(E), the Facility includes all contiguous property under the control of the owner or operator seeking a permit under the HWA. The Facility also includes all the SWMUs and AOCs listed in Attachment K of this Permit. The regional location of the Facility is shown in Figure 1 of Permit Attachment L (Figures).

"Federal Facility Compliance Order" (FFCO) means the Order issued by the Department to the United States Department of Energy, and Sandia Corporation on October 4, 1995 pursuant to section 3012(b) of RCRA, 42 U.S.C. § 6939(c), as amended by the Federal Facility Compliance Act (the Act) of 1992, Public Law 102 386, 106 Stat. 1505 (1992).

"Foreign Source" means a hazardous waste source outside the United States.

"Groundwater" means water below the land surface in a zone of saturation.

"Hazardous Constituent" or "Hazardous Waste Constituent" means 1) any constituent identified in 40 CFR Part 261 Appendix VII; 2) any constituent identified in 40 CFR Part 261, Appendix VIII, or 3) any constituent listed in Table 1 of 40 CFR § 261.24. For purposes of corrective action, "hazardous constituent" and "hazardous waste constituent" also means any constituent identified in 40 CFR Part 264 Appendix IX.

"Hazardous Waste" means any solid waste, or combination of solid wastes which because of its quantity, concentration, or physical, chemical, or infectious characteristics meets the description set forth in NMSA § 74-4-3(K), or is listed as a hazardous waste or exhibits a hazardous waste characteristic under 40 CFR Part 261.

"Hazardous Waste Management Regulations" means the New Mexico Hazardous Waste Management Regulations, 20.4.1 NMAC.

"Hazardous Waste Management Unit" means a contiguous area of land on or in which hazardous waste is placed, or the largest area in which there is significant likelihood of mixing hazardous waste constituents in the same area. Examples of Hazardous Waste Management Units include a surface impoundment, a waste pile, a land treatment area, a landfill cell, an incinerator, a tank and its associated piping and underlying containment system and a container storage area. A container alone does not constitute a unit; the unit includes containers and the land or pad upon which they are placed.

"Interim Measures" means actions necessary to minimize or prevent the further migration of hazardous constituents and limit actual or potential human and environmental exposure to hazardous constituents while long-term corrective action remedies are evaluated and, if necessary, implemented.

"Mixed Waste" means waste that contains both hazardous waste subject to the HWA and RCRA, and radioactive materials, including source, special nuclear or byproduct material, subject to the Atomic Energy Act of 1954, as amended. (42 U.S.C. § 2011 et seq.).

"Off-Site Source" means a generator of hazardous or mixed waste or a treatment, storage, or disposal facility (TSDF) managing hazardous or mixed waste located within the United States of America, but outside the Permittees' Facility boundary.

"Permit" means this Permit, EPA ID No. NM5890110518, issued to the Permittees for the Facility pursuant to the HWA and the HWMR, to operate hazardous and mixed waste treatment and storage units and to conduct post-closure care and corrective action, as it may be modified or amended. This Permit consists of Permit Parts 1 through 8 and Attachments A through L.

"Permitted Unit" means a Hazardous Waste Management Unit authorized for operations or for which post-closure care is required by this Permit. The Permitted Units authorized by this Permit are listed in Attachment J (Hazardous Waste Management Units), Table J-1 (Active Portion of the Facility), and Table J-2 (Permitted Units Undergoing Post-Closure Care). The location of the Permitted Units is shown in Figure 2, Permit Attachment L (Figures).

"Permittees" mean Sandia Corporation and the United States Department of Energy (DOE). Permittees are jointly and severally subject to the conditions of this Permit.

"RCRA" means the Resource Conservation and Recovery Act of 1980 as amended (42 U.S.C. §§ 6901 to 6992K]) by the Hazardous and Solid Waste Amendments (HSWA) in 1984.

"Release" means any spilling, leaking, pouring, emitting, emptying, discharging, injecting, pumping, escaping, leaching, dumping, or disposing of any hazardous or mixed waste or hazardous constituents into the environment (including the abandonment or discarding of barrels, containers, and other closed receptacles containing hazardous waste or hazardous constituents).

"Remediation Waste" means all solid, hazardous, and mixed wastes; and all media (including groundwater, surface water, soils, and sediments) and debris; that are managed for implementing cleanup.

"Sandia Corporation" means a corporation organized under the laws of the State of Delaware, doing business in the State of New Mexico as a wholly owned subsidiary of Lockheed Martin, Inc., and as identified on the Part A application submitted pursuant to 40 CFR § 270.13.

"Solid Waste Management Unit" (SWMU) means any discernible unit at which solid waste has been placed at any time, and from which the Department determines there may be a risk of a release of hazardous waste or hazardous constituents, irrespective of whether the unit was intended for the management of solid or hazardous waste. Such units include any area at the Facility at which solid wastes have been routinely and systematically released; they do not include one-time spills. (*See* 61 Fed. Reg. 19431, 19442-43 (May 1, 1996)).

"Technical Area" (TA) means a specific parcel of land controlled by the Permittees and owned by the U.S. Department of Energy.

1.7 EFFECT OF INACCURACIES IN PERMIT APPLICATION

This Permit is based on information submitted in the Permittees' Part A and Part B of the Permit Applications dated February 2002, and subsequent revisions and supplemental information, herein referred to as the Application.

Any inaccuracies found in the Application may be grounds for the termination, revocation and re-issuance, or modification of the Permit in accordance with 40 CFR §§ 270.41 through 270.43, which are incorporated herein by reference, and for enforcement action.

1.8 PERMIT ACTIONS

1.8.1 Duration of Permit

This Permit shall be effective for a fixed term of ten years from its effective date, except as provided in Permit Section 5.1. (40 CFR § 270.50(a)). The effective date of this Permit shall be 30 days after notice of the Department's decision has been served on the Permittees or such later time as the Department may specify.

1.8.2 Permit Modification

This Permit may be modified for both routine and significant changes as specified in 40 CFR §§ 270.41 through 270.43, and any modification shall conform to the requirements specified in these regulations. The filing of a permit modification request by the Permittees, or the notification by the Permittees of planned changes or anticipated noncompliance, does not stay the applicability or enforceability of any permit condition. (40 CFR § 270.30(f)).

1.8.3 Permit Suspension, Termination, and Revocation and Re-Issuance

This Permit may be suspended, terminated, or revoked and re-issued for cause as specified in § 74-4-4.2 of the HWA and 40 CFR §§ 270.41 and 270.43.

1.8.4 Permit Re-Application

If the Permittees intend to continue an activity regulated by this Permit after the expiration date of this Permit, the Permittees shall submit a complete application for a new permit at least 180 days before the expiration date of this Permit unless permission for a later date has been granted by the Department in compliance with 40 CFR §§ 270.10(h) and 270.30(b). The Department may not allow the Permittees to submit applications later than the expiration date of this Permit. (40 CFR § 270.10(h)).

Regardless of whether the Permittees intend to continue any other activity regulated by this permit, the Permittees shall submit at a minimum a complete application for a new permit for post-closure care of the CAMU at least 180 days before the expiration date of this Permit, unless permission for a later date has been granted by the Department or post-closure care has been terminated prior to the expiration date of this Permit in accordance with the requirements set forth in Permit Section 7.1. The application for the CAMU post-closure care permit may be included in an application for other regulated activities.

1.8.5 Continuation of Expiring Permit

If the Permittees have submitted a timely and complete application for renewal of this Permit, in compliance with 40 CFR §§ 270.10 and 270.13 through 270.28 and Permit Section 1.8.4, this Permit shall remain in effect until the effective date of the new permit if, through no fault of the Permittees, the Department has not issued a new permit on or before the expiration date of this Permit. (40 CFR § 270.51).

1.9 DUTIES AND REQUIREMENTS

1.9.1 Duty to Comply

The Permittees shall comply with all conditions in this Permit, except to the extent and for the duration such noncompliance is authorized in a temporary emergency permit pursuant to 40 CFR § 270.61. Any Permit noncompliance, except under the terms of an emergency permit, constitutes a violation of the HWA and RCRA and is grounds for enforcement or other Department action and may subject the Permittees to an administrative or civil enforcement action, including civil penalties and injunctive relief, as provided in Permit Section 1.1, or permit modification, suspension, termination, or revocation, or denial of a permit application or modification request under § 74-4-4.2 of the HWA and 40 CFR §§ 270.41 and 270.43.

1.9.2 Transfer of Permit

The Permittees shall not transfer this Permit to any person except after prior written approval of the Department. The Department will require modification or revocation and re-issuance of the Permit, as specified in 40 CFR §§ 270.40(b) and 270.41(b)(2), to identify the new Permittee and

incorporate other applicable requirements under the HWA, RCRA, and their implementing regulations. The prospective new Permittee shall file a disclosure statement with the Department, if applicable and as specified at § 74-4-4.7 of the HWA, prior to modification or revocation and re-issuance of the Permit.

Before transferring ownership or operation of the Facility, the Permittees shall notify the new owner and operator in writing of all applicable requirements of this Permit and 40 CFR Parts 264 and 270. (40 CFR §§ 264.12(c) and 270.30(l)(3)).

1.9.3 Need to Halt or Reduce Activity Not a Defense

The Permittees shall not use as a defense in an enforcement action that it would have been necessary to halt or reduce permitted activities in order to maintain compliance with the conditions of this Permit. (40 CFR § 270.30(c)).

1.9.4 Duty to Mitigate

In the event of noncompliance with this Permit, the Permittees shall take all reasonable steps to minimize releases of hazardous wastes and hazardous constituents to the environment and shall carry out such measures as are reasonable to prevent significant adverse impacts on human health or the environment. (40 CFR § 270.30(d)).

1.9.5 Proper Operation and Maintenance

The Permittees shall at all times properly operate and maintain all facilities and systems of treatment and control and related appurtenances which are installed or used by the Permittees to achieve compliance with the conditions of this Permit. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance and quality control (QA/QC) procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems only when necessary to achieve compliance with this Permit. (40 CFR § 270.30(e)).

1.9.6 Duty to Provide Information

The Permittees shall furnish to the Department, within a reasonable time as specified by the Department, any relevant information which the Department may request to determine whether cause exists for modifying, suspending, terminating, or revoking and reissuing this Permit or to determine compliance with this Permit.

The Permittees shall also furnish to the Department, upon request, copies of records that are required to be kept by this Permit. Information and records requested by the Department pursuant to this condition shall be provided in hard copy paper form or in an electronic format useable by the Department. (40 CFR §§ 264.74(a) and 270.30(h)).

This Permit condition shall not be construed to limit in any manner the Department's authority under § 74-4-4.3 of the HWA, § 3007(a) of RCRA, or other applicable law.

1.9.7 Inspection and Entry

The Permittees shall allow authorized representatives of the Department, upon the presentation of credentials and at reasonable times, and under the conditions of this Permit, to:

1. Enter upon the Permittees' premises where the Permitted Unit or activity is located or conducted or where records must be kept;
2. Have access to and photograph any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required;
3. Inspect any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required;
4. Have access to, and copy, any records that must be kept; and
5. Sample or monitor, for the purposes of ensuring Permit compliance or as otherwise authorized by the HWA or RCRA, any substances or parameters at any location.

(40 CFR § 270.30(i)).

The Permittees shall provide full access, for the purposes above, to authorized representatives of the Department, limited only by any access restrictions established to protect human health or the environment. To the extent that any such access restrictions exist, the Permittees shall provide a means for authorized representatives of the Department to accomplish these purposes through the use of remote-operated technology or by other safe methods.

1.9.8 Representative Sampling

All samples and measurements taken by the Permittees under this Permit shall be representative of the medium, waste, or other material being sampled. (*See* 40 CFR § 270.30(j)(1)).

1.9.9 Duty to Report

1.9.9.1 Reporting Planned Changes

The Permittees shall give advance written notice to the Department as soon as possible, of any planned physical alterations or additions to any Permitted Unit at the Facility. (40 CFR § 270.30(l)(1)).

1.9.9.2 Reporting Anticipated Noncompliance

The Permittees shall give advance written notice to the Department of any planned changes to any permitted unit at the Facility or activity which may result in noncompliance with Permit requirements. For a new facility, the Permittees may not treat, store, or dispose of hazardous waste; and for a facility being modified, the Permittees may not treat, store, or dispose of hazardous waste in the modified portion of the facility except as provided in § 270.42 until the provision of § 270.30(l)(2)(i) and (ii) are satisfied. (*See* 40 CFR § 270.30(l)(2)).

1.9.9.3 24 Hour and Subsequent Reporting

The Permittees shall report to the Department, both orally and in writing, any noncompliance that may endanger human health or the environment. (*See* 40 CFR § 270.30(l)(6)). This report shall be submitted in accordance with Permit Sections 1.9.9.4 and 1.9.9.5

1.9.9.4 24 Hour Oral Report

The Permittees shall make an initial oral report within 24 hours after the time the Permittees become aware of the circumstances of the noncompliance. The oral report shall include, at a minimum, the following information:

1. A description of the occurrence and its cause including:
    a. a). name, address, and telephone number of the owner or operator, and name and telephone number of person making the report;
    b. b). name, address, and telephone number of the Facility;
    c. c). date, time, and type of incident;
    d. d). name and quantity of materials involved;
    e. e). the extent of injuries, if any;
    f. f). an assessment of actual or potential hazards to the environment and human health outside the Facility, where this is applicable; and
    g. g). the estimated quantity and disposition of recovered material that resulted from the incident. (40 CFR § 270.30(l)(6)(ii)).
2. Information concerning the release of any hazardous waste which may endanger public drinking water supplies;
3. Any information of a fire or explosion at a permitted unit which may threaten the environment or human health; and
4. Any information of a release or discharge of hazardous waste which may threaten the environment or human health outside the permitted unit. (40 CFR §§ 270.30(l)(6)(i)(A) and (B)).

The oral report shall be made by calling the Hazardous Waste Bureau's main telephone number (505) 476-6000 during regular business hours, or by calling the New Mexico Department of Public Safety dispatch telephone number (505) 827-9329 during non-business hours, and requesting that the report be forwarded to the Department spill number.

1.9.9.5 Five Day Written Report

The Permittees shall submit a written report in hard copy or via e-mail within five days after the time the Permittees become aware of the noncompliance under Permit Section 1.9.9.3. Any such report transmitted by e-mail is not subject to the certification and signatory requirements under Permit Section 1.12. However, if such a report is provided to the Department by e-mail, the Permittee must also submit to the Department the same written report or an updated report within 15 days after the Permittees become aware of the noncompliance. The written report must meet

the certification and signatory requirements of Permit Section 1.12. The Permittees must include in the written report the information required in Permit Section 1.9.9.4 (items 1-3) and the following information:

1. The period of the noncompliance including exact dates and times, and, if the noncompliance has not been corrected, the anticipated time it is expected to continue; and
2. Steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. (*See* 40 CFR §§ 270.30(l)(6)(iii) and 270.32(b)(2)).

The Department may extend the time for submitting the written report up to fifteen (15) calendar days. (40 CFR § 270.30(l)(6)(iii).

1.9.9.6 Reports Required by the Contingency Plan

If any emergency requires implementation of the Contingency Plan provided in Permit Attachment D, the Permittees shall comply with the reporting requirements required by 40 CFR § 264.56(i), Permit Section 2.13.5.3, and the Contingency Plan.

1.9.9.7 Reports of Other Noncompliance

The Permittees shall report, at the time monitoring reports are submitted, all other instances of noncompliance not reported under Section 1.9.9 of this Permit. These reports shall contain the information required by Permit Section 1.9.9.5. (*See* 40 CFR § 270.30(1)(10)).

1.9.9.8 Manifest Discrepancy Report

If a significant discrepancy in a manifest is discovered, the Permittees shall attempt to reconcile the discrepancy. If not resolved within 15 calendar days, the Permittees shall submit a letter report, including a copy of the manifest to the Department. (*See* 40 CFR § 264.72 and 40 CFR § 270.30(l)(7)).

1.9.9.9 Unmanifested Waste Report

If the facility accepts for treatment, or storage unmanifested hazardous or mixed waste from an off-site source, the Permittees shall meet the reporting requirements of 40 CFR § 264.76. (*See* 40 CFR § 270.30(l)(8)).

1.9.9.10 Biennial Report

A biennial report must be submitted by March 1 of each even numbered calendar year. The report must cover facility activities during the previous calendar year in accordance with the requirements of 40 CFR § 264.75. (*See* 40 CFR § 270.30(l)(9)).

1.10 ADMISSIBILITY OF DATA

In any administrative or judicial action to enforce a condition of this Permit, the Permittees waive any objection to the admissibility as evidence of any data generated pursuant to this Permit.

1.11 OTHER INFORMATION

Whenever the Permittees become aware that they failed to submit any relevant facts in the Permit Application, or submitted incorrect information in the Permit Application, or in any report to the Department, the Permittees shall promptly submit such facts or correct information in writing to the Department. (40 CFR § 270.30(l)(11)).

1.12 SIGNATORY REQUIREMENT

The Permittees shall sign and certify all applications, reports, or information submitted to or requested by the Department or required by this Permit, in accordance with the requirements in 40 CFR §§ 270.11 and 270.30(k). The Permittees shall provide written notification to the Department within thirty days of any changes concerning the names of and contact information for the responsible corporate and principal executive officers or their duly authorized representatives.

1.13 COMPLIANCE SCHEDULES

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Permit shall be submitted no later than 14 calendar days following each scheduled date. (40 CFR § 270.30(l)(5)).

1.14 SUBMITTAL OF REPORTS, NOTIFICATIONS, AND INFORMATION TO THE DEPARTMENT

1.14.1 Information Submittal

Unless otherwise provided in this Permit, the Permittees shall submit by certified mail, courier/delivery service, or hand delivery all reports, notifications, or other submissions that are required by this Permit to be sent or given to the Department.

A summary of the reporting requirements pursuant to this Permit is found in Attachment I (Compliance Schedule). This Attachment is not exhaustive and the absence of a reporting requirement in the Attachment shall not be interpreted to waive an otherwise applicable requirement.

The original plans, reports, notifications or other submissions shall be submitted to the Department by certified mail, courier/delivery service or hand delivery to:

Chief
New Mexico Environment Department
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, New Mexico 87505-6303
Telephone Number: (505) 476-6000
Facsimile Number: (505) 476-6030

And one copy to:

New Mexico Environment Department
Hazardous Waste Bureau
5500 San Antonio NE
Albuquerque NM 87109
Telephone Number: (505) 222-9500
Facsimile Number: (505) 222-9510

1.14.2 Approval of Submittals

All documents that the Permittees prepare under the terms of this Permit and submit to the Department that are subject to the provisions of 20.4.2 NMAC shall be subject to the procedures set forth therein. Documents requiring Department approval that are not subject to the provisions of 20.4.2 NMAC may be reviewed and approved, approved with modifications or directions, disapproved, denied, or rejected by the Department.

Upon the Department's written approval, all submittals and associated schedules shall become enforceable as part of this Permit in accordance with the terms of the Department's written approval, and such documents, as approved, shall control over any contrary or conflicting requirements of this Permit. This provision does not affect any public process that is otherwise required by this Permit, the HWA, or its implementing regulations.

1.14.3 Extension of Time

The Permittees may seek an extension of time in which to perform a requirement of this Permit, for good cause, by sending a written request for extension of time and proposed revised schedule to the Department. The request shall state the length of the requested extension and describe the basis for the request. The Department will respond in writing to any request for extension following receipt of the request. If the Department denies the request for extension, it will state the reasons for the denial.

1.15 CONFIDENTIAL INFORMATION

The Permittees may claim confidentiality for any information required to be submitted by this Permit. Any such claim must be asserted at the time of submittal in the manner prescribed on the application form, or in the case of other submittal, by stamping the words "confidential business information" on each page containing such information. If no claim is made, the Department may make the information available to the public without further notice. If a claim is asserted, the information will be treated in accordance with the procedures in 40 CFR Part 2 (Public Information). (Section 74-4-4.3(D) and (F) of the HWA and 40 CFR § 260.2 and 40 CFR § 270.12).

1.16 RESERVED

1.17 INFORMATION REPOSITORY

The Permittees shall establish and maintain a physical Information Repository (IR) in accordance with the requirements of 40 CFR §§124.33(c) through (f), which are incorporated herein by reference. The Permittees shall propose for the Department's approval a location for the IR within 30 days after the effective date of this Permit. The documents contained in the IR shall be accessible to the public during normal business hours. (*See* 40 CFR §§124.33 and 270.30(m))

The Permittees shall ensure that the IR contains the following documents:

1. The Permittees' Part A and Part B Permit Applications associated with the permit renewal;
2. Permit modification requests associated with this Permit submitted pursuant to 40 CFR §270.42; and associated Department responses;
3. The Waste Minimization Report submitted pursuant to Permit Section 2.5;
4. Requests for extensions of time submitted pursuant to Permit Section 1.14.3;
5. Corrective action documents submitted pursuant to Permit Part 8; and
6. Each report submitted pursuant to Section 1.9.9 of this Permit if such report is required to be submitted in writing. The Permittees shall establish the IR within 180 days of the effective date of this Permit or within 90 days of the Department's approval of the location, whichever is later.

1.17.1 Index of Information Repository

The Permittees shall ensure that the IR includes an index of the documents contained in the IR. This index shall be accessible on the internet through a link on the Permittees' web page. An online index that includes IR documents shall be acceptable if the IR is located in a publicly accessible library.

The Permittees shall add new documents to the IR within 30 days after the new documents are submitted to the Department.

The Permittees shall inform the public of the existence of the IR and the locations where it may be viewed by the following methods:

1. Written notice to all individuals on the facility mailing list 30 days after the IR becomes operational;
2. Public notice in area news papers, including the Albuquerque Journal when the IR becomes operational;
3. Continuous notice on the Permittees' web page of the existence of the IR; and
4. In the public notice for any of the Permittees' initiated or requested permit modifications when such notices are required.

1.17.2 Notification of Repository Updates

1.17.2.1 Interested Persons List

The Permittees shall maintain a list of persons who have requested notification by e-mail of updates to the IR. The Permittees shall provide a link on the Permittees' web page whereby members of the public may submit a request to be placed on the e-mail notification list. In the event that the web page stops operation, the Permittees shall use their best efforts to fully restore the page and its operation as soon as possible.

E-mail Notification

Within 30 days of submission to the Department of any document required to be included in the IR under Section 1.17 of this permit, the Permittees shall send an email notification to the list maintained under section 1.17.2.1 of this Permit.

1.18 COMMUNITY RELATIONS PLAN

The Permittees shall establish and implement a Community Relations Plan (CRP) to describe how the Permittees will keep communities and interested members of the public informed of Permit-related activities, including waste management, closure, post-closure, and corrective action. (*See* 40 CFR § 270.32(b)(2)).

The CRP must describe how the Permittees will:

1. Establish an open working relationship with communities and interested members of the public;
2. Keep communities, the Pueblo of Isleta, and interested members of the public informed of permit actions of interest (e.g., clean-up activities, implementation of the Contingency Plan, Permit modification requests);
3. Attempt to minimize disputes and resolve differences with communities, the Pueblo of Isleta and interested members of the public;
4. Provide a mechanism for the timely dissemination of information in response to individual requests; and
5. Provide a mechanism for communities, the Pueblo of Isleta, and interested members of the public to provide feedback and input to the Permittees semi-annually.

The Permittees shall implement and post the CRP on the Permittees' web site within 180 days of approval by the Department. The Permittees shall maintain the CRP until the termination of this Permit.

The Permittee shall review the CRP at least annually and, if necessary, submit to the Department for approval an updated plan.

1.19 DISPUTE RESOLUTION

In the event the Permittees disagree, in whole or in part, with an approval, approval with modifications or directions, disapproval, denial, or rejection by the Department of any submittal subject to the provisions of Permit Section 1.14.2, the Permittees may seek dispute resolution.

The Permittees may pursue any available legal remedy to resolve the dispute only after dispute resolution is exhausted.

1.19.1 Notice to the Department

To invoke dispute resolution, the Permittees shall notify the Department in writing within 30 days of receipt of the Department's action subject to the dispute. Such notice shall set forth the specific matters in dispute, the position the Permittees assert should be adopted, the basis for the Permittees' position, and any matters considered necessary for the Secretary's determination.

1.19.2 Agreement or Disagreement between the Parties

The Department and the Permittees shall have thirty (30) calendar days from the Department's receipt of notification provided under the above Permit Section to meet or confer to resolve any disagreement. In the event an agreement is reached, the Permittees shall comply with the terms of such agreement or, if appropriate, submit a revised submittal and implement the same in accordance with, and within the time frame specified in, such agreement.

1.19.3 Final Decision of the Secretary of the Department

If agreement is not reached within the thirty (30) calendar-day period, the Department Secretary will notify the Permittees in writing of his/her decision on the dispute, and the Permittees shall comply with the terms and conditions of the decision. Such decision shall be the final resolution of the dispute and shall be incorporated as an enforceable part of this Permit. The Permittees shall implement the decision in accordance with, and within the time frame specified in, such decision.

1.19.4 Actions Not Affected By Dispute

With the exception of those conditions under dispute, the Permittees shall proceed to take any action required by those portions of the submission and of this Permit that the Department determines are not affected by the dispute. The Department will specify in writing which portions of the submission are not affected by the dispute.

1.20 REAL PROPERTY CONVEYANCE AND TRANSFER

The provisions of this Permit Section (1.20) shall apply to the conveyance of fee from the United States to another entity (subsection 1.20.1), and shall apply to the transfer of real property to another federal entity (subsection 1.20.2), if such real property is subject to any requirement under this Permit. The requirements of this Permit Section do not apply to Facility real property that is subject to requirements of Section III.Y of the Consent Order except as may be necessary for fully completing notice requirements.

1.20.1 Conveyance of Facility Property in Fee

DOE shall not convey any real property to a non-federal entity without submitting a notice to the Department, if such real property is subject to any requirement under this Permit. DOE shall submit the notice at least 120 days prior to the proposed effective date of conveyance.

The notice of real property conveyance shall:

1. Identify the boundaries of the land proposed for conveyance by providing the Department with a boundary survey certified by a registered professional surveyor;
2. Provide the new owner's name, address, telephone number, and status as a state, private, public, or other (non-federal) entity;
3. Describe the location and identity of any unit subject to this permit including existing solid waste management units and areas of concern and permitted units, on the land proposed for conveyance;
4. Describe any known or suspected presence of hazardous waste, hazardous constituents in soil, sediment, surface water, or groundwater at any depth within the boundaries of the land proposed for conveyance;
5. Describe the status of any past, present, or planned investigations or remediation of contamination of soil, sediment, surface water, or groundwater at any depth within the boundaries of the land proposed for conveyance;
6. Comply with the requirements of § 120(h) of the Comprehensive Environmental Response, Compensation, and Liability Act, 42 U.S.C. § 9620(h); and
7. State any applicable restriction (e.g., "the property shall not be used for any purpose other than [define the use scenario on which the Permittees have based their cleanup of the property]. That means that the property shall not be used for [define less restrictive uses]").

1.20.1.1 Determination of Need for Further Action

The Department will determine whether closure, post-closure, and any corrective actions implemented by the Permittees with regard to the property are protective of human health and the environment in light of the new owner's intended use of the property. If the Department determines that the closure, post-closure care activities, or the corrective actions are not sufficiently protective in light of the new owner's intended use, the Department will notify the Permittees whether additional actions are necessary. The DOE must ensure the new owner is made aware of any remaining obligations associated with the property. Upon receipt of a determination that no (future) closure, post-closure and corrective action activities are necessary, the Permittees shall submit a permit modification request to reflect the Facility's new property boundary.

1.20.1.2 Restricted Use

When DOE conveys to a non-federal entity real property that has been remediated to a level less protective than that deemed by the Department appropriate for residential use, DOE shall include in the deed a restriction that limits future use of the property to the particular use scenario on which the Permittees have based their cleanup of the property (e.g., if the property was cleaned based on an industrial use scenario, future use of the property would be limited to industrial use). The language of the deed restriction governing future land use necessarily will differ for each deed, depending upon the facts and circumstances of the property being transferred. Such restriction shall, at a minimum, be consistent with the following language:

The property shall not be used for any purpose other than [define the use scenario on which the Permittees have based their cleanup of the property]. That means that the property shall not be used for [define less restrictive uses].

At least 60 days prior to transfer, DOE shall provide the Department the opportunity to review and comment upon the language of the proposed deed restriction limiting future land use. The Department may provide comments on such proposed language.

1.20.1.3 Enforceability against Subsequent Owners

The covenant required by CERCLA § 120(h)(3)(A)(ii), and the deed restriction described above in this Section (to the extent the property is not remediated for unrestricted use), are requirements within the meaning of CERCLA § 310(a)(1), 42 U.S.C. § 9659(a)(1). The contract of sale will state that the parties to the contract agree that the deed restriction to be set forth in the deed is a requirement within the meaning of CERCLA § 310(a)(1), 42 U.S.C. § 9659(a)(1). DOE shall ensure such statement within the Contract of Sale will survive the conveyance of the real property. The deed conveying title from DOE to the new owner shall state that the restriction on land use set forth in the deed is intended to be an equitable servitude running with the land, that both the Department and the DOE are beneficiaries and that such restriction is enforceable by the Department and the DOE against any subsequent owner that fails to comply with its terms. The deed shall be recorded in the appropriate recording office in the chain of title of the property to give record notice of the use restriction to subsequent owners of the property.

1.20.1.4 EPA Institutional Controls Tracking System

For any deed conveying title from DOE that contains a restriction on future land use, the Permittees shall, within 90 days of the conveyance, notify EPA Region 6 of the conveyance and identify for EPA the location of the property that is the subject of the conveyance.

1.20.2 Transfer of Facility Property to another Federal Agency

If any portion of the Facility subject to the requirements of this Permit will be transferred from DOE to another entity, department, or instrumentality of the United States, the Permittees shall provide written notice of such transfer to the Department at least 120 days prior to the transfer. If, however, the Permittees learn of such decision fewer than 120 days prior to the transfer, the Permittees shall provide written notice to the Department as soon thereafter as is reasonably practicable.

The notice of operational transfer shall:

1. Identify the boundaries of the land proposed for transfer by providing the Department with a boundary survey certified by a registered professional surveyor;
2. Provide the new federal entity's name, address, telephone number;
3. Describe the location and identity of any unit subject to this permit including existing solid waste management units and areas of concern and permitted units, on the land proposed for transfer;
4. Describe any known or suspected presence of hazardous waste, hazardous constituents in soil, sediment, surface water, or groundwater at any depth within the boundaries of the land proposed for transfer; and

5. Describe the status of any past, present, or planned investigations or remediation of contamination of soil, sediment, surface water, or groundwater at any depth within the boundaries of the land proposed for transfer;

1.20.2.1 Notice and Meeting

Appropriate representatives of DOE will meet with representatives of the Department and the transferee federal entity. Such meeting shall take place within 30 days after DOE's written notice under this Permit Section (1.20.2.1). The meeting may occur following the transfer, if the United States determines that the transfer cannot be delayed. At the meeting, the parties will discuss the transferee entity's intended use of the property. The Department and DOE will review the closure, post-closure, and any corrective actions taken with regard to the property, in light of the transferee entity's intended use of the property.

1.20.2.2 Department's Determination

Within 60 days after the meeting required under Section 1.20.2.1, the Department will determine whether the closure, post-closure, and any corrective actions implemented by the Permittees with respect to the transferred property are protective of human health and the environment in light of the transferee entity's intended use of the property. If the Department determines that they are not, the Department must explain its determination in writing and identify the specific additional actions or requirements that the Permittees must complete with regard to the property. To the extent practicable, the Permittees will complete any additional actions or requirements identified by the Department prior to the transfer of operational control. DOE may, however, conduct such additional actions or requirements following transfer of operational control, pursuant to a schedule approved by the Department. Such schedule shall be enforceable pursuant to the terms of this Permit.

If the Department does not notify the Permittees within 60 days following the meeting required under Section 1.20.2.1 that additional actions or requirements are necessary with respect to the transferred property, the Permittees will not be required to take additional actions under this Permit.

1.20.2.3 Contrary Land Use

If the Department determines that the transferee entity plans to use, or is using, the subject property in a manner contrary to the use(s) discussed at the meeting described under Section 1.20.2.1, the Department shall notify DOE and the transferee entity in writing. In such writing, the Department shall explain its concerns with regard to the proposed or current use of the property. Within 30 days thereafter DOE, the Department, and the transferee entity shall meet to discuss the Department's stated concerns. The Department reserves its right to take any action, including administrative or judicial action, to address the contrary land use.

PERMIT PART 2 GENERAL FACILITY REQUIREMENTS

2.1 DESIGN, CONSTRUCTION, MAINTENANCE, AND OPERATION OF THE FACILITY

The Permittees shall design, construct, maintain, and operate the Permitted Units to minimize the possibility of a fire, explosion, or any sudden or non-sudden release of hazardous or mixed waste or hazardous waste constituents to air, soil, sediment, groundwater, or surface water which could threaten human health or the environment, as required by 40 CFR § 264.31.

2.2 WASTE SOURCES

2.2.1 Permitted Waste

The Permittees shall treat, store, or both, only those hazardous and mixed wastes specified in Part 3 (Storage of Hazardous and Mixed Waste), Part 4 (Treatment of Hazardous and Mixed Wastes) and 5 (Treatment by Open Burning), and Attachment B (Authorized Wastes) of this Permit. No wastes shall be managed at the CAMU except waste generated by post-closure care activities conducted at the CAMU and the CWL.

2.2.2 Hazardous and Mixed Waste from Foreign Sources

The Permittees shall not accept, store, treat, or otherwise manage at permitted units at the Facility hazardous and mixed wastes from foreign sources.

2.2.3 Hazardous and Mixed Waste from Off-site Sources

The Permittees may accept, store, treat or otherwise manage at the permitted units at the Facility, only the following hazardous or mixed wastes from off-site sources.

1. Treatment-derived waste or residues from wastes generated at the Facility, sent off site for treatment at off-site facilities, and subsequently returned to the Facility prior to final disposition off-site may be managed at the Facility only subject to the following conditions:
    a. for wastes with no available site for final disposal, the Permittees shall provide written notice in accordance with Permit Section 1.14.1, either through mailing of a hard copy letter or via electronic mail that will be followed by submittal of a hard copy letter, to the Department that there is no available site for final disposal within five days of receipt of the treatment-derived waste or waste residues at the Facility; or
    b. for wastes with an available final disposal path, the Permittees shall store the wastes for not more than 90 days prior to shipping the wastes off-site.
2. Waste generated by the Permittees as a result of investigation or remediation of a solid waste management unit (SWMU) or area of concern (AOC) listed in Attachment K (Listing of SWMUs and AOCs) and Table K-1 (SWMUs and AOCs Requiring Corrective Action).

3. Wastes from Sandia National Laboratories operations located within the metropolitan Albuquerque area.

The Permittees shall receive from off-site sources under this permit section 2.2.3 only the hazardous or mixed wastes listed in Permit Attachment B (Authorized Wastes) for treatment and storage at the Permitted Units.

2.2.4 Restrictions on PCB-Contaminated Waste

The Permittees are prohibited from storing liquid hazardous or mixed wastes containing polychlorinated biphenyls (PCBs) at concentrations equal to or greater than 50 parts per million (ppm) unless such storage is in compliance with all requirements of 40 CFR § 761.65(b). The Permittees are prohibited from storing liquid hazardous or mixed wastes containing PCBs at concentrations greater than 50 ppm for more than one year from the date such waste was first placed into storage, pursuant to 40 CFR § 268.50(f).

2.3 LAND DISPOSAL RESTRICTIONS

The Permittees shall comply with the requirements of 40 CFR Part 268. The Permittees are prohibited from treatment and storage of hazardous or mixed wastes restricted from land disposal as specified in 40 CFR Part 268, unless the requirements of 40 CFR Part 268, Subpart E, are met.

Pursuant to 40 CFR § 268.7, the Permittees shall determine if a hazardous or mixed waste managed under this Permit must be treated before it may be land disposed in accordance with 40 CFR §§ 268.40, 268.45, 268.48, and 268.49. The Permittees shall make this determination in one or both of the following ways, as appropriate:

1. Testing the waste for either total constituent concentrations for the hazardous constituents of concern or the concentrations of hazardous constituents in an extract of the waste using Test Method 1311, depending upon whether the treatment standard for the waste is expressed as a total constituent concentration or the concentration of the constituent in the waste extract.
2. Using Acceptable Knowledge of the waste.

2.3.1 Prohibition on Dilution or Aggregation as a Substitute for Treatment

In accordance with 40 CFR § 268.3, the Permittees shall not dilute a waste that is restricted from land disposal or the residue from treatment of a restricted waste. Dilution to avoid an applicable treatment standard includes, but is not limited to, the addition of solid waste to reduce a hazardous constituent's concentration and ineffective treatment that does not destroy, remove, or permanently immobilize hazardous constituents. The Permittees shall not aggregate a waste that is restricted from land disposal with other waste or materials as a substitute for compliance with 40 CFR § 268.3. Aggregating or mixing wastes as part of a legitimate treatment process is not considered impermissible dilution for purposes of complying with this Permit.

2.3.2 Documentation of Exclusion or Exemption

Pursuant to 40 CFR § 268.7(a)(7), the Permittees shall place a one-time notice in the Facility Operating Record for any land disposal prohibited wastes that the Permittees determine are

excluded from the definition of hazardous or solid waste or determine are exempted from Subtitle C regulation under 40 CFR §§ 261.2 through 261.6 subsequent to the point of generation. Exemptions required to be documented include, but are not limited to, hazardous waste managed in wastewater treatment systems subject to the Clean Water Act (CWA) as specified at 40 CFR §§ 264.1(g)(6) and 260.10. The Operating Record shall include in this documentation a description of the process that generated the waste, the justification for its exemption or exclusion, and a description of the final disposition of the waste.

The Permittees shall not place in any land disposal unit the wastes specified in 40 CFR Part 268 after the effective date of the prohibition unless the Department has established disposal or treatment standards for the hazardous or mixed waste and the Permittees meet such standards and other applicable conditions of this Permit. Notwithstanding the foregoing, the Permittees may land dispose hazardous or mixed waste restricted by 40 CFR Part 268 which does not meet treatment standards if a variance from the treatment standards has been granted by the Department pursuant to 40 CFR §§ 268.44.

2.4 WASTE ANALYSIS

2.4.1 General Waste Characterization Requirements

The Permittees shall accept, store, treat, or otherwise manage at the Permitted Units at the Facility only those hazardous wastes and mixed wastes that have been characterized in accordance with 40 CFR § 264.13, the requirements of this Permit Part, and Permit Attachment C (Waste Analysis Plan).

At a minimum, the Permittees must obtain and document all of the necessary information that must be known to manage a hazardous or mixed waste in accordance with 40 CFR Parts 264, this Permit Part, and Permit Attachment C (Waste Analysis Plan), including but not limited to:

1. Applicable EPA hazardous waste numbers
2. Waste characterization necessary to prevent the mixing or placing of incompatible wastes in the same container (*see* 40 CFR § 264.17 and § 264.177) and to prevent the impairment of containers. (*See* 40 CFR § 264.172);
3. Waste characterization necessary to prevent accidental or spontaneous ignition or reaction of ignitable or reactive wastes, including, but not limited to, ignition or reaction in containers. (*See* 40 CFR § 264.17 and 40 CFR § 264.177);
4. Whether the waste contains free liquids; and
5. A description of the waste generation process that includes material inputs, or other information, as needed to determine hazardous waste codes and physical form of the waste.

The Permittees shall obtain and document the following additional information as needed to treat a hazardous or mixed waste in accordance with 40 CFR Part 268:

1. Applicable additional EPA hazardous waste numbers
2. Waste characterization necessary to determine whether the waste is prohibited from land disposal, including applicable underlying hazardous constituents and treatment

requirements under 40 CFR §§ 268.40, 268.45 and 268.49 for treatment that will be performed at the Permitted Units.

The Permittees shall characterize waste by using sampling and analysis methods that are specified in SW-846, or approved by the Department, acceptable knowledge, or a combination of the two. When acceptable knowledge is insufficient to fully characterize a waste for management at a Permitted Unit, the Permittees shall utilize sampling and analysis to complete that characterization.

The Permittees shall maintain all waste characterization information in the Facility Operating Record. For records that contain waste characterization information concerning any hazardous or mixed wastes managed under this Permit, which are required to be archived elsewhere at the Facility (e.g., laboratory record books), the Permittees shall maintain a traceable identifier to this documentation or use another method to facilitate access to the information by the Permittees and the Department (*see* 40 CFR § 270.32(b)(2)). The Permittees shall maintain waste characterization documentation in accordance with the record retention requirements in Permit Section 2.14.4.

2.4.2 Sampling and Analysis for Hazardous and Mixed Wastes

The Permittees shall perform all sampling and analytical procedures used for waste characterization in accordance with Permit Attachment C, the most recent version of "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods" (U.S. EPA Publication SW-846), or an equivalent method which has received prior written approval from the Department in accordance with 40 CFR § 260.21.

The Permittees shall ensure that samples collected and analyzed for waste characterization are representative of both the nature and the entire volume of the waste under consideration.

The Permittees shall ensure that the sampling and analytical procedures used preserve each sample in its original physical form and composition and ensure prevention of contamination or changes in concentration of the constituents to be analyzed.

The Permittees shall identify, collect or prepare, and analyze the appropriate number of quality control samples associated with each sample collected (including trip and field blanks, field duplicates, and field spikes). When performing laboratory analysis required under Section 2.4.2 of this Permit Part (2), the Permittees shall analyze the appropriate number of method blanks, laboratory duplicates, and other laboratory control samples to assess the quality of the data generated. The Permittees shall maintain a record of these quality assurance procedures and results in the Facility Operating Record, as required under 40 CFR § 264.73 and Permit Section 2.14.2.

If the Permittees use an independent contract laboratory to perform waste analyses, the Permittees shall require the analytical laboratory to conduct such analyses in accordance with the waste analysis conditions set forth in this Permit.

When using laboratory analysis to characterize an unknown waste for which no information is available concerning its chemical makeup or origin, the Permittees shall require the laboratory to report concentrations of all hazardous constituents listed at 40 CFR § 268.48, Table UTS, that the analytical test method used is capable of measuring, as specified at the most recent version of the U.S. EPA's Test Methods for Evaluating Solid Wastes (SW-846). (*See* 40 CFR § 270.32(b)).

When using laboratory analyses to determine whether a waste meets its applicable Land Disposal Restrictions (LDR) treatment standard concentrations specified in 40 CFR § 268.40, Treatment Standards for Hazardous Wastes, in compliance with 40 CFR §§ 268.7(a) and (b), the Permittees shall ensure that the analytical method detection limits are appropriate for making such a determination. (*See* 40 CFR § 270.32(b)).

2.4.3 Acceptable Knowledge

If the Permittees use Acceptable Knowledge for waste characterization, the Permittees shall include in the Acceptable Knowledge documentation all of the background information assembled and used in the characterization process. Acceptable Knowledge documentation must be maintained in writing or in an electronic format in the Facility Operating Record. Acceptable Knowledge records must document the resolution of any data discrepancies between Acceptable Knowledge sources. When Acceptable Knowledge is insufficient to characterize a waste, the Permittees shall perform the necessary sampling and analysis to characterize the waste in accordance with Section 2.4.1 of this Permit Part.

The Permittees shall assign a traceable identification number to this documentation to facilitate access to this information by the Permittees and the Department for as long as required under Permit Section 2.14.2 of this Permit Part.

2.4.4 Waste Characterization Review

The Permittees shall ensure that the initial characterization of any hazardous or mixed waste is reviewed or repeated according to the frequency established in Sections C-3 and C-4 of Permit Attachment C (Waste Analysis Plan) to verify that characterization is accurate and up-to-date, as required by 40 CFR § 264.13(b)(4). The Permittees shall also:

1. Annually review the characterization of ten percent by volume of the hazardous and mixed wastes to verify that the characterization is accurate.
2. Recharacterize a hazardous or mixed waste whenever there is a change in waste-generating processes that may affect the physical or chemical properties, listed status of the waste, or the land disposal restriction status of the waste.
3. Recharacterize a hazardous or mixed waste whenever the Permittees are notified by an off-site facility that has received a hazardous or mixed waste from the Facility that the characterization of the waste received at the off-site facility does not match a pre-approved waste analysis certification or accompanying waste manifest or shipping paper.

Waste characterization reviews shall be documented in the Operating Record.

2.4.5 Wastes Received from Off-Site

If a hazardous or mixed waste is received at the Facility from an off-site source identified at Permit Section 2.2.3, the Permittees shall obtain waste characterization information from the source. If acceptable knowledge is used for the waste characterization, the Permittees shall require the source to provide all acceptable knowledge documentation used to characterize the waste (*see* 40 CFR § 270.32(b)(2)). In addition, the Permittees shall ensure that all applicable

waste characterization requirements specified in Permit Section 2.4.1 have been met and documented.

The Permittees shall ensure that the waste matches the identity of the waste designated on the accompanying manifest or shipping paper. If discrepancies between the waste received from an off-site treatment facility and the information on the manifest are found, the Permittees shall comply with the requirements of 40 CFR § 264.72 to resolve the discrepancies.

2.4.6 Treatment-Derived Waste

The Permittees shall characterize treatment-derived wastes generated onsite by determining whether the waste is a hazardous or mixed waste in compliance with the requirements of Permit Section 2.4.1of this Permit Part, 40 C.F.R. § 268.7(b) and Permit Attachment C (Waste Analysis Plan), and in compliance with the notification and record-keeping requirements specified in 40 CFR § 268.7(b)(3)(ii), Treatment Facility Paperwork Requirements Table.

2.4.7 Procedures to Ensure Compliance with LDR Requirements

The Permittees shall comply with LDR requirements for wastes through compliant management of wastes subject to LDR storage prohibitions, and through characterization of treated waste for LDR compliance, and processing of the applicable LDR certifications and notifications for such treated wastes.

2.4.8 Characterization of Wastes Generated Through Treatment of Hazardous or Mixed Wastes for LDR Compliance

Hazardous or mixed wastes generated through treatment at the Permitted Units (e.g., treated waste, treatment residue) shall be characterized as required by the off-site TSDF receiving the waste to determine whether it meets the applicable LDR treatment and in accordance with the requirements of this Permit.

Waste that must meet concentration-based treatment standards prior to shipment off-site for disposal shall be evaluated by the Permittees to determine if applicable constituent concentration levels have been attained, as described in Section C.3.1. If a waste must be treated by one or more specified treatment methods (e.g., macroencapsulation) prior to land disposal, analytical testing to certify LDR compliance for the waste before treatment may not be necessary, as described in Section C.3.4.5.

If acceptable knowledge or use of a specified treatment technology is not appropriate for determining LDR compliance status, the treated waste or treatment residue shall be sampled and analyzed to determine if it meets LDR treatment standards. The analysis shall determine the total concentration of hazardous waste constituents in the waste, or the concentrations of hazardous waste constituents in an extract of the waste obtained using Test Method 1311 in SW-846, as appropriate. Analytical results obtained in compliance with LDR requirements shall be retained within the Unit Operating Record. Characterization of treatment waste and treatment residues for LDR compliance will include hazardous waste constituents that were introduced as part of the treatment process, as discussed in Section C.3.4.3.

For wastes generated through treatment at one of the Permitted Units, the Permittees shall comply with the applicable requirements of 40 CFR § 268.7(b), § 268.40, and § 268.49.

Hazardous and mixed wastes treatment residues and treated wastes that are determined through characterization to meet the applicable treatment standards will be sent to a permitted TSDF for disposal without further treatment. Wastes that have been generated through treatment using technologies specified in 40 CFR § 268.42 and § 268.44 shall also be sent to a permitted TSDF for disposal without further treatment. Treatment residues that do not meet all of the applicable treatment standards shall undergo further treatment at a Permitted Unit or be sent to a permitted TSDF for further treatment prior to land disposal.

Whenever the Permittees send waste to an off-site TSDF for treatment or disposal as described above, it shall be in accordance with that facility's waste acceptance criteria. For treated wastes and treatment residues, the Permittees shall review the LDRs as they relate to the further treatment or disposal of the treated waste or treatment residues at the TSDF that intends to accept the waste. Part of this review includes evaluating the waste for UHCs and Universal Treatment Standards, and documenting the results of the evaluation as part of the certification process. UHCs must be declared if reasonably expected to be present in D001 through D043 wastes. The Permittees shall complete an appropriate LDR notification form (including signed certification) that accompanies the Uniform Hazardous Waste Manifest as part of the shipping documentation to the TSDF. Records shall be maintained at the Facility as discussed in Section 2.14.2 Permit Part 2. The Permittees shall obtain approval from the TSDF and meet TSDF-specific waste analysis requirements (including LDR requirements) prior to shipment.

2.4.9 Waste Characterization for Compliance with RCRA Air Emission Requirements

The Permittees shall characterize hazardous wastes subject to emission controls in accordance with this Permit Section 2.4 (Waste Analysis) and Attachment C (Waste Analysis Plan).

The Permittees shall characterize hazardous wastes managed in containers to determine the average volatile organic compound (VOC) concentration relative to 500 parts per million by weight (ppmw) at the point of waste origination in compliance with 40 CFR Part 264, Subpart CC. The Permittees shall determine the average VOC concentration either by utilizing acceptable knowledge or by using the procedures specified in 40 CFR § 264.1083(a). The Permittees shall review and update this determination at least once every 12 months following the date of the initial determination in compliance with 40 CFR § 264.1082(c)(1).

The Permittees shall not be required to characterize the waste for its average VOC concentration in the following circumstances.

1. The container is used solely for management of mixed waste in accordance with all applicable regulations under the Atomic Energy Act and the Nuclear Waste Policy Act. (*See* 40 CFR § 264.1080(b)(6)); or
2. The container storing the wastes has a total capacity of less than 0.1 cubic meter (approximately 26 gallons). (*See* 40 CFR § 264.1080(b)(2)).

The Permittees shall not be required to determine the average VOC concentration of wastes if control of air pollution emissions from containers is achieved utilizing the container construction specifications and operation requirements specified in 40 CFR § 264.1086(b).

2.5 WASTE MINIMIZATION PROGRAM

The Permittees shall implement and maintain a waste minimization program to reduce the volume and toxicity of hazardous and mixed wastes generated at the Facility (*see* 40 CFR § 264.73(b)(9)). The waste minimization program shall include proposed, practicable methods of treatment and storage currently available to the Permittees to minimize the present and future threat to human health and the environment. The Waste Minimization Program shall include the following items:

1. Plan for reducing the volume and toxicity of hazardous and mixed waste at the Facility and recycling of hazardous and mixed waste at the Facility;
2. Employee training designed to identify and implement source reduction and recycling opportunities for all hazardous and mixed wastes;
3. Waste minimization and recycling implemented over the last year and additional waste minimization efforts that could be implemented at the Facility in the next federal fiscal year; and
4. Estimated costs devoted to waste minimization and recycling of hazardous and mixed waste.

The Permittees shall submit to the Department a report regarding progress made in the waste minimization program in the previous year. The report shall address items (1)-(4) above, shall show changes from the previous report, and shall be submitted annually by December 15 for the previous fiscal year ending September 30th.

2.6 DUST SUPPRESSION

The Permittees shall not use waste or used oil or any other material, which is contaminated with dioxin nor any other hazardous or mixed waste (other than a waste identified solely on the basis of ignitability), for dust suppression or road treatment (*see* 40 CFR § 266.23(b)). In addition, the Permittees shall not use waste or used oil or any other material contaminated with PCBs in this manner.

2.7 SECURITY

2.7.1 Barriers and Means to Control Entry

The Permittees shall prevent the unknowing entry and minimize the possibility for the unauthorized entry of persons or livestock onto the permitted units at the Facility. (*See* 40 CFR § 264.14).

The Permittees shall ensure the permitted units' security by implementing the following measures:

1. 24-hour surveillance system continuously monitoring and controlling entry into the permitted units at the Facility; or
2. Controlled entry into the permitted units at all times via gates, stations, or other means (e.g., attendants, locks, prohibited or controlled roadway access).

The Permittees shall maintain and ensure the effectiveness of all security fences, entry gates, and entry stations surrounding the permitted units as specified in Figures 4, 10, 16, 21-B, 26 and 32 in Permit Attachment L (Figures).

2.7.2 Warning Signs

The permanent perimeter fence surrounding each permitted unit and the entrance to the unit shall be posted with "Danger: Unauthorized Personnel Keep Out" signs (or signs with equivalent language). The signs shall state the warning in English and Spanish, shall be legible from a distance of 25 feet, and shall be visible from any approach to each Permitted Unit. (*See* 40 CFR § 264.14(c)).

2.8 GENERAL INSPECTION REQUIREMENTS

The Permittees shall inspect all the permitted units for malfunctions, deterioration, operator errors, and discharges which has caused or may lead to:

1. A release of hazardous or mixed waste constituents to the environment; or
2. A threat to human health or the environment.

(*See* 40 CFR § 264.15(a)).

Inspections shall be conducted of all waste management structures, base materials, containers, monitoring equipment, safety and emergency equipment, security devices, and operating equipment that are important in preventing, detecting, and responding to environmental or human health hazards associated with hazardous or mixed wastes. (*See* 40 CFR §§ 264. 15(b)(1) and (b)(4)).

The Permittees shall implement the inspection program for the permitted units in compliance with the operating schedule, recordkeeping, and response action commitments in Attachment E (Inspection Plan).

The Permittees shall maintain Attachment E (Inspection Plan) at the administrative office of all applicable permitted units or at the permitted unit. The Permittees' ability to access an electronic version of this Permit's inspection requirements at the above locations shall be deemed to satisfy this Permit condition.

2.8.1 Inspection Schedule

The Permittees shall conduct inspections to identify problems in time to correct them before they harm human health or the environment (*see* 40 CFR § 264.15(a)). The Permittees shall inspect the permitted units and all associated structures and equipment, in compliance with the inspection schedules contained in Attachment E (Inspection Plan).

2.8.2 Repair of Equipment and Structures

The Permittees shall remedy any deterioration or malfunction of equipment or structures discovered during an inspection on a schedule which ensures the problem does not lead to an environmental or human health hazard. (*See* 40 CFR §§ 264.15(c)).

2.8.3 Inspection Logs and Records

The Permittees shall record the results of each inspection conducted in accordance with Permit Section 2.8 and Attachment E. At a minimum, the Permittees shall produce a record of the date and time of the inspection, an identification of the permitted unit and associated structures or equipment, the name and signature of the inspector, a notation of the observations made, and the date and nature of any repairs or other remedial actions taken (see 40 CFR § 264.15(d)). The Permittees shall ensure that these records are clearly legible, all handwritten information is in ink, and errors are crossed out with a single line, initialed, and dated by the individual making the correction. The records shall be retained for the period of time specified in Permit Section 2.14.2.

The Permittees shall record the following observations or actions in the Facility Operating Record:

1. The results of any preventive maintenance activities including, but not limited to, maintenance on floors, secondary containment structures, unit drainage structures, and fire protection equipment at a permitted unit;
2. Any malfunctions and deterioration of such structures or equipment;
3. Any errors potentially affecting waste containment or compliance with this Permit;
4. The locations, dimensions, and repairs of all identified cracks or gaps in floors or base materials;
5. Any discharges of hazardous or mixed waste, hazardous constituents, or fire suppression systems at a permitted unit; and
6. Any occurrences that might cause or exacerbate contamination of a permitted unit.

The Permittees shall maintain inspection logs in the Facility Operating Record as specified in Permit Section 2.14.2.

2.9 PERSONNEL TRAINING

The Permittees shall ensure that all Facility personnel who are involved in hazardous or mixed waste management activities regulated under this Permit successfully complete all training programs in compliance with the training requirements of 40 CFR § 264.16, as well as the training requirements in Attachment F (Personnel Training Plan).

2.10 SPECIAL REQUIREMENTS FOR IGNITABLE, REACTIVE, OR INCOMPATIBLE WASTE

The Permittees shall comply with the requirements of 40 CFR §§ 264.17, 264.176, and 264.177. The Permittees shall follow the procedures for handling ignitable, reactive, and incompatible wastes specified in Permit Attachment A (Facility Description). The Permittees shall ensure that containers holding ignitable or reactive wastes are located at least 15 meters from the SNL Technical Area boundary with the following exceptions: at the MSB where they shall be stored at least 15 meters from the fence restricting access by non-Facility personnel at all times, and at the HWHU where they shall be stored at least 15 meters from the Facility property line. (*See* 40 CFR §§ 264.176).

The Permittees shall take precautions during the treatment or storage of ignitable or reactive waste, the mixing of incompatible waste, or the mixing of incompatible wastes and other materials to prevent reactions that could lead to or cause the following:

1. Generation of extreme heat, pressure, fire, explosions (except explosions that are a result of normal treatment operations at the TTU), or violent reactions;
2. Production of uncontrolled toxic mist, fumes, dusts, or gases in sufficient quantities to threaten human health or the environment;
3. Production of uncontrolled flammable fumes or gases in sufficient quantities to pose a risk of fire or explosions;
4. Damage to the structural integrity of the container, permitted unit, or other structure associated with the permitted unit;
5. A threat to human health or the environment;
6. Spontaneous combustion; or
7. Reaction of wastes with water. Water-reactive wastes shall not be stored in waste management areas equipped with automatic water sprinkler systems. When water-reactive wastes are present in such waste management areas (e.g. for treatment or temporary staging), the Permittees shall isolate the wastes with water-resistant barriers such as cabinets or over pack drums to keep water from coming in contact with the waste.

(*See* 40 CFR § 264.17(b)).

2.10.1 Ignitable and Reactive Waste Precautions

The Permittees shall prevent accidental ignition or reaction of ignitable or reactive wastes by taking the following precautions.

1. Ensure there are no sources of open flames in, on, or around the containers;
2. Segregate and separate ignitable or reactive wastes and protect them from sources of ignition or reaction such as cutting and welding, frictional heat, sources of sparks (e.g., static, electrical, mechanical), hot surfaces, spontaneous ignition, and radiant heat (e.g., heat-generating wastes) except when deliberately introduced during treatment in accordance with Permit Part 4;
3. Ensure that no forklifts or other motorized equipment are used in the vicinity of open containers of ignitable or reactive wastes unless such equipment is designed for use in flammable environments.
4. Maintain adequate clearance around fire hydrants at permitted units;
5. Use only non-sparking/spark-proof tools when managing open containers of hazardous or mixed waste that contain ignitable or reactive wastes, and when opening or closing such containers. When flammable or reactive liquids are transferred from one container to another (for conductive containers), grounding procedures or equivalent methods shall be used to minimize or dissipate static electric charge;
6. Ensure appropriate lightning protection is provided for all storage and treatment units;

7. Perform inspection, testing, and maintenance of fire protection equipment;
8. Confine smoking and open flames to designated areas that are a minimum of 50 feet from areas where ignitable or reactive wastes are handled; and
9. Ensure that each permitted unit's fire suppression system is compatible with the waste being stored or treated at the permitted unit.

2.10.2 Incompatible Waste Precautions

The Permittees shall ensure that any storage container holding a hazardous or mixed waste that is incompatible with any waste or other materials stored nearby in other containers, piles, open tanks, or surface impoundments must be separated from the other waste or materials or protected from them by means of a dike, berm, wall, or other device. (*See* 40 CFR § 264.177(c)).

The Permittees shall ensure that wastes are not stored with incompatible wastes or materials within or on the same secondary containment structure. The Permittees shall ensure that all wastes are stored in containers made of or lined with materials that are compatible with the wastes. (*See* 40 CFR § 264.172).

The Permittees shall not store cyanides and cyanide mixtures or solutions with acids if a mixture of the materials could generate hydrogen cyanide. The Permittees shall not store Class 8 (corrosive) liquids above or adjacent to Class 4 (flammable) or Class 5 (oxidizing) wastes except when it is known that the mixture of the wastes could not cause a fire or a dangerous evolution of heat or gas.

The Permittees shall ensure that hazardous or mixed wastes are not placed in an unwashed container (*See* 40 CFR § 264.177(b)) that previously held an incompatible waste or material.

2.10.3 Presence of Liquids in Containers

Containers that contain free liquids shall be stored in areas equipped with secondary containment. Before storing containers in areas without secondary containment, the Permittees shall verify that the containers do not contain free liquids by reviewing the information provided by the waste generator as detailed under the Waste Analysis Plan in Permit Attachment C.

2.11 PREPAREDNESS AND PREVENTION

2.11.1 Required Equipment

At a minimum, the Permittees shall maintain the equipment set forth in Permit Attachment D (Contingency Plan), and as required by 40 CFR § 264.32.

The Permittees shall maintain required equipment, including internal communications or alarm systems; devices to summon emergency assistance; fire control, spill control, and decontamination equipment; and adequate water volume and pressure for fire suppression equipment at each Permitted Unit. Permitted Units, except the TTU and the MSB, shall be equipped with fire suppression systems. The Permittees shall maintain portable fire extinguishers, fire control equipment, spill control equipment, and decontamination equipment as

required by 40 CFR § 264.32(c). The Permittees shall make available fire control inspection records upon request by the Department.

A list of required equipment, with the location and capabilities of the equipment, is provided in each Unit-specific Section of Permit Attachment D (Contingency Plan) of this Permit. (40 CFR § 264.32).

2.11.2 Testing and Maintenance of Equipment

The Permittees shall test and maintain the equipment specified in Permit Attachment D (Contingency Plan), as necessary, to assure its proper operation in time of emergency, as required by 40 CFR § 264.33.

This equipment shall undergo inspection at a frequency specified in Attachment E, and in accordance with 40 CFR §264.15(b)(4) to ensure proper functionality.

If testing identifies any nonfunctioning communication equipment, alarm system component or fire protection component, spill control or decontamination equipment, the Permittees shall ensure it is promptly repaired; and shall provide substitute equipment or systems during the time it takes to make repairs.

The Permittees shall assure that communications and alarm systems and fire protection, spill control, and decontamination equipment are inspected or tested according to the inspection plans and schedules detailed in Permit Attachment E. Maintenance, repair, and replacement of emergency equipment shall be performed as needed to ensure proper function and in a timely manner.

2.11.3 Access to Communications or Alarm System

The Permittees shall maintain access to the communications or alarm system as required by 40 CFR § 264.34, and in accordance with Permit Attachments D (Contingency Plan) and E (Inspection Plan).

The Permittees shall ensure that whenever waste is being managed at the permitted units, the personnel involved shall have immediate access to an internal alarm or emergency communication device, either directly or through visual or voice contact with another individual. In the event of an emergency, this communication equipment or method must allow personnel to contact the Unit-specific Emergency Coordinator and the Emergency Operations Center. (40 CFR § 264.32(a-b) and 40 CFR § 264.34).

2.12 HAZARDS PREVENTION

2.12.1 Preventing Hazards in Loading and Unloading

Only closed waste containers shall be accepted for transportation by vehicles to the Permitted Units. Prior to transport, containers shall be inspected to ensure that they are properly closed, labeled, secured, and in suitable condition for transport.

If loading and unloading operations occur outdoors, they shall be conducted in an area immediately adjacent to the Permitted Unit to minimize the distance that the waste must be

moved. Spills that occur during loading or unloading operations shall be promptly cleaned up, and if an emergency, in accordance with spill response procedures contained in Permit Attachment D (Contingency Plan). All loading and unloading areas shall be level, and the asphalt, concrete, or other pavement maintained in good condition.

Loading and unloading areas shall be free of overhead obstructions and other obstructions to visibility and operations. All containers shall be handled in a manner to prevent shifting or falling while being stored or transported. Containers too large to hand carry shall be transported using forklifts, drum dollies, pallet jacks, or other appropriate equipment. Waste-handling equipment shall be maintained and operated in accordance with manufacturers' guidance. Except as necessary in an emergency, only qualified personnel trained in hazardous and mixed waste management procedures are allowed to handle waste at the Permitted Units. The Permittees shall be aware of weather conditions and other operations that could adversely affect the safety of waste management operations, and shall exercise caution.

2.12.2 Preventing Runoff or Flooding

Run-on of surface water from surrounding areas, run-off of hazardous or mixed waste or hazardous waste constituents, runoff of surface water contaminated with hazardous or mixed waste or hazardous waste constituents shall be prevented at Permitted Units by design and operating practices. Unit-specific run-on and run-off features and operating precautions are described in Permit Attachment A (Facility Description).

2.12.3 Preventing Contamination of Water Supplies

Hazardous or mixed waste releases shall be cleaned up promptly. Releases occurring outside buildings shall be contained promptly. (40 CFR § 270.32(b)(2))

2.12.4 Mitigating Effects of Equipment Failure and Power Outages

In the event of a power loss or equipment failure at a Permitted Unit, the Permittees shall place the affected equipment in a safe state, close or cover open containers of hazardous or mixed wastes that are present, stop operations until power is restored, or take other measures to ensure the failure or outage does not adversely affect human health or the environment. (*See* 40 CFR §§270.30(e)).

2.12.5 Preventing Undue Exposure

Facility personnel and visitors at Permitted Units and SWMUs/AOCs undergoing corrective action shall be required to use appropriate PPE to protect themselves from hazards, including but not limited to handling heavy containers, operating waste-handling equipment, weather conditions, and contact with or other exposure to hazardous or mixed wastes and hazardous waste constituents as required.

2.12.6 Arrangements with Local Authorities

The Permittees shall maintain Coordination Agreements with the Kirtland Air Force Base, the New Mexico Department of Public Safety, and one or more area hospitals (such as the

Albuquerque Regional Medical Center, Lovelace Medical Center, Presbyterian Health Care Services), and the U.S. Forest Service. The Coordination Agreements shall be in writing executed by Permittees and the local authorities, and shall include the requirements provided in 40 CFR § 264.37(a). Copies of the Coordination Agreements shall be maintained at the Facility. If an agreement cannot be reached with any of the above entities in spite of the Permittees' best efforts, the Permittees shall document in writing the failed attempt to obtain a Coordination Agreement in the Operating Record, as required by 40 CFR §264.37(b).

2.13 CONTINGENCY PLAN

2.13.1 Implementation of Contingency Plan

The Permittees shall implement the Contingency Plan (Attachment D) immediately whenever at a permitted unit (including any unit undergoing post-closure care):

1. A release of a hazardous or mixed waste or hazardous waste constituents occurs which could threaten human health or the environment;
2. An explosion occurs; or
3. A fire occurs.

(*See* 40 CFR § 264.51(b)).

2.13.2 Distribution

The Permittees shall maintain a current copy of the Contingency Plan, at or in the following locations:

1. Each Permitted Unit;
2. The Emergency Management and Response Office; and
3. The Facility Operating Record; this shall include all revisions and amendments.

The Permittees shall distribute copies of the current Contingency Plan to all entities with which the Permittees have arrangements in accordance with Permit Section 2.12.6.

The Permittees shall distribute the Contingency Plan within fifteen days of the effective date of this Permit and within fifteen days of the effective date of a modification of the Contingency Plan. The Permittees shall ensure that all copies of the Contingency Plan distributed outside the Facility are sent either through mailing of a hard copy letter or via electronic mail. The Permittees shall obtain a return receipt or other record of receipt to ensure distribution. A record of compliance with this requirement shall be maintained in the Facility Operating Record. (*See* 40 CFR § 270.32(b)(2)).

The Permittees shall ensure that evacuation routes for each Permitted Unit are prominently posted at each Permitted Unit. (*See* 40 CFR § 270.32(b)(2)).

2.13.3 Amendments to Plan

Pursuant to 40 CFR § 264.54 the Permittees shall review the Contingency Plan and amend the Plan, if necessary, whenever:

1. This Permit is revised;
2. The Contingency Plan fails during an emergency;
3. The Permittees modify a Permitted Unit in either its design, construction, operation, maintenance, or other circumstances in a manner that materially increases the potential for fires, explosions, or releases of hazardous or mixed wastes or hazardous waste constituents;
4. A change in the Permitted Unit design or operation affects the response necessary in an emergency;
5. The Permittees modify the list of Emergency Coordinators;
6. The Permittees modify the list of emergency response equipment; or
7. The Permittees review and evaluate their emergency response resources and capabilities with respect to hazardous or mixed waste management and find deficiencies.

The Permittees shall ensure that all amendments to the Contingency Plan adhere to the permit modification requirements at 40 CFR §§ 270.41 through 270.43, which are incorporated herein by reference, including the modification classifications at 40 CFR § 270.42 Appendix 1, Category B.6.

2.13.4 Emergency Coordinator

The Permittees shall designate an Emergency Coordinator required at 40 CFR § 264.55, who shall be responsible for coordinating all emergency response measures related to the management of hazardous or mixed wastes. An Emergency Coordinator shall be on call at all times, be familiar with the Contingency Plan, and shall have the authority to commit promptly the personnel and financial resources needed to implement the Contingency Plan (*see* 40 CFR § 264.55). The Permittees shall name at least one alternate Emergency Coordinator who shall assume the responsibilities of the Emergency Coordinator in accordance with Permit Attachment D (Contingency Plan).

The Permittees shall notify the Department in writing of changes to the personnel designated as Emergency Coordinators (EC) and listed with their telephone numbers in Attachment D (Contingency Plan), Table D-5 (HWHU EC list), Table D-7 (TTU EC list), Table D-9 (RMWMU EC list), Table D-11 (AHCU EC list), Table D-13 (MSB EC list), and Table D-15 (CAMU EC list). This notification shall be a Class 1 permit modification.

2.13.5 Required Emergency Procedures

2.13.5.1 Immediate Notifications

In the event of an imminent or actual emergency situation, Permitted Unit personnel shall immediately activate the internal facility alarm or communication systems to notify all facility personnel. The Emergency Coordinator shall ensure that the appropriate federal, tribal, state, and local agencies with designated response roles are notified as necessary.

2.13.5.2 Hazard Assessment

The Emergency Coordinator shall, in the event of a fire, explosion, or release:

1. As soon as practicable, identify the character, source, amount, and areal extent of any released materials. Possible methods are by observation, review of facility records, or by chemical analysis (*see* 40 CFR § 264.56(b)); and
2. Assess possible hazards to human health or the environment that may result from the release, fire, or explosion, considering both direct and indirect effects of the release, fire, or explosion (e.g., the effects of any toxic, irritating, or asphyxiating gases that are generated, or the effects of any hazardous surface water runoff from water or chemical agents used to control fire and heat induced explosions). (*See* 40 CFR § 264.56(c)).

2.13.5.3 Reporting Emergencies

In the event that the Emergency Coordinator determines that there has been a release, fire, or explosion that may threaten human health or the environment outside the boundaries of the Facility, he or she shall report the emergencies as follows:

1. If an assessment indicates that evacuation of local areas may be advisable, he or she shall immediately notify the appropriate local and tribal authorities and shall be available to assist appropriate officials in deciding whether local areas should be evacuated (*see* 40 CFR § 264.56(d)(1)); and
2. Immediately notify the New Mexico Department of Public Safety dispatcher (1-505-827-9329), and the National Response Center (1-800-424-8802) (*see* 40 CFR § 264.56(d)(2)). This notification shall include the list of items found in Permit Attachment D Section D.8.

2.13.5.4 Mitigative Measures

When the Contingency Plan is implemented under Permit Section 2.13.5, the Emergency Coordinator shall take all reasonable measures necessary to ensure that fires, explosions, and releases do not occur, recur, or spread to other hazardous or mixed wastes at the Facility. These measures shall include, where applicable, stopping processes and operations, collecting and containing released wastes, and removing or isolating containers. (*See* 40 CFR § 264.56(e)).

2.13.5.5 Monitoring

When the Contingency Plan is implemented under Permit Section 2.13.5, the Emergency Coordinator shall utilize available air monitoring resources, as appropriate, to measure and characterize any air emissions both inside and outside the Facility boundary caused by a fire, explosion, or release to the atmosphere. (*See* 40 CFR § 270.32(b)(2)).

In the event that the Facility stops operations in response to a fire, release, or explosion, the Emergency Coordinator shall monitor for leaks, pressure buildup, gas generation, or ruptures in containers, valves, pipes, or other equipment as appropriate. (*See* 40 CFR § 264.56(f)).

2.13.6 Post-Emergency Procedures

Immediately after an emergency in which the Contingency Plan was implemented, the Emergency Coordinator shall provide for the treatment, storage, or disposal of recovered wastes, contaminated soils or surface water, or any other material or contaminated environmental media that resulted from the fire, explosion, or release at the Facility (*see* 40 CFR § 264.56(g)).

The Emergency Coordinator shall ensure that in the affected areas of the Facility:

1. No waste that may be incompatible with the released material is treated, stored, or disposed of in the impacted area until cleanup procedures are completed; and
2. All emergency equipment listed in the Contingency Plan is cleaned and fit for its intended use before operations are resumed

(*See* 40 CFR § 264.56(h)).

2.13.7 Need for Further Corrective Action

If, after implementation of the Contingency Plan in response to a fire, explosion or release, the Department determines the area affected by the fire, explosion or release has not been entirely remediated, the Permittees shall conduct corrective action as directed by the Department and in accordance with Permit Part 8 (Corrective Action Procedures).

2.13.8 Notification and Record Keeping

The Permittees shall notify the Department of implementation of the Contingency Plan in compliance with 40 CFR § 264.56(i).

Before operations resume in the Facility's affected areas the Permittees shall notify the Department that the Facility is in compliance with Permit Section 2.13.6.

2.14 RECORD KEEPING AND REPORTING

The Permittees shall comply with the record keeping and reporting requirements specified throughout this Permit and at 40 CFR § 264.73.

2.14.1 Manifest Systems

The Permittees shall comply with the record keeping and reporting requirements associated with manifests in accordance with 40 CFR §§ 264.71, 264.72, and 264.76, which are incorporated herein by reference, whenever a shipment of hazardous or mixed waste is either received at, or initiated from the Facility.

2.14.2 Operating Record

The Permittees shall comply with the recordkeeping and reporting requirements specified in 40 CFR § 264.73(a), 40 CFR § 270.30(j)(2) and (3), and elsewhere in this Permit. Pursuant to 40 CFR § 264.73, the Permittees shall maintain a written Operating Record for each Permitted Unit at the Facility for the active life of the Facility, except as provided by 20.4.1.501.A(5) NMAC, Permit Section 7.2.2 and Permit Attachment H (Post-Closure Care Plans).

Unless specifically prohibited by this Permit, an electronic record in format usable by the Department capable of producing a paper copy shall be deemed to be a written record. Any substantive alterations made to the electronic record shall be documented, dated, and made part of the Facility Operating Record.

The Permittees shall incorporate into the Facility Operating Record the following documents and all amendments, revisions and modifications to these documents:

1. A description of the hazardous or mixed waste received and the methods and dates of treatment and storage at each Permitted Unit in accordance with Appendix I of 40 CFR Part 264;
2. The location of each type of hazardous or mixed waste within each Permitted Unit and the total quantity of all hazardous or mixed wastes at each unit. This information must include cross-references to specific manifest document numbers for any waste received in accordance with Permit section 2.2.3;
3. Records and results of waste analyses and waste determinations that are performed pursuant to Permit Attachment C (Waste Analysis Plan), and 40 CFR §§ 264.13, and any section cited in 264.73(b)(3);
4. Reports and details of all emergencies that required the implementation of Permit Attachment D (Contingency Plan) as specified in 40 CFR § 264.56(i);
5. Information on any instance of fire, explosion, spill, or release from, or at, a Permitted Unit regardless of whether the incident required implementation of the Contingency Plan;
6. Records and results of inspections as required in Permit Attachment E (Inspection Plan) and 40 CFR § 264.15(d);
7. Monitoring, testing, analytical data, and response actions when required by 40 CFR §§ 264.602, 264.1082, 264.1083, and 264.1086 through 264.1090;
8. Notices to off-site generators as specified in 40 CFR § 264.12(b);
9. An annual certification, pursuant to 40 CFR 264.73(b)(9), stating a Facility program is in place to reduce the volume and toxicity of hazardous and mixed waste generated;
10. Copies of the notices and certifications required under 40 CFR §§268.7(b) and 268.9 for wastes treated at a Permitted Unit;
11. All monitoring reports and records required by this Permit, including but not limited to;
    a. records of all monitoring data used to complete Permit Application(s),
    b. all data gathered or generated during the closure or post-closure process, and
    c. all raw data, such as laboratory reports, drilling logs, bench scale or pilot scale data, and other supporting information gathered or generated during activities undertaken pursuant to this Permit. Raw data shall be made available to the Department upon request;
12. Documentation demonstrating distribution of the Contingency Plan in accordance with Permit Section 2.13.2;
13. Documentation demonstrating the installation and maintenance of secondary containment system coatings or sealants as required at Part 3, Permit Section 3.6;
14. Personnel training records including both introductory and continuing training programs used to prepare employees to safely operate and maintain each Permitted Unit in compliance with 40 CFR § 264.16(d), and Permit Attachment F (Personnel Training Plan);
15. Documentation of all instances where an indoor fire suppression system has been activated resulting in fire suppressants directly contacting hazardous or mixed waste;
16. This Permit, including the Waste Analysis Plan set forth in Attachment C (Waste Analysis Plan), the Contingency Plan as set forth in Attachment D (Contingency Plan), the Closure Plans set forth in Attachment G (Closure Plans), the Post-Closure Plan, as required under 40 CFR § 264.118 and all other Permit Parts and Attachments;
17. All correspondence and other documents related to post-closure care from the Department and U. S. Environmental Protection Agency.

The Permittees shall maintain each document required in the Operating Record at the Facility where they can easily be retrieved and reviewed; except the following documents which shall be maintained at the Permitted Units at the Facility:

1. Inspection Schedule and all completed inspection records for that Unit for the last three years, as set forth in Attachment E (Inspection Plan), as required by 40 CFR § 264.15(b) and this Permit,
2. Records of all training required by this Permit for current and past personnel at that Unit, except personnel training records for the MSB shall be maintained at the RMWMU, and the Contingency Plan (Permit Attachment D).

Corrective action documents required by Part 8 of this Permit shall be retained at the Facility by the Permittees until ten years after the Permittees' receipt of the Department's written notice that corrective action has been completed for all SWMUs and AOCs listed in Tables K-1 and K-2 of Permit Attachment K (List of SWMUs and AOCs).

2.14.3 Availability of Facility Operating Record

The Permittees shall furnish and make reasonably available for inspection, upon request by any officer, employee, or representative of the Department, the Facility Operating Record and all other records required under 40 CFR Part 264 or this Permit. (*See* 40 CFR § 264.74(a) and pursuant to 74-4-4.3 NMSA 1978). Information and records requested by the Department pursuant to this condition shall be made available for inspection in hard copy or in electronic format usable by the Department. (*See* 40 CFR § 270.32(b)(2)).

2.14.4 Record Retention

The Permittees shall retain all records required by this Permit during the course of any unresolved enforcement action regarding the Facility or as required by the Department. (*See* 40 CFR § 264.74(b)).

PERMIT PART 3 STORAGE OF HAZARDOUS AND MIXED WASTE

3.1 GENERAL CONDITIONS

The Permittees shall store and otherwise manage containers of hazardous and mixed waste in accordance with 40 CFR Part 264, Subpart I (Use and Management of Containers), which is incorporated herein by reference, and Attachment A (Facility Description).

The Permittees shall store containers of hazardous and mixed wastes subject to this Permit only at the permitted units specified in Attachment J (Hazardous Waste Management Units), Table J-1 (Active Portion of the Facility). The Permittees are authorized to store only those wastes identified by EPA Hazardous Waste Numbers (waste codes) listed in Attachment B (Authorized Wastes). The Permittees shall not store containers of hazardous or mixed waste in excess of the maximum capacities listed in Attachment J, Table J-1.

3.1.1 Storage Prohibitions

Hazardous and mixed wastes are prohibited from land disposal unless they meet the applicable regulatory treatment standards. Prohibited wastes (i.e., wastes that do not meet the applicable treatment standards) may be stored for up to one year at the Permitted Units in compliance with 40 CFR § 268.50. The Permittees shall assume that all of the hazardous and mixed wastes at the Facility are prohibited from land disposal (i.e., they do not meet the applicable treatment standards) and shall apply the one-year storage limit to all hazardous and mixed wastes stored at any Permitted Unit except as noted below:

1. Mixed wastes that are subject to the Federal Facilities Compliance Order (FFCO) (NMED 1995, as amended) between DOE, Sandia Corporation, and the Department can be stored at Permitted Units for more than one year even if they do not meet the treatment standards, provided such storage meets the requirements of the FFCO.
2. Hazardous and mixed wastes that do not meet the treatment standard(s) can be stored at Permitted Units for more than one year, solely for the purpose of accumulating sufficient quantities of hazardous or mixed wastes to facilitate proper recovery, treatment, or disposal, in accordance with 40 CFR § 268.50(c). Information regarding proper recovery, treatment, or disposal shall be maintained in the Operating Record described in Permit Part 2 Section 2.14.2. The Permittees shall bear the burden of proof that the storage beyond one year is necessary for proper recovery, treatment, or disposal.
3. Hazardous and mixed wastes that meet the treatment standards are not subject to the one-year storage limit. Analytical data or other information demonstrating compliance with the applicable treatment standard(s) shall be maintained in the Operating Record described in Permit Part 2 Section 2.14.2.

3.2 CONDITION OF CONTAINERS

The Permittees shall ensure that all containers used to store hazardous or mixed wastes subject to this Permit are in good condition (e.g., no severe rusting or structural defects) in accordance with 40 CFR § 264.171, which is incorporated herein by reference. If a container is not in good condition or begins to leak, the Permittees shall transfer the waste from such a container into a

container that is in good condition upon discovery of the problem, and in accordance with 40 CFR § 264.171.

3.3 ACCEPTABLE STORAGE CONTAINERS

The Permittees shall only use containers that comply with 40 CFR Part 264 Subpart I for storage of hazardous or mixed waste at Permitted Units.

3.4 COMPATIBILITY OF WASTE WITH CONTAINERS

The Permittees shall use containers made of, or lined with materials that will not react with, and are otherwise compatible with the hazardous or mixed waste to be stored so that the ability of the container to contain the waste is not impaired. (*See* 40 CFR § 264.172).

3.5 MANAGEMENT OF CONTAINERS

1. The Permittees shall ensure that all containers are kept closed during storage except when waste is added to or removed from the container or when a container's contents need to be repackaged (*see* 40 CFR § 264.173(a)), except as provided in 40 CFR § 264.1086(c)(3). The Permittees shall not open, handle, or store a container holding hazardous or mixed waste in a manner that may rupture the container or cause the container to leak. (*See* 40 CFR § 264.173(b)).
2. The Permittees shall mark containers either with the words "Hazardous Waste" or with other words that identify the contents of the containers.
3. The Permittees shall ensure that when waste containers are moved during storage, the location of each hazardous or mixed waste and the quantity at each location is documented in accordance with Permit Section 2.12. (*See* 40 CFR § 264.73(b)(2)).

3.5.1 Storage Configuration and Required Aisle Space

1. The Permittees shall maintain adequate aisle space at all times to allow the unobstructed movement of personnel, fire protection equipment, spill control equipment, and decontamination equipment within the permitted units. Additionally, emergency egress aisles with a minimum aisle space of two feet must be maintained at all personnel doors. (*See* 40 CFR § 264.35).
2. Containers shall be placed on pallets as appropriate, and shall be stored in a stable configuration.
3. The stacking configuration of waste containers shall not exceed the load-bearing capacity of the floor or metal grating.
4. The Permittees shall store gas cylinders containing waste in a manner that provides support and restraint, (e.g., racks, baskets, or specially constructed pallets).
5. The Permittees shall store containers in a manner that allows for their inspection, as specified in Section 3.7 of this Permit Part, and such that their container labels are visible.

3.5.2 Outdoor Storage

The Permittees shall ensure that hazardous and mixed waste containers that are stored outdoors and are not being actively managed are protected from degradation caused by precipitation using weather protective equipment (e.g., secured tarp) or are protected by the design of the equipment.

3.6 CONTAINMENT SYSTEMS

3.6.1 Containers with Free Liquids

The Permittees shall maintain secondary containment systems in all permitted units used to store wastes which contain free liquids in compliance with 40 CFR § 264.175. Secondary containment systems shall also:

1. Have sufficient capacity to contain at least 10 percent of the volume of containers or the volume of the largest container, whichever is greater;
2. Prevent contact between containers and spilled material or waste;
3. Prevent run-on and run-off; and
4. Prevent releases of liquids.

The containment systems at the Permitted Units shall be designed to be sufficiently impervious to contain leaks, spills, or accumulated precipitation until the liquid is removed. Asphalt or asphaltic pavement shall not be used to construct secondary containment systems without the use of a sealing material that prevents adsorption or infiltration of hazardous or mixed waste or hazardous constituents into the asphalt or asphalt pavement.

Unless waste is removed or another form of secondary containment is provided, the Permittees shall immediately repair any damage to a secondary containment system. The Permittees shall perform any concrete or asphalt repair using an appropriate repair method (e.g., ACI standards or manufacturer's recommendations), on a schedule that will prevent harm to human health or the environment. (*See* 40 CFR §§ 264.15(c), 270.32(b)(2)). The Permittees shall apply coatings or sealants, if applicable, to the repaired area before waste storage activities resume. The Permittees must record any damage or repair to containment systems in the inspection logs required by Permit Section 3.7.

Spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in as timely a manner as necessary to prevent overflow of the collection system. (*See* 40 CFR § 264.175(b)(5)). The Permittees shall determine the source of liquids that accumulate in secondary containment systems. If the source of the release can be clearly identified (e.g., a leaking container) the Permittees shall characterize the liquid based on knowledge of the source of leakage, and shall remove it and manage it appropriately. If the source cannot be identified, or if the liquid cannot be characterized based on knowledge of the source of the leakage, the Permittees shall follow the process described in Permit Attachment C to characterize the liquid for appropriate management. The liquid shall then be pumped into containers, or absorbed onto absorbent material, swept up, and placed into containers as appropriate.

Accumulated liquids or water generated during fire suppression activities in the Permitted Units shall be characterized using the process described in the Waste Analysis Plan contained in Permit Attachment C.

Accumulated liquids present in secondary containment systems from precipitation or snowmelt shall be characterized in accordance with Permit Attachment C and managed appropriately.

3.6.2 Containers that do not Contain Free Liquids

For containers that do not contain free liquids the Permittees shall ensure that:

1. The containers are stored in storage areas that are sloped or otherwise designed and operated to drain and remove liquid resulting from precipitation or other liquids (*see* 40 CFR § 264.175(c)(1)); or
2. The containers are elevated or otherwise protected from contact with accumulated liquids (*See* 40 CFR § 264.175(c)(2)).

The Permittees shall comply with the secondary containment requirements for containers that do not contain free liquids and contain wastes that have the following waste codes: F020, F021, F022, F023, F026 and F027. (*See* 40 CFR § 264.175(d)(1)).

3.7 INSPECTIONS

The Permittees shall inspect the permitted units for the condition of containers and secondary containment systems, safety equipment, and aisle space for evidence of leaks; deterioration of the containment system by corrosion, cracking, differential settlement or other factors; and to ensure safety equipment and aisle space are adequate in the event of an emergency as specified in Attachment E (Inspection Plan). (*See* 40 CFR § 264.174).

Containers in which hazardous waste is placed shall be visually inspected at the time they first arrive at a Unit. A visual inspection shall be done to ensure that there are no cracks, holes, gaps, or other defects and that the cover or other closure devices are secured in the closed position. At each Permitted Unit where containers will be stored, the Permittees shall:

1. Check the condition of containers and the placement of their covers or other closure devices;
2. For containers subject to air emission standards in 40 CFR 264.1086(c), when a defect is detected for the container cover or closure devices, the Permittees shall make first efforts at repair of the defect no later than 24 hours after detection, and repair is to be completed as soon as possible but no later than 5 calendar days after detection. If a repair of a defect cannot be completed within 5 calendar days, then the hazardous waste shall be removed from the container and the container shall not be used to manage hazardous waste until the defect is repaired.
3. For containers not subject to air emission standards in 40 CFR 264.1086(c), the Permittees shall take corrective action in a timely manner upon discovery of a defect in a container or cover to ensure the problem does not lead to an environmental or human health hazard or noncompliance with this Permit.
4. Document container condition and any remedial actions taken.

3.8 AIR EMISSIONS

The Permittees shall control air emissions from each hazardous waste container at a permitted unit in accordance with the applicable regulations in 40 CFR Part 264 Subpart CC.

PERMIT PART 4 TREATMENT OF HAZARDOUS AND MIXED WASTES

4.1 GENERAL CONDITIONS

Treatment of hazardous and mixed waste shall be conducted only at the permitted units identified as utilizing waste process code T04 and specified in Attachment J (Hazardous Waste Management Units), Table J-1.2 (Active Portion of the Facility). The Permittees are authorized to treat only those hazardous and mixed wastes identified by EPA Hazardous Waste Numbers (Waste Codes) listed in Attachment B (Authorized Wastes). The Permittees shall not treat hazardous or mixed waste in excess of the maximum capacities identified in Attachment J, Table J-1.2.

Hazardous and mixed wastes that are treated at the Radioactive and Mixed Waste Management Unit (RMWMU) and Auxiliary Hot Cell Unit (AHCU) include manufactured items and wastes generated from specific processes and activities. To ensure that proper and accurate waste characterization occurs, the Permittees shall use the characterization procedures outlined in Section C.3 of Permit Attachment C, as well as sampling and analysis, as appropriate.

1. Hazardous and mixed wastes that are treated at the RMWMU and AHCU include:
2. Solid items exhibiting the hazardous waste characteristics of ignitability and/or reactivity;
3. Solid items (including debris) exhibiting the hazardous waste characteristic of toxicity or containing spent solvents or commercial chemical products;
4. Liquid wastes and wastewaters exhibiting the hazardous waste characteristics of ignitability, corrosivity, or reactivity; and
5. Liquid wastes and wastewaters containing toxicity characteristic constituents and organic compounds.
6. Liquid wastes consisting of or containing spent solvents or commercial chemical products.

Treatment processes and the associated treatment goals at the RMWMU and AHCU are discussed in Permit Attachment A, Sections A.4.5 and A.5.4, respectively. The treatment processes include:

1. Chemical deactivation to eliminate the hazardous waste characteristics of ignitability, corrosivity, and reactivity;
2. Thermal deactivation to eliminate the hazardous waste characteristic of reactivity in reactive wastes, including explosives;
3. Amalgamation to immobilize elemental mercury into a solid, leach-resistant form;
4. Stabilization to immobilize hazardous waste toxicity characteristic metals or eliminate free liquids, or both;
5. Macro-encapsulation to immobilize hazardous constituents; and
6. Physical treatment to change the physical character of the waste in order to make it more amenable to subsequent treatment or storage, or to reduce waste volume.

The hazardous and mixed wastes to be treated at the RMWMU and AHCU are typically assigned one or more of the following EPA Hazardous Waste Numbers: D001-D011, D018-D043, and F001-F005. The EPA Hazardous Waste Numbers for hazardous and mixed waste to be treated at the RMWMU and AHCU are determined through the characterization procedures described in Permit Attachment C, Section C.3, in which process knowledge is supplemented by sampling and analysis, as appropriate.

4.2 DEPARTMENT APPROVAL

Approved treatment methods are described in Permit Parts 4.4 – 4.9 below. Prior to treatment by any method not specified in this Permit, the Permittees must submit to the Department for its review and approval a detailed treatment plan for each waste that is to be treated. The treatment plan shall describe, at a minimum, the wastes to be treated, the volume or weight of the wastes, detailed descriptions of the methods of treatment, and how treatment efficacy will be verified. Such treatment plans shall not include treatment by the Permittees using tanks, incinerators, boilers, industrial furnaces, surface impoundments, or land treatment unless such plans are submitted as a request to modify this Permit.

The Department expects within 45 days of receipt of a plan to notify the Permittees of the treatment plan's approval, conditional approval, denial, or the need to submit a permit modification request if the treatment method requires a permit modification. If the method of treatment does not require a modification of this Permit, and if the Department does not so notify the Permittees, the Permittees may implement the plan provided that all applicable requirements of 40 CFR Parts 264 and 268, including 40 CFR 268 Subpart D, and this Permit are met, releases of waste and treated wastes are prevented, and the health and safety of workers and the public protected from harm related to implementation of the plan. Nothing in this Permit Part shall be read to obviate the requirement for a Permit Modification if necessary pursuant to 40 CFR § 270.42.

A detailed description of the treatment methods subject to the requirements of this Permit, including this Section 4.2, are described in Permit Attachment A (Facility Description).

4.3 CONTAINMENT SYSTEMS

Containers in which treatment is conducted under this Permit Part 4 shall be subject to the requirements of Permit Section 3.6 (Containment Systems).

4.4 PHYSICAL TREATMENT

Hazardous and mixed wastes shall be treated physically at the RMWMU and AHCU to reduce waste volume and change the physical character of the waste to make it more amenable to subsequent treatment or storage, or both. Hazardous and mixed wastes that are physically treated at the RMWMU and AHCU generally consist of solid items that exhibit the hazardous waste characteristics of ignitability, reactivity, or toxicity and include unknown solids, debris, aerosol cans and other pressurized containers.

Physical treatment shall include only the following:

1. Reducing waste volume by using commercially available tools (e.g., hammers, screwdrivers, wrenches, pliers, saws, drills, cutters) to separate items with hazardous constituents from larger items or from each other, including removal of coating and filler materials.
2. Removing glues or resins by dissolution in containers (e.g., trays or pails) in order to facilitate separation of items with hazardous waste constituents from each other or from other items. Dissolution shall take place within a fume hood.
3. Reducing the size of waste items by using tools (e.g. mallets, cutters, etc.) to crush or cut items into smaller pieces.

4. Puncturing aerosol cans within a container to allow recovery of the contents. The liquid contents of the aerosol cans must be collected in a container, and any gaseous propellants must be filtered through a carbon or other appropriate filter attached to a container.
5. Releasing pressurized contents of containers other than aerosol cans (e.g., gas cylinders). Organic gaseous contents must be filtered through a carbon filter. All contents must be vented to a chemical fume hood with a high-efficiency particulate air filtration system.

4.5 MACROENCAPSULATION

Solid hazardous and mixed waste items, including debris, are treated by macroencapsulation at the RMWMU and AHCU to immobilize hazardous waste constituents.

The Permittees shall perform macroencapsulation in containers. Macroencapsulation shall consist of completely encasing waste within a polymer coating or concrete, or within a jacket of inert inorganic materials to immobilize wastes such as debris-type solids containing hazardous constituents by completely surrounding the waste with a leach-resistant coating.

The Permittees shall perform macroencapsulation using any one of the following:

1. Encasing the waste in concrete, within a larger container that serves as a mold.
2. Coating the waste with polymer agents within a mold. Polymers used for macroencapsulation shall be limited to asphalt, polyethylene, thermosetting plastics, and resins that can be polymerized under ambient temperatures in the presence of a catalyst. Equipment used for macroencapsulation may include molds, polymer extrusion equipment, and resin mixing equipment. In-drum macroencapsulation may be performed with the drum acting as the mold. Temperature control of polymer macroencapsulation processes is critical and shall be carefully maintained to assure that adequate coating occurs.
3. Placing the waste inside a commercially available container made of inert or noncorroding materials such as polyethylene or stainless steel and sealing the container to encapsulate the waste. This method may not be used to treat D008 radioactive lead solids.
4. Placing the waste in a container consisting of an outer shell with a liner of inert or noncorroding material such as polyethylene or stainless steel, along with inert void-filling materials, then sealing the liner to encapsulate the wastes.

For options (3) and (4) above, the Permittees may use containers of various sizes, depending on the volume and dimensions of waste items to be macroencapsulated.

4.6 STABILIZATION AND SOLIDIFICATION

Hazardous and mixed wastes are treated by stabilization at the RMWMU and AHCU to immobilize hazardous waste toxicity characteristic metals or eliminate free liquids, or both. Hazardous and mixed wastes that are stabilized at the RMWMU and AHCU generally consist of liquids, soils, and particulate-type wastes.

The Permittees shall perform stabilization in containers. Treatment shall take place within a fume hood when possible. Stabilization shall consist of binding hazardous metals so that the metals become chemically a part of the matrix or are physically bound within the matrix to immobilize toxicity characteristic metals.

Stabilization agents for toxic metals may include Portland cement, pozzolans, thermoplastics, organic polymers, and clays.

4.7 WASTE TREATED BY CHEMICAL DEACTIVATION

Hazardous and mixed wastes are treated by chemical deactivation at the RMWMU and the AHCU to remove the hazardous waste characteristics of ignitability, corrosivity, and/or reactivity. Hazardous and mixed wastes that are chemically deactivated consist of solids or liquids, including laboratory chemical waste, process waste, and reactive hazardous wastes.

4.8 WASTE TREATED BY THERMAL DEACTIVATION

Hazardous and mixed wastes treated by thermal deactivation consist of reactive hazardous wastes that are solid items. Such wastes are treated at the RMWMU to remove the hazardous waste characteristic of reactivity.

4.9 WASTE TREATED BY AMALGAMATION

Mixed waste consisting of liquid elemental mercury is treated by amalgamation at the RMWMU to immobilize elemental mercury into a solid, leach-resistant form that has minimal potential for emission of mercury vapor.

PERMIT PART 5 TREATMENT BY OPEN BURNING

5.1 AUTHORIZATION OF THE THERMAL TREATMENT UNIT

The Permittees are authorized to treat by open burning hazardous waste at the Thermal Treatment (TTU) located at the northern part of TA-III in accordance with this Permit Part, 40 CFR Part 264, Subparts X and BB, and 40 CFR § 268.7(b) and the current Open Burn Permit issued by the City of Albuquerque Environmental Health Department.

The Permittees shall provide the Department a copy of its open burn permit issued by the City of Albuquerque by February 1st of each year or within 30 days of receipt of the permit. The City of Albuquerque open burn permit shall be maintained in the Operating Record.

The Permittees are authorized to treat at the TTU only silver acetylide/silver nitrate (SASN) and SASN mixed with only the solid and hazardous wastes identified in Table 5-1 of this Permit Part, and only if these wastes are generated by the Facility operations in Building 6715. Wastes that are not mixed with SASN at the point of generation shall not be mixed with SASN for the purpose of generating a hazardous waste that is authorized for treatment at the TTU.

A burn event encompasses the duration of a burn, and begins upon ignition of the propane fuel that is used to sustain a burn at the TTU, and ends upon deliberate extinguishment of the flame regardless of whether the flame is a result of the burning of propane, waste or both. More than one burn event may take place during treatment operations, and more than one burn event may take place during a given day, subject to the requirements of this Permit.

Treatment operations may last more than one working day, and include all waste management and other activities required to prepare for a burn event(s), the burn event(s), and all waste management and other activities that must be conducted following the burn event(s) to comply with the requirements of this Permit.

Treatment operations occur periodically and are initiated when wastes requiring treatment at the TTU are generated in Building 6715. For each treatment operation, burn events shall be conducted to treat all waste, kick-out, and treatment residues generated during that operation as expeditiously as practicable.

5.2 WASTE PROHIBITED FROM TREATMENT AT THE TTU

The Permittees shall not treat by open burning any of the following wastes or materials:

1. Waste generated at any location other than Building 6715 and ancillary locations (e.g., the process wastewater system) within the Building 6715 perimeter fence, or the TTU;
2. The hazardous component of mixed wastes;
3. Solid items, except for items mixed or contaminated with SASN;
4. Soils or remediation waste, except incidental soil deposited by the wind and soil as provided in Permit Sections 5.5.3 and 5.6.2 of this Permit Part for kick-out generated from the TTU that is mixed with soil; and
5. Waste containing polychlorinated biphenyls (PCBs).

5.3 MAXIMUM QUANTITY OF WASTE TO BE TREATED

The maximum volume of authorized solid and hazardous wastes present in the burn pan at any one time during a burn event at the TTU shall not exceed 21 gallons (80 liters). The maximum amount of SASN treated during any burn event shall not exceed 2.41 pounds (1.1 kilograms). The Permittees are prohibited from treating waste, on a per burn event basis, in excess of the quantities specified in Table 5-1.

TABLE 5-1
Types and Maximum Quantities of Solid and Hazardous Wastes Allowed for Treatment at the TTU per Burn Event

Solid or Hazardous Waste	Maximum quantity
Acetone (F003)	80 L
Acetonitrile (D001)	6 L
Nitric acid (D002)	0.25 L
Silver nitrate (D001, D011)	340 gram
SASN (D001, D003, D011)	2.41 lbs (1.1 kg)
PETN (D003)	0.88 lbs (0.40 kg)
Water(1)	210 L
solid items containing SASN (e.g., filters, paper, cloth, wood, or cardboard)	50 kg

The maximum amount of SASN and SASN mixed with other authorized solid and hazardous wastes (solid and liquid combined) that can be treated per calendar year shall not exceed 9,500 pounds (4,310 kg) or 1,200 gallons (4,550 liters).

The total volume of liquid wastes can exceed 21 gallons (80 liters) during a burn event as liquids can be periodically fed into the burn pan as a burn event proceeds.

5.4 PREVENTING EXPOSURE

1. Treatment operations shall be conducted on the day waste is loaded at the TTU, subject to the requirements of this Permit Part. If any conditions arise that prohibit commencement of treatment operations on the day waste is loaded at the TTU, treatment operations shall begin as soon as conditions allow for treatment in compliance with this Permit Part.
2. When wastes are present in the burn pan, the Permittees shall keep the burn pan closed by lowering the lid, except when wastes are being loaded into or unloaded from the pan or when treatment is occurring.
3. The TTU shall be operated remotely during burn events from a control console inside Building 6715. Operating personnel shall observe burn events using a video camera.

4. The TTU shall have a warning bell or buzzer. The sound produced by the warning bell or buzzer shall be louder than the TTU propane burners. Building 6715 or the TTU shall be equipped with a warning light in a visible location for personnel that are hearing impaired.

5.5 OPERATING PROCEDURES

5.5.1 Pre-Burn Operations

1. The Permittees shall notify the Permittees' Emergency Management & Response organization personnel and the Kirtland Air Force Base Fire Department of anticipated treatment operations before treatment operations begin.
2. The Permittees shall inspect the TTU burn pad and pan, and its associated equipment, within 24 hours preceding a burn event (*see* Permit Attachment E, Inspection Plan).
3. The Permittees shall inspect the camera located in Building 6715 control building to ensure it is functional before waste is transferred to the TTU for a burn event.
4. The Permittees shall check the area in the vicinity of the TTU immediately preceding burn events to ensure that no unauthorized personnel are present in or around the TTU. Prior to a burn event, the fenced area surrounding the TTU and the area between Building 6715 and the TTU (Figure 10, Permit Attachment L (Figures)) shall be cleared of all personnel by announcing over the public address system that a burn event will soon commence and by use of a bell or buzzer warning signal and warning light.
5. Vegetation and other combustible substances within a 50-feet radius of the Burn Pan shall be removed before conducting any burn events, including keeping the grounds and berms within the perimeter fence clear of dry or dead weeds, or any other combustible substances.
6. Wastes shall not be stored at the TTU prior to treatment operations for longer than 24 hours, except as provided under Section 5.4.1(1) of this Permit Part

5.5.2 Treatment Operations

5.5.2.1 General Requirements

1. No person shall be permitted to enter the TTU fenced area during a burn event. No personnel shall be between Building 6715 and the TTU fenced area during a burn event.
2. Any gates within the perimeter fence that surrounds the TTU shall be closed and locked during burn events and for a four-hour cool-down period after each burn event to prevent the entry of unauthorized personnel into the area.
3. A sign indicating that a burn event is underway shall be placed on the Building 6715 access gate. The sign shall be on the gate prior to the start of burn events and remain during burn events and during the four-hour cool down period following burn events.
4. A minimum of two people shall be present during burn events.
5. A minimum of four hours shall elapse between burn events before reuse or inspection of the burn pan.
6. The TTU burn pan shall be covered with the lid except during burn events, during loading or unloading of wastes or treatment residues, or when inspections, maintenance, or repairs are taking place.

7. Only non-sparking tools shall be utilized at the TTU when waste is present.
8. Following a burn event, the TTU Operator shall be responsible for determining whether or not it is safe to approach the burn pan area. The TTU shall be closed for a minimum of four hours after a burn event before anyone is permitted to approach the burn pan area.
9. All wastes shall be treated on the same day waste is placed into the TTU burn pan, provided that if any conditions arise that prohibit commencement of a burn event, the burn event shall begin as soon as conditions allow for treatment in compliance with this Permit Part.
10. No fuel other than propane shall support open burning of waste.
11. Treatment operations shall not be conducted if there is an uncontrolled range fire within one mile from the TTU.

5.5.2.2 Solid Items

Authorized solid items, saturated (i.e., wetted or submerged) in water shall be containerized and carried to the TTU burn pan by personnel trained and qualified to manage the waste.

Authorized solid items shall be loaded manually into the burn pan. The operator shall open the screen door remotely from the control console in Building 6715. The door shall be operable only from the control console. The operator shall remove the key from the burner control, thus disabling the gas burner system before loading waste into the TTU Burn Pan. The same operator who loads the TTU burn pan shall control the gas burner system.

5.5.2.3 Liquids

Authorized liquids may be transferred to the burn pan through the waste transfer pump, waste transfer tubing, and ancillary pipes. The operator at the control console in Building 6715 shall operate the pump remotely.

Authorized liquid waste may be containerized and carried to the TTU burn pan by personnel trained and qualified to manage the waste. The containerized liquid waste shall be loaded into the burn pan following the steps in Section 5.5.2.2.

5.5.2.4 Hours of Operation

Burn events at the TTU shall be initiated only during the time period beginning one hour after astronomical sunrise and ending one hour before astronomical sunset. Burn events may continue beyond sunset as necessary to complete treatment already in progress.

5.5.2.5 Weather Conditions

1. Burn events at the TTU shall not be initiated when an electrical storm (with or without precipitation) exists within 10 miles of the TTU.
2. Burn events at the TTU shall not be initiated during inclement or threatening weather. Inclement or threatening weather is defined as : 1) sustained winds greater than 20 mph; 2) wind gusts exceeding 35 mph; 3) tornado watches or warnings; 4) snowstorms with visibility less than 2000 feet; 5) rain with accumulation rates greater than 0.3 inches per hour; and 6) hail, sleet, or ice storms.

3. Burn events at the TTU shall not be conducted when wind speeds at the Albuquerque Sunport exceed a sustained speed of 20 mph.
4. If one or more adverse weather conditions as defined in this Section develop during a burn event, the TTU operator shall evaluate the risk of continued operation against the risks of halting treatment operations. If the operator determines that weather conditions warrant ceasing treatment operations, the Permittees shall stop the burn event, deactivate the propane burners and close the lid on the burn pan as soon as it is safe. The TTU operator may saturate the untreated explosive waste with water to cool it and stabilize the explosive. If water is to be added to the waste, the operator will wait until the TTU is safe to approach, and will use water from the spigot located just inside the TTU fence. The operator will direct water from the spigot into the burn pan, being careful not to disperse waste from the pan. If available, water may also be pumped directly into the burn pan using the waste transfer pump.

The Permittees shall continue to comply with all requirements, including all security and safety requirements of this Permit concerning treatment operations from the time an aborted burn event is stopped through the time that the burn event is restarted and completed. An aborted burn event shall be re-started as soon as conditions allow for treatment in compliance with this Permit Part. Prior to restarting treatment, the operator shall determine whether it is necessary to wet the untreated waste and shall follow the procedures above if it is necessary.

5.5.3 Post-Burn Operations

The Permittees shall operate the burners for at least 30 minutes after observing evidence that all wastes have been completely combusted. The Permittees shall use visual and audible evidence to determine that all wastes have been deactivated and combusted. The cessation of audible popping noises and visual flashes of light and puffs of smoke indicate complete combustion of waste. Other evidence of the complete combustion includes the absence of yellow flames from the burn pan and the absence of liquid inside the burn pan.

After the cool-down period of at least four hours, but within one business day, the Permittees shall perform a post-treatment inspection to check for any untreated waste in the burn pan and any contamination or untreated waste ejected from the burn pan during a burn event ("kick-out"). If kick-out is observed, the Permittees shall wet it with water, and containerize the kick-out and any contaminated soil mixed with kick-out for treatment during the next burn event. If contamination is observed, the Permittees shall wet the contaminated area and decontaminate it with wet paper wipes or wash it with water. Residues and wipes shall be managed in accordance with Permit Section 5.5.4.

The Permittees shall remove treatment residues in the burn pan using plastic scoops or a vacuum cleaner equipped with a high-efficiency particulate air filter. The Permittees shall close the lid on the TTU burn pan to prevent dispersal of any residue which could not be removed by the plastic scoop or vacuum cleaner. The residue that is removed from the burn pan shall be containerized and characterized in accordance with Permit Attachment C.

After treatment operations conclude, the Permittees shall notify their Emergency Management & Response organization personnel, to inform them that treatment operations have been completed.

5.5.4 Management of Treatment Residues

The Permittees shall clean the burn pan, lid and other waste containment devices of any treatment residues within one working day of a burn event unless another burn event is to take place within one day, or one or more adverse weather conditions as defined in Section 5.5.2.2 is present. If the Permittees find any untreated waste or treatment residue requiring further treatment at the TTU, the waste may be left in the burn pan for treatment as soon as possible in compliance with the requirements of this Permit. Alternatively, untreated waste, treatment residue requiring further treatment at the TTU, contaminated paper wipes from cleaning the pad, or kick-out collected during inspection of the Unit after a burn event may be containerized and treated during the next burn event.

5.5.5 Alternative Treatment Assessment

The Permittees shall submit an open burn alternative treatment assessment report to the Department no later than the eighth anniversary of the effective date of this Permit.

5.6 MAINTENANCE AND MITIGATION REQUIREMENTS

5.6.1 Accumulated Precipitation

If the burn pan lid is open during precipitation, any standing water in any portion of the burn pan shall be removed within one business day of a precipitation event, containerized, characterized in accordance with Permit Attachment C, and managed accordingly.

The Permittees shall make a hazardous waste determination of the water that has drained from the pad surrounding the burn cage and accumulated in the catch tank in accordance with 40 CFR § 262.11 and Permit Attachment C (Waste Analysis Plan) upon removal of any such water and manage the water appropriately.

5.6.2 Mitigation of Spills

1. Spills of solid items on the ground or on the TTU pad shall be wetted as needed to stabilize any unreacted explosive. Spills of solid or liquids shall be wiped or scooped up and placed in the burn pan or containerized for treatment, as appropriate and safe. Soils contaminated by a spill from the TTU shall be wetted, excavated, and placed in the burn pan or containerized for treatment, as appropriate.
2. In the event of a spill from the burn pan, the spilled waste shall be contained on the steel-lined concrete pad until it is wiped or scooped up as necessary to remove the spilled waste.
3. Spill cleanup wastes placed in the burn pan shall be treated in compliance with the requirements of this Permit.

5.6.3 Maintenance and Repair Activities

The Permittees shall check the surfaces of the burn cage, the pad, and the surrounding area with a portable propane burner before maintenance and repair activities that involve hot work or friction (e.g., cutting, welding, or grinding) to ensure that residual or untreated waste, treatment

residue requiring further treatment at the TTU, or kick-out are not present to cause a hazard to workers.

5.7 WASTE ANALYSIS PLAN

The Permittees shall comply with the requirements of Section 2.4 of Permit Part 2 and Permit Attachment C (Waste Analysis Plan) for characterizing wastes to be treated at the TTU and wastes treated at the TTU.

5.8 RUN-ON AND RUN-OFF CONTROLS

The Permittees shall inspect monthly and on the day of and prior to treatment operations, and maintain as necessary, the surface water run-on and run-off control features (e.g., all associated retention structures, retaining walls, covers, berms, ditches) associated with the TTU in accordance with Permit Attachment E (Inspection Plan). The results of each inspection shall be documented in writing and maintained in the Operating Record.

5.9 SOIL MONITORING REQUIREMENTS

5.9.1 Sampling and Analysis

The Permittees shall conduct a soil sampling program to monitor for hazardous waste or constituents released to soils as a result of treatment operations or spills, and to ensure that any releases from the Unit do not have an adverse effect on human health or the environment (*see* 40 CFR § 264.602). Samples shall be collected annually no later than August 1 of each year sampling is required, beginning no later than the first August after the effective date of this Permit. Samples shall also be collected no later than August 1 of the next year (year two) and of years four, seven, and nine after the effective date of this Permit. The Permittees shall provide oral and written notification to the Department of the scheduled sampling activities at least 15 days prior to commencing each sampling event.

Soil samples collected for the first two sampling events shall be analyzed for silver, semi-volatile organic compounds (SVOCs), polycyclic aromatic hydrocarbons (PAHs), and dioxin/furan congeners (Table 5-3). If the results for all samples analyzed for SVOCs, PAHs, and dioxin/furan congeners are less than or equal to their applicable New Mexico industrial soil screening levels (NMED 2012 or current, see Permit Section 5.9.2), soil samples collected for sampling years four, seven, and nine may be analyzed for silver only. However, if results are greater than their applicable New Mexico industrial soil screening levels, the Permittees shall continue to analyze soil samples for any of those parameters listed in Table 5-3 that are greater than their applicable New Mexico industrial soil screening levels, in addition to silver, for each subsequent sampling event.

Soil samples shall be collected at a depth of 0-2 inches at the locations listed in Table 5-2 of this Permit Part. Approved analytical methods, preservation methods, holding times, and container requirements are listed in Table 5-3 of this Permit Part. Sample locations must be surveyed pursuant to Permit Section 8.10.2.5.

Soil samples must be collected according to the requirements in Permit Section 8.10.2. The samples shall not contain vegetation, debris, or large rocks.

The Permittees shall document field activities in accordance with Permit Section 8.10.2.14. Information provided in the logbooks must be sufficient to allow reviewers to reconstruct sampling events, and must note any deviations from the requirements of this Permit Section (5.9). The sample documentation along with the data recorded in logbooks must ensure that each sample has a unique identification number and sufficient sample information to ensure traceability of each sample to a specific sample location. A chain-of-custody (COC) form shall be maintained with samples from the time of collection through shipment to the laboratory and analysis of the samples. The Permittees shall collect field quality control samples in accordance with Section 8.10.2.4.vii. The Permittees shall comply with the requirements of Permit Part 8.10.3 regarding sample analysis, including all applicable requirements for quality assurance samples and review of laboratory data. If re-usable sampling equipment is used for collection of soil samples, trowels and stainless steel bowls and any other equipment that comes in direct contact with the samples shall be decontaminated between each sample in accordance with the requirements of Permit Part 8.10.2.11.

The Permittees shall manage investigation-derived waste in accordance with Permit Section 8.10.2.13.

5.9.2 Reporting of Sampling Results and Risk Assessment

The risk assessment screening method outlined in the most current New Mexico Soil Screening Guidance (NMED 2012 or current) must be applied for assessing the risks to human health.

Sampling results (including associated field and laboratory quality control results), the comparison to the Soil Screening Guidance, and the results of the screening risk assessment based on an industrial receptor shall be reported to the Department by October 1 of each year that sampling occurs under this Permit Part.

5.9.3 References

NMED, 2012. NMED Risk Assessment Guidance for Site Investigations and Remediation.

SNL, 1996. Joint Sandia National Laboratory/New Mexico Kirtland Air Force Base Background Study.

TABLE 5-2 Summary of Sample Locations and Analytes	
Number and Locations of Samples (11 samples)	2 discrete samples from around the burn unit and within the berm area, 2 discrete samples from the top of the berm area with one sample being located immediately south of the burn unit, 2 discrete samples outside the berm area but within the fence, 1 discrete sample outside the fence to the East of the unit collected at 30 meters from the unit, 1 discrete sample outside the fence to the West of the unit, collected at 30 meters from the unit, 1 discrete sample outside the fence to the South of the unit collected at 30 meters from the unit 1 discrete sample outside the fence to the Northeast of the unit, collected at approximately 30 meters from the unit, and 1 discrete sample outside the fence to the Southeast of the unit, collected at approximately 30 meters from the unit
Surveying Locations	Locations to be surveyed and recorded using GPS
Sample Type	Surface soil (0-2 inches)
Analytes of Concern	Silver, SVOCs, PAHs, dioxins/furans
Quality Assurance	Field duplicate and matrix spike (frequency of one per 20 samples) and equipment blank (at least one per day) if re-usable sampling equipment is used.

Table 5-3
Soil Sample Analysis Requirements[1]

Parameter[2]	Laboratory Method(s)	Preservation	Holding Time	Container Requirements
Silver	6010/6020	None	6 months	Glass or plastic
SVOCs	8270	Cool to 4°C	14 days	Glass
PAHs	8310	Cool to 4°C	14 days	Glass
Dioxin/Furan Congeners	8280	Cool to 4°C	30 days	Glass

1 Unless otherwise noted, methods are EPA SW-846 Methods. Use currently approved method revision.

2 Parameters to be analyzed for may vary over the life of the Permit (see Permit Section 5.9).

PERMIT PART 6 CLOSURE REQUIREMENTS

6.1 INTRODUCTION

The Permittees shall close the Permitted Units in accordance with the requirements in 40 CFR §§ 264.110 through 264.116, 264.178 and 264.601 as applicable, this Permit Part (6), and the procedures described in the Permitted Unit-specific closure plans in Attachment G (*Closure Plans*). Closure is the permanent discontinuation of storage and treatment of hazardous or mixed wastes at a Permitted Unit.

It is anticipated that each Permitted Unit not currently in post-closure care will achieve the clean closure criteria at Permit Section 6.2.1 (*i.e.,* clean closed). Permitted Units that do not clean close remain subject to the requirements for post-closure care under 40 CFR Part 264 Subpart G and Permit Part 7.

The closure process for a particular Permitted Unit is not complete until the Department approves the Closure Report and Closure Certification required under Permit Section 6.7.

For the purpose of closure, Permitted Units may consist of structures, equipment, outdoor storage pads and driving surfaces, and environmental media. These components of a Permitted Unit shall undergo the decontamination and verification sampling procedures specified at Permit Sections 6.3.6 through 6.3.10.3 unless they are removed from the site at closure. Examples of structures include storage sheds; buildings; individual rooms within buildings; interior walls, floors and ceilings; containment systems; and fixtures appurtenant thereto (*e.g.*, stairs, railings, and ancillary piping). Examples of equipment include forklifts, secondary containment pallets, treatment apparatus, and hand tools utilized in waste management. Examples of outdoor storage pads and driving surfaces include concrete or asphalt pavements. Environmental media includes soil, groundwater, surface water, and any anthropogenic base materials (*e.g.*, base course or gravel).

Rooms such as restrooms, offices, storage rooms, and utility rooms at a Permitted Unit in which hazardous or mixed waste was not managed are exempt from closure procedures and performance standards. Office equipment, furnishings, and tools that have not contacted hazardous or mixed waste or been subject to a hazardous constituent release are also exempt from closure procedures and performance standards.

6.2 CLOSURE PERFORMANCE STANDARDS

The Permittees shall meet the following closure performance standards for all constituents of concern (see Permit Section 6.5(1)) at each Permitted Unit to be closed. The Permittees must:

1. Minimize the need for further maintenance; and
2. Control, minimize, or eliminate, to the extent necessary to protect human health and the environment, the post-closure escape of hazardous and mixed waste, hazardous constituents, leachate, contaminated runoff, or hazardous waste decomposition products to the ground, groundwater, surface water, or atmosphere.

(*See* 40 CFR § 264.111).

6.2.1 Criteria for Clean Closure

Clean closure is achieved when:

1. All hazardous wastes have been removed from a Permitted Unit.
2. Any release of a hazardous waste or hazardous constituent to environmental media at or from the Unit has been remediated, if necessary, to a concentration level that is protective of human health and the environment. Concentration levels shall be based on a residential land use scenario such that the risk of human exposure does not exceed 10^{-5} total excess cancers for carcinogenic substances and, for non-carcinogenic substances, a target Hazard Index of 1.0. Concentration levels shall also be in compliance with Permit Section 8.4.5; and such that the Ecological Screening Levels in accordance with Permit Section 8.5 are met.
3. Structures and equipment associated with a Permitted Unit have been decontaminated to remove hazardous waste residues and hazardous constituents, or such structures and equipment have been removed and managed, in accordance with all applicable requirements.
4. All of the closure performance standards under Permit Section 6.2 have been met.
5. The Permittees have demonstrated that there is no potential for contaminated soils associated with a Permitted Unit to contaminate groundwater.

6.2.2 Inability to Achieve Clean Closure

If the Permittees are unable to achieve clean closure of a Permitted Unit under the provisions of Permit Section 6.2.1, they must implement post-closure care pursuant to Permit Part 7 and comply with 40 CFR §§ 264.117-264.120. The Permittees must also prepare a post-closure care plan and submit the plan to the Department within 90 days from the date that the Permittees or the Department determines that clean closure will not be or has not been achieved at the Permitted Unit. Additionally, pursuant to Permit Section 6.6 and prior to the commencement of the post closure period, the Closure Plan shall be amended to implement the procedures that are necessary to meet all of the closure performance standards under Permit Section 6.2.

6.3 CLOSURE PROCESS

6.3.1 Notification of Closure

The Permittees shall initiate closure by notifying the Department in writing that a Permitted Unit will undergo closure.

6.3.2 Time Allowed for Closure

The Permittees shall complete all closure activities required by this Permit Part and the Permitted Unit-specific closure plan at Attachment G (*Closure Plans*) no later than 180 days after initiating closure. The time allowed for closure may be extended if an extension is approved by the Department (*see* 40 CFR § 264.113(b)(1) and (2)) or it is necessary to amend the closure plan in accordance with Permit Section 6.6. If a closure plan must be amended, the Permittees shall complete all closure activities in accordance with the schedule in the Department-approved closure plan, including all amendments.

6.3.3 Closure Schedule

Closure of each Permitted Unit shall comply with the schedule presented in Table 6.1 (*Closure Schedule*) and the additional requirements in each Unit-specific closure plan in Attachment G.

TABLE 6.1
Closure Schedule

Closure Activity	Schedule
Notify the Department of the initiation of closure.	Day 0
Remove all hazardous and mixed wastes. Remove any solid waste that adversely interferes with closure activities.	No later than Day 90
Conduct records review	After initiating closure and before Structural Assessment
Conduct structural assessment	After removal of all wastes and before decontamination
Submit the records review and structural assessment report to the Department, and if necessary as a result of the records review and structural assessment, submit a request to modify the Closure Plan	After conducting the records review and structural assessment and before decontamination
Complete all closure activities	No later than Day 180 after closure is initiated or no later than specified in the Department-approved Closure Plan (including any Department –approved amendments), whichever is later.
Submit final Closure Report and Certification to the Department.	No later than 60 days after completing closure activities
Completion of closure	After Department approval of the Closure Report and certification.

Note: The schedule above indicates calendar days in which the listed activities shall be completed from the day closure activities are initiated. Some activities may be conducted simultaneously.

6.3.4 Removal of Waste

The Permittees shall remove all hazardous and mixed waste from the Permitted Unit within 90 days of initiating closure at a Unit, and shall also remove any solid waste that adversely interferes with closure activities (*see* 40 CFR § 264.113(a)(1) and (2)).

6.3.5 Records Review and Structural Assessment

During closure the Permittees shall conduct a records review and structural assessment of the Permitted Unit and shall submit the review and assessment in the form of a written report to the Department for approval according to the schedule in Table 6-1. If the records review and

structural assessment report is disapproved by the Department, the Permittees shall correct the deficiencies identified by the Department, and if required by the Department, amend the Closure Plan for the Permitted Unit that is to be closed.

6.3.5.1 Records Review

The Permittees shall review the Operating Record for the Permitted Unit to perform two functions: 1) the identification of all hazardous and mixed wastes and hazardous constituents of concern managed at the Permitted Unit [as defined in Permit Section 6.5(1)], and 2) the identification of all potential releases at the Unit.

The Permittees shall prepare a written report that describes the record review process and the results of that review so the Department may be assured of the thoroughness of the review. The Permittees shall, as a result of the records review update the list of constituents of concern. The Permittees shall revise the Sampling and Analysis Plan (SAP) to accurately and completely reflect all constituents of concern managed at the Permitted Unit during the operating life of the Unit. If the list of constituents of concern would be updated only by adding new constituents, then the Permittees shall inform the Department of this fact in writing in the report for the records review. If the list of constituents of concern would be updated to eliminate one or more constituents, then the Permittees must update the list of constituents of concern in the SAP via an amendment of the closure plan in accordance with Permit Section 6.6.

The review of inspection logs and records associated with the implementation of the contingency plan shall be used to determine whether any spills, releases, defects, deterioration, or damage (*e.g.,* cracks in the flooring) has occurred at the Permitted Unit during the time hazardous or mixed waste was managed at the Unit that may have resulted in contamination of structures, equipment, or the environment. If the Operating Record indicates any such incident(s), the Permittees shall include in the written report a description of the location, dates, the nature of the release, and the types and volumes of waste or materials involved in the incident(s), and shall revise the SAP in accordance with Permit Section 6.6 to include the location of the incident and applicable sampling procedures.

The records review shall be completed before initiation of the structural assessment.

6.3.5.2 Structural Assessment

The structural assessment is a visual inspection and evaluation of the Permitted Unit's physical condition, with the intent of identifying areas of contamination or potential contamination. The Permittees shall conduct a structural assessment by evaluating the Permitted Unit for evidence of a release (*e.g.,* stains) or damage (*e.g.,* cracks, gaps) to the flooring, containment structures, building materials, fixtures appurtenant thereto, or outdoor storage pads and driving surfaces. If the structural assessment reveals any evidence of a release or damage the Permittees shall, in accordance with Permit Section 6.6, amend the SAP to incorporate these locations for sampling and to include appropriate sampling procedures.

The Permittees shall notify the Department at least 30 days prior to conducting the assessment to provide the Department the opportunity to participate in the assessment. The structural assessment shall be conducted after wastes have been removed from the Permitted Unit, such that structural surfaces are visible, and before beginning any closure decontamination

procedures. The Permittees shall prepare a written report that describes the assessment conducted and the results of the assessment so the Department may be assured of the thoroughness of the assessment.

6.3.6 Decontamination and Removal of Structures and Equipment

During closure of a Permitted Unit the Permittees shall decontaminate or remove all contaminated structures and equipment in accordance with this Permit Part and the Unit-specific closure plan in Attachment G (*Closure Plans).*

6.3.6.1 Decontamination

Pressure-washing or steam-cleaning shall be the sole methods used by the Permittees to decontaminate the exposed interior surfaces of structures, including but not limited to floors, walls up to 11 feet from the floor, windows, doors, and ceilings lower than 11 feet high. If a release is known to have impacted walls or ceilings higher than 11 feet from the floor, such walls or ceilings shall be decontaminated. Large pieces of equipment shall also be decontaminated via pressure-washing or steam-cleaning. Small hand tools shall be decontaminated utilizing the decontamination procedures for sampling and measuring equipment at Permit Section 8.10.2.11. Decontamination and verification sampling is not required for the internal components of equipment or structures if there is no evidence that a release has impacted such internal components.

The Permittees may propose an alternative decontamination method in an amended closure plan in accordance with 40 CFR § 264.112(c).

6.3.6.2 Removal

The Permittees may remove and transport off-site any structure or piece of equipment associated with a Permitted Unit instead of decontaminating the surfaces of these components and conducting decontamination verification.

Components proposed to be decontaminated in Permitted Unit-specific closure plans but that are unable to be sufficiently decontaminated may be removed during closure. This removal shall not require a modification to the closure plan but instead shall be described in the closure report identified at Permit Section 6.10.

Removed materials deemed waste shall be managed in accordance with Permit Section 6.9.

6.3.7 Verification Sampling of Structures and Equipment

The Permittees shall, after decontamination, collect samples to verify that the surfaces of structures and equipment to remain in place at a Permitted Unit have been decontaminated to meet the clean closure criteria specified at Permit Section 6.2.1. The Permittees shall at closure collect the type and quantity of samples at the locations required by this Permit Part and as specified in Permitted Unit-specific closure plan sampling and analysis plans (SAPs) at Attachment G.

Wet-wipe sampling shall be used to verify surface decontamination of structures and equipment and shall be conducted in accordance with Permit Section 6.3.10.1. For all constituents of

concern, the clean closure criteria will be considered achieved when wet-wipe sample analyses demonstrate constituent concentrations do not exceed background levels or are shown by risk assessment under a variance (see Permit Section 6.7) that the level of decontamination accomplished is protective of human health and the environment. In areas where wet-wipe sampling is to be conducted, background levels for a Permitted Unit shall be established through wet-wipe sampling of an area in the Permitted Unit that was not used for the management of hazardous or mixed wastes. Method detection limits must be the lowest practicable levels that can be achieved by a typical laboratory conducting analysis under EPA SW-846 methods.

If the first-time decontamination verification analysis associated with structures and equipment reveals concentrations that fail to meet the aforementioned criteria for organic and inorganic constituents of concern, the Permittees shall again decontaminate the associated component and again verify that decontamination. If after two attempts to decontaminate a particular component, verification analysis still fails to meet the criteria for constituents of concern the Permittees may petition the Department for a variance under Permit Section 6.7, remove the component from the Facility, or comply with Permit Section 6.2.2.

The Permittees may collect wipe samples for radionuclide analysis for use as indicators of contaminant releases in Units where radionuclides were stored or treated. The Permittees shall not, however, use these as surrogates for validation of attainment of closure at a Permitted Unit.

Decontamination verification of structural surfaces shall be accomplished via the sampling and analysis of discrete samples. The Permittees shall collect at least one wet-wipe sample for each large piece of equipment or fixture at a Permitted Unit.

Wipe samples for equipment or fixtures with surface areas of no greater than 10 ft^2 may be composited for the purpose of laboratory analysis on a batch basis not to exceed 10 pieces of equipment or fixtures per batch. If a composite sample fails to meet the criteria for one or more constituents of concern, all equipment or fixtures in the batch represented by the composite sample shall be decontaminated again and decontamination verification repeated for the constituent(s) of concern that did not meet the criteria. If after two attempts to decontaminate a particular batch of equipment or fixtures, verification analysis still fails to meet the criteria for one or more constituents of concern, the Permittees may petition the Department for a variance under Permit Section 6.7, remove the items in the batch from the Permitted Unit and manage them in accordance with Permit Section 6.9, or comply with Permit Section 6.2.2.

Except as provided below for volatile organic compounds (VOCs), decontamination verification samples shall be collected and analyzed for all of the constituents of concern listed in the SAP for each of the Permitted Unit-specific closure plans.

Structure surface wipe sampling frequencies are one sample:

1. Every 900 ft^2;
2. On structure surfaces with an area less than 900 ft^2 (*e.g.*, the floor, ceiling lower than 11 feet and each wall up to 11 feet in a small room);
3. In each designated indoor loading and unloading zone as the sample for the applicable 900 ft^2 area;
4. At the lowest level of each sump or secondary containment in the interior of a structure; and
5. At other locations as required by the Department.

To verify decontamination for VOCs, the Permittees may decontaminate the surfaces of structures and equipment a minimum of two times in lieu of conducting sampling and analysis for VOCs.

6.3.8 Sampling of Soil and Base Material

At closure the Permittees shall sample native soils associated with Permitted Units to determine the presence and concentrations of constituents of concern. This soil sampling shall in many cases require drilling through the outdoor storage pads and driving surfaces to access the soil. Base materials associated with (*i.e.*, above) a soil sample found to be contaminated shall be considered contaminated, except as provided below regarding asphalt pavement.

Soils shall undergo laboratory analysis to determine concentrations of constituents of concern relative to the clean closure criteria of Permit Section 6.2.1 for environmental media. Soil sampling frequency shall be:

A single native soil sample at a depth of 0 to 6 inches at the following locations:

1. Every 2,500 ft^2 below outdoor pads and driving surfaces;
2. Below designated outdoor loading and unloading zones as the sample for the applicable 2,500 ft^2 area;
3. Below all buried pipe joints of piping carrying waste or waste residuals;
4. Below every 30 linear feet along the axis of any in-ground open or covered drainage system carrying waste or waste residuals; and
5. At other locations as required by the Department.

Two native soil samples, one at a depth of 0 to 6 inches and another at 12 inches:

1. At each location where storm water discharges directly off of an outdoor paved surface that was used for waste handling, storage, treatment, loading and unloading;
2. At the lowest level of each outdoor sump or catchment basin;
3. At the lowest level of each outdoor fixed secondary containment area;
4. At the location of any spill or release of hazardous or mixed waste or hazardous constituents if not previously sampled when the spill or release was remediated, and if another release has not occurred or was unlikely to occur at the same location, and the supporting analytical data are provided to the Department in the records review and structural assessment report; and
5. At other locations as required by the Department.

Base materials found to be contaminated with constituents of concern are subject to the clean up levels and risk assessment procedures for soil specified at Permit Sections 8.4.3, 8.4.4, and 8.4.5 to determine if they should be removed or otherwise remediated to protect human health and the environment. Base material samples shall be discrete and representative of the materials being sampled. The fraction of base materials that must be analyzed shall be that portion that passes a # 4 screen.

Soil and base materials samples must include a fraction to be analyzed for VOCs unless the Permittees can demonstrate that VOCs were never a hazardous or mixed waste managed at any time at the Permitted Unit or a hazardous constituent of such waste.

Soil and base materials under asphalt pavement shall not be considered contaminated if:

1. the only constituents of concern present are those that occur naturally or are constituent(s) of asphalt;
2. the records review and structural assessment did not indicate any potential releases that contaminated or could have contaminated the soil or base material; and,
3. the constituents of concern in soil and base materials do not exceed naturally occurring background concentrations or concentrations within the asphalt, whichever is greater.

If a release of hazardous or mixed waste or a hazardous constituent is discovered in soil or base materials, the Permittee shall abide by the release notification requirements at Permit Section 8.3.3 and the closure plan amendment requirements of Permit Section 6.6.

6.3.9 Removal of Contaminated Soil or Base Materials

For inorganic constituents of concern, soil sampling results shall be compared to the approved background levels for surface soil at the Facility to determine whether contamination is present.

The Permittees shall ensure that soils and base materials (*e.g.*, gravel) at a Permitted Unit that are contaminated with constituents of concern that pose an unacceptable risk to human health or the environment based on the closure performance standards in Permit Section 6.2 are removed from the Permitted Unit. The complete removal of such soil and base materials shall be verified by the Permittees through sampling and analysis to demonstrate that the vertical and horizontal extent of all such soil and base materials have been removed.

If the contaminated soil or other environmental media that pose an unacceptable risk to human health or the environment (i.e., soil or other media that do not meet the clean closure criteria in Permit Section 6.2.1) cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8 and Permit Part 8.

Removed soils or materials deemed waste shall be managed in accordance with Permit Section 6.9.

6.3.10 Other Methods and Procedures

The Permittees shall document closure activities as specified at Permit Section 8.10.2.14.i. The Permittees shall manage wet-wipe and soil samples as specified at Permit Section 8.10.2.9. The Permittees shall at closure abide by the requirements for analyses at laboratories as specified at Permit Section 8.10.3.

6.3.10.1 Wet-Wipe Samples

Wet-wipe sampling shall be accomplished using a wipe material saturated with an appropriate solvent rubbed with consistent pressure over a consistent surface area. The wipe material must be a glass fiber cloth. The appropriate solvent is constituent or compound specific and must conform to Table 6-2. The appropriate amount of solvent shall be provided by the contract laboratory and shall conform to ASTM Standard E1792. The surface area of the wipe sample must be 100 cm^2 and must be an area not previously used for the collection of a wipe sample.

To ensure a consistent sampling surface area the Permittees shall utilize a template or chalk that will not contaminate the sample. The wet-wipe sample shall be collected within the entire

sample area by rubbing that area first in one direction using firm equal pressure. One side of the full wipe shall be used for the first pass. A second pass perpendicular to the first shall be made over the sample area using the wipe cloth folded in half with the side of the cloth used for the first pass inside the fold. A third pass shall be made following the procedures for the first two passes. Upon completion of wipe sampling the sample shall be sealed in an appropriate container.

Table 6-2

Analytical Parameter	Required Solvent[b]	Required Analytical Method[a]
Metals	de-ionized water	6010/6020
Mercury	de-ionized water	7470/7471
SVOCs	acetone/hexane	8270
VOCs	acetone/hexane	8260
PCBs	Isooctane	8080/8082
High Explosives	Acetonitrile	8330
Dioxin/Furan Congeners	Hexane	8280/8290
Herbicides	Isooctane	8150/8151
Cyanide	de-ionized water	9010/9012

a Methods from EPA SW-846 as revised and updated

b Required solvent to be determined at the time of closure according to the current analytical method from SW-846.

6.3.10.2 Soil Samples

The Permittees shall collect soil samples using the most effective, proven, and practicable method for recovery of samples and potential contaminants. The discrete soil samples collected shall be representative of the media being investigated.

Hollow-stem auger or direct push technology methods are the preferred methods for collecting soil samples. Trenching or hand augering are also appropriate sampling methods. If hollow-stem augers are used, a decontaminated split-barrel sampler lined with brass sleeves shall be used to obtain samples. Relatively undisturbed discrete base material and soil samples shall be obtained during the advancement of each boring for the purpose determining the base material/soil interface. The drilling and sampling equipment shall be properly decontaminated before collecting each sample.

Cuttings, cores, or other samples obtained from borings shall be screened in the field for evidence of potential contamination. Screening shall consist of visual examination and

headspace vapor screening for VOCs. Headspace vapor screening for VOCs shall be conducted in accordance with Permit Section 8.10.2.4.vi. Field screening results shall be recorded on the boring logs. Soil samples shall be collected at the location specified in the unit-specific closure plans and at the locations and depths specified at Permit Section 6.3.8. The sample locations shall be measured to the nearest foot and be recorded on a scaled site map upon completion of each boring. Both sample information (*e.g.,* depth) and visual observations of the cuttings and core samples shall be recorded on the boring log. Site attributes (*e.g.*, soil sample locations, outfalls, pertinent structures) shall be located to the nearest foot on the site map.

6.3.10.3 Quality Assurance

Both soil and wipe samples shall be evaluated for associated data quality assurance. Field duplicates will be collected at a rate of ten percent of the number of environmental samples. The Permittees shall collect and analyze equipment blanks from all sampling apparatus at a frequency of ten percent of the number of environmental samples if disposable sampling equipment is not used. The Permittees shall collect field blanks at a frequency of one per day. Reagent blanks shall be used if analytical procedures requiring reagents are employed in the field as part of the investigation or monitoring program. Blanks and duplicates shall be submitted for laboratory analyses associated with the project-specific media being sampled. Data shall be validated and evaluated for quality in accordance with Permit Section 8.10.3.2.

6.4 CLOSURE PLANS

Closure plans for the Permitted Units must include the steps necessary for each Unit to be closed in accordance with this Permit Part and 40 CFR §§ 264.112(b)(4), 264.114, 264.178 as applicable, and 264.601 through 264.603 as applicable. The Unit-specific closure plans are located in Permit Attachment G (*Closure Plans*). The closure plans shall at a minimum include all unique closure procedures, an anticipated closure schedule, and a sampling and analysis plan (SAP) specifying the analytes to be sampled for and specific sampling locations. Closure Plans shall also contain the information specified at 40 CFR § 264.112(b).

6.5 SAMPLING AND ANALYSIS PLANS

SAPs shall include provisions to verify decontamination of the surfaces of structures and equipment; and to determine whether or not a release of hazardous or mixed wastes or hazardous constituents to any environmental media has occurred.

All SAPs shall, at a minimum, include:

1. *List of Constituents of Concern.* A list of hazardous and mixed waste or hazardous constituents to be sampled and analyzed for shall be included in the SAP of the unit-specific closure plan for each Permitted Unit. The list shall include all Hazardous Wastes and Mixed Wastes and hazardous constituents known or likely to have been managed at the Permitted Unit, including those associated with the EPA waste codes identified in the Permittees' Part A application (see also Permit Attachment B).
2. *Site Plan for Decontamination Verification and Soil Samples.* The site plan shall include a figure or figures depicting the boundaries of the Permitted Unit and sampling locations as required at Permit Sections 6.3.7 and 6.3.8.

3. *Type of Samples.* The type of samples to be collected (*e.g.*, wipe, soil) at each sampling location.
4. *Sampling Methods.* A description of the approved *EPA SW-846,* ASTM, or other sampling methods and procedures that will be used to collect each type of sample.
5. *Analytical Methods.* A description of the approved *EPA SW-846* laboratory analytical methods and associated method detection limits. Method detection limits shall be commensurate with the clean closure criteria at Permit Section 6.2.1.
6. *Quality Assurance and Quality Control Procedures.* The SAP must include a description of the quality assurance and quality control (QA/QC) procedures to be used, including but are not limited to:
    a. field and laboratory quality control samples (*e.g.*, duplicates, trip blanks, equipment blanks); and
    b. a description of all sample preservation, handling, labeling, and chain-of-custody procedures.
7. A description of methods for decontamination of re-usable sampling equipment; and,
8. A description of the management of waste derived from the sampling activities.

6.6 AMENDMENT TO CLOSURE PLAN

The Permittees shall amend a Permitted Unit's closure plan whenever:

1. New environmental media sampling locations are determined or if one or more constituents of concern (Permit Section 6.5(1)) are eliminated from the SAP as a result of the Records Review and Structural Assessment;
2. Conditions in 40 CFR § 264.112(c)(2) exist; or
3. The Permittees are unable to achieve clean closure.

If necessary, the Permittees shall amend a Permitted Unit's closure plan at closure to correctly and completely:

1. Identify all constituents of concern as specified in Permit Section 6.5(1); and
2. Identify the laboratory analytical method detection limits for all constituents of concern.

Amendment of a Closure Plan shall be performed in accordance with 40 CFR § 264.112(c).

If a closure plan must be amended, the Permittees shall submit a permit modification request to seek authorization of a change in an approved Permitted Unit-specific closure plan in accordance with 40 CFR § 270.42. The request must include a copy of the amended closure plan and all proposed modifications to the plan.

6.7 PETITION FOR A VARIANCE TO CLEAN CLOSURE CRITERIA

The Permittees may seek the Department's approval of a variance from the decontamination verification requirements for organic and inorganic constituents of concern in Permit Section 6.3.7 by submitting to the Department a written request for a determination that the attainment of the requirement is impracticable because of the inherent properties of the materials undergoing

wipe sampling. The Department would consider a risk-based demonstration of attainment if the level of risk for organic and inorganic constituents of concern is based on an unrestricted human exposure scenario.

The request shall include, but not be limited to, the following:

1. A statement of the proposed variance;
2. A discussion of decontamination and sampling activities conducted in accordance with the closure plan and the associated analytical results;
3. The analytical or other data demonstrating the effectiveness of decontamination;
4. The analytical or other data demonstrating the Permittees' inability to attain the requirements under Permit Section 6.3.7;
5. A discussion of the properties of the equipment or surface pertinent to the requested variance and all analytical or other data demonstrating the chemical or physical properties of the equipment or surface that inhibit attainment of the requirements;
6. A justification for why further decontamination beyond the requirements in the closure plan would not be effective;
7. All other supporting documentation and analyses; and
8. Other information requested by the Department.

6.8 CORRECTIVE ACTION

If after removal of contaminated soil or base materials in accordance with Permit Section 6.3.8 the Permittees find the soil or other materials (*e.g.*, base materials) continue to pose an unacceptable risk to human health and the environment, the Permittees shall initiate and conduct corrective action in accordance with Permit Section 8.8.5, and shall amend the applicable closure plan in accordance with Permit Section 6.6 to describe the proposed corrective action. The proposed amended closure plan shall identify and describe the actions necessary to determine both the lateral and vertical extent of contamination of any release and obtain any other information necessary to determine the nature and risk of the contamination to human health and the environment and to choose an appropriate remedial action.

6.9 WASTE GENERATED DURING CLOSURE

By removing or decontaminating any structures, equipment, soil, or base materials during closure the Permittees may become a generator of waste. The Permittees shall manage those wastes in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

6.10 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure activities at a Permitted Unit, the Permittees shall submit a closure report (Report) for the Unit to the Department for review and approval. The Report shall document that the Permitted Unit has been closed in compliance with this Permit Part and the approved Unit-specific closure plan. A certification that is signed by the Permittees and by an independent New Mexico licensed professional engineer that the Unit was closed in accordance with the specifications in the approved closure plan must be included with the Report (*see* 40 CFR § 264.115).

The Report shall also contain:

1. A summary of all closure activities conducted, including at a minimum:
    a. the results of all investigations;
    b. remediation waste management;
    c. decontamination and removal activities; and
    d. sampling activities.
2. A discussion of any variance from the activities previously approved in a closure plan and the reason for the variance;
3. A detailed presentation of sampling results, including:
    a. sample identification;
    b. sampling location;
    c. laboratory analytical data, including any data qualifiers;
    d. method detection limit for each analyte;
    e. field and analytical laboratory quality control data
    f. identification of analytical procedure; and
    g. identification of analytical laboratory.
4. A discussion of data validation;
5. The location of supporting documentation, including:
    a. field logbooks;
    b. laboratory sample analysis reports;
    c. QA/QC documentation;
    d. chain-of-custody forms; and
    e. waste manifest.
6. The location of storage or disposal of hazardous and mixed waste resulting from closure activities; and
7. A copy of the Human Health and Ecological Risk Assessment Reports, if a risk assessment was necessary.

PERMIT PART 7 POST-CLOSURE CARE

7.1 GENERAL PROVISIONS FOR POST-CLOSURE CARE

The Permittees shall conduct all post-closure care activities at the Permitted Units identified in Attachment J (*Hazardous Waste Management Units)* Table J-2 (*Hazardous Waste Management Units Undergoing Post-Closure Care*) in accordance with this Permit Part, the provisions in 40 CFR §§ 264.117 through 264.120, which are incorporated herein by reference, and in accordance with the provisions of a Department-approved post-closure plan for the unit developed pursuant to Permit Section 7.1.1. (*See* 40 CFR § 264.117(d)).

For the Corrective Action Management Unit (CAMU), the Permittees shall conduct all post-closure activities in accordance with this Permit Part, Permit Section 7.3, the provisions in 40 CFR §§ 264.117 through 264.120, and in accordance with Permit Attachment H.

In accordance with 40 CFR § 264.117(a)(1), post-closure care for any Permitted Unit subject to these requirements must begin after completion of closure of the unit, continue for 30 years after that date, and must consist of at least the following:

1. Monitoring and reporting in accordance with the applicable requirements of 40 CFR Part 264, Subparts F, N, S, and X; and
2. Maintenance and monitoring of waste containment systems in accordance with the applicable requirements of 40 CFR Part 264, Subparts F, N, S, and X.

Any time preceding closure of a Permitted Unit subject to post-closure care requirements, or at any time during the post-closure period, the Department may, in accordance with the permit modification procedures in 40 CFR Parts 124 and 270:

1. Shorten the post-closure care period applicable to the Permitted Unit if all disposal units have been closed, if it is found that the reduced period is sufficient to protect human health and the environment; or
2. Extend the post-closure care period applicable to the Permitted Unit if it is found that the extended period is necessary to protect human health and the environment

(*See* 40 CFR §§ 264.117(a)(2)(i) and (ii)).

7.1.1 Post-Closure Plan

The Permittees shall ensure that the post-closure plan identifies all the activities after closure of each Permitted Unit for which clean closure is not achieved, and the frequency of these activities, including but not limited to:

1. A description of the planned monitoring activities and frequencies at which they will be performed to comply with 40 CFR Part 264, Subparts F, N, S, and X;
2. A description of the planned maintenance activities, and frequencies at which they will be performed to ensure, at a minimum:
    a. the integrity of the cap and final cover or other containment systems, if applicable, in accordance with the requirements of 40 CFR Part 264, Subparts F, N, S, and X;

b. the function of the monitoring equipment in accordance with the requirements of 40 CFR Part 264, Subparts F, N, S, and X;

3. The name, address and phone number of the person(s) or office to contact regarding the unit during the post-closure care period;
4. Sampling and analysis of waste, contaminated media, or both, during the post-closure period;
5. Security requirements during the post-closure period;
6. Inspection requirements, including schedules;
7. Alternative requirements, if any, under 40 CFR § 264.110(c), that apply to the closed unit, or a reference to the enforceable document containing those requirements; and
8. Post-closure plans shall define the beginning date and duration of post-closure care in accordance with this Permit Section 7.1. (*See* 40 CFR §§ 264.118(a) and (b)).

After certification of final closure has been approved by the Department, the person or office specified in Section 7.1.1(3) of this Permit Part shall keep the approved post-closure plan during the remainder of the post-closure care period. (*See* 40 CFR § 264.118(c)).

7.1.2 Amendment of the Post-Closure Plan

At any time during the post-closure care period, the Permittees may submit a written request to the Department to approve a permit modification to amend the requirements of this Permit Part or the requirements of an approved post-closure plan. The Permittees shall submit a written request for such a permit modification whenever modifications are needed because of changes in regulatory requirements or if modifications are needed to ensure protection of human health or the environment.

The Permittees shall submit a request for a permit modification in accordance with 40 § CFR 264.118(d). The written request must include a copy of the proposed amended post-closure plan for review and approval by the Department.

7.2 NOTICES, CERTIFICATIONS, AND RECORDS FOR POST-CLOSURE CARE

7.2.1 Notification Requirements

The Permittees shall maintain in the Facility Operating Record copies of all documentation submitted to the local zoning authority or the authority with jurisdiction over local land use. For units closed with wastes in place, no later than 60 days after certification of closure the Permittees shall submit to the local zoning authority, or the authority with jurisdiction over local land use, and to the Department a record of the type, location, and quantity of hazardous wastes and hazardous constituents remaining within each Permitted Unit. (*See* 40 CFR §§ 264.119(a). Such a record has already been submitted by the Permittees for the CAMU and does not need to be resubmitted when this Permit becomes effective.

7.2.2 Record Requirements

The Permittees shall maintain documentation of closure of all hazardous waste management units. (*See* 40 CFR § 264.119(b) and 40 CFR § 270.32(b)(2)).

For Permitted Units subject to post-closure care, the Permittees shall record a notation on the deed to the Facility property, or on some other instrument that is normally examined during the title search, that will in perpetuity notify any potential purchaser of the property of the following:

1. The land has been used to manage hazardous wastes;
2. Its use is restricted under 40 CFR Part 264, Subpart G; and
3. The survey plat and record of the type, location, and quantity of hazardous wastes managed at the Permitted Unit at the Facility has been filed with the Department.

The Permittees shall maintain training, operating, inspection and monitoring, and other required records. (*See* 40 CFR 264.73).

The Permittees shall maintain copies of all reports submitted to the Department during post-closure care period until the end of post-closure care. (*See* 40 CFR §§ 264.119(b)(1) and 270.32(b)(2)).

7.2.3 Completion of Post-Closure Care Requirements

No later than 60 days after completion of the post-closure care period for a hazardous waste management unit for which post-closure care is required, the Permittees shall submit to the Department a certification that the post-closure care for the hazardous waste management unit was performed in accordance with the requirements of the approved Post-Closure Plan developed pursuant to Permit Section 7.1.1, and for the CAMU, Permit Attachment H. The certification must be signed by the Permittees and an independent, New Mexico registered professional engineer. Documentation supporting the independent, registered professional engineer's certification must be furnished to the Department in conjunction with the certification. (*See* 40 CFR §§ 264.120 and 270.32(b)(2)).

7.3 POST-CLOSURE CARE OF THE CAMU

In addition to those specified in Permit Section 7.1, the Permittees shall comply with the requirements at 40 CFR § 264.552(e)(6)(v). As part of the requirements in this Permit, the Permittees shall conduct the following activities at the CAMU to protect human health and the environment:

1. Maintain the integrity and effectiveness of the final cover by making repairs as necessary to correct the effects of settling, subsidence, erosion, plant or animal intrusion, or other events that compromise the final cover;
2. Maintain and monitor the LCRS and the VZMS as specified herein;
3. Use engineering controls to minimize erosion damage to the final cover from run-on and run-off of surface water;
4. Maintain fencing, security signs, and locks;
5. Maintain training, operating, inspection and monitoring, and other required records; and
6. Submit an annual report to the Department in accordance with Permit Attachment H, Section H.9.

PERMIT PART 8 CORRECTIVE ACTION

8.1 CORRECTIVE ACTION REQUIREMENTS UNDER THE CONSENT ORDER

The Department and the Permittees have agreed to a Compliance Order on Consent (Consent Order) dated April 29, 2004, which requires the Permittees to conduct corrective action at all solid waste management units (SWMUs) and Areas of Concern (AOCs), at the Facility to fulfill the requirements of 40 CFR § 264.101. The Consent Order is an enforceable document pursuant to 40 CFR §§ 264.90(f), 264.110(c), and as defined in 40 CFR § 270.1(c)(7). Nothing in this Permit Part shall be construed to constitute a change to the Consent Order.

8.1.1 Integration with Consent Order

The Permittees shall conduct corrective action under this Permit (or other enforceable document) rather than the Consent Order, in the following circumstances:

1. New releases and newly discovered releases of hazardous waste or hazardous waste constituents from hazardous waste management units at the Facility;
2. At units undergoing closure and post closure care under 40 CFR Part 264, Subpart G, as they apply to Permitted Units at the Facility;
3. Implementation of the controls, including long-term monitoring, for any Solid Waste Management Unit (SWMU), Area of Concern (AOC), or hazardous waste management unit on Attachment K, Table K-3;
4. Releases of hazardous wastes or hazardous constituents that occur or are discovered after the date on which the Consent Order terminates.

(*See* § III.W.1 of the Consent Order).

The Permittees shall conduct corrective action as necessary to protect human health and the environment from any releases of hazardous waste or hazardous waste constituents pursuant to this Permit and in accordance with §§ 74-4-4(A)(5)(h) and (i) and 74-4-4.2(B) of the HWA and Section 3004(u) and (v) of RCRA, 42 U.S.C. § 6924(u) and (v) and 40 C. F. R. Part 264, Subparts F and G. Corrective action for releases from hazardous waste management units that commingle with releases originating from other sources undergoing corrective action under the Consent Order shall be conducted under the Consent Order. Any SWMU or AOC for which corrective action is required that is not subject to corrective action under the Consent Order shall be subject to corrective action under this Permit Part and 40 CFR §§ 264.100 and 264.101, which are incorporated herein by reference. The status of a SWMU or AOC will be indicated through placement in the appropriate Table in Permit Attachment K following the Class 3 permit modification process as specified in Permit Section 8.7.

8.2 GENERAL REQUIREMENTS

8.2.1 Identification and Status of SWMUs, AOCs and Hazardous Waste Management Units

Permit Attachment K, Table K-1 (SWMUs and AOCs Requiring Corrective Action under the Consent Order) lists the SWMUs and AOCs at the Facility for which corrective action is required under the Consent Order; Attachment K, Table K-2 (SWMUs and AOCs Requiring Corrective Action under the Permit) identifies the SWMUs, AOCs, and hazardous waste management units for which corrective action is required under this Permit. Table K-1 will be modified as appropriate to include any newly identified SWMUs, AOCs, and releases from hazardous waste management units for tracking purposes. Releases not associated with SWMUs or hazardous waste management units will be designated as AOCs on Tables K-1 and K-2. Attachment K, Table K-3 (Corrective Action Complete with Controls) lists the SWMUs, AOCs, and hazardous waste management units for which corrective action is complete with controls.

Permit Attachment K, Table K-4 (Corrective Action Complete without Controls) provides a listing of the SWMUs, AOCs, and hazardous waste management units for which corrective action is complete without controls and that do not require monitoring.

Attachment J, Tables J-1 through J-3 (Active Portion of the Facility), lists the hazardous waste management units at the Facility and their status (e.g., permitted operating, closed).

8.3 GENERAL CONDITIONS

8.3.1 Corrective Action Beyond the Facility Boundary

The Permittees shall notify the Department, orally and in writing in accordance with Permit Section 1.9.9.4, upon discovering that a release of hazardous waste or hazardous constituents has migrated beyond the Facility boundary or has the potential to migrate beyond the Facility boundary.

In the event that hazardous waste or hazardous constituents migrate beyond the Facility boundary, the Permittees shall implement corrective action beyond the Facility boundary as necessary to protect human health and the environment, unless the Permittees demonstrate to the Department that, despite the Permittees' best efforts, the Permittees are unable to obtain the necessary permission to undertake such actions. The Permittees are not relieved of any responsibility to clean up a release that has migrated beyond the Facility boundary where off-site access has been denied. On-site measures to address such releases shall be taken, to be determined on a case-by-case basis (*see* 40 CFR § 264.101(c)).

8.3.2 Off-Site Access

To the extent that any corrective action requirement of this Permit requires access to property not owned or controlled by the Permittees, the Permittees shall use their best efforts to obtain access from the present owners of such property to conduct the required activities and to request the present owners allow the Department access to such property to oversee such activities. In the event that the Permittees do not obtain such access, the Permittees shall notify the Department in writing regarding its best efforts and its failure to obtain such access.

8.3.3 Newly Discovered Releases

The Permittees shall notify the Department, orally and in writing in accordance with Permit Section 1.9.9.3., upon discovery of any previously unknown release of hazardous waste or hazardous constituents into soil, sediment, surface water, or groundwater. The Department may determine that further investigation of the release is needed. The Department may also determine that corrective action is needed to address the release. If the Department makes such a determination, it will notify the Permittees in writing.

8.3.4 Field Activities

The Permittees shall notify the Department in writing of any field sampling or other field activities undertaken pursuant to any corrective action requirement of this Permit, and shall allow the Department to collect split samples upon request of the Department. For such sampling or other field activities, the Permittees shall notify the Department no less than 15 days prior to the commencement of such sampling.

8.3.5 Health and Safety Plans

The Permittees shall prepare Health and Safety Plans for all field activities undertaken pursuant to any corrective action requirement of this Permit.

Health and Safety Plans shall include:

1. A description of the area near the planned field activity;
2. A description of the known hazards and evaluation of the risks associated with each activity conducted, including, but not limited to, on and off-site exposure to contaminants during implementation of interim or final corrective measures, site characterization, or monitoring activities;
3. A list of key personnel and alternates who are responsible for site safety, response operations, and protection of public health;
4. A delineation of the work area;
5. A description of levels of protection to be worn by personnel in the work area;
6. Procedures established to control site access;
7. Decontamination procedures for personnel and equipment;
8. Site emergency procedures;
9. Emergency medical care procedures for injuries and toxicological problems;
10. Requirements for an environmental field-monitoring program if applicable;
11. Routine and special training requirements for responders if applicable; and
12. Procedures for protecting workers from weather-related problems.

Health and Safety Plans shall be in accordance with:

1. National Institute of Occupational Safety and Health (NIOSH) Occupation Safety and
2. Health Guidance Manual for Hazardous Waste Site Activities (1985); and

3. Applicable requirements in Occupational Safety and Health Administration regulations, particularly 29 C.F.R. § 1910 and 1926.

8.3.6 Recordkeeping

The Permittees shall maintain all monitoring data, including sampling procedures, records of field measurements, laboratory analytical data, quality assurance/quality control documents, chain-of-custody records, well completion reports and periodic monitoring reports in the Facility Operating Record for a minimum of three years after the end of the operating life of the Facility and a minimum of three years after the end of any post-closure care periods.

8.4 CLEANUP LEVELS

The Department and the New Mexico Water Quality Control Commission (WQCC) have separately specified certain cleanup goals and methods of calculating cleanup levels. The Department has also specified certain reporting requirements for sites where corrective action is required in response to releases to the environment. In general, the Department has selected a human health target risk level of 10-5 for carcinogenic substances and a Hazard Index (HI) of 1.0 for non-carcinogenic substances as cleanup goals for establishing site-specific cleanup levels for one or more contaminants for which toxicological data are published. The Permittees shall follow the cleanup and screening levels described in this Permit Part in implementing the corrective action requirements of this Permit. In addition, cleanup levels for the protection of the environment shall address ecological risk consistent with the Department's guidance for assessing ecological risk as specified in Permit Section 8.5.

8.4.1 Groundwater Cleanup Levels

The cleanup levels for all contaminants in groundwater shall be the WQCC groundwater quality standards, 20.6.2.3103 NMAC, the cleanup levels for toxic pollutants calculated in accordance with 20.6.2.7.WW NMAC, and the drinking water maximum contaminant levels (MCLs) adopted by EPA under the federal Safe Drinking Water Act (42 U.S.C. §§ 300f to 300j-26) or the New Mexico Environmental Improvement Board (EIB), 20.7.10 NMAC. If both a WQCC water quality standard and an MCL have been established for an individual substance, then the lower of the levels shall be the cleanup level for that substance. The WQCC standards apply to the dissolved portion of contaminants with the exception of mercury, organic compounds, and non-aqueous phase liquids. Mercury, organic compounds, and non-aqueous phase liquids shall be evaluated based on total, unfiltered concentrations; EPA MCL standards shall apply to the total unfiltered concentrations.

The most recent version of NMED's Tap Water Screening Levels listed in Table A-1 of Technical Background Document for Development of Soil Screening Levels (as updated) shall be used to establish the cleanup level if either a WQCC standard or an MCL has not been established for a specific substance. In the absence of an NMED tap water screening level then the EPA Regional Screening Levels for Chemical Contaminants at Superfund Sites (RSLs) for tap water shall be used. If no WQCC groundwater standard or MCL has been established for a contaminant for which toxicological information is published, the Permittees shall use a target excess cancer risk level of 10-5 for carcinogenic substances and a HI of 1.0 for non-carcinogenic substances as the basis for proposing a cleanup level for the contaminant. If the background

concentration of an inorganic constituent, as established in accordance with Permit Section 8.10.6, exceeds the standard then the cleanup level is the background concentration for that specific substance. Any cleanup level based on a risk assessment must be submitted to the Department for its review and approval.

The Permittees shall give notice by e-mail to persons on the e-mail notification list in accordance with Permit Section 1.17.2.2 of a submittal to the Department under this Permit Section (8.4.1).

8.4.2 Soil and Sediment

The cleanup levels for soil and sediments shall be the cleanup levels for soil set forth in Permit Section (8.4.3). Should the Permittees be unable to achieve the Soil Cleanup Levels established under Permit Section 8.4.3, they shall conduct risk assessments in accordance with Permit Sections 8.10.4 and 8.10.5. Any cleanup level based on a risk assessment must be submitted to the Department for its review and approval.

8.4.3 Soil Cleanup Levels

The Department has specified soil-screening levels that are based on a target total excess cancer risk of 10-5 for carcinogenic substances and, for non-carcinogenic substances, a target HI of 1.0 for residential, industrial land use, and the construction worker scenarios. If the potential for migration to groundwater is applicable for a site, the Department may determine that a dilution attenuation factor (DAF) of one or greater, as calculated using the Department-approved methods, for contaminated soils is appropriate to achieve clean closure. This approach may apply at sites where the migration of contaminants through the soil column to groundwater has occurred or when the Department determines that the potential exists for migration of contaminants through the soil column to groundwater. Soil cleanup levels shall be the target soil screening levels listed in the Department's Technical Background Document for Development of Soil Screening Levels (as updated). If a Department soil screening level has not been established for a substance for which toxicological information is published, the soil cleanup level shall be established using the most recent version of the EPA RSL for residential and industrial soil for compounds designated as "n" (non-carcinogen effects) or ten times the EPA RSL for compounds designated "c" (carcinogen effects). The cumulative risk shall not exceed a total excess cancer risk of 10-5 for carcinogenic substances and, for non-carcinogenic substances, a target HI of 1.0 at sites where multiple contaminants are present.

If the current and reasonably foreseeable future land use is one for which the Department has not established soil screening levels, the Permittees may propose cleanup levels to the Department based on a risk assessment and a target excess cancer risk level of 10-5 for carcinogenic substances or an HI of 1.0, based on current and reasonably foreseeable future land use (e.g., residential, recreational, industrial, construction worker).

8.4.4 Soil Cleanup Levels for Polychlorinated Biphenyls

The soil cleanup level for PCBs is either a default concentration of 1 milligram per kilogram (mg/kg) for total PCBs or a risk-based PCB concentration level established through performing a health risk assessment using a target excess cancer risk level of 10-5 for carcinogenic substances

or an HI of 1.0. (NMED Risk-based Remediation of Polychlorinated Biphenyls at RCRA Corrective Action Sites (as updated)).

8.4.5 Surface Water Cleanup Levels

The Permittees shall comply with the surface water quality standards outlined in the Clean Water Act (33 U.S.C. §§ 1251 to 1387), the New Mexico WQCC Regulations (20.6.2 NMAC), and the State of New Mexico Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC).

8.5 ECOLOGICAL RISK EVALUATION

Screening for ecological risk shall be conducted using U.S. EPA's ECO-SSLs with the Department approval. The Permittees shall derive a screening level using the methodology in the Department's Guidance for Assessing Ecological Risks Posed by Chemicals: Screening-Level Ecological Risk Assessment (as updated). Ecological risk at each site shall be evaluated in a manner consistent with the Department's Guidance for Assessing Ecological Risks Posed by Chemicals: Screening-Level Ecological Risk Assessment (as updated) and, if appropriate, Assessing Ecological Risks Posed by Radionuclides: Screening-Level Radioecological Risk Assessment (as updated). Provided that any changes to the document are approved in advanced by the Department, procedures in the document Predictive Ecological Risk Assessment Methodology, Environmental Restoration Project, Sandia National Laboratories, NM, developed by Sandia National Laboratories/New Mexico may be used instead of the ecological screening levels cited in the guidance above. If no scientifically valid toxicological studies exist for a particular receptor and/or contaminant, the contaminant and receptor combination shall be addressed using qualitative methods.

8.6 VARIANCE FROM CLEAN-UP LEVELS

The Permittees may seek a variance from a particular cleanup level in accordance with this Permit Section (8.6).

8.6.1 Water Quality Standards

For a cleanup level based on a water quality standard set by the WQCC, the Permittees may seek approval of an alternative abatement standard in accordance with the process specified in the WQCC Regulations, 20.6.2.4103.E and F NMAC.

8.6.2 Other Cleanup Levels

For all other cleanup levels, the Permittees may seek approval of a variance from a cleanup level by submitting to the Department a written request for a determination that attainment of the cleanup level is impracticable. The request must include a demonstration that attaining the cleanup level is technically or physically impossible or otherwise impractical using potential corrective action remedies. The request shall include, at a minimum, the following:

1. A discussion of the effectiveness of potential corrective action remedies;
2. A discussion of whether the proposed variance would result in a present or future hazard to public health or the environment;

3. Proposed alternate cleanup levels that are practical, based on potential corrective action remedies and a site-specific risk assessment;
4. All supporting documentation and analyses; and
5. Any other information requested by the Department.

If the Department approves the Permittees' impracticability demonstration, it will notify the Permittees in writing, and such notice will describe the specific action to be taken by the Permittees.

The Permittees shall give notice by e-mail to persons on the e-mail notification list of a request under this Permit Section (8.6.2), in accordance with Permit Section 1.17.2.2.

8.7 PERMIT MODIFICATION FOR CORRECTIVE ACTION COMPLETE

The Permittees may submit to the Department a request for a Class 3 permit modification to change the status of a SWMU or AOC from "corrective action required" to "corrective action complete." The permit modification will move the SWMU or AOC from Attachment K (Listing of SMWUs and AOCs), Table K-1 (SWMUs and AOCs Requiring Corrective Action) to Attachment K, Table K-2 (Corrective Action Complete with Controls) or Attachment K, Table K-3 (Corrective Action Complete without Controls) pursuant to the terms of this Permit.

The Department's determination that corrective action is complete for a SWMU or AOC placed on either the Corrective Action Complete with Controls list or the Corrective Action Complete without Controls list will be subject to the Department's reservation of rights for new information or unknown conditions. In the event the Department seeks to require additional work at any SWMU or AOC contained on either of the two lists, the Department will initiate a permit modification to remove the SWMU or AOC from the corrective action complete lists.

8.7.1 Long-term Monitoring and Maintenance of SWMUs and AOCs

The Permittees shall submit a Long-term Monitoring and Maintenance Plan as part of the permit modification request, as described in Permit Section 8.7, to change the status of a SWMU or AOC from corrective action required (i.e., listed in Attachment K, Table K-1) to corrective action complete with controls (i.e., listed in Attachment K, Table K-3). The Plan shall describe the combination of ongoing measures required to ensure protection of human health and the environment, such as maintenance of physical or institutional controls, monitoring of environmental media, or other measures. Upon approval, such plans shall be included in Attachment M (Long-term Monitoring and Maintenance Plans).

8.8 CORRECTIVE ACTION PROCEDURES

The Permittees shall conduct corrective action at sites where releases of hazardous waste or hazardous constituents have occurred. If corrective action is necessary to protect human health or the environment, the Department will direct the Permittees to complete one or more of the requirements included in this Permit Section (8.8). The conditions listed below apply to all corrective action conducted under this Permit unless otherwise specified in Permit Part 6 (Closure Requirements).

8.8.1 Release Assessment

8.8.1.1 Release Assessment Report

If required by the Department, the Permittees shall submit a Release Assessment Report for newly discovered releases from any Permitted unit. Any revisions to the Release Assessment Report required by the Department shall be submitted within 90 calendar days of receipt of the Department's comments on the Release Assessment Report.

The Release Assessment Report shall, at a minimum, include the following information:

1. Location of unit(s) on a topographic map of appropriate scale, as required under 40 CFR § 270.14(b)(19);
2. Designation of type and function of unit(s);
3. General dimensions, capacities and structural description of unit(s) (supply any available plans/drawings);
4. Dates that the unit(s) was operated;
5. All available site history information;
6. Specifications of all wastes that have been managed at/in the unit(s) to the extent available. Include any available data on hazardous waste or hazardous constituents in the wastes; and
7. All available information pertaining to any release of hazardous waste or hazardous constituents from such unit(s) (to include ground water data, soil analyses, air, and surface water data).

8.8.1.2 Requirement to Proceed

The Department will review the Release Assessment Report to determine whether any further investigative action is required. The Department will notify the Permittees of the need for confirmatory sampling, if necessary, or notify the Permittees that an Investigation Work Plan is required in accordance with the requirements in Permit Section 8.8.5.1. The Department will notify the Permittees of any corrective action complete decision.

8.8.2 Interim Measures

8.8.2.1 Department-Initiated Interim Measures

Upon written notification by the Department, the Permittees shall prepare and submit an Interim Measures (IM) Work Plan where the Department determines that interim measures are necessary to minimize or prevent the migration of hazardous waste or hazardous constituents and limit actual or potential human and environmental exposure to hazardous waste or hazardous constituents while long term corrective action remedies are evaluated and implemented. The Permittees shall submit its IM Work Plan to the Department within 90 calendar days of the Department's notification, unless another time period is specified by the Department. Such interim measures may be conducted concurrently with any required corrective action. The

Permittees shall prepare and submit IM Work Plans in accordance with the work plan format included in Permit Section 8.12 (Reporting Requirements).

The Permittees shall give notice by e-mail to persons on the e-mail notification list of a submittal made under this Permit Section (8.8.2.1), in accordance with Permit Section 1.17.2.2.

8.8.2.2 Permittee-Initiated Interim Measures

The Permittees may initiate interim measures at a unit by notifying the Department, in writing, at least 30 calendar days prior to beginning the Interim Measures. The Department will approve the Permittees-initiated IM, conditionally approve the IM, or require submittal of an IM Work Plan for the Department approval prior to implementation of the IM.

The Permittees shall give notice by e-mail to persons on the e-mail notification list of a submittal made under this Permit Section (8.8.2.2), in accordance with Permit Section 1.17.2.2.

8.8.3 Emergency Interim Measures

The Permittees may determine, during implementation of site investigation activities, that emergency interim measures are necessary to address an immediate threat of harm to human health or the environment. The Permittees shall notify the Department within one business day of discovery of the facts giving rise to the threat, and shall propose emergency interim measures to address the threat. If the Department approves the emergency interim measures in writing, the Permittees may implement the proposed emergency interim measures without submitting an IM Work Plan. If circumstances arise resulting in an immediate threat to human health or the environment such that initiation of emergency interim measures are necessary prior to obtaining written approval from the Department, the Permittees shall notify the Department within one business day of taking the emergency interim measure. The notification shall contain a description of the emergency situation, the types and quantities of contaminants involved, the emergency interim measures taken, and contact information for the emergency coordinator handling the situation. The notification shall also include a written statement justifying the need to take the emergency action without prior written approval from the Department. This requirement shall not be construed to conflict with 40 CFR §§ 264.1(g)(8) or 270.61.

The Permittees shall give notice by e-mail to persons on the e-mail notification list of a submittal made under this Permit Section (8.8.3), in accordance with Permit Section 1.17.2.2.

8.8.4 IM Work Plan Requirements

The IM Work Plan shall ensure that the interim measures are designed to mitigate any current or potential threat(s) to human health or the environment and is consistent with, and integrated into, any final corrective measures at the Facility. The IM Work Plan shall include the interim measures objectives, procedures for implementation (including any designs, plans, or specifications), and schedules for implementation.

8.8.4.1 Interim Measures Implementation

8.8.4.1.i Implementation and Completion of Approved IM Work Plan

The Permittees shall implement interim measures required under Permit Section 8.8.2 in accordance with the Department-approved IM Work Plan. The Permittees shall complete interim measures within 180 calendar days of the start of implementation of the interim measure. The Permittees may submit a written request to the Department to extend the period for implementation of the interim measure. The request must provide justification for the extension and a proposed schedule for completion of the interim measure. The Department will notify the Permittees, in writing, of the approval or disapproval of the request within 30 calendar days of receipt of the IM implementation extension request.

8.8.4.1.ii Notification of Changes

The Permittees shall give notice to the Department as soon as possible of any planned changes, reductions or additions to the IM Work Plan required by the Department under Permit Section 8.8.2.1 or initiated by the Permittees in accordance with Permit Section 8.8.2.2.

8.8.4.1.iii Interim Measures Reports

The Permittees shall submit to the Department for review and approval, within 90 calendar days of completion of interim measures, an IM Report summarizing the results of interim measure implementation. The IM Report shall contain, at a minimum, the following information:

1. A description of interim measures implemented;
2. Summaries of results;
3. Summaries of all problems encountered during IM investigations;
4. Summaries of accomplishments and/or effectiveness of interim measures; and,
5. Copies of all relevant laboratory/monitoring data, maps, logs, and other related information.

8.8.5 Corrective Action Investigations

8.8.5.1 Investigation Work Plan

8.8.5.1.i Investigation Work Plan Submittal

The Permittees shall submit to the Department Investigation Work Plans for permitted or interim status units where the Department determines that corrective action is necessary to investigate releases to the environment.

8.8.5.1.ii Investigation Work Plan Requirements

Investigation Work Plans shall meet the requirements specified in Permit Section 8.12 (Reporting Requirements). Investigation Work Plans shall include schedules of implementation and completion of specific actions necessary to determine the nature and extent of contamination and the potential pathways of contaminant releases to the air, soil, surface water, and ground water. The Permittees shall provide sufficient justification and associated documentation that a release is not probable or has already been characterized if a unit or a media/pathway associated

with a unit (ground water, surface water, soil, subsurface gas, or air) is not included in an Investigation Work Plan. Such deletions of a unit, medium, or pathway from the work plan(s) are subject to the approval of the Department. The Permittees shall provide sufficient written justification for any omissions or deviations from the minimum requirements specified in Permit Section 8.12 (Reporting Requirements). Such omissions or deviations are subject to the approval of the Department. In addition, Investigation Work Plans shall include all investigations necessary to ensure compliance with 40 CFR § 264.101.

8.8.5.1.iii Historical Documents

The Permittees shall submit to the Department a summary of the historical information and assessment of potential contaminant releases relating to each unit in conjunction with the unit-specific Investigation Work Plan including the most complete, legible, extant (i.e., existing) copies of all associated photographic imprints, maps, figures, drawings, tables, attachments, enclosures, appendices and other relevant supporting documentation. Such summaries shall be submitted as separate documents and not as part of the site-specific Investigation Work Plans.

8.8.5.1.iv Investigation Work Plan Implementation

The Permittees shall implement Investigation Work Plans as approved by the Department. The Permittees shall notify the Department at least 15 days prior to any permit or corrective action-related field activity (e.g., drilling, sampling).

8.8.5.2 Corrective Action Investigation Reports

The Permittees shall prepare and submit to the Department Investigation Reports for the investigations conducted in accordance with Investigation Work Plans submitted under Permit Section 8.8.5.1. The Permittees shall submit the Investigation Reports to the Department for review and approval in accordance with the schedules included in its approved Investigation Work Plans.

The Investigation Reports shall include an analysis and summary of all required investigations conducted under this Permit. The summary shall describe the type and extent of contamination at each unit investigated including sources and migration pathways, identify all hazardous waste or constituents present in all media, and describe actual or potential receptors. The Investigation Report shall also describe the extent of contamination (qualitative and quantitative) in relation to background levels for the area. If the Investigation Report concludes that further work is necessary, the report shall include a schedule for submission of a work plan for the next phase of investigation.

8.8.5.2.i Cleanup Levels

The Investigation Reports shall identify the applicable cleanup levels in accordance with Permit Sections 8.4 through 8.6 for each hazardous waste or hazardous constituent found at each unit where corrective action is required. The Permittees shall propose in the Investigation Report or in a subsequent Risk Assessment or Corrective Measures Evaluation appropriate cleanup levels for those hazardous wastes or hazardous constituents without established cleanup levels based upon human and ecological risk.

8.8.5.2.ii Requirement to Proceed

Based upon the Department's review of the Investigation Report, the Department will notify the

Permittees of the need for further investigative action, if necessary, and inform the Permittees, if not already notified, of the need for a Corrective Measures Evaluation. The Department will notify the Permittees if corrective action is complete. If the Department determines that further investigation is necessary, the Department will require the Permittees to submit a work plan for approval that includes a proposed schedule for additional investigation(s).

8.8.5.3 Risk Assessment

The Permittees shall attain the cleanup goals outlined in Permit Sections 8.4 through 8.6. If the Department determines that the cleanup levels included in Permit Sections 8.4 and 8.5 cannot be achieved at a site, the Department will require performance of risk analyses to establish alternative cleanup levels. Such risk analyses shall be prepared in the format included in the Permit Section 8.12 (Reporting Requirements). The Permittees shall submit to the Department for approval a Risk Assessment Report in accordance with this Permit Section (8.8.5.3) according to the schedule set forth by the Department for sites where risk analyses are conducted.

8.8.6 Corrective Measures Evaluation

8.8.6.1 General

The Department will require corrective measures at a unit if the Department determines, based on the Investigation Report and other relevant information available to the Department, that there has been a release of contaminants into the environment at the site and that corrective action is necessary to protect human health or the environment from such a release. Upon making such a determination, the Department will notify the Permittees in writing. The Department will specify a date for the submittal of the necessary reports and evaluations in the written notification.

8.8.6.2 Corrective Measures Evaluation Report

Following written notification from the Department that a corrective measures evaluation is required, the Permittees shall submit to the Department for approval a Corrective Measures Evaluation Report. The Permittees shall follow the Corrective Measures Evaluation Report format outlined in Permit Section 8.12 (Reporting Requirements). The corrective measures evaluation shall evaluate potential remedial alternatives and shall recommend a preferred remedy that will be protective of human health and the environment and that will attain the appropriate cleanup goals. The Corrective Measures Evaluation Report shall, at a minimum, comply with Permit Section 8.12 (Reporting Requirements) and include the following:

1. A description of the location, status, and current use of the site;
2. A description of the history of site operations and the history of releases of contaminants;
3. A description of site surface conditions;
4. A description of site subsurface conditions;
5. A description of on- and off-site contamination in all affected media;

6. An identification and description of all sources of contaminants;
7. An identification and description of contaminant migration pathways;
8. An identification and description of potential receptors;
9. A description of cleanup standards or other applicable regulatory criteria;
10. An identification and description of a range of remedy alternatives;
11. Remedial alternative pilot or bench scale testing results;
12. A detailed evaluation and rating of each of the remedy alternatives, applying the criteria set forth in Permit Section.8.6.4 including costs for long-term monitoring and maintenance (Reporting Requirements);
13. An identification of a proposed preferred remedy or remedies;
14. Design criteria of the selected remedy or remedies; and
15. A proposed schedule for implementation of the preferred remedy.

8.8.6.3 Cleanup Standards

Following written notification from the Department that a corrective measures evaluation is required, the Permittees shall submit to the Department for approval a Corrective Measures Evaluation Report. The Permittees shall follow the Corrective Measures Evaluation Report format outlined in Permit Section 8.12 (Reporting Requirements). The corrective measures evaluation shall evaluate each of the remedy alternatives. The Permittees shall select corrective measures that are capable of achieving the clean-up standards and goals outlined in Permit Sections 8.4 through 8.6 (Clean-up Levels) including, as applicable, approved alternative clean-up goals established by a risk assessment.

8.8.6.4 Remedy Evaluation Criteria

8.8.6.4.i Threshold Criteria

The Permittees shall evaluate each of the remedy alternatives for the following threshold criteria. To be selected, the remedy alternative must:

1. Be protective of human health and the environment;
2. Attain media cleanup standards;
3. Control the source or sources of releases so as to reduce or eliminate, to the extent practicable, further releases of contaminants that may pose a threat to human health and the environment; and
4. Comply with applicable standards for management of wastes.

8.8.6.4.ii Remedial Alternative Evaluation Criteria

The Permittees shall evaluate each of the remedy alternatives for the factors described in this Permit Section (8.8.6.4). These factors shall be balanced in proposing a preferred alternative.

8.8.6.4.iii Long-term Reliability and Effectiveness

The remedy shall be evaluated for long-term reliability and effectiveness. This factor includes consideration of the magnitude of risks that will remain after implementation of the remedy; the extent of long-term monitoring, or other management or maintenance that will be required after implementation of the remedy; the uncertainties associated with leaving contaminants in place; and the potential for failure of the remedy. The Permittees shall give preference to a remedy that reduces risks with little long-term management, and that has proven effective under similar conditions.

8.8.6.4.iv Reduction of Toxicity, Mobility, or Volume

The remedy shall be evaluated for its reduction in the toxicity, mobility, and volume of contaminants. The Permittees shall give preference to a remedy that uses treatment to more completely and permanently reduce the toxicity, mobility, and volume of contaminants.

8.8.6.4.v Short-Term Effectiveness

The remedy shall be evaluated for its short-term effectiveness. This factor includes consideration of the short-term reduction in existing risks that the remedy would achieve; the time needed to achieve that reduction; and the short-term risks that might be posed to the community, workers, and the environment during implementation of the remedy. The Permittees shall give preference to a remedy that quickly reduces short-term risks, without creating significant additional risks.

8.8.6.4.vi Implementability

The remedy shall be evaluated for its implementability or the difficulty of implementing the remedy. This factor includes consideration of installation and construction difficulties; operation and maintenance difficulties; difficulties with cleanup technology; permitting and approvals; and the availability of necessary equipment, services, expertise, and storage and disposal capacity. The Permittees shall give preference to a remedy that can be implemented quickly and easily, and poses fewer and lesser difficulties.

8.8.6.4.vii Cost

The remedy shall be evaluated for its cost. This factor includes a consideration of both capital costs, and operation and maintenance costs. Capital costs shall include, without limitation, construction and installation costs; equipment costs; land development costs; and indirect costs including engineering costs, legal fees, permitting fees, startup and shakedown costs, and contingency allowances. Operation and maintenance costs shall include, without limitation, operating labor and materials costs; maintenance labor and materials costs; replacement costs; utilities; monitoring and reporting costs; administrative costs; indirect costs; and contingency allowances for the entire anticipated post-closure care or long term monitoring period. All costs shall be calculated based on their net present value. Permittees shall give preference to a remedy that is less costly, but does not sacrifice protection of health and the environment.

8.8.6.5 Approval of Corrective Measures Evaluation Report

The Department will review and approve the Corrective Measures Evaluation Report in accordance with Permit Section 8.12.6. If the Department disapproves the Corrective Measures Evaluation Report, the Department will notify the Permittees in writing of the Corrective

Measures Evaluation Report's deficiencies and specify a due date for submission of a revised Corrective Measures Evaluation Report. Upon receipt of such notification of disapproval, the Permittees shall submit to the Department, within the specified time, a revised Corrective Measures Evaluation Report that corrects the deficiencies. If the Department approves the Corrective Measures Evaluation Report, the Department will notify the Permittees in writing.

8.8.6.6 Relationship to Corrective Action Requirements

The Corrective Measures Evaluation shall serve as a Corrective Measures Study for the purposes of RCRA compliance. (*See* 55 Fed. Reg. 30875-77 (July 27, 1990) (proposed 40 CFR §§ 264.520 through 264.524)).

8.8.6.7 Statement of Basis

Upon approval of the Corrective Measures Evaluation Report, the Department will select a remedy or remedies for the unit. The Department may choose a different remedy from that recommended by the Permittees. The Department will issue a Statement of Basis for selection of the remedy, and will receive public comment on the remedy. The public comment period will extend for at least 45 days from the date of the public notice of the Statement of Basis. As provided in 20.4.1.901.A(5)(a)-(c) NMAC, the Department will provide an opportunity for a public hearing on the remedy, at which all interested persons will be given a reasonable chance to submit data, views or arguments orally or in writing and to examine witnesses testifying at the hearing. The comment period will automatically be extended to the close of the public hearing. The public hearing will follow the hearing requirements under section 20.4.1.901.F NMAC. The Department will select a final remedy and issue a response to public comments to all commenters, after the end of the public comment period. In selecting a remedy, the Department will follow the public participation requirements applicable to remedy selection under 40 CFR §§ 270.41 through 270.42 and 20.4.1.901 NMAC.

The administrative record for the Facility will be made available to the public for review at the Department's offices in Santa Fe, New Mexico. All significant written and signed comments, including e-mailed comments, will be considered by the Department prior to approving a final remedy or remedies.

The Department's decision on the final remedy or remedies shall follow the requirements under section 20.4.1.901 NMAC, Secretary's Decision. The Department will issue a response to public comments at the time of the Department's final decision.

8.8.7 Corrective Measures Implementation

8.8.7.1 General

The Permittees shall implement the final remedy selected by the Department.

8.8.7.2 Corrective Measures Implementation Plan

Within 90 days after the Department's selection of a final remedy, or as otherwise specified by the schedule contained in the approved Corrective Measure Evaluation Report or as specified by

a schedule required by the Department in the written approval notification, the Permittees shall submit to the Department for approval a Corrective Measures Implementation Plan outlining the design, construction, operation, maintenance, and performance monitoring for the selected remedy, and a schedule for its implementation. The implementation plan shall be submitted to the Department for review in accordance with the procedures in Permit Section 8.9. The Corrective Measures Implementation Plan shall, at a minimum, include the following elements:

1. A description of the selected final remedy;
2. A description of the cleanup goals and remediation system objectives;
3. An identification and description of the qualifications of all persons, consultants, and contractors that will be implementing the remedy;
4. Detailed engineering design drawings and systems specifications for all elements of the remedy;
5. A construction work plan;
6. An operation and maintenance plan;
7. The results of any remedy pilot tests;
8. A plan for monitoring the performance of the remedy, including sampling and laboratory analysis of all affected media;
9. A waste management plan;
10. A proposed schedule for submission to the Department of periodic progress reports; and
11. A proposed schedule for implementation of the remedy.

8.8.7.3 Health and Safety Plan

The Permittees shall conduct all activities in accordance with a site-specific or facility-wide Health and Safety Plan during all construction, operation, maintenance, and monitoring activities conducted during corrective measures implementation.

8.8.7.4 Progress Reports

The Permittees shall submit to the Department progress reports in accordance with the schedule approved in the Corrective Measures Implementation Plan. The progress reports shall, at a minimum, include the following information:

1. A description of the remedy work completed during the reporting period;
2. A summary of problems, potential problems, or delays encountered during the reporting period;
3. A description of actions taken to eliminate or mitigate the problems, potential problems, or delays;
4. A discussion of the remedy work projected for the next reporting period, including all sampling events;

5. Copies of the results of all monitoring, including sampling and analysis, and other data generated during the reporting period; and
6. Copies of all waste disposal records generated during the reporting period.

8.8.8 Remedy Completion

8.8.8.1 Remedy Completion Report

Within 90 days after completion of remedy, the Permittees shall submit to the Department a Remedy Completion Report. The report shall, at a minimum, include the following items:

1. A summary of the work completed;
2. A statement, signed by a registered professional engineer, or subject to approval by the Department, another competent person with appropriate expertise or professional certification, that the remedy has been completed in accordance with the Department approved work plan for the remedy;
3. As-built drawings and specifications signed and stamped by a registered professional engineer if applicable;
4. Copies of the results of all monitoring, including sampling and analysis, and other data generated during the remedy implementation, if not already submitted in a progress report;
5. Copies of all waste disposal records, if not already submitted in a progress report; and
6. A certification, signed by a responsible official of DOE/Sandia (owner/operator), stating: "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision according to a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

8.8.9 Accelerated Clean-up Process

If the Permittees identify a corrective action or measure that, if implemented voluntarily, will reduce risks to human health and the environment to levels acceptable to the Department, will reduce cost and/or will achieve cleanup of a SWMU, AOC or other contaminated location, ahead of schedule, the Permittees may implement the corrective measure as provided in this Permit Section (8.8.9), in lieu of the process established in Permit Section 8.8. The accelerated cleanup process shall be used at sites to implement presumptive remedies (*see* 61 Fed. Reg. 19432, 19439-40)(May 1, 1996) at small-scale and relatively simple sites where groundwater contamination is not a component of the accelerated cleanup, where the remedy is considered to be the final remedy for the site, and where the field work will be accomplished within 180 days of the commencement of field activities. The proposed accelerated cleanup will be documented in an Accelerated Corrective Measure Work Plan, which shall include:

1. A description of the proposed remedial action, including details of the unit or activity that is subject to the requirements of this Permit;
2. An explanation of how the proposed cleanup action is consistent with the overall corrective action objectives and requirements of this Permit;
3. The methods and procedures for characterization and remediation sample collection and analyses; and
4. A schedule for implementation and reporting on the proposed cleanup action.

The Permittees shall notify the Department of the planned accelerated corrective measure a minimum of 30 days prior to the commencement of any accelerated field activity. The notification shall include the submittal of the Plan if not already submitted to the Department.

The Permittees shall give notice by e-mail to persons on the e-mail notification list of a notification made under this Permit Section (8.8.9), in accordance with Permit Section 1.17.2.2.

8.8.9.1 Accelerated Corrective Measures Work Plan

The Permittees shall obtain approval of an Accelerated Corrective Measures Work Plan prior to implementation. The Permittees shall prepare the Work Plan in general accordance with the requirements of Permit Section 8.12 (Reporting Requirements). The Work Plan shall be submitted to the Department for review in accordance with the procedures in Permit Section 8.9. If the Department disapproves the Accelerated Corrective Measures Work Plan, the Department will notify the Permittees in writing of the Plan's deficiencies and specify a due date for submission of a revised Accelerated Corrective Measures Work Plan. The Permittees shall include an implementation schedule in the revised Accelerated Corrective Measures Work Plan.

8.8.9.2 Accelerated Corrective Measures Implementation

The Permittees shall implement the accelerated corrective measures in accordance with the approved Accelerated Corrective Measures Work Plan. Within 90 days of completion of the accelerated corrective measures, the Permittees shall submit to the Department for approval a Remedy Completion Report in a format approved by the Department in general accordance with Permit Section 8.12 (Reporting Requirements). If upon review, the Department identifies any deficiencies in the Remedy Completion Report, the Department will notify the Permittees in writing.

8.8.10 Well Completion Report

For each monitoring well or piezometer completed under this Permit, the Permittees shall submit to the Department a completion summary report within 90 days of completing installation which is to include a construction log and diagram, a boring log, and a development log. Installation shall be considered complete when all of the wells required under an investigation plan have been installed and their locations surveyed. The construction log and diagram and the boring log shall contain at a minimum the information required under Permit Section 8.11.

8.9 APPROVAL OF SUBMITTALS

All documents shall be subject to the review and approval procedures described in Permit Section 1.14.

8.10 METHODS AND PROCEDURES

The Permittees shall submit to the Department, for review and written approval, site-specific work plans for sites prior to the commencement of field activities where environmental investigation, corrective action, sampling or monitoring is being conducted or proposed. The site-specific work plans shall include the methods to be used to conduct all activities at each site or unit and shall be prepared in accordance with the format described in the Permit Section 8.12 (Reporting Requirements). The Permittees shall provide notification to the Department of corrective action field activities a minimum of 15 days prior to commencing the activity.

The methods used to conduct investigation, remediation, and monitoring activities shall be sufficient to fulfill the requirements of this Permit and provide accurate data for the evaluation of site conditions, the nature and extent of contamination and contaminant migration, and for remedy selection and implementation, where necessary. The methods presented in this Permit Section (8.10 et.seq.) are minimum requirements for environmental investigation and sampling, and are not intended to include all methods that may be necessary to fulfill the requirements of this Permit. In cases where alternative methods are required due to site conditions or contaminants, such methods will be specified in a site-specific work plan or other plan approved by the Department. The methods for conducting investigations, corrective actions, and monitoring at the Facility must be determined based on the conditions and contaminants that exist at each site or unit.

8.10.1 Standard Operating Procedures

The Permittees shall provide a description of investigation, sampling or analytical methods and procedures in documents submitted to the Department that includes sufficient detail for the Department to evaluate the expected quality of the data that would be acquired using the methods and procedures. Facility standard operating procedures (SOPs) shall not be substituted for such descriptions, but may be used to augment the descriptions and must be provided to the Department upon request. If any requirement or procedure in SOP is found by the Department to be unacceptable for reasons including, but not limited to, the requirement or procedure will or could prevent the acquisition of representative and reliable sampling results, the requirement or procedure shall be replaced by the Permittees with a different requirement or procedure that is acceptable to the Department.

8.10.2 Investigation, Sampling, and Analysis Methods

8.10.2.1 Introduction and Purpose

This Permit Section (8.10.2) provides minimum requirements for field investigations, sample collection, handling and screening procedures, field and laboratory sample analysis, and quality assurance procedures for samples of the medium being investigated or tested at the Facility.

The purpose of this Permit Section is to: 1) provide minimum requirements for drilling and sample collection in exploratory borings and other excavations; 2) provide minimum requirements for sampling of the target media; 3) provide minimum requirements for monitoring of groundwater and vadose zone conditions; and 4) identify minimum required screening, analytical, and quality assurance procedures that shall be implemented during field sampling activities and laboratory analyses.

The quality assurance procedures referenced in the previous paragraph include: 1) the Facility investigation data quality objectives; 2) the requirements for QA/QC to be followed during field investigations and by the analytical laboratories; and 3) the methodology for the review and evaluation of the field and laboratory QA/QC results and documentation.

8.10.2.2 Field Exploration Activities

Exploratory borings shall be advanced at locations specified in the Department approved site-specific work plans. The Department may require additional exploratory borings to fulfill the requirements of this Permit. Any additional boring locations, if required, will be determined or approved by the Department. The depths and locations of all exploratory and monitoring well borings shall be specified in the site-specific work plans submitted to the Department for approval prior to the start of the respective field activities.

8.10.2.3 Sub-Surface Features/Utility Geophysical Surveys

If required in an approved work plan, the Permittees shall conduct surveys to locate underground utilities, pipelines structures, drums, debris, and other buried features, including buried waste, in the shallow subsurface prior to the start of field exploration activities. The methods used to conduct the surveys, such as magnetometer, ground penetrating radar, resistivity, or other methods, shall be selected based on the characteristics of the site and the possible or suspected underground structures. The results of the surveys shall be included in the investigation reports submitted to the Department.

If required in an approved work plan, the Permittees shall conduct geophysical logging of boreholes using techniques such as acoustic televiewer, spinner flow, acoustic velocity/full wave form acoustic, density/porosity, gamma, neutron, single point resistance or electric (long/short normal or inductance) methods.

8.10.2.4 Drilling and Soil, Rock, and Sediment Sampling

8.10.2.4.i Drilling

Exploratory and monitoring well borings shall be drilled using the most effective, proven, and practicable method for recovery of undisturbed samples and potential contaminants. The Department shall approve the drilling methods selected for advancement of each boring prior to the start of field activities. Based on the drilling conditions, the borings shall be advanced using one of the following methods:

1. Hollow-stem auger;
2. Air rotary;
3. Mud rotary;

4. Percussion hammer;
5. Sonic;
6. Dual wall air rotary;
7. Direct Push Technology (DPT);
8. Cryogenic; and
9. Cable tool.

Hollow-stem auger or DPT drilling methods are preferred if vapor-phase or VOC contamination is known or suspected to be present. The type of drilling fluid used, if necessary, shall be approved by the Department prior to the start of drilling activities or prior to use at any site.

All drilling equipment shall be in good working condition and capable of performing the assigned task. Drilling rigs and equipment shall be operated by properly trained, experienced, and responsible crews. The Permittees are responsible for ensuring that contaminants from another site or facility are not introduced into the site under investigation due to malfunctioning equipment or poor site maintenance. The drilling equipment shall be properly decontaminated before drilling each boring.

Exploratory borings shall be advanced to unit- and location-specific depths specified or approved by the Department. The Permittees shall propose drilling depths in the site-specific work plans submitted for each subject area.

The Permittees shall notify the Department as early as practicable if conditions arise or are encountered that do not allow the advancement of borings to the depths specified by the Department or proposed in an approved work plan so that alternative actions may be discussed. Precautions shall be taken to prevent the migration of contaminants between geologic, hydrologic, or other identifiable zones during drilling and well installation activities. Contaminant zones shall be isolated from other zones encountered in the borings.

The drilling and sampling shall be accomplished under the direction of a qualified engineer or geologist who shall maintain a detailed log of the materials and conditions encountered in each boring. Both sample information and visual observations of the cuttings and core samples shall be recorded on the boring log. Known site features and/or site survey grid markers shall be used as references to locate each boring prior to surveying the location as described in Permit Section 8.10.2.5. The boring locations shall be measured to the nearest foot, and locations shall be recorded on a scaled site map upon completion of each boring.

Trenching and other exploratory excavation methods shall follow the applicable general procedures outlined in this Permit Section. The particular methods proposed for use by the Permittees for exploratory excavation and sampling at any specific unit shall be included in the site-specific investigation work plan submitted to the Department. The Department will include any changes or additional requirements for conducting exploratory excavation and sampling activities at the subject unit in its response to the Permittees after review of the investigation work plans.

Borings not completed as groundwater or vapor monitoring wells shall be properly abandoned in accordance with the methods listed in Permit Section 8.11.5 or other method approved by the Department. Borings completed as groundwater monitoring wells shall be constructed in

accordance with the requirements described in Permit Section 8.11.3.2 (Well Construction Techniques).

8.10.2.4.ii Soil and Rock Sampling

Relatively undisturbed discrete soil and rock samples shall be obtained, where possible, during the advancement of each boring for the purpose of logging, field screening, and analytical testing. Generally, the samples shall be collected at the following intervals and depths:

1. At 5-ft intervals, 10-ft intervals, continuously, or as approved by the Department;
2. At the depth immediately below the base of the disposal unit or facility structure;
3. At the maximum depth of each boring;
4. At the depths of contacts or first encounter, observed during drilling, with geologic units of different lithology, changes in structural or textural characteristics, or zones of relatively higher or lower permeability;
5. Of soil or rock types relatively more likely to sorb or retain contaminants than surrounding lithology;
6. At the depth of the first encounter, during drilling, with shallow or intermediate saturated zones;
7. At intervals suspected of being source or contaminated zones;
8. At the top of the regional aquifer; and
9. At other intervals approved or required by the Department.

The sampling interval for the borings may be modified, or samples may be obtained from a specific depth, based on field observations. A decontaminated split-barrel sampler lined with brass sleeves, a coring device, or other method approved by the Department shall be used to obtain samples during the drilling of each boring.

The following procedures should be followed if a split barrel sampler is used. Upon recovery of the sample, one or more brass sleeves shall be removed from the split barrel sampler and the open ends of the sleeves covered with Teflon tape or foil and sealed with plastic caps fastened to the sleeves with tape for shipment to the analytical laboratory. If brass sleeves are not used, a portion of the sample shall be placed in pre-cleaned, laboratory-prepared sample containers for laboratory chemical analysis. The remaining portions of the sample shall be used for logging and field screening, as described in Permit Sections 8.10.2.4.v and 8.10.2.4.vi, respectively.

Discrete samples shall be collected for field screening and laboratory analyses. Homogenization of discrete samples collected for analyses other than for VOC and SVOC analyses shall be performed by the analytical laboratory, if necessary. The Permittees may submit site-specific, alternative methods for homogenization of samples in the field to the Department for review and written approval.

Samples to be submitted for laboratory analyses shall be selected based on: 1) the results of the field screening or mobile laboratory analyses; 2) the position of the sample relative to groundwater, suspected releases, or site structures; 3) the sample location relative to former or altered site features or structures; 4) suspected migration pathways and the stratigraphy encountered in the boring; and 5) the specific objectives and requirements of this Permit and the

approved site-specific work plan. The proposed number of samples and analytical parameters shall be included as part of the site-specific work plan submitted to the Department for approval prior to the start of field investigation activities at each unit. The work plans shall allow for flexibility in modifying the project-specific tasks based on information obtained during the course of the investigation. Modifications to site-specific work plan tasks must be pre-approved in writing by the Department.

8.10.2.4.iii Sediment Sampling

Sediment samples shall be collected in the same manner as described in Permit Section 8.10.2.4.ii for soil and rock sampling where borings are drilled to explore alluvial subsurface conditions. The sampling device shall be a decontaminated, hand-held stainless steel coring device, Shelby tube, thin-wall sampler, or other device approved by the Department where sediment sampling is conducted without the use of the drilling methods described in Permit Section 8.10.2.4.i. The samples shall be transferred to pre-cleaned laboratory prepared containers for submittal to the laboratory. Samples obtained for volatiles analysis shall be collected using Shelby tubes, thin-wall samplers, or other device approved by the Department. The ends of the samplers shall be lined with Teflon tape or aluminum foil and sealed with plastic caps fastened to the sleeves with tape for shipment to the analytical laboratory.

The physical characteristics of the sediment (such as mineralogy, ASTM soil classification, AGI (American Geological Institute) rock classification, moisture content, texture, color, presence of stains or odors, and/or field screening results), depth where each sample was obtained, method of sample collection, and other observations shall be recorded in the field log.

8.10.2.4.iv Logging of Soil/Rock and Sediment Samples

Samples obtained from all exploratory borings and excavations shall be visually inspected and the soil or rock type classified in general accordance with ASTM D2487 (Unified Soil Classification System) and D2488, or AGI Methods for soil and rock classification. Detailed logs of each boring shall be completed in the field by a qualified engineer or geologist. Additional information, such as the presence of water-bearing zones and any unusual or noticeable conditions encountered during drilling shall be recorded on the logs. Field boring logs, test pit logs, and field well construction diagrams shall be converted to the format acceptable for use in final reports submitted to the Department. If requested, draft boring logs, test pit logs, and well construction diagrams shall be submitted to the Department for review within 30 days after the completion of each boring or monitoring well.

8.10.2.4.v Soil, Rock, and Sediment Sample Field Screening

Samples obtained from borings shall be screened in the field for evidence of the potential presence of contaminants. Field screening results shall be recorded on the exploratory boring and excavation logs. Field screening results are used as a general guideline to determine the nature and extent of possible contamination. In addition, screening results shall be used to aid in the selection of soil, rock, sediment, and vapor-phase samples for laboratory analysis. The Department recognizes that field screening alone will not detect the possible presence or full nature and extent of all contaminants that may be encountered at the site.

The primary screening methods to be used shall include: 1) visual examination; 2) headspace vapor screening for VOCs; and 3) metals screening using X-ray fluorescence (XRF). Additional screening for site- or release-specific characteristics such as pH, High Explosives (HE), Total

Petroleum Hydrocarbons (TPH), nitrates, or for other specific compounds using field test kits shall be conducted where appropriate.

Headspace vapor screening shall target VOCs and shall be conducted by placing a soil or rock sample in a plastic sample bag or a foil-sealed container allowing space for ambient air. The container shall be sealed and then shaken gently to expose the soil or rock to the air trapped in the container. The sealed container shall be allowed to rest for a minimum of five minutes while vapors equilibrate. Vapors present within the sample bag headspace will then be measured by inserting the probe of the instrument in a small opening in the bag or through the foil. The maximum value and the ambient air temperature shall be recorded on the field boring or test pit log for each sample. The monitoring instruments shall be calibrated each day to the manufacturer's standard for instrument operation. A photo-ionization detector (PID) equipped with a 10.6 or higher electron volt (eV) lamp, combustible gas indicator, or other instrument approved by the Department shall be used for VOC field screening. The limitations, precision, and calibration procedures of the instrument to be used for VOC field screening shall be included in the site-specific investigation work plan prepared for each unit.

XRF may be used to screen soil, rock, or sediment samples for the presence of metals. XRF screening requires proper sample preparation and proper instrument calibration. Sample preparation and instrument calibration procedures shall be documented in the field logs. The methods and procedures for sample preparation and instrument calibration shall be approved by the Department prior to the start of field activities. Field XRF screening results for selected metals may be used in lieu of laboratory analyses upon written approval by the Department; however, the results shall, at a minimum, be confirmed by laboratory analyses at a frequency of 20 percent (1 sample per every 5 analyzed by XRF analysis).

Field screening results are site- and boring-specific and the results vary with instrument type, media screened, weather conditions, moisture content, soil or rock type, and type of contaminant. The Permittees shall record on the field logs all conditions capable of influencing the results of field screening. The Permittees shall submit to the Department conditions potentially influencing field screening results as part of the site-specific investigation, remediation, or monitoring reports.

At a minimum, the Permittees shall submit the samples with the greatest apparent degree of contamination, based on field observations and field screening, for laboratory analysis. The Permittees shall also use the location of the sample relative to groundwater, stratigraphic units or contacts, and the proximity to significant site or subsurface features or structures as a guideline for sample selection. In addition, the Permittees shall submit the samples with no or little apparent contamination, based on field screening, for laboratory analysis if the intention is to confirm that the base (or other depth interval) of a boring or other sample location is not contaminated.

8.10.2.4.vi Soil, Rock, and Sediment Sample Types

The Permittees shall collect soil, rock, and sediment samples at the frequencies outlined in the site-specific investigation, corrective action, or monitoring work plans for each unit, or other site submitted by the Permittees for review and written approval by the Department. The samples collected shall be representative of the media and site conditions being investigated or monitored. The Permittees shall collect QA/QC samples to monitor the validity of the soil, rock, and sediment sample collection procedures. Field duplicates will be collected at a rate of ten

percent. The Permittees shall collect equipment blanks from all sampling apparatus at a frequency of ten percent of environmental samples if disposable sampling equipment is not used. The Permittees shall collect field blanks at a frequency of one per day for each medium (with the exception of air samples) at each unit, or other site. The resulting data will provide information on the variability associated with sample collection, handling, and laboratory analysis operations. The blanks and duplicates shall be submitted for laboratory analyses associated with the project-specific contaminants, data quality concerns, and media being sampled.

8.10.2.5 Sample Point and Structure Location Surveying

The horizontal and vertical coordinates of the top of each monitoring well casing and the ground surface at each monitoring well location shall be determined by a registered New Mexico professional land surveyor in accordance with the State Plane Coordinate System (§§ 47-1-49 through 56 NMSA 1978)). The surveys shall be conducted in accordance with Sections 500.1 through 500.12 of the Regulations and Rules of the Board of Registration for Professional Engineers and Surveyors Minimum Standards for Surveying in New Mexico. Horizontal positions shall be measured to the nearest 0.1-ft, and vertical elevations shall be measured to the nearest 0.01-ft. The Permittees shall prepare site map(s), certified by a registered New Mexico professional land surveyor, presenting all surveyed locations and elevations including relevant site features and structures for submittal with well installation reports to the Department.

Site attributes (e.g., soil sample locations, sediment sample locations, springs, outfalls, pertinent structures, monitoring stations, as well as staked out sampling grids), shall be located by using a professional/mapping grade global positioning system (GPS), or another Department-approved surveying system, or by using a registered New Mexico Registered Land Surveyor using the methods described in the paragraph above. If using GPS, horizontal locations shall be measured to sub-meter accuracy. The Permittees shall provide the Department a statement of accuracy for survey data upon request.

8.10.2.6 Subsurface Vapor-Phase Monitoring and Sampling

Samples of subsurface vapors shall be collected from vapor monitoring points from both discrete zones, selected based on investigation and field screening results, and as total well subsurface vapor samples where required by the Department. Subsurface vapor samples shall be collected using methods approved by the Department that will produce reliable and representative results from the zones subject to investigation or monitoring.

During subsurface drilling explorations at sites where there is a potential for vapor-phase contamination to be present, soil gas samples shall be obtained at the Department-approved intervals for field screening and/or laboratory analyses. Soil-vapor sampling techniques during borehole drilling must be proposed in the work plan and approved by the Department. The data shall be logged and also used for determining the samples to be sent to an analytical laboratory.

The Permittees shall, as specified in the work plan and approved by the Department, collect vapor samples for field measurement of some or all of the following during subsurface vapor monitoring activities:

1. Percent oxygen;

2. Organic vapors (using a photo-ionization detector with an 11.7 eV (electron volt) lamp, a combustible vapor indicator or other method approved by the Department);
3. Percent carbon dioxide;
4. Static subsurface pressure; and
5. Other parameters (such as carbon monoxide and hydrogen sulfide) as required by the Department.

The Permittees also shall collect vapor samples for laboratory analysis of the following as required:

1. Percent moisture;
2. VOCs; and
3. Other analytes required by the Department.

Vapor samples analyzed by the laboratory for percent moisture and VOCs shall be collected using SUMMA canisters or other sample collection method approved by the Department. The samples shall be analyzed for VOC concentrations by EPA Method TO-14A, as it may be updated or by an equivalent VOC analytical method such as TO-15.

Field vapor measurements, the date and time of each measurement, and the instrument used shall be recorded on a vapor monitoring data sheet. The instruments used for field measurements shall be calibrated daily in accordance with the manufacturer's specifications and as described in Permit Section 8.10.2.12. The methods used to obtain vapor-phase field measurements and samples shall be approved by the Department in writing prior to the start of air monitoring at each Facility site where vapor-phase monitoring is conducted.

8.10.2.7 Groundwater Monitoring

8.10.2.7.i Groundwater Levels

Groundwater level measurements shall be obtained at intervals required by the Department. Groundwater levels also shall be obtained prior to purging in preparation for a sampling event. Measurement data and the date and time of each measurement shall be recorded on a site monitoring data sheet. The depth to groundwater shall be measured to the nearest 0.01 feet. The depth to groundwater shall be recorded relative to the surveyed well casing rim or other surveyed datum.

Groundwater levels shall be measured in all wells at the facility (or the number of wells otherwise specified in a Department approved groundwater monitoring work plan) within 14 days of the commencement of the monitoring activities. The Permittees shall conduct periodic measuring events, the schedule for which shall be provided in the groundwater monitoring work plans.

8.10.2.8 Groundwater Sampling

Groundwater samples shall initially be obtained from newly installed monitoring wells between ten and 30 days after completion of well development or during the next scheduled sampling event for that site for wells installed at a site with existing wells. Groundwater monitoring and

sampling shall be conducted at an interval approved by the Department after the initial sampling event. The Permittees shall sample all saturated zones screened to allow entry of groundwater into each monitoring well during each sampling event (or as otherwise specified in the Department approved groundwater monitoring work plan). All requests for variances from the groundwater sampling schedule shall be submitted to the Department, in writing, no less than 30 days prior to the start of scheduled monitoring and sampling events.

For exploratory borings subject to this Permit, groundwater samples shall be collected from all saturated zones, where possible, within exploratory borings not intended to be completed as monitoring wells prior to abandonment of the borings.

Water samples shall be analyzed for site-specific parameters in accordance with the Department-approved groundwater monitoring work plan. The analytical list may include, but is not limited to, one or more of the following general chemistry parameters as required by the Department:

sulfate	chloride	sodium	magnesium
carbonate/bicarbonate	fluoride	manganese	calcium
potassium	sulfide	bromide	

8.10.2.8.i Well Purging

All zones in each monitoring well shall be purged by removing groundwater prior to sampling and in order to ensure that formation water is being sampled. Purge volumes shall be determined by monitoring, at a minimum, groundwater pH, specific conductance, dissolved oxygen concentrations, turbidity, redox potential, and temperature during purging of volumes and at measurement intervals approved by the Department in writing. The groundwater quality parameters shall be measured using a flow-through cell and instruments approved by the Department in writing. The volume of groundwater purged, the instruments used, and the readings obtained at each interval shall be recorded on the field monitoring log. In general, water samples may be obtained from the well after the measured parameters of the purge water have stabilized to within ten percent for three consecutive measurements. Well purging may also be conducted in accordance with the Department's Position Paper "Use of Low-Flow and other Non-Traditional Sampling Techniques for RCRA Compliant Groundwater Monitoring" (October 30, 2001). The Permittees may submit, to the Department for approval, a written request for a variance from the described methods of well purging for individual wells no later than 90 days prior to scheduled sampling activities. The Department will respond to the request, in writing, within 60 days of receipt of the variance request.

8.10.2.8.ii Groundwater Sample Collection

Groundwater samples shall be obtained from each well after a sufficient amount of water has been removed from the well casing to ensure that the sample is representative of formation water. Groundwater samples shall be obtained using methods approved by the Department within 24 hours of the completion of well purging or an adequate volume is available to sample. Sample collection methods shall be documented in the field monitoring reports. The samples shall be transferred to the appropriate, clean, laboratory-prepared containers provided by the

analytical laboratory. Sample handling and chain-of-custody procedures are described in Permit Section 8.10.2.9. Decontamination procedures shall be established for reusable water sampling equipment as described in Permit Section 8.10.2.11.

All purged groundwater and decontamination water shall be temporarily stored at satellite accumulation areas or transfer stations in labeled 55-gallon drums, less-than-90-day storage areas or other containers approved by the Department until proper characterization and disposal can be arranged. The methods for disposal of purge/decontamination water shall be approved by the Department prior to removal from the temporary storage area. Disposable materials shall be handled as described in Permit Section 8.10.2.13.

Groundwater samples intended for metals analysis shall be submitted to the laboratory as total metals samples. If required by the Department, the Permittees shall obtain groundwater samples for dissolved metals analysis to be filtered using disposable in-line filters with a 0.45 micron or other mesh size approved by the Department.

8.10.2.8.iii Surface Water Sample Collection

Surface water samples shall be collected using methods approved by the Department. Samples shall be collected in clean laboratory-prepared sampling containers. The methods and instruments used to measure field parameters shall be approved by the Department prior to conducting surface water sampling. The sampling and monitoring techniques used and the measurements obtained shall be recorded in the field monitoring reports.

8.10.2.8.iv Groundwater and Surface Water Sample Types

Groundwater samples shall be collected from each monitoring well and surface water samples shall be collected at predetermined locations. Field duplicates, field blanks, equipment rinsate blanks, reagent blanks, if necessary, and trip blanks shall be obtained for quality assurance during groundwater and surface water sampling activities. The samples shall be handled as described in Permit Section 8.10.2.9.

Field duplicate surface water and groundwater samples shall be obtained at a frequency of ten percent. At a minimum, one duplicate sample per sampling event shall always be obtained.

Field blanks shall be obtained at a frequency of at least ten percent of the number of environmental VOC samples, with at least one field blank per analytical batch of samples. Field blanks shall be generated by filling sample containers in the field with deionized water and submitting the samples, along with the groundwater or surface water samples, to the analytical laboratory for the appropriate analyses.

Equipment rinsate blanks shall be collected at a rate of ten percent of environmental samples if disposable sampling apparatus is not used. Rinsate samples shall be generated by rinsing deionized water through decontaminated sampling equipment. The rinsate sample then shall be placed in the appropriate sample container and submitted with the groundwater or surface water samples to the analytical laboratory for the appropriate analyses.

Reagent blanks shall be obtained at a frequency of ten percent but no fewer than one per day per unit if chemical analyses requiring the use of chemical reagents are conducted in the field during water sampling activities.

Trip blanks shall accompany laboratory sample bottles and shipping and storage containers intended for VOC analyses. Trip blanks shall consist of a sample of analyte-free deionized water

prepared by the laboratory and placed in an appropriate sample container. The trip blank shall be prepared by the analytical laboratory prior to the sampling event and shall be kept with the shipping containers and placed with other water samples obtained from the site each day. Trip blanks shall be analyzed at a frequency of one for each shipping container of samples.

8.10.2.9 Sample Handling

At a minimum, the following procedures shall be used at all times when collecting samples during investigation, corrective action, and monitoring activities unless otherwise specified in a Department-approved work plan:

1. Neoprene, nitrile, or other protective gloves shall be worn when collecting samples. New disposable gloves shall be used to collect each sample;
2. All samples collected of each medium for chemical analysis shall be transferred into clean sample containers supplied by the project analytical laboratory with the exception of soil, rock, and sediment samples obtained in brass sleeves, Shelby tubes, thin wall samplers, or in Encore™ samplers. Upon recovery of the sample collected using split barrel samplers with brass sleeves, the brass sleeves shall be removed from the split barrel sampler and the open ends of the sleeves shall be lined with Teflon tape or foil and sealed with plastic caps. The caps shall be fastened to the sleeve with tape for storage and shipment to the analytical laboratory. Samples collected in Shelby tubes or thin wall samplers shall be capped in a similar fashion. The sample depth and the top of the sample shall be clearly marked. Sample container volumes and preservation methods shall be in accordance with EPA SW-846 and established industry practices for use by accredited analytical laboratories. Sufficient sample volume shall be obtained for the laboratory to complete the method-specific QC analyses on a laboratory-batch basis; and
3. Sample labels and documentation shall be completed for each sample following procedures included in the site-specific work plans approved by the Department. Immediately after the samples are collected, they shall be stored in a cooler with ice or other appropriate storage method until they are delivered to the analytical laboratory. Standard chain-of-custody procedures, as described in Permit Section 8.10.2.14.ii, shall be followed for all samples collected. All samples shall be submitted to the laboratory soon enough to allow the laboratory to conduct the analyses within the method holding times.

Shipment procedures shall include the following:

1. Individual sample containers shall be packed to prevent breakage and transported in a sealed cooler with ice or other suitable coolant or other EPA or industry-wide accepted method. The drainage hole at the bottom of the cooler shall be sealed and secured in case of sample container leakage.
2. Each cooler or other container shall be delivered directly to the analytical laboratory;
3. Glass bottles shall be separated in the shipping container by cushioning material to prevent breakage;
4. Plastic containers shall be protected from possible puncture during shipping using cushioning material;

5. The chain-of-custody form and sample request form shall be shipped inside the sealed storage container to be delivered to the laboratory;
6. Chain-of-custody seals shall be used to seal the sample-shipping container in conformance with EPA protocol; and
7. Signed and dated chain-of-custody seals shall be applied to each cooler prior to transport of samples from the site.

8.10.2.10 In-Situ Testing

In-situ permeability tests, remediation system pilot tests, stream flow tests, and other tests conducted to evaluate site and subsurface conditions shall be designed to accommodate specific site conditions and to achieve the test objectives. The testing methods shall be approved, in writing, by the Department prior to implementation. The tests shall be conducted in order to appropriately represent site conditions and in accordance with USGS, ASTM or other methods generally accepted by the industry. Detailed logs of all relevant site conditions and measurements shall be maintained during the testing events. If requested, a summary of the general test results, including unexpected or unusual test results and equipment failures or testing limitations shall be reported to the Department within 30 days of completion of the test. The summary shall be presented in a format acceptable to the Department and in general accordance with the report formats outlined in Permit Section 8.12 (Reporting Requirements). A report summarizing the results of each test shall be submitted to the Department within 120 days of completion of each test.

8.10.2.11 Decontamination Procedures

The objective of the decontamination procedures is to minimize the potential for cross-contamination. A designated decontamination area shall be established for decontamination of drilling equipment, reusable sampling equipment and well materials. The drilling rig shall be decontaminated prior to entering the site or unit. Drilling equipment or other exploration equipment that may come in contact with the borehole shall be decontaminated by steam cleaning, by hot-water pressure washing, or by other method approved by the Department prior to drilling each new boring.

Sampling or measurement equipment, including but not limited to, stainless steel sampling tools, split-barrel or core samplers, well developing or purging equipment, groundwater quality measurement instruments, water level measurement instruments, and reusable vapor sampling equipment shall be decontaminated in accordance with the following procedures or other applicable methods approved by the Department before each sampling attempt or measurement:

1. Brush equipment with a wire or other suitable brush, if necessary or practicable, to remove large particulate matter;
2. Rinse with potable tap water;
3. Wash with nonphosphate detergent or other detergent approved by the Department (examples include Fantastik™, Liqui-Nox®) followed by a tap water rinse;
4. Rinse with 0.1 molar nitric acid (to remove trace metals, if necessary) followed by a tap water rinse;

5. Rinse with methanol (to remove organic compounds, if necessary) followed by a tap water rinse;
6. Rinse with potable tap water; and
7. Double rinse with deionized water.

All decontamination solutions shall be collected and stored temporarily as described in Permit Section 8.10.2.13. Decontamination procedures and the cleaning agents used shall be documented in the daily field log.

8.10.2.12 Field Equipment Calibration Procedures

Field equipment requiring calibration shall be calibrated to known standards, in accordance with the manufacturers' recommended schedules and procedures. At a minimum, calibration checks shall be conducted daily, or at other intervals approved by the Department, and the instruments shall be recalibrated, if necessary. Calibration measurements shall be recorded in the daily field logs. If field equipment becomes inoperable, its use shall be discontinued until the necessary repairs are made. In the interim, a properly calibrated replacement instrument shall be used.

8.10.2.13 Collection and Management of Investigation Derived Waste

Investigation derived waste (IDW) includes general refuse, drill cuttings, excess sample material, water (decontamination, development and purge), and disposable equipment generated during the course of investigation, corrective action, or monitoring activities. All IDW shall be properly characterized in accordance with 40 CFR Part 261 and Attachment C of this Permit, and shall be managed in accordance with all Federal, State, and local rules and regulations for storage, labeling, handling, transport, and disposal of waste. The Permittees shall include a description of anticipated management of IDW as part of the applicable work plan submitted to the Department for approval prior to an investigation or corrective action.

8.10.2.14 Documentation of Field Activities

8.10.2.14.i General

Daily field activities, including observations and field procedures, shall be recorded on appropriate forms. The original field forms shall be maintained at the Facility. Indelible ink shall be used to record all field activities. Photographic documentation of field activities shall be performed, as appropriate. The daily record of field activities shall include the following:

1. Site or unit designation;
2. Date;
3. Field investigation team members;
4. Weather conditions;
5. Daily activities and times conducted;
6. Observations;
7. Signature of personnel completing the field record.

The daily record of field activities shall also include the following, as applicable:

1. Record of samples collected with sample designations and locations specified;
2. Photographic log;
3. Field monitoring data, including health and safety monitoring if conditions arise that require modification of required work;
4. Equipment used and calibration records, if appropriate;
5. List of additional data sheets and maps completed;
6. An inventory of the waste generated and the method of storage or disposal; and
7. Names of visitors

8.10.2.14.ii Sample Custody

All samples collected for analysis shall be recorded in the field report or data sheets. Chain-of-custody forms shall be completed at the end of each sampling day, prior to the transfer of samples off site, and shall accompany the samples during shipment to the laboratory. A signed and dated custody seal shall be affixed to the lid of the shipping container. Upon receipt of the samples at the laboratory, the custody seals will be broken, the chain-of-custody form shall be signed as received by the laboratory, and the conditions of the samples shall be recorded on the form. The original chain-of-custody form shall remain with the laboratory and copies shall be returned to the relinquishing party. The Permittees shall maintain copies of all chain-of-custody forms generated as part of sampling activities. Copies of the chain-of-custody records (either paper copies or electronically scanned in PDF format) shall be included with all draft and final laboratory reports submitted to the Department.

8.10.3 Chemical Analyses

The Permittees shall submit all samples for laboratory analysis to accredited contract laboratories. The laboratories shall use the most recent EPA and industry-accepted extraction and analytical methods for chemical analyses for target analytes as the testing methods for each medium sampled. The Permittees shall use the most sensitive laboratory methods (with the lowest detection limits) available unless specific conditions preclude their use.

The Permittees shall submit a list of analytes and analytical methods to the Department, for review and written approval as part of each site-specific investigation, corrective action, or monitoring work plan. The detection limits for each method shall be less than applicable background, screening, and regulatory cleanup levels. The preferred method detection limits are a maximum of 20 percent of the cleanup, screening, or background levels. Analyses conducted with detection limits that are greater than applicable background, screening, and regulatory cleanup levels shall be considered data quality exceptions and the reasons for the elevated detection limits shall be reported to the Department. All analytical data (non-detects, estimated concentrations, and detects) shall be included in an electronic copy of an investigation report in a format useable by the Department and with qualifiers as attached from the analytical laboratory. The summary tables shall include only detects (including estimated quantities) of the data based on the corresponding qualifiers. The Permittees shall not censor the data based on detection limits, quantitation limits, or measurement uncertainty.

8.10.3.1 Laboratory QA/QC Requirements

The following requirements for laboratory QA/QC procedures shall be considered the minimum QA/QC standards for the laboratories employed by the Permittees that provide analytical services for environmental investigation, corrective action, and monitoring activities conducted at the Facility. The Permittees shall provide the names of the contract analytical laboratories and copies of the laboratory quality assurance manuals to the Department within 90 days of awarding a contract for analytical services to any contract laboratory.

8.10.3.1.i Quality Assurance Procedures

Contract analytical laboratories shall maintain internal quality assurance programs in accordance with EPA and industry-wide accepted practices and procedures. At a minimum, the laboratories shall use a combination of standards, blanks, surrogates, duplicates, matrix spike/matrix spike duplicates (MS/MSD), blank spike/blank spike duplicates (BS/BSD), and laboratory control samples to demonstrate analytical QA/QC. The laboratories shall establish control limits for individual chemicals or groups of chemicals based on the long-term performance of the test methods. In addition, the laboratories shall establish internal QA/QC that meets EPA's laboratory certification requirements. The specific procedures to be completed are identified in the following sections.

8.10.3.1.ii Equipment Calibration Procedures and Frequency

The laboratories' equipment calibration procedures, calibration frequency, and calibration standards shall be in accordance with the EPA test methodology requirements and documented in the laboratories' quality assurance and SOP manuals. All instruments and equipment used by the laboratory shall be operated, calibrated, and maintained according to manufacturers' guidelines and recommendations. Operation, calibration, and maintenance shall be performed by personnel who have been properly trained in these procedures. A routine schedule and record of instrument calibration and maintenance shall be kept on file at the laboratory.

8.10.3.1.iii Laboratory QA/QC Samples

Analytical procedures shall be evaluated by analyzing reagent or method blanks, surrogates, MS/MSDs, BS/BSDs, and laboratory duplicates, as appropriate for each method. The laboratory QA/QC samples and frequency of analysis to be completed shall be documented in the cited EPA or DOE test methodologies. At a minimum, the laboratory shall analyze laboratory blanks, MS/MSDs, BS/BSDs, and laboratory duplicates at a frequency of one in twenty for all batch runs requiring EPA test methods and at a frequency of one in ten for non-EPA test methods. Laboratory batch QA/QC samples shall be specific to the project.

8.10.3.1.iv Laboratory Deliverables

The laboratory analytical data package submitted to the Department shall be prepared in accordance with EPA-established Level II analytical support protocol. The laboratory analytical data package kept on file at the Facility shall be prepared in accordance with EPA-established Level III or IV analytical support protocol. The following shall be provided by the contract analytical laboratories to the Permittees in the analytical laboratory reports submitted to the Permittees either electronically, magnetically or in hard (paper) copy for each project:

1. Transmittal letter, including information about the receipt of samples, the testing methodology performed, any deviations from the required procedures, any problems

encountered in the analysis of the samples, any data quality exceptions, and any corrective actions taken by the laboratory relative to the quality of the data contained in the report;

2. Sample analytical results, including sampling date; date of sample extraction or preparation; date of sample analysis; dilution factors and test method identification; soil, rock, or sediment sample results in consistent units (mg/kg) or micrograms per kilogram in dry-weight basis; water sample results in consistent units (milligrams per liter or micrograms per liter (µg/L)); vapor sample results in consistent units (ppm or µg/m3); and detection limits for undetected analytes. Results shall be reported for all field samples, including field duplicates and blanks, submitted for analysis;
3. Method blank results, including detection limits for undetected analytes;
4. Surrogate recovery results and corresponding control limits for samples and method blanks (organic analyses only);
5. MS/MSD and/or BS/BSD spike concentrations, percent recoveries, relative percent differences (RPDs), and corresponding control limits;
6. Laboratory duplicate results for inorganic analyses, including relative percent differences and corresponding control limits;
7. Sample chain-of-custody documentation;
8. Holding times and conditions;
9. Conformance with required analytical protocol(s);
10. Instrument calibration;
11. Blanks;
12. Detection/quantitation limits;
13. Recoveries of surrogates;
14. Variability for duplicate analyses;
15. Completeness; and
16. Data report formats.

The following data deliverables for organic compounds shall be required from the laboratory:

1. A cover letter referencing the procedure used and discussing any analytical problems, deviations, and modifications, including signature from authority representative certifying to the quality and authenticity of data as reported;
2. Report of sample collection, extraction, and analysis dates, including sample holding conditions;
3. Tabulated results for samples in units as specified, including data qualification in conformance with EPA protocol, and definition of data descriptor codes;
4. Reconstructed ion chromatograms for gas chromatograph/mass spectrometry (GC/MS) analyses for each sample and standard calibration;

5. Selected ion chromatograms and mass spectra of detected target analytes (GC/MS) for each sample and calibration with associated library/reference spectra;
6. Gas chromatograph/electron capture device (GC/ECD) and/or gas chromatograph/flame ionization detector (GC/FID) chromatograms for each sample and standard calibration;
7. Raw data quantification reports for each sample and calibrations, including areas and retention times for analytes, surrogates, and internal standards;
8. A calibration data summary reporting calibration range used and a measure of linearity [include decafluorotriphenylphosphine (DFTPP) and p-bromofluorobenzene (BFB) spectra and compliance with tuning criteria for GC/MS];
9. Final extract volumes (and dilutions required), sample size, wet-to-dry weight ratios, and instrument practical detection/quantitation limit for each analyte;
10. Analyte concentrations with reporting units identified, including data qualification in conformance with the CLP Statement of Work (SOW) (include definition of data descriptor codes);
11. Quantification of analytes in all blank analyses, as well as identification of method blank associated with each sample;
12. Recovery assessments and a replicate sample summary, including all surrogate spike recovery data with spike levels/concentrations for each sample and all MS/MSD results (recoveries and spike amounts); and
13. Report of tentatively identified compounds with comparison of mass spectra to library/reference spectra.

The following data deliverables for inorganic compounds shall be required from the laboratory:

1. A cover letter referencing the procedure used and discussing any analytical problems, deviations, and modifications; including signature from authority representative certifying to the quality and authenticity of data as reported;
2. Report of sample collection, digestion, and analysis dates, with sample holding conditions;
3. Tabulated results for samples in units as specified, including data qualification in conformance with the CLP SOW (including definition of data descriptor codes);
4. Results of all method QA/QC checks, including inductively coupled plasma (ICP) Interference Check Sample and ICP serial dilution results;
5. Tabulation of instrument and method practical detection/quantitation limits;
6. Raw data quantification report for each sample;
7. A calibration data summary reporting calibration range used and a measure of linearity, where appropriate;
8. Final digestate volumes (and dilutions required), sample size, and wet-to-dry weight ratios;
9. Quantification of analytes in all blank analyses, as well as identification of method blank associated with each sample; and

10. Recovery assessments and a replicate sample summary, including post-digestate spike analysis; all MS data (including spike concentrations) for each sample, if accomplished; all MS results (recoveries and spike amounts); and laboratory control sample analytical results).

The Permittees shall present summary tables of these data and Level II QA/QC results to the Department in the formats described in Permit Section 8.12 (Reporting Requirements). The raw analytical data, including calibration curves, instrument calibration data, data calculation work sheets, and other laboratory support data for samples from this project, shall be compiled and kept on file at the Facility for reference. The Permittees shall make the data and all Level III or Level IV QA/QC data available to the Department upon request.

8.10.3.2 Review of Field and Laboratory QA/QC Data

The Permittees shall evaluate the sample data, field, and laboratory QA/QC results for acceptability with respect to the data quality objectives (DQOs). Each group of samples shall be compared with the DQOs and evaluated using data validation guidelines contained in EPA guidance documents, the latest version of SW-846, and industry-accepted QA/QC methods and procedures.

The Permittees shall establish processes with analytical laboratories to identify data quality exceptions and to expeditiously initiate appropriate corrective actions. The Permittees shall require the laboratories to notify them when data quality exceptions are determined. Laboratory notification shall be timely in order to allow for sample re-analysis, if possible. The Permittees shall evaluate data quality exceptions and determine whether sample re-analysis is justified or resampling is required. Corrective actions may include documentation of QC issues in an analytical laboratory report, data qualifiers, and/or sample re-analysis. In all cases, the DQOs of the investigation or compliance activity shall be met.

8.10.3.3 Blanks, Field Duplicates, Reporting Limits, and Holding Times

8.10.3.3.i Blanks

The analytical results of field blanks and field equipment rinsate blanks shall be reviewed to evaluate the adequacy of the equipment decontamination procedures and the possibility of cross-contamination caused by decontamination of sampling equipment. The analytical results of trip blanks shall be reviewed to evaluate the possibility for contamination resulting from the laboratory-prepared sample containers or the sample transport containers. The analytical results of laboratory blanks shall be reviewed to evaluate the possibility of contamination caused by the analytical procedures. If contaminants are detected in field or laboratory blanks, the sample data shall be qualified, as appropriate.

8.10.3.3.ii Field Duplicates

Field duplicates shall consist of two samples either split from the same sample device or collected sequentially. Field duplicate samples shall be collected at a minimum frequency of 10 percent of the total number of environmental samples submitted for analysis. RPDs for field duplicates shall be calculated. The acceptable level of precision for duplicates shall be specified in the investigation work plan.

8.10.3.3.iii Method Reporting Limits

Method reporting limits for sample analyses for each medium shall be established at the lowest level practicable for the method and analyte concentrations and shall not exceed soil, groundwater, surface water, or vapor emissions background levels, cleanup standards, and screening levels. The preferred method detection limits are a maximum of 20 percent of the background, screening, or cleanup levels. Detection limits that exceed established soil, groundwater, surface water, or air emissions cleanup standards, screening levels, or background levels and are reported as "not detected" shall be considered data quality exceptions and an explanation for the exceedance and its acceptability for use shall be provided.

8.10.3.3.iv Holding Times

The Permittees shall review the sampling, extraction, and analysis dates to confirm that extraction and analyses were completed within the recommended holding times, as specified by EPA protocol. Appropriate data qualifiers shall be noted if holding times were exceeded.

8.10.3.4 Representativeness and Comparability

8.10.3.4.i Representativeness

Representativeness is a qualitative parameter related to the degree to which the sample data represent the relevant specific characteristics of the media sampled. The Permittees shall implement procedures to assure representative samples are collected and analyzed, such as repeated measurements of the same parameter at the same location over several distinct sampling events. The Permittees shall note any procedures or variations that may affect the collection or analysis of representative samples and shall qualify the data.

8.10.3.4.ii Comparability

Comparability is a qualitative parameter related to whether similar sample data can be compared. To assure comparability, the Permittees shall report analytical results in appropriate units for comparison with other data (past studies, comparable sites, screening levels, and cleanup standards), and shall implement standard collection and analytical procedures. Any procedure or variation that may affect comparability shall be noted and the data shall be qualified.

8.10.3.5 Laboratory Reporting, Documentation, Data Reduction, and Corrective Action

Upon receipt of each laboratory data package, data shall be evaluated against the criteria outlined in the previous sections. Any deviation from the established criteria shall be noted and the data will be qualified. A full review and discussion of analytical data QA/QC and all data qualifiers shall be submitted as appendices or attachments to investigation and monitoring reports prepared in accordance with Permit Section 8.12 (Reporting Requirements). Data validation procedures for all samples shall include checking the following, when appropriate:

1. Holding times;
2. Detection limits;
3. Field equipment rinsate blanks;
4. Field blanks;

5. Field duplicates;
6. Trip blanks;
7. Reagent blanks;
8. Laboratory duplicates;
9. Laboratory blanks;
10. Laboratory matrix spikes;
11. Laboratory matrix spike duplicates;
12. Laboratory blank spikes;
13. Laboratory blank spike duplicates; and
14. Surrogate recoveries.

If significant quality assurance problems are encountered, appropriate corrective action shall be implemented. All corrective action shall be defensible and the corrected data shall be qualified

8.10.4 Site-Specific Human Health Risk Assessment

Should the Permittees be unable to meet the cleanup levels in Permit Section 8.4, they shall conduct a site-specific risk assessment in accordance with current and acceptable EPA, Regional EPA, and Department guidance and methodology (as updated). If the Department determines that a human health risk assessment work plan is necessary, the Permittees shall submit to the Department for its review and approval a work plan that includes, at a minimum, the site-specific exposure assumptions and any additional sampling needed to support the risk assessment. The Permittees shall prepare a Human Health Risk Assessment Report in support of corrective action, and, if necessary, for closure in accordance with Permit Part 6.

8.10.4.1 Human Health Risk Assessment Methods

A risk assessment may be required for human receptors that are potentially exposed to site-related chemicals in environmental media. The risk assessment shall contain a conceptual site model (CSM), which shall aid in understanding and describing each site. The CSM shall address the following components:

1. Identification of suspected sources;
2. Identification of contaminants;
3. Identification of contaminant releases;
4. Identification of transport mechanisms;
5. Identification of affected media;
6. Identification of land use scenarios;
7. Identification of potential receptors under current land use scenario;
8. Identification of potential receptors under future land use scenario; and
9. Identification of potential routes of exposure.

Potential human receptors under current and/or future land use scenarios may include residential, industrial, construction, and recreational. Other special receptors may be required on a site-specific basis.

8.10.4.1.i Exposure Pathways

The identification of exposure pathways shall include a discussion of all potential pathways and justify whether the pathways are complete. Pathways that shall be considered include soil, groundwater, air, surface water, sediment, and biota. An evaluation of the potential for contaminants to migrate from soil to groundwater shall also be provided. The risk assessment shall also address exposure mechanisms for each exposure pathway, including ingestion, inhalation, dermal, and inhalation of volatile organic compounds volatilized from soil and/or groundwater.

8.10.4.1.ii Data Quality Assurance

The risk assessment shall include an evaluation of analytical data and the usability of the data in the assessment. Data validation shall be conducted in accordance with current EPA guidelines. The evaluation of data shall also include a comparison of detection limits with appropriate and current risk-based screening levels, if MDLs are inconsistent and do not achieve the requirements of Permit Section 8.10.3 (Chemical Analyses).

8.10.4.1.iii Constituents of Potential Concern

Appropriate EPA and/or the Department guidance shall be used to identify constituents of potential concern (COPCs). With the exception of chemicals attributed to field or laboratory contamination, all analytes detected in sampled media (i.e., soil, air, surface water, groundwater, biota, and/or sediment) shall be retained or eliminated as COPCs using one or more of the following processes:

1. Site attribution analysis;
2. Essential nutrients; and/or
3. Risk-based toxicity screen.

Unless sufficient evidence and special circumstances can be provided by the Permittees, all detected organics not attributable to field or laboratory contamination shall be retained and treated as site-related chemicals.

Inorganics detected in site media shall be compared to an appropriate background data set to determine if concentrations are present at levels significantly above background. The site attribution analysis may consist of a tiered approach as follows:

1. Comparison of maximum site concentrations to a background reference value (e.g., upper tolerance limit, UTL);
2. If the site maximum exceeds the background reference value, and sample size is sufficient, statistically compare the site data set to the background data set using appropriate statistical analyses (e.g., Wilcoxon Rank Sum Test). If the sampling size is not sufficient to perform statistical analysis, a comparison of the maximum site concentration to the maximum background concentrations shall be used;

3. Conduct a graphical analysis of site data and background data (e.g., histograms and/or box and whisker plots);
4. Conduct a geochemical analysis of site data to a background reference chemical; and/or
5. Evaluate essential nutrients and compare to recommended daily allowances and/or upper intake limits.

All inorganics for which the site attribution analyses indicate are present above natural background shall be retained as COPCs for the risk assessments.

8.10.4.1.iv Exposure Point Concentrations

The Permittees shall determine exposure point concentrations (EPCs) that are representative of the concentrations of chemicals in each given medium to which a receptor may be exposed. Current EPA methodology for handling non-detects and replicates in the risk assessment shall be applied. EPA recommends a 95% or greater estimate of the upper confidence limit (UCL $\geq$ 95%) on the arithmetic mean be used as an EPC for chronic exposures. If conditions are identified where acute exposures must be evaluated, the maximum detected site concentration shall be used as the EPC.

The EPCs shall be determined using statistical analyses that are data distribution and size dependent. EPA and/or the Department accepted guidance and methodologies shall be used, such as the ProUCL software.

EPCs shall be calculated for soil, groundwater, surface water, sediment, and biota.

EPA does not recommend estimating intakes for the air inhalation pathway, but rather compares estimated volatile/particulate air concentrations adjusted for exposure frequencies, duration, and time. For inhalation of volatiles/particulates from soil, EPCs shall be determined based upon the current EPA and/or Department methodology, based upon the volatilization factor or particulate emission factor. Indoor air concentrations shall be determined using EPA and Department accepted approaches, such as the EPA-recommended Johnson and Ettinger model.

8.10.4.1.v Toxicity Assessment

The Permittees shall use the most recently available toxicity factors to calculate carcinogenic and noncarcinogenic risks/hazards based upon the currently acceptable hierarchy of sources for toxicity data.

8.10.4.1.vi Risk Characterization

The Permittees shall quantitatively estimate the potential for carcinogenic (risk) and non-carcinogenic (hazard) effects for all chemicals with toxicity data and provide a discussion of uncertainties associated with the risk assessment. Cumulative effects for risk and hazard for all media and pathways shall be determined.

For those chemicals without toxicity data, appropriate surrogate data may be applied. If surrogate toxicity data are not available, risks/hazards shall be qualitatively addressed in the uncertainties section of the report.

8.10.4.1.vii Uncertainties

The Permittees shall provide an uncertainties section that discusses all assumptions, professional judgments, and data which may result in uncertainties in the final estimates of risk and hazard.

The uncertainties shall also discuss whether risks/hazards may have been under or overestimated due to the assumptions made in the assessment.

8.10.5 Site-Specific Ecological Risk Assessment Methods

If the screening level ecological risk assessment indicates unacceptable risk, then the Permittees shall conduct a site-specific ecological risk assessment. If the Department determines that an ecological risk assessment work plan is necessary, the Permittees shall submit to the Department for its review and approval a work plan that includes, at a minimum, the site-specific exposure assumptions and any additional sampling needed to support the risk assessment. In addition, the Permittees shall prepare a site-specific Ecological Risk Assessment Report in support of corrective action, and, if necessary, for closure in accordance with Permit Part 6 (Closure Requirements). The assessment shall be conducted using EPA and/or the Department approved guidance and methodologies. The ecological risk assessment shall follow the same methodologies outlined above in the human health risk assessment for determining constituent of potential ecological concern (COPEC) and data quality assurance.

8.10.6 Determination of Background

The Permittees shall use the background reference values that have been previously approved by the Department for the Facility to assess whether environmental media at a SWMU or AOC have been contaminated to levels exceeding background conditions for naturally occurring inorganic constituents (see Dinwiddie, 1997).

If the Permittees or Department determines that site-specific background values are necessary for a particular site investigation, the Permittees shall obtain an appropriate background data set. Background concentrations for groundwater shall be collected from upgradient wells. The background data set shall be representative of natural conditions unaffected by site activities and shall be statistically defensible. A sufficient number of background samples shall be collected to determine whether one or more background populations exist for each constituent and media of concern, and to determine appropriate statistical descriptors for each identified population.

The Permittees shall determine the following summary statistics for background concentrations for each constituent and media:

1. Number of detects;
2. Total number of samples;
3. Frequency of detection;
4. Minimum detected concentration;
5. Maximum detected concentration;
6. Arithmetic mean;
7. Median;
8. Sample standard deviation;
9. 25th and 95th % of sample population; and

10. Distribution type (for example, normal; log normal; or other type, including indeterminate).

If a sample population may be adequately represented as a normal or log normal distribution, the Permittees shall also determine the upper tolerance limit (UTL) for the distribution at a confidence level of 95% and with 95% coverage.

8.10.6.1 Comparing Site Data to Background

The 95% UTL for each metal shall be used as the background reference value for use in screening assessments and determining whether metals are present in the subject media (e.g., soil, groundwater, surface water, sediment) due to site activities. The site maximum detected concentration shall be compared to the 95% UTL for each metal. If the site maximum detected concentration is greater than the background reference value, then additional site attribution analyses shall be conducted.

Site attribution analyses shall be conducted in accordance with Permit Section 8.10.4.1.iii and current EPA and/or the Department accepted guidance. The site attribution analyses shall consist of a statistical comparison of the background data set to the site data set, if sufficient samples are available, using distribution based tests such as the Wilcoxon Rank Sum Test.

If the results of the site attribution analyses indicate that the metal is present at the site above naturally occurring levels, then the Permittees shall include that metal as a site contaminant.

8.11 MONITORING WELL CONSTRUCTION REQUIREMENTS

8.11.1 Drilling Methods

Groundwater monitoring wells and piezometers must be designed and constructed in a manner which will yield high quality samples and ensure that the well will not serve as a conduit for contaminants to migrate between different stratigraphic units or aquifers. The design and construction of groundwater monitoring wells shall comply with the guidelines established in various EPA RCRA guidance, including, but not limited to:

1. U.S. EPA, RCRA Groundwater Monitoring: Draft Technical Guidance, EPA/530-R-93-001 (November 1992);
2. U.S. EPA, RCRA Groundwater Monitoring Technical Enforcement Guidance Document, OSWER-9950.1 (September 1986); and
3. Aller, L., Bennett, T.W., Hackett, G., Petty, R.J., Lehr, J.H., Sedoris, H., Nielsen, D.M., and Denne, J.E., Handbook of Suggested Practices for the Design and Installation of Groundwater Monitoring Wells, EPA 600/4-89/034 (1989).

A variety of methods are available for drilling monitoring wells. While the selection of the drilling procedure is usually based on the site-specific geologic conditions, the following issues shall also be considered:

1. Drilling shall be performed in a manner that minimizes impacts to the natural properties of the subsurface materials;

2. Contamination and cross-contamination of groundwater and aquifer materials during drilling shall be avoided;
3. The drilling method shall allow for the collection of representative samples of rock, unconsolidated materials, and soil;
4. The drilling method shall allow the Permittees to determine when the appropriate location for the screened interval(s) has been encountered; and
5. The drilling method shall allow for the proper placement of the filter pack and annular sealants. The borehole diameter shall be at least 4 inches larger in diameter than the nominal diameter of the well casing and screen to allow adequate space for placement of the filter pack and annular sealants.

The drilling method shall allow for the collection of representative groundwater samples. Drilling fluids (which includes air) shall be used only when minimal impact to the surrounding formation and groundwater can be ensured.

A brief description of the different drilling methods that may be appropriate for the construction of monitoring wells at the Facility follows. Many of these methods may be used alone, or in combination, to install monitoring wells at the Facility. While the selection of the specific drilling procedure will usually depend on the site-specific geologic conditions, justification for the method selected must be included in the Well Installation Work Plan or other work plan submitted to the Department prior to well installation.

8.11.1.1 Hollow-Stem Auger

The hollow-stem continuous flight auger consists of a hollow, steel shaft with a continuous, spiraled steel flight welded onto the exterior site of the stem. The stem is connected to an auger bit and, when rotated, transports cuttings to the surface. The hollow stem of the auger allows drill rods, split-spoon core barrels, Shelby tubes, and other samplers to be inserted through the center of the auger so that samples may be retrieved during the drilling operations. The hollow stem also acts to temporarily case the borehole, so that the well screen and casing (riser) may be inserted down through the center of the augers once the desired depth is reached, minimizing the risk of possible collapse of the borehole. A bottom plug or pilot bit can be fastened onto the bottom of the augers to keep out most of the soils and/or water that have a tendency to clog the bottom of the augers during drilling. Drilling without a center plug is acceptable provided that the soil plug, formed in the bottom of the auger, is removed before sampling or installing well casings. The soil plug can be removed by washing out the plug using a side discharge rotary bit, or augering out the plug with a solid-stem auger bit sized to fit inside the hollow-stem auger. In situations where heaving sands are a problem, potable water may be poured into the augers to equalize the pressure so that the inflow of formation materials and water shall be held to a minimum when the bottom plug is removed. The hollow-stem auger method is best suited for drilling shallow overburden wells.

8.11.1.2 Air Rotary/Air Down-The-Hole Hammer/ODEX

The air rotary method consists of a drill pipe or drill stem coupled to a drill bit that rotates and cuts through soils and rock. The cuttings produced from the rotation of the drilling bit are transported to the surface by compressed air, which is forced down the borehole through the drill

pipe and returns to the surface through the annular space (between the drill pipe and the borehole wall). The circulation of the compressed air not only removes the cuttings from the borehole but also helps to cool the drill bit. The use of air rotary drilling is best suited for hard-rock formations. In soft unconsolidated formations, casing is driven to keep the formation from caving. When using air rotary, the air compressor shall have an in-line filter system to filter the air coming from the compressor. The filter system shall be inspected regularly to insure that the system is functioning properly. In addition, a cyclone velocity dissipater or similar air containment/dust-suppression system shall be used to funnel the cuttings to one location instead of allowing the cuttings to discharge uncontrolled from the borehole. Air rotary that employs the dual-tube (reverse circulation) drilling system is acceptable because the cuttings are contained within the drill stem and are discharged through a cyclone velocity dissipater to the ground surface.

The injection of air into the borehole during air rotary drilling has the potential to alter the natural properties of the subsurface. This can occur through air-stripping of the VOCs in both soil and groundwater in the vicinity of the borehole, altering the groundwater geochemical parameters (e.g., pH and redox potential), and potentially increasing biodegradation of organic compounds in the aquifer near the borehole. These factors may prevent the well from yielding groundwater samples that are representative of in-situ conditions.

In hard, abrasive, consolidated rock, a down-the-hole hammer may be more appropriate than the air rotary method. In this method, compressed air is used to actuate and operate a pneumatic hammer as well as lift the cuttings to the surface and cool the hammer bit. One drawback of the down-the-hole hammer is that oil is required in the air stream to lubricate the hammer-actuating device, and this oil could potentially contaminate the soil in the vicinity of the borehole and the aquifer.

The ODEX method is a variation of the air rotary method in which a casing-driving technique is used in combination with air rotary drilling. With the ODEX system, the drill bit extends outward and reams a pilot hole large enough for a casing assembly to slide down behind the drill bit assembly. As a result, casing is advanced simultaneously while drilling the hole.

8.11.1.3 Water Rotary and Mud Rotary

The water and mud rotary drilling methods consist of rotary drilling techniques where water or drilling mud is used as the circulating fluid. In both methods, the circulating fluid is pumped down through the drill pipe and is returned back up the borehole through the annular space. The circulating fluid stabilizes the borehole, cools the drill bit, and carries the drill cuttings up to the surface. While the water and mud rotary drilling techniques are rapid and effective drilling methods, the recognition of water-bearing zones is hampered by the addition of water into the system. Mud rotary drilling methods are discouraged if the well is to be used for monitoring of water quality.

Mud rotary drilling is similar to water rotary drilling with the exception that mud additives are added to the water to change the properties (e.g., density, viscosity, yield point, gel strength, fluid-loss-control effectiveness, and lubricity) of the circulating fluid. Drilling muds provide greater borehole stabilization than water alone. There are several types of mud presently available, including bentonite, barium sulfate, organic polymers, cellulose polymers, and polyacrylamides. While drilling muds enhance the stability of the borehole and allow for drilling

in formations not appropriate to other methods, they can adversely affect the hydrologic properties and geochemistry of the aquifer. For example, drilling fluid invasion and the buildup of borehole filter cake may reduce the effective porosity of the aquifer in the vicinity of the borehole. In addition, bentonite drilling muds may affect the pH of groundwater and organic polymer drilling muds have been observed to facilitate bacterial growth, which reduces the reliability of sampling results. If polymer emulsions are to be used in the drilling program at the Facility, polymer dispersion agents shall be used at the completion of the drilling program to remove the polymers from the boreholes. For example, if EZ Mud® is used as a drilling additive, a dispersant (e.g., BARAFOS® or five percent sodium hypochlorite) shall be used to disperse and chemically break down the polymer prior to developing and sampling the well. If drilling fluids are used as part of well installation, the Permittees must demonstrate that all data acquired from the well is representative of existing subsurface conditions using methods approved by the Department. The Department may require additional sampling and testing periodically to ensure that the data collected is not affected by residual drilling fluids.

8.11.1.4 Dual-Wall Reverse Circulation

The dual-wall reverse circulation drilling method utilizes a double-wall drill pipe and has the reverse circulation of other conventional rotary drilling methods. The circulating fluid (water or air) is pumped down the borehole between the outer and inner drill pipe, and returns up the inner drill pipe. Cuttings are lifted to the surface through the inner drill pipe. The inner drill pipe rotates the bit, and the outer drill pipe acts as a casing and stabilizes the borehole. Typically, a tri-cone bit is used when drilling through unconsolidated formations and a down-the-hole hammer is used in hard rock.

The dual-wall reverse circulation rotary method is one of the better methods available for obtaining representative and continuous formation samples while drilling. If a roller cone bit is used, the formation that is being drilled is located only a few inches ahead of the double-wall pipe. As a result, the cuttings observed at the surface represent no more than one foot of the formation at any point in time.

When drilling with air, an in-line filter shall be used to remove oil or other impurities from the airstream. However, if a down-the-hole hammer is used, it must be used with caution since it requires oil in the airstream to lubricate the hammer. This could possibly introduce contaminants to the borehole and aquifer.

8.11.1.5 Resonant Sonic

Resonant sonic drilling is a method that uses a sonic drill head to produce high-frequency, high-force vibrations in a steel drill pipe. The vibrations in the pipe create a cutting action at the bit face, which allows a continuous core of the formation to move into a core barrel. The method requires no drilling fluid, drills very fast (up to one ft/sec in certain formations), drills at any angle through all formations (rock, clay, sand, boulders, permafrost, glacial till), and yields virtually no cuttings in the drilling process. While there are numerous advantages to this process, the primary disadvantage is the cost of the method. This drilling method has been proven and used at various facilities.

8.11.1.6 Cryogenic

Cryogenic drilling is a technique that uses standard air rotary drilling methods, but employs cold nitrogen gas as the circulating fluid instead of compressed air. The use of nitrogen gas as the circulation fluid freezes the borehole wall while drilling, which stabilizes unconsolidated sediments and prevents potential cross-contamination of different water-bearing zones. In addition, the method produces fewer cuttings than liquid based drilling methods, requires minimal equipment modifications to existing drill rigs, and does not add contaminants to the borehole during the drilling process due to the benign nature of nitrogen gas. The method is especially applicable for drilling through alternating hard (competent) and soft (unconsolidated) formations. This drilling method has been tested by the DOE and proposed for future use at various DOE facilities.

8.11.2 Well Construction/Completion Methods

8.11.2.1 Well Construction Materials

Well construction materials shall be selected based on the goals and objectives of the proposed monitoring program and the geologic conditions at the site. When selecting well construction materials, the primary concern shall be selecting materials that will not contribute foreign constituents or remove contaminants from the groundwater. Other factors to be considered include the tensile strength, compressive strength, and collapse strength of the materials; length of time the monitoring well will be in service; and the material's resistance to chemical and microbiological corrosion.

Well screen and casing materials acceptable for the construction of RCRA monitoring wells include stainless steel (304 or 316), rigid PVC (meeting American National Standards Institute/National Sanitation Foundation Standard 14), and fluoropolymer materials (polytetrafluoroethylene, fluorinated ethylene propylene, and polyvinylidene). In addition, there are other materials available for the construction of monitoring wells including acrylonitrile butadiene styrene (ABS), fiberglass-reinforced plastic (FRP), black iron, carbon steel, and galvanized steel, but these materials are not recommended for use in long term monitoring wells due to their low resistance to chemical attack and potential contribution of contamination to the groundwater. However, these materials may be used in the construction of monitoring wells where they will not be in contact with the groundwater that will be sampled (e.g., carbon steel pipe used as surface casing).

8.11.2.2 Well Construction Techniques

8.11.2.2.i Single-Cased Wells

The borehole shall be bored, drilled, or augered as close to vertical as possible, and checked with a plumb bob, level, or appropriate downhole logging tool. Slanted boreholes shall not be acceptable unless specified in the design. The borehole shall be of sufficient diameter so that well construction can proceed without major difficulties. To assure an adequate size, a minimum two-inch annular space is required between the casing and the borehole wall (or the hollow-stem auger wall). The two-inch annular space around the casing will allow the filter pack, bentonite seal, and annular grout to be placed at an acceptable thickness. Also, the two-inch annular space

will allow up to a 1.5-inch outer diameter tremie pipe to be used for placing the filter pack, bentonite seal, and grout at the specified intervals.

It may be necessary to over-drill the borehole so that any soils that have not been removed (or that have fallen into the borehole during augering or drill stem retrieval) will fall to the bottom of the borehole below the depth where the filter pack and well screen are to be placed. Normally, three to five ft is sufficient for over-drilling shallow wells. Deep wells may require deeper over-drilling. The borehole can also be over-drilled to allow for an extra space for a well sump to be installed. If the borehole is over-drilled deeper than desired, it can be backfilled to the designated depth with bentonite pellets or the filter pack.

The well casings (riser assembly) should be secured to the well screen by flush-jointed threads or other appropriate connections and placed into the borehole and plumbed by the use of centralizers, a plumb bob, or a level. No petroleum-based lubricating oils or grease shall be used on casing threads. Teflon tape can be used to wrap the threads to insure a tight fit and minimize leakage. No glue of any type shall be used to secure casing joints. Teflon "O" rings can also be used to ensure a tight fit and minimize leakage. "O" rings made of materials other than Teflon are not acceptable if the well will be sampled for organic compound analyses. Before the well screen and casings are placed at the bottom of the borehole, at least six inches of filter material shall be placed at the bottom to serve as a firm footing. The string of well screen and casing should then be placed into the borehole and plumbed. If centralizers are used, they shall be placed below the well screens and above the bentonite annular seals so that the placement of the filter pack, overlying bentonite seal, and annular grout will not be hindered. Centralizers placed in the wrong locations can cause bridging during material placement. If installing the well screen and casings through hollow-stem augers, the augers shall be slowly extracted as the filter pack, bentonite seal, and grout are placed in the well. The gradual extraction of the augers will allow the materials being placed in the augers to flow out of the bottom of the augers into the borehole. If the augers are not gradually extracted, the materials will accumulate at the bottom of the augers causing potential bridging problems. After the string of well screen and casing is plumb, the filter material shall be placed around the well screen up to the designated depth. After the filter pack has been installed, the bentonite seal shall be placed directly on top of the filter pack up to the designated depth or a minimum of two ft above the filter pack, whichever is greater. After the bentonite seal has hydrated for the specified time, the annular grout shall be pumped by the tremie method into the annular space around the casings (riser assembly) up to within two feet of the ground surface or below the frost line, whichever is greater. The grout shall be allowed to cure for a minimum of 24 hours before the surface pad and protective casing are installed. After the surface pad and protective casing are installed, bumper guards (guideposts) shall be installed (if necessary).

8.11.2.2.ii Double-Cased Wells

Double-cased wells should be constructed when there is reason to believe that interconnection of two aquifers by well construction may cause cross contamination, or when flowing sands make it impossible to install a monitoring well using conventional methods. A pilot borehole should be advanced through the overburden and the contaminated zone into a clay, confining layer, or bedrock. An outer casing (surface or pilot casing) shall be placed into the borehole and sealed with grout. The borehole and outer casing should extend into tight clay a minimum of two ft or into competent bedrock a minimum of one foot. The total depth into the clay or bedrock will vary depending upon the plasticity of the clay and the extent of weathering and fracturing of the

bedrock. The size of the outer casing shall be of sufficient inside diameter to contain the inner casing and the two-inch annular space. In addition, the borehole shall be of sufficient size to contain the outer casing and the two-inch minimum outer annular space, if applicable.

The outer casing shall be grouted by the tremie method from the bottom of the borehole to within two ft of the ground surface. The grout shall be pumped into the annular space between the outer casing and the borehole wall. This can be accomplished by either placing the tremie pipe in the annular space and pumping the grout from the bottom of the borehole to the surface, or placing a grout shoe or plug inside the casing at the bottom of the borehole and pumping the grout through the bottom grout plug and up the annular space on the outside of the casing. The grout shall consist of Type I Portland cement and bentonite or other approved grout to provide a rigid seal. A minimum of 24 hours shall be allowed for the grout plug (seal) to cure before attempting to drill through it. When drilling through the seal, care shall be taken to avoid cracking, shattering, and washing out of the seal. If caving conditions exist so that the outer casing cannot be sufficiently sealed by grouting, the outer casing shall be driven into place and a grout seal placed in the bottom of the casing.

8.11.2.2.iii Bedrock Wells

The installation of monitoring wells into bedrock can be accomplished in two ways. The first method is to drill or bore a pilot borehole through the soil overburden into the bedrock. An outer casing is installed into the borehole by setting it into the bedrock, and grouting it into place. After the grout has set, the borehole can be advanced through the grout seal into the bedrock. The preferred method of advancing the borehole into the bedrock is rock coring. Rock coring makes a smooth, round hole through the seal and into the bedrock without cracking or shattering the seal. Roller cone bits are used in soft bedrock, but extreme caution should be taken when using a roller cone bit to advance through the grout seal in the bottom of the borehole because excessive water and bit pressure can cause cracking, eroding (washing), and/or shattering of the seal. Low volume air hammers may be used to advance the borehole, but they have a tendency to shatter the seal because of the hammering action. If the structural integrity of the grout seal is in question, a pressure test can be utilized to check for leaks. If the seal leaks, the seal is not acceptable. When the drilling is complete, the finished well will consist of an open borehole from the ground surface to the bottom of the well. The major limitation of open borehole bedrock wells is that the entire bedrock interval serves as the monitoring zone.

The second method is to install the outer surface casing and drill the borehole into bedrock, and then install an inner casing and well screen with the filter pack, bentonite seal, and annular grout. The well is completed with a surface protective casing and concrete pad. This well installation method gives the flexibility of isolating the monitoring zone(s) and minimizing inter-aquifer flow. In addition, it gives structural integrity to the well, especially in unstable areas (e.g., steeply dipping shales) where the bedrock has a tendency to shift or move when disturbed.

8.11.2.3 Well Screen and Filter Pack Design

Well screens and filter packs shall be designed to accurately sample the aquifer zone that the well is intended to sample, minimize the passage of formation materials (turbidity) into the well, and ensure sufficient structural integrity to prevent the collapse of the intake structure. The selection of the well screen length depends upon the objective of the well. Monitoring well screens shall be kept to the minimum length appropriate for intercepting a contaminant plume.

The screen slot size shall be selected to retain from 90 to 100 percent of the filter pack material in artificially filter packed wells, and from 50 to 100 percent of the formation material in naturally packed wells. All well screens shall be factory wire-wrapped or machine slotted.

A filter pack shall be used when: 1) the natural formation is poorly sorted; 2) a long screen interval is required or the screen spans highly stratified geologic materials of widely varying grain sizes; 3) the natural formation is uniform fine sand, silt, or clay, 4) the natural formation is thin-bedded; 5) the natural formation is poorly cemented sandstone; 6) the natural formation is highly fractured or characterized by relatively large solution channels; 7) the natural formation is shale or coal that will act as a constant source of turbidity to groundwater samples; or 8) the diameter of the borehole is significantly greater than the diameter of the screen. The use of natural formation material as a filter pack is only recommended when the natural formation materials are relatively coarse-grained, permeable, and uniform in grain size.

Filter pack materials shall consist of clean, rounded to well-rounded, hard, insoluble particles of siliceous composition (industrial grade quartz sand or glass beads). The required grain-size distribution or particle sizes of the filter pack materials shall be selected based upon a sieve analysis of the aquifer materials or the formation to be monitored, or the characteristics of the aquifer materials using information acquired during previous investigations.

Where sieve analyses are used to select the appropriate filter pack particle size, the results of a sieve analysis of the formation materials are plotted on a grain-size distribution graph, and a grain-size distribution curve is generated. The 70 percent retained grain size value should be multiplied by a factor between four and six (four for fine, uniform formations and six for coarse, non-uniform formations). A second grain-size distribution curve is then drawn on the graph for this new value, ensuring that the uniformity coefficient does not exceed 2.5. The filter pack that shall be used will fall within the area defined by these two curves.

Once the filter pack size is determined, the screen slot size shall be selected to retain at least 90 percent of the filter pack material. The Permittees may propose the use of a pre-determined well screen slot size and filter pack for monitoring wells in the site-specific work plans submitted to the Department.

The filter pack shall be installed in a manner that prevents bridging and particle-size segregation. Filter pack materials shall not be poured into the annular space unless the well is shallow (e.g., less than 30 ft deep) and the filter pack material can be poured continuously into the well without stopping. At least two inches of filter pack material shall be installed between the well screen and the borehole wall, and two ft of material shall extend above the top of the well screen. A minimum of six-inches of filter pack material shall also be placed under the bottom of the well screen to provide a firm footing and an unrestricted flow under the screened area. In deep wells (e.g., greater than 200 ft deep), the filter pack may not compress when initially installed. As a result, filter packs may need to be installed as high as five ft above the screened interval in these situations. The precise volume of filter pack material required shall be calculated and recorded before placement, and the actual volume used shall be determined and recorded during well construction. Any significant discrepancy between the calculated and actual volume shall be explained. Prior to installing the filter pack annular seal, a one to two-ft layer of chemically inert fine sand shall be placed over the filter pack to prevent the intrusion of annular sealants into the filter pack.

8.11.2.4 Annular Sealant

The annular space between the well casing and the borehole must be properly sealed to prevent cross-contamination of samples and the groundwater. The materials used for annular sealants shall be chemically inert with respect to the highest anticipated concentration of chemical constituents expected in the groundwater at the Facility. In general, the permeability of the sealing material shall be one to two orders of magnitude lower than the least permeable parts of the formation in contact with the well. The precise volume of annular sealants required shall be calculated and recorded before placement, and the actual volume shall be determined and recorded during well construction. Any significant discrepancy between the calculated volume and the actual volume shall be explained.

During well construction, an annular seal shall be placed on top of the filter pack. This seal shall consist of a high solids (10-30 percent) bentonite material in the form of bentonite pellets, granular bentonite, or bentonite chips. The bentonite seal shall be placed in the annulus by pouring directly down the annulus. If the bentonite materials are poured directly down the annulus a tagging device shall be used to ensure that the seal is emplaced at the proper depth and the bentonite has not bridged higher in the well casing. The bentonite seal shall be placed above the filter pack a minimum of two ft vertical thickness. The bentonite seal shall be allowed to completely hydrate in conformance with the manufacturer's specifications prior to installing the overlying annular grout seal. The time required for the bentonite seal to completely hydrate will differ with the materials used and the specific conditions encountered, but is generally a minimum of four to 24 hours.

A grout seal shall be installed on top of the filter pack annular seal. The grout seal may consist of a high solids (30 percent) bentonite grout, a neat cement grout, a cement/bentonite grout, or other suitable seal material that is approved by the Department. The grout shall be pumped under pressure (not gravity fed) into the annular space by the tremie pipe method, from the top of the filter pack annular seal to within a few feet of the ground surface. The tremie pipe shall be equipped with a side discharge port (or bottom discharge for grouting at depths greater than 100 feet) to minimize damage to the filter pack or filter pack annular bentonite seal during grout placement. The grout seal shall be allowed to cure for a minimum of 24 hours before the concrete surface pad is installed. All grouts shall be prepared in accordance with the manufacturer's specifications. High solids (30 percent) bentonite grouts shall have a minimum density of 10 pounds per gallon (as measured by a mud balance) to ensure proper setup. Cement grouts shall be mixed using six and one-half to seven gallons of water per 94-pound bag of Type I Portland cement. Bentonite (five to ten percent) may be added to delay the setting time and reduce the shrinkage of the grout.

8.11.3 Well Development

All monitoring wells shall be developed to create an effective filter pack around the well screen, correct damage to the formation caused by drilling, remove fine particles from the formation near the borehole, and assist in restoring the natural water quality of the aquifer in the vicinity of the well. Development stresses the formation around the screen, as well as the filter pack, so that mobile fines, silts, and clays are pulled into the well and removed. Development is also used to remove any foreign materials (e.g., water, drilling mud) that may have been introduced into the borehole during the drilling and well installation activities, and to aid in the equilibration that

will occur between the filter pack, well casing, and the formation water. The development of a well is extremely important to ensuring the collection of representative groundwater samples.

Newly installed monitoring wells shall not be developed for at least 48 hours after the annular seal and backfill are installed. A new monitoring well shall be developed until the column of water in the well is free of visible sediment, and the pH, temperature, turbidity, and specific conductivity have stabilized. In most cases, the above requirements can be satisfied. However, in some cases, the pH, temperature, and specific conductivity may stabilize but the water remains turbid. In this case, the well may still contain well construction materials, such as drilling mud in the form of a mud cake or formation soils that have not been washed out of the borehole. Thick drilling mud cannot be flushed out of a borehole with one or two well volumes of flushing. Instead, continuous flushing over a period of several days may be necessary to complete the well development. If the well is pumped dry, the water level shall be allowed to sufficiently recover before the next development period is initiated. The common methods used for developing wells include:

1. Pumping and over-pumping;
2. Backwashing;
3. Surging (with a surge block);
4. Bailing;
5. Jetting; and
6. Airlift pumping.

These development procedures can be used, either individually or in combination, to achieve the most effective well development. However, the most favorable well development methods include pumping, over-pumping, bailing, surging, or a combination of these methods. Well development methods and equipment that alter the chemical composition of the groundwater shall not be used. Development methods that involve adding water or other fluids to the well or borehole, or that use air to accomplish well development should be avoided, if possible. Approval shall be obtained from the Department prior to introducing air, water, or other fluids into the well for the purpose of well development. If water is introduced to a borehole during well drilling and completion, then the same or greater volume of water shall be removed from the well during development. In addition, the volume of water withdrawn from a well during development shall be recorded, and the Permittees shall use their best efforts to avoid pumping wells dry during development activities. Well or piezometer development must be completed within 30 days of installation of the well or piezometer or immediately after all wells proposed in an investigation work plan are installed.

8.11.4 Surface Completion

Monitoring wells may be completed either as flush-mounted wells, or as above-ground completions. A surface seal shall be installed over the grout seal and extended vertically up the well annulus to the land surface. The lower end of the surface seal shall extend a minimum of 1 foot below the frost line to prevent damage from frost heaving. The composition of the surface seal shall be neat cement or concrete. In above-ground completions, a three-foot wide, four-inch thick concrete surface pad shall be installed around the well at the same time the protective

casing is installed. The surface pad shall be sloped so that drainage will flow away from the protective casing and off the pad. In addition, a minimum of one inch of the finished pad shall be below grade or ground elevation to prevent washing and undermining by soil erosion.

A locking protective casing shall be installed around the well casing (riser) to prevent damage or unauthorized entry. The protective casing shall be anchored in the concrete surface pad below the frost line and extend several inches above the well riser stickup. A weep hole may be drilled into the protective casing just above the top of the concrete surface pad to prevent water from accumulating and freezing inside the protective casing around the well riser. A cap shall be placed on the well riser to prevent tampering or the entry of foreign materials, and a lock shall be installed on the protective casing to provide security. If the wells are located in an area that receives traffic, a minimum of three bumper guards consisting of steel pipes three to four inches in diameter and a minimum of five-foot length should be installed. The bumper guards should be installed to a minimum depth of two feet below the ground surface in a concrete footing and extend a minimum of three feet above ground surface. The pipes should be filled with concrete to provide additional strength. The pipes should be painted a bright color to reduce the possibility of vehicular damage.

If flush-mounted completions are required (e.g., in active roadway areas), a protective structure such as a utility vault or meter box should be installed around the well casing. In addition, measures should be taken to prevent the accumulation of surface water in the protective structure and around the well intake. These measures should include outfitting the protective structure with a steel lid or manhole cover that has a rubber seal or gasket, and ensuring that the bond between the cement surface seal and the protective structure is watertight.

8.11.5 Well Abandonment

All well abandonment must be conducted in accordance with 19.27.4 NMAC. Wells are usually abandoned when they are no longer required in the monitoring network or when they are damaged beyond repair. The goal of well abandonment is to seal the borehole in such a manner that the well cannot act as a conduit for migration of contaminants from the ground surface to the aquifer or between aquifers. To properly abandon a well, the preferred method is to completely remove the well casing and screen from the borehole, clean out the borehole, and backfill with a cement or bentonite grout, neat cement, or concrete. The well abandonment procedure must also comply with current EPA well abandonment guidance.

If conditions allow, for wells with small diameter casing, abandonment shall be accomplished by overdrilling the well with a large diameter hollow-stem auger. After the well has been overdrilled, the well casing and grout can be lifted out of the ground with a drill rig, and the remaining filter pack can be drilled out. The open borehole can then be pressure grouted (via the tremie pipe method) from the bottom of the borehole to the ground surface. After the grout has cured, the top two ft of the borehole shall be filled with concrete to insure a secure surface seal.

Several other well abandonment procedures are available for wells with larger diameter screens and casings. One method is to force a drill stem with a tapered wedge assembly or a solid-stem auger into the well casing and pull the casing out of the ground. However, if the casing breaks or the well cannot be pulled from the ground, the well will have to be grouted in place. To abandon a well in place, a tremie pipe shall be placed at the lowest point in the well (at the bottom of the screen or in the well sump). The entire well is then pressure grouted from the bottom of the well

upward. The pressurized grout will be forced out through the well screen into the filter pack and up the inside of the well casing sealing off all breaks and holes in the casing. Once the well is grouted, the casing is cut off even with the ground surface and covered with concrete.

If a PVC well cannot be abandoned due to internal casing damage (e.g., the tremie pipe cannot be extended to the bottom of the screen), it may be necessary to drill out the casing with a roller cone or drag bit using the wet rotary drilling method, or grind out the casing using a solid-stem auger equipped with a carbide tooth bit. Once the casing is removed, the open borehole can be cleaned out and pressure grouted from the bottom of the borehole upward.

8.11.6 Documentation

All information on the design, construction, and development of each monitoring well shall be recorded and presented on a boring log, a well construction log, and well construction diagram. The well construction log and well construction diagram shall include the following information:

1. Well name/number;
2. Date/time of well construction;
3. Borehole diameter and well casing diameter;
4. Well depth;
5. Casing length;
6. Casing materials;
7. Casing and screen joint type;
8. Screened interval(s);
9. Screen materials;
10. Screen slot size and design;
11. Filter pack material and size;
12. Filter pack volume (calculated and actual);
13. Filter pack placement method;
14. Filter pack interval(s);
15. Annular sealant composition;
16. Annular sealant placement method;
17. Annular sealant volume (calculated and actual);
18. Annular sealant interval(s);
19. Surface sealant composition;
20. Surface seal placement method;
21. Surface sealant volume (calculated and actual);
22. Surface sealant interval;

23. Surface seal and well apron design and construction;
24. Well development procedure and turbidity measurements;
25. Well development purge volume(s) and stabilization parameter measurements;
26. Type and design and construction of protective casing;
27. Well cap and lock;
28. Ground surface elevation;
29. Survey reference point elevation on well casing;
30. Top of monitoring well casing elevation; and
31. Top of protective steel casing elevation.

8.12 REPORTING REQUIREMENTS

8.12.1 General

The purpose of this Permit Section is to provide the reporting requirements and report formats for corrective action activities at all SWMUs, AOCs, and permitted units required under this Permit. This Permit Section is not intended to provide reporting requirements for every potential corrective action conducted at the Facility; therefore, the formats for all types of reports are not presented below. The described formats include the general reporting requirements and formats for site-specific investigation work plans, investigation reports, periodic monitoring reports, risk assessment reports, and corrective measures evaluations. The Permittees shall generally consider the reports to be the equivalents of RCRA Facility Investigation (RFI) work plans, RFI reports, periodic monitoring reports, risk assessments, Corrective Measures Study (CMS) plans, and CMS reports, for the purposes of RCRA compliance. The Permittees shall include detailed, site-specific requirements in all SWMU, AOC, permitted unit and facility-wide investigation work plans, investigation reports, monitoring reports, and corrective measures evaluations. All plans and reports shall be prepared considering any technical and regulatory input received from the Department. All work plans, reports and other documents shall be submitted to the Department as required in Permit Section 1.14.

The reporting requirements listed in this attachment do not include all sections that may be necessary to complete each type of report listed and may include sections that are not relevant for a specific site action. The Permittees or the Department may determine that additional sections may be needed to address additional site-specific issues or information collected during corrective action or monitoring activities not listed below. All reports submitted by the Permittees shall follow the general approach and limitations for data presentation described in this Permit Part.

8.12.2 Investigation Work Plan

The Permittees shall prepare work plans for site investigations or corrective action activities at the Facility using the general outline below. The minimum requirements for describing proposed activities within each section are included. All research, locations, depths and methods of exploration, field procedures, analytical results, data collection methods, and schedules shall be

included in each work plan. In general, interpretation of data acquired during previous investigations shall be presented only in the background sections of the work plans. The other text sections of the work plans shall be reserved for presentation of anticipated site-specific activities and procedures relevant to the project. The general work plan outline is described below.

8.12.2.1 Title Page

The title page shall include the type of document; Facility name; Area designation; SWMU or AOC name, site, and any other unit name; and the submittal date. A signature block providing spaces for the names and titles of the responsible DOE and Sandia representatives shall be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

8.12.2.2 Executive Summary (Abstract)

The executive summary or abstract shall provide a brief summary of the purpose and scope of the investigation to be conducted at the subject site. The Facility, SWMU or AOC name, permitted unit reference, site name, any other unit name, location, and Area designation shall be included in the executive summary.

8.12.2.3 Table of Contents

The table of contents shall list all text sections, tables, figures, and appendices or attachments included in the work plan. The corresponding page numbers for the titles of each section of the work plan shall be included in the table of contents.

8.12.2.4 Introduction

The introduction shall include the Facility name, area designation, unit location, and unit status (e.g., closed, corrective action). General information on the current site usage and status shall be included in this section. A brief description of the purpose of the investigation and the type of site investigation to be conducted shall be provided in this section.

8.12.2.5 Background

The background section shall describe relevant background information. This section shall briefly summarize historical site uses by the U.S. Government and any other entity, including the locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features. The locations of pertinent subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures shall be included in the background summary and labeled on the figure, unless none exist.

This section shall identify potential receptors, including groundwater, and include a brief summary of the type and characteristics of all waste and all contaminants managed or released at the site, the known and possible sources of contamination, the history of releases or discharges of contamination, and the known extent of contamination. This section shall include brief summaries of results of previous investigations, if conducted, including references to pertinent

figures, data summary tables, and text in previous reports. At a minimum, detections of contaminants encountered during previous investigations shall be presented in table format, with an accompanying figure showing sample locations. References to previous reports shall include page, table, and figure numbers for referenced information. Summary data tables and site plans showing relevant investigation locations shall be included in the Tables and Figures sections of the document, respectively.

8.12.2.6 Site Conditions

8.12.2.6.i Surface Conditions

A section on surface conditions shall provide a description of current site topography, features and structures including a description of topographic drainages, man-made drainages, vegetation, erosional features, and basins. It shall also include a detailed description of current site usage and any current operations at the site. In addition, descriptions of features located in surrounding sites that may have an impact on the subject site regarding sediment transport, surface water run-off, or contaminant fate and transport shall be included in this section.

8.12.2.6.ii Subsurface Conditions

A section on subsurface conditions shall provide a description of the site conditions observed during previous subsurface investigations, including relevant soil horizons, stratigraphy, presence of groundwater, and other relevant information. A site plan showing the locations of all borings and excavations advanced during previous investigations shall be included in the Figures section of the work plan. A brief description of the anticipated stratigraphic units that may be encountered during the investigation may be included in this subsection if no previous investigations have been conducted at the site.

8.12.2.7 Scope of Activities

A section on the scope of activities shall briefly describe a list of all anticipated activities to be performed during the investigation including background information research, health and safety requirements that may affect or limit the completion of tasks, drilling, test pit or other excavations, well construction, field data collection, survey data collection, chemical analytical testing, aquifer testing, remediation system pilot tests, and IDW storage and disposal.

8.12.2.8 Investigation Methods

A section on investigation methods shall provide a description of all anticipated locations and methods for conducting the activities to be performed during the investigation. This section shall include research methods, health and safety practices that may affect the completion of tasks, drilling methods, test pit or other excavation methods, sampling intervals and methods, well construction methods, field data collection methods, geophysical and land survey methods, field screening methods, chemical analytical testing, materials testing, aquifer testing, pilot tests, and other proposed investigation and testing methods. This information may also be summarized in table format, if appropriate.

8.12.2.9 Monitoring and Sampling Program

A section on monitoring and sampling shall provide a description of the groundwater, ambient air, subsurface vapor, remediation system, engineering controls, and other monitoring and sampling programs currently being implemented at the site.

8.12.2.10 Schedule

A section shall set forth the anticipated schedule for completion of field investigation, pilot testing, and monitoring and sampling activities. In addition, this section shall set forth a schedule for submittal of reports and data to the Department including a schedule for submitting all status reports and preliminary data.

8.12.2.11 Tables

The following summary tables may be included in the investigation work plans, if previous investigations have been conducted at the site:

1. Summaries of regulatory criteria, background, and applicable cleanup levels (may be included in the analytical data tables instead of as separate tables);
2. Summaries of historical field survey location data;
3. Summaries of historical field screening and field parameter measurements of soil, rock, sediments, groundwater, surface water, and air quality data;
4. Summaries of historical soil, rock, or sediment laboratory analytical data shall include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;
5. Summaries of historical groundwater elevation and depth to groundwater data. The table shall include the monitoring well depths, the screened intervals in each well, and the dates and times measurements were taken;
6. Summaries of historical groundwater laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;
7. Summary of historical surface water laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data;
8. Summary of historical air sample screening and chemical analytical data. The data tables shall include the screening instruments used, laboratory analytical methods, detection limits, and significant data quality exceptions that could influence interpretation of the data; and
9. Summary of historical pilot or other test data, if applicable, including units of measurement and types of instruments used to obtain measurements.

Data presented in the tables shall include information on dates of data collection, analytical methods, detection limits, and significant data quality exceptions. The analytical data tables

shall include only detected analytes and data quality exceptions that could potentially mask detections.

8.12.2.12 Figures

The following figures shall be included with each investigation work plan for each site, including presentation of data where previous investigations have been conducted. All figures must include an accurate bar scale and a north arrow. An explanation shall be included on each figure for all abbreviations, symbols, acronyms, and qualifiers. All maps shall contain a date of preparation.

1. A vicinity map showing topography and the general location of the site relative to surrounding features and properties;
2. A site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and details. Off-site well locations and other relevant features shall be included on the site plan, if appropriate. Additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;
3. Figures showing historical and proposed soil boring or excavation locations and sampling locations;
4. Figures presenting historical soil sample field screening and laboratory analytical data if applicable;
5. Figures presenting the locations of all existing and proposed borings and vapor monitoring well locations;
6. Figures showing all existing and proposed wells and piezometers, presenting historical groundwater elevation data, and indicating groundwater flow directions;
7. Figures presenting historical groundwater laboratory analytical data, if applicable. The chemical analytical data corresponding to each sampling location can be presented in tabular form on the figure or as an isoconcentration map;
8. Figures presenting historical and proposed surface water sample locations and field measurement data, if applicable;
9. Figures presenting historical surface water laboratory analytical data, if applicable;
10. Figures showing historical and proposed air or vapor sampling locations and presenting historical air quality data, if applicable;
11. Figures presenting historical pilot and other testing locations and data, where applicable, including site plans and graphic data presentation; and
12. Figures presenting geologic cross-sections, based on outcrop and borehole data acquired during previous investigations, if applicable.

8.12.2.13 Appendices

A description of IDW management shall be included as an appendix to the investigation work plan. The results of historical investigations required in this Permit shall be submitted with the

investigation work plan as a separate document. Additional appendices may be necessary to present additional data or documentation not listed above.

8.12.3 Investigation Report

The Permittees shall prepare investigation reports at the Facility using the general outline below. The Investigation Report shall be the reporting mechanism for presenting the results of completed Investigation Work Plans. This Permit Section (8.12.3) describes the minimum requirements for reporting on site investigations. All data collected during each site investigation event in the reporting period shall be included in the reports. In general, interpretation of data shall be presented only in the background, conclusions and recommendations sections of the reports. The other text sections of the reports shall be reserved for presentation of facts and data without interpretation or qualifications. The general report outline is provided below.

8.12.3.1 Title Page

The title page shall include the type of document; Facility name; Area designation; SWMU or AOC name, site, and any other unit name; and the submittal date. A signature block providing spaces for the names and titles of the responsible DOE and Sandia representatives shall be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

8.12.3.2 Executive Summary (Abstract)

The executive summary or abstract shall provide a brief summary of the purpose, scope, and results of the investigation; site names; location; and area designation. In addition, this section shall include a brief summary of conclusions included in the report based on the investigation data collected and recommendations for future investigation, monitoring, remedial action or site closure.

8.12.3.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the report. The corresponding page numbers for the titles of each section of the report shall be included in the table of contents.

8.12.3.4 Introduction

The introduction section shall include the Facility name, area designation, unit location, and unit status (e.g., closed, corrective action). General information on the site usage and status shall be included in this section. A brief description of the purpose of the investigation, the type of site investigation conducted, and the type of results presented in the report also shall be provided in this section.

8.12.3.5 Background

The background section shall describe relevant background information. This section shall briefly summarize historical site uses by the U.S. Government and any other entity, including the

locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features. The locations of any subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures shall be included in the background summary and labeled on the figure, as appropriate. In addition, this section shall include a brief summary of the possible sources of contamination, the history of releases or discharges of contamination, the known extent of contamination, and a general summary of the results of previous investigations including references to previous reports. The references to previous reports shall include page, table, and figure numbers for referenced information. A site plan, showing relevant investigation locations, and summary data tables shall be included in the Figures and Tables sections of the document, respectively.

8.12.3.6 Scope of Activities

A section on the scope of activities shall briefly describe all activities performed during the investigation event including background information research, implemented health and safety measures that affected or limited the completion of tasks, drilling, test pit or other excavation methods, well construction methods, field data collection, survey data collection, chemical analytical testing, aquifer testing, remediation system pilot tests, and IDW storage or disposal.

8.12.3.7 Field Investigation Results

A section shall provide a summary of the procedures used and the results of all field investigation activities conducted at the site including the dates that investigation activities were conducted, the type and purpose of field investigation activities performed, field screening measurements, logging and sampling results, pilot test results, construction details, and conditions observed. Field observations or conditions that altered the planned work or may have influenced the results of sampling, testing, and logging shall be reported in this section. The following sections shall be included.

8.12.3.8 Site Conditions

8.12.3.8.i Surface Conditions

A section on surface conditions shall provide a description of current site topography, features and structures including a description of topographic drainages, man-made drainages, vegetation, erosional features, and basins. It shall also include a detailed description of current site usage and any current operations at the site. In addition, descriptions of features located in surrounding sites that may have an impact on the subject site regarding sediment transport, surface water run-off, or contaminant fate and transport shall be included in this section.

8.12.3.8.ii General Subsurface Conditions

A section on subsurface conditions shall provide a description of the general site conditions observed during the subsurface investigations, including relevant soil horizons, stratigraphy, presence of groundwater, and other relevant information. A site plan showing the locations of all borings and excavations advanced during the investigation and, as applicable, previous investigations shall be included in the Figures section of the work plan. A brief description of

the stratigraphic units that were observed during the investigation shall be included in this subsection if no previous investigations have been conducted at the site.

8.12.3.9 Exploratory Drilling or Excavation Investigations

A section shall describe the locations, methods, and depths of subsurface explorations. The description shall include the types of equipment used, the logging procedures, the soil or rock classification system used to describe the observed materials, exploration equipment decontamination procedures, and conditions encountered that may have affected or limited the investigation.

A description of the site conditions observed during subsurface investigation activities shall be included in this section, including soil horizon and stratigraphic information. Site plans showing the locations of all borings and excavations shall be included in the Figures Section of the report. Boring and test pit logs for all exploratory borings and test pits shall be presented in an appendix or attachment to the report.

8.12.3.10 Exploratory and Monitoring Well Boring Geophysical Logging

A section shall describe the methods, dates of measurement, depth intervals measured, and the results of geophysical logging. The relative merits and limitations of each geophysical logging method employed shall be discussed, along with any field conditions or instrument malfunctions that occurred that may have affected the results of the geophysical logging.

8.12.3.11 Subsurface Conditions

A section on subsurface conditions shall describe known subsurface lithology and structures, based on observations made during the current and previous subsurface investigations, including interpretation of geophysical logs and as-built drawings of man-made structures. A description of any known locations of pipelines and utility lines and observed geologic structures shall also be included in this section. A site plan showing boring and excavation locations and the locations of the site's above- and below-ground structures shall be included in the Figures Section of the report. In addition, cross-sections shall be constructed, if appropriate, to provide additional visual presentation of site or regional subsurface conditions.

8.12.3.12 Monitoring Well Construction and Boring or Excavation Abandonment

A section shall describe the methods and details of monitoring well construction and the methods used to abandon or backfill exploratory borings and excavations. The description shall include the dates of well construction, boring abandonment, or excavation backfilling. In addition, well construction diagrams shall be included in an appendix or attachment with the associated boring logs for monitoring well borings. The Permittees may submit well abandonment reports as an appendix to the investigation report.

8.12.3.13 Groundwater Conditions

A section shall describe groundwater conditions observed beneath the subject site and relate local groundwater conditions to regional groundwater conditions. A description of the depths to

water, aquifer thickness, and groundwater flow directions shall be included in this section for perched and regional groundwater, as appropriate to the investigation. Figures showing well locations, surrounding area, and groundwater elevations and flow directions for each hydrologic zone shall be included in the Figures Section of the report.

8.12.3.14 Surface Water Conditions

A section shall describe surface water conditions and include a description of surface water run-off, drainage, surface water sediment transport, and contaminant transport in surface water as suspended load and as a dissolved phase in surface water via natural and man-made drainages, if applicable. A description of contaminant fate and transport shall be included, if appropriate.

8.12.3.15 Surface Air and Subsurface Vapor Conditions

A section shall describe surface air and subsurface vapor monitoring and sampling methods used during the site investigation. It shall also describe observations made during the site investigation regarding subsurface flow pathways and the subsurface air-flow regime.

8.12.3.16 Materials Testing Results

A section shall discuss the materials testing results, such as core permeability testing, grain size analysis, or other materials testing results. Sample collection methods, locations, and depths shall also be included. Corresponding summary tables shall be included in the Tables Section of the report.

8.12.3.17 Pilot Testing Results

A section shall discuss the results of any pilot tests. Pilot tests are typically conducted after initial subsurface investigations are completed and the need for additional investigation or remediation has been evaluated. Pilot tests, including aquifer tests and remediation system pilot tests, shall be addressed through separate work plans and pilot test reports. The format for pilot test work plans and reports shall be approved by the Department prior to submittal.

8.12.3.18 Regulatory Criteria

A section shall set forth the cleanup standards, risk-based screening levels, and risk-based cleanup goals for each pertinent medium at the subject site. The appropriate cleanup levels for each site shall be included if site-specific levels have been established at separate Facility sites or units. A table summarizing the applicable cleanup standards or levels or inclusion of applicable cleanup standards or levels in the data tables shall be included as part of the document. The risk assessment, if conducted, shall be presented in a separate document or in an appendix to this report. If cleanup or screening levels calculated in the Department-approved risk evaluation are employed, the risk evaluation document shall be referenced and shall include pertinent page numbers for referenced information.

8.12.3.19 Site Contamination

A section shall provide a description of sampling intervals and methods for detection of surface and subsurface contamination in soils, rock, sediments, groundwater, and surface water, and as vapor-phase contamination. Only factual information shall be included in this section. Interpretation of the data shall be reserved for the summary and conclusions sections of the report. Tables summarizing all sampling, testing, and screening results for detected contaminants shall be prepared in a format approved by the Department. The tables shall be presented in the Tables Section of the report.

8.12.3.19.i Soil, Rock, and Sediment Sampling

A section shall describe the sampling of soil, rock, and sediment. It shall include the dates, locations and methods of sample collection; sampling intervals; sample logging methods; screening sample selection methods; and laboratory sample selection methods including the collection depths for samples submitted for laboratory analyses. A site plan showing the sample locations shall be included in the Figures Section of the report.

8.12.3.19.ii Soil, Rock, and Sediment Sample Field Screening Results

A section shall describe the field screening methods used during the investigation and the field screening results. Field screening results also shall be presented in summary tables in the Tables Section of the document. The limitations of field screening instrumentation and any conditions that influenced the results of field screening shall be discussed in this section.

8.12.3.19.iii Soil, Rock, and Sediment Sampling Analytical Results

A section shall summarize the results of laboratory analysis for soil, rock, and sediment samples. It shall also describe the analytical methods used and provide a comparison of the analytical results to background levels, cleanup standards, or established cleanup levels for the site. The laboratory results also shall be presented in summary tables in the Tables Section of the document. Field conditions and sample collection methods that could potentially affect the analytical results shall be described in this section. If appropriate, soil analytical data shall be presented with sample locations on a site plan and included in the Figures Section of the report.

8.12.3.19.iv Groundwater Sampling

A section on groundwater sampling shall describe the dates, locations, depths, and methods of sample collection; methods for sample logging; and methods for screening and laboratory sample selection. A map showing all sites and surrounding area well locations shall be included in the Figures Section of the report.

8.12.3.19.v Groundwater General Chemistry

A section on the general groundwater chemistry shall describe the results of measurement of field purging parameters and field analytical measurements. Field parameter measurements and field analytical results also shall be presented in summary tables in the Tables Section of the document. The limitations of field measurement instrumentation and any conditions that may have influenced the results of field screening shall be discussed in this section. As determined by the Permittees and the Department, relevant water chemistry concentrations shall be presented as data tables or as iso-concentration contours on a map included in the Figures Section of the report.

8.12.3.19.vi Groundwater Chemical Analytical Results

A section shall summarize the results of groundwater chemical analyses. It shall describe the groundwater chemical analytical methods and analytical results. It shall also provide a comparison of the data to cleanup standards or established cleanup levels for the site. The rationale or purpose for altering or modifying the groundwater sampling program outlined in the site investigation work plan shall also be provided in this section. Field conditions shall be described in this section that may have affected the analytical results during sample collection. Tables summarizing the groundwater laboratory, field, and field sample QA/QC chemical analytical data; applicable cleanup levels; and modifications to the groundwater sampling program shall be provided in the Tables Section of the report. Relevant contaminant concentrations shall be presented as individual analyte concentrations, data tables, or as isoconcentration contours on a map included in the Figures Section of the report.

8.12.3.19.vii Surface Water Sampling

A section shall describe the surface water sampling and shall include the dates, times, locations, depths, and methods of sample collection. It shall also describe methods for sample logging, sample-screening methods, and laboratory sample selection methods. A map showing all surface-water sampling locations shall be included in the Figures Section of the report.

8.12.3.19.viii Surface Water General Chemistry

A section on the surface water general chemistry shall describe the results of measurement of field parameters and field analytical measurements. Field parameter measurements and field analytical results also shall be presented in summary tables in the Tables Section of the document. The limitations of field measurement instrumentation and any conditions that influenced the results of field screening shall be discussed in this Section. Relevant water chemistry concentrations shall be presented as data tables on a map included in the Figures Section of the report.

8.12.3.19.ix Surface Water Chemical Analytical Results

A section shall summarize the results of surface water chemical analyses. It shall describe the analytical methods and analytical results, and provide a comparison of the data to the cleanup standards or established background or cleanup levels for the site. The rationale or purpose for altering or modifying the surface-water sampling program outlined in the site investigation work plan also shall be provided in this section. Field conditions that may have affected the analytical results during sample collection shall be described in this section. Tables summarizing the surface water laboratory, field, and analytical field sample QA/QC analytical data; applicable cleanup levels; and modifications to the surface-water sampling program shall be provided in the Tables Section of the report. Relevant contaminant concentrations shall be presented as individual analyte concentrations or as data tables on a map included in the Figures Section of the report.

8.12.3.19.x Air and Subsurface Vapor Sampling

A section shall describe the air and subsurface vapor sampling. It shall describe the dates, locations, depths or elevations above ground surface, methods of sample collection, methods for sample logging, and methods for laboratory sample selection. A map showing all air sampling locations shall be provided in the Figures Section of the report.

8.12.3.19.xi Air and Subsurface Vapor Field Screening Results

A section shall describe the air and subsurface vapor field screening results. It shall describe the field screening methods used for ambient air and subsurface vapors during the investigation. Field screening results shall also be presented in summary tables in the Tables Section of the report. The locations of ambient air and subsurface vapor screening sample collection shall be presented on a site plan included in the Figures Section of the report. The limitations of field screening instrumentation and any conditions that influenced the results of field screening shall be discussed in this Section.

8.12.3.19.xii Air and Subsurface Vapor Laboratory Analytical Results

A section shall describe the results of air and subsurface vapor laboratory analysis. It shall describe the air sampling laboratory analytical methods and analytical results, and provide a comparison of the data to emissions standards or established cleanup or emissions levels for the site. The rationale or purpose for altering or modifying the air monitoring or sampling program outlined in the site investigation work plan also shall be provided in this section. Field conditions that may have affected the analytical results during sample collection shall be described in this section. Tables summarizing the air sample laboratory, field, and analytical field sample QA/QC data; applicable cleanup levels or emissions standards; and modifications to the air sampling program shall be provided in the Tables Section of the report. Relevant contaminant concentrations shall be presented as individual analyte concentrations, data tables, or as iso-concentration contours on a map included in the Figures Section of the report.

8.12.3.20 Conclusions

A section shall provide a brief summary of the investigation activities and a discussion of the conclusions of the investigation conducted at the site. In addition, this section shall provide a comparison of the results to applicable cleanup or screening levels, and to relevant historical investigation results and analytical data. Potential receptors, including groundwater, shall be identified and discussed. An explanation shall be provided with regard to data gaps. A risk assessment may be included as an appendix to the investigation report; however, the risk assessment shall be presented in the Risk Assessment format described in Permit Section 8.12.5. References to the risk assessment shall be presented only in the summary and conclusions sections of the Investigation Report.

8.12.3.21 Recommendations

A section shall discuss the need for further investigation, corrective measures, risk assessment and monitoring, or recommendations for corrective action completed, based on the conclusions provided in the Conclusions section. It shall include explanations regarding additional sampling, monitoring, and site closure. A corresponding schedule for further action regarding the site shall also be provided. No action recommendations shall include the anticipated schedule for submittal of a petition for a permit modification.

8.12.3.22 Tables

A section shall provide the following summary tables as applicable:

1. Tables summarizing regulatory criteria, background levels, and applicable cleanup levels (this information may be included in the analytical data tables instead of as separate tables);
2. Tables summarizing field survey location data. Separate tables shall be prepared for well locations and individual medium sampling locations except where the locations are the same for more than 1 medium;
3. Tables summarizing field screening and field parameter measurements of soil, rock, sediments, groundwater, surface water, and air quality data;
4. A table summarizing soil, rock, and/or sediment laboratory analytical data. It shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
5. A table summarizing the groundwater elevations and depths to groundwater. The table shall include the monitoring well depths and the screened intervals in each well;
6. A table summarizing the groundwater laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
7. A table summarizing the surface water laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
8. A table summarizing the air sample screening and laboratory analytical data. The data tables shall include the screening instruments used, laboratory analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
9. Tables summarizing the pilot test data, if applicable, including units of measurement and types of instruments used to obtain measurements; and
10. A table summarizing any materials test data.

With prior approval from the Department, the Permittees may combine one or more of the tables. Data presented in the tables shall include the current data, dates of data collection, analytical methods, detection limits, and significant data quality exceptions. The summary analytical data tables shall include only detected analytes and data quality exceptions that could potentially mask detections.

8.12.3.23 Figures

A section shall provide the following figures as applicable:

1. A vicinity map showing topography and the general location of the subject site relative to surrounding features and properties;
2. A site plan that presents any pertinent site features and structures, underground utilities, well locations, and remediation system location(s) and details. Off-site well locations and other relevant features shall be included on the site plan. Additional site plans may be required to present the locations of relevant off-site well locations, structures and features;

3. Figures showing boring or excavation locations and sampling locations;
4. Figures presenting soil sample field screening and laboratory analytical data;
5. Figures displaying the locations of all newly installed and existing wells and borings;
6. Figures presenting monitoring well and piezometer locations, groundwater elevation data, and groundwater flow directions;
7. Figures presenting groundwater laboratory analytical data, including any past data requested by the Department. The laboratory analytical data corresponding to each sampling location may be presented in table form on the figure or as an isoconcentration map;
8. Figures presenting surface water sample locations and field measurement data including any past data requested by the Department;
9. Figures presenting surface water laboratory analytical data including any past data requested by the Department. The laboratory analytical data corresponding to each sampling location may be presented in table form on the figure;
10. Figures showing air sampling locations and presenting air quality. The field screening or laboratory analytical data corresponding to each sampling location may be presented in table form on the figure or as an isoconcentration map;
11. Figures presenting geologic cross-sections based on outcrop and borehole data; and
12. Figures presenting pilot test locations and data, where applicable, including site plans or graphic data presentation.

All figures shall include an accurate bar scale and a north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All maps shall have a date.

8.12.3.24 Appendices

Each investigation report shall include the following appendices. Additional appendices may be necessary to present data or documentation not listed below.

8.12.3.24.i Field Methods

An appendix shall provide detailed descriptions of the methods used to acquire field measurements of each medium that was surveyed or tested during the investigation. This appendix shall include exploratory drilling or excavation methods, the methods and types of instruments used to obtain field screening, field analytical or field parameter measurements, instrument calibration procedures, sampling methods for each medium investigated, decontamination procedures, sample handling procedures, documentation procedures, and a description of field conditions that affected procedural or sample testing results. Methods of measuring and sampling during pilot tests shall be reported in this appendix, if applicable. Geophysical logging methods shall be discussed in a separate section of this appendix. Investigation derived waste (IDW) storage and disposal methods shall also be discussed in this appendix. Copies of IDW disposal documentation shall be provided in a separate appendix.

8.12.3.24.ii Boring/Test Pit Logs and Well Construction Diagrams

An appendix shall provide boring logs, test pit logs, or other excavation logs, and well construction details. In addition, a key to symbols and a soil or rock classification system shall be included in this appendix. Geophysical logs shall be provided in a separate section of this appendix.

8.12.3.24.iii Analytical Program

An appendix shall discuss the analytical methods, a summary of data quality objectives, and the data quality review procedures. A summary of data quality exceptions and their effect on the acceptability of the field and laboratory analytical data with regard to the investigation and the site status shall be included in this appendix along with references to the case narratives provided in the laboratory reports.

8.12.3.24.iv Analytical Reports

An appendix shall provide the contract laboratory final analytical data reports generated for the investigation. The reports shall include all chain-of-custody records and Level II QA/QC results provided by the laboratory. The final laboratory reports and data tables shall be provided electronically in a format approved by the Department. Paper copies (or copies electronically scanned in PDF format) of all chain-of-custody records shall be provided with the reports.

8.12.3.24.v Other Appendices

Other appendices containing additional information shall be included as required by the Department or as otherwise appropriate.

8.12.4 Periodic Monitoring Report

The Permittees shall use the following guidance for preparing periodic monitoring reports under this Permit Part. The reports shall present the reporting of periodic groundwater, surface water, vapor, and remediation system monitoring at the Facility. The following sections provide a general outline for monitoring reports, and also provide the minimum requirements for reporting for specific Facility sites, areas, and regional monitoring. All data collected during each monitoring and sampling event in the reporting period shall be included in the reports. In general, interpretation of data shall be presented only in the background, conclusions, and recommendations sections of the reports. The other text sections of the reports shall be reserved for presentation of facts and data without interpretation or qualifications.

8.12.4.1 Title Page

The title page shall include the type of document; Facility name; area designation; SWMU or AOC name, site, watershed, and any other unit name; and the submittal date. A signature block providing spaces for the names and titles of the responsible DOE and Sandia representatives shall be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

8.12.4.2 Executive Summary (Abstract)

The executive summary or abstract shall provide a brief summary of the purpose, scope, and results of the monitoring conducted at the subject site during the reporting period. The area (e.g.,

Plume-front, Facility-wide) SWMU, AOC and site name, location, and/or area designation shall be included in the executive summary. In addition, this section shall include a brief summary of conclusions based on the monitoring data collected.

8.12.4.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the report. The corresponding page numbers for the titles of each section of the report shall be included in the table of contents.

8.12.4.4 Introduction

The introduction section shall include the Facility name, area designation physical area and/or, unit location, and unit status as applicable (e.g. closed, corrective action). General information on the site usage and status shall be included in this section. A brief description of the purpose of the monitoring, type of monitoring conducted, and the type of results presented in the report also shall be provided in this section.

8.12.4.5 Scope of Activities

A section on the scope of activities shall briefly describe all activities performed during the monitoring event or reporting period including field data collection, analytical testing, remediation system monitoring, if applicable, and purge/decontamination water storage and disposal.

8.12.4.6 Regulatory Criteria

A section on regulatory criteria shall provide information regarding applicable cleanup standards, risk-based screening levels and risk-based cleanup goals for the subject site. A separate table summarizing the applicable screening levels or standards or inclusion of the applicable cleanup standards or screening levels in the data tables can be substituted for this section. The appropriate cleanup or screening levels for each site shall be included, if site-specific levels have been established at separate sites. Risk-based evaluation procedures, if used to calculate cleanup or screening levels, must either be included as an attachment or referenced. The specific document and page numbers must be included for all referenced materials.

8.12.4.7 Monitoring Results

A section shall provide a summary of the results of monitoring conducted at the site. This section shall include the dates and times that monitoring was conducted, the measured depths to groundwater, directions of groundwater flow, field air and water quality measurements, contaminant surveys, static pressures, field measurements, and a comparison to previous monitoring results. Field observations or conditions that may influence the results of monitoring shall be reported in this section. Tables summarizing vapor-monitoring parameters, groundwater elevations, depths to groundwater measurements, and other field measurements can be substituted for this section. The tables shall include all information required in Permit Section 8.12.4.11.

8.12.4.8 Analytical Data Results

A section shall discuss the results of the chemical analyses. It shall provide the dates of sampling, the analytical methods, and the analytical results. It shall also provide a comparison of the data to previous results and to background levels, cleanup standards, or established cleanup levels for the site. The rationale or purpose for altering or modifying the monitoring and sampling program shall be provided in this section. A table summarizing the laboratory analytical data, QA/QC data, applicable cleanup levels, and modifications to the sampling program can be substituted for this section. The tables shall include all information required in Permit Section 8.12.4.11.

8.12.4.9 Remediation System Monitoring

A section shall discuss the remediation system monitoring. It shall summarize the remediation system's capabilities and performance. It shall also provide monitoring data, treatment system discharge sampling requirements, and system influent and effluent sample analytical results. The dates of operation, system failures, and modifications made to the remediation system during the reporting period shall also be included in this section. A summary table may be substituted for this section. The tables shall include all information required in Permit Section 8.12.4.11.

8.12.4.10 Summary

A summary section shall provide a discussion and conclusions of the monitoring conducted at the site. In addition, this section shall provide a comparison of the results to applicable cleanup levels, and to relevant historical monitoring and laboratory analytical data. An explanation shall be provided with regard to data gaps. A discussion of remediation system performance, monitoring results, modifications, if applicable, and compliance with discharge requirements shall be provided in this section. Recommendations and explanations regarding future monitoring, remedial actions, or site closure, if applicable, shall also be included in this section.

8.12.4.11 Tables

A section shall provide the following summary tables for the media sampled:

1. A table summarizing the regulatory criteria (a Regulatory Criteria text section may be substituted for this table or the applicable cleanup levels may be included in the analytical data tables);
2. A table summarizing groundwater elevations and depths to groundwater data. The table shall include the monitoring well depths, the screened intervals in each well, and the dates and times of measurements;
3. A table summarizing field measurements of surface water quality data;
4. A table summarizing field measurements of vapor monitoring data (must include historical vapor monitoring data as described above);
5. A table summarizing field measurements of groundwater quality data (must include historical water quality data as described above);

6. A table summarizing vapor sample analytical data (must include historical vapor sample analytical data as described above);
7. A table summarizing surface water analytical data (must include historical surface water analytical data as described above);
8. A table summarizing groundwater analytical data (must include historical groundwater analytical data as described above); and
9. A table summarizing remediation system monitoring data, if applicable (must include historical remediation system monitoring data as described above).

With prior approval from the Department, the Permittees may combine one or more of the tables. Data presented in the tables shall include the current sampling and monitoring data plus data from the three previous monitoring events or, if data from less than three monitoring events is available, data acquired during previous investigations. Remediation system monitoring data also shall be presented. The dates of data collection shall be included in the tables. Summary tables may be substituted for portions of the text. The analytical data tables shall include only detected analytes and data quality exceptions that could potentially mask detections.

8.12.4.12 Figures

The section shall include the following figures:

1. A vicinity map showing topography and the general location of the subject site relative to surrounding features or properties;
2. A site plan that presents pertinent site features and structures, well and piezometer locations, and remediation system location(s) and features. Off-site well locations and pertinent features shall be included on the site plan, if practical. Additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;
3. Figures presenting the locations of piezometer, monitoring and other well locations, groundwater elevation data, and groundwater flow directions;
4. Figures presenting groundwater analytical data for the current monitoring event. The analytical data corresponding to each sampling location may be presented as individual concentrations or in table form on the figure or as an iso-concentration map;
5. Figures presenting surface water sampling locations and analytical data for the current monitoring period if applicable;
6. Figures presenting vapor sampling locations and analytical data for the current monitoring event if applicable. The analytical data corresponding to each sampling location may be presented as individual concentrations or in table form on the figure or as an iso-concentration map; and
7. Figures presenting geologic cross-sections based on outcrop and borehole data, if applicable.

All figures shall include an accurate bar scale and a north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All figures shall have a date.

8.12.4.13 Appendices

Each monitoring report shall include the following appendices. Additional appendices may be necessary to present data or documentation not listed below.

8.12.4.13.i Field Methods

An appendix shall include the methods used to acquire field measurements of groundwater elevations, vapor and water quality data, and vapor, surface water and groundwater samples. It shall include the methods and types of instruments used to measure depths to water, air or headspace parameters, flow measurements, and water quality parameters. In addition, decontamination, well purging techniques, well sampling techniques, and sample handling procedures shall be provided in this appendix. Methods of measuring and sampling remediation systems shall be reported in this appendix, if applicable. Purge and decontamination water storage and disposal methods shall also be presented in this appendix. Copies of purge and decontamination water disposal documentation shall be provided in a separate appendix, if applicable.

8.12.4.13.ii Analytical Program

An appendix shall discuss the analytical program. It shall include the analytical methods, a summary of data quality objectives, and data quality review procedures. A summary of data quality exceptions and their effect on the acceptability of the analytical data with regard to the monitoring event and the site status shall be included in this appendix along with references to case narratives provided in the laboratory reports.

8.12.4.13.iii Analytical Reports

An appendix shall provide the analytical reports and shall include the contract laboratory final chemical analytical data reports generated during this reporting period. The reports must include all chain-of-custody records and Level II QA/QC results provided by the laboratory. The laboratory final reports and data tables shall be provided electronically in a format approved by the Department. Paper copies (or electronically scanned in PDF format) of all chain-of-custody records shall be provided with the reports.

8.12.5 Risk Assessment Report

The Permittees shall prepare risk assessment reports for sites requiring corrective action at the Facility using the format listed below. This Permit Section (8.12.5) provides a general outline for risk assessments and also lists the minimum requirements for describing risk assessment elements. In general, interpretation of data shall be presented only in the Background, Conceptual Site Model, and Conclusions and Recommendations Sections of the reports. The other text sections of the Risk Assessment report shall be reserved for presentation of sampling results from all investigations, conceptual and mathematical elements of the risk assessment, and presentations of toxicity information and screening values used in the risk assessment. The general risk assessment outline, applicable to both human health and ecological risk assessments, is provided below.

8.12.5.1 Title Page

The title page shall include the type of document; Facility name; Area designation; SWMU or AOC name, site, and any other unit name; and the submittal date. A signature block providing spaces for the names and titles of the responsible DOE and Sandia representatives shall be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

8.12.5.2 Executive Summary (Abstract)

The executive summary or abstract section shall provide a brief summary of the purpose and scope of the risk assessment of the subject site. The executive summary shall also briefly summarize the conclusions of the risk assessment. The Facility, SWMU, AOC, and site names; location; and Area designation shall be included in the executive summary.

8.12.5.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the risk assessment. The corresponding page numbers for the titles of each unit of the report shall be included in the table of contents.

8.12.5.4 Introduction

The introduction section shall include the Facility name, area designation, unit location, and unit status (e.g., closed, corrective action). General information on the current site usage and status shall be included in this section.

8.12.5.5 Background

The background section shall describe relevant background information. This section shall briefly summarize historical site uses by the U.S. Government and any other entity, including the locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features.

8.12.5.6 Site Description

A section shall describe current site topography, features and structures including topographic drainages, man-made drainages, erosional features, current site uses, and other data relevant to assessing risk at the site. Depth to groundwater and direction of groundwater flow shall be included in this section. The presence and location of surface water bodies such as any springs or wetlands shall be noted in this section. Photographs of the site may be incorporated into this section. Ecological features of the site shall be described here, including type and amount of vegetative cover, observed and expected wildlife receptors, and level of disturbance of the site. A topographical map of the site and vicinity of the site showing habitat types, boundaries of each habitat, and any surface water features shall be included in the Figures Section of the document.

8.12.5.7 Sampling Results

A section shall discuss the results of the sampling at the site. It shall include a description of the history of releases of contaminants, the known and possible sources of contamination, and the

vertical and lateral extent of contamination present in each medium. This section shall include summaries of sampling results of all investigations including site plans (included in the Figures Section of the report) showing locations of detected contaminants. This section shall reference pertinent figures, data summary tables, and references in previous reports. References to previous reports shall include page, table, and figure numbers for referenced information.

Summaries of sampling data shall include for each constituent: the maximum value detected, the detection limit, and for constituents following normal or log-normal distributions with sample sizes greater than eight, the upper confidence level (UCL) of the mean calculated at a 95% confidence level. Background values used for comparison to inorganic constituents at the site shall be presented here. The table of background values should appear in the Tables Section of the document and include actual values used as well as the origin of the values (e.g. Facility-wide, UCL, upper tolerance level (UTL)). This section shall also include a discussion of how "non-detect" sample results were handled in the averaging of data.

8.12.5.8 Conceptual Site Model

A section shall present the conceptual site model. It shall include information on the expected fate and transport of contaminants detected at the site. This section shall provide a list of all sources of contamination at the site. Sources that are no longer considered to be ongoing but represent the point of origination for contaminants transported to other locations shall be included. The discussion of fate and transport shall address potential migration of each contaminant in each medium, potential breakdown products and their migration, and anticipated pathways of exposure for human or ecological receptors. Diagrammatic representations of the conceptual site model shall appear in the Figures Section of the document.

For human health risk assessments, the conceptual site model shall include the current and reasonably foreseeable future land use and residential land use for all risk assessments. All values for exposure parameters and the source of those values shall be included in table format and presented in the Tables Section of the document.

Conceptual site models presented for ecological risk assessments shall identify assessment endpoints and measurement receptors for the site. The discussion of the model shall explain how the measurement receptors for the site are protective of the wildlife receptors identified by the Permittees in the Site Description Section (see Permit Section 8.12.5.6).

8.12.5.9 Risk Screening Levels

A section shall present the actual screening values used for each contaminant for comparison to all human health and ecological risk screening levels. The Department's SSLs for residential and industrial soil shall be used to screen soil for human health using EPA's Risk Assessment Guidance for Superfund (RAGS), Volume I, Part A, 1989 as updated. For those contaminants not appearing on the Department's SSL table, the EPA Region 6 soil screening value adjusted to meet the Department's risk goal of 10-5 for total risk for carcinogens shall be used to screen the site for human health risks. Screening for ecological risk shall be conducted using U.S. EPA's ECO-SSLs, or derive a screening level using the methodology in the Department's Guidance for Assessing Ecological Risks Posed by Chemicals: Screening–Level Ecological Risk Assessment. (Version 2.0)(July 2008). If no valid toxicological studies exist for a particular receptor or contaminant, the contaminant/receptor combination shall be addressed using qualitative methods.

If a Department-approved site-specific risk scenario is used for the human health risk assessment, this section shall include all toxicity information and exposure assessment equations used for the site-specific scenario as well as the sources for that information. Other regulatory levels applicable to screening the site, such as drinking water Maximum Contaminant Levels (MCLs), shall also be included in this section.

8.12.5.10 Risk Assessment Results

A section shall present all risk values, hazard quotients (HQ), and HIs for human health based on current and reasonably foreseeable future land use. Where the current or reasonably foreseeable future land use is not residential, risk values, HQs, and HIs for a residential land use scenario shall also be calculated and reported. The residential scenario shall be used for comparison purposes only, unless the land use becomes residential. This section shall also present the HQ and HI for each contaminant for each ecological receptor.

8.12.5.10.i Uncertainty analysis

A section shall include discussion of qualitative, semi-quantitative, and quantitative uncertainty in the risk assessment and estimate the potential impact of the various uncertainties.

8.12.5.11 Conclusions and Recommendations

A section shall include the interpretation of the results of the risk assessment and any recommendations for future disposition of the site. This section may include additional information and considerations that the Permittees believe are relevant to the analysis of the site.

8.12.5.12 Tables

A section shall provide the following summary tables, as appropriate:

1. A table presenting background values used for comparison to inorganic constituents at the site. The table shall include actual values used as well as the origin of the values (Facility-wide, UCL, UTL, or maximum);
2. A table summarizing sampling data shall include, for each constituent detected above background, the maximum value detected, the detection limit, and for constituents following normal or log-normal distributions with sample sizes greater than eight, the UCL of the mean calculated at a 95% confidence level;
3. A table of all screening values used and the sources of those values;
4. A table presenting all risk values, HQs, and HIs under current and reasonably foreseeable future land use for human health;
5. If residential use is not a current or reasonably foreseeable future land use, a table presenting all risk values, HQs, and HIs under a residential land use scenario for human health shall be included for comparison purposes;
6. A table presenting the HQ and HI for each contaminant for each ecological receptor; and
7. A table presenting values for exposure parameters and the source of the values.

With prior approval from the Department, the Permittees may combine one or more of the tables. Data presented in the summary tables shall include information on detection limits and significant data quality exceptions. The analytical data tables shall include only detected analytes and data quality exceptions that could potentially mask detections.

8.12.5.13 Figures

A section shall present the following figures for each site, as appropriate:

1. A vicinity map showing topography and the general location of the subject site relative to surrounding features or properties;
2. For human health risk assessments, a site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system location(s) and its details. Off-site well locations and other relevant features shall be included on the site plan if practical. Additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;
3. For ecological risk assessments, a topographical map of the site and vicinity of the site showing habitat types, boundaries of each habitat, and any surface water features; and
4. Conceptual site model diagrams for both human health and ecological risk assessments.

With prior approval from the Department, the Permittees may combine one or more of the figures. All figures shall include an accurate bar scale and a north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers.

8.12.5.14 Appendices

Each risk assessment report shall include appendices containing supporting data. Appendices may include the results of statistical analyses of data sets and comparisons of data, full sets of results of all sampling investigations at the site, or other data as appropriate.

8.12.6 Corrective Measures Evaluation Report

The Permittees shall prepare corrective measures evaluations for sites requiring corrective measures using the format listed below. This Permit Section (8.12.6) provides a general outline for corrective measures evaluations and also lists the minimum requirements for describing corrective measures when preparing these documents. All investigation summaries, site condition descriptions, corrective action goals, corrective action options, remedial options selection criteria, and schedules shall be included in the corrective measures evaluations. In general, interpretation of historical investigation data and discussions of prior interim activities shall be presented only in the background sections of the corrective measures evaluations. At a minimum, detections of contaminants encountered during previous site investigations shall be presented in the corrective measures evaluations in table format with an accompanying site plan showing sample locations. The other text sections of the corrective measures evaluations shall be reserved for presentation of corrective action-related information regarding anticipated or potential site-specific corrective action options and methods relevant to the project. The general corrective measures evaluation outline is provided below.

8.12.6.1 Title Page

The title page shall include:

1. The type of document;
2. Facility name;
3. Area designation;
4. SWMU or AOC name, site, and any other unit name; and
5. The submittal date.

A signature block providing spaces for the names and titles of the responsible DOE and Sandia representatives shall be provided on the title page in accordance with 40 CFR § 270.11(d)(1).

8.12.6.2 Executive Summary (Abstract)

This executive summary or abstract shall provide a brief summary of the purpose and scope of the corrective measures evaluation to be conducted at the subject site. The executive summary or abstract shall also briefly summarize the conclusions of the evaluation. The SWMU, AOC, and site names, location, and Area designation shall be included in the executive summary.

8.12.6.3 Table of Contents

The table of contents shall list all text sections, subsections, tables, figures, and appendices or attachments included in the corrective measures evaluation. The corresponding page numbers for the titles of each section of the report shall be included in the table of contents.

8.12.6.4 Introduction

The Introduction Section shall include the Facility name, Area designation, site location, and site status (e.g. closed, corrective action). General information on the current site usage and status shall be included in this Section. A brief description of the purpose of the corrective measures evaluation and the corrective action objectives for the project also shall be provided in this Section.

8.12.6.5 Background

The Background Section shall describe the relevant background information. This Section shall briefly summarize historical site uses by the U.S. Government and any other entity, including the locations of current and former site structures and features. A labeled figure shall be included in the document showing the locations of current and former site structures and features. The locations of any subsurface features such as pipelines, underground tanks, utility lines, and other subsurface structures shall be included in this Section and labeled on the site plan, as appropriate.

This Section shall include contaminant and waste characteristics, a brief summary of the history of contaminant releases, known and possible sources of contamination, and the vertical and lateral extent of contamination present in each medium. This Section shall include brief summaries of results of previous investigations, including references to pertinent figures, data summary tables, and text in previous reports. References to previous reports shall include page,

table, and figure numbers for referenced information. Summary tables and site plans showing relevant investigation locations shall be referenced and included in the Tables and Figures Sections of the document, respectively.

8.12.6.6 Site Conditions

8.12.6.6.i Surface Conditions

A section on surface conditions shall describe current and historic site topography, features, and structures, including a description of topographic drainages, man-made drainages, vegetation, and erosional features. It shall also include a description of current uses of the site and any current operations at the site. This section shall also include a description of those features that could potentially influence corrective action option selection or implementation such as archeological sites, wetlands, or other features that may affect remedial activities. In addition, descriptions of features located in surrounding sites that may have an effect on the subject site regarding sediment transport, surface water run-off or contaminant transport shall be included in this section. A site plan displaying the locations of all pertinent surface features and structures shall be included in the Figures Section of the corrective measures evaluation.

8.12.6.6.ii Subsurface Conditions

A section on subsurface conditions shall describe the site conditions observed during previous subsurface investigations. It shall include relevant soil horizon and stratigraphic information, groundwater conditions, fracture data, and subsurface vapor information. A site plan displaying the locations of all borings and excavations advanced during previous investigations shall be included in the Figures Section of the corrective measures evaluation. A brief description of the stratigraphic units anticipated to be present beneath the site may be included in this section if stratigraphic information is not available from previous investigations conducted at the site.

8.12.6.7 Potential Receptors

8.12.6.7.i Sources

A section shall provide a list of all sources of contamination at the subject site where corrective measures are to be considered or required. Sources that are no longer considered to be releasing contaminants at the site, but may be the point of origination for contaminants transported to other locations, shall be included in this section.

8.12.6.7.ii Pathways

A section shall describe potential migration pathways that could result in either acute or chronic exposures to contaminants. It shall include such pathways as utility trenches, paleochannels, surface exposures, surface drainages, stratigraphic units, fractures, structures, and other features. The migration pathways for each contaminant and each relevant medium should be tied to the potential receptors for each pathway. A discussion of contaminant characteristics relating to fate and transport of contaminants through each pathway shall also be included in this section.

8.12.6.7.iii Receptors

A section shall provide a listing and description of all anticipated potential receptors that could possibly be affected by the contamination present at the site. Potential receptors shall include human and ecological receptors, groundwater, and other features such as pathways that could

divert or accelerate the transport of contamination to human receptors, ecological receptors, and groundwater.

8.12.6.8 Regulatory Criteria

A section shall set forth the applicable cleanup standards, risk-based screening levels, and risk-based cleanup goals for each pertinent medium at the subject site. The appropriate cleanup levels for each site shall be included, if site-specific levels have been established at separate sites or units. A table summarizing the applicable cleanup standards or levels, or inclusion of applicable cleanup standards or levels in the summary data tables shall be included in the Tables Section of the document. The risk assessment shall be presented in a separate document or in an appendix to this report. If cleanup or screening levels calculated in a risk evaluation are employed, the risk evaluation document shall be referenced including pertinent page numbers for referenced information.

8.12.6.9 Identification of Corrective Measures Options

A section shall identify and describe potential corrective measures for source, pathway, and receptor controls. Corrective measures options shall include the range of available options including, but not limited to, a no action alternative, institutional controls, engineering controls, in-situ and on-site remediation alternatives, complete removal, and any combination of alternatives that would potentially achieve cleanup goals.

8.12.6.10 Evaluation of Corrective Measures Options

A section shall provide an evaluation of the corrective measures options identified in Permit Section 8.12.6.9. The evaluation shall be based on the applicability, technical feasibility, effectiveness, implementability, impacts to human health and the environment, and cost of each option. A table summarizing the corrective measures alternatives and the criteria listed below shall be included in the Tables Section of the document. The general basis for evaluation of corrective measures options is defined below.

8.12.6.10.i Applicability

Applicability addresses the overall suitability for the corrective action option for containment or remediation of the contaminants in the subject medium for protection of human health and the environment.

8.12.6.10.ii Technical Practicability

Technical practicability describes the uncertainty in designing, constructing, and operating a specific remedial alternative. The description shall include an evaluation of historical applications of the remedial alternative including performance, reliability, and minimization of hazards.

8.12.6.10.iii Effectiveness

Effectiveness assesses the ability of the corrective measure to mitigate the measured or potential impact of contamination in a medium under the current and projected site conditions. The assessment also shall include the anticipated duration for the technology to attain regulatory compliance. In general, all corrective measures described above will have the ability to mitigate

the impacts of contamination at the site, but not all remedial options will be equally effective at achieving the desired cleanup goals to the degree and within the same time frame as other options. Each remedy shall be evaluated for both short-term and long-term effectiveness.

8.12.6.10.iv Implementability

Implementability characterizes the degree of difficulty involved during the installation, construction, and operation of the corrective measure. Operation and maintenance of the alternative shall be addressed in this section.

8.12.6.10.v Human Health and Ecological Protectiveness

This category evaluates the short-term (remedy installation-related) and long-term (remedy operation-related) hazards to human health and the environment of implementing the corrective measure. The assessment shall include whether the technology will create a hazard or increase existing hazards and the possible methods of hazard reduction.

8.12.6.10.vi Cost

This section shall discuss the anticipated cost of implementing the corrective measure. The costs shall be divided into:

1. Capital costs associated with construction, installation, pilot testing, evaluation, permitting, and reporting of the effectiveness of the alternative; and
2. Continuing costs associated with operating, maintaining, monitoring, testing, and reporting on the use and effectiveness of the technology.

8.12.6.11 Selection of Preferred Corrective Measure

The Permittees shall propose the preferred corrective measure(s) at the site and provide a justification for the selection in this section. The proposal shall be based upon the ability of the remedial alternative to:

1. Achieve cleanup objectives in a timely manner;
2. Protect human and ecological receptors;
3. Control or eliminate the sources of contamination;
4. Control migration of released contaminants; and
5. Manage remediation waste in accordance with State and Federal regulations.

The justification shall include the supporting rationale for the remedy selection, based on the factors listed in Permit Section 8.12.6.10 and a discussion of short- and long-term objectives for the site. The benefits and possible hazards of each potential corrective measure alternative shall be included in this section.

8.12.6.12 Design Criteria to Meet Cleanup Objectives

The Permittees shall present descriptions of the preliminary design for the selected corrective measures in this section. The description shall include appropriate preliminary plans and specifications to effectively illustrate the technology and the anticipated implementation of the remedial option at the subject area. The preliminary design shall include a discussion of the

design life of the alternative and provide engineering calculations for proposed remediation systems.

8.12.6.13 Schedule

A section shall set forth a proposed schedule for completion of remedy-related activities such as bench tests, pilot tests, construction, installation, remedial excavation, cap construction, installation of monitoring points, and other remedial actions. The anticipated duration of corrective action operations and the schedule for conducting monitoring and sampling activities shall also be presented. In addition, this section shall provide a schedule for submittal of reports and data to the Department, including a schedule for submitting all status reports and preliminary data.

8.12.6.14 Tables

A section shall present the following summary tables, as appropriate:

1. A table summarizing regulatory criteria, background, and/or the applicable cleanup standards;
2. A table summarizing historical field survey location data;
3. Tables summarizing historical field screening and field parameter measurements of soil, rock, sediments, groundwater, surface water, and air quality data;
4. Tables summarizing historical soil, rock, or sediment laboratory analytical data. The summary tables shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
5. A table summarizing historical groundwater elevation and depth to groundwater data. The table shall include the monitoring well depths and the screened intervals in each well;
6. Tables summarizing historical groundwater laboratory analytical data. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
7. Tables summarizing historical surface water laboratory analytical data if applicable. The analytical data tables shall include the analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
8. Tables summarizing historical air sample screening and analytical data. The data tables shall include the screening instruments used, laboratory analytical methods, detection limits, and significant data quality exceptions that would influence interpretation of the data;
9. Tables summarizing historical pilot or other test data, if applicable, including units of measurement and types of instruments used to obtain measurements;
10. A table summarizing the corrective measures alternatives and evaluation criteria; and
11. A table presenting the schedule for installation, construction, implementation and reporting of selected corrective measures.

With prior approval of the Department, the Permittees may combine one or more of the tables. Data presented in the summary tables shall include information on dates of sample collection, analytical methods, detection limits, and significant data quality exceptions. The analytical data tables shall include only detected analytes and data quality exceptions that could potentially mask detections.

8.12.6.15 Figures

A section shall present the following figures for each site, as appropriate:

1. A vicinity map showing topography and the general location of the subject site relative to surrounding features or properties;
2. A unit site plan that presents pertinent site features and structures, underground utilities, well locations, and remediation system locations and details. Off-site well locations and other relevant features shall be included on the site plan if practical. Additional site plans may be required to present the locations of relevant off-site well locations, structures, and features;
3. Figures showing historical soil boring or excavation locations and sampling locations.
4. Figures presenting historical soil sample field screening and laboratory analytical data, if appropriate;
5. Figures showing all existing wells including vapor monitoring wells and piezometers. The figures shall present historical groundwater elevation data and indicate groundwater flow directions;
6. Figures presenting historical groundwater laboratory analytical data including past data, if applicable. The analytical data corresponding to each sampling location may be presented as individual concentrations, in table form on the figure or as an iso-concentration map;
7. Figures presenting historical surface water sample locations and analytical data including past data, if applicable. The laboratory analytical data corresponding to each sampling location may be presented as individual concentrations or in table form on the figure;
8. Figures presenting historical air sampling locations and presenting air quality data. The field screening or laboratory analytical data corresponding to each sampling location may be presented as individual concentrations, in table form on the figure or as an iso-concentration map;
9. Figures presenting historical pilot or other test locations and data, where applicable, including site plans or graphic data presentation;
10. Figures presenting geologic cross-sections based on outcrop and borehole data, if applicable;
11. Figures presenting the locations of existing and proposed remediation systems;
12. Figures presenting existing remedial system design and construction details; and
13. Figures presenting preliminary design and construction details for preferred corrective measures.

All figures must include an accurate bar scale and a north arrow. An explanation shall be provided on each figure for all abbreviations, symbols, acronyms, and qualifiers. All figures shall have a date.

8.12.6.16 Appendices

Each corrective measures evaluation shall include, as appropriate, as an appendix, the management plan for waste, including investigation derived waste, generated as a result of construction, installation, or operation of remedial systems or activities conducted. Each corrective measures evaluation shall include additional appendices presenting relevant additional data, such as pilot or other test or investigation data, remediation system design specifications, system performance data, or cost analyses as necessary.

RESOURCE CONSERVATION AND RECOVERY ACT FACILITY OPERATING PERMIT

ATTACHMENTS A THROUGH M

EPA ID No. NM5890110518

issued to the

U.S. DEPARTMENT OF ENERGY/SANDIA CORPORATION

for the

SANDIA NATIONAL LABORATORIES
HAZARDOUS AND MIXED WASTE TREATMENT AND STORAGE UNITS AND POST-CLOSURE CARE OF THE CORRECTIVE ACTION MANAGEMENT UNIT

located in

BERNALILLO COUNTY, NEW MEXICO

prepared by the

NEW MEXICO ENVIRONMENT DEPARTMENT
HAZARDOUS WASTE BUREAU
2905 RODEO PARK DRIVE EAST, BUILDING 1
SANTA FE, NEW MEXICO 87505

SEPTEMBER17, 2012

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PERMIT ATTACHMENT A FACILITY DESCRIPTION

A.1 INTRODUCTION

This Permit Attachment contains general information pertaining to Sandia National Laboratories (SNL; the Facility) and the treatment and storage units covered by this Permit. The Facility is owned by the U.S. Department of Energy (DOE) and co-operated by Sandia Corporation and DOE.

The Facility is located on Kirtland Air Force Base (KAFB) immediately south and southeast of the Albuquerque city limits in Bernalillo County, New Mexico. The Facility occupies five Technical Areas and additional test areas as defined in Permit Section 1.6 (see Figure 1 in Permit Attachment L (*Figures*).

The Facility is a multidisciplinary laboratory engaged in research and development of weapons and alternative energy sources. The Facility is managed for the DOE by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation with work also performed for others.

The major Facility research and administration functions are located at five Technical Areas (TAs), designated I through V. TAs I, II, and IV are located north of the Tijeras Arroyo and Arroyo del Coyote (see Figure 2 in Permit Attachment L (*Figures*)). TAs III and V occupy contiguous tracts of land south of the Tijeras Arroyo and west of Arroyo del Coyote.

The individual units permitted under this Permit include: (1) the Hazardous Waste Handling Unit; (2) the Thermal Treatment Unit; (3) the Radioactive and Mixed Waste Management Unit; (4) the Auxiliary Hot Cell Unit; (5 through 9) Five Manzano Storage Bunkers; and (10) the Corrective Action Management Unit (CAMU). All the Permitted Units are shown on Figure 2 (*Unit Location Map*) in Permit Attachment L (*Figures*).

The following information contains unit descriptions, including the dimensions, materials of construction, and operational procedures and requirements. Additional information on the CAMU is presented in Permit Attachment H (*Post-Closure Care Plan*).

A.2 TA-I: HAZARDOUS WASTE HANDLING UNIT

The Hazardous Waste Handling Unit (HWHU) is located south of TA-I, north of the entrance to TA-II; and occupies 1.35 acres on Facility property between TA-I and TA-II (see Figure 2 in Permit Attachment L (*Figures*)). The HWHU is a fenced compound with several buildings and three hazardous waste management areas used for storage and packaging of hazardous and mixed wastes (see Figure 3 in Permit Attachment L (*Figures*)). Hazardous and mixed wastes are transported to off-site RCRA-permitted facilities for treatment or disposal.

A.2.1 HWHU Container Types

Waste containers that may be managed at the HWHU include but are not limited to 30 and 55-gallon steel, polyethylene, and fiber drums; fiberglass-reinforced plastic or plywood boxes; various steel boxes; metal over pack boxes; cardboard shipping containers; gas cylinders; roll-off

bins; lab pack containers; various small containers; bags; and some oversized, irregularly-shaped containers or large self-contained items (e.g. a large piece of equipment containing hazardous or mixed waste in which the hazardous component of the item is located within the interior of the item, or is covered with an inert material, such as plastic sheeting, if located on the exterior of the item).

A.2.2 HWHU Designated Waste Management Areas

Appendix A.1 in Permit Attachment L (*Figures*) contains photographs of the three designated hazardous and mixed waste management areas at the HWHU. The three hazardous or mixed waste management areas are shown on Figure 4 of Permit Attachment L (*Figures*). These include:

1. The Hazardous Waste Packaging Building (Building 959),
2. The Hazardous Waste Storage Building (Building 958), and
3. Two modular storage buildings - Buildings 958B and 958C.

Two covered, bermed, open concrete-lined areas that are not used for the management of hazardous or mixed wastes are located at the HWHU; one is located in the northeast corner of the Unit, and the other is located on the west side of Building 959.

The following sections provide descriptions of the storage layout, location, and secondary containment systems of each hazardous waste management area and the bermed areas. Storage capacities are listed in Attachment J, Table J-1.1.

A.2.3 TA-I: HWHU Hazardous Waste Packaging Building 959

The Hazardous Waste Packaging Building 959 is the easternmost hazardous waste management area and is a 1,800-square-foot (ft^2) pre-cast concrete building with an eave height of 12 feet (ft) (see Figure 4 in Permit Attachment L (*Figures*)). Eight waste-holding cells with half-height concrete masonry walls and a waste packaging area are located in the building. The packaging area contains a fume hood and flexible ventilation hoses attached to a local negative-pressure ventilation system that exhausts to the exterior of the building.

All the cells and part of the packaging area have recessed floors that are constructed of reinforced concrete and are covered with metal grating. Waste containers in the cells are placed on shelves over the metal grating or directly on the metal grating. The load-bearing capacities of the metal grating and the reinforced concrete floor are 450 and 2,000 pounds per ft^2, respectively. The floor and the bottom seven inches of wall surface in each recessed area are covered with an epoxy-based chemical-resistant coating or equivalent protective coating, and shall be maintained as needed to be free from cracks and gaps. Figures 5 and 6 in Permit Attachment L (*Figures*) are the floor plans of Buildings 959 and 958, respectively.

The individual shelves are covered with removable chemical-resistant grating, and they have edges to hold the containers in place. The shelves are not designed to provide secondary containment. The recessed areas provide secondary containment. The recessed area in each holding cell is 5 feet by 4.5 feet and 7 inches deep, with a capacity of 98 gallons. The recessed floor area under the packaging area is 5 feet by 12 feet and 7 inches deep, with an actual capacity

of 261 gallons. The capacity for each holding cell is limited to 71 gallons, and the capacity for the packaging area is limited to 191 gallons.

Wastes are stored in the Hazardous Waste Packaging Building. In addition, wastes are prepared for shipment to off-site treatment and disposal facilities (e.g., lab packs are prepared by placing small containers into larger containers filled with absorbent material).

Water reactive wastes are not managed in the Hazardous Waste Packaging Building, except on a temporary basis during receipt, repackaging, and staging activities which shall not exceed 3 days. Water reactive wastes shall be protected from contact with water when managed in Building 959.

A.2.4 TA-I: HWHU Hazardous Waste Storage Building 958

The Hazardous Waste Storage Building 958 is located west of the Hazardous Waste Packaging Building (see Figure 9 in Permit Attachment L (*Figures*)). The Hazardous Waste Storage Building is a 3,520-ft^2 precast concrete building with an eave height of 14 ft and contains eight separate and recessed waste storage cells for segregation of waste (see Figure 11 in Permit Attachment L (*Figures*)). The floors of Cells 1, 2, 3, 4, 6, 7, and 8 are constructed of reinforced concrete and metal grating. The floor of Cell 5 is constructed of reinforced concrete. The floor and bottom 5 inches of the walls are coated with an epoxy-based chemical-resistant coating, or equivalent protective coating, and shall be maintained as needed to be free from cracks and gaps. The load-bearing capacity of the metal grating and reinforced concrete are 450 and 2,000 pounds per ft^2, respectively. The storage cells vary in size, secondary-containment capacity, and waste-container capacity.

The recessed areas under the grating provide the secondary containment in Cells 1, 2, 3, 4, 6, 7, and 8. The volume of the entire recessed area provides the secondary containment capacity in Cell 5. For example, the recessed area in Cell 1 is 11.75 feet by 14.67 feet by 5 inches deep, with a capacity of 542 gallons.

Water reactive wastes shall not be managed in the Hazardous Waste Storage Building, except on a temporary basis during receipt, repackaging, and staging activities which shall not exceed 3 days. Water reactive wastes shall be protected from contact with water when managed in Building 958.

A.2.5 TA-I: HWHU Modular Storage Buildings 958B and 958C

The modular storage buildings are located west of Building 958 (see Figures 4 and 7 in Permit Attachment L (*Figures*)) and are used for storage of wastes such as ignitable solids and water reactives.

The exterior dimensions of each modular storage building are 22-ft long, 8-ft wide, and 8-ft high. The buildings are constructed of welded 10- and 12-gauge steel supported by structural steel sections. Each building has three doors, each with a three-point locking system to provide access and security. Each has a 6-inch-deep integral spill containment reservoir under the entire building; the containment capacity is 500 gallons. The secondary-containment sub-floor is constructed of continuously welded 10-gauge steel, which is painted to provide additional protection against degradation of the secondary containment. The floors are vinyl ester

fiberglass gratings. The load-bearing capacity of the floor for each structure is 250 pounds per square foot. The inside walls and ceiling are also painted. The sumps shall be maintained to be free from cracks and gaps. Each building rests on structural supports that elevate it and allow visual checks of the underside of the spill containment reservoir if there is evidence of deterioration on the interior surfaces noted during inspections performed according to the Inspection Plan in Permit Attachment E.

A.2.6 TA-I: HWHU Covered Open Storage Areas

A covered, open, bermed, concrete-lined area is located in the northeast corner of the HWHU. This area is not used for management of hazardous or mixed wastes.

An empty drum crusher is located within the covered area on the west side of Building 959. Only drums that meet the regulatory definition of empty will be crushed in the drum crusher. This area is not used for management of hazardous or mixed wastes.

A.2.7 TA-I: Unit Operations at the HWHU

The Permittees shall store at the HWHU only the hazardous and mixed wastes bearing U.S. EPA Hazardous Waste Numbers listed in Permit Attachment B (*Authorized Wastes*).

Containers shall be inspected for integrity when the wastes arrive at the HWHU, before they are placed in storage in either Building 959 or 958. Containers in poor condition shall not be placed in storage; the containers shall be over packed or the hazardous or mixed wastes in them shall be transferred to containers in good condition. The shelves in Building 959 shall be lined with absorbent pads under removable grating in areas where containers of liquids are stored. Containers shall be inspected regularly following the Inspection Plan contained in Permit Attachment E (*Inspection Plan*). Any liquids released from hazardous or mixed waste containers are to be contained in the absorbent pads under the removable grating on which the waste containers are placed and shall be cleaned up upon discovery.

Upon discovery of any accumulated liquids in a secondary containment system Unit personnel shall take action to evaluate and remove the liquids in accordance with Permit Section 3.6..

A.2.8 TA-I: Preventing Hazards in Unloading and Loading of Waste at the HWHU

Loading and unloading operations occur outdoors on the south side of Buildings 958 and 959 in the area immediately adjacent to a hazardous waste management area to minimize the distance that the waste must be moved. All loading and unloading areas shall be level, and the asphalt or concrete or other pavement shall be maintained in good condition. Loading and unloading areas shall be free of overhead and other obstructions to visibility and operations.

Containers too large to hand carry shall be transported within the HMWU with drum dollies, or pallet jacks, or other appropriate equipment. Containers shall be handled in a manner to prevent shifting or falling.

A.2.9 Preventing Run-Off or Run-On (Flooding) at the HWMU

The land around the HWHU is nearly level, sloping gently towards the south and west. The perimeter of the paved areas of the HWHU is higher than the surrounding land on all sides, preventing sheet-flow run-on of surface water from surrounding areas. The western edge of the paved area is steeply sloped at the edge, rising to a level at least 6 inches above the surface outside the Unit, further preventing run-on and run-off from the HWHU. Within the HWHU, the paved areas are sloped toward a 74,800-gallon catchment pond located at the northwest corner of the Unit. During normal operations, the catchment pond collects only storm water. The catchment pond is not intended to provide secondary containment for hazardous waste. Figure 8 in Permit Attachment L (*Figures*) shows the drainage control features at the HWHU.

A.2.9.1 TA-I: HWHU Catchment Pond Operating Procedures

A lined pond is located on the northwest side of the HWHU. The pond is capable of holding 10,000 cubic feet of liquid and is designed to receive storm water and snowmelt run-off from the HWHU. Run-off collected in the pond shall be evaluated before discharge. If the run-off is known or likely to be contaminated with hazardous waste constituents from a spill, leak, or other release, it will be sampled. The pond shall be inspected for evidence of contamination (e.g., surface sheen) during the weekly inspection. Inspection results and any remediation shall be recorded in the Operating Record. If there is no reason to suspect the storm water is contaminated with hazardous constituents based on the Unit Operating Record and the inspection, the storm water shall be managed in accordance with the current Unit storm water discharge permit.

If sampling and analysis are required due to known or suspected contamination, a water sample shall be collected within 5 days of when the Permittee becomes aware of the known or suspected contamination. The analytical results, together with information from the Operating Record, shall be used to characterize the water in accordance with Permit Attachment C (*Waste Analysis Plan*). If the run-off present in the pond is determined to be hazardous waste, the waste water shall be removed within 5 working days of the determination. The type and quantity of waste water present in the pond, the date of the incident, and the date of removal of the waste water shall be recorded in the Operating Record.

A.2.10 HWHU Container Management Practices

Requirements regarding the management of hazardous and mixed waste storage containers, information on container handling, the condition of containers, aisle space, compatibility of waste with containers, and storage configuration are contained in Section 2.10 of Permit Part 2, and in Part 3 of this Permit.

In Building 958, if containers are stacked, they shall be in a stable configuration that does not exceed the load-bearing capacity of the reinforced concrete or the grating.

In Building 959, containers shall be stored in the holding cells. If containers are stacked, they will be in a stable configuration that does not exceed the load- bearing capacity of the reinforced concrete or the grating.

In Buildings 958B and 958C, if containers are stacked, they will be in a stable configuration that does not exceed the load-bearing capacity of the floor.

In all buildings, containers holding hazardous or mixed waste liquids without absorbent shall not be stacked without separation or some other means to allow Unit personnel to clearly identify the source of liquid, if liquid is discovered in the secondary containment area.

A.3 TA-III: THE THERMAL TREATMENT UNIT

The Thermal Treatment Unit (TTU) is located in a fenced area on a concrete pad outside the south end of Building 6715 in Technical Area (TA)-III, and occupies 196 square feet. The location of the TTU at the Facility is indicated in Figure 9 of Permit Attachment L (*Figures*). Figure 2 of Permit Attachment L (Figures) illustrates its location in Technical Area III. Figure 10 of Permit Attachment L (*Figures*) shows the TTU waste management area. The TTU loading and unloading areas are shown on Figure 11 in Permit Attachment L (*Figures*). The area surrounding the TTU is occupied by test areas and controlled operations (industrial land use). Drainage control features (e.g., run-on/run-off, drainage barriers) are shown on Figure 12 of Permit Attachment L (*Figures*). Figure 13 in Permit Attachment L (*Figures*) shows access control features at the TTU. Appendix A.2 in Permit Attachment L (*Figures*) contains photographs of the hazardous waste management area at the TTU.

The TTU is used for treatment of reactive and ignitable hazardous waste exhibiting the hazardous characteristic of reactivity (D003) and ignitability (D001) that is generated during operations in Building 6715, and may also bear EPA Hazardous Waste Numbers D002, D011 and F003, depending on the presence of nitric acid, silver, and spent solvents. Explosive silver acetylide/silver nitrate (SASN) slurry is formulated from raw ingredients as needed for tests. SASN is present in the solid and liquid wastes treated at the TTU. Pentaerythritol tetranitrate (PETN) (an explosive) is sometimes included in the tests and would also be present in the wastes. SASN is categorized as a primary explosive, and each discrete crystal (when dry) has the potential to detonate. SASN can be initiated by the energy of bright light (by raising the surface temperature to the auto-ignition temperature of 457 degrees Fahrenheit) or small contact shock. (Wilden, 1986).

A.3.1 TA-III: TTU Hazardous Waste Management Area

The TTU consists of a square burn pan constructed of 0.375-inch steel, 2 feet 6 inches on a side and 6 inches deep with ancillary equipment (see Figure 14 in Permit Attachment L (*Figures*)). The burn pan is located near the center of a square curbed slab of concrete 14 ft on a side lined with 0.5-in. steel, with a 4-in. high, steel-lined concrete curb around the edge. The bottom of the burn pan is elevated approximately 10 inches to 12 inches above the floor by steel beams. The burn pan is enclosed within a square cage approximately 4 ft on a side, consisting of expanded metal screen approximately 8-ft high with a nearly solid metal roof having slots for tracks and cables. An expanded metal screen door, remotely activated from inside Building 6715, provides access to the burn pan. Moveable steel panels are attached to the lower part of two sides of the cage to control airflow as needed.

An enclosure on the east side of the cage houses three propane burners, which are remotely activated from inside Building 6715. The burners shall be positioned to heat the burn pan and ignite the wastes in the burn pan and flammable vapors above the pan. An 8-foot earthen berm and a fence surround the burn cage of the TTU.

A.3.2 TA-III: Unit Operations at the TTU

The treatment of waste at the TTU is designed to deactivate reactive and ignitable components of the waste. The wastes treated at the TTU are generated as a result of the formulation of silver acetylide/silver nitrate (SASN) slurry, its application to test articles, and cleanup activities during and after the tests. The waste may also contain the explosive pentaerythritol tetranitrate (PETN); however, PETN is rarely used in the process. The TTU was specifically built to treat SASN slurry and SASN-contaminated waste because of the hazards associated with managing this waste.

Treatment residues may contain other constituents such as ash (carbon) produced from burned solid items (e.g., paper, filters), and treatment events may release gases (i.e., nitrogen, water vapor, carbon dioxide, carbon monoxide, diatomic oxygen, and traces of nitrous oxides) produced by the decomposition of SASN, PETN, acetone, and acetonitrile. Elemental silver is present in the treatment residues when SASN is treated at the TTU.

Liquid wastes to be treated may be transferred from Building 6715 to the TTU through flexible transfer hoses utilizing a remotely operated peristaltic pump. The hoses are contained inside a metal channel to provide secondary containment. The flexible hoses and channel terminate approximately 5 feet from the burn pan and metal tubing will be used to transfer the waste the final distance into the burn pan.

Liquids or solids to be treated may also be containerized and manually loaded into the burn pan. Solid items are saturated (wetted with or submerged) in water as needed to protect personnel from explosive hazards before transfer to the burn pan.

Liquids that might accumulate at the TTU will be contained within a secondary containment system (i.e., the entire steel-lined concrete pad that drains through a filter into a catch tank) as described in Section A.3.4.

A circular tank located north of the Unit and south of Building 6715 is primarily utilized as a process tank for collecting cleaning water from test operations. Water from this tank is sampled and analyzed. If this wastewater contains unreacted SASN explosive, then the contents of the tank will be treated at the TTU; otherwise, the wastewater collected in this tank is not treated at the TTU. This process tank is a part of building 6715 test operations but not part of the treatment unit.

Because the TTU is located outside, it is difficult to prevent equipment deterioration; however, the Unit and its ancillary equipment are inspected regularly according to the inspection schedule in Permit Attachment E (*Inspection Plan*) to ensure proper operation and waste management at the TTU. If deterioration sufficient to affect the operation, safety, or effectiveness of the TTU is identified, the affected equipment will either be repaired or replaced before any treatment of hazardous waste takes place.

A.3.3 Preventing Hazards in Unloading and Loading at the TTU

Loading activities include the placement of wastes into the burn pan, and may include loading containers of treatment residue and drums of water from the catch tank onto flatbed trucks or other suitable vehicles, as applicable. Vehicles that will transport wastes shall be loaded on the paved area south or southeast of Building 6715 as shown in Figure 11 of Permit Attachment L (*Figures*). This surface shall be maintained to be level and in good condition. There shall also be sufficient room for vehicles to safely maneuver in the loading area.

Liquid wastes may be pumped to the burn pan through the Waste Transfer Tubing. Solid and liquid waste that cannot be pumped to the TTU burn pan shall first be wetted with or submerged in water, then placed manually into the burn pan for treatment.

Unloading activities include removal of treatment residue from the burn pan. Treatment residues shall be managed in accordance with Section 5.5.4 of this Permit Part. Water from the catch tank may be pumped into 55-gallon drums or other suitable containers, characterized according to Permit Attachment C, and managed appropriately. If the water is contaminated with unreacted explosive, the water shall be treated at the TTU.

A.3.4 Operation of Containment Systems at the TTU

Liquids that might accumulate at the TTU will be contained within a secondary containment system (i.e., the entire steel-lined concrete pad that drains through a filter into a catch tank). The system is sufficiently impervious to contain spills or accumulated precipitation until the liquid is removed. The secondary containment system provided by the steel-lined concrete pad is designed to contain at least 21 gallons of waste, representing the maximum volume of hazardous waste in the TTU burn pan at any one time. The catch tank has a containment capacity of at least 157 gallons.

Because the TTU is located outside, the steel-lined concrete pad periodically collects water from precipitation events, and the water drains through a filter into a catch tank. The Permittees shall manage the water in the tank to prevent overflow and ensure that sufficient capacity is available to accommodate precipitation.

The pad shall be inspected and cleaned as needed, and maintained in accordance with Permit Attachment E. The water shall be managed as specified in Permit Section 5.6.1. The filter shall be characterized in accordance with Permit Attachment C (*Waste Analysis Plan*) and shall be managed accordingly. If the filter is known or suspected to contain unreacted explosive, it shall be treated in the TTU.

A.4 TA-III: RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT

The Radioactive and Mixed Waste Management Unit (RMWMU) consists of several buildings within a fenced area located at the southeastern corner of Technical Area III (TA-III), west of the Chemical Waste Landfill, and occupies 135,472 square feet. The RMWMU is used for storage, treatment, and packaging of hazardous and mixed wastes generated as a result of Facility operations and corrective action activities. Hazardous and mixed wastes and treatment residues are transported to off-site permitted facilities for treatment, storage and disposal.

The location of the RMWMU at the Facility is indicated in Figure 15 of Permit Attachment L (*Figures*). Figure 2 of Permit Attachment L (*Figures*) illustrates its location in Technical Area III. Figure 16 of Permit Attachment L (Figures) illustrates the six hazardous and mixed waste management areas at the RMWMU. Appendix A.3 in Permit Attachment L (*Figures*) contains photographs of the hazardous waste management areas at the RMWMU.

Waste containers that may be managed at the RMWMU include but are not limited to 30 and 55-gallon steel, polyethylene, and fiber drums; fiberglass-reinforced plastic or plywood boxes; various steel boxes; metal over pack boxes; cardboard shipping containers; gas cylinders; roll-off bins; lab pack containers; various small containers; bags; and some oversized, irregularly-shaped containers or large self-contained items (e.g. a large piece of equipment containing hazardous or mixed waste in which the hazardous component of the item is located within the interior of the item, or is covered with an inert material, such as plastic sheeting, if located on the exterior of the item).

A.4.1 RMWMU Designated Waste Management Areas

The RMWMU has six designated hazardous and mixed waste management areas. These include Buildings 6920, 6921, 6925, and 6926; two modular storage buildings; and the outdoor waste storage area (i.e., paved areas within the RMWMU fence to the north, east, and west of Building 6920).

In each waste management area (except where noted), containers holding liquid hazardous or mixed wastes shall be stored on portable spill pallets or pans. These are commercially available units consisting of a tub made of a heavy-duty inert material such as polyethylene or polypropylene with a heavy-duty inert plastic grating cover. The containers of liquids (up to and including 85-gallon overpack containers) will be stored on grating. Any liquids released from the containers drain through the grating into the tub. The pallets come in various sizes and capacities designed for use with 55-gallon drums or other standard containers, as required by 40 CFR § 264.175(b)(1-3).

Each pallet will have sufficient capacity to hold the contents of the largest container of liquid waste stored on it. Containers shall be stored in a stable configuration; the weight shall not exceed the load-bearing capacity of the grating or the pallet.

Hazardous and mixed wastes will be stored inside one of the buildings, inside transportainers in the outdoor storage area, or outside in the outdoor storage area. Transportainers are 10- to 40-cubic-yard transportable containers, which typically have doors at one end and can be lifted onto a large flatbed truck for transportation. Wastes in the containers will be protected from precipitation by the buildings, transportainers, or other appropriate means, and by the slope of the pavement and concrete pads outside the buildings that direct storm water toward the retention pond, in accordance with 40 CFR §264.175.

The following sections provide descriptions of each structure and the waste management areas. Storage capacities are listed in Attachment J, Table J-1.1.

A.4.1.1 TA-III: Building 6920 at the RMWMU

The principal structure at the RMWMU is Building 6920. The floor plan for Building 6920 is presented on Figure 17 in Permit Attachment L (*Figures*). The waste management areas in Building 6920 include waste staging, repackaging, and storage areas, and treatment areas. Building 6920 is a single-story concrete and steel structure housing approximately 5,800 square feet of waste management area. The floors are 6-inch reinforced, sealed concrete on compacted sub-grade sloped to sumps with no outlets. Walls are 8-inch load-bearing concrete masonry unit with pre-finished metal building panels in some areas. Non-grouted cells of the 8-inch concrete masonry unit exterior walls are filled with vermiculite insulation. The staging area at the east end of the building has 14-foot (ft) high reinforced concrete walls. Inner partitions are 8-inch reinforced concrete masonry unit.

A.4.1.1.i North Bay of Building 6920

In the RMWMU waste treatment, storage, and repackaging are performed in the north bay of Building 6920 (see Figure 17 in Permit Attachment L (*Figures*)). Treatment in the North Bay will be limited to physical treatment and macroencapsulation.

The floor in the North Bay slopes from the doorways toward one or more shallow (6-in.-deep) blind sumps, some of which are covered with grating. Containers of liquid hazardous and mixed wastes will be stored on portable spill pallets or pans. Floors, (including the sumps), and the walls in the waste management areas of Building 6920 are painted. The floors shall be maintained as needed to be free from cracks and gaps.

The RMWMU North Bay includes two enclosed areas that are equipped with a negative-pressure exhaust system. The exhaust passes through a high-efficiency particulate air (HEPA) filter train before being released to the environment through an exhaust stack. The filters remove particulates entrained in the airflow.

A.4.1.1.ii South Bay of Building 6920

In the RMWMU, waste treatment, storage, and repackaging are performed in the South Bay of Building 6920 (see Figure 17 in Permit Attachment L (*Figures*)). Wastes are stored in the main bay and in the airlocks at either end. Treatment in the South Bay will be limited to chemical and thermal deactivation, stabilization/solidification, amalgamation, macroencapsulation, and physical treatment.

The floor in the south bay slopes from the doorways toward shallow (6-inches-deep) blind sumps covered with grating along the south wall which provides secondary containment. Containers of liquid hazardous or mixed wastes are stored over the sump in the south bay or on portable spill pallets or pans. Floors (including the sumps), and the walls in the waste management areas of Building 6920 are painted. The floors and sump shall be maintained as needed to be free from cracks and gaps.

In the RMWMU, there are four small rooms in the South Bay. A commercially available fume hood with a negative-pressure ventilation system is located in one of these rooms. A second local ventilation system is located in another of the rooms. The exhaust from both of these systems is combined and passes through a HEPA filter train before being released to the

environment through the exhaust stack. The filters remove particulates entrained in the airflow of each system.

A.4.1.2 TA-III: Building 6921 at the RMWMU

Building 6921, the Waste Assay Unit, is located east of Building 6920 (see Figure 16 of Permit Attachment L (*Figures*)). The Permittees treat, repackage, and store hazardous and mixed wastes in the waste management areas. The Building 6921 floor plan is presented on Figure 18 of Permit Attachment L (*Figures*). Building 6921 is a single-story structure constructed with interior walls of 8-inch concrete masonry unit and metal studs. The roof is comprised of steel bar joists with metal decking, rigid insulation, and single-ply membrane roofing. The floors are 6 inches thick concrete slab-on-grade. The floors throughout the waste management areas shall be maintained as needed to be free from cracks and gaps. The total area of the waste management areas is approximately 1,450 ft^2.

Building 6921 waste treatment area, (see Figure 18 in Permit Attachment L (*Figures*)) is equipped with a commercially available fume hood with a negative-pressure ventilation system. The ventilation airflow from the hood passes through a HEPA filter train before being released to the environment through an exhaust stack. The filters remove particulates entrained in the airflow.

Treatment in Building 6921 is limited to chemical and thermal deactivation, stabilization/solidification, amalgamation, macroencapsulation, and physical treatment.

A.4.1.3 TA-III: Buildings 6925 and 6926 at the RMWMU

Buildings 6925 and 6926 are used for storage, repackaging, and some treatment of hazardous and mixed waste at the RMWMU. Treatment shall be limited to macroencapsulation in Building 6925.

The floor plans for RMWMU Buildings 6925 and 6926 are presented on Figure 19 of Permit Attachment L (*Figures*). Building 6925 has a total storage area of approximately 4,000 ft^2. Building 6926 also has a total storage area of approximately 4,000 ft^2.Each is a prefabricated steel building erected on a reinforced concrete slab floor and foundation. The concrete floors in both buildings will be maintained as needed to be free from cracks and gaps. Steel rollup doors are located on the south wall of each building, on the east wall of Building 6925 and on the west wall of Building 6926. Personnel doors are located on the east, south, and west sides of each building.

A.4.1.4 TA-III: RMWMU Modular Storage Buildings (TP150 and TP153)

There are two modular storage buildings located west of Building 6920 used for storage of reactive and ignitable hazardous and mixed wastes (see Figure 16 of Permit Attachment L (*Figures*)).

The exterior dimensions of each modular storage building are 23-ft long, 9-ft wide, and 8.6-ft high. The structures are constructed of welded 10- and 12-gauge steel supported by structural

steel. Each building has double doors with inside handle. The inside walls and ceiling of each building are painted..

Each modular storage building has a 5.5-inch deep integral spill containment reservoir constructed of welded 10-gauge steel under the entire building; the capacity is 650 gallons. The inside surfaces (bottom and sides) of each reservoir are painted to provide additional protection against degradation of the secondary containment. The sumps shall be maintained as needed to be free from cracks and gaps. Containers shall be stored on painted steel grating or equivalent over the sumps. The grating shall be maintained as needed to support the containers and elevate them above any accumulated liquid. Each building shall rest on structural supports that elevate it and allow visual checks of the underside of the spill containment reservoir if there is evidence of deterioration on the interior surfaces noted during inspections performed according to the Inspection Plan in Permit Attachment E.

A.4.1.5 TA-III: Outdoor Waste Storage Area of the RMWMU

The outdoor waste storage area consists of the asphalt-paved areas to the north, east, and west of Building 6920 and within the RMWMU fence (see Figure 16 of Permit Attachment L (*Figures*)). The outdoor waste storage area may be used for storage of containerized hazardous and mixed wastes. It has an area of approximately 48,500 ft^2. The area is curbed, and paved.

Containers of hazardous and mixed wastes may be stored inside enclosed steel transportainers. Containers that are stored outside shall meet the requirements of this Permit Attachment and Permit Parts 2 and 3.

A.4.2 TA-III: RMWMU Container Management Practices

Requirements for management of hazardous and mixed waste containers, information on container handling, the condition of containers, aisle space, compatibility of waste with containers, and storage configuration at the RMWMU are described in Permit Section 2.10 and Permit Part 3.

Containers shall be stacked in a stable configuration that does not exceed the load-bearing capacity of the floor or secondary containment system. Containers holding hazardous or mixed waste liquids without absorbent shall not be stacked without separation or some other means to allow Unit personnel to clearly identify the source of liquid, if liquid is discovered in the secondary containment area.

A.4.3 TA-III: Preventing Hazards in Loading/Unloading at the RMWMU

Loading and unloading activities take place on paved areas, typically immediately outside the buildings. The ramp on the west side of Building 6926 slopes gently up to the dock, allowing forklift operators to drive onto trailers of trucks parked at the dock. The dock and ramp will be maintained in good condition and is covered to provide protection from weather. Unit personnel typically use the loading dock for loading and unloading waste from trucks.

All containers shall be handled in a manner to prevent shifting or falling. Containers too large to hand carry shall be transported using forklifts, drum dollies, pallet jacks, or other appropriate equipment.

A.4.4 TA-III: Preventing Run-On and Run-Off (or Flooding) at the RMWMU

The area around the RMWMU slopes gently toward the west. Sheet-flow run-on of surface water from surrounding areas outside the Unit will be prevented from entering the waste management areas. The elevated gravel road located outside the east fence of the Unit diverts water flowing from areas farther to the east. An 8-in. curb at the east edge of the pavement and an asphalt-lined drainage swale along the eastern edge of the Unit (inside the fence) divert run-on from the gravel road toward the south away from the Unit. On the south and west sides, the Unit is higher than the surrounding land. On the north side, the Unit and a narrow ledge of land outside the fence are higher than the surrounding land. Thus, run-on from all directions is prevented from entering the Unit.

The paved areas within the Unit are surrounded by an 8-inch curb, further preventing run-on and run-off. The outside storage area slopes toward the south and west. The concrete pads outside the doors and the pavement surrounding Buildings 6920, 6921, 6925, and 6926 all slope away from the doors and toward shallow drainage channels that run between buildings 6920, 6925, and 6926. The channels lead to the synthetic-material-lined water retention pond at the southwest corner of the Unit, and will divert storm water from roof downspouts and the paved areas in the RMWMU into the water retention pond. Normally, the water retention pond collects only storm water. It is not intended to provide secondary containment for waste.

A.4.5 TA-III: Treatment Operations at the RMWMU

Waste treatment is performed at the RMWMU for one or more of the following reasons:

1. To meet land disposal restrictions (LDRs);
2. To allow for the safe storage of the waste; and/or
3. To meet treatment, storage, or disposal facility (TSDF) requirements

Waste treatment practices currently involve various technologies at the RMWMU, and include the following methods.

1. Chemical deactivation: The Permittees may chemically deactivate wastes exhibiting the hazardous waste characteristics of ignitability, corrosivity, or reactivity in either Building 6920 or Building 6921.
2. Thermal deactivation: The Permittees may thermally deactivate wastes exhibiting the hazardous waste characteristics of ignitability or reactivity in either Building 6920 or Building 6921.
3. Stabilization: The Permittees may stabilize and solidify wastes in either Building 6920 or Building 6921.
4. Amalgamation: The Permittees may amalgamate elemental mixed mercury wastes in either Building 6920 or Building 6921.

5. Macro-encapsulation (performed in Buildings 6920, 6921, or 6925): The Permittees may macroencapsulate hazardous or mixed waste debris or other wastes subject to a variance from the treatment standards granted by the Department pursuant to 40 CFR 268.44.
6. Physical treatment: The Permittees may conduct physical treatment of hazardous or mixed wastes in either Building 6920 or Building 6921.

Treatment quantities are listed in Attachment J, Table J-1.2. All of the treatment at the RMWMU is batch treatment. Treatment will be conducted in containers unless the physical properties of the waste and the nature of the treatment process require treatment without containers (e.g., deactivation of thermal batteries and some physical treatment). Liquid wastes shall be treated in batches of 60 gallons or less.

Waste treatment may generate secondary waste streams (treatment residues). Treatment residues may undergo additional on-site treatment only by the methods described in this Section (A.4.5) to meet LDRs or may be sent to an appropriate off-site facility for additional treatment prior to disposal. The waste treatment processes described in this section are intended to address hazardous characteristics in hazardous and mixed wastes, including:

1. Wastes that are solid and exhibit the hazardous characteristics of ignitability or reactivity that may be chemically deactivated to eliminate the characteristic.
2. Debris, and wastes containing hazardous waste toxicity characteristic metals (excluding elemental and high mercury subcategories), that may be macroencapsulated to reduce or eliminate the leaching potential of the waste or hazardous constituent(s).
3. Wastes that are solid and with hazardous constituents that may be physically separated from larger items and the size of individual pieces reduced.
4. Pressurized containers that may be punctured or opened to release their contents.
5. Liquid waste exhibiting the characteristics of ignitability, corrosivity, and/or reactivity that may be chemically or thermally deactivated to remove the hazardous characteristic(s).
6. Liquid waste and particulates containing toxicity characteristic metals (excluding elemental mercury and high mercury subcategories) that may be stabilized and/or solidified to reduce or eliminate the leaching potential.
7. Reactive wastes (including explosive wastes) that may be treated using thermal deactivation techniques.
8. Elemental mercury that may undergo amalgamation to reduce or eliminate the leaching potential.

Each of the waste treatment technologies or processes listed above is described in the following sections.

A.4.5.1 Chemical Deactivation

Chemical Deactivation will be performed in containers in the treatment areas only in Buildings 6920 and 6921. Whenever possible, treatment will take place within the fume hoods that are present in each building, as appropriate to protect human health and the environment. Containers vary in size depending on the quantity of waste to be treated, and include laboratory glassware, 5-gallon buckets, and 55-gallon drums.

Chemical deactivation refers to a number of chemical processes that can eliminate the hazardous waste characteristics of ignitability, corrosivity, and/or reactivity. Chemical deactivation can be accomplished by several technologies, such as neutralization or chemical oxidation. The intent of this section is to identify and describe specific methods or treatment trains which may be used at the RMWMU to deactivate ignitable, corrosive, and reactive hazardous and mixed waste. Deactivation may or may not result in the final waste form, depending on the process, and may be used as the first method in a series of treatment steps.

Deactivation processes will be conducted under carefully controlled conditions so that hazardous and mixed waste with the characteristic of reactivity is allowed to react in a slow, nonviolent manner. Deactivation of reactive wastes shall be conducted in small batches such that process control can be easily maintained. Hydrides, deuterides, and tritides are deactivated by slow addition to an ice water bath. Deactivation of water-reactive metals such as elemental sodium and lithium involves the slow and controlled addition of an appropriate alcohol/water solution. Alcohol/water will be added until the water reactive potential of the waste has been eliminated. Deactivation of pyrophoric metal powders and particulates may be achieved by mixing waste in a Portland cement matrix.

Water-soluble oxidizers in particulate form will be slowly dissolved in water to deactivate them as the first step in the treatment process. The resulting solution may undergo further treatment (e.g., neutralization and stabilization). Water-soluble concentrated liquid oxidizers such as hydrogen peroxide will be diluted with water in a controlled manner to make them safer to handle before deactivation with an appropriate chemical agent such as iron filings.

The reactive material in thermal batteries may be deactivated through introduction of an electrical current that induces a chemical reaction in the material, deactivating it and generating heat. Batteries are treated one at a time in this manner; this process is not conducted in containers due to the need to dissipate the heat generated during the chemical reaction.

Chemical deactivation to remove the characteristic of corrosivity is the process of removing excess acidity or alkalinity from an aqueous liquid waste. Other uses may include pH (Potential Hydrogen - a measure of the acidity or basicity of an aqueous solution) adjustment to facilitate subsequent treatment; such pre-treatment through deactivation may be necessary to prevent corrosive damage to equipment, deter undesirable reactions, and preclude the formation of unwanted byproducts.

Reagents added to achieve a desired pH are combined with liquid waste in a mixing vessel or directly in the waste container. Common deactivating reagents include, but are not limited to, sodium hydroxide, for acid wastes; and phosphoric acid for alkaline wastes. The selection of reagents is dependent on the quantity of reagent required, cost, availability, and the potential byproduct(s). These deactivation processes are conducted under carefully controlled conditions in which the reagent is added to the waste slowly and mixed thoroughly. This allows the reaction to proceed in a nonviolent manner and allows the energy to be dissipated effectively. Ice may be used if needed to cool the mixture during the reaction. In the case of reactions that are expected to be strongly exothermic, wastes will be treated in small batches in containers (similar to the deactivation of reactive wastes) such that process control can be easier to maintain.

A.4.5.2 Thermal Deactivation

The Permittees shall perform thermal deactivation of reactive wastes, including batteries, explosives and explosive components in a Sandia National Laboratories-designed and tested portable deactivation device that meets the regulatory definition of a container. The device is a thick-walled stainless steel vacuum apparatus equipped with an internal heated covered tray and sensors to measure temperature and pressure. The device was designed to contain a detonation of 25 grams TNT-equivalents of reactive hazardous or mixed waste. The inside diameter of the cylinder is 8 inches, and it is 18 inches long. The thermal deactivation device is portable and may be used in any of the treatment areas in Building 6920 or 6921. It is shown in Figure 20 in Permit Attachment L (*Figures*).

Reactive waste is placed on the covered tray, inserted into the cold unit, the unit is sealed and filled with an inert atmosphere (e.g., nitrogen), and the temperature of the tray is slowly raised until reaching a temperature at which the reactive waste being treated decomposes. The Permittees will use waste characterization data and/or published chemical information (e.g., "DOE Explosives Safety Manual" [DOE, 2002] or other chemical or engineering handbook) as appropriate to determine the required temperature to decompose the reactive waste. The temperature will be maintained for two hours or longer as appropriate, to complete the decomposition of the waste. The unit will be cooled and decomposition gases will be vented to a fume hood with a high-efficiency particulate air filtration system.

A.4.5.3 Stabilization and Solidification

The Permittees will perform stabilization in containers in the treatment areas only in Buildings 6920 and 6921 at the RMWMU. Whenever possible, treatment will take place within the fume hoods that are present in each building to protect human health and the environment. Stabilization is the process of binding hazardous metals so that the metals become chemically part of the matrix or are physically bound within the matrix. The primary use of stabilization is to immobilize toxicity characteristic metals but many stabilization agents also eliminate free liquids. Typical waste forms often suitable for stabilization and/or solidification include liquids, sludge, soils, and particulate-type wastes.

Process equipment for mixing waste and binder materials depends on the type of reagents used and the volume of waste to be treated. In-drum mixing is typically used for large volume waste quantities. Once waste and binder have been thoroughly mixed in a container, the mass is allowed to cure and/or set. Smaller batches may be mixed by hand in smaller containers (e.g., 5-gallon pails, and tubs and trays of various sizes) and allowed to cure.

Development of appropriate formulas is waste specific. Stabilization agents for toxic metals may include Portland cement, pozzolans, thermoplastics, organic polymers, and clays. Other waste forms may require proprietary reagents that are available for specific applications. Additional reagents may be added to reduce constituent leachability, reduce cure or set time, and increase strength.

Waste characteristics that are important to the success of the stabilization and/or solidification process for liquids may include volume percent of water, oil, solvents, or other organics, pH and

hazardous constituents. Waste characterization data shall be used to determine whether waste is amenable to stabilization, any necessary pretreatment requirements, and the appropriate binding agent.

Once the stabilization or solidification method is selected, the binding agent is identified based on chemical compatibility with the waste form and hazardous constituents present. Pretreatment may be required to assure compatibility between the waste, the binding agent, and the containers (e.g., neutralization of liquid wastes to an acceptable pH range of 5.0 to 11.0). Once the proper binding agents have been identified, bench-scale testing is performed to determine optimum amounts of each agent. In the case of low volume waste streams (e.g., less than approximately 0.26 gallons), bench-scale testing may not be practical and treatment is performed without bench-scale testing using the manufacturer's suggested quantities or by estimating binding agent quantities from previous experience. Stabilization is performed by combining predetermined quantities of binding agents with the waste and mixing the combination thoroughly, as appropriate. The resulting mixture is staged to allow an appropriate cure time.

A.4.5.4 Amalgamation

The Permittees shall perform amalgamation of small quantities (about 2 ounces) of elemental mercury in small (e.g., laboratory) containers in the treatment areas only in Buildings 6920 and 6921 at the RMWMU. The amalgamation process for liquid elemental mercury involves mixing mercury waste with a powdered base metal. The amalgamation process is intended to immobilize elemental mercury into a solid leach-resistant form that has minimal potential for emission of mercury vapor.

The two important operating parameters for effective treatment are: (1) the ratio of base metal to mercury, and (2) the efficiency of mixing. Copper or zinc is typically used as a base metal, but tin, nickel, gold, and sulfur may also be used. The base metal may be pretreated with acid to improve the effectiveness of the amalgamation reaction. For the small quantities of mercury that are treated at the RMWMU, hand mixing the mercury and base metal using a mortar and pestle or mechanical mixing shall be used to create an amalgam with uniform properties.

A.4.5.5 Macro-Encapsulation

The Permittees will perform macroencapsulation in containers only in Buildings 6920, 6921, and 6925 at the RMWMU. Macro-encapsulation is the process of completely encasing waste within a polymer coating or concrete, or within a jacket of inert inorganic materials. The primary use of macroencapsulation is to immobilize wastes such as debris-type solids containing hazardous constituents by completely surrounding the waste with a leach-resistant coating.

The Permittees will perform macroencapsulation using one of three processes:

1. Encasing the waste in concrete, within a larger container that serves as a mold.
2. Coating the waste with polymer agents within a mold. Polymers used for macroencapsulation include, but are not limited to, asphalt, polyethylene, thermosetting plastics, and resins that can be polymerized under ambient temperatures in the presence of a catalyst. Equipment used for macroencapsulation may include molds, polymer extrusion equipment, and resin mixing equipment. In-drum macroencapsulation may also

be performed with the drum acting as the mold. Temperature control of polymer macroencapsulation processes is critical and will be carefully maintained to assure that adequate coating occurs.

3. For example, the Permittees perform macroencapsulation with a chemically inert resin (typically polyethylene), using 30-gallon containers (metal baskets). Each basket containing the solid waste items is placed in a 50-gallon mold (similar in size and shape to a 55-gallon drum). The basket is designed to fit into the mold with one to two inches of clearance on all sides, the top, and the bottom. The mold containing the basket and waste items is then filled with melted resin that is heated using a commercially available extrusion unit. Each basket is used only once because it becomes encapsulated within the inert resin and is part of the final waste form. After the resin cools and solidifies, the mold is removed, the waste form is turned over and more polyethylene is added to form final caps on the ends. The completed waste form is a cylinder slightly smaller than a 55-gallon drum.
4. Placing the waste inside a commercially available container made of inert or non-corroding materials such as polyethylene or stainless steel. Alternatively, the container may consist of an outer shell with a liner of inert or non-corroding material such as polyethylene resin or stainless steel. After the wastes and inert void-filler materials are placed in the container, the resin is heated to seal the container and lid (e.g. using a resistance-heated wire system embedded in the container lid). Non-corroding materials such as stainless steel are also available as containers and liners; the stainless steel is welded closed to seal the container and encapsulate the wastes. The Permittees use containers of various sizes, depending on the volume and dimensions of waste items to be macroencapsulated.

A.4.5.6 Physical Treatment

The Permittees will perform physical treatment (volume reduction) of hazardous or mixed waste only in Buildings 6920 and 6921. Such treatment includes:

1. Reducing waste volume by using commercially available tools (e.g., hammers, screwdrivers, wrenches, pliers, saws, drills, cutters, etc.) to separate items with hazardous constituents from larger items or from each other, including removal of coating and filler materials.
2. Removing coating and filler materials (e.g. resins) by dissolution in containers (e.g., trays or pails) in order to facilitate separation of items with hazardous waste constituents from each other or from other items. Whenever possible, dissolution will take place within the fume hood(s) that are present in each building.
3. Reducing the size of waste items by using tools (e.g. mallets, cutters, etc.) to crush or cut items into smaller pieces.
4. Puncturing aerosol cans within a container to allow recovery of the contents. The liquid contents of the aerosol cans are collected in the container, and any gaseous propellants are filtered through a carbon filter attached to the container.
5. Releasing pressurized contents of containers other than aerosol cans (e.g., gas cylinders). Organic gaseous contents are filtered through a carbon or other appropriate filter. All contents will be vented to a chemical fume hood with a high-efficiency particulate air filtration system.

A.4.6 Treatment Effectiveness

Treatment effectiveness will be verified through evaluation of the treated waste in accordance with Permit Attachment C (*Waste Analysis Plan*).

The Permittees will evaluate treatment effectiveness by appropriate methods for each batch of waste treated. In many cases (e.g. stabilization), the Permittees treat small samples of a batch of waste using a single agent in various proportions or using various agents to determine which is most effective. That process is then used in treating the rest of the waste, and the data demonstrating that the treatment is effective for the samples may be used to demonstrate effectiveness for the rest of the waste, when appropriate.

A.4.6.1 Chemical Deactivation

The Permittees will also verify treatment effectiveness using one or more of the following methods, as appropriate:

1. Visual check for completeness of chemical reaction for solid items of waste that were treated to remove the characteristic of reactivity (e.g., color change or structural change).
2. Visual check or ignitability test for liquid wastes that were treated to remove the characteristic of ignitability.
3. Document check to determine whether treated waste is an oxidizer as defined in 40 CFR Part 173.
4. Visual check for liquid wastes that were treated to remove the characteristic of reactivity.
5. Fingerprint chemical check for the presence of sulfides and cyanides if their presence caused the waste to be reactive.
6. Fingerprint check for pH of liquid wastes that were treated to remove the characteristic of corrosivity.
7. Knowledge of process to determine whether chemical reaction(s) were completed. Such knowledge of process shall be based on stoichiometry or the measurement of other properties (e.g., temperature or time). The Permittees shall attempt to use the applicable methods listed above before using knowledge of process as the sole means of verifying treatment effectiveness.

A.4.6.2 Thermal Deactivation

The Permittees will also verify treatment effectiveness through proper operation of the unit (maintaining specified decomposition temperature for specified length of time). In some cases, personnel may visually check for evidence of chemical reaction (e.g., color change or structural change) in a waste solid.

A.4.6.3 Stabilization and Solidification

The Permittees will also verify treatment effectiveness using one or more of the following methods, as appropriate:

1. Visual check for the presence of free liquids.
2. Paint filter test to determine whether free liquids are present if the treated waste is amorphous and may contain some liquids.

3. Laboratory analysis of samples of the treated waste using the TCLP for hazardous waste toxicity characteristic metals. If the stabilization is intended to meet the treatment standards in 40 CFR § 268.40, the analysis will include underlying hazardous constituents as described in Permit Attachment C (*Waste Analysis Plan*).

A.4.6.4 Amalgamation

Treatment is effective by using the specified method as discussed in Permit Attachment A, Section A.4.5.4.

A.4.6.5 Macro-encapsulation

The Permittees will verify treatment effectiveness by visually checking each macroencapsulated item to verify that it is completely encased in the inert resin or concrete. For containers with inert liners, the Permittees shall check the seal of the liner and/or container.

A.4.6.6 Physical Treatment

The Permittees will also verify treatment effectiveness by one or more of the following methods, as appropriate:

1. Visual inspection that items with hazardous waste constituents have been completely separated from other items.
2. Visual inspection that pieces are the desired size.
3. Visual inspection that punctured aerosol cans are empty and the contents are containerized.
4. Leaving a container for a time to allow it to continue venting after visual and/or audible evidence indicates it is empty. The length of time would be determined by the size of the container, the contents, and the strength of the evidence.

A.5 TA-V: THE AUXILIARY HOT CELL UNIT

The auxiliary hot cell unit (AHCU) within the Facility is shown in Figure 21-A of Permit Attachment L (*Figures*). The location of the AHCU at TA-V is shown on Figure 21-B in Permit Attachment L (*Figures*). Appendix A.4 in Permit Attachment L (*Figures*) contains photographs of the hazardous waste management areas at the AHCU.

A.5.1 TA-V: Designated Waste Management Areas at the AHCU

The AHCU is located within the high bay of Building 6597 and comprises four designated waste management areas, which are shown on Figure 22 of Permit Attachment L (*Figures*). These waste management areas include:

1. The Auxiliary Hot Cell;
2. The work area near the hot cell, which includes the fume hood;
3. The storage silos; and
4. The container storage area.

Storage capacities are listed in Attachment J, Table J-1.1. Treatment quantities are listed in Table J-1.2.

A.5.1.1 TA-V: AHCU Hot Cell

The Auxiliary Hot Cell is located in the high bay area of Building 6597. Waste management activities are repackaging hazardous and mixed wastes for shipment to off-site Treatment, Storage, or Disposal Facilities (TSDFs), and treatment of hazardous and mixed wastes by reducing waste volumes using tools to separate items with hazardous waste constituents from larger items. The outside dimensions of the hot cell are 16 feet (ft) 8 inches square and 16 ft 2 inches high. Inside space dimensions are 100 square feet with a height of 13-ft 10 inches. The inside surfaces are lined with stainless steel. An 18-inch thick concrete foundation mat supports the hot cell. The hot cell walls are constructed of inner and outer pre-cast concrete panels that are held apart by threaded rods. The space between the panels is filled with sand. The roof sections are also constructed of reinforced concrete panels with sand between them. Each individual roof panel is designed to structurally support one 5,000-pound point load. Each roof section supports a roof port and roof plug. The hot cell is equipped with manipulator arms that allow personnel to handle items remotely.

A.5.1.2 TA-V: AHCU Work Area and Fume Hood

The work area is located in the corner of the high bay, north and east of the hot cell and the permanent shield wall. Activities include treatment and storage. Treatment methods will be limited to deactivation, stabilization/solidification, macroencapsulation, and physical treatment. Personnel also repackage wastes for shipment to off-site TSDFs. From time to time, a temporary tent-like room may be erected in the work area north of the hot cell and east of the permanent shield wall to accommodate containerized mixed wastes or large mixed waste items. If the mixed waste item or container must be handled remotely, the temporary room will be built directly against the permanent shield wall to allow the use of the manipulators at the shield wall. Each time the temporary room is erected, package-specific considerations will determine details of the design; however, basic construction will consist of polyvinyl chloride or metal framing, clear or translucent plastic roof and walls, and plastic doors. The temporary room will operate at a slight negative pressure.

A 6-ft-wide walk-in fume hood is located in the work area northeast of the Auxiliary Hot Cell. It can accommodate two 55-gallon drums placed side by side. Unit personnel treat and repackage hazardous and mixed wastes in the fume hood. The fume hood is included in the maximum storage capacity for the overall work area.

A.5.1.3 TA-V: AHCU Storage Silos

Four 10-inch inside-diameter, 15-ft deep floor silos and two 30-inch inside-diameter, 15-ft deep floor silos are located in the work area north of the hot cell and east of the permanent shield wall. These silos have removable locking-type shield plugs. The tops of the silos are raised slightly above the floor level to reduce the possibility of water entry into the silo.

Two additional storage silos are located within the hot cell. Each silo is 10-inch inside diameter. One silo is 15-ft deep and the other is 11-ft 8-inch deep.

Each silo is constructed of concrete, and each is lined with a removable welded stainless steel sleeve. The sleeves do not provide secondary containment for the small quantities of liquid (about 2 ounces) wastes that may be stored in the silos. Secondary containment is provided by outer storage containers. The silos are used only for storage of mixed wastes that exhibit high external radiation dose rates that are hazards to personnel.

A.5.1.4 TA-V: AHCU Container Storage

Containers of hazardous and mixed wastes may be stored in the high bay, south and west of the hot cell. The floor of the storage area is painted and shall be maintained as needed to be free from cracks and gaps.

Container storage practices applicable to the AHCU, which include container types and labeling, container handling, and the condition of containers, compatibility of waste with containers, the presence of liquids in containers, and the condition of containers are presented in Part 3 of this Permit.

Waste containers that may be managed at the AHCU include but are not limited to 30 and 55-gallon steel, polyethylene, and fiber drums; fiberglass-reinforced plastic or plywood boxes; various steel boxes; metal over pack boxes; cardboard shipping containers; gas cylinders; roll-off bins; lab pack containers; various small containers; bags; and some oversized, irregularly-shaped containers or large self-contained items (e.g. large pieces of equipment containing hazardous or mixed waste in which the hazardous component of the item is located within the interior of the item, or is covered with an inert material, such as plastic sheeting, if located on the exterior of the item).

In the work area and storage areas, containers holding liquid hazardous or mixed wastes shall be stored on portable spill pallets or pans. These are commercially available units consisting of a tub made of a heavy-duty inert material such as polyethylene or polypropylene with a heavy-duty inert plastic grating cover. The containers of liquids (up to and including 85-gallon overpack containers) will be stored on grating. Any liquids released from the containers drain through the grating into the tub. The pallets come in various sizes and capacities designed for use with 55-gallon drums or other standard containers, as required by 40 CFR § 264.175(b)(1-3).

Each pallet will have sufficient capacity to hold the contents of the largest container of liquid waste stored on it. Containers shall be stored in a stable configuration; the weight shall not exceed the load-bearing capacity of the grating or the pallet.

A.5.1.5 TA-V: AHCU Container Management Practices

Requirements for management of ignitable, reactive, or incompatible wastes at the AHCU are described in Permit Section 2.10. Requirements regarding the management of hazardous and mixed waste storage containers, information on container handling, the condition of containers, aisle space, compatibility of waste with containers, and storage configuration are contained in Part 3 of this Permit.

A.5.2 TA-V: Preventing Hazards in Loading/Unloading at the AHCU

Loading and unloading activities are performed just inside the rollup door on the north side of Building 6597 and may also be performed just inside the rollup door on the south side of the high bay (see Figure 23 in Permit Attachment L (*Figures*)). The floor is level and maintained in good condition. There also is sufficient room for safely operating vehicles and equipment. All containers shall be handled in a manner to prevent shifting and falling. Containers too large to hand carry shall be transported using forklifts, drum dollies, pallet jacks, or other appropriate equipment.

A.5.3 TA-V: Preventing Run-on and Run-Off (or Flooding) at the AHCU

The land surrounding the AHCU slopes gently toward the west. Sheet-flow run-on of surface water from surrounding areas outside TA-V is prevented from entering TA-V by a diversion berm. The diversion berm lies east of TA-V and diverts storm water to the north and south.

The floor of the high bay in Building 6597 is slightly higher than the surrounding ground, and should direct storm water away from the building. The asphalt and concrete pavement around the AHCU slope toward a storm drain that directs storm water toward the west.

Drainage control features (e.g., run-on/run-off, drainage barriers) at the AHCU are shown on Figure 24 of Permit Attachment L (*Figures*).

A.5.4 TA-V: Treatment Operations at the AHCU

Treatment methods for hazardous and mixed wastes that will be treated in containers at the AHCU are:

1. Chemical deactivation of wastes exhibiting the hazardous waste characteristics of ignitability, corrosivity, or reactivity will be performed in the work area, including the fume hood and hot cell.
2. Stabilization and solidification of hazardous or mixed wastes will be performed in the work area, including the fume hood and hot cell.
3. Macro-encapsulation of hazardous or mixed waste debris or other wastes subject to a variance from the treatment standards granted by the Department according to 40 CFR 268.44 will be performed in the work area, including the fume hood, or the hot cell.
4. Physical treatment will be performed in the work area, including the fume hood, or the hot cell.

The waste treatment processes described in this section are intended to address hazardous waste characteristics in hazardous and mixed wastes, including the following:

1. Solid items of waste exhibiting the hazardous waste characteristics of ignitability or reactivity that may be chemically deactivated to eliminate the characteristic(s).
2. Debris, and wastes exhibiting toxicity characteristic metals (excluding elemental and high mercury subcategories), that may be macroencapsulated to reduce or eliminate the leaching potential of the hazardous waste constituent(s).
3. Liquid waste exhibiting the hazardous waste characteristics of ignitability, corrosivity, or reactivity that may be chemically deactivated to remove the characteristic(s).

4. Liquid wastes and particulates exhibiting toxicity characteristic metals (excluding elemental mercury and high mercury subcategories) that may be stabilized and/or solidified to reduce or eliminate the leaching potential of the hazardous waste constituents.
5. Solid items of waste with hazardous constituents that may be physically separated from larger items and the size of individual pieces may be reduced.

The following will be managed as hazardous or mixed wastes (in accordance with LDRs).

1. Treatment residue derived from the treatment of listed hazardous or mixed wastes.
2. Treated waste containing listed hazardous or mixed wastes.
3. Treated waste, which continues to exhibit hazardous waste characteristics, or does not meet treatment standards for underlying hazardous waste constituents.

The description of each waste treatment technology or process to be applied at the AHCU, are identical to those presented in Section A.4.5 of this Attachment (i.e., Chemical Deactivation, Stabilization/Solidification, Macroencapsulation, and Physical Treatment).

A.6 MANZANO BASE: MANZANO STORAGE BUNKERS

The Manzano Bunkers (MSBs), which are owned by Department of Defense and leased to the Department of Energy, are located at the Manzano Base on Kirtland Air Force Base, approximately one mile east of the exit road leading to the entrance of TA-III and TA-V and at the end of Pennsylvania Avenue. The location of the MSBs within the Facility is shown on Figures 2 and 25 in Permit Attachment L (*Figures*).

The Manzano Storage Bunkers (MSBs) comprise five Units, each with approximately 1600 to 2400 square feet of space, and are used for storage of hazardous and mixed wastes. These are Bunkers 37034, 37045, 37055, 37057, and 38118. Figure 26 of Permit Attachment L (*Figures*) shows the general layout of the MSBs and their location at the Manzano Base and depicts the locations of the waste management areas at the MSBs. Appendix A.5 in Permit Attachment L (*Figures*) contains photographs of the hazardous waste management areas at the MSBs.

A.6.1 Manzano Base: Designated Waste Management Areas at the MSB

The walls, roof, and floor of each bunker are constructed of concrete and are covered by earthen materials. The walls and roof of each bunker are rounded. There are three types of bunkers at the Manzano Base. These include Type B (37034); Type C (37118); and Type D bunkers (37045, 37055, and 37057). The following sections provide descriptions of the specific bunker storage structures, and their locations. Storage capacities are listed in Attachment J, Table J-1.1.

A.6.2 Manzano Base: MSB Type B Bunker (37034)

The Type B bunker consists of an access tunnel leading to a main chamber that is used for storage of hazardous and mixed wastes. Figure 27 of Permit Attachment L (*Figures*) illustrates the floor plan for the subject Type B bunker. The Type B bunker access tunnel is approximately 20 feet (ft) long, 12 ft wide and 12.5 ft high. The main chamber is approximately 81 ft long, 26.5 ft wide and 12.8 ft high. The bunker is covered by at least 2 ft of earthen fill over a 6-in. thick

concrete roof. The soil surface above and around the bunker is sloped for water to drain away from the bunker. Access to the waste management area of the bunker is through two sets of double doors that are 9 ft high and 9 ft wide. One set is at the entrance to the access tunnel, and the other set is at the entrance to the main chamber.

A.6.3 Manzano Base: MSB Type C Bunker (37118)

Bunker 37118 does not have an access tunnel and consists entirely of a main chamber used for storage of hazardous and mixed wastes. Figure 28 of Permit Attachment L (*Figures*) shows the floor plan of Type C Bunker 37118. The main chamber is approximately 83 ft long, 29 ft wide and 12.8 ft high. A 6-in. drain tile is located outside the bunker perimeter. Access to the main chamber is through a set of double doors 8 ft wide and 9.5 ft high. The bunker is covered by at least 2 ft of earthen fill over a 6-in. thick concrete roof. The soil surface over and around the bunker is sloped for water to drain away from the bunker.

A.6.4 Manzano Base: MSB Type D Bunkers (37045, 37055, and 37057)

The Type D bunkers being permitted consist of an access tunnel leading to a main chamber. Only the main chamber is used for storage of hazardous and mixed wastes. Figure 29 of Permit Attachment L (*Figures*) is a typical floor plan of a Type D bunker. The access tunnels vary in length from 76 feet to 110 feet and are 9 ft wide and 11 to 12 ft high. The main chamber in each Type D bunker is approximately 61 ft long, 26.5 ft wide and 12.5 ft high. Access to the waste management area of each bunker is through two sets of double doors that are 9 ft high and 9 ft wide. One set is at the entrance to the access tunnel, and the other set is at the entrance to the main chamber. Each bunker is covered by at least 2 ft of earthen fill over a 6-in. thick concrete roof. The soil surface over and around each bunker is sloped so that water drains away from each bunker.

A.6.5 Manzano Base: Unit Operations at the Manzano Storage Bunkers

The Manzano Storage Bunkers are used to store any of the hazardous and mixed wastes bearing EPA's Hazardous Waste Numbers listed in Permit Attachment B (*Authorized Wastes*).

The MSB are not occupied by any SNL personnel except when managing waste or performing inspections. All personnel will sign in on a log before entering each bunker and will sign out when they leave. Waste handling personnel work in pairs and maintain contact with each other. All personnel will be trained to check that during each visit to the MSB everyone has signed out and exited the bunker before turning off the lights and closing and locking the doors.

In each Manzano Storage Bunker, containers holding liquid hazardous or mixed wastes will be stored on portable spill pallets and pans. These are commercially available units consisting of a tub made of a heavy-duty inert material such as polyethylene or polypropylene with a heavy-duty inert plastic grating cover. The pallets come in various sizes and capacities. They are designed for use with 55-gallon drums or other standard containers, and meet the requirements of 40 CFR § 270.15(a-b) and 40 CFR § 264.175(b)(1-3). The pallets and pans are designed to be resistant and impervious to corrosives and other liquids. Containers of liquids (up to and including 85-gallon overpack containers) shall be stored on the grating. Any liquids released from the containers drain through the grating into a tub.

Each pallet has sufficient capacity to hold the contents of the largest container of liquid waste stored on it. Containers shall be stored in a stable configuration; the weight will not exceed the load-bearing capacity of the grating or the pallet.

Waste containers that may be managed at the MSB include but are not limited to 30 and 55-gallon steel, polyethylene, and fiber drums; fiberglass-reinforced plastic or plywood boxes; various steel boxes; metal over pack boxes; cardboard shipping containers; gas cylinders; roll-off bins; lab pack containers; various small containers; bags; and some oversized, irregularly-shaped containers or large self-contained items (e.g. large pieces of equipment containing hazardous or mixed waste in which the hazardous component of the item is located within the interior of the item, or is covered with an inert material, such as plastic sheeting, if located on the exterior of the item).

A.6.6 Manzano Base: MSB Container Management Practices

Other requirements for management of containers, and methods employed for storage of hazardous and mixed waste at the MSB are described in detail under Permit Section 2.10 and in Permit Part 3.

A.6.7 Manzano Base: Preventing Hazards During Loading/Unloading at the MSB

Loading and unloading activities take place on the paved areas immediately outside each of the bunker Units. The surface is sloped gently away from the door, and the pavement is maintained in good condition at each bunker. There is sufficient room for safely operating vehicles. All containers shall be handled in a manner to prevent shifting and falling. Containers too large to hand carry shall be transported using a forklift, drum dolly, hand truck, or other appropriate equipment.

A.6.8 Manzano Base: Preventing Run-on and Run-Off (or Flooding) at the MSB

Sheet-flow run-on of surface water from surrounding areas and run-off from each of the MSB bunkers is prevented from entering or leaving the waste management areas by the design and construction of the bunkers. The MSB are constructed of concrete and covered by earthen materials. The slope of the earthen materials covering each of the bunkers prevents run-on of storm water. The concrete provides a barrier to moisture. In Type B and Type C bunkers, a 6-ft drain tile is located on the exterior perimeter, so that any water that percolates through the earthen fill is drained away from the bunkers. The drive at the front of each bunker is level or sloped gently away from the bunker doors. Drainage control features (e.g., run-on/run-off, drainage barriers) are shown on Figure 30 in Permit Attachment L (*Figures*).

A.7 THE CORRECTIVE ACTION MANAGEMENT UNIT

The CAMU is a 3.75-acre area located in the southeast corner of TA-III at SNL as shown in Figure 2 and Figure 31 of Permit Attachment L (*Figures*). The CAMU was used for treatment, storage, and containment of RCRA Subtitle C- and Toxic Substances Control Act (TSCA)-regulated wastes that were generated during remediation work at the Chemical Waste Landfill located adjacent to and at the southeast portion of the Unit. The Unit was closed with wastes remaining in place in the containment cell. All aboveground facilities, including the Bulk Waste

Staging Area, Containerized Waste Staging Area, Treatment Pad, and the Sprung™ Structures have been clean-closed. The CAMU containment cell contains approximately 31,800 cubic yards of hazardous and toxic wastes. The CAMU containment cell also contains soils having low levels of tritium (up to 20,000 picocuries per liter soil moisture). The containment cell is covered with a 5-foot-thick cover system consisting of a layer of 60-mil high-density polyethylene on top of the waste, which, in turn, is covered by bedding sand, pea gravel, filter sand, a native soil blend, and a topsoil layer.

The CAMU incorporates a less-than-90-day waste accumulation area (leachate storage area) north of the containment cell. This area is used to store leachate periodically pumped from the containment cell leachate collection and removal system (LCRS). The leachate is placed into 55-gallon drums. The leachate consists of wastewater containing low levels of hazardous constituents, polychlorinated biphenyls (PCBs), and tritium.

A.7.1 CAMU Access

Figure 32 of Permit Attachment L (*Figures*) presents the configuration of the CAMU and delineates the containment cell, which is subject to post-closure care. A contiguous four-strand, barbed-wire fence delineates this boundary. Locked gates located at the northern and southern perimeter boundaries provide access to the CAMU containment cell and leachate storage area. A complete description of the security procedures applied at the CAMU is in Section H.4 of Permit Attachment H (*Post-Closure Care Plan for the Corrective Action Management Unit*).

A.7.2 General Description of the CAMU

Prior to closure, the CAMU consisted of four waste staging areas: the bulk waste staging area; the Sprung™ structures, the containerized waste staging area, and the treated waste staging area. Operating areas also included a treatment pad with two temporary treatment systems, and a containment cell. Support areas at the CAMU included an equipment decontamination pad, storm-water retention ponds, and less-than-90-day storage areas for the containment-cell leachate collection tanks and the decontamination-pad wash water storage tanks. All hazardous waste and hazardous waste residues were removed from the waste staging areas, treatment pad, and support areas at the CAMU, and the pad and areas were closed under the New Mexico Hazardous Waste Management Regulations. The CAMU containment cell was closed with waste remaining in place. The containment cell and supporting infrastructure are subject to the post-closure requirements contained in Permit Part 7 of this Permit, and are subject to the regulations at 20.4.1.500 NMAC, incorporating 40 CFR §§ 264.117 through 264.120 and 264.552(e)(6).

A.7.3 CAMU Leachate Management

Whenever leachate is being pumped, poured, or otherwise handled, Unit personnel shall meet all applicable preparedness and prevention requirements in Permit Part 2. Unit personnel shall implement the Contingency Plan (Permit Attachment D) in response to emergencies.

The Permittees shall clean up spills promptly in accordance with Permit Section 2.12, and shall notify the Department in accordance with Permit Part 2. At least two verification samples shall be collected and analyzed to ensure complete cleanup has been achieved. Additional verification samples may be required by the Department depending on the magnitude of the spill. Quality

control samples shall also be collected in accordance with the applicable requirements in Permit Part 8.

A.7.4 CAMU Leachate Collection and Removal

The LCRS sump shall be inspected on a quarterly basis for the presence of leachate in accordance with Permit Attachment Section E.9.4. Leachate shall be pumped into 55-gallon drums or other suitable containers, characterized according to Permit Attachment C, and managed appropriately.

A.7.5 CAMU Less-Than-90-Day Accumulation Area

Hazardous waste managed at the CAMU includes leachate generated from the LCRS and personal protective equipment (PPE) waste generated during the management and sampling of leachate. Hazardous constituents may include, but are not limited to, organic compounds, semivolatile organic compounds, and toxic and heavy metals. The leachate may also be contaminated with low levels of PCBs and tritium. The U.S. EPA Hazardous Waste Number for leachate is F039. Containers of hazardous waste managed within the CAMU less-than-90-day waste accumulation area shall be managed in accordance with applicable regulations in 20 NMAC 4.1.300, incorporating 40 CFR Part 262.34(a).

The less-than-90-day waste accumulation area consists of a rectangular area covered with aggregate. Containerized leachate shall be accumulated in 55-gallon drums or other suitable containers on spill containment pallets to prevent the accidental discharge of leachate to the ground surface. The containers shall be staged in a manner that maintains sufficient aisle space to allow the unobstructed movement of personnel and equipment to any portion of the less-than-90-day waste accumulation area. No more than 100 containers of leachate shall be accumulated in the area at any given time.

A.7.6 Description of the CAMU Containment Cell

The CAMU containment cell consists of an engineered liner and final cover systems that are designed to minimize the migration of hazardous waste and constituents into the environment. In addition to the cell liner and final cover systems, the containment cell incorporates a vadose zone monitoring system (VZMS) and a leachate collection and removal system (LCRS). Details of the CAMU containment cell size plan, liner details and associated features are presented in Figures 33, 34, and 35 of Permit Attachment L (*Figures*).

The CAMU containment cell contains approximately 31,800 cubic yards of remediation wastes that were generated as part of corrective action activities at the chemical waste landfill (CWL), a hazardous waste landfill located adjacent to the CAMU.

A.7.6.1 Containment Cell Liner System

The containment cell liner system includes bottom liner and sidewall liner components.

A.7.6.2 Bottom Liner Components

The bottom liner components include the following in descending order:

1. Leachate Collection and Removal System
2. Geomembrane liner
3. Geosynthetic clay liner

Each of these bottom liner components is discussed in detail as follows.

A.7.6.3 The Leachate Collection and Removal System

The leachate collection and removal system **(LCRS)** is designed to collect and withdraw leachate from the cell. The LCRS includes a lined sump in the north end of the containment cell, a collection pipe in a central trench located above the geomembrane liner, a pump that removes leachate that collects in the sump, and a geocomposite drainage layer.

The central trench traverses the bottom of the containment cell from the south to the north and is sloped approximately 1 percent toward the north. The bottom of the containment cell is sloped approximately 2 percent to drain toward the central trench. The trench receives leachate from the geocomposite drainage layer. The collection pipe in the bottom of the trench is constructed of slotted 4-inch-diameter polyvinyl chloride (PVC) pipe and provides access for a portable pump to the LCRS sump. The pump delivers leachate to 55-gallon drums or other suitable containers. Additional details of the leachate collection process and system inspection/maintenance/repair are presented in Sections E.9 and H.4.3 of Permit Attachments E and H.

A.7.6.4 Geomembrane Liner

A 60-mil high-density polyethylene (HDPE) geomembrane liner lies across the entire containment cell and below the LCRS and acts as the initial barrier to minimize leachate migration from the CAMU. A second 60-mil HDPE liner is located in the LCRS sump area to provide redundant protection in this area.

A.7.6.5 Geosynthetic Clay Liner

A Geosynthetic clay liner (GCL) underlies the geomembrane and functions as a leachate barrier layer in the event that the overlying HDPE geomembrane fails. The GCL is located directly above the prepared wicking materials in the bottom of the cell and over the prepared side slopes. The GCL consists of non-woven, geotextile with its outer layers needle-punched through an inner layer of low-permeability sodium bentonite.

A.7.6.6 Sidewall Liner Components

The sidewall liner components include the following in descending order:

1. Protective cover sheet
2. Geomembrane
3. GCL

4. Prepared subgrade

A.7.6.7 Protective Cover Sheet

A 60-mil HDPE cover sheet lies above the LCRS trench on the north and south side slopes of the cell. The protective cover sheet is field-welded to the geomembrane liner at the edges of the LCRS trench.

A.7.6.8 Geomembrane

A 60-mil HDPE geomembrane liner comprises the uppermost layer on the sidewalls of the cell. The geomembrane provides the initial barrier to minimize leachate migration from the CAMU.

A.7.6.9 GCL

The sidewall liner GCL is identical to the bottom liner GCL described in Section A.7.8.5 of this Permit Attachment.

A.7.6.10 Prepared Subgrade

The prepared subgrade lies below and in direct contact with the GCL. The base below the subgrade was compacted and was constructed to be free of roots, debris, large voids, and rocks greater than 0.5 inch in diameter.

A.7.6.11 Final Cover System

The final cover system design incorporates a capillary barrier and vegetative cover. A HDPE liner is positioned at the base of the final cover system. In addition to the vegetative cover component, engineering controls will be applied to minimize erosion of the final cover. These include slope, surface-water runoff, and perimeter surface-water flow control. The crown of the final cover slopes to the north, south, east, and west at a 3-percent grade. Transition slopes range from 8:1 to 4:1. This design facilitates low-profile mounding and gentle slopes that enhance resistance to erosion caused by wind and precipitation. A plan-view drawing of the completed containment cell showing the final cover configuration and associated perimeter drainage pathways is presented on Figure 36 in Permit Attachment L (*Figures)*.

The final cover system components, as shown on Figure 37 of Permit Attachment L (*Figures*), include the following in descending order:

1. Topsoil and native soil blend
2. Filter sand and pea gravel
3. Bedding sand and HDPE liner

A.7.6.12 Topsoil and Native Soil Blend Layers

The purpose of the topsoil and native soil blend layers is to provide a growing media for the vegetative cover, which consists of native plants. This enhances evapotranspiration and reduces infiltration. The 6-inch-thick topsoil layer is comprised of existing surface soil stripped from the containment cell area during CAMU construction, other surface soil from the Facility, and

surface soil from off-site locations with properties similar to the soil in the vicinity of the CAMU. The uppermost portion of the topsoil layer contains a 1-inch-thick gravel mulch layer used to armor the cover surface and reduce the effects of erosion.

The 36-inch-thick native soil blend layer underlies the topsoil layer and was constructed to be free of organic matter, rubble, trash, and deleterious substances. The topsoil layer provides a suitable root bed for the vegetative cover while the underlying native soil blend layer allows for more moisture storage and facilitates further root penetration.

A.7.6.13 Filter Sand/Pea Gravel Layers

A capillary barrier, comprised of a 4-inch-thick filter sand layer and a 6-inch-thick pea gravel layer, lies beneath the native soil blend. The sand layer beneath the native soil blend promotes lateral movement of percolating water and reduces the migration of fines from the native soil blend into the underlying pea gravel layer.

A.7.6.14 Bedding Sand Layer and HDPE Liner

An 8-inch-thick bedding sand layer underlies the pea gravel layer and provides protection to the underlying HDPE liner. The HDPE liner is included in the final cover design as an additional measure of protection. The flexible HDPE membrane liner consists of a 60-mil-thick, textured HDPE produced from specially formulated polyethylene resin. The HDPE liner lies over the waste material, buttress soil, and extended slope, and is keyed into an anchor trench along the perimeter of the containment cell.

A.7.6.15 Vadose Zone Monitoring System (VZMS)

The VZMS is designed to provide real-time information on containment cell performance with respect to early detection of any leaks from the containment cell.

The VZMS consists of the following three subsystems:

1. The Primary Subliner (PSL) Monitoring Subsystem
2. The Vertical Sensor Array (VSA) Monitoring Subsystem
3. The CWL and Sanitary Sewer Line (CSS) Monitoring Subsystem

The three subsystems, shown on Figures 38 and 39 of Permit Attachment L (*Figures*), are used in an integrated fashion to detect any leakage from the containment cell, and to provide information that can be used to distinguish false detections caused by leakage from the sanitary sewer line or constituent migration from the CWL.

A.7.6.16 Primary Subliner Monitoring Subsystem

The Primary Subliner (PSL) Monitoring Subsystem is the primary monitoring subsystem of the VZMS and is designed to provide early leak-detection capability. It consists of five parallel-trending, sub-horizontal, vitrified clay pipes (VCPs) located 5 feet below the containment cell bottom liner, with horizontal spacing of 17 to 27 feet (see Figures 38 and 39 in Permit Attachment L (*Figures*)). A PVC access tube is connected to the ends of each VCP to facilitate

the deployment of a neutron probe for moisture monitoring. The neutron probe is manually moved through the VCP during monitoring events. Figure 40 of Permit Attachment L (*Figures*) presents a cross-sectional view of the PSL monitoring subsystem components.

A.7.6.17 VSA Monitoring Subsystem

The VSA Monitoring Subsystem will be used to monitor both lateral and vertical soil gradient information on *in situ* soil moisture, temperature, and soil gas, as required (see Table H-1 of Permit Attachment H). It consists of 11 vertical boreholes located below the containment cell, including one beneath the LCRS sump (see Figure 38 and Figure 39 in Permit Attachment L (*Figures*)). Each borehole contains a sampling point at 5 and 15 feet below the containment cell liner, as well as the following three components: a time-domain reflectometry soil-moisture content probe, a temperature sensor, and an active soil-gas sampler. Instrumentation cabling and tubing is ducted to the surface outside of the containment cell liner perimeter. Figure 41 of Permit Attachment L (*Figures*) presents a cross-sectional view of the VSA Monitoring Subsystem components.

A.7.6.18 Chemical Waste Landfill and Sanitary Sewer Line Monitoring Subsystem

The Chemical Waste Landfill and Sanitary Sewer Line (CSS) Monitoring Subsystem is designed to detect and identify leakage of moisture and hazardous constituents from the sanitary sewer line should such leakage occur, as well as volatile organic compounds that could potentially migrate from the CWL toward the containment cell. The CSS subsystem consists of six vertical, 20-foot-deep boreholes, spaced approximately 100 feet apart in a line parallel to the sanitary sewer line (see Figures 38 and 39 in Permit Attachment L (*Figures*)). Each borehole is equipped with a well screen suitable for soil gas sampling or for deployment of a neutron probe for soil moisture monitoring. Figure 42 of Permit Attachment L (*Figures*) presents a cross-sectional view of the CSS monitoring subsystem components.

PERMIT ATTACHMENT B AUTHORIZED WASTES

B.1 INTRODUCTION

This Permit Attachment authorizes the types and quantities of wastes that the Permittees are allowed to manage, treat and/or store at the Permitted Units.

B.2 AUTHORIZED WASTES FOR THE THERMAL TREATMENT UNIT

Table B-1 below lists the wastes that the Permittees are authorized to manage and treat at the Thermal Treatment Unit (TTU) by open burning. Additional treatment requirements are presented in Permit Part 5. The maximum annual quantity of waste treated at the TTU is limited to 9,500 pounds.

TABLE B-1
Types of Hazardous Wastes Allowed for Treatment at the TTU

Solid or Hazardous Waste	EPA Hazardous Waste Number	Process Code[a]
Acetone	F003	X01
Acetonitrile	D001	X01
Nitric acid	D002	X01
Silver nitrate	D001, D011	X01
SASN	D001, D003, D011	X01
PETN	D003	X01

a X01 – open burning/open detonation

B.3 AUTHORIZED WASTES FOR TREATMENT AND/OR STORAGE AT THE HAZARDOUS WASTE HANDLING UNIT, THE RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT, THE AUXILIARY HOT CELL UNIT, AND THE MANZANO STORAGE BUNKERS

Table B-2 below lists the wastes, process codes, and estimated annual quantities that the Permittees are authorized to manage, treat and/or store at the Hazardous Waste Handling Unit (HWHU), the Radioactive and Mixed Waste Management Unit (RMWMU), the Auxiliary Hot Cell Unit (AHCU), and the five Manzano Storage Bunkers (MSB). Additional storage and treatment requirements are presented in Permit Parts 3 and 4. Waste listed in Table B-2 that must be treated using a technology specified in the table of 40 C.F.R. §

If the amount of any waste code handled (i.e., managed, treated, or stored) in a calendar year exceeds the amount listed for that waste code in this Permit Attachment (B), the Permittees shall submit a report explaining the situation to the Department and, if the increase in annual quantity is expected to be repeated, shall submit a revised Part A application by April 1 of the following year and shall request a permit modification to revise this Permit Attachment to update the estimated annual quantity for the waste code.

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
1	P001	S01	100
2	P002	S01	100
3	P003	S01	100
4	P004	S01	100
5	P005	S01	100
6	P006	S01	100
7	P007	S01	100
8	P008	S01	100
9	P009	S01	100
10	P010	S01	100
11	P011	S01	100
12	P012	S01	100
13	P013	S01	100
14	P014	S01	100
15	P015	S01	100
16	P016	S01	100
17	P017	S01	100
18	P018	S01	100
19	P020	S01	100
20	P021	S01	100
21	P022	S01	100
22	P023	S01	100
23	P024	S01	100
24	P026	S01	100
25	P027	S01	100
26	P028	S01	100
27	P029	S01	100
28	P030	S01	100
29	P031	S01	100
30	P033	S01	100
31	PO34	S01	100
32	P036	S01	100
33	P037	S01	100
34	P038	S01	100
35	P039	S01	100
36	P040	S01	100
37	P041	S01	100
38	P042	S01	100
39	P043	S01	100
40	P044	S01	100
41	P045	S01	100
42	P046	S01	100
43	P047	S01	100
44	P048	S01	100
45	P049	S01	100
46	P050	S01	100
47	P051	S01	100
48	P054	S01	100
49	P056	S01	100

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
50	P057	S01	100
51	P058	S01	100
52	P059	S01	100
53	P060	S01	100
54	P062	S01	100
55	P063	S01	100
56	P064	S01	100
57	P065	S01	100
58	P066	S01	100
59	P067	S01	100
60	P068	S01	100
61	P069	S01	100
62	P070	S01	100
63	P071	S01	100
64	P072	S01	100
65	P073	S01	100
66	P074	S01	100
67	P075	S01	100
68	P076	S01	100
69	P077	S01	100
70	P078	S01	100
71	P081	S01	100
72	P082	S01	100
73	P084	S01	100
74	P085	S01	100
75	P087	S01	100
76	P088	S01	100
77	P089	S01	100
78	P092	S01	100
79	P093	S01	100
80	P094	S01	100
81	P095	S01	100
82	P096	S01	100
83	P097	S01	100
84	P098	S01, T04 - Chemical deactivation	150
85	P099	S01	100
86	P101	S01	100
87	P102	S01	100
88	P103	S01	100
89	P104	S01	100
90	P105	S01	100
91	P106	S01	100
92	P108	S01	100
93	P109	S01	100
94	P110	S01	100
95	P111	S01	100
96	P112	S01	100
97	P113	S01	150

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
98	P114	S01	100
99	P115	S01	100
100	P116	S01	100
101	P118	S01	100
102	P119	S01	100
103	P120	S01	100
104	P121	S01	100
105	P122	S01	100
106	P123	S01	100
107	P127	S01	100
108	P128	S01	100
109	P185	S01	100
110	P188	S01	100
111	P189	S01	100
112	P190	S01	100
113	P191	S01	100
114	P192	S01	100
115	P194	S01	100
116	P196	S01	100
117	P197	S01	100
118	P198	S01	100
119	P199	S01	100
120	P201	S01	100
121	P202	S01	100
122	P203	S01	100
123	P204	S01	100
124	P205	S01	100
125	U001	S01	100
126	U002	S01	500
127	U003	S01	500
128	U004	S01	100
129	U005	S01	100
130	U006	S01	100
131	U007	S01	100
132	U008	S01	100
133	U009	S01	100
134	U010	S01	100
135	U011	S01	100
136	U012	S01	100
137	U014	S01	100
138	U015	S01	100
139	U016	S01	100
140	U017	S01	100
141	U018	S01	100
142	U019	S01	100
143	U020	S01	100
144	U021	S01	100
145	U022	S01	100
146	U023	S01	100

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
147	U024	S01	100
148	U025	S01	100
149	U026	S01	100
150	U027	S01	100
151	U028	S01	5,000
152	U029	S01	100
153	U030	S01	100
154	U031	S01	500
155	U032	S01	100
156	U033	S01	100
157	U034	S01	100
158	U035	S01	100
159	U036	S01	100
160	U037	S01	500
161	U038	S01	100
162	U039	S01	100
163	U041	S01	100
164	U042	S01	100
165	U043	S01	100
166	U044	S01	1,000
167	U045	S01	100
168	U046	S01	100
169	U047	S01	100
170	U048	S01	100
171	U049	S01	100
172	U050	S01	100
173	U051	S01	100
174	U052	S01	100
175	U053	S01	100
176	U055	S01	100
177	U056	S01	500
178	U057	S01	500
179	U058	S01	100
180	U059	S01	100
181	U060	S01	100
182	U061	S01	2,000
183	U062	S01	100
184	U063	S01	100
185	U064	S01	100
186	U066	S01	100
187	U067	S01	100
188	U068	S01	100
189	U069	S01	100
190	U070	S01	500
191	U071	S01	100
192	U072	S01	100
193	U073	S01	100
194	U074	S01	100

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
195	U075	S01, T04 – Physical treatment	150
196	U076	S01	100
197	U077	S01	100
198	U078	S01	100
199	U079	S01	100
200	U080	S01	500
201	U081	S01	100
202	U082	S01	100
203	U083	S01	100
204	U084	S01	100
205	U085	S01	100
206	U086	S01	100
207	U087	S01	100
208	U088	S01	100
209	U089	S01	100
210	U090	S01	100
211	U091	S01	100
212	U092	S01	100
213	U093	S01	100
214	U094	S01	100
215	U095	S01	100
216	U096	S01	100
217	U097	S01	100
218	U098	S01	100
219	U099	S01	100
220	U101	S01	100
221	U102	S01, T04 – Stabilization/solidification	100
222	U103	S01	100
223	U105	S01, T04 - Physical treatment	100
224	U106	S01	100
225	U107	S01, T04 – Stabilization/solidification	100
226	U108	S01	100
227	U109	S01	100
228	U110	S01	100
229	U111	S01	100
230	U112	S01	500
231	U113	S01	100
232	U114	S01	100
233	U115	S01	100
234	U116	S01	100
235	U117	S01	500
236	U118	S01	100
237	U119	S01	100
238	U120	S01	100

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
239	U121	S01	100
240	U122	S01	100
241	U123	S01	100
242	U124	S01	100
243	U125	S01	150
244	U126	S01	100
245	U127	S01	100
246	U128	S01	100
247	U129	S01	100
248	U130	S01	100
249	U131	S01	100
250	U132	S01	100
251	U133	S01	500
252	U134	S01	150
253	U135	S01	100
254	U136	S01	100
255	U137	S01	100
256	U138	S01	100
257	U140	S01	500
258	U141	S01	100
259	U142	S01	100
260	U143	S01	100
261	U144	S01	150
262	U145	S01	100
263	U146	S01	100
264	U147	S01	100
265	U148	S01	100
266	U149	S01	100
267	U150	S01	100
268	U151	S01, T04 - Amalgamation, physical treatment	5,000
269	U152	S01	100
270	U153	S01	100
271	U154	S01	500
272	U155	S01	100
273	U156	S01	100
274	U157	S01	100
275	U158	S01	100
276	U159	S01	500
277	U160	S01	100
278	U161	S01	500
279	U162	S01	100
280	U163	S01	100
281	U164	S01	100
282	U165	S01	100
283	U166	S01	100
284	U167	S01	100
285	U168	S01	100
286	U169	S01	100

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
287	U170	S01	100
288	U171	S01	100
289	U172	S01	100
290	U173	S01	100
291	U174	S01	100
292	U176	S01	100
293	U177	S01	100
294	U178	S01	100
295	U179	S01	100
296	U180	S01	100
297	U181	S01	100
298	U182	S01	100
299	U183	S01	100
300	U184	S01	100
301	U185	S01	100
302	U186	S01	100
303	U187	S01	100
304	U188	S01	100
305	U189	S01	100
306	U190	S01	100
307	U191	S01	100
308	U192	S01	100
309	U193	S01	100
310	U194	S01	100
311	U196	S01	100
312	U197	S01	100
313	U200	S01	100
314	U201	S01	100
315	U202	S01	100
316	U203	S01	100
317	U204	S01	100
318	U205	S01	100
319	U206	S01	100
320	U207	S01	100
321	U208	S01	100
322	U209	S01	100
323	U210	S01	500
324	U211	S01	500
325	U213	S01	150
326	U214	S01	100
327	U215	S01	100
328	U216	S01	100
329	U217	S01	100
330	U218	S01	100
331	U219	S01	100
332	U220	S01	500
333	U221	S01	100
334	U222	S01	100
335	U223	S01	150

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
336	U225	S01	100
337	U226	S01	500
338	U227	S01	100
339	U228	S01	500
340	U234	S01, T04 - Physical treatment	100
341	U235	S01	100
342	U236	S01	100
343	U237	S01	100
344	U238	S01	100
345	U239	S01	500
346	U240	S01	100
347	U243	S01	100
348	U244	S01	100
349	U246	S01	100
350	U247	S01	100
351	U248	S01	100
352	U249	S01	100
353	U271	S01	100
354	U278	S01	100
355	U279	S01	100
356	U280	S01	100
357	U328	S01	100
358	U353	S01	100
359	U359	S01	100
360	U364	S01	100
361	U367	S01	100
362	U372	S01	100
363	U373	S01	100
364	U387	S01	100
365	U389	S01	100
366	U394	S01	100
367	U395	S01	100
368	U404	S01	100
369	U409	S01	100
370	U410	S01	100
371	U411	S01	100
372	F001	S01, T04 – Macro-encapsulation, physical treatment	200,000
373	F002	S01, T04 – Macro-encapsulation, physical treatment	250,000
374	F003	S01, T04 - Macro-encapsulation, physical treatment	275,000
375	F004	S01, T04 – Macro-encapsulation, physical treatment	7,500

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
376	F005	S01, T04, – Macro-encapsulation, physical treatment	275,000
377	F006	S01	2,000
378	F007	S01	2,000
379	F008	S01	2,000
380	F009	S01	100
381	F010	S01	100
382	F011	S01	100
383	F012	S01	100
384	F027	S01	100
385	F039	S01	50,000
386	D001	S01, T04 - Thermal deactivation, chemical deactivation, physical treatment	75,000
387	D002	S01, T04 - Chemical deactivation, physical treatment	75,000
388	D003	S01, T04 - Thermal deactivation, chemical deactivation, physical treatment	100,000
389	D004	S01, T04 Stabilization/solidification, macroencapsulation, physical treatment	100,000
390	D005	S01, T04 - Chemical deactivation, stabilization/solidification, macroencapsulation, physical treatment	100,000
391	D006	S01, T04 – Stabilization/solidification, macroencapsulation, physical treatment	100,000
392	D007	S01, T04 Stabilization/solidification, macroencapsulation, physical treatment	200,000
393	D008	S01, T04 – Stabilization/solidification, macroencapsulation, physical treatment	250,000
394	D009	S01, T04 Stabilization/solidification, macroencapsulation, amalgamation, physical treatment	100,000

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
395	D010	S01, T04 Stabilization/solidification, macroencapsulation, physical treatment	50,000
396	D011	S01, T04 Stabilization/solidification, macroencapsulation, physical treatment	100,000
397	D012	S01	100
398	D013	S01	100
399	D014	S01	100
400	D015	S01	100
401	D016	S01	100
402	D017	S01	100
403	D018	S01, T04 - Physical treatment, macro-encapsulation	5,000
404	D019	S01, T04 - Physical treatment, macro-encapsulation	2,000
405	D020	S01, T04 - Physical treatment, macro-encapsulation	2,000
406	D021	S01, T04 - Physical treatment, macro-encapsulation	2,000
407	D022	S01, T04 - Physical treatment, macro-encapsulation	5,000
408	D023	S01, T04 - Physical treatment, macro-encapsulation	2,000
409	D024	S01, T04 Physical treatment, macro-encapsulation	2,000
410	D025	S01, T04 Physical treatment, macro-encapsulation	2,000
411	D026	S01, T04 Physical treatment, macro-encapsulation	2,000
412	D027	S01, T04 Physical treatment, macro-encapsulation	5,000
413	D028	S01, T04 Physical treatment, macro-encapsulation	5,000
414	D029	S01, T04 Physical treatment, macro-encapsulation	2,000

TABLE B-2
Types of Hazardous and Mixed Wastes Authorized for Treatment and/or Storage at the HWHU, RMWMU, AHCU, and the MSB

Line Number	EPA Hazardous Waste No.	Process Code[a]	Annual Quantity of Wastes (kg)
415	D030	S01, T04 Physical treatment, macro-encapsulation	2,000
416	D031	S01, T04 Physical treatment, macro-encapsulation	2,000
417	D032	S01, T04 Physical treatment, macro-encapsulation	15,000
418	D033	S01, T04 Physical treatment, macro-encapsulation	5,000
419	D034	S01, T04 Physical treatment, macro-encapsulation	5,000
420	D035	S01, T04 Physical treatment, macro-encapsulation	5,000
421	D036	S01, T04 Physical treatment, macro-encapsulation	5,000
422	D037	S01, T04 Physical treatment, macro-encapsulation	2,000
423	D038	S01, T04 Physical treatment, macro-encapsulation	5,000
424	D039	S01, T04 Physical treatment, macro-encapsulation	15,000
425	D040	S01, T04 Physical treatment, macro-encapsulation	25,000
426	D041	S01, T04 Physical treatment, macro-encapsulation	2,000
427	D042	S01, T04 Physical treatment, macro-encapsulation	5,000
428	D043	S01, T04 Physical treatment, macro-encapsulation	5,000

a. S01 – storage in containers
T04 – other treatment, method indicated

NOTE 1 (applicable to Lines 1-428): Waste types and volumes are highly variable due to the large number of one-time activities and the nature of the research and development activities at the Facility. For clarity, each waste number is listed only once. Individual wastes may have more than one number.

NOTE 2 (applicable to lines 1-428): The estimated annual quantity of waste with a particular waste number includes the full quantity of each waste with that number, even if the waste also has other applicable numbers. For example, 10 kg of waste F001 F002 and 10 kg of waste F002 would be listed on this form as 10 kg of F001 and 20 kg of F002.

NOTE 3 (applicable to lines 1-428): The treatment methods listed for each hazardous waste number are the methods that are appropriate for that waste number. Wastes with multiple numbers may undergo one or more types of treatment at the Permitted Units for some or all of the characteristics and/or constituents. For example, wastes containing explosives and metals (e.g., barium, chromium, and lead) with numbers D001, D003, D005, D007, and D008 are treated on site to deactivate the explosive and render them non-ignitable. The quantities of these wastes are included in the quantities shown for D001, D003, D005, D007, and D008. Thermal deactivation is listed as a process for D001 and D003 because on-site treatment at the RMWMU and AHCU addresses these hazardous waste constituents and characteristics. Thermal deactivation is not listed as a process for D005, D007, or D008 because these hazardous waste constituents and characteristics are not treated when the waste is subjected to thermal deactivation.

PERMIT ATTACHMENT C WASTE ANALYSIS PLAN

C.1 INTRODUCTION

This waste analysis plan (WAP) contains requirements and procedures for the characterization of the chemical and physical nature of hazardous and mixed wastes generated, stored or treated at the Permitted Units. These include the Hazardous Waste Handling Unit, the Thermal Treatment Unit, the Radioactive and Mixed Waste Management Unit, the Auxiliary Hot Cell Unit, and the Manzano Storage Bunkers, and the Corrective Action Management Unit (CAMU), which are described in Permit Attachment A (*Facility Description*).

C.2 WASTE TYPES GENERATED AT THE FACILITY

Table C-1 summarizes general information on hazardous and mixed waste types generated at the Facility. The following sections contain general descriptions of the waste types, the major associated waste-generating processes and/or activities, and the general waste forms associated with each type. For the purposes of this WAP, a waste type is a general category used to describe one or more wastes that share key features (e.g., type of waste-generating process, waste form, basis for general characterization).

Hazardous and mixed waste types may be of uniform composition (i.e., homogeneous) or of dissimilar and diverse composition (i.e., heterogeneous). Table C-1 includes brief waste type descriptions, the associated waste-generating process or activity, and the characterization basis for hazardous and mixed waste designation. Table C-1 also addresses the variability of each waste type by listing the potential EPA Hazardous Waste Numbers and potential hazardous and mixed waste constituents and/or characteristics associated with each waste type. Each type of waste may include one or more wastes.

TABLE C-1
Types of Wastes Generated at the Facility

Waste Type Description	Principal Waste Generating Activities	Basis for Hazardous or Mixed Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics in the Waste
Laboratory Chemical Waste	Weapon systems and components design, development, fabrication, and testing and material research	Acceptable Knowledge and Sampling and Analysis, as appropriate	D001 D002 D003 D004-D043 All P- and U- EPA Hazardous Waste Numbers	Ignitability Corrosivity Reactivity Toxicity Discarded commercial chemical products and off-specification species
Contaminated Used Oil	Weapon systems and components design, development, fabrication, and testing, material research, pulsed-power research, reactor safety research, and off-site generated waste	Acceptable Knowledge and Sampling and Analysis, as appropriate, Fingerprint Analysis[a]	D001 D002 D003 D004-D043 F001-F005	Ignitability Corrosivity Reactivity Toxicity Spent solvents
Process Wastes	Weapon systems and components design, development, fabrication, and testing, material research, ER Project activities, and off-site generated waste	Acceptable Knowledge and Sampling and Analysis, as appropriate, Fingerprint Analysis	D001 D002 D003 D004-D043 F001-F005	Ignitability Corrosivity Reactivity Toxicity Spent solvents
Explosive Waste	Weapon systems and components design, development, fabrication, and testing	Acceptable Knowledge and Sampling and Analysis, as appropriate	D001 D002 D003 D004-D011 F001-F005	Ignitability Corrosivity Reactivity Toxicity Spent solvents
Batteries	Weapon systems and components design, development, and testing	Acceptable Knowledge and Sampling and Analysis, as appropriate	D001 D002 D003	Ignitability Corrosivity Reactivity

TABLE C-1
Types of Wastes Generated at the Facility

Waste Type Description	Principal Waste Generating Activities	Basis for Hazardous or Mixed Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics in the Waste
			D005 D006 D007 D008 D009 D011	Barium Cadmium Chromium Lead Mercury Silver
Elemental Lead	Pulsed-power research, reactor safety research, ER[b] Project and D&D[c] activities, and off-site generated waste	Acceptable Knowledge and Sampling and Analysis, as appropriate Fingerprint Analysis	D008	Lead
Unknown Liquids and Solids	Legacy wastes from historical weapons system design, development and testing, materials research, ER Project, and D&D activities	Acceptable Knowledge and Sampling and Analysis, as appropriate.	D001 D002 D003 D004-D043	Ignitability Corrosivity Reactivity Toxicity
Contaminated Soil	ER Project and D&D activities	Acceptable Knowledge and Sampling and Analysis, as appropriate Fingerprint Analysis	D001 D003 D004-D043 F001-F005 F039	Ignitability Reactivity Toxicity Spent solvents Leachate
Debris	Weapon systems and components design, development, and testing, material research, pulsed-power research, reactor safety research, support activities, ER Project and D&D activities	Acceptable Knowledge and Sampling and Analysis, as needed Fingerprint Analysis	D001 D003 D004-D043 F001-F005 F039	Ignitability Reactivity Toxicity Spent solvents Leachate
Leachate and Decontaminati on, Purge, and	ER Project, post-closure care, and D&D activities	Acceptable Knowledge and Sampling and Analysis, as appropriate	D002 D004-D043	Corrosivity Toxicity

TABLE C-1
Types of Wastes Generated at the Facility

Waste Type Description	Principal Waste Generating Activities	Basis for Hazardous or Mixed Waste Designation	Potential EPA Hazardous Waste Numbers	Potential Hazardous Waste Constituents and/or Characteristics in the Waste
Treatment Waters			F001-F005 F039	Spent solvents CAMU Leachate
Treated Waste and Treatment Residues	Support activities (radiation protection and waste management)	Acceptable Knowledge and Sampling and Analysis, as needed	D001 D002 D003 D004-D043 F001-F005	Ignitability Corrosivity Reactivity Toxicity Spent -solvents
Containment System Liquids	Support activities (waste management)	Acceptable Knowledge and Sampling and Analysis, as needed	D001 D002 D003 D004-D043 F001-F005	Ignitability Corrosivity Reactivity Toxicity Spent solvents

a "Fingerprint analysis" refers to checks and field methods designed to quickly identify chemical properties (e.g., pH, density, chlorine content, etc). Laboratory analysis may be required to fully and properly characterize a waste.
b ER = Environmental Restoration
c D&D =Decontamination and Decommissioning

C.2.1 Laboratory Chemical Waste

Laboratory chemical waste includes used commercial chemical products or manufacturing chemical intermediates (in solid, liquid, or contained gas forms) declared to be waste, such as reagents, metal powders, oxidizers, reactive metals, elemental mercury, elemental sodium, spent or discarded solvents and other materials. Material Safety Data Sheets (MSDSs) or other product documentation may be available for these wastes. The Permittees initial generators generally produce this type of waste during various research, development and testing operations. Some of these laboratory chemical wastes also exhibit the hazardous waste characteristics of ignitability, corrosivity, reactivity, and/or toxicity.

C.2.2 Contaminated Used Oil

Used oils from vacuum pumps and other machinery may be contaminated with listed hazardous and mixed wastes or may exhibit hazardous waste characteristics of ignitability or toxicity. Specific constituents depend on the processes that generated the contaminated used oil.

C.2.3 Process Wastes

Process wastes, which can be liquid or solid chemicals, solutions, mixtures, waste waters, or manufactured items, are generated as a result of various activities, including experiments and routine operational processes. Typical process hazardous and mixed wastes include, but are not limited to, acidic solutions, alkaline solutions, oxidizers, and wastewaters. These wastes exhibit hazardous waste characteristics (e.g., ignitability, corrosivity, reactivity, toxicity) or are listed waste from nonspecific sources (e.g., spent solvents).

C.2.4 Explosive (Reactive) Waste

An explosive material is defined as a chemical compound or mixture containing any oxidizing and combustible substances, or other ingredients in such proportions, quantities, or packing that ignition by fire, friction, concussion, percussion or detonation of any part thereof causes decomposition with the production of a considerable quantity of heat and gas. Explosive wastes and explosive-contaminated wastes exhibit the hazardous waste characteristic of reactivity if they are capable of detonation or explosive reaction when subjected to a strong initiating source or if heated under confinement. Examples of explosive (reactive) wastes include components and test units that contain an explosive or explosive fragments, powders, and residues. Some of these wastes also exhibit hazardous waste characteristics of ignitability and/or toxicity and may contain spent solvents.

Explosive wastes and explosive-contaminated wastes are generated at the Facility primarily from research and development, fabrication, testing, and Environmental Restoration (ER) Project activities. Explosive waste generally consists of discrete pieces of a solid explosive substance, whereas explosive-contaminated waste typically consists of solid or liquid wastes that have been contaminated with an explosive substance. A specific type of explosive waste is managed at the TTU and is described in greater detail below in Section C.3.4.1.

C.2.5 Batteries

Batteries, in solid or liquid form, or both, are used in numerous Facility activities, and waste batteries may exhibit the hazardous waste characteristics of reactivity, corrosivity, or toxicity (due to the presence of metals such as cadmium, mercury, and lead). Information about the battery content, hazards, and EPA Hazardous Waste Numbers is determined using manufacturer's data. For example, thermal batteries (specialized single-use batteries) contain metals and may exhibit the hazardous waste characteristics of reactivity and toxicity. Lithium batteries exhibit the characteristic of reactivity, while mercury batteries, silver batteries, and nickel-cadmium batteries exhibit the characteristic of toxicity.

C.2.6 Elemental Lead

Elemental lead items that cannot be reused (e.g., for radiation shielding or containment) or are in a form that is unsuitable for recycling may be declared waste. These wastes exhibit the hazardous waste characteristic of toxicity.

C.2.7 Unknown Liquids and Solids

Unknown liquids and solids consist largely of legacy wastes from historical weapons systems design, development and testing, material research, ER Project, and Decontamination and Decommissioning (D&D) activities. Typical unknown hazardous and mixed wastes include, but are not limited to, unlabeled laboratory chemicals, residues in equipment and containers, and solid items that are smaller than debris (as defined in 40 CFR § 268.2). These wastes exhibit the hazardous waste characteristics of ignitability, corrosivity, reactivity, and/or toxicity.

C.2.8 Contaminated Soil

This waste type includes soil from ER Project activities, or other cleanup and excavation operations. Soil may be contaminated with or contain listed waste(s) or exhibit one or more hazardous waste characteristics (i.e., reactivity, ignitability, and/or toxicity).

C.2.9 Debris

This waste type includes waste generated during cleaning operations, D&D operations, ER Project activities, emergency response, waste management, and protection of personnel. These wastes are solid, usually heterogeneous, compactable and non-compactable materials that meet the regulatory definition of hazardous debris. Compactable materials include, but are not limited to, items such as personal protective equipment, rags, wipes, swipes, paper, and filters. Non-compactable materials include, but are not limited to equipment, components, electronic hardware, experimental remnants, cables, tools, machining parts, building materials, and glassware. Debris may be contaminated with or contain listed waste(s) or exhibit one or more hazardous waste characteristics (i.e., reactivity, corrosivity, ignitability, and/or toxicity).

C.2.10 Leachate and Decontamination, Purge, and Treatment Waters

This waste type includes CAMU leachate, and decontamination, purge, and treatment water (i.e., wastewater) from ER Project, D&D activities, and waste management. Decontamination, purge,

or treatment waters may be listed wastes (e.g., CAMU leachate); be contaminated with or contain listed waste(s); or may exhibit a hazardous waste characteristic (i.e., corrosivity and/or toxicity).

C.2.11 Treated Waste and Treatment Residues

Treated waste and treatment residues, which form secondary waste types (i.e., solids, liquids, or contained gases), are generated by treatment operations at Permitted Units. The wastes may be stored on-site at a Permitted Unit and in accordance with this Permit pending determination of success in meeting treatment goals, subsequent treatment, and/or transportation to appropriate off-site Treatment, Storage, and Disposal Facilities (TSDFs).

C.2.12 Containment System Liquids

This waste type includes liquids that accumulate in containment system structures (e.g., spill pallets, trenches, catch tank). Containment system liquids may be contaminated with or contain listed hazardous and mixed waste(s) or exhibit one or more hazardous waste characteristics (i.e., reactivity, corrosivity, ignitability, or toxicity).

C.3 WASTE CHARACTERIZATION PROCEDURES

The approach to waste characterization is based on process knowledge and sampling and analysis data, as appropriate. The following sections describe the characterization procedures that shall apply to hazardous and mixed wastes managed at the Permitted Units.

C.3.1 Waste Characterization Process

The Permittees shall, in accordance with this WAP and the requirements of this Permit, determine what characterization is required. Waste information is submitted using a disposal request (DR) or equivalent form. Waste Characterization shall include identifying physical form, accurately assigning EPA Hazardous Waste Numbers, determining treatment requirements for wastes to be treated at the Permitted Units, and obtaining all information needed for safely handling, storing, and transporting, or otherwise managing the waste.

Waste characterization information includes: the quantity, physical form of the waste (e.g., solid, liquid, gas, wastewater), origin (e.g., research and testing, ER Project, unused commercial chemical product, activity that generated the waste), waste characteristics (e.g., ignitability, corrosivity), hazardous constituents (including reactive or explosive constituents) that are contained in the waste, concentrations and proportions of constituents as needed, and other information as needed or applicable (e.g., materials in contact with the waste such as paper or plastic, and the presence of free liquids in containers).

The Permittees shall review the disposal request forms and associated documentation (e.g., waste process documentation, technical information about the waste, and analytical results) for adequacy, completeness, data reliability, and acceptability.

The Permittees shall consider each waste individually. Each waste is one of the general types listed in Table C-1 and described in Section C.2 of this Permit Attachment. The Permittees shall

use waste type identification in part to determine whether and what kind of additional information is needed to adequately and properly characterize waste. Types of additional information are discussed in Section C.2 of this Permit Attachment. If analytical data are needed to supplement the available information, they shall be obtained through sampling and analysis. A general summary of the characterization methods and parameters and the rationale for characterization are found in Table C-2 of this Permit Attachment.

If the Permittees determine that documentation is incomplete or inadequate for waste characterization, or find or suspect changes in the waste-generating process, they shall obtain the necessary information to properly complete waste characterization.

Using the waste characterization information, the Permittees shall make a hazardous waste determination in accordance with 40 CFR Part 262.11. Before accepting the waste at the appropriate Permitted Unit, the Permittees shall visually check to verify that the waste container(s) matches the information on the disposal request form. If the Permittees detect discrepancies between the shipping documentation and the waste at pickup, the Permittees shall amend the documentation with the correct information. Upon receipt of the waste at a Permitted Unit, the characterization documentation shall become part of the Operating Record. Data from additional waste characterization activities also shall be made part of the Operating Record.

C.3.2 Characterization of Unknown Wastes

Occasionally, wastes of an unknown nature are encountered. For example, unknown wastes may be generated as a result of a container label becoming detached or illegible. Most unknown wastes are contained in small containers (less than 1 gallon or 1 pound) and are related to research or testing projects. These wastes shall be managed on a case-by-case basis. The waste will be tentatively characterized by knowledge of the operations and activities that were performed in the specific area in which the waste was generated. An on-site visual investigation of an unknown waste is another method utilized to help tentatively characterize the waste. The visual investigation includes the assessment of the unknown waste for various properties, such as:

1. Physical state,
2. Color,
3. Age,
4. Storage and container conditions,
5. Changes in substance,
6. Phase separations,
7. Quantity of waste,
8. Any labeling, and
9. Type of operations in the nearby area.

The waste and its proper management shall be identified through this investigation, as appropriate. If identification is made, a disposal request shall be prepared and the waste shall be characterized as described above in Section C.3.1 of this Permit Attachment. If the unknown waste cannot be identified, a HazCat™ or comparable test shall be performed to determine the hazard class. Once the hazard class is determined and the waste is known to be safe to transport, the information shall be recorded on the disposal request form. Additional waste

characterization shall be conducted to whatever extent is necessary to ensure full, accurate, and proper characterization of the waste as described in Section C.3.1.

C.3.3 Characterization of Blended Wastes

Waste may be blended on a limited basis. Liquid hazardous or mixed wastes and non-hazardous wastes may be blended together in a single container. These blending activities shall be limited to compatible wastes, such as oils or process wastes. The Permittees may also combine compatible liquids drained from aerosol cans (e.g., commercial chemical products or characteristic liquids) into a single container.

The Permittees will document the following information for containers with blended wastes:

1. The approximate amounts of each waste type in the mixture;
2. List of hazardous waste characteristics, and underlying hazardous constituents (UHCs) as defined in 40 CFR 268.2(i) in each waste in the mixture; and
3. Whether the wastes in the mixture include listed hazardous wastes such as spent solvents.

The Permittees shall consider the above information when they characterize the waste using the process described in Section C.5 and shall assign the applicable EPA Hazardous Waste Numbers and determine proper management of the waste, including treatment and disposal. The Permittees shall not blend wastes in violation of 40 CFR § 268.3.

TABLE C-2
General Characterization Methods, Parameters, and Rationale

Waste Type Description	Characterization Method	Parameter	Rationale
Laboratory Chemical Waste	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class pH (for liquids) Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability, reactivity, and corrosivity characteristics Determine waste compatibility information Determine toxicity characteristic
Contaminated Used Oil	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Flash point Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability characteristic Determine waste compatibility information Determine toxicity characteristic
Process Wastes	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class pH (for liquids) Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability, corrosivity, and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic

TABLE C-2
General Characterization Methods, Parameters, and Rationale

Waste Type Description	Characterization Method	Parameter	Rationale
Explosive Waste	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic
Batteries	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids Flash point (for liquids), DOT hazard class (for solids) pH (for liquids) Stability, DOT hazard class Hazardous waste metals	Determine waste form Determine presence of free liquids Determine ignitability, corrosivity, and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic
Elemental Lead	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Hazardous waste metals	Determine waste form Determine toxicity characteristic
Unknown Liquids and Solids	Physical Examination, Acceptable Knowledge, and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class	Determine waste form Determine presence of free liquids Determine ignitability, reactivity, and corrosivity characteristics Determine waste compatibility information Determine toxicity characteristic

TABLE C-2
General Characterization Methods, Parameters, and Rationale

Waste Type Description	Characterization Method	Parameter	Rationale
		pH (for liquids) Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	
Contaminated Soil	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids DOT hazard class (for solids) Stability, DOT hazard class Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability, and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic
Debris	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Presence of liquids DOT hazard class (for solids) Stability, DOT hazard class Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability, and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic
Leachate and Decontamination Purge, and Treatment Waters	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Flash point pH	Determine whether waste meets listing criteria Determine waste form Determine ignitability, reactivity, and corrosivity characteristics Determine waste compatibility information

TABLE C-2
General Characterization Methods, Parameters, and Rationale

Waste Type Description	Characterization Method	Parameter	Rationale
		Stability, DOT hazard class Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine toxicity characteristic or constituent concentrations
Treated Waste and Treatment Residues	Acceptable Knowledge and Sampling and analysis, as appropriate	See Table C-3	See Table C-3
Containment System Liquids	Acceptable Knowledge and Sampling and Analysis, as appropriate	Source of waste Available information about waste composition Physical characteristics Flash point pH Hazardous waste metals Hazardous waste VOCs Hazardous waste SVOCs	Determine whether waste meets listing criteria Determine waste form Determine ignitability and corrosivity characteristics Determine waste compatibility information Determine toxicity characteristic

Note: The first three items in the parameter column for each waste type are mandatory and constitute the minimum acceptable knowledge. The remaining parameters are optional and will be selected for each waste type as necessary, if the results of the first three parameters indicate additional information is needed.

C.3.4 Characterization of Wastes Treated at the Permitted Units

Wastes treated at Permitted Units shall be characterized according to the process described in Sections C.3.4.1 through C.3.4.5 of this Permit Attachment. Treated wastes shall be characterized to determine one or more of the following, as appropriate, for each waste:

1. Applicable treatment standards, including standards for both characteristic and listed hazardous wastes in accordance with 40 CFR Part 268, Subpart D;
2. Appropriate treatment methods to meet the standards;
3. Underlying hazardous constituents (UHCs) and their appropriate treatment standards, if applicable;
4. Compliance with applicable treatment standards;
5. Suitability for treatment by one or more methods available on-site to meet treatment standards; and
6. Suitability for treatment by one or more methods available on-site to make the waste safer and more amenable to further management on-site or off-site.

These characterization criteria are summarized in Table C-3.

C.3.4.1 Characterization of Waste to be treated at the Thermal Treatment Unit

Reactive hazardous waste to be treated at the TTU shall be characterized through the use of process knowledge:

1. Explosive (e.g., SASN) and ignitable (e.g., acetone) components of the waste are known as a result of knowledge of process and a well-defined and documented procedure for formulating SASN. Variability occurs in the relative amounts of non-explosive liquid and solid items. Some variability occurs in the relative amounts of explosives (SASN and PETN),
2. The waste constituents shall be documented in the Operating Record for any given formulation of SASN. Prior to formulating the explosive slurry, the Permittees shall screen the formulation instructions to identify any changes. If the formulation has changed, the Permittees shall evaluate the constituents to determine if the wastes generated by producing the formulation are acceptable for treatment at the TTU. Properties evaluated shall include the weight of explosives in the waste, and the non-explosive constituents in the waste.

C.3.4.2 Characterization of Wastes to be treated at the RMWMU and AHCU

Wastes to be treated at the RMWMU and AHCU shall be characterized based on acceptable knowledge and supplemented by sampling and analysis, as appropriate, before treatment takes place. For wastes that will be treated to meet treatment standards in 40 CFR 268 Subpart D that include UHCs, characterization shall include any UHCs that are reasonably expected to be present.

C.3.4.3 Characterization of Treated Wastes and Treatment Residues

Treated wastes and treatment residues shall be characterized through knowledge of process and supplemented by sampling and analysis data, as appropriate, using the process described in Section C.3.1 of this Permit Attachment. Treated wastes and treatment residues shall be characterized to determine each of the following, as applicable, for each waste:

1. Whether the treatment effectively met the treatment-specific goals;
2. Whether the treated waste or residue meets the applicable treatment standards (including requirements and standards for UHCs if applicable) associated with the treatment performed;
3. If the treated waste or residue will not undergo further treatment prior to disposal, whether the treated waste or residue meets all applicable treatment standards (including requirements and standards for UHCs if applicable);
4. The presence of hazardous waste constituents and characteristics that could have been introduced during treatment;
5. Whether the treated waste or residue requires further management as a hazardous or mixed waste; and
6. The suitability for further treatment by one or more methods available on-site to make the waste safer and more amenable to further management on- or off-site.

These characterization criteria are summarized in Table C-3. All treated waste and treatment residues shall be characterized by the process described in Section C.3.1 of this Permit Attachment. Characterization of treated wastes and treatment residues shall include consideration of both listed and characteristic wastes that were present in the untreated wastes. The Permittees shall also follow the appropriate regulatory requirements for characterizing wastes that are listed solely because they exhibit one or more of the characteristics of ignitability, reactivity, or corrosivity.

Wastes that are treated using technologies specified in 40 CFR §§ 268.40-45 are not necessarily subjected to sampling and analysis. Such treatment technologies include physical treatment, and macroencapsulation. Other treated wastes shall be subject to sampling and analysis to characterize the waste and determine the effectiveness of the treatment, as appropriate.

C.3.4.4 Characterization of Treated Waste Residues at the TTU

Treatment residues from the thermal treatment of SASN mixed with other hazardous and solid waste include products of combustion. The principal constituents are ash (carbon) produced from burned solid items (e.g., paper, filters) inert non-combustible solid items (e.g.,. metal clips and pieces that were part of the solid waste) and gases (i.e., nitrogen, water vapor, carbon dioxide, carbon monoxide, diatomic oxygen, and traces of nitrous oxides) produced by decomposition of these wastes. Elemental silver is present in the ash when SASN is treated.

The treatment residue at the TTU shall be assessed by visually observing it for the presence of any untreated waste.

Treatment residue is hazardous waste (D011) based on process knowledge. Alternatively, the Permittees may use sampling and analysis to determine the silver content of the treatment

residue. The Permittees shall characterize the treatment residue as appropriate for further treatment and disposal at a permitted off-site TSDF.

C.3.4.5 Characterization of Treated Wastes and Treatment Residues Generated at the RMWMU and the AHCU

Effectiveness of treatment is determined in one or more ways that are specific to the type of treatment and the waste undergoing treatment. Evaluation of the treatment effectiveness is described in detail in Permit Part 4. Treated wastes and treatment residues generated from the treatment of hazardous and mixed wastes at the RMWMU and AHCU shall be characterized using one or more of the following methods:

1. The Permittees may use process knowledge, as appropriate, to determine whether treated waste or treatment residues exhibit characteristics of reactivity or ignitability, and the flash point test, as appropriate, for determination of ignitability.
2. Treated corrosive aqueous liquid wastes and their liquid treatment residues, if any, shall be characterized for corrosivity by measuring pH.
3. Treated reactive wastes and their treatment residues, if any, shall be characterized for the presence of sulfides and cyanides if their presence caused the waste to be reactive.
4. Treated reactive batteries and other reactive/explosive items and their treatment residues, if any, shall be characterized for reactivity through process knowledge, as appropriate. Such wastes may also exhibit the characteristic of toxicity.
5. Elemental mercury treated by amalgamation at the RMWMU may be characterized by process knowledge.
6. Treated aqueous liquids that have been solidified (including liquids that have previously been neutralized) shall be checked for the presence of free liquids.
7. Treated oils and organic liquids exhibiting the characteristics of toxicity shall be characterized through process knowledge and sampling and analysis, as appropriate.
8. Treated soils and particulates exhibiting one or more characteristics of ignitability, reactivity, and toxicity may contain UHCs. Treated wastes that were toxic shall be characterized for toxicity by sampling and analysis, as appropriate.
9. Wastes treated by physical treatment include components containing listed wastes or exhibiting hazardous characteristics. After items are separated from larger items they shall be characterized as described in Section C.3.4 of this Permit Attachment.
10. Pressurized containers treated by physical treatment shall be characterized following treatment. If the containers are empty as defined in 40 CFR § 261.7, the containers are not hazardous waste. The collected liquids shall be characterized.

Treated wastes and treatment residues that will not undergo further treatment at the RMWMU and the AHCU shall be characterized as appropriate to determine compliance with applicable treatment standards for UHCs (*See* 40 CFR § 268.2(i) and 268.40(e)).

C.4 VERIFICATION AND RE-EVALUATION FREQUENCIES

The Permittees' waste verification process shall be designed to provide assurance that wastes are adequately characterized. Personnel involved in verification activities shall be trained and qualified for the activities they perform.

The Permittees shall review whether hazardous wastes are being stored in compliance with 40 CFR Part 264, Subpart CC at least once every 12 months. Such reviews shall be documented in the Operating Record.

C.4.1 Verification of Wastes

Wastes shall be selected for further evaluation as part of the verification program using one or more of the following criteria:

1. Random selection;
2. Adequacy of waste characterization information;
3. Recommendations from personnel;
4. Incomplete or inconsistent documentation; and
5. Other waste-specific criteria.

During each calendar year, the Permittees shall verify the characterization for ten percent (10%) by volume.

C.4.2 Re-evaluation of Waste Streams

If there is any information that indicates a change in the process that generates a waste that may affect the waste, the waste shall be re-characterized no later than the next time the waste is generated from the changed process.

C.5 USE OF ACCEPTABLE KNOWLEDGE

According to the EPA guidance, acceptable knowledge is defined to include process knowledge, supplemental waste analysis data, and facility records of analysis (EPA, 1994, "*Waste Analysis at Facilities That Generate, Treat, Store, And Dispose of Hazardous Wastes*). Process knowledge is described as data developed under 40 CFR Part 264 and existing published or documented data on a specific hazardous waste or a waste generated from similar processes. Supplemental waste analysis data include concentration(s) of hazardous waste constituents and/or results of tests for hazardous waste characteristics to determine whether or how wastes are regulated under RCRA Subtitle C.

Examples that are presented in the 1994 EPA guidance as to when the application of acceptable knowledge may be appropriate include:

1. Wastes containing hazardous waste constituents from specific processes that are well documented such as F and K listed wastes; and
2. Wastes consisting of discarded commercial chemical products, reagents, or chemicals containing known physical and chemical constituents (such as, spent solvents and P and U listed wastes).
3. Health and safety risks to personnel would not justify sampling and analysis (e.g., radioactive mixed waste).
4. Physical nature of the waste does not lend itself to taking a laboratory sample.

Documentation of acceptable knowledge shall be maintained in the Operating Record. [*See* 40 CFR §§ 264.13(a)(2) and (b)(5), and 264.73(b)(3)].

C.5.1 Process Knowledge

Process knowledge, a subset of acceptable knowledge, consists of one or more of the following:

1. Detailed information on a waste obtained from published or documented waste analysis data;
2. Studies conducted on hazardous or mixed waste generated by processes similar to that which generated the waste; and
3. Knowledge of the materials and operations that generated the waste and that demonstrates the potential for hazardous waste constituents in the waste.

Documentation of process knowledge for each waste shall be maintained in the Operating Record. The documentation shall be traceable to a given waste. There are many sources of documentation that can be used to substantiate process knowledge for a specific waste. Examples include but are not limited to the following:

1. Material safety data sheets (MSDSs), product labels, vendor information and manufacturer's literature and other product package information;
2. Information from operating procedures and research projects, which can include a list of the raw materials or reagents, a description of the process/experiment that uses the materials, and a description of the wastes generated and how the wastes are handled;
3. Site databases (e.g., chemical inventory database for Superfund Amendments and Reauthorization Act Title III requirements);
4. Industry reports and analytical data on a similar process when there is a clear connection between the Facility's process/experiment and the industry's similar process/experiment;
5. Previous analytical data relevant to the waste;
6. Documented visual inspections to confirm or identify the physical characteristics and packaging of a waste; and
7. ER Project site and waste characterization data.

TABLE C-3
Additional Parameters, Characterization Methods, and Rationale for Treated Wastes

Waste Type Description	Characterization Method	Parameter[a]	Rationale
Explosive waste to be treated by open burning	Knowledge of Process	All characterization information previously obtained Knowledge of treatment process	Verify that waste has same characteristics and constituents as previous wastes treated at TTU Determine treatment standards Identify UHCs reasonably expected to be present in characteristic waste
Residues from treatment of reactive hazardous wastes through open burning	Acceptable Knowledge and by Sampling and Analysis, as appropriate	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class Hazardous waste metals UHCs	Determine whether treated waste meets listing criteria Determine waste form Determine presence of free liquids Determine waste compatibility information Determine toxicity characteristics Determine whether waste meets treatment standards, including standards for UHCs
Waste to be treated through chemical deactivation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process Cyanides and sulfides UHCs	Verify that waste is suitable for treatment by planned process Determine treatment standards Identify UHCs expected to be present in characteristic waste
Wastes that have been treated through chemical deactivation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process Presence of liquids Flash point (for liquids), DOT hazard class (for solids) pH (for liquids) Stability, DOT hazard class Cyanides and sulfides UHCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability, corrosivity, and reactivity characteristics Determine waste compatibility information Determine whether waste meets treatment standards, including standards for UHCs

TABLE C-3
Additional Parameters, Characterization Methods, and Rationale for Treated Wastes

Waste Type Description	Characterization Method	Parameter[a]	Rationale
Waste to be treated through thermal deactivation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process UHCs	Verify that waste is suitable for treatment by planned process Determine treatment standards Identify UHCs expected to be present in characteristic waste
Wastes that have been treated through thermal deactivation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process DOT hazard class Stability, DOT hazard class UHCs	Determine waste form Determine ignitability and reactivity characteristics Determine waste compatibility information Determine whether waste meets treatment standards, including standards for UHCs
Waste to be treated through amalgamation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process	Verify that waste is suitable for treatment by planned process Determine treatment standards
Wastes that have been treated through amalgamation	Knowledge of Process	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process	Determine waste form Determine whether waste meets treatment standards
Waste to be treated through stabilization/ solidification	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process UHCs	Verify that waste is suitable for treatment by planned process Determine treatment standards Identify UHCs expected to be present in characteristic waste

TABLE C-3
Additional Parameters, Characterization Methods, and Rationale for Treated Wastes

Waste Type Description	Characterization Method	Parameter[a]	Rationale
Wastes that have been treated through stabilization/ solidification	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class UHCs	Determine whether waste meets listing criteria Determine waste form Determine presence of free liquids Determine ignitability and reactivity characteristics Determine waste compatibility information Determine whether waste meets treatment standards, including standards for UHCs
Waste to be treated through macroencapsulation	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process	Verify that waste is suitable for treatment by planned process Determine treatment standards
Waste that have been treated through macroencapsulation	Knowledge of Process	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process	Determine waste form Determine whether waste meets treatment standards
Waste to be treated through physical treatment	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained Knowledge of treatment process UHCs	Verify that waste is suitable for treatment by planned process Determine treatment standards Identify UHCs expected to be present in characteristic waste

TABLE C-3
Additional Parameters, Characterization Methods, and Rationale for Treated Wastes

Waste Type Description	Characterization Method	Parameter[a]	Rationale
Wastes that have been treated through physical treatment	Acceptable Knowledge and Sampling and Analysis, as appropriate	All characterization information previously obtained for untreated waste Physical characteristics Knowledge of treatment process Presence of liquids Flash point (for liquids), DOT hazard class (for solids) Stability, DOT hazard class pH (for liquids) Hazardous waste VOCs Hazardous waste SVOCs Hazardous waste metals UHCs	Determine whether waste meets listing criteria Determine waste form, including size Determine presence of free liquids Determine ignitability, corrosivity, and reactivity characteristics Determine waste compatibility information Determine toxicity characteristic Determine whether waste meets treatment standards, including standards for UHCs

[a] Parameters listed are in addition to those shown in Table C-2. Parameters shown in *italics* are mandatory; the others are selected based on obtaining additional information necessary for treatment or for characterizing the treated waste.

C.6 WASTE SAMPLING AND ANALYSIS

Sampling and analysis shall be performed to provide supplemental information when acceptable knowledge does not provide sufficient information to adequately and properly characterize a hazardous or mixed waste as needed for the activities conducted under this Permit. Characterization methods, analytical parameters, and rationale are summarized in Tables C-2 and C-3.

Pursuant to 40 CFR 264.13(b)(1 and 2), Table C-4 identifies analytical testing requirements and test methods for parameters of interest, including UHCs that are reasonably expected to be present in the waste at the point of generation, as defined in 40 CFR 268.2(i).

C.6.1 Quality Assurance/Quality Control

The Permittees shall implement sampling quality assurance/quality control (QA)/QC) procedures to assure that analytical results are adequate for their intended purpose(s). The QA/QC program shall be designed by adhering to the EPA sampling protocol and analytical procedures specified in this section; documenting sampling activities and sample custody; using controlled and standard equipment and materials; and collecting, analyzing, and evaluating field and laboratory QA/QC samples, to meet the requirements of EPA Office of Solid Waste publication SW-846, *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods* (EPA, 1986) and all approved updates,(SW-846), Chapter 1.0.

C.6.2 Waste Sampling

The objective of waste sampling shall be to obtain a sample representative of a waste and shall consider the waste-generating and -handling processes. Some wastes separate into distinct layers, and representative samples must include aliquots or portions from each layer. In some cases, it shall be necessary to use a statistical or random sampling scheme for the collection of representative samples.

A number of criteria shall be considered by the Permittees in determining the number, location, and frequency of samples that should be collected. If the waste is uniform and from a single process location, one grab sample collected periodically may be sufficient. If a waste is a mixture of materials, more samples shall be required, and composite sampling may be appropriate. Sampling shall be repeated if the waste-generating process changes in a substantial way, or if inspection of the waste reveals the waste has changed such that the previous determination is no longer applicable.

The Permittees shall comply with SW-846, other approved EPA or American Society for Testing and Materials (ASTM) methods. The Permittees shall obtain prior approval by the Department to use other methods.

Samples of waste shall be collected and handled in a manner that preserves their original physical form and composition.

When sampling is required for waste characterization, the following strategies shall be used unless an alternative sampling strategy that meets the requirements of SW-846 is determined to be more appropriate for a specific waste:

1. Sampling shall be conducted in a manner that minimizes the generation of waste;
2. The Permittees shall consider personnel safety in determining how and whether to collect samples. If sampling of a waste would pose an unacceptable risk to human health, a non-waste item similar in chemical and physical properties to the waste may be sampled as a surrogate;
3. For heterogeneous solid items, such as contaminated debris, samples shall be obtained from areas that are most likely to be contaminated;
4. For solid items whose surfaces are suspected to be contaminated with hazardous or mixed wastes, the sampling method employed shall be appropriate for detecting surface contamination and may include, but is not limited to, surface wipe samples, crushing, grinding, and shredding, depending on the physical form of the waste and the suspected contaminants; and
5. Samples shall include portions or aliquots from each phase of a waste if more than one phase is present.

The Permittees may propose an alternative sampling strategy by submitting a sampling and analysis plan (SAP) to the Department for approval. If the Department does not notify the Permittees of the SAP's approval, conditional approval, or denial within 45 days of receipt of the SAP, the Permittees may implement the SAP provided that all applicable requirements of 40 CFR Parts 264 and 268 and this Permit are met; releases of waste are prevented; and the health and safety of workers and the public are protected from harm related to implementation of the plan.

C.6.3 Sample Handling, Preservation, and Storage

Use of appropriate sample container types and preservation are necessary to prevent some hazardous constituents from chemically, physically, or biologically altering other substances prior to analysis. Typical preservation techniques shall include the addition of appropriate chemicals, refrigeration, and adhering to holding time limitations between sampling and analysis. The Permittees shall use current EPA-approved preservation and container types, such as those presented in Table C-5 of this Permit Attachment, or in SW-846.

Field duplicate samples shall be collected at a rate of ten percent, and shall be analyzed for the same parameters as the associated waste samples. If disposable sampling equipment is not used, an equipment rinsate blank shall also be prepared and analyzed at a rate of ten percent, with at least one for each sampling event. If VOCs are included in the analyses, a trip blank shall be prepared and analyzed for volatile organic compounds (VOCs), and shall accompany VOC samples.

After a sample is collected, a label providing the following information at a minimum shall be immediately affixed to the sample container:

1. Sample number;
2. Date and time of collection;

3. Sampling location or container number(s) for composite samples;
4. Type of sample media (e.g., liquid, solid); and
5. Name of sample collector.

Sample numbers shall be unique to each sample. The sample number shall also be recorded on a sample collection log, which shall include the following information for each sample:

1. Sample number;
2. Sample and analysis request number;
3. Date and time of sample collection;
4. Sampling location or container number(s) for composite samples;
5. Type of sample media (e.g., solid, liquid);
6. Purpose of sample collection;
7. Number and volume of samples;
8. Sample type (e.g., grab, composite);
9. Results of field observations or measurements;
10. Name of sample collector; and
11. Signature of sample collector.

To assure that the sample is traceable from the time of collection to the time of analysis, an analysis request/chain-of-custody (AR/COC) form or equivalent shall be completed and maintained by the Permittees for each sample. The form shall include the following information at a minimum:

1. Sample number;
2. Date and time of sample collection;
3. Sampling location or container number(s) for composite samples;
4. Type of sample media (e.g., solid, liquid);
5. Required analytical testing;
6. Sample description (e.g., grab, composite);
7. Name of sample collector;
8. Signature of sample collector;
9. Signatures of persons involved in the chain of custody; and
10. Dates of possession.

Table C-5 lists requirements for sample containers, preservation techniques, and holding times for the Active Units listed in Table J-1 of Permit Attachment J (*Hazardous Waste Management Units*).

Sampling shall be performed with an appropriate device.

C.6.4 Analytical Laboratory Selection and Analytical Methods

The Permittees shall perform the chemical and physical analyses specified in SW-846 as necessary to adequately characterize waste. Laboratories conducting the analyses must have:

1. A documented comprehensive QA/QC program,
2. Technical analytical expertise,
3. A document control/records management plan, and

4. The capability to perform data reduction, validation, and reporting.

The selection of analytical testing methods for waste shall be based on the following considerations:

1. The physical form of the waste,
2. Chemical composition, and
3. Required detection limits (e.g., regulatory thresholds).

TABLE C-4
Summary of Analytical Methods

Parameter	Method Numbers [b]	Rationale
Volatile Organic Compounds Spent halogenated and non-halogenated solvents	American Society for Testing and Materials (ASTM) Method D4547-91[c] or equivalent method EPA/540/4-91/001[d] or equivalent methods[e] EPA Methods SW-846 (1311, 8260, 8261)[f] or equivalent methods[e] Methods included in 20 NMAC 4.1.600/40 CFR §§ 265.1084(a)(2), (a)(3), and (a)(4)	Determine total and/or TCLP concentration in samples of solids or liquids, to characterize wastes, evaluate air emissions, or determine whether treated wastes meet treatment standards[a]
Semivolatile Organic Compounds	EPA Methods SW-846 (1311 and 8270)[f] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids to characterize wastes or determine whether treated wastes meet treatment standards[a]
Metals Arsenic Antimony Barium Beryllium Cadmium Chromium Lead Mercury Nickel Selenium Silver Thallium	EPA Methods SW-846[f]: (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 7470, 7471)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010, 7741, 7742)[e] (1311, 6010, 6020, 7000, 7010)[e] (1311, 6010, 6020, 7000, 7010)[e] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids, or determine whether treated wastes meet treatment standards[a]
Reactive Sulfide	EPA Methods SW-846, Test Method to Determine Hydrogen Sulfide Released from Wastes[g] or equivalent methods[e] EPA Methods SW-846 (9030, 9031, 9034)[f] or equivalent methods[e]	Determine concentration of reactive sulfides
Cyanide (total and amenable)	(1311, 9010, 9012)[e]	Determine concentration of cyanides

TABLE C-4
Summary of Analytical Methods

Parameter	Method Numbers [b]	Rationale
Paint Filter Liquids Test	EPA Methods SW-846 (9095)[f] or equivalent methods[e]	Determine presence of free liquids
Flash Point	EPA Methods SW-846 (1010, 1020, 1030)[f] or equivalent methods[e]	Determine ignitability
pH	EPA Methods SW-846 (9040, 9041, 9045)[f] or equivalent methods[e]	Determine corrosivity
Explosives in waste	EPA Methods SW-846 (Appropriate analytical method from the Method 8300 series - e.g., 8330)[f]	Determine reactivity
Dioxin/Furan Congeners	EPA Methods SW-846 (8280, 8290)[f] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids to characterize wastes or determine whether treated wastes meet treatment standards[a]
Polychlorinated Biphenyls	EPA Methods SW-846 (8082, 8275)[f] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids to characterize wastes or determine whether treated wastes meet treatment standards[a]
Pesticides	EPA Methods SW-846 (8140, 8141, 8081, 8085)[f] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids to characterize wastes or determine whether treated wastes meet treatment standards[a]
Herbicides	EPA Methods SW-846 (8150, 8151)[f] or equivalent methods[e]	Determine total and/or TCLP concentration in samples of solids or liquids to characterize wastes or determine whether treated wastes meet treatment standards[a]

[a] For treated wastes, analyses are limited to determining whether treated wastes meet the treatment standards in 40 CFR § 268.40 or the universal treatment standards for the underlying hazardous constituents that can reasonably be expected to be present at the point of generation of the hazardous waste, as provided in 40 CFR § 268.48

[b] The Permittees shall use the most current methods for analysis. Method numbers shown in this table are subject to change through future updates and may differ from those shown here.

[c] American Society for Testing and Materials, 1991, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," ASTM D4547-91, *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials. (ASTM, 1991)

[d] U.S. Environmental Protection Agency (EPA), 1991, "Soil Sampling and Analysis for Volatile Organic Compounds," EPA 1/540/4-91/001, Office of Research and Development. (EPA, 1991)

[e] Equivalent methods not listed in one of the references in this Permit Attachment may be substituted to accommodate waste-specific properties if approved in advance by the Department.

[f] U.S. Environmental Protection Agency, 1986 and all approved updates, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846*.

[g] SW-846, Section 7.3.4.2 contains specialized methods to determine if a sulfide-containing waste exhibits the reactivity characteristic.

TABLE C-5
Sample Containers[a], Preservation Techniques, and Holding Times[b]

Analyte Class and Sample Type	Container	Preservative	Holding Time
Volatile Organic Compounds			
Concentrated Waste Samples	Method 5035[b]:See method. Method 5021: See method. Methods 5031 & 5032: See methods. Use polytetrafluoroethylene (PTFE)-lined lids for all procedures.	Cool to 4° degrees Celsius (°C) and adjust pH[e] to less than 2 with H_2SO_4, HCl, or solid $NaHSO_4$	14 days
Soil/Sediments and Sludges	Method 5035: See method. Method 5021: See method. Methods 5031 & 5032: See methods.	See the individual method	14 days
Liquid Samples: No Residual Chlorine Present	Methods 5030, 5031, & 5032: 2 x 40-milliliter (Ml) vials with PTFE-lined septum caps.	Cool to 4°C and adjust pH to less than 2 with H_2SO_4, HCl, or solid $NaHSO_4$	14 days
Liquid Samples: Residual Chlorine Present	Methods 5030, 5031, & 5032: 2 x 40-mL vials with PTFE-lined septum caps.	Collect sample in a 125-mL container, which has been pre-preserved with 4 drops of 10% sodium thiosulfate solution. Gently swirl to mix sample and transfer to a 40-mL volatile organic analysis (VOA) vial. Cool to 4°C and adjust pH to less than 2 with H_2SO_4, HCl, or solid $NaHSO_4$	14 days
Liquid Samples: Acrolein and Acrylonitrile	Methods 5030, 5031, & 5032: 2 x 40-mL vials with PTFE-lined septum caps.	Adjust to pH of 4-5. Cool to 4°C	14 days
Semivolatile Organic Compounds/Organochlorine Pesticides and Herbicides			
Concentrated Waste Samples	125 mL WM[c]-G[d] with PTFE-lined lid	None	14 days
Soil/Sediments and Sludges	250 mL WM[c]-G[d] with PTFE-lined lid	Cool to 4°C	14 days
Liquid Samples, No Residual Chlorine Present	4 x 1 liter (L) AG[f] with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis.	Cool to 4°C	14 days
Liquid Samples, Residual Chlorine Present	4 x 1-L AG[f] with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis.	Add 3-mL 10% sodium thiosulfate solution per gallon (or 0.008%). Cool to 4°C.	14 days
Polychlorinated Biphenyls, Polychlorinated Dibenzo–p-dioxins, and Polychlorinated Dibenzofurans			
Concentrated waste samples	125-mL WM[c]-G[d]	None	14 days
Soil/Sediments and Sludges	250 mL WM[c]-G[d] with PTFE-lined lid	Cool to 4°C	14 days
Liquid Samples, No Residual Chlorine Present	4 x 1 liter (L) AG[f] with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis	Cool to 4°C	14 days
Liquid Samples, Residual Chlorine Present	4 x 1-L AG[f] with PTFE-lined lid, or other size, as appropriate, to allow use of entire sample for analysis.	Add 3-mL 10% sodium thiosulfate solution per gallon (or 0.008%). Cool to 4°C.	14 days

TABLE C-5
Sample Containers[a], Preservation Techniques, and Holding Times[b]

Analyte Class and Sample Type	Container	Preservative	Holding Time
Metals and Inorganic Compounds			
Soil/Sediments and Sludges: Metals (except hexavalent chromium and mercury)	500-mL WM[c]-P[g] or G[d]	Cool to 4°C	180 days
Soil/Sediments and Sludges: Hexavalent chromium	500-mL WM[c]-P[g] or G[d]	Cool to 4°C	Not established - analyze as soon as possible.
Soil/Sediments and Sludges: Mercury	500-mL WM[c]-P[g] or G[d]	Cool to 4°C	28 days
Liquid Samples: Metals (except hexavalent chromium and mercury)	1-L P[g] or G[d]	Add nitric acid to adjust pH to less than 2.	180 days
Liquid Samples: Hexavalent chromium	500-mL P[g] or G[d]	Cool to 4°C	24 hours
Liquid Samples: Mercury	500-mL P[g] or G[d]	Add nitric acid to adjust pH to less than 2.	28 days
Cyanide	500-mL WM[c]-P[g] or G[d]	Cool to 4°C. See method for preservation if oxidizing agents or interferences are present.	14 days

[a] Smaller sample containers may be required due to health and safety concerns associated with potential radiation exposure, transportation requirements, and waste management considerations. Permittees shall comply with EPA requirements for container types, preservatives, and holding times as specified under the current version of SW-846 or other applicable regulations.
[b] Information primarily from "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846,* U.S. Environmental Protection Agency, 1986 and all approved updates. The Permittees shall use the most current containers and preservation methods. Containers and preservatives shown in this table are subject to change through future updates and may differ from those shown here.
[c] WM = Wide-mouth
[d] G = Glass
[e] A term used to describe the hydrogen-ion activity of a system.
[f] AG = Amber glass
[g] P = Polyethylene

C.7 ORGANIC AIR EMISSION REQUIREMENTS

The Permittees manage wastes that are subject to organic air emissions requirements of 40 CFR Part 264, Subpart CC. For wastes that are not eligible for exemption, the Permittees shall address the applicable requirements for control of air pollutant emissions as follows:

1. In lieu of determining the concentration of VOCs in a waste at the point of generation, the Permittees may declare that a container holding the waste is subject to the requirements of 40 CFR Part 264, Subpart CC.
2. To determine the VOC concentration, the Permittees shall follow the waste determination procedures specified in 40 CFR 264.1083(a). If sampling and analysis is necessary, it shall be performed in accordance with the methods specified in this Permit Attachment.
3. Whenever changes to the source generating the waste are reasonably likely to or may potentially cause the average VOC concentration of the hazardous waste to increase to a level that is equal to or greater than the applicable VOC concentration limits specified in 40 C.F.R. § 264.1082, a new waste evaluation shall be performed by the Permittees, as specified in 40 C.F.R. § 264.1083(a)(1)(ii).
4. The Permittees shall review the characterization documentation for VOCs as part of the characterization process discussed in Section C.3 of this Permit Attachment.
5. Hazardous wastes containing VOCs that are newly generated through treatment and treatment residues shall be characterized for VOC content if the waste being treated contains VOCs, and/or the treatment process involves VOCs.
6. Characterization of routinely generated hazardous and mixed wastes that are subject to 40 C.F.R. Part 264, Subpart CC shall be reviewed and updated at least once every 12 months to determine whether Subpart CC requirements continue to apply.

C.8 PROCEDURES FOR ACCEPTANCE OF WASTE FROM OFF-SITE SOURCES

Hazardous and mixed wastes from off-site sources listed in Section 2.2.3 of Permit Part 2 may be accepted at the Facility.

The Permittees shall meet the requirements of 40 CFR §§, 264.13(a)(3)(ii), 264.13(a)(4), 264.13(b)(5), and 264.13(c).

Prior to accepting waste from an off-site source, the Permittees shall obtain a request and waste characterization data from the off-site source. The Permittees shall review the request and characterization data for completeness and consistency with the characterization process in Section C.3.1. The Permittees shall require large-quantity and small-quantity off-site sources to provide land disposal restriction (LDR) notification that addresses LDR requirements applicable to the wastes in the proposed shipment. The Permittees shall provide written notice to the source as required by 40 CFR 264.12(b).

The Permittees shall visually inspect each shipment to ensure that the number and type of container(s) and container labels match the manifest or other shipping papers. Discrepancies shall be addressed in compliance with 40 CFR 264.72 and Permit Section 1.9.9.8.

Documentation regarding wastes received from off-site sources shall be maintained in the Operating Record.

C.9 RECORDS

The Permittees shall enter characterization information into the Operating Record. Each package (the smallest discrete waste item) shall be assigned a unique identification and tracking number no later than its arrival at a Permitted Unit. Characterization information associated with the package shall be either in paper or electronic format. The Permittees shall document information related to activities that affect a waste package (e.g., repackaging, additional characterization, treatment).

C.10 REFERENCES

ASTM, 1991 American Society for Testing and Materials, "Standard Practice for Sampling Waste and Soils for Volatile Organic Compounds," 1991

ASTM, 1991 *Annual Book of ASTM Standards*, Philadelphia, Pennsylvania, American Society for Testing and Materials, 1991.

EPA, 1986 U.S. Environmental Protection Agency, "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," *SW-846,* 1986 and all approved updates.

EPA, 1991 "Soil Sampling and Analysis for Volatile Organic Compounds," *EPA 1/540/4-91/001*, Office of Research and Development, 1991

EPA, 1994 "Waste Analysis at Facilities That Generate, Treat, Store, And Dispose of Hazardous Wastes, A Guidance Manual," *OSWER 9938.4-03*, 1994.

PERMIT ATTACHMENT D CONTINGENCY PLAN

D.1 INTRODUCTION

This Permit Attachment describes Facility and site-specific contingency plans for the Permitted Units (*See* 40 CFR Part 264, Subpart D) including the Corrective Action Management Unit (CAMU). The Permitted Units covered by this Contingency Plan are listed in Permit Attachment J (*Hazardous Waste Management* Units) and described in Permit Attachment A (*Facility Description*).

Facility security personnel shall monitor each Unit periodically during non-operating hours. If an emergency is discovered during this monitoring, the Facility Emergency Operations Center (EOC) and the Unit-specific Emergency Coordinator (EC) shall be notified immediately.

D.2 DISTRIBUTION OF CONTINGENCY PLAN AND AMENDMENTS

Copies of the current Contingency Plan, including the applicable Unit-specific information shall be maintained: (1) at each Permitted Unit, (2) at the Facility Emergency Operations Center (EOC), and (3) in the Operating Record. The Permittees shall also provide copies of the Contingency Plan and any amendments and updates of it to the KAFB Fire Department and the New Mexico Environment Department (the Department).

The Emergency Coordinators (ECs) and Facility Emergency Response Organization (ERO) personnel shall review this Contingency Plan at least annually. The Contingency Plan shall be amended, if necessary, whenever one or more of the following occurs:

1. Applicable regulations or RCRA permit conditions that affect the Plan are revised;
2. There is a significant change in Facility or Permitted Unit design, construction, maintenance, operation, or other circumstance that increases the potential for emergencies or changes the response necessary in an emergency;
3. The list of designated ECs changes;
4. The list of required emergency equipment changes; or
5. Actual implementation of the Contingency Plan during an emergency demonstrates inadequacies or the Contingency Plan fails.

D.3 EMERGENCY RESPONSE PERSONNEL AND SUPPORT AGREEMENTS

The Permittees shall ensure that emergency response personnel and support agreements are available for each Permitted Unit at the Facility as described in this section.

D.3.1 Emergency Coordinator and Responsibilities

The EC shall have thorough familiarity with this Contingency Plan, including the applicable Unit-specific information, Unit layout and operations, the location of records, the locations and characteristics of the hazardous or mixed waste managed at the Unit, and the emergency equipment and supplies. The EC shall have the authority through the Permittees' management to

commit the necessary resources (including personnel, materials, and funds) to respond to an emergency at the Permitted Unit.

During emergencies or until the Facility Emergency Response Incident Commander (IC) arrives and takes control, the EC has three primary responsibilities:

1. **Assess the Situation.** By observing the scene, interviewing personnel, and reviewing records as appropriate, the EC shall gather information relevant to the response, such as the type of event, quantity and type of released material or waste, and actual or potential hazards to human health or the environment.
2. **Protect Personnel.** The EC shall take all reasonable measures to ensure the safety of personnel, such as activating the fire alarm, accounting for personnel, attending to injuries, or coordinating the evacuation of personnel, if necessary. If evacuation is indicated for other personnel outside of a Permitted Unit, the IC must be informed.
3. **Contain or Mitigate the Hazards.** The EC shall take reasonable measures to ensure that fires, explosions, or releases do not occur, recur, or spread.

After emergencies, the EC shall ensure that the Unit and equipment are cleaned, waste is properly managed and disposed of, the Unit is safe to resume operation, and all notifications and reports are provided to the Department, as outlined in Sections D.8, D. 9, and D.13 of this Permit Attachment.

In the event that the EC is not on site or immediately available during an emergency, an alternate EC shall be responsible for conducting the duties of the EC. The names, addresses, and phone numbers of the primary and alternate ECs for each Permitted Unit are included in each Unit-specific Section of this Permit Attachment. A Unit-specific EC or alternate EC shall be on-site or immediately available during the operating hours of each Unit and shall be on call the rest of the time. The ECs shall also be available during non-routine hazardous or mixed waste management operations that may be conducted outside normal operating hours.

D.3.2 Emergency Response Groups

The Facility emergency response organization (ERO) consists of two response groups that respond to an emergency situation: (1) a field response group led by an IC under the Incident Command System and (2) the EOC. The Incident Command System includes Facility security, the KAFB Fire Department, and Facility Permitted Unit personnel; any of these will be deployed in an emergency response as required by the circumstances of the emergency. An IC shall be on site at the Facility at all times (24 hours per day, 7 days per week). Facility security and the KAFB Fire Department personnel are available at all times. Waste management personnel shall be available on-site at the Facility during operating hours at the Permitted Units. The Facility EOC staff shall include personnel who are responsible for the management decisions and notifications to outside parties that are required during an emergency response. Such personnel shall be available on-site at the Facility during operating hours at the Permitted Units, and shall be on call the rest of the time.

In the field, the IC shall maintain overall management and control of response operations at the emergency site once control is relinquished by the EC. The IC shall work in a unified command with the KAFB Fire Department and in concert with safety personnel, the EC, other emergency

responders and waste management personnel to develop and execute response plans, including on-site protective actions and recommendations for off-site protective actions. The Incident Command System or equivalent system shall be implemented at the time an emergency occurs and shall remain in effect until the need for emergency management no longer exists.

D.3.3 Emergency Chain of Command

When the EC is notified of or discovers an incident, he shall first determine if the procedures for emergencies should be implemented. The EC shall manage the emergency response until the IC arrives at the Unit and will relinquish control to the arriving IC. If possible, the EC shall maintain communication with the IC by telephone or radio before the IC arrives at the Unit. The EC shall remain at the Unit as necessary and assist in emergency response as directed by the IC. The EC shall advise the IC, as needed, on Unit operations, Unit layout, characteristics of hazardous or mixed waste on-site, location of records, radio and cellular communication systems, and other information as necessary to respond to the emergency.

The IC is the liaison for communications with other emergency response organizations and functions, including medical and fire protection support. The EC can request both medical and fire protection services, if necessary, at the same time that he notifies the IC of an emergency.

D.3.4 Support Agreements and Coordination with Outside Agencies

The Permittees shall maintain sufficient response resources to handle emergencies arising from hazardous waste management activities as described in this Contingency Plan. These response resources include personnel, emergency equipment, medical facilities, communications systems, and support agreements with off-site agencies and facilities. Permittees shall attempt to establish mutual aid agreements and memoranda of understanding with several off-site agencies and facilities for additional response capabilities for the Facility. Such agencies and facilities include the establishments listed in Table D-1. If the Permittees cannot establish mutual aid agreements or memoranda of understanding through no fault of their own, the Permittees shall maintain in the Operating Record demonstration of the failed attempt.

D.4 EMERGENCY EQUIPMENT

A list of equipment that shall be available through the Facility emergency response system is provided in Table D-2. Lists of emergency equipment that shall be available for use at each Unit are presented below under the Unit-specific Sections of this Permit Attachment.

TABLE D-1 Agreements and Memoranda of Understanding for Emergency Response	
Agency or Facility	**Type of Service**
The New Mexico Department of Public Safety	Mutual aid involving an actual or potential emergency, assistance in training and emergency response for local and tribal governments.
The 377th Air Base Wing, Kirtland Air Force Base	Various types of support, including fire protection, police services, communications, and utilities.
The U.S. Forest Service	Cooperative fire fighting arrangement between the USFS and KAFB for wild land fires.
The City of Albuquerque	Mutual support and responsibilities during a potential or actual emergency requiring the combined resources of DOE and the City of Albuquerque.
Lovelace Medical Center	Mutual cooperation and assistance in providing timely and effective emergency medical services.
Presbyterian Health Care Services	Mutual cooperation and assistance in providing timely and effective emergency medical services.

D.5 CONTINGENCY PLAN IMPLEMENTATION

Anyone who becomes aware of an incident or emergency shall contact facility personnel or the EC immediately. If an incident is determined to be an emergency, the Permittees shall implement evacuation procedures, as appropriate, as described in Section D.7 of this Permit Attachment.

If the EC determines that an emergency situation exists or is imminent at the Unit, the EC shall immediately notify the EOC and activate this Contingency Plan. The methods for contacting emergency response representatives are listed in Table D-2.

TABLE D-2
Facility -Wide Emergency Response Equipment

Item or Equipment	Description/Telephone
Emergency Vehicles (owned by DOE/SNL unless noted)	
Emergency Response Vehicle	Mobile Command Post equipped with communications equipment, located at the Facility. Facility Emergency Response System — Call 911 or (505) 844-0911
Ambulance	Typically located at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Security Vehicles	Vans and trucks equipped with communications equipment and utilized for transportation of personnel and equipment, located throughout SNL. SNL Emergency Response System — Call 911 or (505) 844-0911
Fire Trucks (owned by KAFB Fire Department)	Fire-fighting vehicles outfitted with equipment for fighting fires, located at KAFB fire stations. SNL Emergency Response System — Call 911 or (505) 844-0911
Medical Supplies	
Stretchers/Stokes Litter	Equipment for movement of injured personnel. Stokes litter will immobilize personnel so they may be moved vertically. Typically located in ambulance or at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Blankets	Normal blankets, located in ambulance or at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Medical Kits	Emergency first-aid supplies, located in ambulance or at SNL medical facility. SNL Emergency Response System — Call 911 or (505) 844-0911
Safety Supplies	
Air Packs	Self-contained breathing apparatus for use by personnel entering hazardous atmospheres, located in ambulance or response vehicle. SNL Emergency Response System — Call 911 or (505) 844-0911
Monitoring Instruments	Typically located in ambulance or emergency response vehicle. SNL Emergency Response System — Call 911 or (505) 844-0911

Note: The Facility EOC is located at Technical Area I (TA-I).

TABLE D-3 Emergency Response System Notification	
Method	**Emergency Number**
Telephone (at Unit)	911
Mobile Telephone	(505)-844-0911
Portable Radio	NA
Automatic notification of emergency response when smoke detector or pull station is activated and/or water flows in sprinkler system, except as noted	NA

Note: Any person in any Unit is authorized to implement the evacuation procedures, notify the Unit-specific EC or alternate EC, or contact the emergency response representatives in the unlikely event that the Unit-specific EC or alternate EC cannot be contacted or respond in a timely manner.

D.6 EMERGENCIES

In the event of an emergency, the EC, a designee, or waste management personnel shall immediately telephone the EOC (by calling 911 or 844-0911) or notify them in some other way. The EC and the IC shall:

1. Determine the extent of the emergency;
2. Identify the character, source, amount, and extent of released materials or waste by observation, records reviews, or chemical analysis;
3. Assess possible resulting hazards to human health or the environment, considering both direct and indirect effects;
4. Take all reasonable measures necessary to ensure fires, explosions, and releases do not occur, recur, or spread to other hazardous or mixed waste at the Unit, including collecting and containing released waste, and removing or isolating containers; and
5. Monitor for leaks, pressure buildup, gas generation, and ruptures in equipment.

D.6.1 Fire

The following steps shall be implemented as needed in the event of an emergency involving an imminent or existing fire that could threaten human health or the environment:

1. All non-essential personnel shall evacuate following the evacuation routes described in each of the Unit-specific Sections of this Permit Attachment or to an alternate assembly location as directed by the EC. All personnel may evacuate at this time.
2. The EC (or waste management personnel) shall immediately notify the Facility ERO and KAFB Fire Department by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and Facility ERO are also notified by activation of automatic fire alarms at the Units.
3. Waste management personnel may consider taking action to put out the fire or minimize its spread only if safe. These actions may be taken only after the IC and KAFB Fire

Department have been notified. Personnel must not jeopardize their own safety or the safety of other personnel.

4. If the fire is small and the fuel source is small, portable fire extinguishers may be used to put out the fire.
5. Fire extinguishers shall only be used by personnel trained in their use, and only for very small fires.
6. Flammable materials shall be removed from the area of fire if safe.
7. Only appropriate fire extinguishers and/or fire extinguishing agents shall be used for water-reactive waste (e.g., Met-L-X, Lith-X, or equivalent).
8. If the fire spreads or increases in intensity, all remaining personnel must evacuate.
9. The EC shall take actions as directed by the IC. Unless directed otherwise, the EC shall remain near the Unit, but at a safe distance, so he can advise personnel responding to the fire of the known hazards.
10. Upon arrival at a fire, the KAFB Fire Department officer-in-charge is in command of fire fighting. DOE/Sandia emergency response and waste management personnel shall advise and assist the KAFB Fire Department, but the officer-in-charge retains the responsibility of selecting the fire-fighting methods and tactics.
11. Hazardous or mixed wastes involved in a fire can be identified in the following ways:
    a) The location of the container may indicate the contents.
    b) If the location does not indicate its contents, the label number can be used to identify the waste.
    c) Records on the contents of each container can be accessed from outside the Unit or in the Unit office.
    d) If the label has been burned and the container cannot be identified, the material or waste shall be treated as an unknown and analyzed according to the methods described in the Waste Analysis Plan under Permit Attachment C.
12. Spills of hazardous or mixed wastes shall be collected and contained by stabilizing or neutralizing the spilled waste, as appropriate; pouring an absorbent over the spilled waste; and sweeping or shoveling the absorbed waste into drums or other appropriate containers.
13. Surfaces affected by released hazardous or mixed wastes shall be cleaned using cleaners appropriate to the wastes.
14. If possible and safe, responding personnel shall take measures to contain potentially hazardous run-off and keep it away from storm drains or sewers (for example, by building dikes around storm drains).
15. Any fire-fighting waters collected in the storm water catchment and retention ponds at the HWHU and RMWMU, the storm water retention tank at the TTU, or the floor trenches at the AHCU shall be analyzed to determine the appropriate method for management and subsequent disposal of the waste water.

D.6.2 Explosion

The following steps shall be implemented as needed in the event of an emergency involving an imminent or existing explosion that could threaten human health or the environment:

1. Personnel shall immediately evacuate the area.
2. The EC (or personnel) shall immediately notify the Facility ERO and KAFB Fire

Department by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and the ERO are also notified by activation of automatic fire alarms at the Units.

3. The EC shall take actions as directed by the IC. Unless directed otherwise, the EC shall remain near the Unit, but at a safe distance, so that he or she can advise the response personnel of the hazards involved and the degree and location of the explosion and any fires.
4. Upon arrival at the site, the KAFB Fire Department officer-in-charge is in command of fire fighting. The EC shall advise and assist the KAFB Fire Department, but the officer-in-charge retains the responsibility of selecting the fire-fighting methods and tactics.
5. The IC shall be in overall control of Facility emergency response efforts until the emergency is terminated.
6. Wastes may be stabilized or neutralized, as appropriate; pouring an absorbent over the waste; and sweeping or shoveling the absorbed waste into drums or appropriate containers.
7. Surfaces affected by released hazardous or mixed wastes shall be cleaned using cleaners appropriate to the wastes involved.
8. If possible and safe, personnel shall take measures to contain potentially hazardous runoff and prevent it from entering storm drains, sewers, ditches, or drop inlets(for example, by building dikes around storm drains).
9. Any potentially contaminated waters collected in storm water catchment and retention ponds and tanks or floor trenches shall be analyzed to determine the appropriate treatment and disposal method, as applicable.
10. The EC shall secure all equipment (e.g., process equipment, ventilation equipment) that may be affected by the explosion and any fire once entry has been determined to be safe by the IC or a safety officer.

D.6.3 Uncontrolled Release

The following steps shall be implemented by the EC and Unit personnel in the event of an emergency involving an imminent or existing release of hazardous or mixed waste or hazardous waste constituents that could threaten human health or the environment:

1. Evacuate the immediate area.
2. The EC (or Unit personnel) shall immediately notify the ERO and KAFB Fire Department by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and ERO are also notified by activation of automatic fire alarms at the Units.
3. Take actions to minimize, contain, and clean up the release only if safe.
4. Review Facility records (e.g., waste inventory database) to determine the identity and chemical nature of the released material or waste.
5. Wear appropriate personal protective equipment for exposure to the material or waste.
6. If possible, secure the source of the release.
7. If necessary and possible, build a dike to contain runoff.
8. Take measures to contain potentially hazardous runoff and keep it away from storm drains or sewers and if possible, build dikes around the storm drains.
9. Released wastes shall be collected and contained by stabilizing or neutralizing the spilled

waste, as appropriate; pouring an absorbent over the spilled waste; and sweeping or shoveling the absorbed waste into drums or other appropriate containers.

10. No waste that may be incompatible with a released waste shall be treated, stored, or disposed of in the vicinity of the release location until the released waste is cleaned up or stabilized.
11. After collection of a released waste, the release site shall be sampled and evaluated. If contamination is present, the contaminated media shall be characterized and remediated to achieve clean closure as defined in Section 6.2.1 of Permit Part 6. The Permittees may choose to implement an alternative decontamination method for contaminated media such as surface cleaning or in-situ neutralization or stabilization. Any such alternative shall be approved by the Department prior to implementation. If the contaminated media cannot be remediated to achieve clean closure, the contaminated media shall be subject to corrective action as required under Permit Part 8.

D.7 EVACUATION

During an emergency that threatens the health or safety of personnel within a Permitted Unit, the following steps shall be taken to facilitate safe coordinated evacuation:

1. Stop work.
2. If safe, close containers and shut down equipment or otherwise place it in a safe mode.
3. Alert personnel in the affected area by announcing the evacuation by voice command, "Evacuate the area."
4. Activate the internal communications and alarm systems.
5. Notify the Facility ERO by activating a manual pull alarm or by dialing the EOC at 911 or 844-0911. Medical response can also be requested at the same time. The KAFB Fire Department and the ERO are also notified by activation of automatic fire alarms at the Units.
6. Check whether the evacuation route is safe.
7. If there is no evidence of danger or obstacles, exit the Permitted Unit according to the evacuation routes.
8. If there is evidence of danger or obstacles, exit the Permitted Unit by any safe route available.
9. If safe, check for other personnel in other areas.
10. Proceed to the designated assembly area for roll call to be taken by the EC.
11. If the EC and personnel are assembling at an alternate location, proceed to that location.
12. Inform the EC about any people that may still be inside the Permitted Unit.
13. Do not re-enter the Permitted Unit until the IC determines that is safe.

D.8 COORDINATION WITH OFF-SITE PARTIES AND EMERGENCY NOTIFICATION

The Permittees shall verbally inform the City of Albuquerque, KAFB command, and Isleta Pueblo immediately, in the event that residents of Albuquerque or Isleta Pueblo, or workers at KAFB could be affected. The notification shall include available information about the nature and location of the emergency, the materials and wastes involved, and the recommended protective actions and any relevant information listed in Section 1.9.9 of Permit Part 1 and

Section 2.13 of Permit Part 2. Protective actions may include evacuation or sheltering indoors with doors and windows closed and ventilation systems shut off.

The Permittees shall verbally notify the New Mexico Department of Public Safety (1-505-827-9329) and the National Response Center (1-800-424-8802) in accordance with 40 CFR 264.56(d) if human health or the environment outside the SNL Facility is threatened. The notification shall include a description of the emergency with the following information:

1. Name, address, and telephone number of the owner or operator, and name and telephone number of person making the report;
2. Name and address of the Facility;
   c). time and type of incident;
   d). name and quantity of material(s) involved, to the extent known;
   e). the extent of injuries, if any;
   f). the possible hazards to human health, or the environment, outside the Facility.

Further, the Permittees shall also provide this information to the Department.

D.8.1 Post-Emergency Actions

Immediately after an emergency, the EC and when present, the IC, shall:

1. Continue to monitor for leaks, pressure buildup, gas generation, and ruptures in valves, pipes, or other equipment as appropriate until normal operations are resumed;
2. Provide for proper treatment, storage, or disposal of recovered material or waste, contaminated soil or surface water, or any other media or material;
3. Ensure that no waste that may be incompatible with the released material or waste is transferred to, treated at, or stored at the Permitted Unit in the vicinity of the release location until normal operations are resumed; and
4. Ensure that all equipment that is listed in this Permit Attachment is fit for its intended use.

Before resuming hazardous waste management operations at the Permitted Unit after an emergency, the Permittees shall notify the Department.

D.9 EMERGENCY RESPONSE RECORDS AND REPORTS

The time, date, and details of an emergency that require implementation of this Contingency Plan shall be noted in the Operating Record maintained for the affected Unit. Within fifteen (15) calendar days following the emergency, a written report shall be submitted to the Department in hard copy or via e-mail identifying:

1. Name, address, and telephone number of the reporter;
2. Name, address, and telephone number of the Facility;
3. Date, time, and type of the emergency (e.g., fire, explosion, release);
4. Name and quantity of material(s) and wastes involved;
5. Extent of injuries (if any);
6. Assessment of actual or potential hazards to human health or the environment, where applicable; and

7. Estimated quantity and disposition of recovered material, contaminated media, and wastes that resulted from the emergency.

D.10 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE HAZARDOUS WASTE HANDLING UNIT

This Section contains additional information for the Hazardous Waste Handling Unit (HWHU). Current copies of this Contingency Plan shall be maintained at the HWHU and at the Facility EOC.

Figure 43 of Permit Attachment L (*Figures*) presents the evacuation routes for the HWHU. Figure 44 of Permit Attachment L (*Figures*), illustrates the HWHU emergency response and access information locations. The Permittees shall maintain at the HWHU the emergency equipment listed in Table D-4 of this Permit Attachment. The Permittees shall keep current the list of ECs for the HWHU in Table D-5 of this Permit Attachment.

TABLE D-4
Emergency Equipment to be Maintained at the HWHU

Category	Description	Location
Building 958		
Spill Control and Decontamination Equipment	Fixed shower / eyewash	Near south entrance
	Recovery drums and containers	In equipment storage at the HWHU
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	In equipment storage at the HWHU
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the HWHU
	Self-contained breathing apparatus (SCBA)	At south entrance
	Miscellaneous personal protective equipment (protective suits, goggles, and/or safety glasses, gloves)	In equipment storage at the HWHU
Internal Communication and Alarm System	Voice command	
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	On the walls near north and south personnel doors
	Audible fire alarms	
External Communication System	Telephones – unlimited employee access	One on the interior walls near the north and south entrances
	Fire alarm pull stations (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	On the walls near north and south personnel doors
Fire Extinguishers	Portable (A-B-C)	One at both the north and south entrances
Fire Suppression	Automatic wet-pipe water sprinkler system, with heat-actuated sprinklers	Coverage throughout the building
	Water supplied by fire hydrants	One hydrant, location shown in Figure 44 of Permit Attachment L (*Figures*)

TABLE D-4
Emergency Equipment to be Maintained at the HWHU

Category	Description	Location
Building 959		
Spill Control and Decontamination Equipment	Fixed shower/eyewash	Near south entrance
	Recovery drums and containers	In equipment storage at the HWHU
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	In equipment storage at the HWHU
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the HWHU
	SCBA	In equipment storage at the HWHU
	Miscellaneous personal protective equipment (protective suits, goggles, and/or safety glasses, gloves)	In equipment storage at the HWHU
Internal Communication and Alarm System	Voice command	
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers).	On the walls near each personnel door and one inside the office area
	Audible fire alarms	
External Communication System	Telephones – unlimited employee access	One in the office
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers).	On the walls near each personnel door
Fire Extinguishers	Portable (A-B-C)	One at both the north and south entrances
	Portable (D)	One in the general use area, one in the office
Fire Suppression	Automatic wet-pipe water sprinkler system, heat-actuated sprinklers	Coverage throughout the building
	Water supplied by fire hydrants	One hydrant, location shown in Figure 44 of Permit Attachment L (*Figures*)
Modular Storage Buildings (958B and 958C)		
Spill Control and Decontamination Equipment	Personal protective equipment Recovery drums and containers Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present) and spill cleanup items	Buildings 958 and 959, equipment storage at the HWHU
Internal Communication and Alarm System	Voice command	
	Fire alarm pull-boxes (pulling handle sends signal to KAFB fire department, does not actuate system).	Buildings 958 and 959
	Audible fire alarms	
External Communication System	Telephones – unlimited employee access	Buildings 958 and 959
	Fire alarm pull boxes (pulling handle sends signal to KAFB fire department, does not actuate system)	Buildings 958 and 959

TABLE D-4 Emergency Equipment to be Maintained at the HWHU		
Category	**Description**	**Location**
Fire Suppression	Ansul automatic dry chemical system	Coverage throughout the building

TABLE D-5 Emergency Coordinator List for the HWHU			
HWHU Emergency Coordinator		**Office Phone**	**Home Phone**
Primary Office Address:	David Castillo Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 284-4192 (office) (505) 269-1705 (cell) (505) 951-6340 (pager)	(505) 269-1705
First Alternate Office Address:	Ken Tetreault Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 844-1346 (office) (505) 270-4089 (cell) (505) 283-1949 (pager)	(505) 822-6336
Second Alternate Office Address	Chris Dean Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 284-8083 (office) (505) 350-4982 (cell) (505) 283-1942 (pager)	(505) 268-8913
Third Alternate Office Address	Mary Ann Krauss Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 845-9997 (office) (505) 250-2422 (cell) (505) 951-6335 (pager)	(505) 299-0793

D.11 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE THERMAL TREATMENT UNIT

This Section contains additional information for the Thermal Treatment Unit (TTU). Current copies of this Contingency Plan shall be maintained at the TTU and at the Facility EOC.

Figure 45 of Permit Attachment L (*Figures*) presents the evacuation routes for the TTU. The Permittees shall maintain at the TTU the emergency equipment listed in Table D-6 of this Permit Attachment. The Permittees shall keep current the list of ECs for the TTU in Table D-7 of this Permit Attachment.

D.12 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT

This Section contains additional information for the Radioactive and Mixed Waste Management Unit (RMWMU). Current copies of this Contingency Plan shall be maintained at the RMWMU and at the Facility EOC.

Figure 46 of Permit Attachment L (*Figures*) presents the evacuation routes for the RMWMU. The Permittees shall maintain at the RMWMU the emergency equipment listed in Table D-8 of this Permit Attachment. The Permittees shall keep current the list of ECs for the RMWMU in Table D-9 of this Permit Attachment.

TABLE D-6
Emergency Equipment to be Maintained at the TTU Building 6715

Category	Description	Location
Safety and Decontamination Equipment	Permanent eyewash/hand-held deluge showers	Building 6715
	First aid kit	Building 6715
	Absorbent (sufficient absorbent for 20.8 gallons of liquid that could be present in the burn pan)	Building 6715
	Recovery drums and containers	In equipment storage at Building 6715
	Spill cleanup items (mops, brooms, and/or shovels)	Building 6715 equipment storage
	Miscellaneous PPE (protective suits, goggles, gloves)	Building 6715
Internal Communication and Alarm System	Fire alarm pull station (pulling handle sends signal to KAFB fire department)	One on east wall inside Building 6715 near personnel door
	Public address system	Microphone in Building 6715
External Communication System	Telephones	Building 6715
	Fire alarm pull station (pulling handle sends signal to KAFB fire department)	Near personnel doors in Building 6715.
Fire Extinguishers	Portable (A-B-C)	One at or near each personnel door in Buildings 6715, one located at the TTU fence.
Fire Suppression	Water supplied by fire hydrant	One hydrant, location is shown in Figure 45, Attachment L (*Figures*)

TABLE D-7
Emergency Coordinator List for the TTU

TTU Emergency Coordinator		Office Phone	Home Phone
Primary Office Address:	Tim Covert Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-4664 (office) (505) 951-7315 (pager)	(505) 506-5907
First Alternate Office Address:	David Castillo Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-4192 (office) (505) 951-6340 (pager)	(505) 269-1705
Second Alternate Office Address:	Daniel Dow Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-1622 (505) 951-6781 (pager)	(505) 892-0497

TABLE D-8
Emergency Response Equipment to be Maintained at the RMWMU

Category	Description	Location
Building 6920		
Spill Control and Decontamination Equipment	Eyewash Stations/ Showers	On north wall in south bay Near office in north bay
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	In hallway between north and south bays
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
	Miscellaneous PPE (protective suits, goggles, and/or safety glasses, chemical-resistant gloves)	In hallway between north and south bays
Internal Communication and Alarm System	Voice command Portable 2-way radio or equivalent, as needed	Operating personnel
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door in southeast corner of south bay In southwest corner of southwest airlock By personnel door in west mechanical room By personnel door on north wall of north bay By personnel door in entryway west of office
	Audible fire alarms	Located throughout the building
External Communication System	Telephones	Control room, south and north bays
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door in southeast corner of south bay In southwest corner of southwest airlock By personnel door in west mechanical room By personnel door on north wall of north bay By entryway west of office
Fire Extinguishers	Portable (A-B-C)	By personnel door in northeast corner of building By personnel door in southeast corner of south bay By personnel door in southwest corner of south bay In hallway between north and south bays By personnel door in west mechanical room
	Portable (D)	In northwest corner of north bay
	Portable (A-B-C)(D)	By personnel door on north wall of north bay
Fire Suppression	Automatic wet-pipe sprinkler system with heat-actuated sprinklers	Coverage throughout the building

TABLE D-8
Emergency Response Equipment to be Maintained at the RMWMU

Category	Description	Location
	Water supplied by fire hydrants	Three hydrants, Figure 47 of Permit Attachment L (*Figures*)
Building 6921		
Spill Control and Decontamination Equipment	Eyewash Station/Shower	On north wall of assay area
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	By north wall of assay area
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
	Miscellaneous PPE (protective suits, goggles, and/or safety glasses, chemical-resistant gloves)	By north wall of assay area
Internal Communication and Alarm System	Voice command Portable 2-way radio or equivalent, as needed	Operating personnel
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in electrical/mechanical room In central hallway outside restrooms In northwest corner of assay area By east personnel door in southeast counting room By east personnel door in middle east office area
	Audible fire alarms	Located throughout the building
External Communication System	Telephones	Office and lab areas
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in electrical/mechanical room In central hallway outside restrooms In northwest corner of assay area By east personnel door in southeast counting room By east personnel door in middle east office area
Fire Extinguishers	Portable (A-B-C)	By north personnel door in electrical/mechanical room In hallway between assay area and north office area By northwest personnel door of assay area By east personnel door in southeast counting room
Fire Suppression	Automatic wet-pipe sprinkler system with heat-actuated sprinklers	Coverage throughout the building
	Water supplied by fire hydrants	Three hydrants, locations shown in Figure 47 (*Figures*) of Permit Attachment L
Building 6925		
Spill Control and	Portable Eyewash	By personnel door near center of south wall

TABLE D-8
Emergency Response Equipment to be Maintained at the RMWMU

Category	Description	Location
Decontamination Equipment	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	By personnel door near center of south wall
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
	Miscellaneous PPE (protective suits, goggles, and/or safety glasses, chemical-resistant gloves)	By personnel door near center of south wall
Internal Communication and Alarm System	Voice command Portable 2-way radio or equivalent, as needed	Operating personnel
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door in southwest corner of building By personnel door near center of south wall
	Audible fire alarms	Located on east and west wall
External Communication System	Telephone	By personnel door in southwest corner of building
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door in southwest corner of building By personnel door near center of south wall
Fire Extinguishers	Portable (A-B-C)	By personnel door in northeast corner of building By personnel door in southwest corner of building
	Portable (A-B-C)(D)	By personnel door near center of south wall
Fire Suppression	Automatic dry-pipe sprinkler system with heat-actuated sprinklers	Sprinklers located throughout building
	Water supplied by fire hydrants	Three hydrants, locations shown in Figure 47 of Permit Attachment L (*Figures*)
Building 6926		
Spill Control and Decontamination Equipment	Eyewash Station/Shower	In southeast area of building
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	In southeast area of building 6926
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
	Miscellaneous PPE (protective suits, goggles, and/or safety glasses, chemical-resistant gloves)	In southeast area of building 6926
Internal Communication	Voice command	

TABLE D-8
Emergency Response Equipment to be Maintained at the RMWMU

Category	Description	Location
and Alarm System	Portable 2-way radio or equivalent, as needed	Operating personnel
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door on west wall of building By personnel door on south wall of building
	Audible fire alarms	Located on east wall and west wall
External Communication System	Telephone	In southeast area of building 6926
	Fire alarm pull station (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	By personnel door in northeast corner of building By personnel door on west wall of the building By personnel door on south wall of the building
Fire Extinguishers	Portable (A-B-C)	By personnel door in northeast corner of building By personnel door on west wall of the building
	Portable (A-B-C)(D)	By personnel door on south wall of building
Fire Suppression	Automatic dry-pipe sprinkler system with heat-actuated sprinklers	Sprinklers located throughout building 6926
	Water supplied by fire hydrants	Three hydrants, locations shown in Figure 47 of Permit Attachment L (*Figures*)
Modular Storage Buildings		
Spill Control and Decontamination Equipment	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	Buildings 6920 and 6926
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
	Miscellaneous PPE (protective suits, goggles, and/or safety glasses, chemical-resistant gloves)	Buildings 6920 and 6926
Internal Communication and Alarm System	Voice command Portable 2-way radio or equivalent, as needed	Operating personnel
	Fire alarm pull boxes (pulling handle sends signal to KAFB fire department, does not actuate system)	Buildings 6920, 6921, 6925, and 6926
	Audible fire alarms	Buildings 6920, 6921, 6925, and 6926
External Communication System	Telephones	Buildings 6920 and 6926
	Fire alarm pull boxes (pulling handle sends signal to KAFB fire department, does not actuate system)	Buildings 6920, 6921, 6925, and 6926
Fire Suppression	Automatic dry chemical system	Coverage throughout the building

TABLE D-9
Emergency Coordinator List for the RMWMU

RMWMU Emergency Coordinator		Office Phone	Home Phone
Primary Office Address:	Leroy Duran Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-1488 (office) (505) 951-6297 (pager)	(505) 980-4401
First Alternate Office Address:	Phil Zelle Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 844-2486 (office) (505) 951-6248 (pager)	(505) 615-7445
Second Alternate Office Address:	Jesse Farr Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-3041 (office) (505) 951-6336 (pager)	(505) 379-8913
Third Alternate Office Address:	Jeff Jarry Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-3080 (office) (505) 951-6332 (pager)	(505) 697-2108

D.13 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE AUXILIARY HOT CELL UNIT

This Section contains additional information for the Auxiliary Hot Cell Unit (AHCU). Current copies of this Contingency Plan shall be maintained at the AHCU and at the Facility EOC.

Figure 48 of Permit Attachment L (*Figures*) presents the evacuation routes for the AHCU. The Permittees shall maintain at the AHCU the emergency equipment listed in Table D-10 of this Permit Attachment. The Permittees shall keep current the list of ECs for the AHCU in Table D-11 of this Permit Attachment. Facility security officers shall provide unimpeded access to the AHCU for authorized personnel as directed by the IC.

TABLE D-10
Emergency Equipment to be Maintained at the AHCU

Category	Description	Location
Building 6597		
Spill Control and Decontamination Equipment	Fixed shower/eyewash	Near north entrance to Building 6597 high bay
	Absorbent (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	Near north entrance to Building 6597 high bay
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage in Building 6597
	Recovery drums and containers	In equipment storage in Building 6597
	Personal protective equipment (goggles and/or safety glasses, gloves)	Near north entrance to Building 6597 high bay
Internal Communication and Alarm System	Voice communication	
	Fire alarm pull stations (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	One near each exit door Building 6597 high bay
	Audible fire alarms	Located throughout the building
External Communication System	Telephones	Near north entrance to Building 6597 high bay
	Fire alarm pull stations (pulling handle sends signal to KAFB fire department, does not actuate sprinklers)	One near each exit door to Building 6597 high bay
Fire Extinguishers	Portable (A-B-C)	By personnel doors on the east, south, and west walls
Fire Suppression	Automatic wet-pipe sprinkler system with heat-actuated sprinklers	Coverage throughout the high-bay in Building 6597
	Sprinkler head	Hot Cell
	Sprinkler head	In fume hood
	Branch line from the Building 6597 sprinkler system	Temporary Room
	Water supplied by fire hydrant	One hydrant, location shown on Figure 49 of Permit Attachment L (*Figures*)

TABLE D-11 Emergency Coordinator List for the AHCU			
AHCU Emergency Coordinator		**Office Phone**	**Home Phone**
Primary Office Address:	David Siddoway Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 844-2713- (office) (505) 343-9316 (pager)	(505) 867-0828
First Alternate Office Address:	Michael Torneby Sandia National Laboratories P.O. Box 5800 Albuquerque, New Mexico	(505) 845-3254 (office) (800) 343-9371 (pager)	(505) 823-2451

TABLE D-12 Emergency Equipment to be Maintained at the MSBs		
Category	**Description**	**Location**
Spill Control and Decontamination Equipment	Portable Eyewash	By inner door inside each bunker
	Personal protective equipment (chemical-resistant gloves and safety glasses)	By inner door inside each bunker
	Absorbents (sufficient absorbent for 55 gallons of liquid when liquid wastes are present)	By inner door inside each bunker
	Spill cleanup items (mops, brooms, and/or shovels)	In equipment storage at the RMWMU
	Recovery drums and containers	In equipment storage at the RMWMU
Internal Communication and Alarm System	Voice command Portable 2-way radio or equivalent, as needed	Operating personnel.
	Smoke Detectors	Smoke detectors inside each bunker Strobe light on front outside each bunker
External Communication System	Mobile telephone or portable radio	Available to all operating personnel at the bunkers
Fire Extinguishers	Portable (A-B-C)	By entrance door outside each bunker
Fire Suppression	Water to extinguish fires	KAFB tanker truck at the KAFB fire station in the Manzano administrative area

TABLE D-13
Emergency Coordinator List for the MSBs

MSB Emergency Coordinator		Office Phone	Home Phone
Primary Office Address:	Leroy Duran Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-1488 (office) (505) 951-6297 (pager)	(505) 980-4401
First Alternate Office Address:	Phil Zelle Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 844-2486 (office) (505) 951-6248 (pager)	(505) 615-7445
Second Alternate Office Address:	Jesse Farr Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-3041 (office) (505) 951-6336 (pager)	(505) 379-8913
Third Alternate Office Address:	Jeff Jarry Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 284-3080 (office) (505) 951-6332 (pager)	(505) 697-2108

D.14 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE MANZANO STORAGE BUNKERS

This Section contains additional information for the Manzano Storage Bunkers (MSBs). Current copies of this Contingency Plan shall be maintained at each MSB and at the Facility EOC.

Figure 50 of Permit Attachment L (*Figures*) presents the evacuation routes for each MSB. The Permittees shall maintain at each MSB the emergency equipment listed in Table D-12 of this Permit Attachment. The Permittees shall keep current the list of ECs for each MSB in Table D-13 of this Permit Attachment.

D.15 ADDITIONAL CONTINGENCY PLAN INFORMATION FOR THE CAMU

This Section contains additional information for the Corrective Action Management Unit (CAMU). Current copies of this Contingency Plan shall be maintained at the CAMU administrative trailer and the Facility EOC.

The CAMU is a remediation-waste management unit that is located about 100 yards northwest of the adjacent chemical waste landfill (CWL). Emergency response resources for the CAMU are shared with the CWL.

Figure 51 of Permit Attachment L (*Figures*) presents the evacuation routes for the CAMU. The Permittees shall maintain at the CAMU the emergency equipment listed in Table D-14 of this Permit Attachment. The Permittees shall keep current the list of ECs for the CAMU in Table D-15 of this Permit Attachment.

TABLE D-14
Emergency Equipment to be Maintained at the CAMU

Category	Description	Location
Spill Control Equipment	Spill control materials, including sorbent material, brooms and shovels	Leachate Storage Area Shed
Fire Extinguisher	Portable, Multi-Class	One near the Leachate Storage Area and Containment Cell, and one in CAMU office
Communications: (Internal/External)	Mobile telephone or portable radio or equivalent	Carried by personnel as needed
	Telephone	CAMU office
Water Supply	Fire Hydrant	One outside the southeast entrance to the CAMU
Environmental Safety and Health	Portable eyewash station	Leachate Storage Area Shed (during waste handling activities)
Evacuation	Voice command by on-site personnel or signaled by three blasts of a vehicle warning horn.	Designated Assembly Area (See Figure 51 in Permit Attachment L (*Figures*)

TABLE D-15
Emergency Coordinator List for the CAMU

CAMU Emergency Coordinator		Office Phone	Home Phone
Primary Office Address:	Don Schofield Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 844-4088 (office) (505) 259-7098 (cell) (505) 951-6153 (pager)	(505) 268-6888
First Alternate Office Address:	Robert Ziock Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 845-0485 (office) (505) 238-3668 (cell) (505) 951-6160 (pager)	(505) 255-4714
Second Alternate Office Address:	Daneille Nieto Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87185	(505) 845-7706 (office) (505) 239-3989 (cell) (505) 951-6537 (pager)	(505) 239-3989

PERMIT ATTACHMENT E INSPECTION PLAN

E.1 INTRODUCTION

In accordance with the requirements of 40 CFR §§ 264.15, 264.174, and 264.602 the Permitted Units shall be inspected for malfunctions and deterioration, operator errors, and discharges that may be causing, or may lead to, a release of hazardous or mixed waste or hazardous waste constituents to the environment or a threat to human health. Inspections shall be of items including, but not limited to, monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment important to prevent, detect, and respond to environmental and human health hazards. Containers of hazardous and mixed waste stored at a Permitted Unit shall also be routinely inspected to assess, secondary containment, location with respect to incompatible wastes, and compatibility of waste with containers. Unit-specific inspection requirements for all units are found below.

A copy of this Permit Attachment shall be maintained at each Permitted Unit.

1. Hazardous Waste Handling Unit (HWHU),
2. Thermal Treatment Unit (TTU) (records in Building 6715),
3. Radioactive and Mixed Waste Management Unit (RMWMU),
4. Auxiliary Hot Cell Unit (AHCU), and
5. Each Manzano Storage Bunker (MSB, 37034, 37045, 37055, 37057 and 37118).
6. The Corrective Action Management Unit (CAMU) main office.

E.2 INSPECTION RECORDS

The Permittees shall conduct inspections and record the results on inspection forms. The inspection forms shall identify the items to be inspected, and at a minimum, must include the items or parameters specified for each of the permitted units as shown in Tables E-1 through E-6. The following information shall also be recorded on inspection forms.

1. Name of the inspector,
2. The date and time of inspection,
3. Notation of observations and results of the inspection, and
4. The date and nature of any repairs or remedial actions.

Inspection records shall be maintained at the Facility for the active life of the Facility, except as provided by 20.4.1.501.A(5) NMAC, Permit Section 7.2.2 and Permit Attachment H (Post-Closure Care Plans for the Corrective Action Management Unit). Current calendar year inspection records for each Permitted Unit shall be maintained at that Unit. All other inspection records shall be maintained in the Operating Record.

E.3 REMEDIAL ACTION

A response indicating the condition of each item subject to inspection requirements shall be entered in the appropriate column on an inspection form. If any defects, deterioration, damage, release of hazardous or mixed waste or constituents, or potential hazards are discovered during an inspection, the Permittees shall take corrective action in a timely manner upon discovery to

ensure that the problem does not lead to an environmental or human health hazard or noncompliance with this Permit. Actions taken shall, as appropriate, include evaluation and removal of accumulated liquids from secondary containment, transfer of waste from a defective container to an appropriate container in good condition, and repair or replacement of nonfunctioning equipment or systems. If an inspection reveals that a non-emergency problem has developed, corrective action including repairs, maintenance, and replacement shall be completed as soon as practical to preclude further damage.

Corrective action taken (along with time, date, results, and other pertinent information) in response to conditions discovered during an inspection shall be recorded in the appropriate section of the inspection form on which the condition requiring corrective action was first noted or the first inspection form completed following implementation of the corrective action.

E.4 INSPECTION SCHEDULE AND REQUIREMENTS FOR PERMITTED UNITS

The schedules described in this section and indicated on Tables E-1 through E-6 shall be followed for the inspection of the Units noted in Section E.1 of this Permit Attachment.

E.4.1 Daily Inspection

During each day that hazardous wastes or mixed wastes are handled (e.g., containers are opened or moved) at a Permitted Unit the Permittees shall inspect:

1. The loading/unloading areas that were used, including waste handling equipment, and the containers loaded/unloaded;
2. Treatment areas that were used, including treatment equipment and monitoring equipment.

E.4.2 Weekly Inspection

During each week that hazardous waste or mixed waste management (including storage) occurs at a Permitted Unit the Permittees shall at least inspect once weekly: container storage, including container placement, integrity, sealing, labeling, dates of storage, condition of storage area (i.e., floors, walls), secondary containment (liquid waste), waste compatibility and container compatibility storage conditions.

E.4.3 Monthly Inspection

During each month that hazardous waste or mixed waste management occurs at a Permitted Unit the Permittees shall at least once inspect monthly:

1. Safety & Emergency Equipment, including spill control equipment, fire extinguishers, decontamination equipment, external communication systems, internal communication and alarm systems, and fire suppression systems;
2. Security devices, including the perimeter fence, gates and doors, warning signs, locks and tamper indication devices;
3. Unit operation and structural equipment, including the floors, walls, ceilings;
4. Treatment areas, including general conditions (floors, walls), treatment equipment and tools, and monitoring equipment.

E.5 INSPECTION PLAN FOR THE HAZARDOUS WASTE HANDLING UNIT

Specific items and areas that shall be inspected at the HWHU, and the inspection criteria and frequency are listed in Table E-1 of this Permit Attachment. The items listed in the subject Table shall be inspected in each HWMU waste management area.

TABLE E-1
Inspection Schedule for the Hazardous Waste Handling Unit

ITEM OR PARAMETER	INSPECTION CRITERIA	INSPECTION FREQUENCY
SAFETY AND EMERGENCY EQUIPMENT **See Table D-4 in Permit Attachment D for additional information**		
Eye wash / safety shower	Operational, accessible, in good condition	Monthly
First-aid kit	Present and stocked	Monthly
Spill control and cleanup items	Present, quantities per inventory, and in good condition	Monthly
Self-contained breathing apparatus	Present and in good condition	Monthly
Personal protective equipment	Present in quantities per inventory, and in good condition	Monthly
Fire alarm pull station(s)	Present, accessible, and in good condition	Monthly
Fire alarm(s)	Present, appears to be in good condition	Monthly
Telephone(s)	Present and operational	Monthly
Fire extinguisher(s)	Present, charged, accessible, and in good condition	Monthly
Fire sprinklers and system	Present, appears to be in good condition, sprinklers not obstructed	Monthly
OPERATING AND STRUCTURAL EQUIPMENT **Buildings 958, 959, 958B, and 958C**		
Building / storage area floor	Clean, no spills, cracks, or excessive wear	Weekly when and where wastes are managed. Monthly otherwise.
Building walls	Not leaking or spalling, in good condition	Weekly when and where wastes are managed. Monthly otherwise.
Building ceiling	Not leaking or spalling, and in good condition	Weekly when and where wastes are managed. Monthly otherwise.
Building lights	Operational and in good condition	Weekly when and where wastes are managed. Monthly otherwise.
Shelves (Building 959 only)	Clean, in good condition, no accumulated leaks or spills	Daily when and where wastes are handled. Weekly otherwise.

TABLE E-1 Inspection Schedule for the Hazardous Waste Handling Unit		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
Secondary containment	Free of liquids, good condition (i.e., no cracks, excessive wear)	Daily when and where wastes are handled. Weekly otherwise.
Loading and unloading areas	Good condition, safe working surface, no cracks, no spills	Daily when and where wastes are handled. Monthly otherwise.
Waste handling equipment	Good condition, in good repair, operational	Daily when and where wastes are handled. Monthly otherwise.
Monitoring equipment	Instruments in good condition, operational, calibrated	Daily when and where wastes are handled. Monthly otherwise.
Waste transfer pump	Present, operational, and in good condition	Prior to use, Monthly otherwise.
Storm water retention pond	Good condition, adequate freeboard, outlet not obstructed, no evidence of release of hazardous or mixed waste	Weekly
SECURITY DEVICES		
Fence	Present and in good condition	Monthly
Warning signs	Present, legible, and in good condition	Monthly
Gates and doors	Present, operational, in good condition	Monthly
Locks	Present, operational, in good condition	Monthly
CONTAINERS		
Integrity	Good condition (i.e., no bulging, leaks, corrosion, or deterioration)	Weekly
Closed	Correct lid/cover placement (i.e., properly closed and sealed)	Weekly
Labeling	Correct information, correct location, legible	Weekly
Storage Conditions	Waste compatible with container, container located with compatible wastes	Weekly
Location	Correct aisle space, stable stacking	Weekly

E.6 INSPECTION PLAN FOR THE THERMAL TREATMENT UNIT

The Permittees shall perform inspections of the Thermal Treatment Unit (TTU) in accordance with the schedule and requirements in Table E-2.

TABLE E-2 Inspection Schedule for the Thermal Treatment Unit		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
SAFETY AND EMERGENCY EQUIPMENT **See Table D-6 in Permit Attachment D for additional information**		
Eye wash and safety shower	Operational, accessible, in good condition	Monthly
First-aid kit	Present and stocked	Monthly
Personal protective equipment	Present in quantities per inventory, and in good condition	Monthly
Spill control and cleanup items	Present, accessible, quantities per inventory, in good condition	Monthly
Fire alarm pull station(s)	Present, accessible, and in good condition	Monthly
Fire alarm(s)	Present, appears to be in good condition	Monthly
Public address system	Operational	Monthly
Telephone(s)	Present and operational	Monthly
Fire extinguisher(s)	Present, charged, accessible, and in good condition	Prior to treatment. Monthly otherwise
OPERATING AND STRUCTURAL EQUIPMENT		
Waste transfer pump	Present, operational, and in good condition	Prior to use
Waste transfer tubes	Free of apparent leaks and in good condition	Prior to use
Burn pan	Present, free of apparent leaks, and in good condition	Prior to treatment. Monthly otherwise.
Burn pan lid	Operational and in good condition	Prior to treatment. Monthly otherwise.
Burn cage	Present and in good condition	Prior to treatment. Monthly otherwise.
Burn cage door	Operational and in good condition	Prior to treatment. Monthly otherwise.
Steel-lined concrete pad	No cracks and in good condition	Monthly
Filter element	Present, free of tears or holes, and in good condition	Monthly
Rain catch tank	Free of apparent leaks and in good condition	Monthly
Area condition	Free of combustible materials and weeds and in good condition	Prior to treatment. Monthly otherwise.
Red warning beacons	Present and operational	Prior to treatment. Monthly otherwise.

TABLE E-2 Inspection Schedule for the Thermal Treatment Unit		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
Water spigot and hose	Present, operational, and in good condition	Prior to treatment. Monthly otherwise.
Burner control warning bell	Operational	Prior to treatment. Monthly otherwise.
SECURITY DEVICES		
Fence	Present and in good condition	Monthly
Warning signs	Present, legible, and in good condition	Monthly
Gates	Present, operational, in good condition	Monthly
Locks	Present, operational, in good condition	Monthly

E.7 INSPECTION PLAN FOR THE RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT

The Permittees shall perform inspections of the Radioactive and Mixed Waste Management Unit (RMWMU) in accordance with the schedule and requirements in Table E-3.

TABLE E-3 Inspection Schedule for the RMWMU		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
SAFETY AND EMERGENCY EQUIPMENT **See Table D-8 in Permit Attachment D for additional information**		
Eye wash / safety shower	Operational, accessible, in good condition	Monthly
First-aid kit	Present and stocked	Monthly
Spill control and cleanup items	Present, accessible, quantities per inventory, in good condition	Monthly
Personal protective equipment	Present in quantities per inventory, and in good condition	Monthly
Fire alarm pull station(s)	Present, accessible, and in good condition	Monthly
Fire alarm(s)	Present, appears to be in good condition	Monthly
Telephone(s)	Present and operational	Monthly
Fire extinguisher(s)	Present, charged, accessible, and in good condition	Monthly

TABLE E-3
Inspection Schedule for the RMWMU

ITEM OR PARAMETER	INSPECTION CRITERIA	INSPECTION FREQUENCY
Fire sprinklers and system	Present, appears to be in good condition, sprinklers not obstructed	Monthly
OPERATING AND STRUCTURAL EQUIPMENT		
Building / storage area floor	Clean, no spills, cracks, or excessive wear	Weekly when wastes are managed. Monthly otherwise.
Building walls	Not leaking or spalling, in good condition	Weekly when wastes are managed. Monthly otherwise.
Building ceiling	Not leaking or spalling, and in good condition	Weekly when and where wastes are managed. Monthly otherwise.
Building lights	Operational and in good condition	Weekly when and where wastes are managed. Monthly otherwise.
Loading and unloading areas	Good condition, safe working surface, no cracks, no spills	Daily when and where wastes are handled. Monthly otherwise.
Waste handling equipment	Good condition, in good repair, operational	Daily when and where wastes are handled. Monthly otherwise.
Treatment area	Good condition, clean, uncluttered, no spills	Prior to treatment. Monthly otherwise.
Treatment equipment	Good condition (i.e., no releases or deterioration); or present if in storage	Daily when and where wastes are treated. Prior to use for consumables and items that have been stored. Monthly otherwise.
Monitoring equipment	Instruments in good condition, operational, calibrated	Daily when and where wastes are handled. Monthly otherwise.
Storm water retention pond	Good condition, adequate freeboard, outlet not obstructed, no evidence of release of hazardous or mixed waste	Weekly.
SECURITY DEVICES		
Fence	Present and in good condition	Monthly
Warning signs	Present, legible, and in good condition	Monthly
Gates and doors	Present, operational, in good condition	Monthly
Locks	Present, operational, in good condition	Monthly
CONTAINERS		
Integrity	Good condition (i.e., no bulging, leaks, corrosion, or deterioration)	Weekly.
Closed	Correct lid/cover placement (i.e., properly closed and sealed)	Weekly.
Labeling	Correct information, correct location, legible	Weekly.
Secondary Containment (liquid waste)	Adequate volume, free of liquids, good condition (i.e., no cracks, excessive wear)	Daily when and where wastes are handled. Weekly otherwise. .

TABLE E-3 Inspection Schedule for the RMWMU		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
Storage Conditions	Waste compatible with container, container located with compatible wastes	Weekly.
Location	Correct aisle space, stable stacking	Weekly.

E.8 INSPECTION PLAN FOR THE AUXILIARY HOT CELL UNIT

The Permittees shall perform inspections of the Auxiliary Hot Cell Unit (AHCU) in accordance with the schedule and requirements in Table E-4. The items listed in Table E-4 shall be inspected in each AHCU waste management area.

In order to reduce the radiation exposure to levels as low as reasonably achievable (ALARA), the Permittees may conduct alternative inspections of the storage silos. When necessary to reduce radiation exposure for ALARA requirements, instead of inspecting the silos directly, the Permittees may visually inspect waste containers before they are placed in the silos and when they are removed from the silos. The visual inspection may be conducted from a safe distance or remotely via camera to maintain ALARA conditions for personnel.

TABLE E-4 Inspection Schedule for the Auxiliary Hot Cell Unit		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
SAFETY AND EMERGENCY EQUIPMENT **See Table D-10 in Permit Attachment D for additional information**		
Eye wash / safety shower	Operational and in good condition	Monthly
First-aid kit	Present and stocked	Monthly
Spill control and cleanup items	Present, quantities per inventory, and in good condition	Monthly
Personal protective equipment	Present in quantities per inventory, and in good condition	Monthly
Fire alarm pull station(s)	Present, accessible, and in good condition	Monthly
Fire alarm(s)	Present, appears to be in good condition	Monthly
Telephone(s)	Present and operational	Monthly
Fire extinguisher(s)	Present, charged, accessible, and in good condition	Monthly
Fire sprinklers and system	Present, appears to be in good condition, sprinklers not obstructed	Monthly

TABLE E-4 Inspection Schedule for the Auxiliary Hot Cell Unit		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
OPERATING AND STRUCTURAL EQUIPMENT		
Building / storage area floor, tops of silo covers	Clean, no spills, cracks, or excessive wear	Weekly when wastes are managed. Monthly otherwise.
Building walls	Not leaking or spalling, in good condition	Weekly when wastes are managed. Monthly otherwise.
Building ceiling	Not leaking or spalling, and in good condition	Weekly when wastes are managed. Monthly otherwise.
Building lights	Operational and in good condition	Weekly when wastes are managed. Monthly otherwise.
Loading and unloading areas	Good condition, safe working surface, no cracks, no spills	Daily when and where wastes are handled. Monthly otherwise.
Waste handling equipment	Good condition, in good repair, operational	Daily when and where wastes are handled. Monthly otherwise.
Treatment area	Good condition, clean, uncluttered, no spills	Prior to treatment. Monthly otherwise.
Treatment equipment	Good condition (i.e., no releases or deterioration)	Daily when and where wastes are treated. Prior to use for consumables. Monthly otherwise.
SECURITY DEVICES		
Warning signs	Present, legible, and in good condition	Monthly
Doors	Present, operational, in good condition	Monthly
Locks	Present, operational, in good condition	Monthly
CONTAINERS		
Integrity	Good condition (i.e., no bulging, leaks, corrosion, or deterioration)	Weekly
Closed	Correct lid/cover placement (i.e., properly closed and sealed)	Weekly
Labeling	Correct information, correct location, legible	Weekly
Secondary Containment (liquid waste)	Adequate volume, free of liquids, good condition (i.e., no cracks, excessive wear)	Daily when and where wastes are handled. Weekly otherwise.
Storage Conditions	Waste compatible with container, container located with compatible wastes	Weekly
Location	Correct aisle space, stable stacking	Weekly

E.9 INSPECTION PLAN FOR THE MANZANO STORAGE BUNKERS

The Permittees shall perform inspections of the Manzano Storage Bunkers (MSB) in accordance with the schedule and requirements in Table E-5.

TABLE E-5 Inspection Schedule for the Manzano Storage Bunkers		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
SAFETY AND EMERGENCY EQUIPMENT **See Table D-12 in Permit Attachment D for additional information**		
Portable eye wash	Operational, accessible, in good condition	Monthly
First-aid kit	Present and stocked	Monthly
Spill control and cleanup items	Present, quantities per inventory, accessible, in good condition	Monthly
Personal protective equipment	Present in quantities per inventory, and in good condition	Monthly
Smoke detector and external light	Present, appears to be in good condition	Monthly
Fire extinguisher	Present, charged, accessible, and in good condition	Monthly
OPERATING AND STRUCTURAL EQUIPMENT		
Bunker floor	Clean, no spills or excessive wear	Weekly when wastes are managed. Monthly otherwise.
Bunker walls	Not leaking or spalling, in good condition	Weekly when wastes are managed. Monthly otherwise.
Bunker ceiling	Not leaking or spalling, and in good condition	Weekly when wastes are managed. Monthly otherwise.
Bunker lights	Operational and in good condition	Weekly when wastes are managed. Monthly otherwise.
Loading and unloading areas	Good condition, safe working surface, no spills	Daily when and where wastes are handled. Monthly otherwise.
Waste handling equipment	Good condition, in good repair, operational	Daily when and where wastes are handled. Monthly otherwise.
SECURITY DEVICES		
Warning signs	Present, legible, and in good condition	Monthly
Doors	Present, operational, in good condition	Monthly
Locks	Present, operational, in good condition	Monthly
CONTAINERS		
Integrity	Good condition (i.e., no bulging, leaks, corrosion, or deterioration)	Weekly
Closed	Correct lid/cover placement (i.e., properly closed and sealed)	Weekly
Labeling	Correct information, correct location, legible	Weekly
Secondary	Adequate volume, free of liquids, good	Daily when and where wastes are

TABLE E-5 Inspection Schedule for the Manzano Storage Bunkers		
ITEM OR PARAMETER	**INSPECTION CRITERIA**	**INSPECTION FREQUENCY**
Containment (liquid waste)	condition (i.e., no cracks, excessive wear)	handled. Weekly otherwise.
Storage Conditions	Waste compatible with container, container located with compatible wastes	Weekly
Location	Correct aisle space, stable stacking	Weekly

E.10 INSPECTION PLAN FOR THE CORRECTIVE ACTION MANAGEMENT UNIT

E.10.1 Inspection, Maintenance, and Repair Activities and Frequencies

The CAMU shall be routinely inspected during the post-closure care period as discussed in the following sections. The CAMU systems associated with the containment cell that will require inspection and maintenance/repair during the post-closure care period include, but are not limited to: (1) the final cover; (2) surface-water diversion structures; (3) the LCRS; (4) the VZMS; and (5) the perimeter security fence, security signs, and gate locks. Inspection and maintenance of all of these systems shall be performed throughout the post-closure care period in accordance with the schedule in Table E-6. Inspections shall be performed on a regularly scheduled basis to ensure the integrity and proper functioning of the waste containment cell and final cover, surface water diversion structures, the LCRS, the VZMS, and the perimeter fence, security signs and gate locks. Maintenance activities are addressed in more detail in Permit Attachment H.

E.10.2 Final Cover System Inspection

The final cover shall be inspected on a quarterly basis. Cover inspections shall note, in writing, deep-rooted plants (with roots at least 8 ft deep at maturity), such as shrubs and trees, by identifying such species; whether there is any settlement of the cover surface in excess of 6 inches; whether animal intrusion burrows in excess of 4 inches in diameter or burrows of species able to burrow 6 ft or deeper are present; erosion of the cover soil in excess of 6 inches deep; contiguous areas with no vegetation in excess of 200 square feet; and any other conditions that may impact the cover's integrity and performance.

The final cover shall also undergo vegetation monitoring quarterly until the vegetative cover is successfully established according to the following criteria:

1. Total percent foliar coverage equals 20 percent (i.e., 20 percent of the land surface is covered with living plants versus 80 percent bare surface area);
2. Of the 20 percent total foliar coverage, 50 percent or greater comprises native perennial species, and 50 percent or less comprises annual species; and
3. No contiguous bare spots greater than 200 square feet (approximately 14 by 14 feet) are present.

If these criteria are met, it shall be concluded that the native community is successfully established on the cover. After the native community is successfully established, full biological inspections shall be conducted annually.

E.10.3 Storm-Water Diversion Structures Inspection

The storm-water diversion structures shall be inspected on a quarterly basis to verify structural integrity and to ensure adequate performance. Inspections shall note, in writing, whether there is any erosion of the channels or sidewalls in excess of 6 inches deep and whether there is any accumulation of silt greater than 6 inches deep or debris that blocks more than one-third of the channel width.

E.10.4 LCRS Inspection

As described in Section A.7.3.1 of Permit Attachment A, the LCRS shall be inspected on a quarterly basis for the presence of leachate using the LCRS pump. For inspection purposes, the LCRS pump shall be manually activated on at least a quarterly basis and on a schedule consistent with the inspection and maintenance schedule for the LCRS outlined in Table E-6 of this Permit Attachment. When the pump is manually activated, leachate will be removed from the sump until the LCRS pump experiences cavitation. At this point the pump will be deactivated and leachate removal will cease. When the pump is manually activated and no leachate is generated a video camera inspection shall be performed to determine whether the pump is experiencing cavitation due to an insufficient leachate level or whether the pump has malfunctioned. If the pump has malfunctioned, the cause of the malfunction shall be determined, and the pump replaced or repaired as necessary. The pump assembly may be removed and properly stored until needed.

E.10.5 VZMS Inspection

During quarterly monitoring events (see Table E-6 of this Permit Attachment), the VZMS components shall be inspected. The inspection shall note, in writing, the condition of the components including protective casings, access covers and doors, instrumentation access boxes, compression caps, locks, and electronic monitoring systems.

E.10.6 Security Fence Inspection

The fence, gates, and warning signs shall be inspected on a quarterly basis. The inspections shall document, in writing, the condition of the fence, including fence wires, posts, gates, gate locks, and warning signs, and note whether there is any excessive accumulations of wind-blown plants and debris that would obscure warning signs, block access to the CAMU containment cell, or would interfere with any waste management activities or with any of the VZMS components or monitoring of any kind.

Table E-6
CAMU Post-Closure Inspection and Maintenance/Repair Schedule

CAMU System to be Inspected	Inspection Parameters	Inspection Frequency	Maintenance/Repair Implementation	Maintenance/Repair Frequency
Final Cover System	Existence of invasive plants or plants with the potential for forming deep roots (at least 8 ft deep at maturity)	Quarterly	Physically remove or otherwise eliminate the invasive or deep-rooting plant	Within 60 days of identification or as soon as seasonal conditions are most favorable for eliminating the plants.
	Settlement of cover surface in excess of 6 inches		Repair cover system damage that exceeds prescribed limits, relocate animals if possible and repair burrows	Within 60 days of discovery of needed repairs[b]
	Animal intrusion burrows in excess of 4 inches in diameter or burrows that appear to be of species able to burrow 6 ft or greater)			
	Erosion of cover soil in excess of 6 inches deep			
	Contiguous areas of no vegetation >200 ft^2		Revegetate barren areas that exceed prescribed limits	Within 60 days of discovery of needed repairs or as soon as possible if seasonal conditions are not appropriate within 60 days
Final Cover System	Full biological inspection, including: Approximate percentage vegetative coverage (actively photosynthesizing) Approximate percentage native vegetation of the total vegetative cover Main plant species growing on the CAMU cover and the approximate percentage of the cover populated by each species.	Annually[a]	Remove plants, revegetate barren areas, relocate animals if possible and repair burrows, augment soil and/or reseed per biologist recommendations	Follow schedule above for each item.
Storm-Water Diversion Structures	Channel or side-wall erosion in excess of 6 inches deep	Quarterly	Repair erosion that exceeds prescribed limits	Within 60 days of discovery of needed repairs[b]
	Accumulations of silt in excess of 6 inches deep		Remove silt and debris accumulations that exceed prescribed limits	
	Debris that blocks more than 1/3 of channel width.			

Table E-6
CAMU Post-Closure Inspection and Maintenance/Repair Schedule

CAMU System to be Inspected	Inspection Parameters	Inspection Frequency	Maintenance/Repair Implementation	Maintenance/Repair Frequency
LCRS	Leachate in sump	Monthly / Quarterly[c]	Manually activate pump/inspect for leachate collection	Monthly/Quarterly
	Pump	Quarterly	Maintain/repair pump	Within 60 days of discovery of needed repairs[b]
	Plumbing		Maintain/repair plumbing	
VZMS	Protective casings Access covers and doors Instrumentation access boxes Compression caps	Quarterly	Maintain/repair protective casings, access covers and doors, instrumentation access boxes, and compression caps	Within 60 days of discovery of needed repairs[b]
	Locks		Clean/replace locks	
	Electronic monitoring systems		Maintain calibration and proper operating condition of electronic monitoring systems	
	Aboveground VZMS components		Ensure aboveground VZMS components are protected from weather	
	Monitoring equipment (pump, tubing, gauges, valves, etc.) in need of repair/maintenance			
Security Fence	Presence of wind-blown plants and debris	Quarterly	Remove wind-blown plants and debris	Within 60 days of discovery of needed repairs[b]
	Condition of fence wires, posts, gates, gate locks, and warning signs		Repair broken wire sections and posts Repair and oil gates Clean or replace locks Repair or replace warning signs	
Safety and Emergency Equipment See Table D-14 in Permit Attachment D for additional information	Spill control materials, including sorbent material, brooms and shovels are present, accessible, and in good condition	Monthly	Repair or replace	As soon as possible, but no later than 10 work days.
	Fire extinguisher is present, charged, accessible, and in good condition			
	Portable eyewash station is operational and in good condition			

a This inspection will be conducted quarterly until the vegetative cover is successfully established and annually thereafter.
b Maintenance/repairs shall be performed as necessary, based upon the results of inspections.
c The LCRS pump and plumbing shall be maintained/repaired based upon the results of quarterly inspections.
CAMU Corrective Action Management Unit.
ft2 Square foot (feet).
LCRS Leachate Collection and Removal System.
VZMS Vadose Zone Monitoring System

PERMIT ATTACHMENT F PERSONNEL TRAINING PLAN

F.1 INTRODUCTION

This Permit Attachment (F) describes training requirements for employees and any contractors who work at the Permitted Units, including the Corrective Action Management Unit (CAMU) (*See* 40 CFR § 264.16). The primary objective of the training is to prepare those personnel to safely manage hazardous and mixed waste. The degree of training varies with the job duties.

F.2 HAZARDOUS WASTE MANAGEMENT RESPONSIBILITIES

This program provides employees with training relevant to their positions. Personnel shall be given, at a minimum, a basic understanding of the Resource Conservation and Recovery Act (RCRA) regulatory requirements for waste management, emergency procedures, and operating procedures. Some employees shall receive additional classroom and on-the-job training designed for specific duties. In accordance with 40 CFR § 264.16(b) employees who have not received training or are unable to provide relevant and appropriate training documentation shall receive the required training within six months of assignment to hazardous and mixed waste management activities and prior to managing those wastes without supervision.

F.3 TRAINING CONTENT, FREQUENCY, AND TECHNIQUES

Personnel who are directly involved in hazardous and mixed waste handling shall be informed of the potential hazards, procedures for safe handling of wastes, and emergency procedures. Individuals in supervisory or decision-making positions shall receive a comprehensive overview of all aspects of waste management relevant to the Permitted Unit. Personnel with specific or short-term assignments, such as visitors or temporary contractors not directly involved in waste management, may receive a site-specific safety briefing with emergency response information necessary for their duties as an alternative to the training specified in this Permit Attachment. The training program shall include a combination of classroom instruction, reviews of written documents, and on-the-job training exercises as appropriate for the position. Training course content and frequency shall be as shown in Table F-1 of this Permit Attachment. As regulatory compliance requirements change training courses shall be evaluated and modified, as necessary.

F.4 JOB TITLE/JOB DESCRIPTION AND TRAINING RECORDS

Job titles and descriptions of hazardous and mixed waste management personnel are provided in Tables F-4 through F-14 of this Permit Attachment. The job descriptions include requisite skills, education, and/or other qualifications as well as hazardous and mixed waste management job duties. The required training for each job title is listed in Tables F-1 and F-2 of this Permit Attachment. Additional required training for each job title for workers at the TTU are listed in Table F-3 of this Attachment.

In accordance with 40 CFR §264.16(d)(1) and (d)(2), a file of all Permitted Unit personnel, including their job titles and job descriptions shall be maintained at each Permitted Unit. For each job title, the file shall contain requisite qualifications, and training records.

In accordance with 40 CFR § 264.16(d) (4), training records shall be kept to document the type and amount of training received by employees at each Permitted Unit. Contents of these records shall include at a minimum, the following:

1. Job title for each position related to hazardous or mixed waste management;
2. The name of the employee assigned to each job title;
3. Written job description;
4. Written training requirements for each job title;
5. Records that document training received, such as attendance or signature lists, certificates, memoranda of training, or reports from computerized databases of training completion status.

Current-year training records shall be kept at the Unit to which employees are or were assigned and training records for previous years shall be maintained at the Facility Records Center. For MSB personnel, all training records to be maintained at the Unit shall be maintained at the RMWMU. For former employees, training records shall be maintained at the Facility Records Center for a minimum of three years from the date the employee last worked at a Permitted Unit.

F.5 TRAINING DIRECTOR

The Unit-specific Department Manager or designee shall function as the Training Director. The Manager shall maintain responsibility for ensuring that all Unit-specific required training is administered to all employees. The Training Director shall be knowledgeable about the hazardous waste management regulations, this Permit and specific hazardous or mixed waste management operations employed at the Permitted Unit. The Training Director shall ensure that the training required for individual employees is administered in accordance with the requirements of this Permit.

The Training Director may perform or delegate training to qualified trainers. Trainers shall be qualified on the basis of attainment of one or more of the following:

1. Certification in the subject matter addressed by the training;
2. Demonstration of knowledge and competence in the training subject; or,
3. Previous on-the-job or classroom training in the topics covered.

TABLE F-1
Training Content and Frequency

A. RCRA Regulation Training

Duration: Variable (1-4 hours)

Frequency: Initial/Periodic Refresher (at least annually)

Method: Classroom instruction, on-the-job training, document review.

Minimum content may include (as applicable to the specific Permitted Unit to which an employee is assigned):

1. Identification of hazardous waste
2. Treatment, storage, and disposal requirements
3. Generator and transporter requirements

B. RCRA Contingency Plan and Emergency Procedures

Duration: Variable (1-4 hours)

Frequency: Initial/Annual Refresher

Method: Classroom or online instruction, document review, classroom and hands-on exercises

Minimum content must include (as applicable to the specific Permitted Unit to which an employee is assigned):

1. Emergency notification procedures;
2. Response to emergencies
3. Evacuation route and procedures
4. Emergency equipment and personal protective equipment
5. Emergency Coordinator responsibilities
6. Post-emergency actions
7. Contingency Plan
8. Shutdown procedures (if any)

TABLE F-1 (Continued)

C. Technical Work Documents and Refresher

Duration: As appropriate

Frequency: Initial/Periodic Refresher

Method: Document review, on-the-job training

Minimum Content: This training is function-specific and may be divided into sections or modules. Each employee must participate in the sections that apply to his or her specific job function. Sections include, but are not limited to, the following as needed:

1. Waste Analysis Plan
2. Unit-specific safety practices
3. Unit-specific operational procedures (e.g., loading and unloading)
4. Unit security, entry, and control
5. Operation, maintenance, and inspection of equipment
6. Prevention of the ignition/reaction of ignitable/reactive wastes
7. Permit conditions
8. Emergency response
9. Unit tour

D. Hazardous Waste Operations and Emergency Response

Duration: Variable (24 hours or more with an 8-hour refresher)

Frequency: Initial/Refresher (at least annually)

Method: Classroom instruction, hands-on exercises

Minimum Content:

1. Hazardous and mixed waste management and regulations
2. Sources of information
3. Compatibility of hazardous and mixed wastes
4. Personnel protection
5. Principles of safety
6. Emergency procedures

TABLE F-2
Training for Each Job Title

Required Training (*See* Table F-1)	JOB TITLES										
	Training Director	**RCRA Project Leader**	**Emergency Coordinator**	**Chemist**	**Field Technician (Waste Handler)**	**Special Projects Staff**	**Inspector**	**Transpor-tation Manager**	**Unit Operations Support Staff**	**CAMU Leader/ Coordinator**	**CAMU Field Technician**
Resource Conservation and Recovery Act (RCRA) Regulations	X	X	X	X	X	X	X	X		X	X
Contingency Plan and Emergency Procedures	X	X	X	X	X	X	X	X	X	X	X
Technical Work Documents		X		X	X	X	X			X	X
Hazardous Waste Operations and Emergency Response (24- or 40-hour course)	X	X	X	X	X	X	X	X		X	X
Hazardous Waste Operations and Emergency Response (8-hour course)	X	X	X	X	X	X	X	X		X	X

TABLE F-3
Thermal Treatment Unit Personnel Training Content

A. **Explosives Personnel Safety Course**

Duration: Variable (at least 16 hours)

Frequency: Initial

Method: Classroom instruction

Minimum content may include:

1. Basic explosives definitions
2. Overview of explosives and explosive device categories and characteristics
3. Initiation stimuli and safety guidelines for avoiding accidental ignition
4. Standards for explosives operations, including compatibility, storage, and standard operating procedures

B. **Operating Procedures of the Thermal Treatment Unit**

Duration: Variable (1 to 4 hours)

Frequency: Annually

Method: Classroom instruction, on-the-job training, and/or document review

Minimum content may include:

1. Overview of written operating procedures
2. Overview of the Waste Analysis Plan
3. Safety practices
4. Security, site entry, and site control
5. Unit operations
6. Unit equipment and structures
7. Procedures to prevent the reaction of reactive waste
8. Permit requirements for the Thermal Treatment Unit

F.6 EMERGENCY TRAINING

Permitted Unit employees shall participate in Unit-specific emergency response training to assure effective response to emergencies. Emergency response training consists of classroom or online instruction, document reviews, and classroom or hands-on exercises. The content shall be reviewed at least annually and revised as necessary to incorporate changes in regulatory compliance requirements. Topics covered shall include at a minimum:

1. Emergency notification procedures;
2. Response to emergencies, including fires, explosions, and releases of hazardous and mixed wastes;
3. Procedures for using, inspecting, maintaining, and replacing emergency equipment and personal protective equipment;
4. Procedures for the shutdown of operations;
5. Procedures for evacuation (i.e., communications/alarms);
6. Responsibilities of the Emergency Coordinator;
7. Post-emergency reports and actions; and
8. Contingency Plan (See Permit Attachment D).

F.7 IMPLEMENTATION OF TRAINING PROGRAMS

The training program shall be implemented to assure that Unit personnel receive appropriate training in a timely manner.

Table F-4
Job Title, Description, and Qualifications:
RCRA Training Director

Job Title: Training Director

Job Description:

The Training Director shall ensure that all personnel meet the training requirements of this Permit. Examples of duties are:

- Identify and coordinate training required by RCRA regulations, this Permit, and Facility waste management worker-training requirements;
- Ensure maintenance of training records required by RCRA regulations and this Permit and demonstrate compliance with Facility waste management worker training requirements for all personnel; and
- Inform personnel when specific training is required.

Skill, Education, and Other Qualifications:

At a minimum, the qualifications for the Training Director are:

- Bachelor's degree from an accredited post-secondary institution; or,
- Three years experience with RCRA hazardous or mixed waste management regulations.

Training:

Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-5
Job Title, Description, and Qualifications:
RCRA Project Leader

Job Title: RCRA Project Leader

Job Description:

A RCRA Project Leader oversees, supervises, and coordinates collection, storage, and shipment of hazardous waste at a Permitted Unit. Examples of duties are:

- Ensure operation of the Permitted Unit in compliance with applicable RCRA regulations and this Permit;
- Identify and coordinate training required by RCRA regulations and this Permit;
- Determine training and reading requirements specific to positions, tasks or Unit activities;
- Coordinate activities related to management of hazardous or mixed waste at a Permitted Unit;
- Ensure maintenance of records required by RCRA regulations and this Permit, such as training records, inspection records, waste analysis records, and Contingency Plan;
- Ensure maintenance of additional records required for the Unit Operating Record;
- Prepare, review, and submit documents on waste management activities;
- Ensure compliance with RCRA regulations and this Permit for hazardous or mixed waste shipments; and
- Coordinate activities pertaining to hazardous or mixed waste audits.

Skill, Education, and Other Qualifications:

At a minimum, the qualifications for a RCRA Project Leader are:

- Bachelor's degree from an accredited post-secondary institution; or,
- Three years experience in managing hazardous or mixed waste.

Training:

Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-6
Job Title, Description, and Qualifications:
Emergency Coordinator

Job Title: Emergency Coordinator

Job Description:
An Emergency Coordinator evaluates, coordinates, and implements emergency actions in accordance with the Contingency Plan during an emergency (as defined in the Contingency Plan, Permit Attachment D). As defined in the Contingency Plan, Emergency Coordinator duties during and after an emergency include, but are not limited to:

- Identify the character, exact source, amount, and extent of released material or hazardous or mixed waste by observation, records reviews, or chemical analysis;
- Assess possible hazards to human health or the environment considering both direct and indirect effects;
- Take all reasonable measures necessary to ensure fires, explosions, and releases do not occur, recur, or spread to other hazardous or mixed waste at the Unit including stopping processes and operations, collecting and containing released waste, and removing or isolating containers;
- Monitor for leaks, pressure buildup, gas generation, and ruptures in valves, pipes, or other equipment if the Unit stops operations prior to restoration of normal operations;
- Provide for properly treating, storing, or disposing of recovered material, waste, contaminated soil or surface water, or any other media or material;
- Ensure that no waste that may be incompatible with the released waste is treated, stored, or disposed of until cleanup procedures are completed; and
- Ensure that all equipment listed in the Contingency Plan and site-specific contingency plan for any affected Unit is cleaned and fit for its intended use before resuming operations.

Skill, Education, and Other Qualifications:
At a minimum, the qualifications for an Emergency Coordinator are:

- High school diploma or equivalent;
- Three years experience working with hazardous or mixed waste.

Training:
Initial and refresher training will be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-7
Job Title, Description, and Qualifications:
Chemist

Job Title: Chemist

Job Description:
A Chemist conducts supporting characterization of hazardous and mixed waste managed at the Facility. Examples of duties are:

- Evaluate data provided by the initial generator of a solid waste, and obtain additional information as needed for hazardous waste determination;
- Determine whether solid wastes are hazardous or mixed wastes as defined in 40 CFR Part 261;
- Assign appropriate hazardous waste codes to hazardous and mixed wastes;
- Identify treatment options and treatment standards for hazardous and mixed wastes to be treated on site;
- Evaluate data or information for treated wastes and treatment residues to characterize the residues, assign appropriate hazardous waste codes, and determine land disposal restrictions; and,
- Segregate hazardous and mixed waste.

Skill, Education, and Other Qualifications:
At a minimum, the qualifications for a Chemist are:

- Bachelor's degree in chemistry or related field, and
- Two years experience working with hazardous or mixed waste.

Training:
Initial and refresher training will be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-8
Job Title, Description, and Qualifications:
Field Technician

Job Title: Field Technician (Waste Handler)

Job Description:
A Waste Handler conducts hazardous and mixed waste handling, segregating, and storing operations at a Permitted Unit. Examples of duties are:

- Transport and handle hazardous and mixed waste;
- Conduct daily inspections of Permitted Units where hazardous and mixed waste loading, unloading, or treatment operations occur;
- Perform basic maintenance and housekeeping activities;
- Segregate hazardous and mixed waste
- Sort, package, mark, label, store, treat, and segregate hazardous and mixed waste; and
- Compile information for the Facility or Unit Operating Record.

Skill, Education, and Other Qualifications:

At a minimum, the qualifications for a Waste Handler are:

- High school diploma or equivalent; or
- Two years experience in handling hazardous or mixed waste.

Training:

Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-9
Job Title, Description, and Qualifications:
Special Project Staff

Job Title: Special Projects Staff

Job Description:
A Special Projects Staff member performs duties associated with non-routine and special projects at a Permitted Unit. Examples of duties are:

1. Handle hazardous and mixed waste during a special project;

- Perform special project related maintenance and housekeeping activities;
- Operate hazardous and mixed waste treatment equipment associated with a special project;
- Store, label, and segregate hazardous and mixed waste associated with a special project;
- Identify and schedule special project activities involving hazardous waste or mixed waste;
- Monitor hazardous or mixed waste special project activities for safety and procedural compliance; and
- Compile special project information for the Facility or Unit Operating Record.

Required Skill, Education, or Other Qualifications:
At a minimum, the qualifications for a Special Projects Staff member are:

- High school diploma or equivalent; or
- Two years experience in handling hazardous or mixed waste.

Training:
Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-10
Job Title, Description, and Qualifications:
Inspector

Job Title: Inspector

Job Description: An Inspector conducts inspections of both hazardous or mixed waste and a Permitted Unit. Examples of duties are:

- Inspect at least daily areas subject to spills of hazardous or mixed waste when these areas are in use;
- Inspect at least weekly containers holding hazardous or mixed waste, container equipment, and secondary containment;
- Inspect at least monthly emergency equipment, security devices, and structural equipment at a Permitted Unit; and
- Record inspection date, time, name, observations, and repairs in an inspection log (in the form of an inspection checklist).

Skill, Education, and Other Qualifications:
At a minimum, the qualifications for an Inspector are:

- High school diploma or equivalent; or
- Two years experience working with hazardous or mixed waste.

Training:
Initial and refresher training shall be as required in Table F-1 and Table F-2 in this Permit Attachment.

Table F-11
Job Title, Description, and Qualifications:
Transportation Manager

Job Title: Transportation Manager

Job Description:
A Transportation Manager coordinates the shipment of hazardous or mixed waste from a Permitted Unit. Examples of duties are:

- Prepare documentation and paperwork for off-site shipments of hazardous or mixed waste;
- Ensure proper packaging, labeling, marking, and placarding are in place for off-site shipments of hazardous and mixed waste; and
- Coordinate the loading of hazardous and mixed waste for off-site shipment.

Required Skill, Education, or Other Qualifications:
At a minimum, the qualifications for a Transportation Manager are:

- High school diploma or equivalent; or
- Two years experience coordinating shipments of hazardous or mixed waste.

Training:
Initial and refresher training shall be as required in Table F-1 and Table F-2 in this Permit Attachment.

Table F-12
Job Title, Description, and Qualifications:
Unit Operations Support Staff

Job Title: **Unit Operations Support Staff**

Job Description:
A Unit Operations Support Staff member has unescorted access to the Permitted Units but performs no activities that require contact with hazardous or mixed waste or waste containers. Unit Operations Support Staff include, but are not limited to:

- Administrative personnel;
- Information systems (database) personnel;
- Generator interface personnel, and
- Radiation support personnel. Note that the duties of radiation support personnel involve collecting radiological data; this requires contact with hazardous and mixed wastes and waste containers but is not consistent with the duties of a field technician in Table F-8.

Skill, Education, and Other Qualifications:
The Training Supervisor determines the requisite level of experience for each position.

Training:
Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-13
Job Title, Description, and Qualifications:
CAMU Project Leader/Operations Coordinator

Job Title: **Corrective Action Management Unit (CAMU) Project Leader/Operations Coordinator**

Job Description:
To provide ongoing oversight, supervision, and coordination at the CAMU during the post-closure care period for vadose zone monitoring and inspection and maintenance of the containment cell and Vadose Zone Monitoring System (VZMS) in compliance with this Permit. Examples of duties are:

- Coordinate and implement VZMS monitoring activities;
- Compile and archive VZMS monitoring data into the Operating Record;
- Produce annual monitoring results reports and other reports;
- Maintain/revise sampling and analysis plans for VZMS monitoring, as required;
- Coordinate and implement leachate removal and management activities;
- Ensure necessary inspections and required maintenance are properly conducted;
- Assure the maintenance of records, such as training records, inspection and maintenance records, and data reports, as specified in this Permit;
- Supervise the inventory, maintenance, and repair of all tools, supplies, equipment, and vehicles (i.e., ensure that they are in good working order) used for monitoring and maintenance operations; and
- Provide oversight of CAMU Field Technicians.

Required Education, Skill, and/or Experience:
- Bachelors' degree in chemistry, biology, physical science, engineering, environmental science; or
- Minimum of 5 years experience in waste management operations and/or environmental restoration; and
- Project management experience.

Training:
- Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

Table F-14
Job Title, Description, and Qualifications:
CAMU Field Technician

Job Title: Corrective Action Management Unit (CAMU) Field Technician

Job Description:
Perform post-closure monitoring, inspection, and maintenance activities as instructed by the CAMU Project Leader/Operations Coordinator. Examples of duties are:

- Perform VZMS monitoring activities;
- Perform inspection and maintenance activities; and
- Assist CAMU Project Leader/Operations Coordinator with leachate removal and management activities.

Required Education, Skill, and/or Experience:
The Training Supervisor determines the requisite level of experience for each position.

Training:
Initial and refresher training shall be as required in Table F-1 and Table F-2 of this Permit Attachment.

PERMIT ATTACHMENT G CLOSURE PLANS

G.1 CLOSURE PLAN FOR THE HAZARDOUS WASTE HANDLING UNIT

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G.1.1 INTRODUCTION

This closure plan details the activities necessary to close the Hazardous Waste Handling Unit south of Technical Area I at Sandia National Laboratories, hereafter referred to as the HWHU. This closure plan incorporates the requirements in 40 CFR §§ 264.110 through 264.116, 264.178, and Permit Part 6.

The HWHU is located south of TA-I, north of the entrance to TA-II, and occupies 1.35 acres enclosed within a fence on Facility property between the two Technical Areas. For purposes of closure the HWHU consists of four structures, an outdoor loading and driving surface, various equipment, a storm water catchment pond, and environmental media. Structures at the HWHU include the Hazardous Waste Packaging Building (Building 959), the Hazardous Waste Storage Building (Building 958), and two modular storage buildings (Buildings 958B and 958C). A covered storage pad, two office trailers, six storage sheds located near the eastern boundary of the HWHU, and associated equipment, furnishings, and tools that do not manage or contact hazardous or mixed wastes are not subject to the closure procedures and performance standards in this closure plan. A complete physical and operational description of the HWHU is in Permit Attachment A, Section A.2. The various HWHU components are shown generally on Figure G.1-1.

The HWHU is permitted to repackage and store hazardous and mixed wastes with the EPA waste codes listed in Permit Attachment B, Section B.2, in containers. The storm water catchment pond is designed to receive storm water and snowmelt run-off from the HWHU. The operating capacity of the four buildings is specified at Permit Attachment J, Table J-1.

It is anticipated that the HWHU will be clean closed. The Permittees shall attain clean closure of the HWHU by meeting the closure performance standards specified at Permit Section 6.2.1. Final closure of the HWHU will be complete when the New Mexico Environment Department (Department) approves the Closure Report and certification required under Permit Part 6, Section 6.10 and Section 6.0 of this Closure Plan.

G.1.2 CLOSURE PROCESS

The Permittees shall, in accordance with Permit Part 6, Section 6.3.1, notify the Department in writing that they have initiated closure at the HWHU.

The Permittees shall, in accordance with Permit Part 6, Section 6.3.2 and Table 6.1, complete all HWHU closure activities.

The Permittees shall, in accordance with Permit Section 6.3.4, remove all hazardous and mixed waste from the HWHU no later than 90 days after initiating closure at the Unit, and shall also remove any solid waste that adversely interferes with closure activities.

The Permittees shall, in accordance with Permit Section 6.3.5, conduct a records review and structural assessment of the HWHU and shall submit the review and assessment in the form of a written report in accordance with that Section.

The Permittees shall, in accordance with Permit Section 6.3.6, decontaminate or remove all contaminated structures and equipment at the HWHU.

The Permittees shall, in accordance with Permit Section 6.3.7 and Section 3.0 (below), perform decontamination verification sampling of all structures and equipment at the HWHU that were required to be decontaminated.

The Permittees shall, in accordance with Permit Section 6.3.8 and Section 3.0 (below), sample soils and base materials (*e.g.*, gravel) associated with HWHU to quantify constituents of concern associated with any releases of hazardous or mixed wastes.

The Permittees shall ensure that soils and base materials at the HWHU contaminated with constituents of concern that pose an unacceptable risk to human health (based on the closure criteria in Permit Section 6.2.1) or the environment as specified in Permit Section 6.3.8 are removed from the Permitted Unit in accordance with Permit Section 6.3.9. The complete removal shall be verified by the Permittees in accordance with Permit Section 6.3.9.

If the contaminated soil or other environmental media cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8.

G.1.3 SAMPLING AND ANALYSIS PLAN

This sampling and analysis plan identifies: 1) the constituents of concern at the HWHU, 2) the locations where sampling shall occur, 3) the laboratory analytical methods that shall be employed to quantify analyte concentration in samples, and 4) the quality assurance procedures to be utilized during closure.

The constituents of concern at the HWHU shall be determined in accordance with Permit Sections 6.3.5 and 6.5(1). A preliminary list of groups of constituents is presented in Table G.1-1 of this Permit Attachment; the list shall be modified at the time of closure if necessary in accordance with Permit Section 6.3.5.

The Permittees shall collect wet-wipe and soil samples, and perform sample quality assurance procedures in accordance with Permit Sections 6.3.10.1, 6.3.10.2, and 6.3.10.3.

The Permittees shall sample soils and base materials at the applicable locations identified at Permit Section 6.3.8. Soil sampling locations are identified in part on Figure G.1-1. Because of the length of the storm water catchment pond, the Permittees shall also collect two samples at the specified depths at each of three locations within the pond, the east and west ends and in the middle.

The Permittees shall sample structures and equipment at the applicable locations identified in accordance with Permit Section 6.3.7.

The wet-wipe sampling locations to verify decontamination at Buildings 958, 959, and 958B/958C are identified in part on Figures G.1-2, G.1-3, and G.1-4 respectively.

Sampling locations may vary from those shown in the figures due to conditions at closure. Sampling locations may also change as a result of amendments to this closure plan, such as amendments required under Permit Section 6.6.

The Permittees shall handle samples as specified at Permit Part 8, Section 8.10.2.9.

The Permittees shall utilize the laboratory analytical methods, the sample preservation criteria, and the sample holding times as specified in Table G.1-1, as the information in the table may be updated via a closure plan amendment. The Permittees shall abide with the requirements for chemical analyses at laboratories as specified at Permit Part 8, Section 8.10.3.

The Permittees shall document field activities associated with closure as specified at Permit Section 8.10.2.14.i.

Table G.1-1
Sampling Requirements[1]

Parameter	Laboratory Method(s)	Preservation	Holding Time
Metals (Total: Ag, As, Ba, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, and Tl)	6010/6020/ 7470/7471	None	6 months (except Hg 28 days)
VOCs	8260	Headspace free, Cool to 4°C	14 days
SVOCs	8270	Cool to 4°C	14 days
Dioxin/Furan Congeners	8280, 8290	Place in dark and cool to 4°C	30 days
PCBs	8080/8082	Cool to 4°C	14 days
Herbicides	8150/8151	Cool to 4°C	14 days
Cyanide	9010/9012	Cool to 4°C	14 days

[1] Methods are EPA SW-846 Methods, as revised and updated.

G.1.4 AMENDMENT TO THIS CLOSURE PLAN

The Permittees shall submit permit modification requests to amend this Closure Plan, if needed, in accordance with Permit Section 6.6.

G.1.5 WASTES GENERATED FROM CLOSURE ACTIVITIES

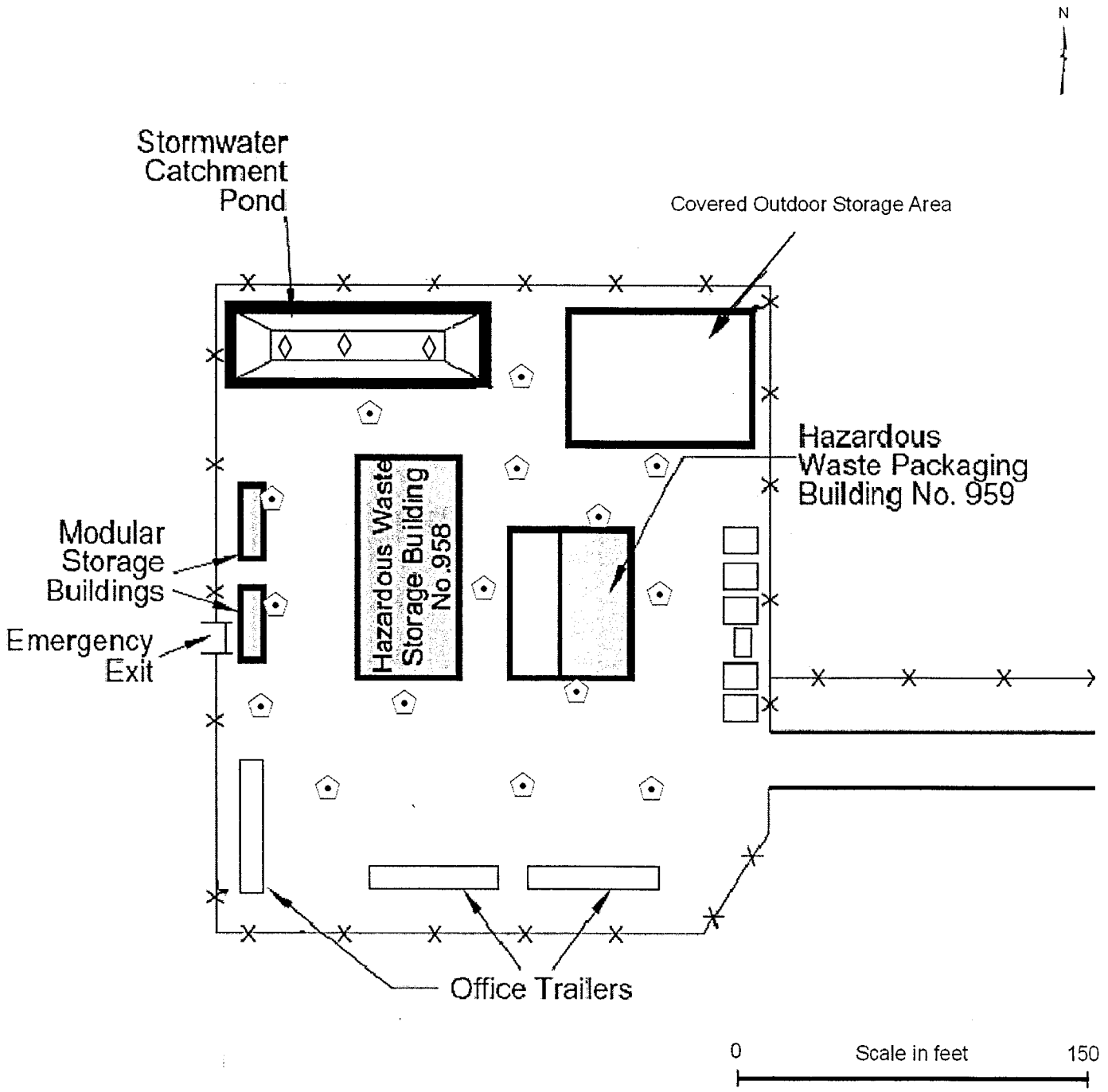
The Permittees shall ensure that waste (*e.g.*, demolition debris and contaminated soil) generated from closure of the HWHU is managed in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

G.1.6 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure of the HWHU, the Permittees shall in accordance with Permit Section 6.10 submit a closure report to the Department for review and approval.

INSERT FIGURE G.1-1

INSERT FIGURE G.1-2



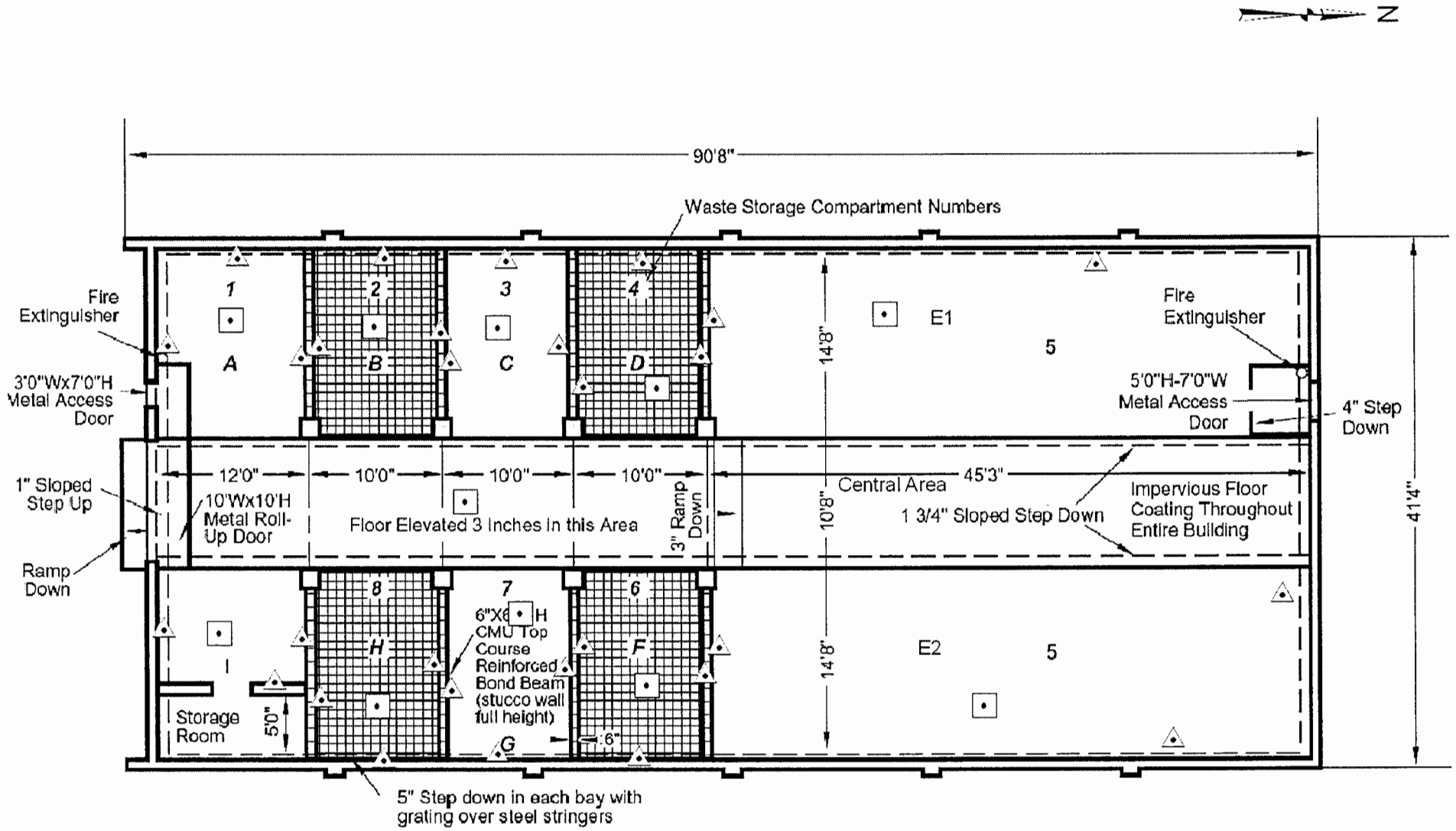
Hazardous Waste Management Area

outdoor (includes load/unload)(15)

stormwater catchment pond (3 locations - 2 samples at 0" and 12")

Actual locations may vary from the figure.

Figure G.1-1
HWHU Outdoor Sampling Locations

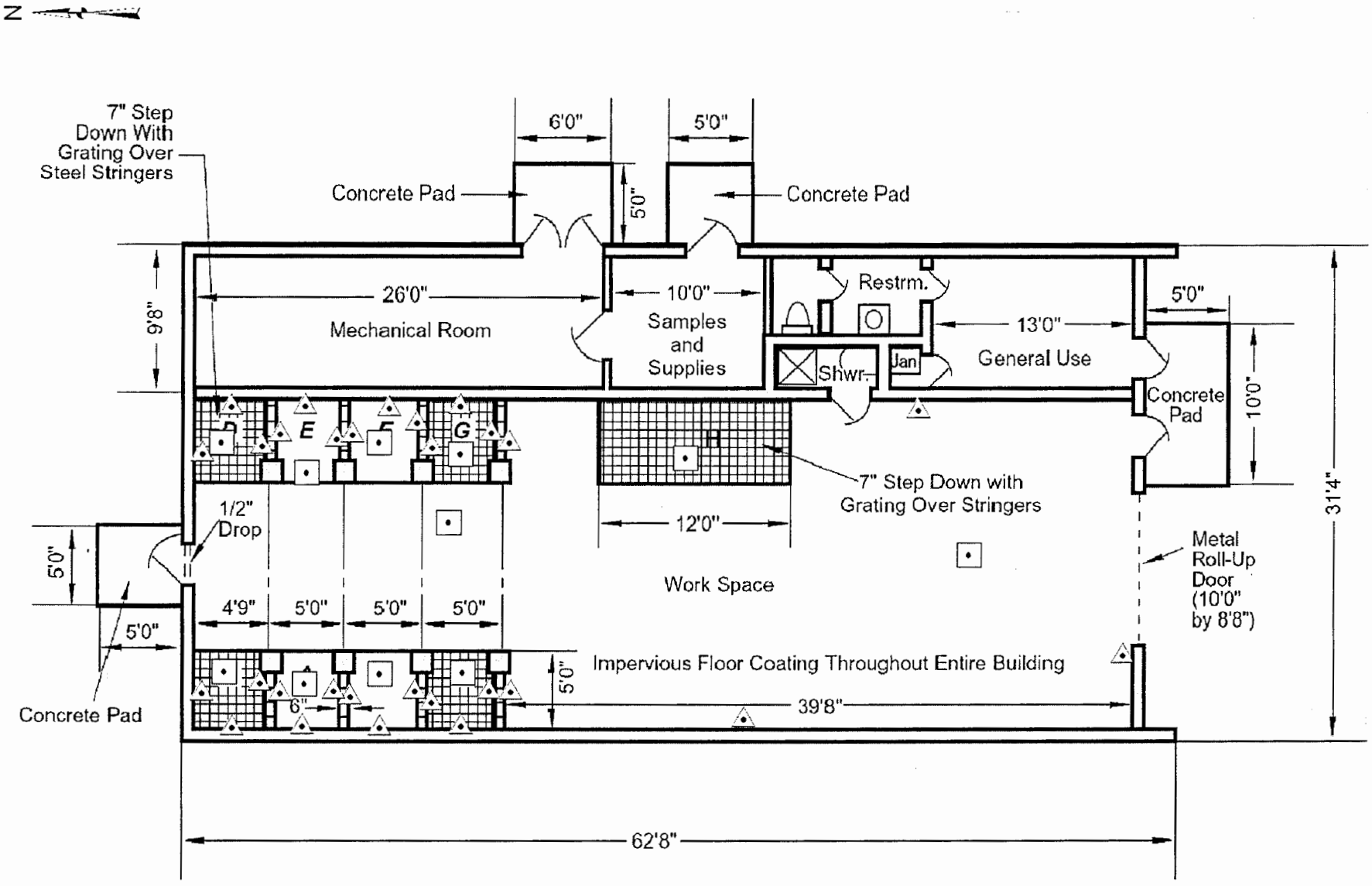


Actual locations may vary from the figure.

Legend

- floor (11)
- wall (29)

Figure G.1-2
HWHU Building 958 Sampling Locations

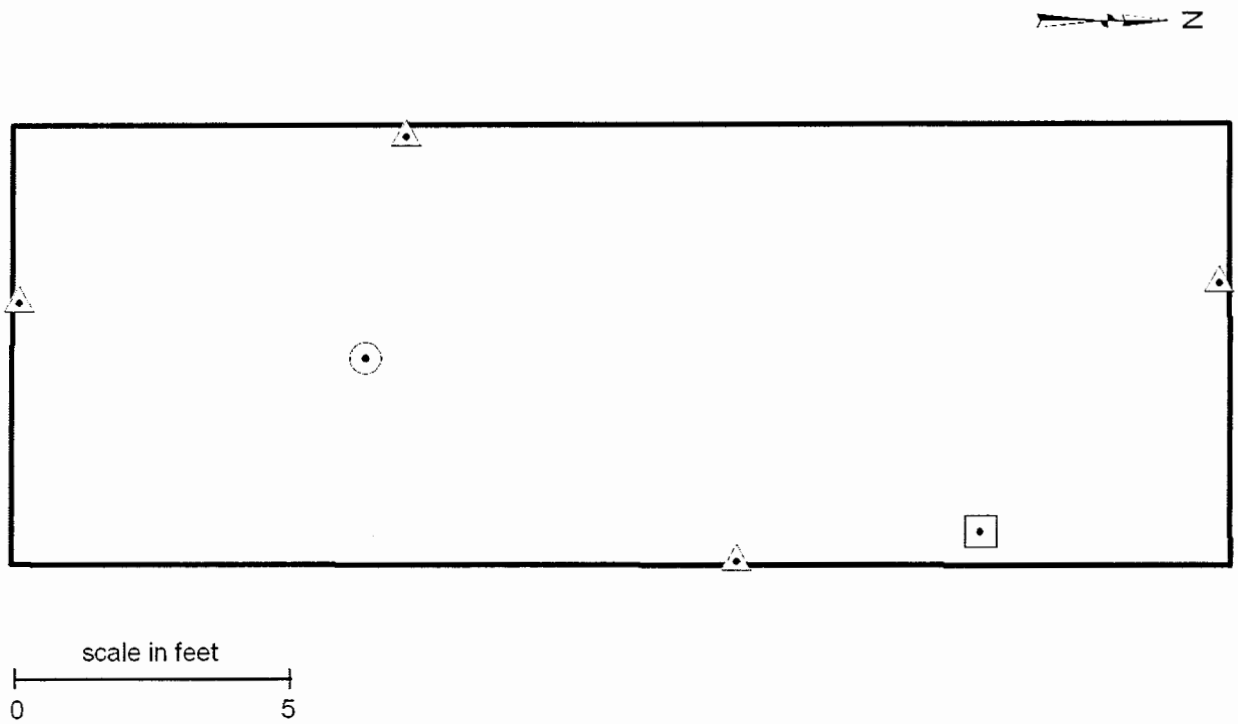


Actual locations may vary from the figure.

floor (11)

wall (29)

Figure G.1-3
HWHU Building 959 Sampling Locations



Actual locations may vary from the figure.

Note: Same sample plan for both modular buildings.

floor (1)

wall (4)

ceiling (1)

Figure G.1-4
HWHU Buildings 958B and 958C Sampling Locations

INSERT FIGURE G.1-3

INSERT G.1-4

G.2 CLOSURE PLAN FOR THE THERMAL TREATMENT UNIT

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G.2.1 INTRODUCTION

This closure plan details the activities necessary to close the Thermal Treatment Unit at Technical Area III at Sandia National Laboratories, hereafter referred to as the TTU. This closure plan incorporates the requirements in 40 CFR §§ 264.110 through 264.116, 264.601 through 264.603, and Permit Part 6.

The TTU is a steel burn pan and cage located in a fenced area on a concrete pad south of Building 6715 and is surrounded by an earthen berm. The area potentially impacted by the TTU and therefore subject to closure extends outside the TTU caged area and includes ancillary piping and equipment, a loading area, and soils potentially impacted by particulate deposition and surface water run-off. A complete physical and operational description of the TTU is in Permit Attachment A, Section A.3. The various TTU components are shown generally on Figures G.2-1 and G.2-2.

The TTU treats reactive (*i.e.*, explosive) and ignitable hazardous wastes with the EPA waste codes listed in Permit Attachment B, Section B.1.

It is anticipated that the TTU will be clean closed. The Permittees shall attain clean closure of the TTU by meeting the closure performance standards specified at Permit Section 6.2.1. Final closure of the TTU will be complete when the New Mexico Environment Department (Department) approves the Closure Report and certification required under Permit Part 6, Section 6.10 and Section 7.0 of this Closure Plan.

G.2.2 CLOSURE PROCESS

The Permittees shall, in accordance with Permit Part 6, Section 6.3.1, notify the Department in writing that they have initiated closure at the TTU.

The Permittees shall, in accordance with Permit Part 6, Section 6.3.2 and Table 6.1, complete all TTU closure activities.

The Permittees shall, in accordance with Permit Section 6.3.4, remove all hazardous waste from the TTU no later than 90 days after initiating closure at the Unit, and shall also remove any solid waste that adversely interferes with closure activities.

The Permittees shall, in accordance with Permit Section 6.3.5, conduct a records review and structural assessment of the TTU and shall submit the review and assessment in the form of a written report in accordance with that Section.

The Permittees shall, in accordance with Permit Section 6.3.6, decontaminate or remove all contaminated structures and equipment at the TTU.

The Permittees shall, in accordance with Permit Section 6.3.7 and Section 3.0 (below), perform decontamination verification sampling of all structures and equipment at the TTU that were required to be decontaminated.

The Permittees shall, in accordance with Permit Section 6.3.8 and Section 3.0 (below), sample soils and base materials (*e.g.*, gravel) associated with TTU to quantify constituents of concern associated with any releases of hazardous or mixed wastes.

The Permittees shall ensure that soils and base materials at the TTU contaminated with constituents of concern that pose an unacceptable risk to human health (based on the closure criteria in Permit Section 6.2.1) or the environment as specified in Permit Section 6.3.8 are removed from the Permitted Unit in accordance with Permit Section 6.3.9. The complete removal shall be verified by the Permittees in accordance with Permit Section 6.3.9.

If the contaminated soil or other environmental media cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8.

G.2.3 SAMPLING AND ANALYSIS PLAN

This sampling and analysis plan identifies: 1) the constituents of concern at the TTU, 2) the locations where sampling shall occur, 3) the laboratory analytical methods that shall be employed to quantify analyte concentration in samples, and 4) the appropriate quality assurance procedures to be utilized during closure.

The constituents of concern at the TTU shall be determined in accordance with Permit Sections 6.3.5 and 6.5(1). A preliminary list of constituents and groups of constituents is presented in Table G.2-1 of this Permit Attachment; the list shall be modified at the time of closure if necessary in accordance with Permit Section 6.3.5.

The Permittees shall collect wet-wipe and soil samples, and perform sample quality assurance procedures in accordance with Permit Sections 6.3.10.1, 6.3.10.2, and 6.3.10.3.

The Permittees shall sample soils and base materials at the applicable locations identified at Permit Section 6.3.8 and Figures G.2-1 and G.2-2.

The Permittees shall sample structures and equipment at the applicable locations identified in accordance with Permit Section 6.3.7.

Sampling locations may vary from those shown in the figures due to conditions at closure. Sampling locations may also change as a result of amendments to this closure plan, such as amendments required under Permit Section 6.6.

The Permittees shall handle samples as specified at Permit Part 8, Section 8.10.2.9.

The Permittees shall utilize the laboratory analytical methods, the sample preservation criteria, and the sample holding times as specified in Table G.2-1, as the information in the table may be updated via a closure plan amendment. The Permittees shall abide with the requirements for chemical analyses at laboratories as specified at Permit Part 8, Section 8.10.3.

The Permittees shall document field activities associated with closure as specified at Permit Section 8.10.2.14.i.

Table G.2-1
Sampling Requirements[1]

Parameter	Laboratory Method(s)	Preservation	Holding Time
Total silver	6010/6020	None	6 months
VOCs	8260	Headspace free, Cool to 4°C	14 days
SVOCs	8270	Cool to 4°C	14 days
Dioxin/Furan Congeners	8280, 8290	Cool to 4°C	30 days
High Explosives	8330	Cool to 4°C	14 days

[1] Methods are EPA SW-846 Methods, as revised and updated.

G.2.4 AMENDMENT TO THIS CLOSURE PLAN

The Permittees shall submit permit modification requests to amend this Closure Plan, if needed, in accordance with Permit Section 6.6.

G.2.5 WASTES GENERATED FROM CLOSURE ACTIVITIES

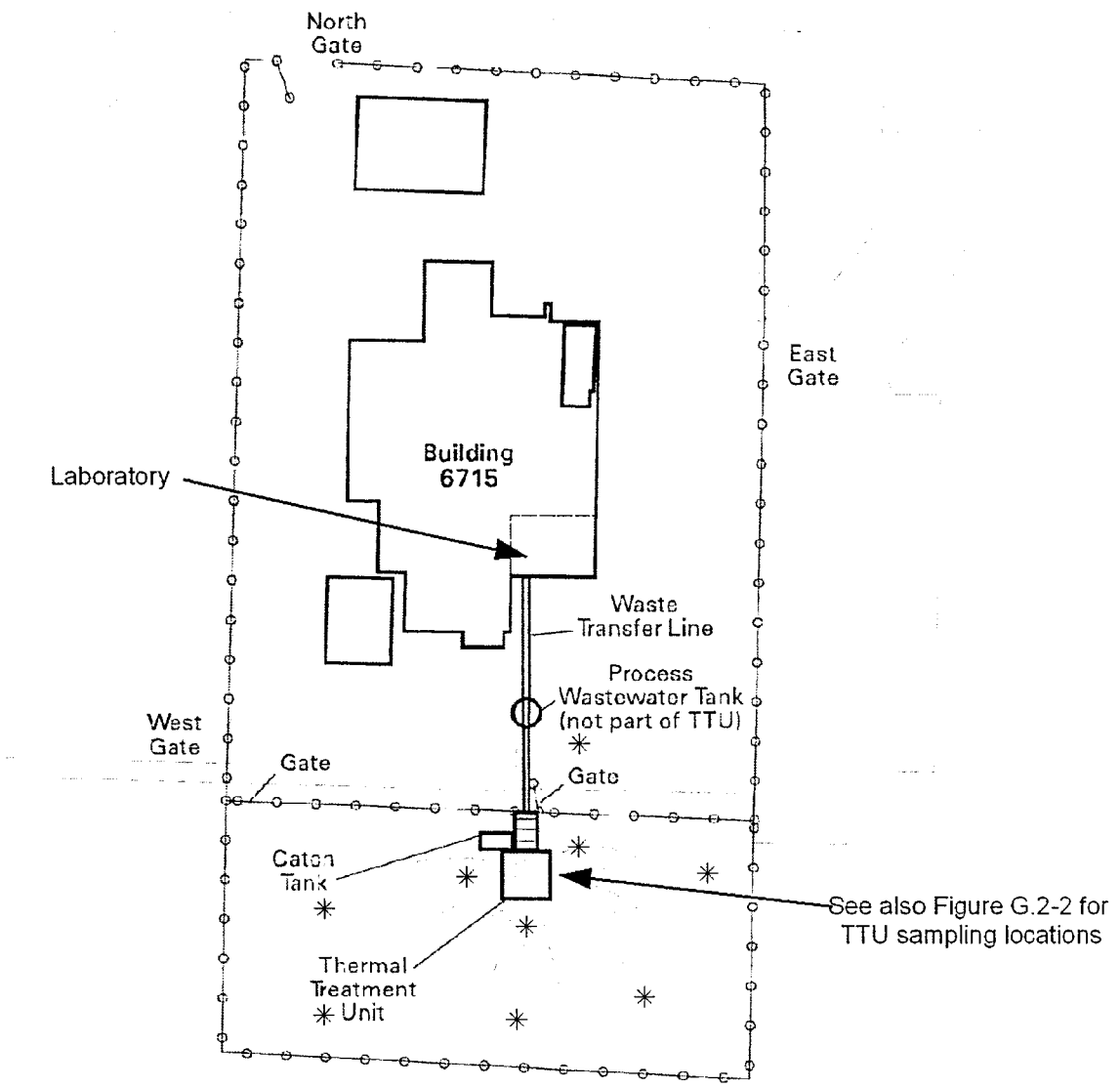
The Permittees shall ensure that waste (*e.g.*, demolition debris and contaminated soil) generated from closure of the TTU is managed in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

G.2.6 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure of the TTU, the Permittees shall in accordance with Permit Section 6.10 submit a closure report to the Department for review and approval.

INSERT FIGURE G.2-1

INSERT FIGURE G.2-2



Legend

- Earthen Berm
- Road / Parking
- Fence
- Building / Structure
- Hazardous Waste Management Area
- Steps

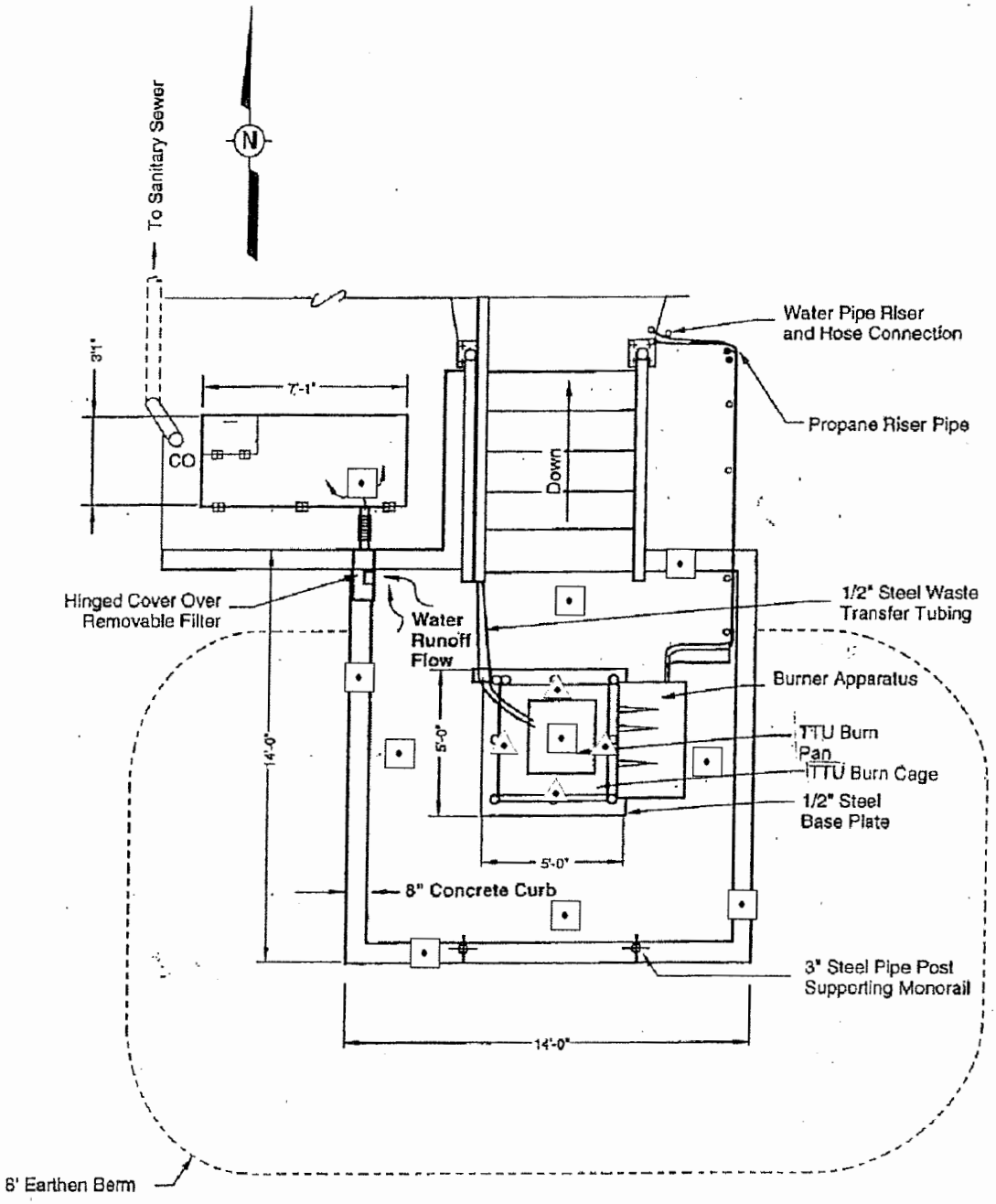
Actual locations may vary from the figure.

✳ outdoor (9)

0 25 50
Scale in Feet

N

Figure G.2-1
TTU Soil Sampling Locations



Actual locations may vary from the figure.

floor (10)

wall (4)

Figure G.2-2
TTU Sampling Locations

G.3 CLOSURE PLAN FOR THE RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT

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G.3.1 INTRODUCTION

This closure plan details the activities necessary to close the Radioactive and Mixed Waste Management Unit at Technical Area III at Sandia National Laboratories, hereafter referred to as the RMWMU. This closure plan incorporates the requirements in 40 CFR §§ 264.110 through 264.116, 264.178, and Permit Part 6.

The RMWMU is located in the southeastern portion of Technical Area (TA)-III and occupies approximately 3.1 acres enclosed within a fence. For purposes of closure the RMWMU consists of six structures, equipment, an outdoor storage pad and driving surface, a storm water retention pond, and environmental media. The waste management structures include Buildings 6920, 6921, 6925, and 6926, and two modular storage buildings, TP-150 and TP-153. The outdoor storage pad includes the paved areas within the fence to the north, east, and west of Building 6920 and to the south of Building 6921. Buildings 6920 and 6921 have associated fume hoods and negative-pressure ventilation systems whose exhaust passes through a HEPA filter before being released to the environment through an exhaust stack. The outdoor storage pad and driving surface drain to a storm water retention basin. Numerous rooms within Buildings 6920 and 6921 and associated equipment, furnishings, and tools that do not manage or contact hazardous or mixed wastes are not subject to the closure procedures and performance standards in this closure plan. A complete physical and operational description of the RMWMU is in Permit Attachment A, Section A.4. The various RMWMU components are shown generally on Figure G.3-1.

The RMWMU is permitted to store and treat hazardous and mixed wastes with the EPA waste codes listed in Permit Attachment B, Section B.2. The RMWMU is permitted to treat hazardous and mixed wastes with the set of EPA waste codes indicated in Permit Attachment B, Section B.3. The total square footage and permitted operating capacity of the buildings, the modular storage buildings, and the outdoor storage pad are specified at Permit Attachment J, Table J-1.

It is anticipated that the RMWMU will be clean closed. The Permittees shall attain clean closure of the RMWMU by meeting the closure performance standards specified at Permit Section 6.2.1. Final closure of the RMWMU will be complete when the New Mexico Environment Department (Department) approves the Closure Report and certification required under Permit Part 6, Section 6.10 and Section 6.0 of this Closure Plan.

G.3.2 CLOSURE PROCESS

The Permittees shall, in accordance with Permit Part 6, Section 6.3.1, notify the Department in writing that they have initiated closure at the RMWMU.

The Permittees shall, in accordance with Permit Part 6, Section 6.3.2 and Table 6.1, complete all RMWMU closure activities.

The Permittees shall, in accordance with Permit Section 6.3.4, remove all hazardous and mixed waste from the RMWMU no later than 90 days after initiating closure at the Unit, and shall also remove any solid waste that adversely interferes with closure activities.

The Permittees shall, in accordance with Permit Section 6.3.5, conduct a records review and structural assessment of the RMWMU and shall submit the review and assessment in the form of a written report in accordance with that Section.

The Permittees shall, in accordance with Permit Section 6.3.6, decontaminate or remove all contaminated structures and equipment at the RMWMU.

The Permittees shall, in accordance with Permit Section 6.3.7 and Section 3.0 (below), perform decontamination verification sampling of all structures and equipment at the RMWMU that were required to be decontaminated .

The Permittees shall, in accordance with Permit Section 6.3.8 and Section 3.0 (below), sample soils and base materials (*e.g.*, gravel) associated with RMWMU to quantify constituents of concern associated with any releases of hazardous or mixed wastes.

The Permittees shall ensure that soils and base materials at the RMWMU contaminated with constituents of concern that pose an unacceptable risk to human health (based on the closure criteria in Permit Section 6.2.1) or the environment as specified in Permit Section 6.3.8 are removed from the Permitted Unit in accordance with Permit Section 6.3.9. The complete removal shall be verified by the Permittees in accordance with Permit Section 6.3.9.

If the contaminated soil or other environmental media cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8.

SAMPLING and analysis plan

This sampling and analysis plan identifies: 1) the constituents of concern at the RMWMU, 2) the locations where sampling shall occur, 3) the laboratory analytical methods that shall be employed to quantify analyte concentration in samples, and 4) the quality assurance procedures to be utilized during closure.

The constituents of concern at the RMWMU shall be determined in accordance with Permit Sections 6.3.5 and 6.5(1). A preliminary list of groups of constituents is presented in Table G.3-1 of this Permit Attachment; the list shall be modified at the time of closure if necessary in accordance with Permit Section 6.3.5.

The Permittees shall collect wet-wipe and soil samples, and perform sample quality assurance procedures in accordance with Permit Sections 6.3.10.1, 6.3.10.2, and 6.3.10.3.

The Permittees shall sample soils and base materials at the applicable locations identified at Permit Section 6.3.8. Soil sampling locations are identified in part on Figure G.3-1. Because of the length of the storm water retention pond at the RMWMU, the Permittees

shall collect two samples at the specified depths at each of three locations within the pond, the north and south ends and in the middle.

The Permittees shall sample structures and equipment at the applicable locations identified in accordance with Permit Section 6.3.7. The wet-wipe sampling locations to verify decontamination at Buildings 6920, 6921, 6925 and 6926, and modular storage units TP-150 and TP-153 are identified in part on Figures G.3-2, G.3-3, G.3-4, and G-3-5 respectively.

Sampling locations may vary from those shown in the figures due to conditions at closure. Sampling locations may also change as a result of amendments to this closure plan, such as amendments required under Permit Section 6.6.

The Permittees shall handle samples as specified at Permit Part 8, Section 8.10.2.9.

The Permittees shall utilize the laboratory analytical methods, the sample preservation criteria, and the sample holding times as specified in Table G.3-1, as the information in the table may be updated via a closure plan amendment. The Permittees shall abide with the requirements for chemical analyses at laboratories as specified at Permit Part 8, Section 8.10.3.

The Permittees shall document field activities associated with closure as specified at Permit Section 8.10.2.14.i.

Table G.3-1
Sampling Requirements[1]

Parameter	Laboratory Method(s)	Preservation	Holding Time
Metals (Total: Ag, As, Ba, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, and Tl)	6010/6020/ 7470/7471	None	6 months (except Hg 28 days)
VOCs	8260	Headspace free, Cool to 4°C	14 days
SVOCs	8270	Cool to 4°C	14 days
High Explosives	8330	Cool to 4°C	14 days
PCBs	8080/8081	Cool to 4°C	14 days
Cyanide	9010/9012	Cool to 4°C	14 days

[1] Methods are EPA SW-846 Methods, as revised and updated.

G.3.3 AMENDMENT TO This CLOSURE PLAN

The Permittees shall submit permit modification requests to amend this Closure Plan, if needed, in accordance with Permit Section 6.6.

G.3.4 WASTES GENERATED FROM CLOSURE ACTIVITIES

The Permittees shall ensure that waste (*e.g.*, demolition debris and contaminated soil) generated from closure of the RMWMU is managed in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

G.3.5 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure of the RMWHU, the Permittees shall in accordance with Permit Section 6.10 submit a closure report to the Department for review and approval.

INSERT FIGURE G.3-1

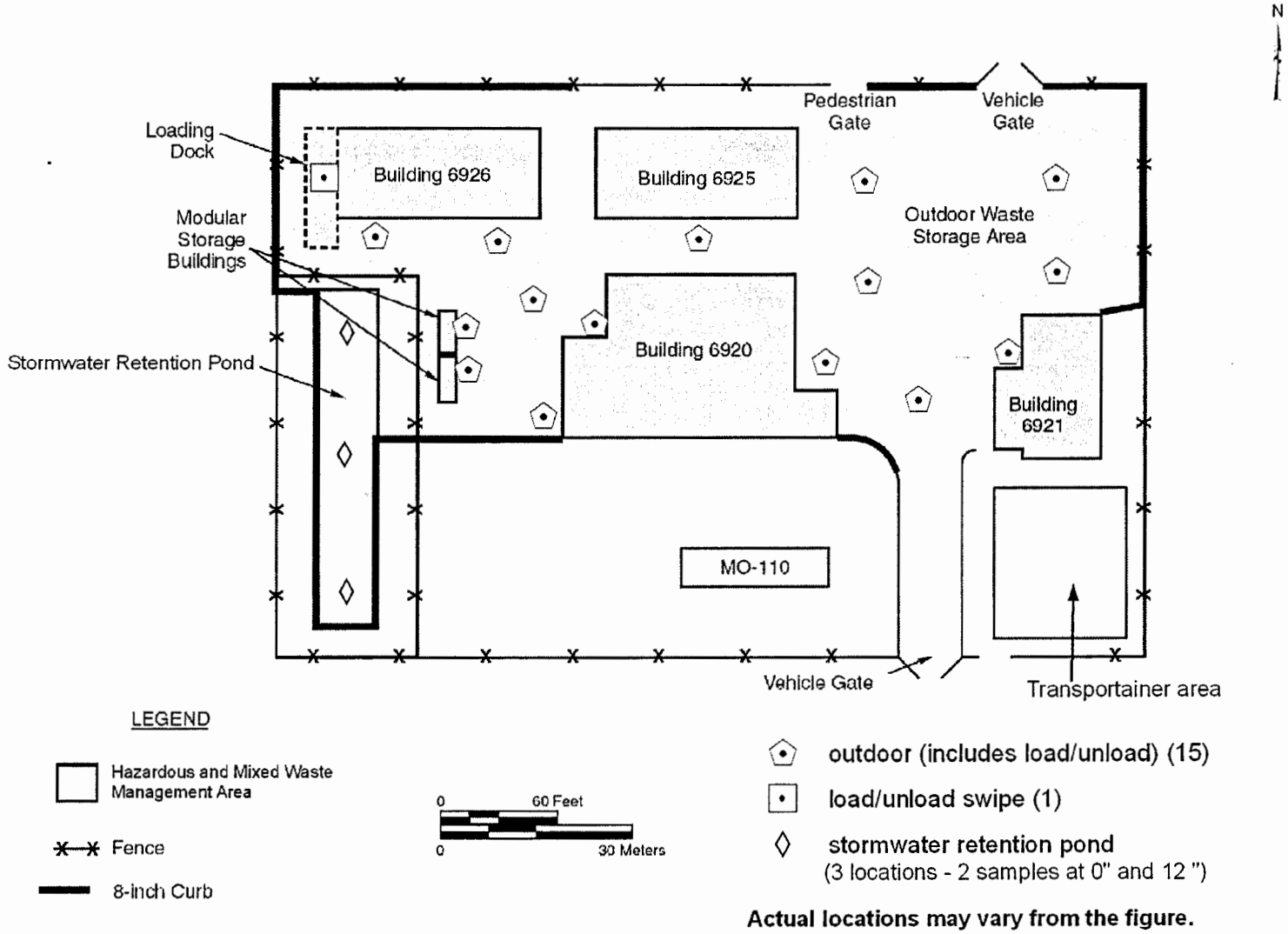
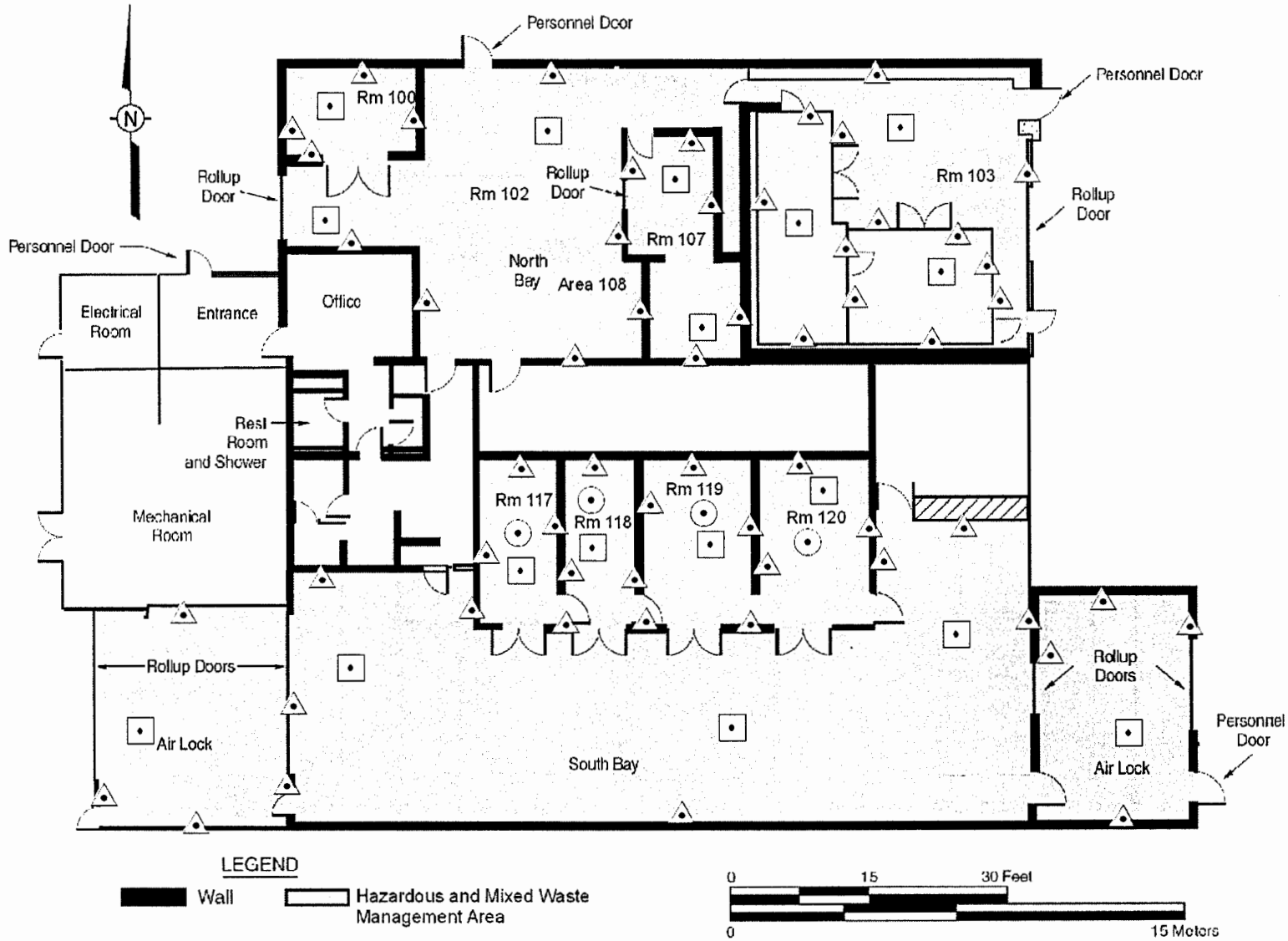


Figure G.3-1
RMWMU Sampling Locations



6920 floor (17)

6920 wall (57)

6920 ceiling (4)

Actual locations may vary from the figure.

Figure G.3-2
RMWMU Building 6920 Sampling Locations

INSERT FIGURE G.3-2

INSERT FIGURE G.3-3

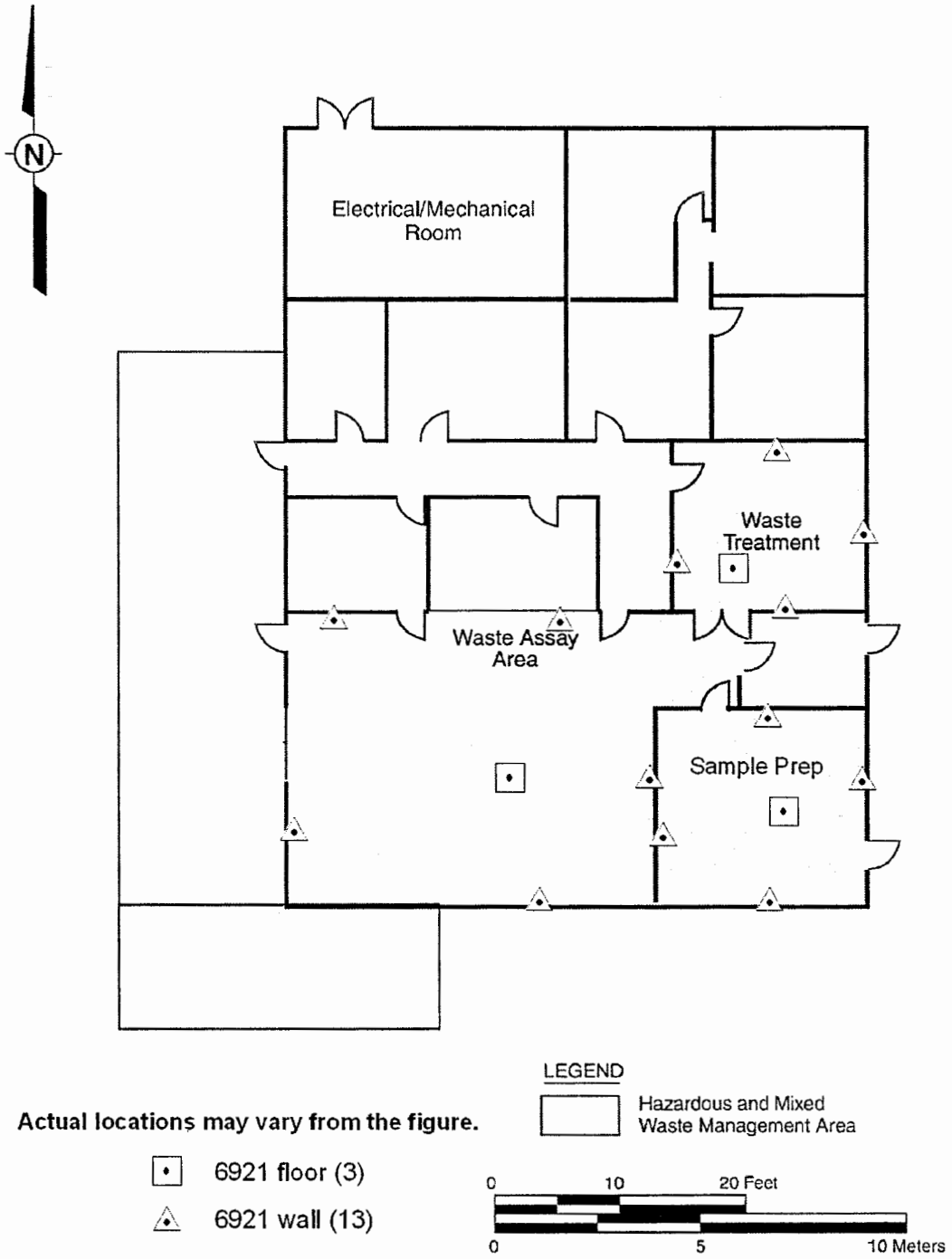
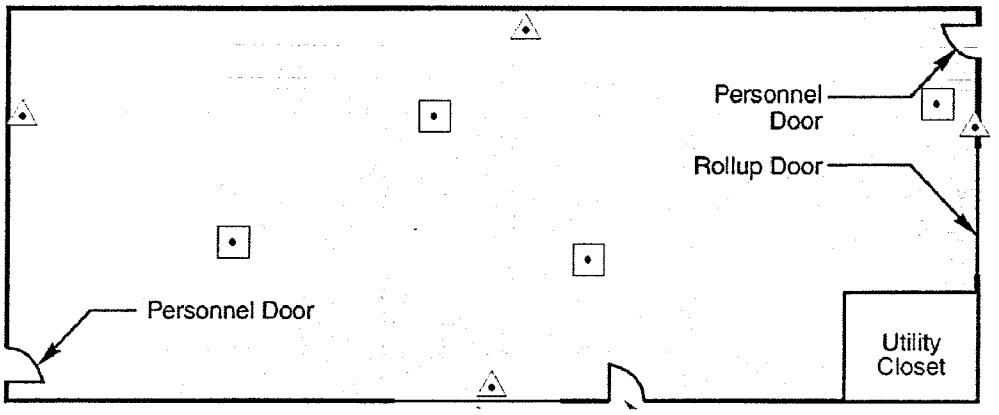
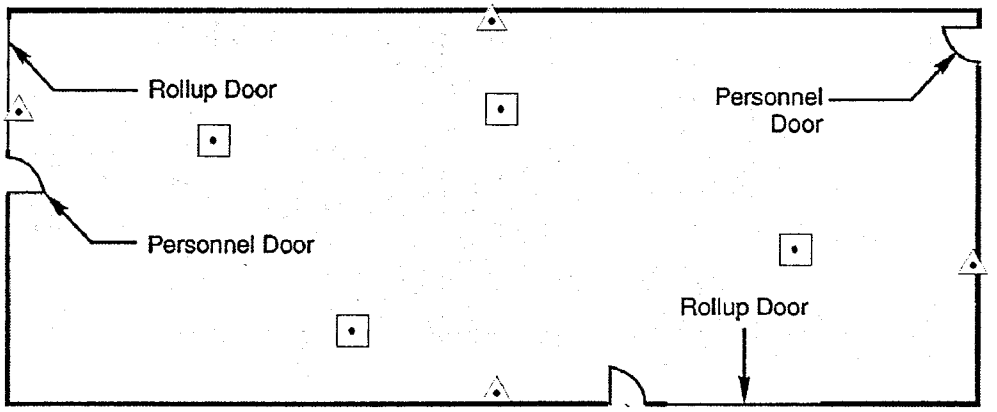


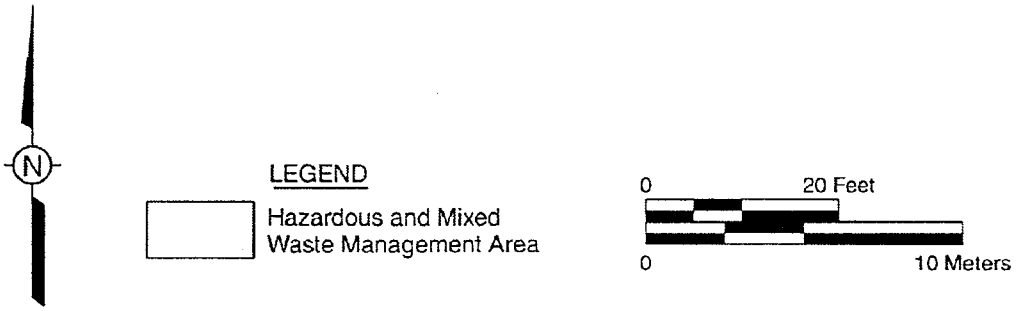
Figure G.3-3
RMWMU Building 6921 Sampling Locations



Building 6925



Building 6926



Actual locations may vary from the figure.

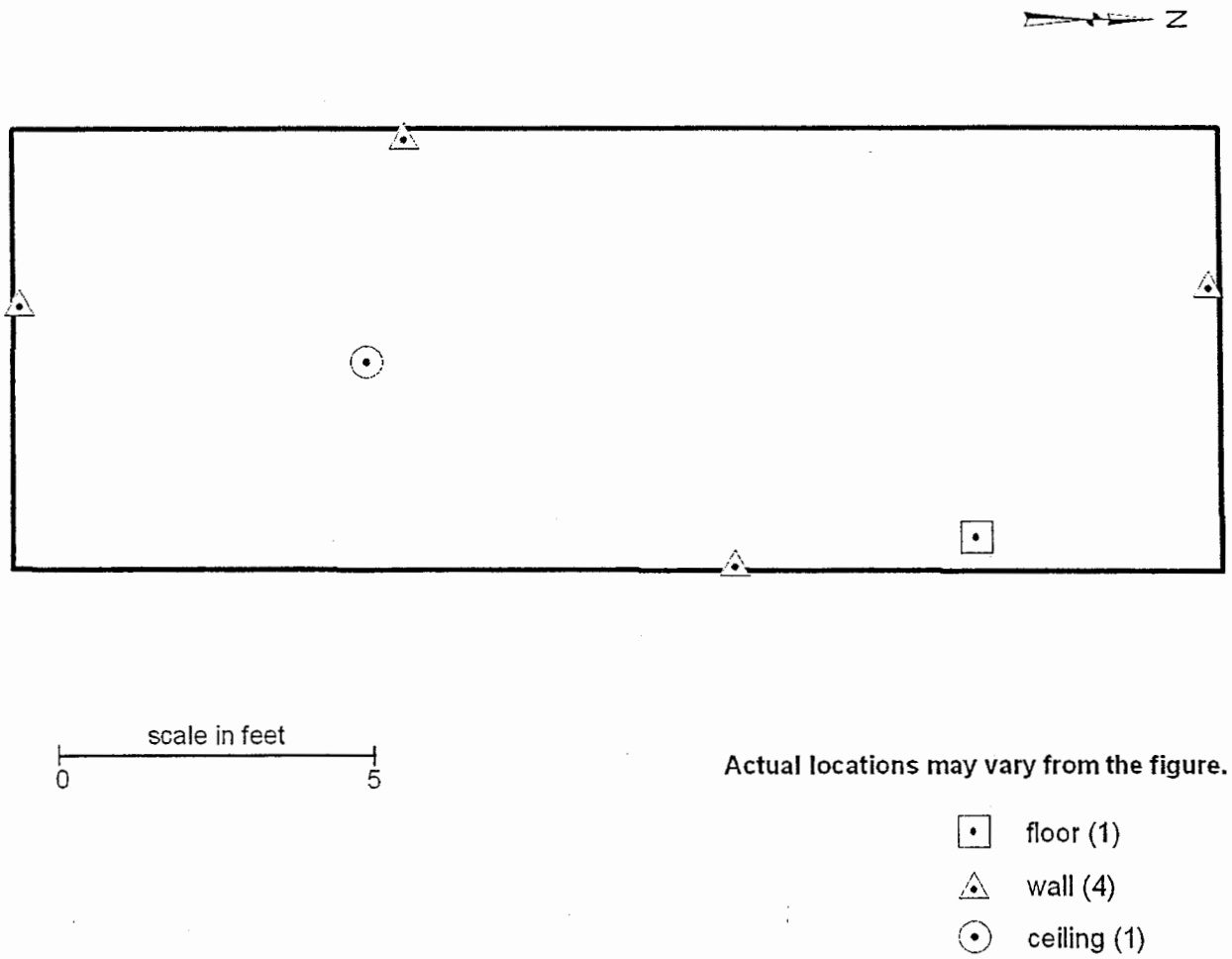
floor (4 each)

wall (4 each)

Figure G.3-4
RMWMU Buildings 6925 and 6926 Sampling Locations

INSERT FIGURE G.3-4

INSERT FIGURE G.3-5



Note: Same sample plan for both modular buildings.

Figure G.3-5
RMWMU Modular Storage Units - TP-150 and TP-153 Sampling Locations

G.4 CLOSURE PLAN FOR THE AUXILIARY HOT CELL UNIT

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Figure G.4-1 AHCU Sampling Locations

G.4.1 INTRODUCTION

This closure plan details the activities necessary to close the Auxiliary Hot Cell Unit at Technical Area V at Sandia National Laboratories, hereafter referred to as the AHCU. This closure plan incorporates the requirements in 40 CFR §§ 264.110 through 264.116, 264.178, and Permit Part 6.

The AHCU is located in the high bay of Building 6597 and is comprised of four waste management areas: 1) the auxiliary hot cell, 2) the work area near the hot cell including a fume hood, 3) the storage silos, and 4) the container storage area. The unloading/loading area is indoors. A complete physical and operational description of the AHCU is in Permit Attachment A, Section A.5. The various AHCU components are shown generally on Figure G.4-1.

The AHCU is permitted to treat and store hazardous and mixed wastes with the EPA waste codes listed in Permit Attachment B, Section B.1. The AHCU is permitted to treat hazardous and mixed wastes with the set of EPA waste codes listed in Permit Attachment B, Section B.3. The square footage and operating capacity of the AHCU are identified in Permit Attachment J, Table J-1.

It is anticipated that the AHCU will be clean closed. The Permittees shall attain clean closure of the AHCU by meeting the closure performance standards specified at Permit Section 6.2.1. Final closure of the AHCU will be complete when the New Mexico Environment Department (Department) approves the Closure Report and certification required under Permit Part 6, Section 6.10 and Section 7.0 of this Closure Plan.

G.4.2 CLOSURE PROCESS

The Permittees shall, in accordance with Permit Part 6, Section 6.3.1, notify the Department in writing that they have initiated closure at the AHCU.

The Permittees shall, in accordance with Permit Part 6, Section 6.3.2 and Table 6.1, complete all AHCU closure activities.

The Permittees shall, in accordance with Permit Section 6.3.4, remove all hazardous and mixed waste from the AHCU no later than 90 days after initiating closure at the Unit, and shall also remove any solid waste that adversely interferes with closure activities.

The Permittees shall, in accordance with Permit Section 6.3.5, conduct a records review and structural assessment of the AHCU and shall submit the review and assessment in the form of a written report in accordance with that Section.

The Permittees shall, in accordance with Permit Section 6.3.6, decontaminate or remove all contaminated structures and equipment at the AHCU.

The Permittees shall, in accordance with Permit Section 6.3.7 and Section 3.0 (below), perform decontamination verification sampling of all structures and equipment at the AHCU, that were required to be decontaminated.

The Permittees shall, in accordance with Permit Section 6.3.8 and Section 3.0 (below), sample soils and base materials (*e.g.*, gravel) associated with AHCU as needed to quantify constituents of concern associated with any releases of hazardous or mixed wastes.

The Permittees shall ensure that soils and base materials at the AHCU contaminated with constituents of concern that pose an unacceptable risk to human health (based on the closure criteria in Permit Section 6.2.1) or the environment as specified in Permit Section 6.3.8, are removed from the Permitted Unit in accordance with Permit Section 6.3.9. The complete removal shall be verified by the Permittees in accordance with Permit Section 6.3.9.

If the contaminated soil or other environmental media cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8.

G.4.3 SAMPLING AND ANALYSIS PLAN

This sampling and analysis plan identifies: 1) the constituents of concern at the AHCU, 2) the locations where sampling shall occur, 3) the laboratory analytical methods that shall be employed to quantify analyte concentration in samples, and 4) the quality assurance procedures to be utilized during closure.

The constituents of concern at the AHCU shall be determined in accordance with Permit Sections 6.3.5 and 6.5(1). A preliminary list of groups of constituents is presented in Table G.4-1 of this Permit Attachment; the list shall be modified at the time of closure if necessary in accordance with Permit Section 6.3.5.

The Permittees shall collect wet-wipe and soil samples, and perform sample quality assurance procedures in accordance with Permit Sections 6.3.10.1, 6.3.10.2, and 6.3.10.3.

The Permittees shall sample soils and base materials at the applicable locations identified at Permit Section 6.3.8. Soil sampling locations are identified in part on Figure G.4-1. The Permittees shall sample structures and equipment at the applicable locations identified in accordance with Permit Section 6.3.7.

Sampling locations may vary from those shown in the figures due to conditions at closure. Sampling locations may also change as a result of amendments to this closure plan, such as amendments required under Permit Section 6.6.

Table G.4-1.
Sampling Requirements[1]

Parameter	Laboratory Method(s)	Preservation	Holding Time
Metals (Total: Ag, As, Ba, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, and Tl)	6010/6020/ 7470/7471	None	6 months (except Hg 28 days)
VOCs	8260	Headspace free, Cool to 4°C	14 days
SVOCs	8270	Cool to 4°C	14 days
Cyanide	9010/9012	Cool to 4°C	14 days

[1] Methods are EPA SW-846 Methods, as revised and updated.

The Permittees shall handle samples as specified at Permit Part 8, Section 8.10.2.9.

The Permittees shall utilize the laboratory analytical methods, the sample preservation criteria, and the sample holding times as specified in Table G.4-1, as the information in the table may be updated via a closure plan amendment. The Permittees shall abide with the requirements for chemical analyses at laboratories as specified at Permit Part 8, Section 8.10.3.

The Permittees shall document field activities associated with closure as specified at Permit Section 8.10.2.14.i.

G.4.4 AMENDMENT TO THIS CLOSURE PLAN

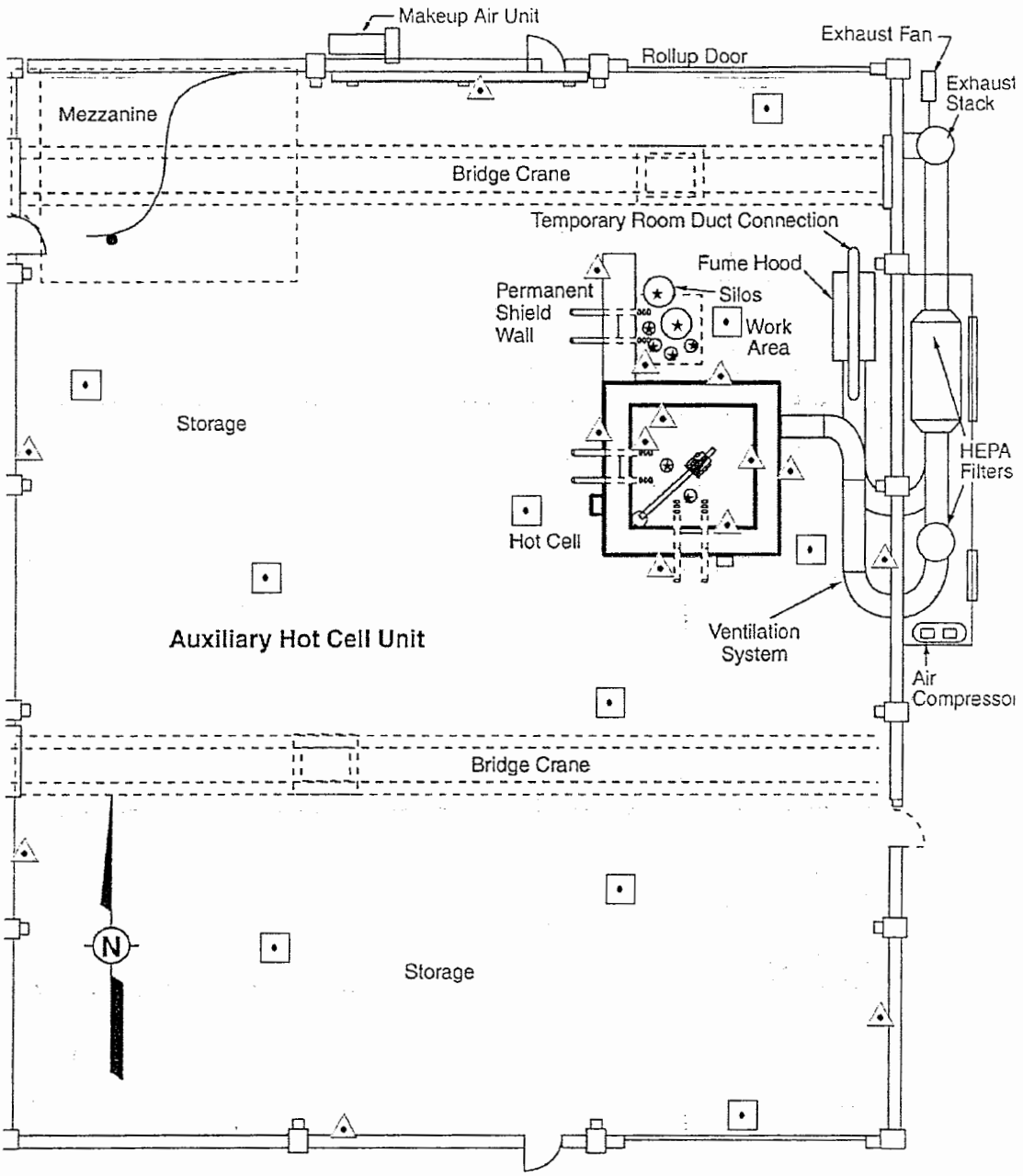
The Permittees shall submit permit modification requests to amend this Closure Plan, if needed, in accordance with Permit Section 6.6.

G.4.5 WASTES GENERATED FROM CLOSURE ACTIVITIES

The Permittees shall ensure that waste (*e.g.*, demolition debris and contaminated soil) generated from closure of the AHCU is managed in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

G.4.6 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure of the AHCU, the Permittees shall in accordance with Permit Section 6.10 submit a closure report to the Department for review and approval.



LEGEND

Hazardous and Mixed Waste Management Area

0 7.5 15
SCALE IN FEET

AHCU floor (10)

AHCU wall (16)

★ AHCU silo (8) Note: Each silo requires 1 sample.

Actual locations may vary from the figure.

Figure G.4-1
AHCU Sampling Locations

INSERT FIGURE G.4-1

G.5 CLOSURE PLAN FOR THE MANZANO STORAGE BUNKERS

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Figure G.5-3 Type D Bunker Sampling Locations

G.5.1 INTRODUCTION

This closure plan details the activities necessary to close the Manzano Storage Bunkers. The Manzano Storage Bunkers are hereafter referred to as the MSBs. This closure plan incorporates the requirements in 40 CFR §§ 264.110 through 264.116, 264.178, and Permit Part 6.

The MSBs are located within the fenced Manzano Base approximately 1 mile east of the exit road leading to the entrances to Technical Areas (TAs)-III and V and at the end of Pennsylvania Avenue. The location of the MSBs within the Sandia National Laboratories is shown on Figures 2 and 25 in Permit Attachment L (*Figures*).

There are five bunkers collectively referred to as the MSBs. Each of the five bunkers is considered an individual hazardous waste management unit. The five bunkers include Bunkers 37034, 37045, 37055, 37057, and 37118. There are three types of bunkers: Type B (37034); Type C (37118); and Type D (37045, 37055, and 37057). Each of these bunkers is constructed of concrete (walls, roof, and floor), is covered by earthen materials, and the walls and roof of each bunker are rounded. Type B and D bunkers consist of an access tunnel leading to a main chamber that is used for storage of hazardous and mixed wastes. Type C bunkers do not have an access tunnel and consist entirely of a main chamber used for storage of hazardous and mixed wastes. The waste loading/unloading area for each MSB is immediately outside the outer door. A complete physical and operational description of the MSBs is in Permit Attachment A, Section A.6. Type B, C, and D bunker configurations and dimensions are shown generally on Figures G.5-1, G.5-2, and G.5-3 respectively.

Because this Permit Attachment G.5 addresses five hazardous waste management units, and because the units may close at different times or in concert, the requirements of this closure plan may be fulfilled at separate times for individual units or at the same time and with the same documents for all or multiple units.

The MSBs are permitted to store hazardous and mixed wastes with the EPA waste codes listed in Permit Attachment B, Section B.2, in containers. The operating capacities and total square footage of the individual bunkers are identified at Permit Attachment J, Table J-1.

It is anticipated that the MSBs will be clean closed. The Permittees shall attain clean closure of the MSBs by meeting the closure performance standards specified at Permit Section 6.2.1. Final closure of the MSBs will be complete when the New Mexico Environment Department (Department) approves the Closure Report and certification required under Permit Part 6, Section 6.10 and Section 6.0 of this Closure Plan.

G.5.2 CLOSURE PROCESS

The Permittees shall, in accordance with Permit Part 6, Section 6.3.1, notify the Department in writing that they have initiated closure at a given MSB.

The Permittees shall, in accordance with Permit Part 6, Section 6.3.2 and Table 6.1, complete all closure activities at the MSB.

The Permittees shall, in accordance with Permit Section 6.3.4, remove all hazardous and mixed waste from the MSB no later than 90 days after initiating closure at the Unit, and shall also remove any solid waste that adversely interferes with closure activities.

The Permittees shall, in accordance with Permit Section 6.3.5, conduct a records review and structural assessment of the MSB and shall submit the review and assessment in the form of a written report in accordance with that Section.

The Permittees shall, in accordance with Permit Section 6.3.6, decontaminate or remove all contaminated structures and equipment at the MSB.

The Permittees shall, in accordance with Permit Section 6.3.7 and Section 3.0 (below), perform decontamination verification sampling of all structures and equipment at the MSB that were required to be decontaminated.

The Permittees shall, in accordance with Permit Section 6.3.8 and Section 3.0 (below), sample soils and base materials (*e.g.*, gravel) associated with the MSB to quantify constituents of concern associated with any releases of hazardous or mixed wastes.

The Permittees shall ensure that soils and base materials at the MSB contaminated with constituents of concern that pose an unacceptable risk to human health (based on the closure criteria in Permit Section 6.2.1 or the environment as specified in Permit Section 6.3.8, are removed from the Permitted Unit in accordance with Permit Section 6.3.9. The complete removal shall be verified by the Permittees in accordance with Permit Section 6.3.9.

If the contaminated soil or other environmental media cannot be removed because it would be impracticable, the soil or other environmental media shall be subject to corrective action under Permit Section 6.8.

G.5.3 SAMPLING AND ANALYSIS PLAN

This sampling and analysis plan identifies: 1) the constituents of concern at the MSB, 2) the locations where sampling shall occur, 3) the laboratory analytical methods that shall be employed to quantify analyte concentration in samples, and 4) the quality assurance procedures to be utilized during closure.

The constituents of concern at the MSB shall be determined in accordance with Permit Sections 6.3.5 and 6.5(1). A preliminary list of groups of constituents is presented in Table G.5-1 of this Permit Attachment; the list shall be modified at the time of closure if necessary in accordance with Permit Section 6.3.5.

The Permittees shall collect wet-wipe and soil samples, and perform sample quality assurance procedures in accordance with Permit Sections 6.3.10.1, 6.3.10.2, and 6.3.10.3.

The Permittees shall sample soils and base materials at the applicable locations identified at Permit Section 6.3.8. Samples shall be collected at the waste loading and unloading area (*i.e.*, area outside the door to the bunker).

Table G.5-1
Sampling Requirements[1]

Parameter	Laboratory Method(s)	Preservation	Holding Time
Metals (Total: Ag, As, Ba, Be, Cd, Cr, Hg, Ni, Pb, Sb, Se, and Tl)	6010/6020/ 7470/7471	None	6 months (except Hg 28 days)
VOCs	8260	Headspace free, Cool to 4°C	14 days
SVOCs	8270	Cool to 4°C	14 days
High Explosives	8330	Cool to 4°C	14 days
PCBs	8080/8081	Cool to 4°C	14 days
Cyanide	9010/9012	Cool to 4°C	14 days

[1] Methods are EPA SW-846 Methods, as revised and updated.

The Permittees shall sample structures and equipment at the applicable locations identified in accordance with Permit Section 6.3.7. The sampling locations to demonstrate decontamination verification are identified in part on Figures G.5-1, G.5-2, and G.5-3.

Sampling locations may vary from those shown in the figures due to conditions at closure. Sampling locations may also change as a result of amendments to this closure plan, such as amendments required under Permit Section 6.6.

The Permittees shall handle samples as specified at Permit Part 8, Section 8.10.2.9.

The Permittees shall utilize the laboratory analytical methods, the sample preservation criteria, and the sample holding times as specified in Table G.5-1, as the information in the table may be updated via a closure plan amendment. The Permittees shall abide with the requirements for chemical analyses at laboratories as specified at Permit Part 8, Section 8.10.3.

The Permittees shall document field activities associated with closure as specified at Permit Section 8.10.2.14.i.

G.5.4 AMENDMENT TO THIS CLOSURE PLAN

The Permittees shall submit permit modification requests to amend this Closure Plan, if needed, in accordance with Permit Section 6.6.

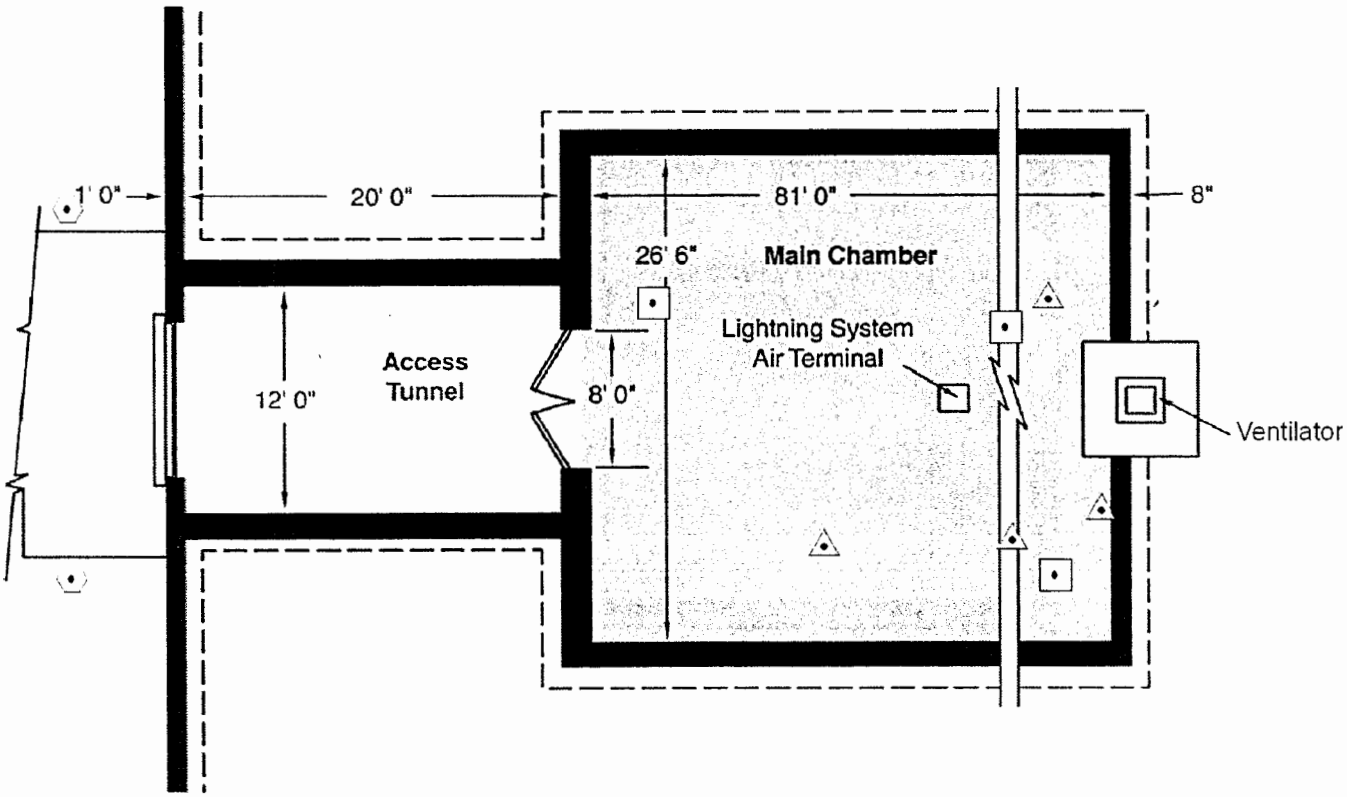
G.5.5 WASTES GENERATED FROM CLOSURE ACTIVITIES

The Permittees shall ensure that waste (*e.g.*, demolition debris and contaminated soil) generated from closure of each MSB is managed in compliance with all applicable state, federal, and local requirements (*see* 40 CFR § 264.114).

G.5.6 CLOSURE REPORT AND CERTIFICATION

No later than 60 days after completing closure of the MSB, the Permittees shall in accordance with Permit Section 6.10 submit a closure report to the Department for review and approval.

INSERT FIGURE G.5-1



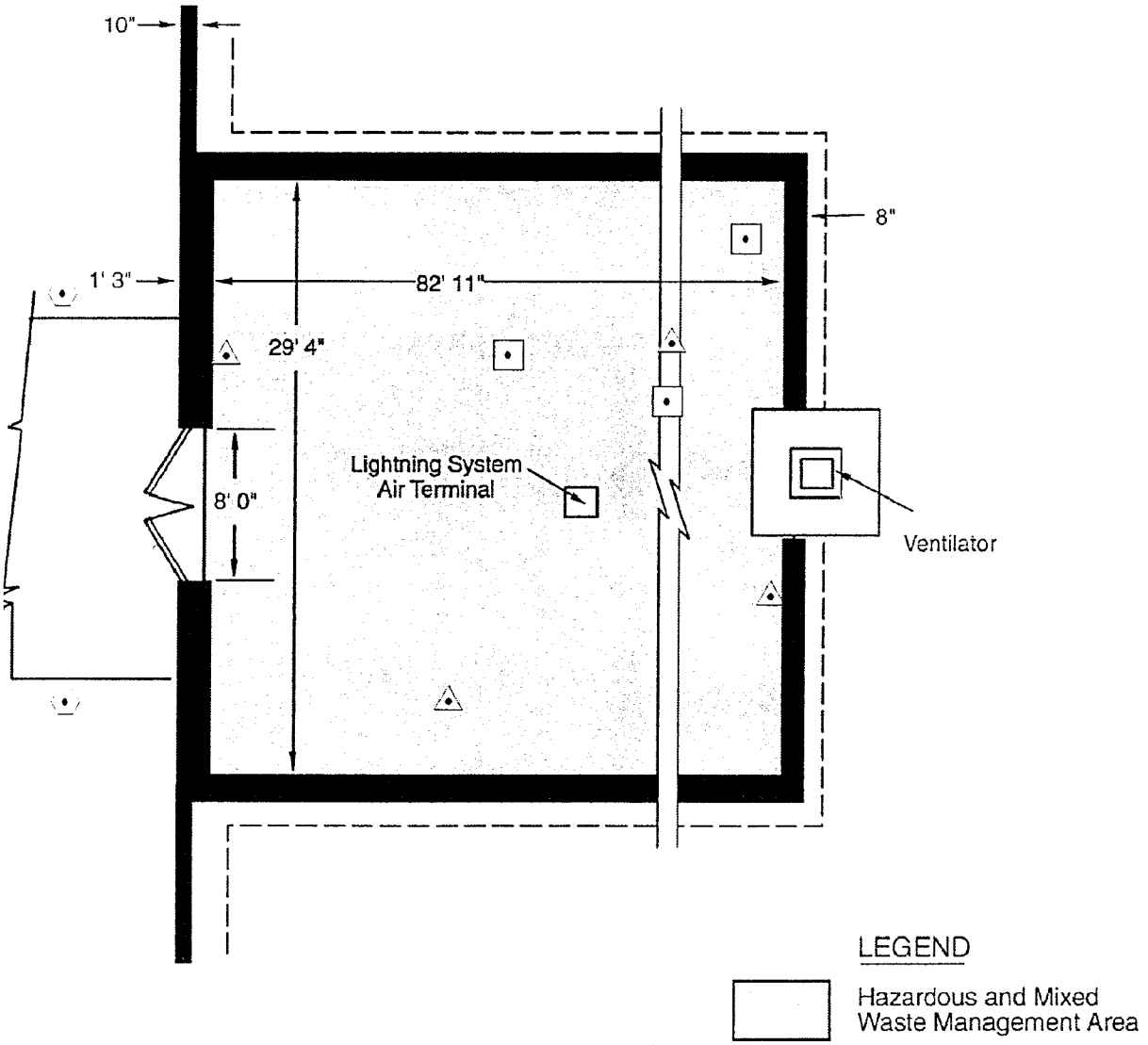
LEGEND

Hazardous and Mixed Waste Management Area

Actual locations may vary from the figure.

- floor (3)
- wall/ceiling (4)
- load/unload/soil (2)

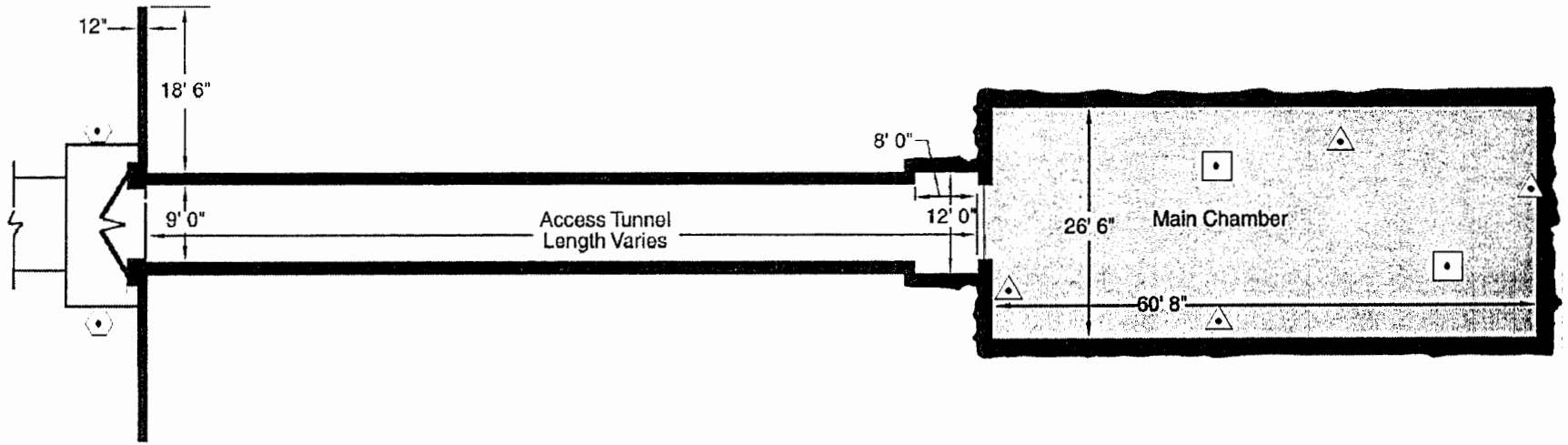
Figure G.5-1
Manzano Bunker 37034 (Type B Bunker Configuration) Sampling Locations



Actual locations may vary from the figure.

- floor (3)
- wall/ceiling (4)
- load/unload/soil (2)

Figure G.5-2
Manzano Bunker 37118 (Type C Bunker Configuration) Sampling Locations



LEGEND

Hazardous and Mixed Waste Management Area

Actual locations may vary from the figure.

- floor (2)
- wall/ceiling (4)
- load/unload/soil (2)

Figure G.5-3
Manzano Bunkers 37045, 37055, and 37057 (Type D Bunker Configuration) Sampling Locations

INSERT FIGURE G.5-2

INSERT FIGURE G.5-3

PERMIT ATTACHMENT H POST-CLOSURE CARE PLAN FOR THE CORRECTIVE ACTION MANAGEMENT UNIT

H.1 INTRODUCTION

This post-closure care plan addresses the post-closure activities that shall be performed at the Corrective Action Management Unit (CAMU) by the Permittees. The CAMU is used for the containment of hazardous and toxic wastes that were generated during remediation activities at the Chemical Waste Landfill (CWL), which is located 100 yards southeast of the CAMU. The CWL is regulated by a stand-alone Post-Closure Care Permit.

This post-closure plan incorporates the requirements of 40 CFR § 264.117 through § 264.120 and § 264.552(e)(6). Post-closure care of the CAMU began on October 15, 2003, and shall continue for 30 years after that date, except that the 30-year post-closure care period may be shortened or extended, as specified in Part 7 of this Permit.

Additional information on post-closure waste management practices to be conducted at the CAMU, and a description of the Unit is provided in Permit Attachment A (*Facility Description*).

During the post-closure care period, the CAMU containment cell shall be monitored and maintained in a manner that shall ensure protection of human health and the environment. The potential for exposure shall be minimized by means of employing the following:

1. Engineered barriers shall be maintained to minimize the migration of leachate into the surrounding environment;
2. Security measures shall be maintained to restrict access to the area; and
3. Inspections, maintenance, and repairs shall be performed as needed and in accordance with Permit Attachment E and this Permit Attachment.

H.2 STORM-WATER DIVERSION STRUCTURES

During post-closure care, the function of storm-water diversion structures associated with the containment cell is to prevent storm-water run-on and runoff from eroding the final cover and to reduce the amount of water that potentially could infiltrate into the final cover. As shown in Figure 36 of Permit Attachment L (*Figures*), the two storm-water diversion structures associated with the containment cell are the site diversion ditch and the containment cell perimeter drainage swale. Storm-water run-on is diverted away from the containment cell by the site diversion ditch where it is directed toward existing surface-water drainage features. Storm-water runoff from the containment cell cover is directed to the perimeter drainage swale where it is discharged off-site via an outfall.

H.3 SECURITY

Figure 32 of Permit Attachment L (*Figures*) shows the post-closure perimeter boundary for the CAMU containment cell area. A contiguous four-strand, barbed-wire fence with two main gates delineates this boundary. The gates are locked when authorized personnel are not present at the CAMU; only authorized personnel control access. Warning signs stating, "*Danger—*

Unauthorized Personnel Keep Out" are posted on all sides of the CAMU fence at 100-foot intervals, at the main gate, and at the emergency exit. The warning signs are legible from a distance of at least 25 feet, visible from any approach to the CAMU, and are posted in both Spanish and English.

H.4 MAINTENANCE AND REPAIRS

Maintenance and repairs shall be conducted as required in this Permit Attachment and in accordance with Permit Attachment E, Section E.3 and Table E-6.

H.4.1 Final Cover System

Water shall be prevented from ponding on the surface of the CAMU cover in any area in excess of 100 square feet. The Permittees shall prevent the establishment of deep-rooted plants, such as shrubs and trees by identifying such species during quarterly inspections and eliminating them before they become established. The plants shall be killed within 60 days or as soon as seasonal conditions are favorable for eliminating them.

Cover damage that exceeds the limits described under "Inspection" shall be repaired within 60 days to a condition that meets or exceeds the original design. Repair specifications shall include, but not be necessarily limited to, the following.

Animal intrusion burrows, settlement areas, and areas of erosion shall be backfilled and compacted using non-contaminated soil with properties similar to the soil used to construct the final cover. The soil shall meet the original construction specifications for the CAMU final cover. The Permittees shall make reasonable attempts to relocate animals prior to backfilling their burrows.

Areas with no vegetation in excess of 200 square feet shall be reseeded in accordance with the original construction specifications for the CAMU final cover. If seasonal conditions (e.g. temperature) are not appropriate for establishing vegetation within 60 days, repairs shall be completed as soon as possible when appropriate conditions occur. Where necessary, the topsoil layer and gravel mulch surface shall be repaired to provide a suitable seedbed. The repair shall be done using materials meeting the original specifications of the CAMU final cover.

H.4.2 Storm-Water Diversion Structures

Based upon the results of the storm-water diversion structure inspections, erosion or damage that exceeds the limits described under the preceding paragraph shall be repaired within 60 days to a condition that meets or exceeds the original design. Silt and debris accumulations that exceed the above specified limits shall be removed within 60 days.

H.4.3 LCRS

The LCRS pump and plumbing shall be maintained/repaired as necessary to maintain them in good condition based upon the results of quarterly inspections. Maintenance/repairs shall be done within 60 days of discovery that the maintenance/repairs are needed.

H.4.4 VZMS

The VZMS components shall be maintained/repaired within 60 days, as needed, to maintain them in good condition -- based upon inspection results. Activities shall include, but not be limited to, maintaining protective casings, access covers/doors, and instrumentation access boxes, ensuring the PSL and CSS compression caps are in good repair, cleaning or replacing locks as necessary, and maintaining calibration and proper operating condition of all electronic monitoring systems. Maintenance/repair activities shall also include ensuring that all aboveground VZMS components are protected from the weather.

H.4.5 Security Fencing and Signage

The fence, gates, and warning signs shall be maintained/repaired within 60 days, as needed, to maintain them in good condition -- as indicated by quarterly inspections. Activities shall include, but are not limited to, the following as needed: removing excessive accumulations of wind-blown plants and debris, repairing broken wire sections and posts, repairing and oiling gates, cleaning or replacing locks, and repairing or replacing warning signs.

H.5 VADOSE ZONE MONITORING SYSTEM LEAK DETECTION MONITORING FREQUENCY AND ASSESSMENT

Sampling and analysis plans (SAPs) for the PSL, VSA, and CSS monitoring subsystems are included in Sections H.6, H.7 and H.8 of this Permit Attachment, respectively, and related Sandia National Laboratories/NM (SNL/NM) Field Operating Procedures (FOPs) are summarized in Table H-2. The purpose of these SAPs is to document procedures for the collection and reporting of consistent, reliable, defensible, and comparable sampling results. Other instructions are provided in SNL/NM FOPs; however, the requirements of the SAPs in this Permit Attachment shall take precedence over any cited FOPs. The most current versions of these FOPs shall be consulted for the purpose of conducting vadose zone monitoring.

The Permittees shall provide to the New Mexico Environment Department (the Department) within 60 days of the effective date of this Permit in hard copy and electronic format the current versions of the FOPs cited in this Permit Attachment. The Permittees shall provide the Department with any updated versions of the FOPs within 30 days of their acceptance by the Permittees. If any requirement or procedure is found by the Department to be unacceptable for reasons including, but not limited to, the requirement or procedure will or could prevent the acquisition of representative and reliable sampling results, the requirement or procedure shall be replaced by the Permittees with a different requirement or procedure that is acceptable to the Department.

TABLE H-1
Vadose Zone Monitoring System Post-Closure Monitoring Frequency, Parameters, and Methods

Time Frame	Monitoring Frequency	Monitoring System	Monitoring/Sampling Parameter	Monitoring Method
Years 2–30 after closure[a]	Quarterly	PSL	Moisture Content	Neutron Probe
		VSA	Soil Moisture Content Temperature	TDR probe Temperature Sensor
		CSS	Moisture Content	Neutron Probe
	Annually[b]	VSA	Active Soil Gas	EPA Method TO-14 or equivalent, as revised and updated[c]
		CSS		

TDR Time domain reflectometer
a Closure of the Unit was completed in October 2003.
b Active soil-gas sampling shall be conducted annually unless increased soil moisture is detected, in which case active soil-gas sampling shall be conducted on a quarterly basis.
c Method TO-14 or an equivalent method such as TO-15 that includes the same analyte list, method detection limits equal to or lower than the TO-14 limits, and provides the same or higher level of data quality. Methods from *Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air – Second Edition* (EPA/625/R-96/010b), 1999, as revised and updated.

Table H-2
Applicable SNL Operating Procedures[a]

Procedure Number	Procedure Title
FOP 08-20	Soil Moisture Determination Utilizing Neutron Logging
FOP 08-21	Soil Moisture Monitoring Using Time Domain Reflectometry
FOP 08-22	Soil Vapor Sampling

[a] Sandia National Lab's Procedures (procedures will be used as revised and updated)

H.5.1 Frequency

During the initial stages of the post-closure care period, the primary subliner (PSL), vertical sensor array (VSA), and chemical waste landfill and sanitary sewer line monitoring subsystems (CSS) of the vadose zone monitoring system (VZMS) were monitored on a quarterly and annual

basis for one year. Monitoring shall continue on a quarterly and annual basis for the remainder of the monitoring period unless corrective action is required because of a release of hazardous waste or constituents. A summary of the VZMS post-closure monitoring frequency, parameters, and methods are presented in Table H-1 of this Permit Attachment.

H.5.2 Assessment

As part of each monitoring event, soil moisture content and soil gas results obtained from the VZMS shall be evaluated to determine if there has been leakage or a release of soil gas from the containment cell and, if so, the character and magnitude of the leak or release.

H.5.2.1 Soil Moisture

In the case of a soil moisture increase greater than 4 percent (expressed as gravimetric percent moisture content) at any monitoring location(s), the Permittees shall immediately confirm the result by collecting and analyzing additional samples. If a second analysis confirms that the trigger level has been exceeded, the Permittees must notify the Department in writing within seven days after receipt of the second analysis confirming that the trigger level has been exceeded during the particular sampling event. Within 180 days, the Permittees shall evaluate the soil moisture data to determine the likely location and source of the moisture and report the results in writing to the Department. If the likely source is the sanitary sewer line, the Permittees shall continue monitoring and shall take action if necessary to locate, reduce, and/or eliminate the source of the moisture.

If the likely source is the containment cell, the Permittees shall initiate corrective action as specified below.

H.5.2.2 Soil Gas

If a soil-gas sample result exceeds a trigger level of 20 parts per million by volume (ppmv) total volatile organic compounds (VOCs), the Permittees shall immediately confirm the result by collecting and analyzing additional samples. If a second analysis confirms that the trigger level has been exceeded, the Permittees must notify the Department in writing within seven days after receipt of the second analysis confirming that the trigger level has been exceeded during the particular sampling event.

H.5.2.3 Corrective Action

The Permittees shall submit, within 180 days of confirmation that the trigger level for soil gas has been exceeded, an evaluation of soil gas data in the vicinity of the CAMU, including data for the CWL. The evaluation shall include a determination of the source of the soil gas, and an evaluation of whether the increased soil gas will cause groundwater contamination of any hazardous constituent to exceed the clean up levels specified in Permit Part 8. After the Department has reviewed and approved the evaluation, and the source is determined to be the CAMU, the Permittees shall submit, within 180 days, an application for a permit modification to establish a corrective action program for the CAMU. The application must include at a minimum, a detailed description of the corrective action that will be taken by the Permittees to reduce the concentrations of soil gas to levels that will not exceed the trigger level of 20 ppmv

total VOCs, and the action that will be taken to reduce the concentrations of soil gas to levels that will not cause groundwater contamination of any hazardous constituent to exceed the clean up levels specified in Permit Part 8. The application shall also include a plan for a soil-gas monitoring program that will demonstrate the effectiveness of the corrective action.

For soil moisture, if the Permittees have determined that the likely source of increased moisture is the containment cell, the Permittees shall submit within 180 days an application for a permit modification to establish a corrective action program for the CAMU. The application must include at a minimum, a detailed description of the corrective action that will be taken by the Permittees to stop the release.

All applications for corrective action shall contain a schedule for implementation of the corrective action, and shall describe any necessary characterization and clean up of the vadose zone and groundwater that must be accomplished to protect human health and environment in accordance with the requirements of Permit Section H.1 and Permit Part 8.

H.6 SAMPLING AND ANALYSIS PLAN FOR THE CAMU PRIMARY SUBLINER MONITORING SYSTEM

The Primary Subliner (PSL) is one of three vadose zone monitoring systems associated with the Corrective Action Management Unit (CAMU) containment cell. Monitoring using the PSL Monitoring Subsystem shall be conducted to verify containment cell integrity and performance. This Sampling and Analysis Plan (SAP) describes the monitoring and sampling strategy for the PSL that shall be used during post-closure care.

The PSL is the primary monitoring system for the containment cell. It consists of five parallel-trending, horizontal, vitrified clay pipes (VCPs) located 5 feet below the containment cell bottom liner, with horizontal spacing of 17 to 27 feet. A polyvinyl chloride access tube is connected to the ends of each VCP to facilitate the deployment of a neutron probe for moisture monitoring. The access tubes open on the north and south sides of the containment cell. A neutron probe is manually moved through the VCP during monitoring events.

Monitoring requirements for the post-closure care period are specified in Table H-1 of this Permit Attachment.

H.6.1 Monitoring Methods

Moisture monitoring in the PSL subsystem involves measuring soil moisture content through each VCP using a neutron probe. The moisture sensor will be a California Pacific Nuclear (CPN) 503DR Hydroprobe Moisture Depth Gauge, or equivalent. The CPN 503DR probe uses a 50.0-millicurie americium-241:beryllium neutron source for moisture content measurement. With the custom-made cable-and-winch system available at the Facility, the CPN 503DR probe can be configured to move through each VCP while communicating with the control box on the surface.

Following neutron logging, the calculated moisture content data shall be entered onto a computer spreadsheet for evaluation. Moisture monitoring shall be conducted in accordance with FOP 08-20 (most current version).

H.6.2 CPN 503DR Hydroprobe Moisture Depth Gauge QA/QC and Correlation

The CPN 503DR Hydroprobe Moisture Depth Gauge is used to measure absorption of emitted neutrons and is a geophysical technique to measure soil moisture content. The assumption is made that the hydrogen in soil moisture is the dominant absorber of the emitted neutrons.

The CPN 503DR probe shall be operated in accordance with FOP 08-20. The standard count measures the proper function of the gauge electronics and also compensates for the source decay. This measurement shall be performed daily when the probe is used, as described in the FOP.

The correlation of neutron counts to soil moisture content using the CPN 503DR neutron probe was initially performed in a vessel that duplicated as closely as possible the *in situ* characteristics at the field measuring location. The probe was inserted into the access tube within the vessel, and count readings were taken for a known soil moisture content in the repacked native soil. The resulting neutron count/soil moisture content relationship was used to develop the initial correlation currently used for the instrument, which associates a neutron count to a known soil moisture content. To insure the accuracy of the moisture measurement using the correlation formula the neutron probe must be recalibrated to account for source decay and drift of the electronic counting system. During calibration the probe response is restored to the same condition as existed when the correlation formula was determined. The probe shall be returned to the manufacturer annually for calibration.

H.7 SAMPLING AND ANALYSIS PLAN FOR THE CAMU VERTICAL SENSOR ARRAY MONITORING SYSTEM

The Vertical Sensor Array (VSA) monitoring subsystem provides both lateral and vertical gradient information on *in situ* soil moisture, soil temperature and soil gas. Sampling and analysis via the VSA monitoring system shall be conducted to verify the integrity and performance of the CAMU containment cell. This Sampling and Analysis Plan (SAP) describes the monitoring and sampling strategy that shall be used for the VSA during post-closure care.

The VSA monitoring subsystem consists of 11 vertical boreholes located below the containment cell. Each borehole contains sampling points at 5 and 15 feet below the containment cell liner. The sampling points contain the following three components: a time-domain reflectometry (TDR) soil-moisture probe, a temperature sensor, and an active soil-gas sampler. Instrumentation cabling and tubing is ducted to the surface outside of the containment cell liner perimeter. The cabling and tubing connection ends for each VSA borehole are located within individual weatherproof, aboveground enclosures positioned around the perimeter of the containment cell.

H.7.1 Monitoring and Sampling Strategy

Monitoring requirements for the VSA are also outlined in Table H-1 of this Permit Attachment.

TDR moisture monitoring and temperature monitoring will be conducted in accordance with FOP 08-21.

H.7.2 Sampling Methods and Analytical Procedures

The soil gas-sampling package consists of a 2-inch-diameter and 6-inch-long, end-capped and slotted polyvinyl chloride screen at the sampling location, connected to the ground surface by 1/4-inch-inside-diameter Teflon™ tubing. Except as required herein, soil gas sampling shall be conducted in accordance with FOP 08-22.

Laboratory sample custody, data management, reporting, and sample disposal shall be performed in accordance with established laboratory procedures. Analytical procedures shall follow established laboratory standard operating procedures based upon the referenced EPA method. Active soil gas sampling shall be conducted for volatile organic compounds included in EPA Methods TO-14 or equivalent analytical method.

Except as required herein, Table H-2 of this Permit Attachment lists the field procedures that will be used in support of this SAP. These procedures provide instructions for conducting VSA monitoring and sampling operations. For each scheduled sampling event on Table H-2, field and laboratory quality assurance (QA) samples shall include duplicate samples and trip and field blanks in accordance with the procedure and the TO-14 or equivalent analytical method.

H.7.3 Time-Domain Reflectometer and Data Acquisition Software and QA/QC

The TDR100 Time-Domain Reflectometer and PC-TDR software will be operated in accordance with the FOP 08-21 and the Campbell Scientific, Inc. TDR100 Instruction Manual (Campbell Scientific, Inc., April 2002).

The reflectometer will be operated and tested according to the operator's manual as discussed in FOP 08-21. Predetermined settings for the cable length, waveform, and probe for each monitoring location are entered into the PC-TDR software to ensure capture of the waveform signal to determine soil volumetric water content.

H.8 SAMPLING AND ANALYSIS PLAN FOR THE CHEMICAL WASTE LANDFILL AND SANITARY SEWER LINE MONITORING SYSTEM AT THE CAMU

The Chemical Waste Landfill (CWL) and Sanitary Sewer Line (CSS) monitoring subsystem is designed to allow detection and identification of leakage from the sanitary sewer line, as well as volatile organic compounds (VOCs) that could potentially migrate from the CWL towards the CAMU containment cell. This SAP describes the monitoring and sampling strategy that shall be used for the CSS monitoring system during post-closure care.

The CSS monitoring subsystem is located east of the containment cell and consists of six vertical, 20-foot-deep boreholes, spaced approximately 100 feet apart in a line parallel to the north-south oriented sanitary sewer line. Each borehole is equipped with galvanized steel casing suitable for deployment of a neutron probe for soil moisture monitoring and a sampling port used to collect soil gas samples.

H.8.1 Monitoring and Sampling Strategy

Monitoring shall also be conducted as specified in Table H-1 of this Permit Attachment. The CSS monitoring system shall be used to perform the following activities:

1. Detect liquid releases from the sanitary sewer line, thereby providing information to eliminate false positive detections at the other vadose zone monitoring systems. Potential releases from the sanitary sewer line would be of an aqueous nature and could contain nitrates and perhaps phosphates and sulfates. VOCs originating from the sanitary sewer line are not anticipated; and
2. Detect VOC vapors migrating northwest through the vadose zone toward the containment cell from residual contamination at the CWL.

A neutron probe shall be used at the CSS monitoring locations to measure soil moisture. During a monitoring event, the probe is manually lowered to the selected monitoring point inside the galvanized steel casing. Moisture monitoring within the CSS shall be conducted following FOP 08-20.

H.8.2 Sampling Methods and Analytical Procedures

The CSS monitoring points shall also be used for soil gas sampling to detect and identify VOC vapors that may potentially migrate toward the containment cell from residual contamination at the CWL. Except as required herein, soil gas sampling shall be conducted in accordance with FOP 08-22.

An analytical laboratory under contract to the Permittees for the Facility shall be used to provide the analytical services. Laboratory sample custody, data management, reporting, and sample disposal shall be performed in accordance with established laboratory procedures. Active soil gas sampling shall be conducted for VOCs included in EPA Methods TO-14 or equivalent analytical method.

Except as required herein, Table H-2 of this Permit Attachment lists the field procedures that shall be used in support of this SAP. These procedures provide instructions for CSS monitoring and sampling operations. For each scheduled sampling event prescribed by Table H-1 of this Permit Attachment, field and laboratory quality assurance (QA) samples shall include duplicate samples.

The Permittees shall perform the QA/QC checks and correlations for the CPN 503DR Hydroprobe Moisture Depth Gauge as set forth in Section H.6.2 of this Permit Attachment, and shall operate the probe in accordance with FOP 08-20.

H.9 ANNUAL REPORT

The Permittees shall submit to the Department a certified annual report describing the post-closure care conducted at the CAMU for the previous year. The annual report shall be submitted no later than March 31 of every year that post-closure care takes place. The report shall summarize the results of required inspection and maintenance/repair activities indicating whether repairs were effective and met the applicable CAMU construction or Permit maintenance

specifications. The report shall also summarize sampling results, leachate generation, and any problems, leaks, or releases that either endangered or presented significant potential to endanger human health or the environment and what was done to mitigate such problems, leaks, or releases.

H.10 CERTIFICATION OF COMPLETION OF POST-CLOSURE CARE

Within 60 days of the end of the post-closure care period for the CAMU, the Permittees shall submit to the Department, by registered mail, a written certification that post-closure care for the CAMU was performed in accordance with the specifications of this Permit including this Permit Attachment. Responsible officials of the Permittees, as well as an independent registered professional engineer, shall sign the certification. Documentation supporting the independent registered professional engineer's certification of completion of post-closure care shall be furnished by the Permittees to the Department upon request In addition, the Permittees shall prepare a final post-closure care report summarizing pertinent information regarding post-closure monitoring, maintenance, and repair activities and any variances from this Permit Attachment and the reasons for the variances. The post-closure care report shall be provided with the certification to the Department within 60 days of the end of the post-closure period. Transmittal of the report shall include a request from the Permittees for the Department to approve termination of post-closure care for the CAMU. However, submittal of the latter request does not obligate the Department to terminate post-closure care, and the Department instead, may extend the period of post-closure care if necessary to protect human health and the environment pursuant to 40 CFR § 264.117(a)(2)(ii).

PERMIT ATTACHMENT I COMPLIANCE SCHEDULES

Reserved

PERMIT ATTACHMENT J HAZARDOUS AND MIXED WASTE MANAGEMENT UNITS

J.1 ACTIVE PORTION OF THE FACILITY

The active portion of the facility comprises those units permitted to treat and store hazardous and mixed waste. These units are listed in Table J-1.1.

The following information describes process codes and associated process descriptions:

- S01-storage in containers (Table J-1.1)
- T04-treatment in containers (Table J-1.2)
- X01-treatment by open burning (Table J-1.2)
- T04-physical treatment (Table J-1.2)

Table J-1.1. Units Permitted for Storage in Containers (Process Code S01)

Unit Identifier	Storage Capacity	General Information	Type of Unit
TA-I: Hazardous Waste Handling Unit Building 958	59,950 gal	Includes hazardous and mixed waste packaging and storage Total square footage : 3520	Indoor
TA-I: Hazardous Waste Handling Unit Building 959	7,590 gal	Includes hazardous and mixed waste packaging and storage Total square footage: 1800	Indoor
TA-I: Hazardous Waste Handling Unit, Modular Storage Building 958B	5,000 gal	Includes the storage of ignitable and reactive wastes (e.g., lithium batteries) and flammable solids Total square footage: 176	Indoor
TA-I: Hazardous Waste Handling Unit, Modular Storage Building 958C	5,000 gal	Includes the storage of ignitable and reactive wastes (e.g., lithium batteries) and flammable solids Total square footage: 176	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - Building 6920	13,420 gal	Includes storage, treatment (see Table J-1.2), and repackaging of hazardous and mixed wastes Total square footage: 5800	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - in Building 6921	7,810 gal	Includes treatment (See Table J-1.2), , repackaging and storage of hazardous and mixed wastes Total square footage: 1450	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - Building 6925	83,160 gal	Includes treatment (See Table J-1.2), repackaging and storage of hazardous and mixed wastes Total square footage: 4000	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - Building 6926	83,160 gal	Includes storage of hazardous and mixed wastes Total square footage: 4000	Indoor

Table J-1.1. Units Permitted for Storage in Containers (Process Code S01)			
Unit Identifier	**Storage Capacity**	**General Information**	**Type of Unit**
TA-III: Radioactive And Mixed Waste Management Unit - Modular Storage Building TP150	1,100 gal	Includes storage of reactive and ignitable hazardous and mixed wastes Total square footage: 207	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - Modular Storage Building TP153	1,100 gal	Includes storage of reactive and ignitable hazardous and mixed wastes Total square footage: 207	Indoor
TA-III: Radioactive And Mixed Waste Management Unit - Asphalt Storage Area located North, East, and West of Building 6920	19,800 gal	Includes the storage of hazardous and mixed wastes. Total square footage: 48500	Outdoor
TA-V: Auxiliary Hot Cell Unit	6,620 gal	Includes storage, treatment (See Table J-1.2), and repackaging of hazardous and mixed wastes in Building 6597 Total square footage: 3500	Indoor
TA-V: Auxiliary Hot Cell Unit	1,455 gal	Includes storage of mixed waste in Storage Silos located in Building 6597 Total square footage: 13	Indoor
Manzano Base: Bunker 37034	25,080 gal	Includes storage of hazardous and mixed waste Total square footage: 2146	Indoor
Manzano Base: Bunker 37045	18,480 gal	Includes storage of hazardous and mixed waste Total square footage: 1608	Indoor
Manzano Base: Bunker 37055	18,480 gal	Includes storage of hazardous and mixed waste Total square footage: 1608	Indoor
Manzano Base: Bunker 37057	18,480 gal	Includes storage of hazardous and mixed waste Total square footage: 1608	Indoor
Manzano Base: Bunker 37118	35,200 gal	Includes storage of hazardous and mixed waste Total square footage: 2433	Indoor

Table J-1.2. Units Permitted for Treatment (Process Codes T04 and X01)

Unit Identifier	Process Codes	Operating Capacity	General Information	Type of Unit
TA-III: Radioactive And Mixed Waste Management Unit – All treatment in Buildings 6920 and 6921 Macroencapsulation also in Building 6925	T04	65 gal/day 3,000 gal/yr 80 lb/day 150 lb/yr 550 gal/day 6,000 gal/yr 16 lb/day 100 lb/yr 13,800 gal/day 138,000 gal/yr 5,000 lb/day 50,000 lb/yr	Chemical deactivation Thermal deactivation Stabilization and solidification Amalgamation Macroencapsulation Physical treatment See Table J-1.1 for storage	Indoor
TA-III: Thermal Treatment Unit	X01	20.8 gal in pan 9,500 lb/yr	Open burning	Outdoor
TA-V: Auxiliary Hot Cell Unit	T04	55 gal/day 2,000 gal/yr 550 gal/day 2,000 gal/yr 55 gal/day 6,000 gal/yr 5,000 lb/day 50,000 lb/yr	Chemical deactivation Stabilization and solidification Macroencapsulation Physical treatment See Table J-1.1 for storage	Indoor

Units subject to post-closure care under this Permit are listed in Table J-2. The Chemical Waste Landfill is regulated under a stand-alone Post-Closure Care Permit.

Table J-2. Permitted Units Undergoing Post-Closure Care (Process Code S99)

Unit Identifier	Regulatory Status	Operating Capacity	General Information
TA-III: Corrective Action Management Unit	Post-Closure Permitted Unit	31,800 cubic yards	Post-Closure care of CAMU containment cell where remediation wastes remain in place

The closed units that are listed in Table J-3 do not require post-closure care and are not considered units subject to the requirements of this Permit. Therefore, Table J-3 is for informational purposes only.

Table J-3. Closed Units Not Requiring Post-Closure Care

Unit Identifier	Process Codes	Regulatory Status	Operating Capacity	General Information
TA-V: High Bay Waste Storage Unit, Building 6596	S01	Clean Closed	100,320 gallons	Container storage unit underwent RCRA Clean Closure in June of 2006
Manzano Base: Bunker 37063	S01	Clean Closed	25,080 gallons	Container storage unit was never used for hazardous or mixed waste storage. Therefore, the application to permit it was withdrawn and the Unit was closed in October of 2006
Manzano Base: Bunker 37078	S01	Clean Closed	35,200 gallons	Container storage unit was never used for hazardous or mixed waste storage. Therefore, the application to permit it was withdrawn and the Unit was closed in October of 2006

PERMIT ATTACHMENT K SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN

Table K-1 provides the list of solid waste management units (SWMUs) and areas of concern (AOCs) at the Facility for which corrective action is required under the Consent Order; whereas, Table K-2 includes the SWMUs, AOCs, and hazardous waste management units for which corrective action is required under this Permit. Table K-3 provides the list of SWMUs, AOCs, and hazardous waste management units for which corrective action is complete with controls. Table K-4 includes the SWMUs, AOCs, and hazardous waste management units for which corrective action is complete without controls and that do not require monitoring. Attachment J, Table J-1 (*Active Portion of the Facility*) includes a list of hazardous waste management units at the Facility and the status (*e.g.*, permitted operating, closed) of each unit.

TABLE K-1
Solid Waste Management Units and Areas of Concern Requiring Corrective Action Under the Consent Order

SWMU/AOC #	Name or Description	Comments
OU-1289	***Mixed Waste Landfill***	
76	Mixed Waste Landfill (TA-III)	
OU 1295	***Septic Tanks and Drainfields***	
49	Bldg. 9820 Drains (Lurance Canyon)	Pending CAC status
101	Bldg. 9926/9926A Septic System and Seepage Pit (Coyote Test Field)	Pending CAC status
116	Bldg. 9990 Septic System (Coyote Test Field)	Pending CAC status
138	Bldg. 6630 Septic System (TA-III)	Pending CAC status
140	Bldg. 9965 Septic System and Drywell (Thunder Range)	Pending CAC status
147	Bldg. 9925 Septic Systems (Coyote Test Field)	Pending CAC status
149	Bldg. 9930 Septic System (Coyote Test Field)	
150	Bldgs. 9939/ 9939A Septic System and Drainfield (Coyote Test Field)	Pending CAC status
154	Bldg. 9960 Septic System and Seepage Pits (Coyote Test Field)	
161	Bldg. 6636 Septic System (TA-III)	Pending CAC status
OU-1306	***TAs-III & V***	
83	Long Sled Track	
84	Gun Facilities	
105	Mercury Spill (Bldg. 6536)	Pending CAC status
196	Bldg. 6597 Cistern (TA-V)	Pending CAC status
240	Short Sled Track	
OU-1307	***Liquid Waste Disposal System***	
4	LWDS Surface Impoundments	Pending CAC status
5	LWDS Drainfield (TA-V)	Pending CAC status
52	LWDS Holding Tank	Pending CAC status
OU-1309	***Tijeras Arroyo***	
46	Old Acid Waste Line Outfall	Pending CAC status

TABLE K-1
Solid Waste Management Units and Areas of Concern Requiring Corrective Action Under the Consent Order

SWMU/AOC #	Name or Description	Comments
OU-1332	***Foothills Test Area***	
8	Open Dump (Coyote Canyon Blast Area)	
28-2	Mine Shafts	Pending CAC status
58	Coyote Canyon Blast Area	
OU-1334	***Central Coyote Test Area***	
68	Old Burn Site	
OU-1335	***Southwest Test Area***	
91	Lead Firing Site (Thunder Range)	Pending CAC status
	Miscellaneous Sites	
	Tijeras Area Ground-Water (TAG) Investigation	
	TA-V Area Ground-Water Investigation	
	Burn Site Area Ground-Water Investigation	
1090	Bldg. 6721 Septic System (TA-III)	Pending CAC status
1094	Live Fire Range East Septic System (Lurance Canyon)	Pending CAC status
1095	Bldg. 9938 Seepage Pit (Coyote Test Field)	Pending CAC status
1101	Bldg. 885 Septic System (TA-I)	Pending CAC status
1114	Bldg. 9978 Drywell (Coyote Test Field)	Pending CAC status
1116	Bldg. 9981A Seepage Pit (Solar Tower Complex)	Pending CAC status
1117	Bldg. 9982 Drywell (Solar Tower Complex)	Pending CAC status
LTES-1	Cable Debris Site	Pending CAC status

TABLE K-2
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units Requiring Corrective Action Under this Permit

SWMU/AOC #	Name or Description	Comments
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved
Reserved	Reserved	Reserved

TABLE K-3
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete with Controls

SWMU/AOC#	Name or Description	Date of CAC Approval
OU 1295	***Septic Tanks and Drainfields***	
137	Bldg. 6540/6542 Septic System (TA-III)	02/08
140	Bldg. 9965 Septic System and Drywell (Thunder Range)	Pending CAC status
OU 1302	***TA-I***	
96	Storm System Drain	06/06
98	Bldg. 863 (TCA, Photochemical Releases: Silver Catch Boxes)	11/05
187	Septic Tank Piping for POTW	06/06
190	Steam Plant Tank Farm	06/06
226	Old Acid Waste Line	06/06
OU 1303	***TA-II***	
1	Radioactive Waste Landfill	02/08
2	Classified Waste Landfill (TA-II)	06/06
3	Chemical Disposal Pit	02/08
135	Bldg. 906 Drain System (TA-II)	06/06
OU 1306	***TAs-3&5***	
105	Mercury Spill (Bldg. 6536)	Pending CAC status
196	Bldg. 6597 Cistern (TA-V)	Pending CAC status
OU 1307	***Liquid Waste Disposal System***	
4	LWDS Surface Impoundments	Pending CAC status
OU 1309	***Tijeras Arroyo***	
45	Liquid Discharge (behind TA-IV)	02/08
46	Old Acid Waste Line Outfall	Pending CAC status
96	Storm Drain System Outfall (for TA-II)	06/06
229	Storm Drain System Outfall (for TA-II)	06/06
OU 1332	***Foothills Test Area***	
87	Bldg. 9990 Firing Site	06/06
OU 1335	***Southwest Test Area***	
91	Lead Firing Site (Thunder Range)	Pending CAC status
	Miscellaneous Sites	
1029	Bldg. 6584 North Septic System (TA-III)	06/06
1081	Bldg. 6650 Septic System (TA-III)	02/08
1090	Bldg. 6721 Septic System (TA-III)	Pending CAC status

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
OU 1295	***Septic Tanks and Drainfields***		
49	Bldg. 9820 Drains (Lurance Canyon)	Pending	Pending CAC status
101	Bldg. 9926/9926A Septic System and Seepage Pit (Coyote Test Field)	Pending	Pending CAC status
116	Bldg. 9990 Septic System (Coyote Test Field)	Pending	Pending CAC status
138	Bldg. 6630 Septic System (TA-III)	Pending	Pending CAC status
139	Bldg. 9964 Septic System	12/95	
141	Bldg. 9967 Septic System	11/01	
142	Bldg. 9970 Septic System	09/00	
143	Bldg. 9972 Septic System	09/00	
144	Bldg. 9980 Septic System	09/00	
145	Bldgs. 9981/9982 Septic System	09/00	
146	Bldg. 9920 Drain System (Coyote Test Field)	02/08	
147	Bldg. 9925 Septic Systems (Coyote Test Field)	Pending	Pending CAC status
148	Bldg. 9927 Septic System (Coyote Test Field)	02/08	
150	Bldgs. 9939/ 9939A Septic System and Drainfield (Coyote Test Field)	Pending	Pending CAC status
151	Bldg. 9940 Septic System	11/01	
152	Bldg. 9950 Septic System (Coyote Test Field)	02/08	
153	Bldg. 9956 Septic Systems (Coyote Test Field)	02/08	
160	Bldg. 9832 Septic System	11/01	
161	Bldg. 6636 Septic System (TA-III)	Pending	Pending CAC status
OU 1300			
211	Bldg. 840, Former UST 840-1 (TA-I)	09/00	
OU 1302	***TA-I***		
25	Burial Site (South of TA-I)	12/95	
30	PCB Spill (Reclamation Yard)	04/05	
32	Steam Plant Oil Spill	12/95	
33	Motor Pool Oil Spill	04/05	
41	Bldg. 838 Mercury Spill	12/95	
42	Acid Spill, Bldg. 879 Water Treatment Facility	09/00	
73	Hazardous Waste Repackaging and Storage (Bldg. 895)	12/95	
104	PCB Spill	12/95	
186	TCE Dumping south of Bldg. 859	09/00	
192	TA-I Waste Oil Tank	07/00	
276	Former Bldg. 829X Silver Recovery Sump (TA-I)	02/08	
OU 1303	**TA-II**		

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
43	Radioactive Material Storage Yard (TA-2)	09/00	
44	Decontamination Site and Uranium Calibration Pits (UCPs)	07/00	
48	Bldg. 904 Septic System and HE Drain System (TA-II)	06/06	
113	Area II Firing Sites	11/01	
114	Explosive Burn Pit	04/05	
136	Bldg. 907 Septic System and HE Drain System (TA-II)	06/06	
159	Bldg. 935 Septic System and Drywell (TA-II)	06/06	
165	Bldg. 901 Septic System (TA-II)	06/06	
166	Bldg. 919 Septic System (TA-II)	06/06	
167	Bldg. 940 Septic System and Seepage Pit (TA-II)	06/06	
OU 1306	***TAs-3&5***		
18	Concrete Pad	04/05	
26	Burial Site (Western Part of TA-3)	04/05	
31	Electrical Transformer Oil Spill	11/01	
34	Centrifuge Oil Spill	11/01	
35	Vibration Facility Oil Spill (TA-3)	04/05	
36	HERMES Oil Spill	11/01	
37	PROTO Oil Spill	11/01	
51	Bldg. 6924 Pad, Tank, and Pit	11/01	
78	Gas Cylinder Disposal Pit	02/08	
100	Bldg. 6620 Drain/Sump	11/01	
102	Radioactive Disposal Area	11/01	
107	Explosive Test Area (South-East TA-3)	04/05	Also site of CAMU
111	Bldg. 6715 Sump/Drain	11/01	
188	Bldg. 6597 Above Ground Containment Spill Tank	12/95	
241	Storage Yard	04/05	
275	Seepage Pits, TA-V	07/00	
OU 1307	***Liquid Waste Disposal System***		
5	LWDS Drainfield (TA-V)	Pending	Pending CAC status
52	LWDS Holding Tank	Pending	Pending CAC status
OU 1309	***Tijeras Arroyo***		
7	Gas Cylinder Disposal (Arroyo del Coyote)	09/00	Transferred to KAFB in 2000, listed on KAFB Permit
16	Open Dumps (Arroyo del Coyote)	09/00	
23	Disposal Trenches (near Tijeras Arroyo)	07/00	
40	Oil Spill (6000 Igloo Area)	11/97	
50	Old Centrifuge Site (Tijeras Arroyo)	09/00	

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
77	Oil Surface Impoundment	07/00	
227	Bunker 904 Outfall	06/06	
228A	Centrifuge Dump Site	09/00	
228B	Centrifuge Dump Site	11/01	
230	Storm Drain System Outfall (for TA-4)	04/05	
231	Storm Drain System Outfall (for TA-4)	04/05	
232	Storm Drain System Outfall	04/05	
233	Storm Drain System Outfall	07/12	
234	Storm Drain System Outfall	07/12	
235	Storm Drain System Outfall	09/00	
OU 1332	***Foothills Test Area***		
15	Trash Pits (Frustration Site)	12/97	
19	TRUPAK Boneyard Storage Area (NW End of Old Aerial Cable)	07/00	
27	Animal Disposal Pit (Coyote Springs)	07/00	
28-1	Mine Shafts	12/97	
28-2	Mine Shafts	Pending	Pending CAC status
28-3	Mine Shafts	12/97	
28-4	Mine Shafts	12/97	
28-5	Mine Shafts	12/97	
28-6	Mine Shafts	12/97	
28-7	Mine Shafts	12/97	
28-8	Mine Shafts	12/97	
28-9	Mine Shafts	12/97	
28-10	Mine Shafts	11/01	
66	Boxcar Site	04/05	
67	Frustration Site	11/01	
82	Old Aerial Cable Site	11/01	
277	New Firing Site East of Optical Range	11/01	
OU 1333	***Canyons Test Area***		
10	Burial Mounds (Bunker Area North of Pendulum Site)	07/00	
12A	Open Arroyo Channel	09/00	
12B	Buried Debris in Graded Area	07/00	
13	LCBS Oil Surface Impoundment (Lurance Canyon Burn Site)	07/00	
59	Pendulum Site	07/00	
60	Bunker Area	11/01	
63-A	Balloon Test Area: Plutonium Dispersal Study Program (PDSP) Site	09/00	
63-B	Balloon/Helicopter Site	07/00	
64	Gun Site (Madera Canyon)	09/00	
65-A	Lurance Canyon Explosive Test Site: Small Debris Mound	09/00	
65-B	Lurance Canyon Explosive Test Site: Primary Detonation Area	09/00	

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
65-C	Lurance Canyon Explosive Test Site: Secondary Detonation Area	09/00	
65-D	Lurance Canyon Explosive Test Site: Near Field Dispersion Area	09/00	
65-E	Far Field Dispersion Area	07/00	
72	Operation Beaver Site	07/00	
81-A	Catcher Box/Sled Track	11/01	
81-B	Impact Pad	11/01	
81-C	New Aerial Cable Site: Former Burial Location	09/00	
81-D	Northern Cable Area	11/01	
81-E	Gun Impact Area	11/01	
81-F	Scrap Yard	11/01	
92	Pressure Vessel Test Site (Coyote Canyon Blast Area)	12/97	
93	Madera Canyon Rocket Launcher Pads A, B & C	07/00	
94-A	Aboveground Tanks, Lurance Canyon Burn Site	07/00	
94-B	Debris/Soil Mound Area	04/05	
94-C	Bomb Burner Area and Discharge Line	11/01	
94-D	Lurance Canyon Burn Site: Bomb Burner Discharge Pit	09/00	
94-E	Lurance Canyon Burn Site: Small Surface Impoundment	09/00	
94-F	LAARC Discharge Pit	04/05	
94-G	Scrap Yard, Lurance Canyon Burn Site	11/01	
94-H	Fuel Spill at Open Pool Test Area, Lurance Canyon Burn Site	04/05	
225	AEC Storage Facility/Kirtland AFB	12/05/96	Transferred to KAFB in 1996, listed on KAFB Permit
OU 1334	***Central Coyote Test Area***		
9	Burial/Open Dump (Schoolhouse Mesa)	04/05	
11	Explosive Burial Mounds	09/00	
20	School House Mesa Burn Site	12/95	
21	Metal Scrap (Coyote Springs)	09/00	
22	Storage/Burn (West of DEER)	07/00	
47	Unmanned Seismic Observatory	12/95	
57-A	Workman Site-Firing Site	09/00	
57-B	Workman Site-Target Area	09/00	
61-A	Blast Area	07/00	
61-B	Cratering Area	12/05/96	Transferred to KAFB in 1996, listed on KAFB Permit
61-C	Schoolhouse Mesa Test Site -- Schoolhouse Bldg.	09/00	

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
62	Greystone Manor Site (Coyote Springs)	12/95	
69	Old Borrow Pit	12/95	
70	Explosives Test Pit (Water Towers)	09/00	
71	Moonlight Shot Area	07/00	
88-A	Firing Site: Ranch House	12/95	
88-B	Firing Site: Instrumentation Pole	09/00	
OU 1335	***Southwest Test Area***		
6	Gas Cylinder Disposal Pit (Bldg. 9966)	11/01	
6-A	Gas Cylinder Disposal Pit	11/01	
14	Burial Site (Bldg. 9920)	07/00	
17	Scrap Yards/Open Dump (Thunder Range)	07/00	
39	Oil Spill - Solar Facility	11/97	
38	Oil Spills (Bldg. 9920)	07/00	
53	Bldg. 9923 Storage Igloo	11/97	
54	Pickax Site (Thunder Range)	07/00	
55	Red Towers Site (Thunder Range)	09/00	
56	Old Thunderwells (Thunder Range)	07/00	
85	Burial Site (Bldg. 9920)	07/00	
86	Firing Site (Bldg. 9927)	11/01	
89	Shock Tube Site (Thunder Range)	07/00	
90	Beryllium Firing Site (Thunder Range)	09/00	
103	Scrap Yard (Bldg. 9939)	07/00	
108	Firing Site (Bldg. 9940)	07/00	
109	Firing Site (Bldg. 9950)	07/00	
112	Explosive Contaminated Sump (Bldg. 9956)	09/00	
115	Firing Site (Bldg. 9930)	09/00	
117	Trenches (Bldg. 9939)	11/01	
191	EQUUS Red	11/01	
193	Sabotage Test Area	07/00	
194	General Purpose Heat Source Test Area	11/97	
Misc. Sites			
	Building 828, TA-1	04/05	
	TNT Site	04/05	
195	Experimental Test Pit	11/05	
1001	Bldg. 898 Septic System (TA-I)	11/05	
1002	Bldg. 8895/MO 100 Septic System (TA-I)		No Investigation Needed, Active System
1003	Former Bldg. 915/922 Septic System (TA-II)	11/05	
1004	Bldg. 6969 Septic System (Robotic Vehicle Range)	02/08	
1005	Bldg. 6020 Septic System (6000 Igloo Area)		No Investigation Needed, Active System

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
1006	Bldg. 6741 Septic System (TA-III)	06/06	
1007	Bldg. 6530 Septic System (TA-III)	06/06	
1008	Bldg. 6750 Septic System (TA-III)	11/05	
1009	Bldg. 6620 Internal Sump (TA-III)	11/05	
1010	Bldg. 6530 Septic System (TA-III)	06/06	
1013	Bldg. T-52 and Former Bldg. 6500 South Septic System (TA-V)		Does Not Exist
1014	Former T-12, T-42, and T-43 Septic System (TA-V)	11/05	
1015	Bldg. 6530 Septic System (TA-III)	06/06	
1016	Bldg. 914 Seepage Pit (TA-II)		No Investigation Needed
1017	Bldg. 897X Septic System (TA-I)		Does Not Exist
1020	MO-146, MO-235, and T-40 Septic System (TA-III)	06/06	
1021	Bldg. 859 Drywell (TA-I)		No Investigation Needed
1022	Bldg. 6505A Seepage Pit (TA-III)		No Investigation Needed
1023	Bldg. 6505 Southwest Seepage Pit (TA-III)		No Investigation Needed
1024	MO 242-245 Septic System (TA-III)	06/06	
1025	Bldg. 6501 East Septic System (TA-III)	11/05	
1026	Bldg. 6501 West Septic System (TA-III)	11/05	
1027	Bldg. 6530 Septic System (TA-III)	11/05	
1028	Bldg. 6560 Septic System (TA-III)	06/06	
1030	Bldg. 6587 Septic System (TA-III)	11/05	
1031	Former Bldgs. 6589 and 6600 Septic System (TA-III)	02/08	
1032	Bldg. 6610 Septic System (TA-III)	11/05	
1033	Bldg. 6631 Septic System (TA-III)	11/05	
1034	Bldg. 6710 Septic System (TA-III)	02/08	
1035	Bldg. 6715 Septic System (TA-III)	02/08	
1036	Bldg. 6922 Septic System (TA-III)	02/08	
1037	MO 14, MO 15 Septic System (TA-I)		No Investigation Needed, Active System
1038	MO 154 Drywell (TA-I)		No Investigation Needed
1039	MO 155 Drywell (TA-I)		No Investigation Needed
1040	MO 156 Drywell (TA-I)		No Investigation Needed
1041	T-28 Drywell (TA-I)		No Investigation Needed
1042	T-29 Drywell (TA-I)		No Investigation Needed
1043	T-30 Drywells (TA-I)		No Investigation Needed
1044	T-31 Drywell (TA-I)		No Investigation Needed
1045	T-32-2 Drywell (TA-I)		No Investigation Needed
1046	T-44 Drywell (TA-I)		No Investigation Needed
1047	T-45 Drywell (TA-I)		No Investigation Needed
1048	T-46 Drywell (TA-I)		No Investigation Needed
1049	T-47 Drywells (TA-I)		No Investigation Needed

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
1050	T-48 Drywells (TA-I)		No Investigation Needed
1051	Bldg. 803 Outfall (TA-1)		No Investigation Needed
1052	Bldg. 803 Seepage Pit (TA-I)	02/08	
1053	Bldg. 823 Outfall (TA-I)		No Investigation Needed
1054	Bldg. 823 Drywells (TA-I)		No Investigation Needed
1055	Bldg. 829 Drywell (TA-I)		No Investigation Needed
1056	Bldg. 838 Drywell (TA-I)		No Investigation Needed
1057	Bldg. 839 Drywell (TA-I)		No Investigation Needed
1058	Bldg. 847 Drywell (TA-I)		No Investigation Needed
1059	Bldg. 850 Drywell (TA-I)		No Investigation Needed
1060	Bldg. 857A Drywell (TA-I)		No Investigation Needed
1061	Bldg. 867 Drywells (TA-I)		No Investigation Needed
1062	Bldg. 869 Drywell (TA-I)		No Investigation Needed
1063	Bldg. 882 Drywell (TA-I)		No Investigation Needed
1064	Bldg. 890 Drywells (TA-I)		No Investigation Needed
1065	Bldg. 893 Drywells (TA-I)		No Investigation Needed
1066	Bldg. 894 Drywells (TA-I)		No Investigation Needed
1067	Bldg. 959 Drywell (TA-I)		No Investigation Needed
1068	Bldg. 904E Drywell (TA-II)		No Investigation Needed
1069	Bldgs. 913/913A Septic System (TA-II)		Does Not Exist?
1070	Bldg. 962 Drywells (TA-IV)		No Investigation Needed
1071	Bldg. 986 Drywell (TA-IV)		No Investigation Needed
1072	Bldg. T-52 and Former Bldg. 6500 Septic System (TA-V)	11/05	
1073	Bldg. 6580 Seepage Pit (TA-V)	11/05	
1074	Bldgs. 6581/6582 MO 32/57 Septic System (TA-V)		No Investigation Needed
1075	Bldg. 6582 Septic System (TA-V)		Does Not Exist
1076	Bldg. 6585 Septic System (TA-V)		Does Not Exist
1077	Bldg. 6920 Septic System (TA-III)	11/05	
1078	Bldg. 6640 Septic System (TA-III)	02/08	
1079	Bldg. 6643 Septic System (TA-III)	02/08	
1080	Bldg. 6644 Septic System (TA-III)	02/08	
1082	Bldg. 6620 Septic System (TA-III)	11/05	
1083	Bldg. 6570 Septic System (TA-III)	06/06	
1084	Bldg. 6505 Septic System (TA-III)	02/08	
1085	Bldg. 6520 Septic System (TA-III)		Does Not Exist
1086	Bldg. 6526 Septic System (TA-III)	06/06	
1087	Bldg. 6743 Seepage Pit (TA-III)	02/08	
1088	Bldg. 6736 Septic System (TA-III)		Does Not Exist
1089	Bldg. 6734 Seepage Pit (TA-III)	11/05	
1091	Bldg. 6720 Septic System (TA-III)	11/05	
1092	MO 228-230 Septic System (TA-III)	02/08	
1093	Bldg. 6584 West Septic System (TA-III)	11/05	
1094	Live Fire Range East Septic System (Lurance Canyon)	Pending	Pending CAC status

TABLE K-4
Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for which Corrective Action is Complete without Controls

SWMU/AOC#	Name or Description	Date of CAC Approval	Comments
1095	Bldg. 9938 Seepage Pit (Coyote Test Field)	Pending	Pending CAC status
1096	Bldg. 6583 Septic System (TA-III)	11/05	
1097	SFER/127/128/130 Septic System (Lurance Canyon) (DOE Facility)		No Investigation Needed
1098	TA-V Plenum Rooms Drywell (TA-V)	02/08	
1099	Bldg. 634 Outfall (TA-I)		No Investigation Needed
1100	Bldg. 814 Outfall (TA-I)		No Investigation Needed
1101	Bldg. 885 Septic System (TA-I)	Pending	Pending CAC status
1102	Former Bldg. 889 Septic System (TA-I)	02/08	
1103	Bldg. 6030 Septic System (6000 Igloo Area)		No Investigation Needed, Active System
1104	Bldg. 6595 Seepage Pit (TA-V)	02/08	
1105	Bldg. 6596 Drywell (TA-V)	11/05	
1106	Bldg. 6505 Interior Sump (TA-III)		No Investigation Needed
1107	Bldg. 6526 Drywell (TA-III)		No Investigation Needed
1108	Bldg. 6531 Seepage Pits (TA-III)	06/06	
1109	Bldg. 6530 Seepage Pit (TA-III)		No Investigation Needed
1110	Bldg. 6536 Drain System (TA-III)	06/06	
1111	Bldg. 6720 Seepage Pit (TA-III)	11/05	Site referred to as Bldg. 6720 Drywell (TA-III) in Consent Order
1112	Bldg. 6590 Reactor Sump Drywell (TA-V)	11/05	
1113	Building 6597 Drywell (TA-V)	02/08	
1114	Bldg. 9978 Drywell (Coyote Test Field)	Pending	Pending CAC status
1115	Former Offices Septic System (Solar Tower Complex)	07/12	
1116	Bldg. 9981A Seepage Pit (Solar Tower Complex)	Pending	Pending CAC status
1117	Bldg. 9982 Drywell (Solar Tower Complex)	Pending	Pending CAC status
1118	Bldg. 9966 Drywell (Thunder Range)		No Investigation Needed
1119	Live Fire Range West Septic System (Lurance Canyon) (DOE Facility)		No Investigation Needed, Active System
1120	Bldg. 6595 Seepage Pit (TA-V)	02/08	
LTES-1	Cable Debris Site	Pending	Pending CAC status

PERMIT ATTACHMENT L FIGURES

(for Attachment G and Attachment M figures, see Attachment G and M)

Figure 1: Regional Location Map of Sandia National Laboratories
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Figure 50: Manzano Storage Bunkers Evacuation Routes
Figure 51: Corrective Action Management Unit Evacuation Routes
Appendix A.1: Photographs of the Hazardous and Mixed Waste Management Areas at the HWHU
Appendix A.2: Photographs of the Hazardous Waste Management Areas at TTU
Appendix A.3: Photographs of the Hazardous and Mixed Waste Management Areas at the RMWMU
Appendix A.4: Photographs of the Hazardous and Mixed Waste Management Areas at the AHCU
Appendix A.5: Photographs of the Hazardous and Mixed Waste Management Areas at the MSBs

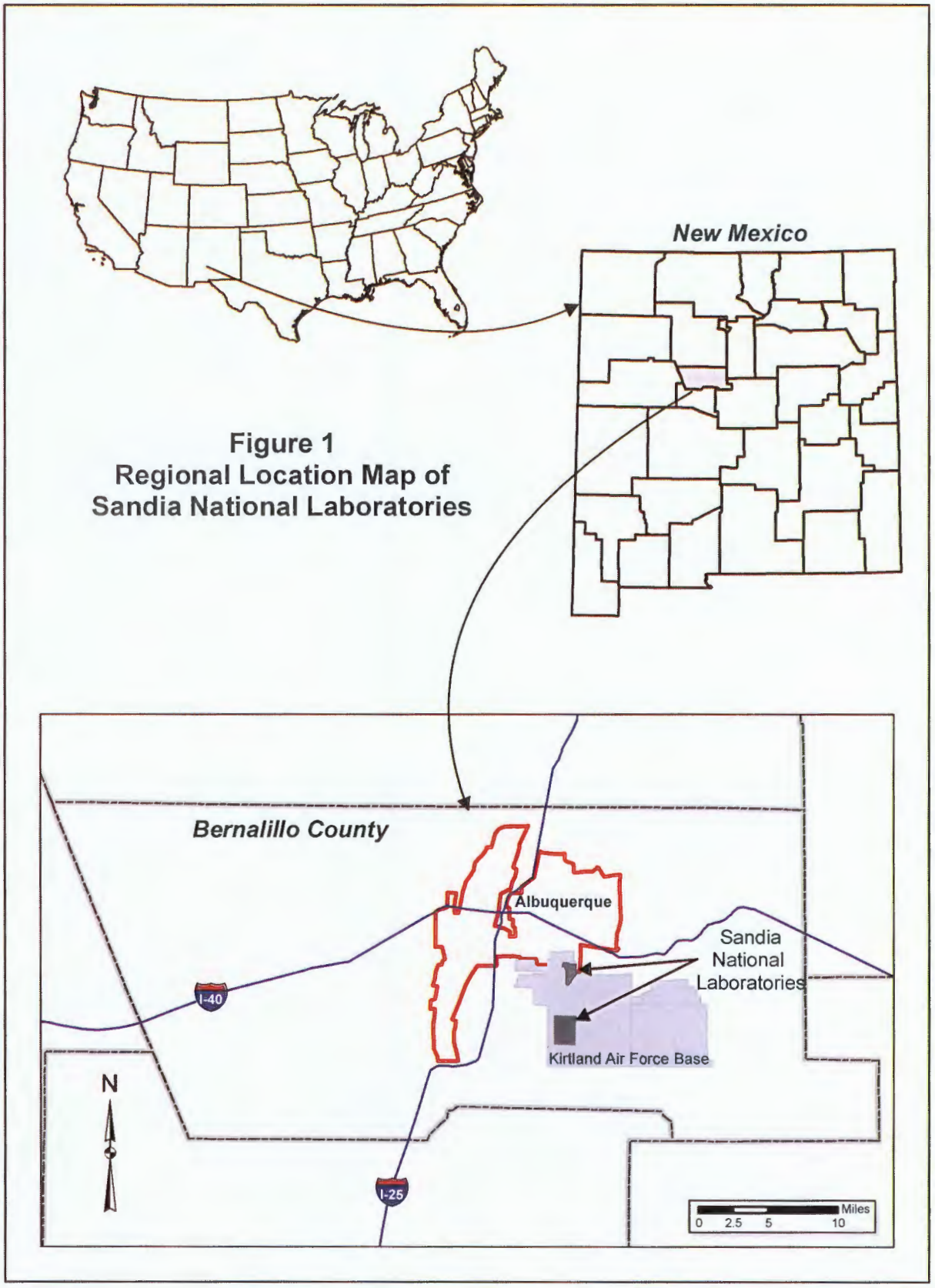


Figure 1
Regional Location Map of
Sandia National Laboratories

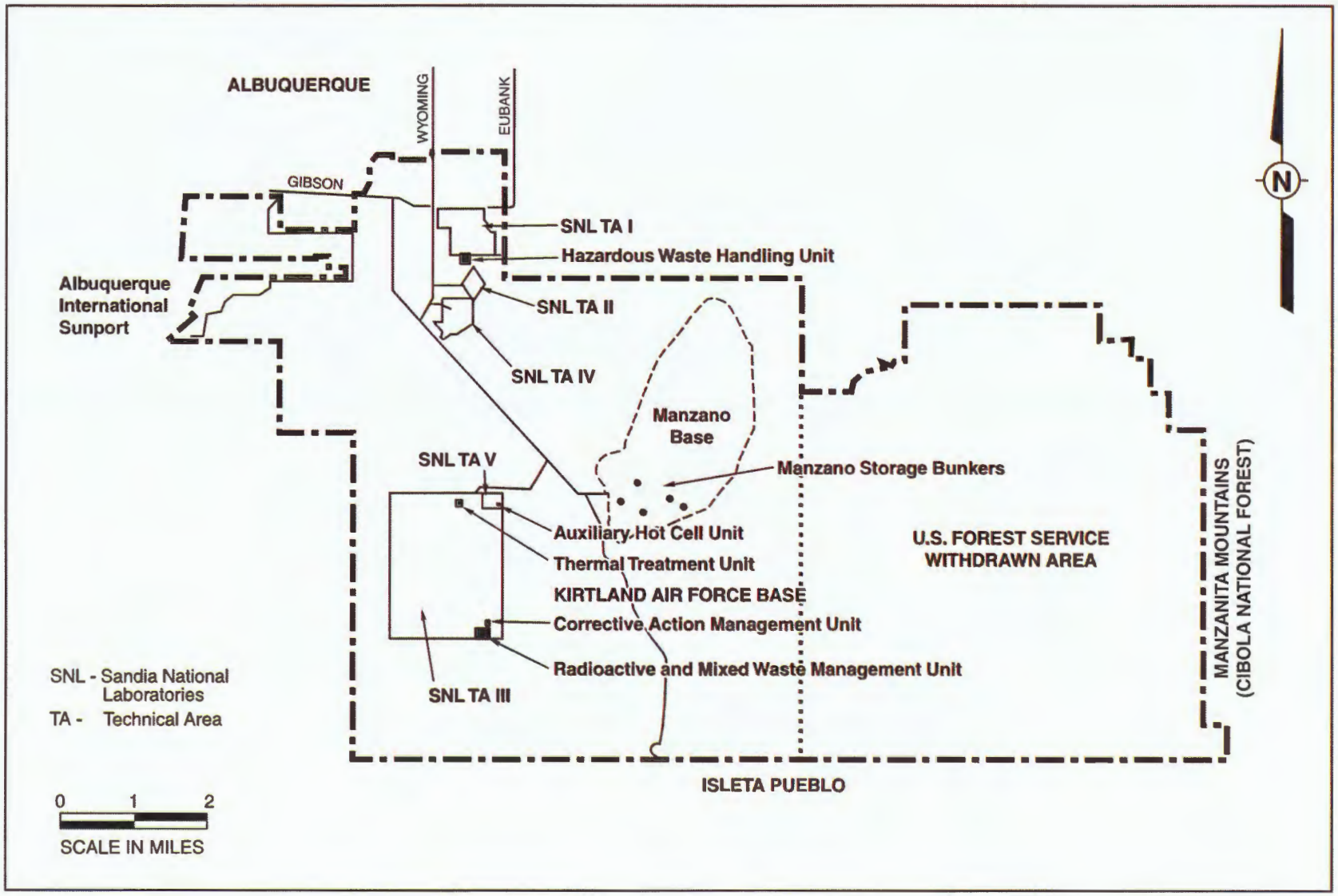


Figure 2

Technical Areas and Permitted Hazardous and Mixed Waste Management Units at the Facility

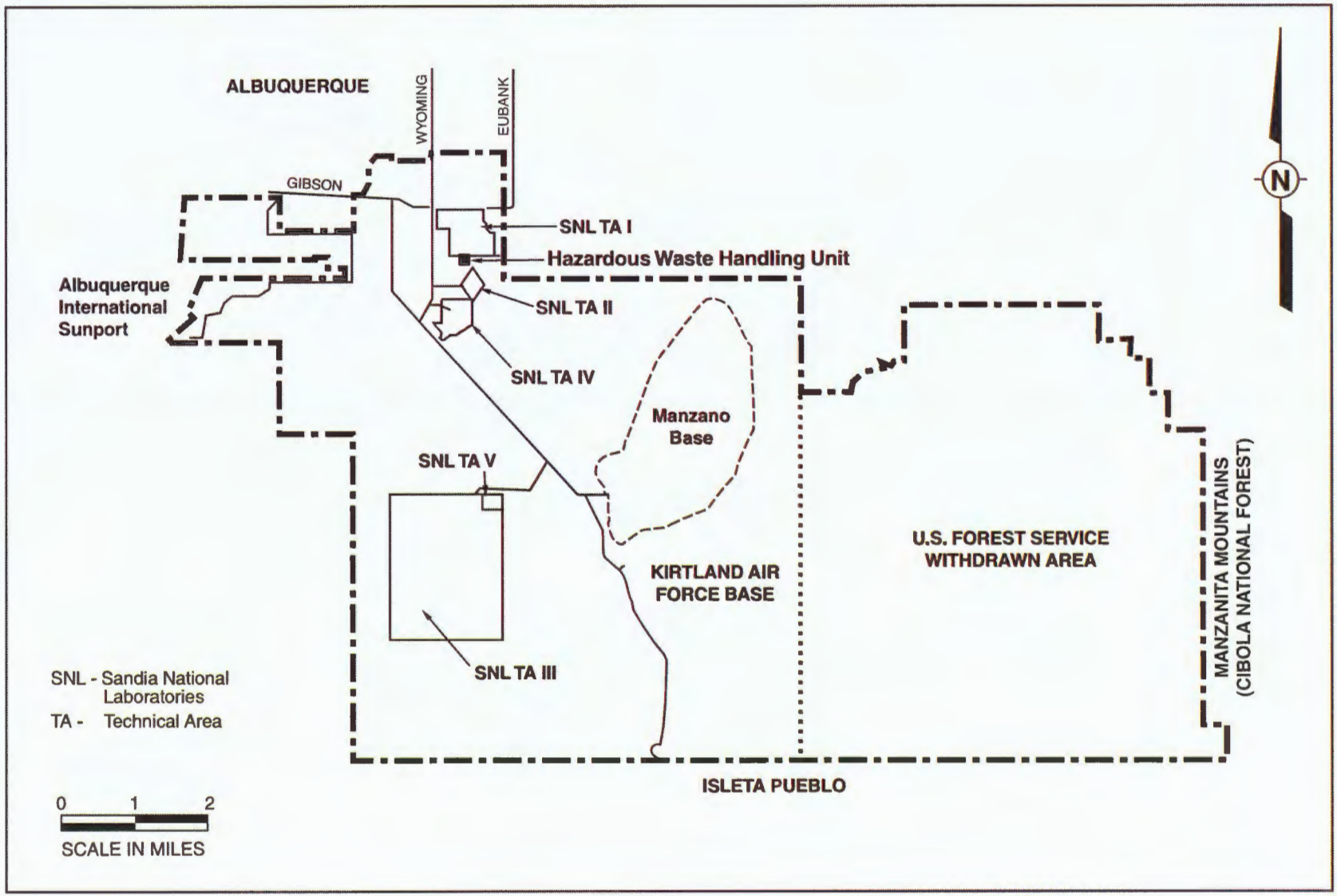


Figure 3
Location of the Hazardous Waste Handling Unit at the Facility

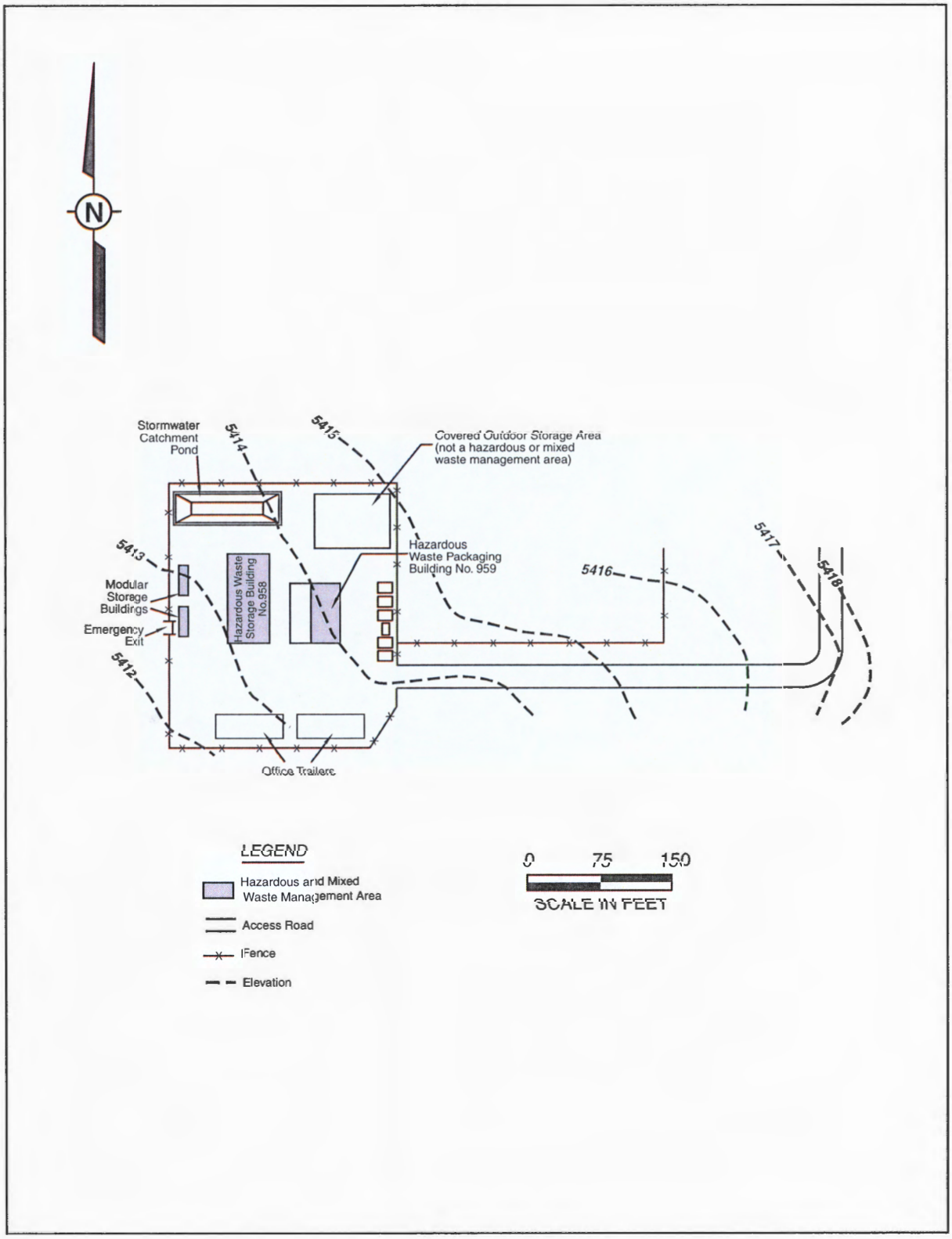
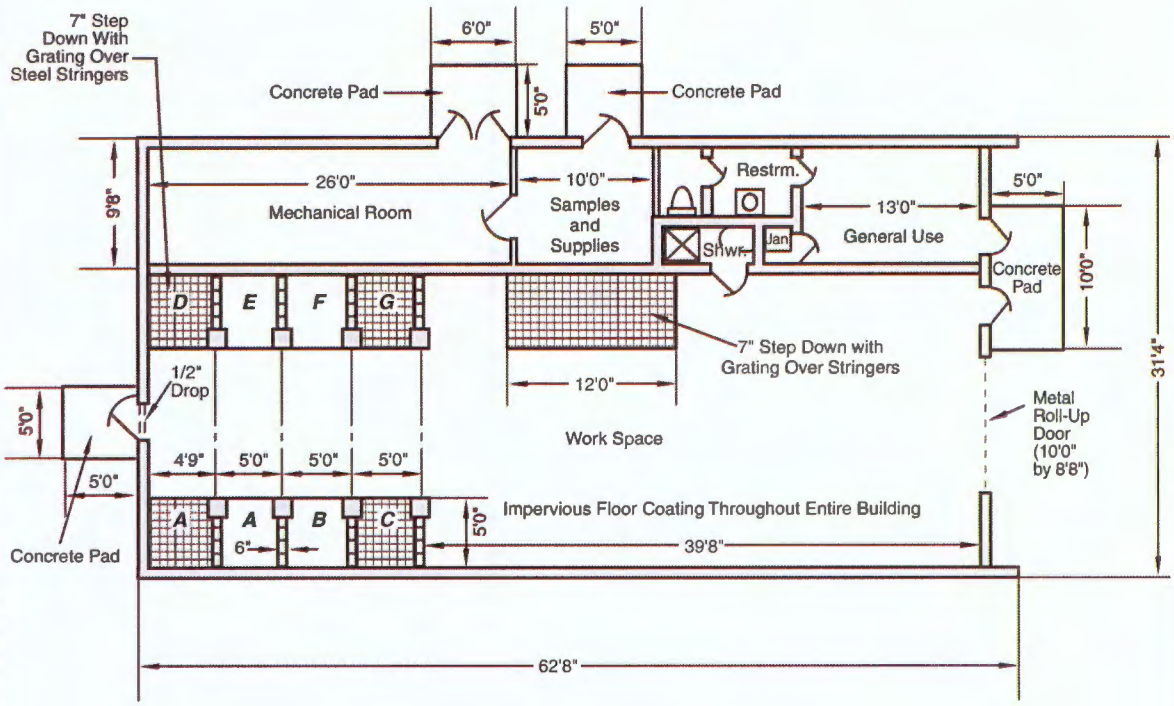


Figure 4

Hazardous Waste Handling Unit Waste Management Areas



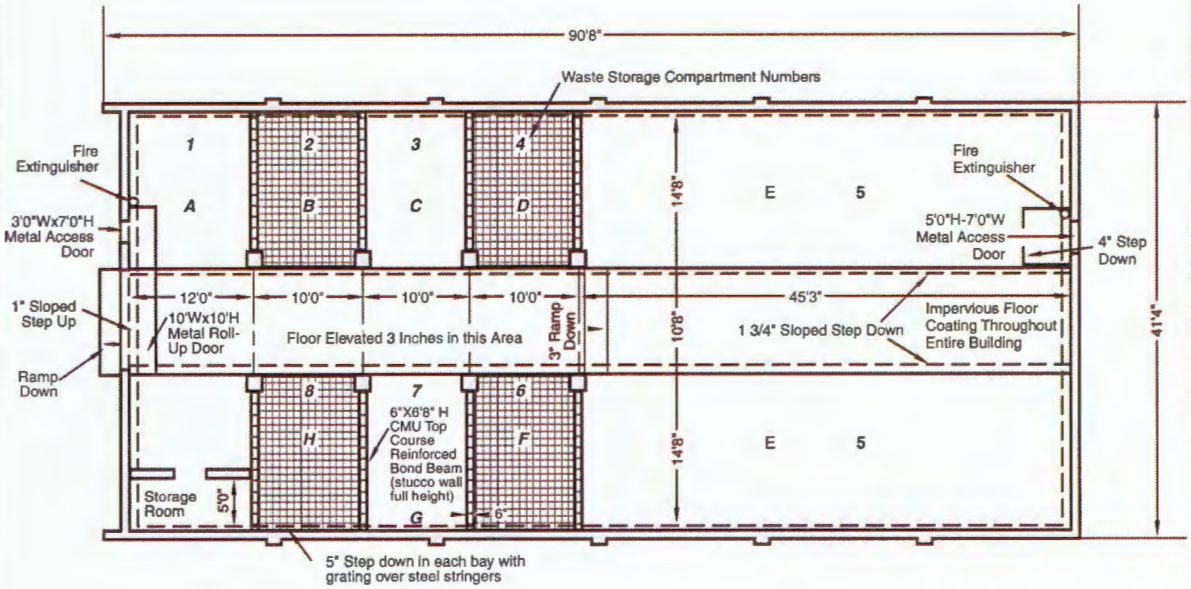
Typical Waste Segregation Groups

A Hydrocarbons, Organics, and Solvents
B Class 9 Solids and Liquids
C Poisons
D Oxidizing Mineral Acids, Non-Acidic Oxidizers
E Non-Regulated Waste
F Caustics
G Organic Acids, Non-Oxidizing Mineral Acids, Mercury

Note: All storage cells equipped as shown for Cell D: 7" step down and steel grating over stringers.

Figure 5

Hazardous Waste Handling Unit Building 959 Floor Plan



Typical Waste Segregation Groups

- A Holding Bay
- B Poisons
- C Flammables
- D Oxidizers
- E Hydrocarbons, Organics, Solvents, Non-Regulated Wastes
- F Corrosives (caustics)
- G Corrosives (acids or caustics)
- H Corrosives (acids)

Note: Cells 1-4 and 6-8 are constructed with a 5" step down and grating over steel stringers. Cell 5 is not equipped with grating.

Figure 6

Hazardous Waste Handling Unit Building 958 Floor Plan

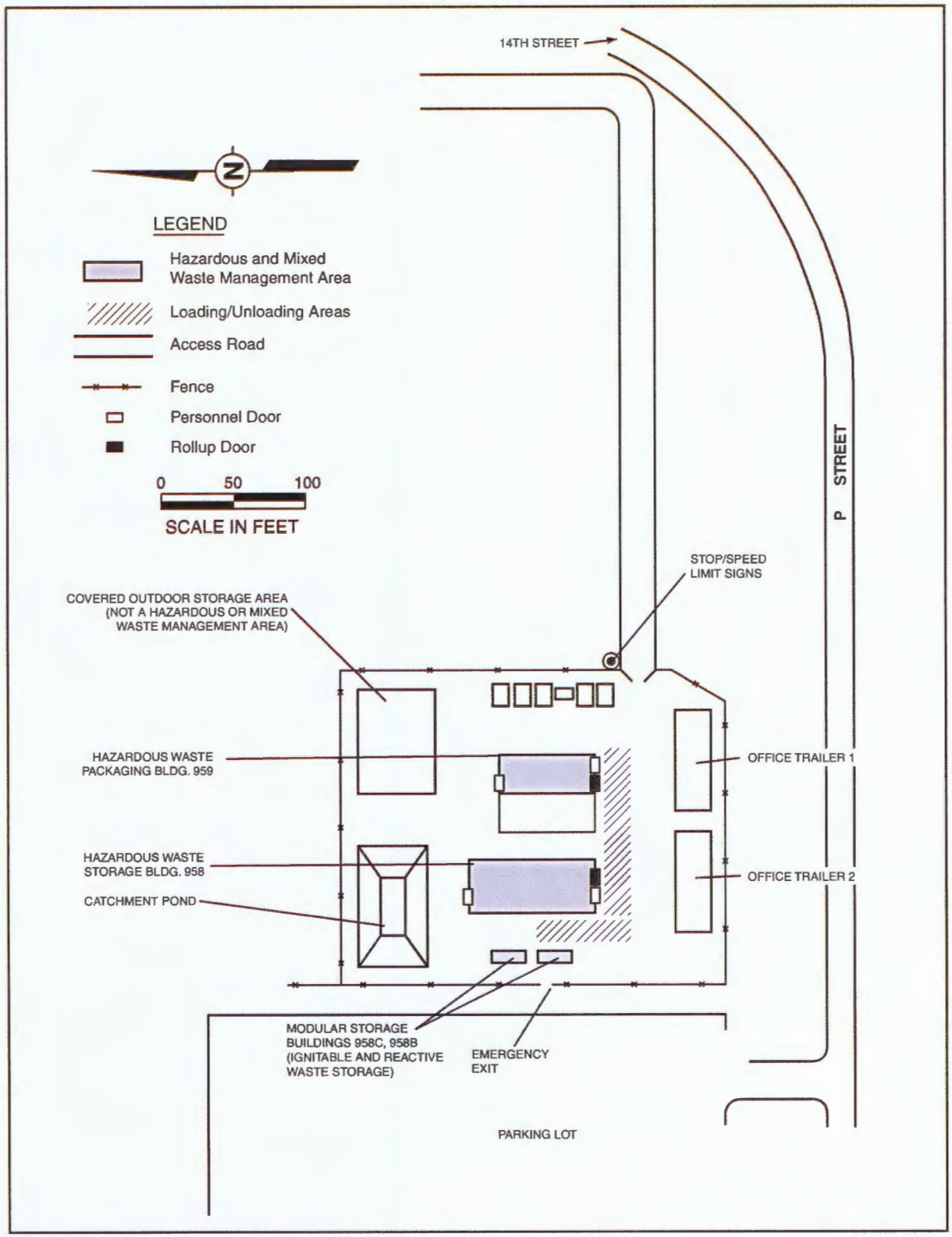


Figure 7

Hazardous Waste Handling Unit Access Control Features and Loading/Unloading Areas

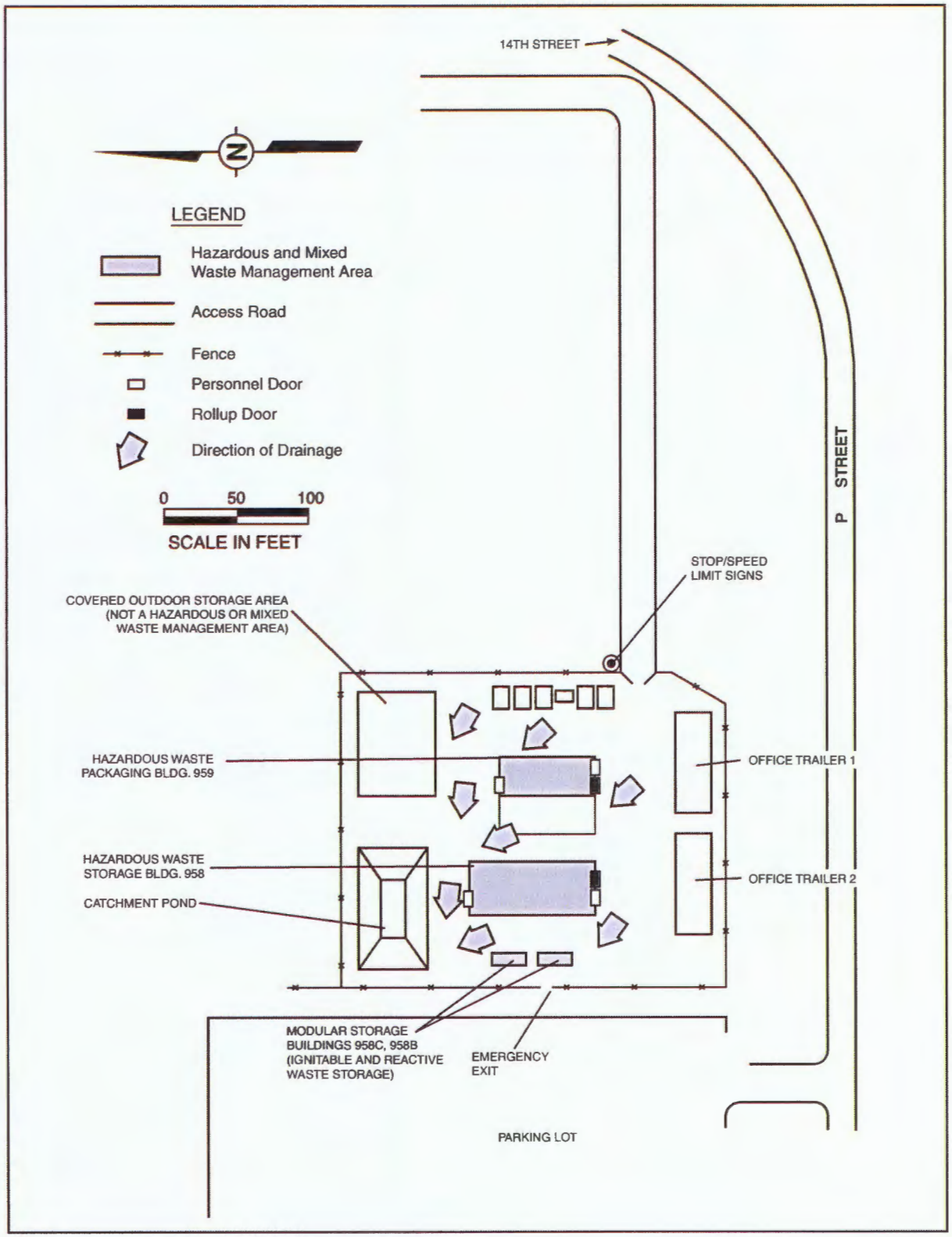


Figure 8

Hazardous Waste Handling Unit Drainage Control Features

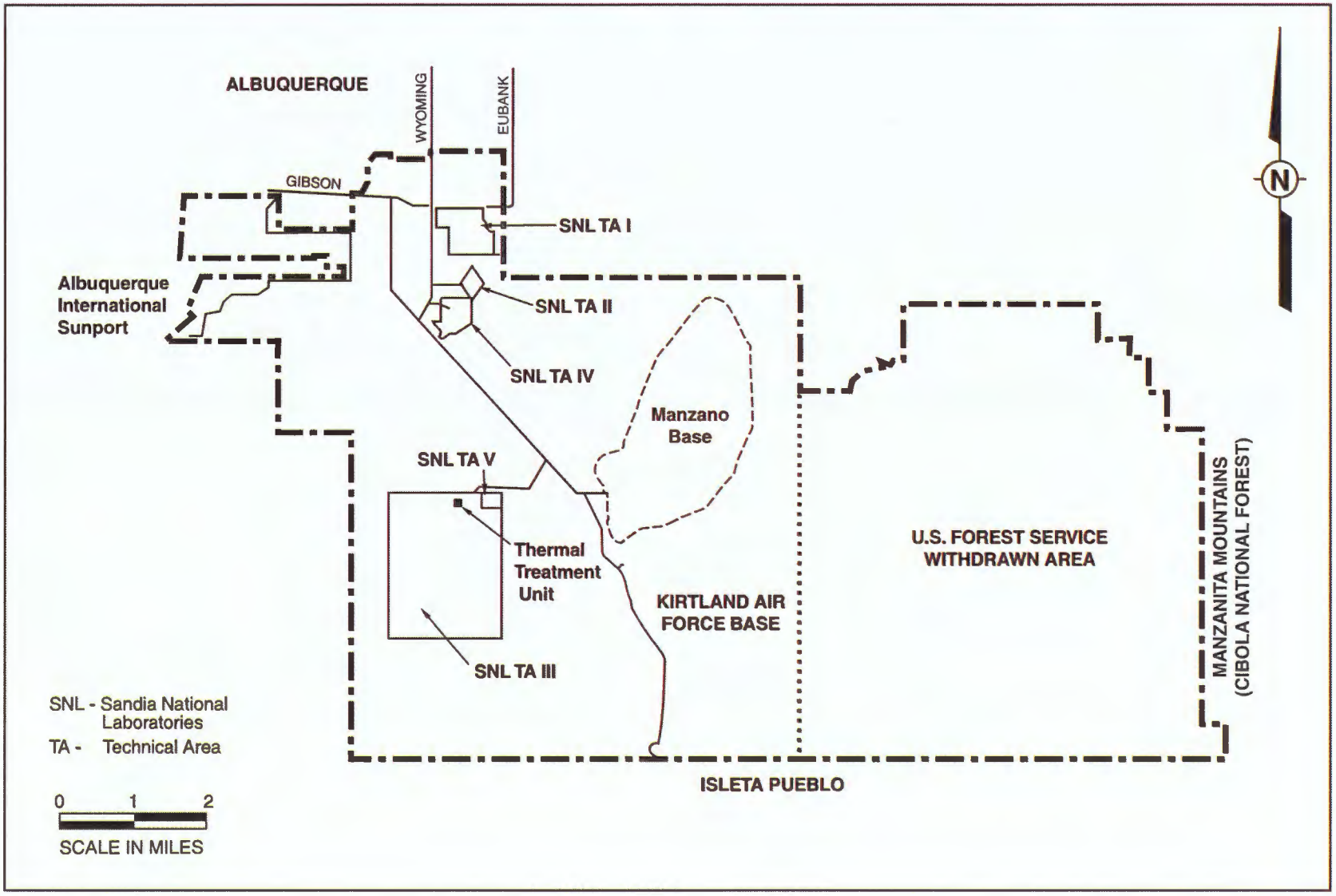


Figure 9
Location of the Thermal Treatment Unit at the Facility

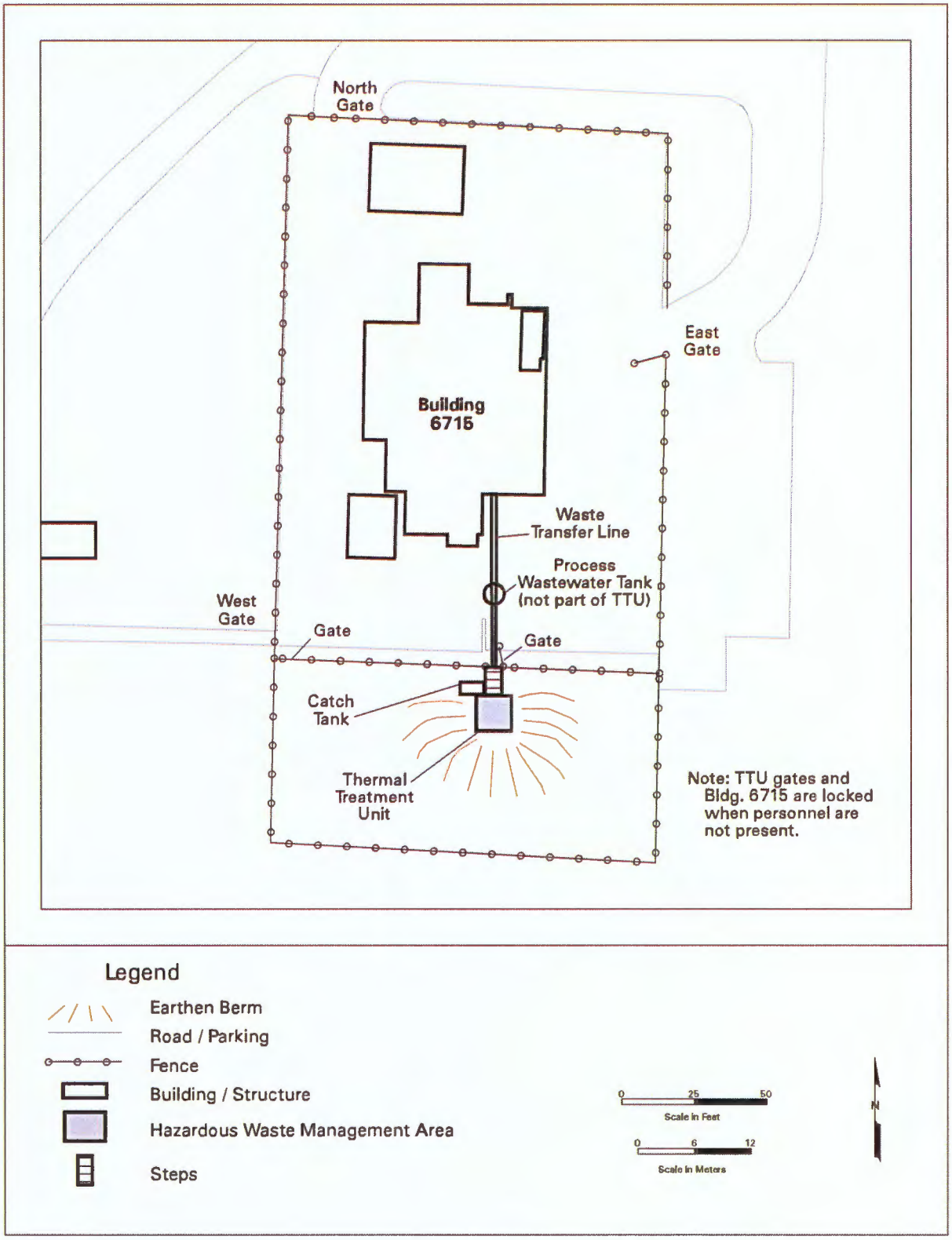


Figure 10
Thermal Treatment Unit (TTU)
Waste Management Area

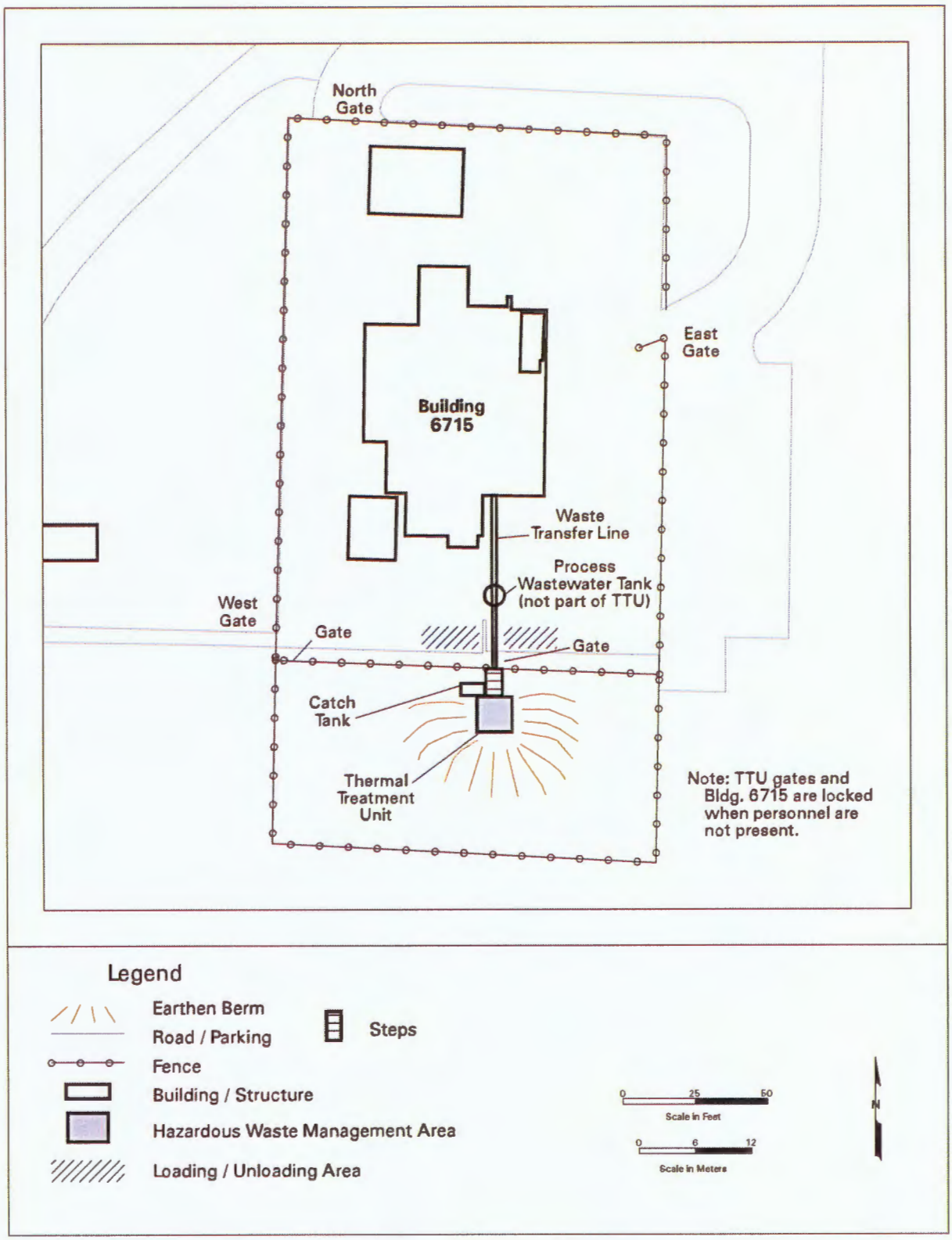


Figure 11
Thermal Treatment Unit Loading/Unloading Area

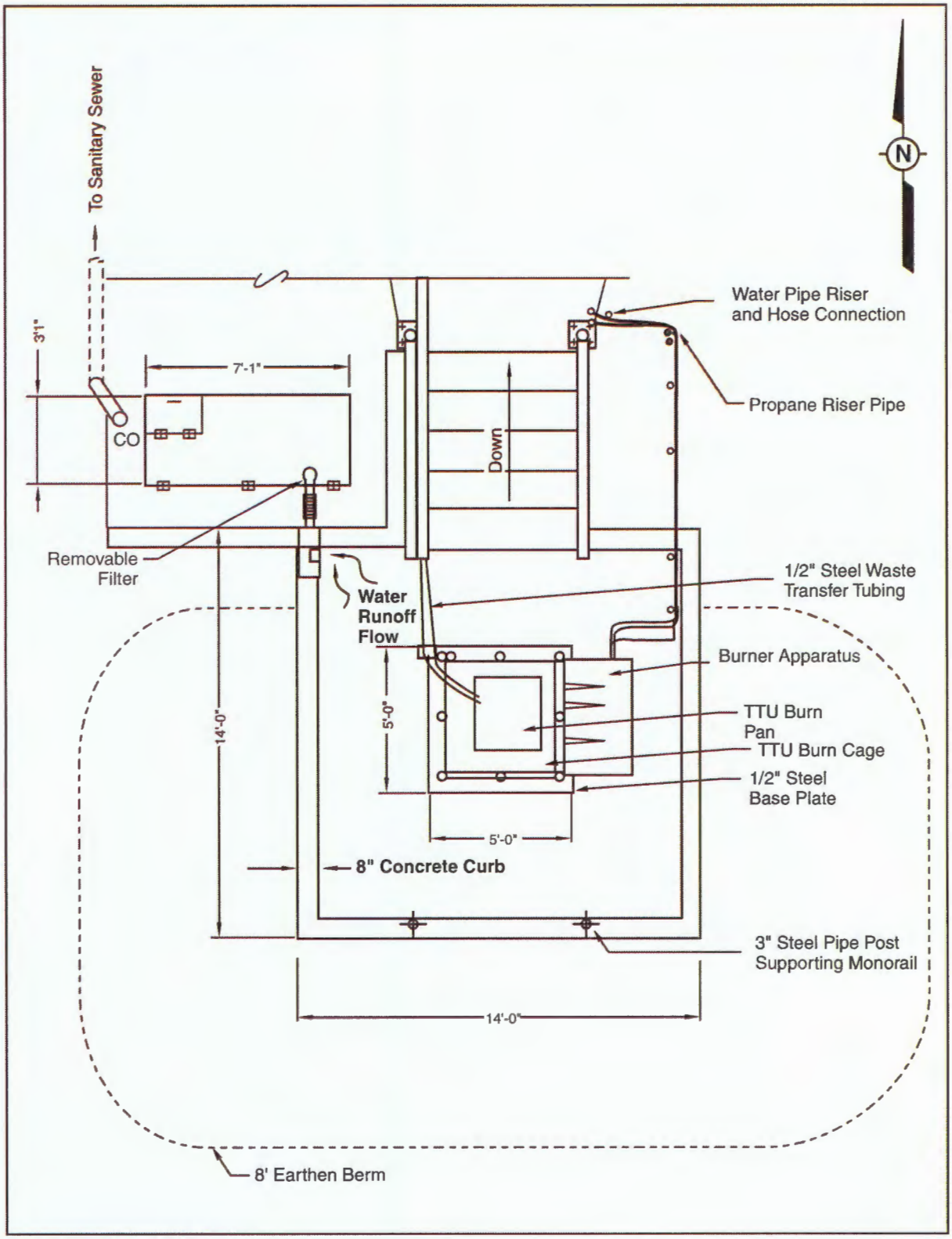


Figure 12

Thermal Treatment Unit Drainage Control Features

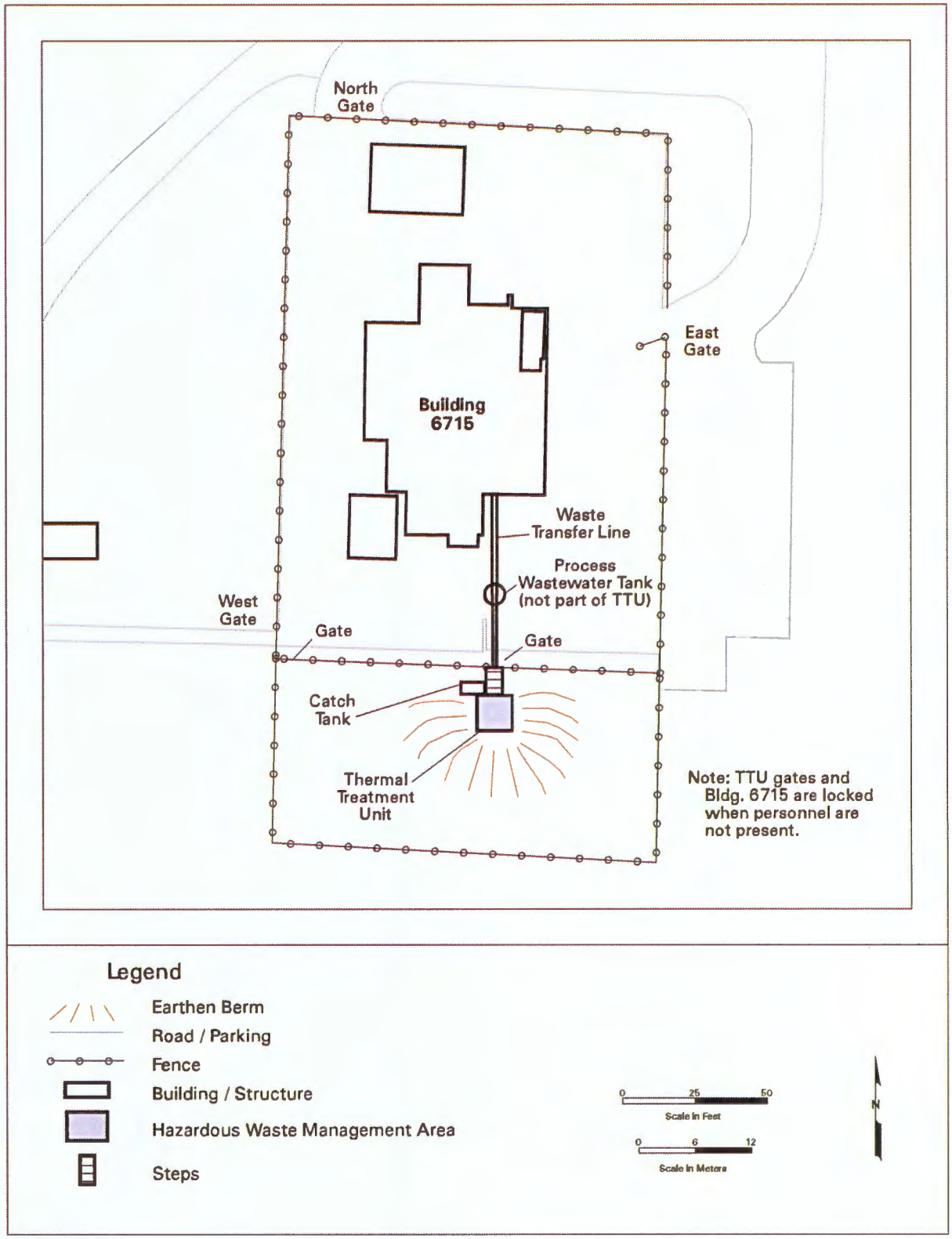


Figure 13
Thermal Treatment Unit Access Control Features

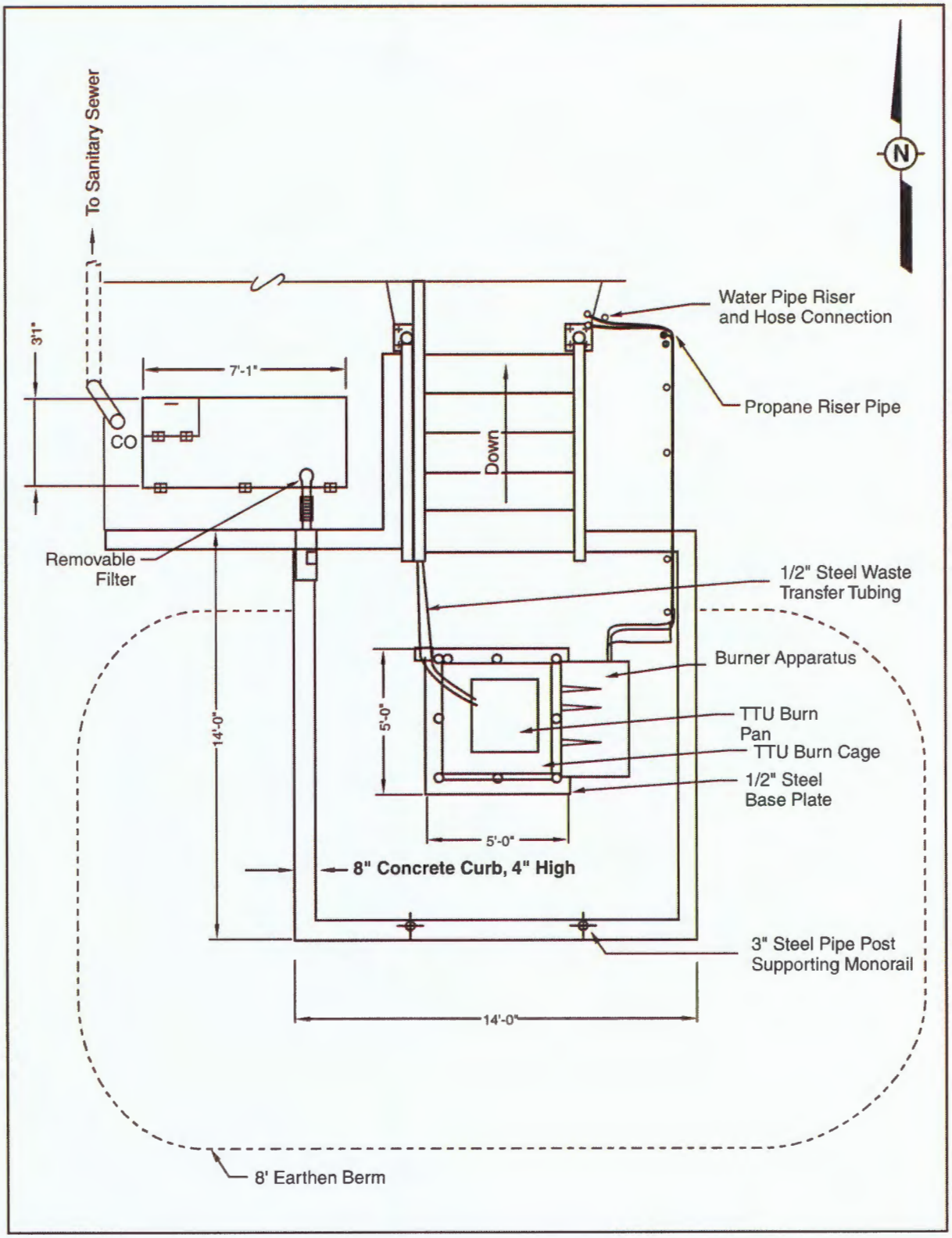


Figure 14

Thermal Treatment Unit Plan View with Dimensions

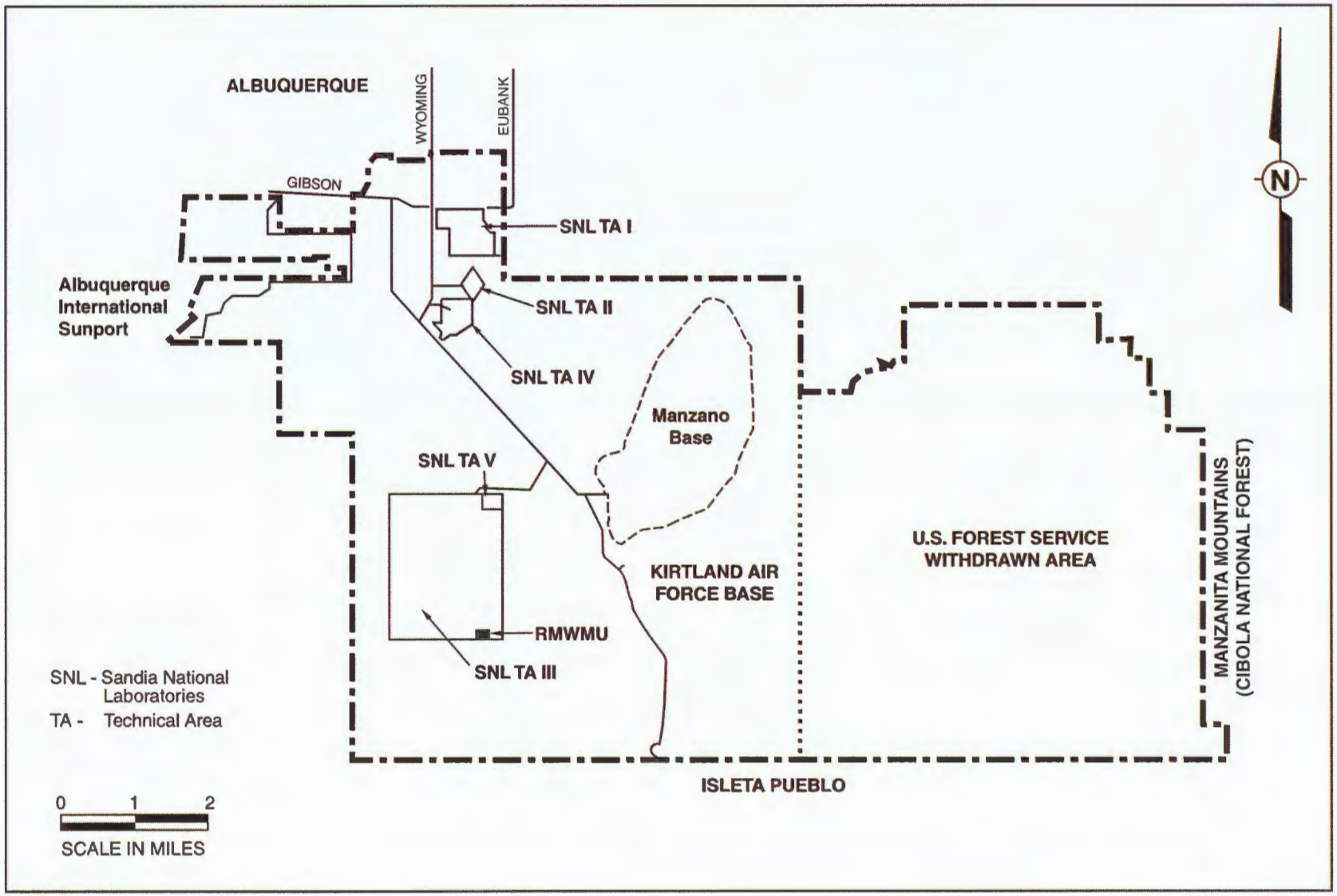


Figure 15

Location of the Radioactive and Mixed Waste Management Unit (RMWMU) at the Facility

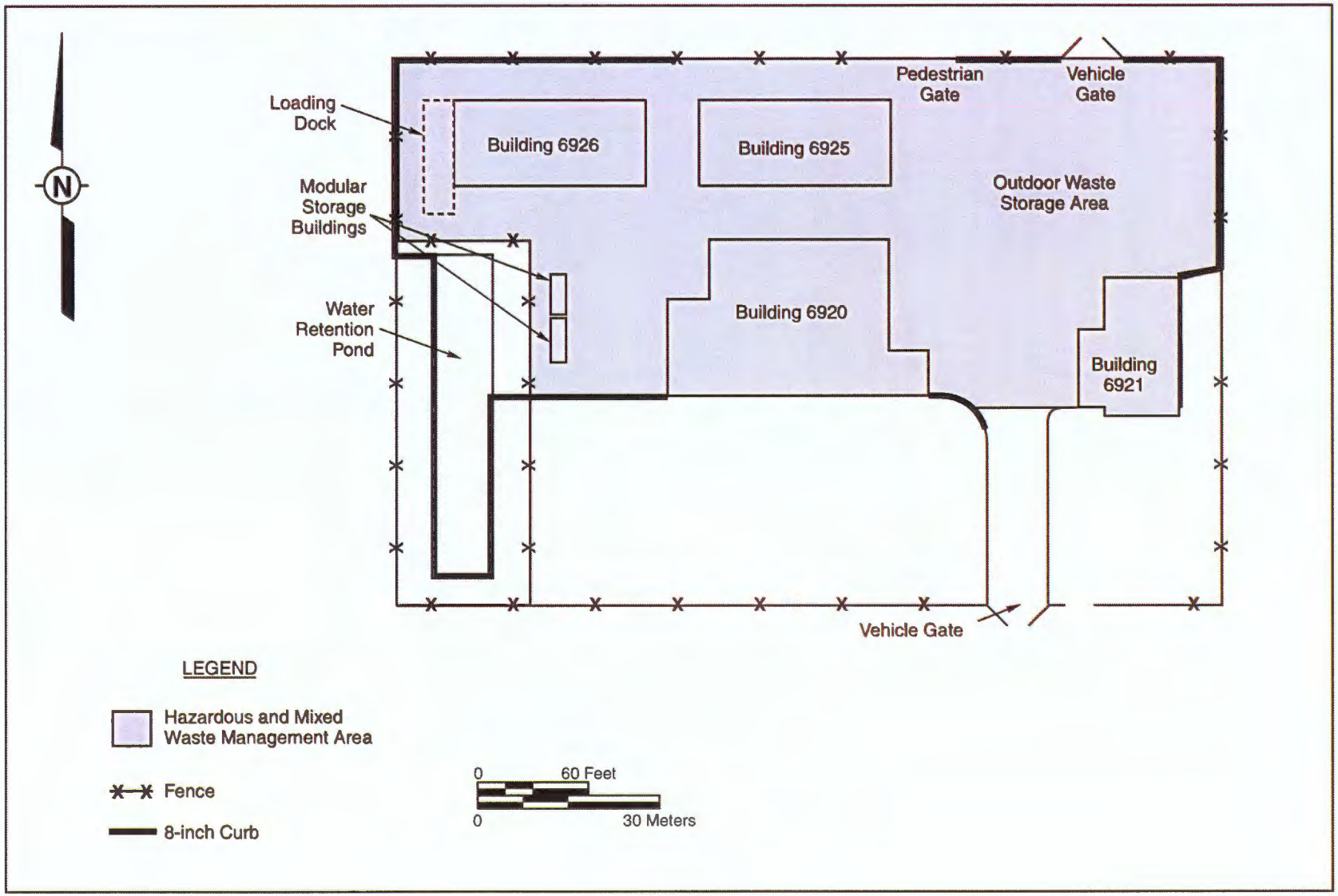


Figure 16

Radioactive and Mixed Waste Management Unit Hazardous and Mixed Waste Management Areas

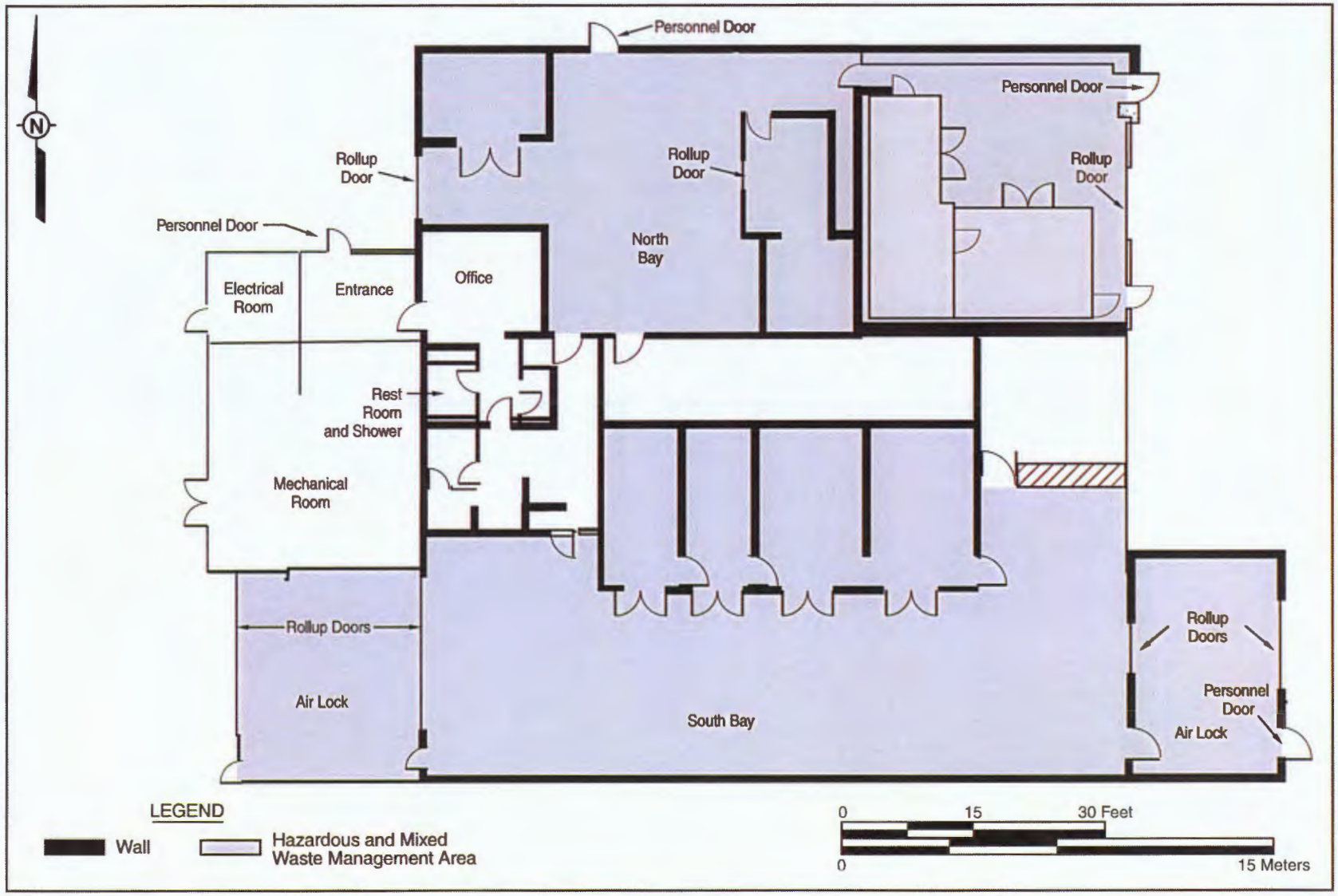


Figure 17

Radioactive and Mixed Waste Management Unit, Building 6920, Waste Management Areas

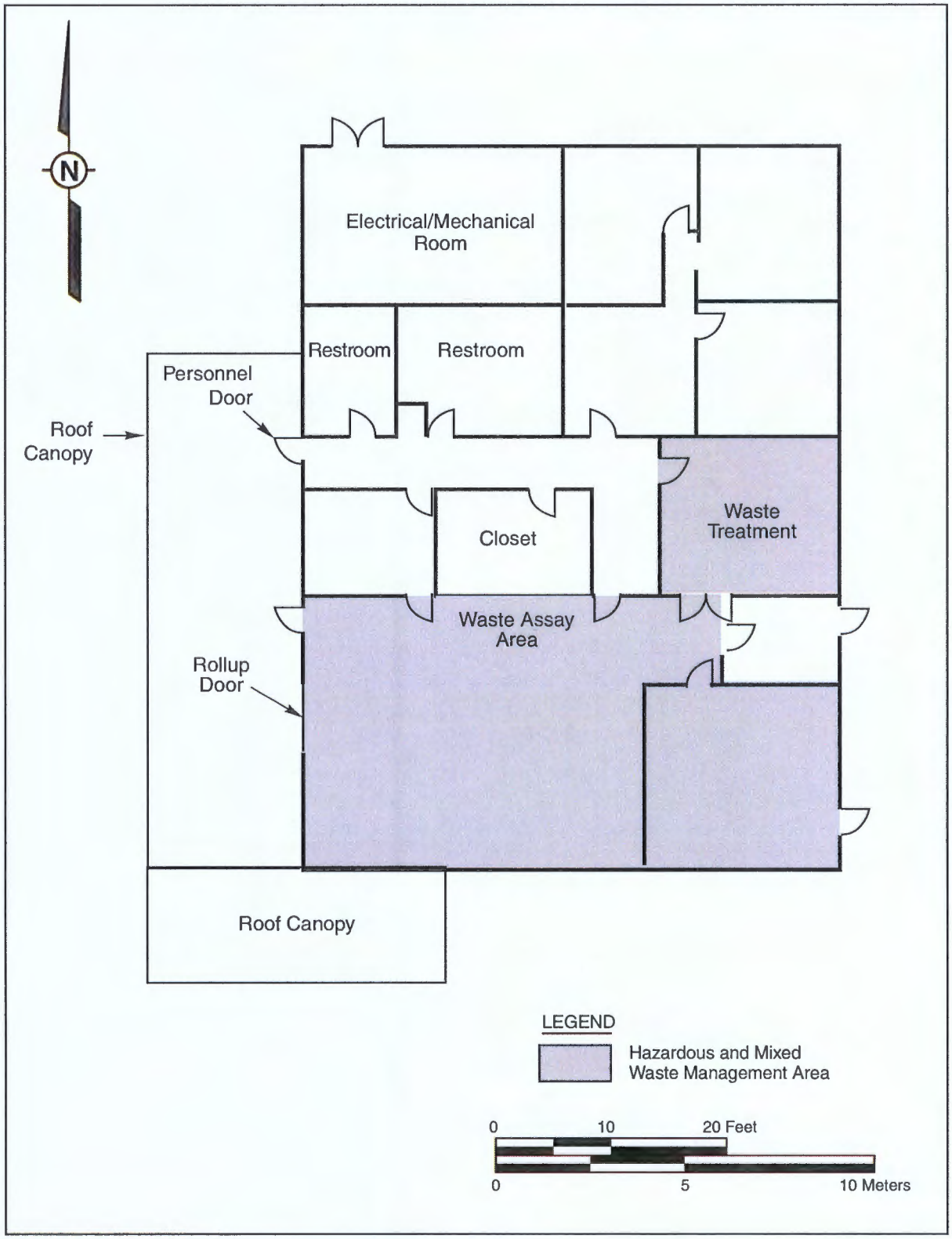


Figure 18

Radioactive and Mixed Waste Management Unit, Building 6921, Waste Management Areas

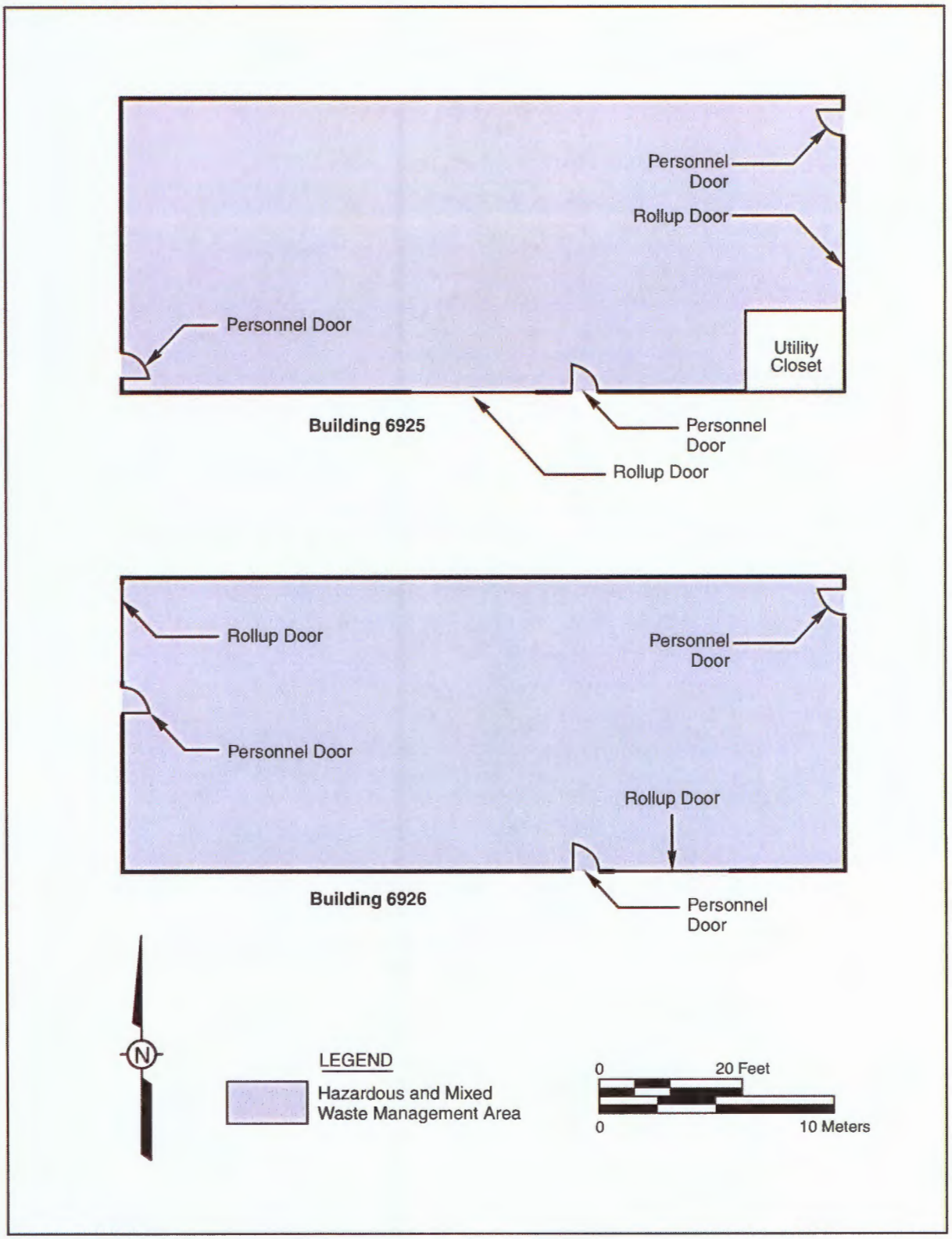


Figure 19

Radioactive and Mixed Waste Management Unit, Buildings 6925 and 6926, Waste Management Areas

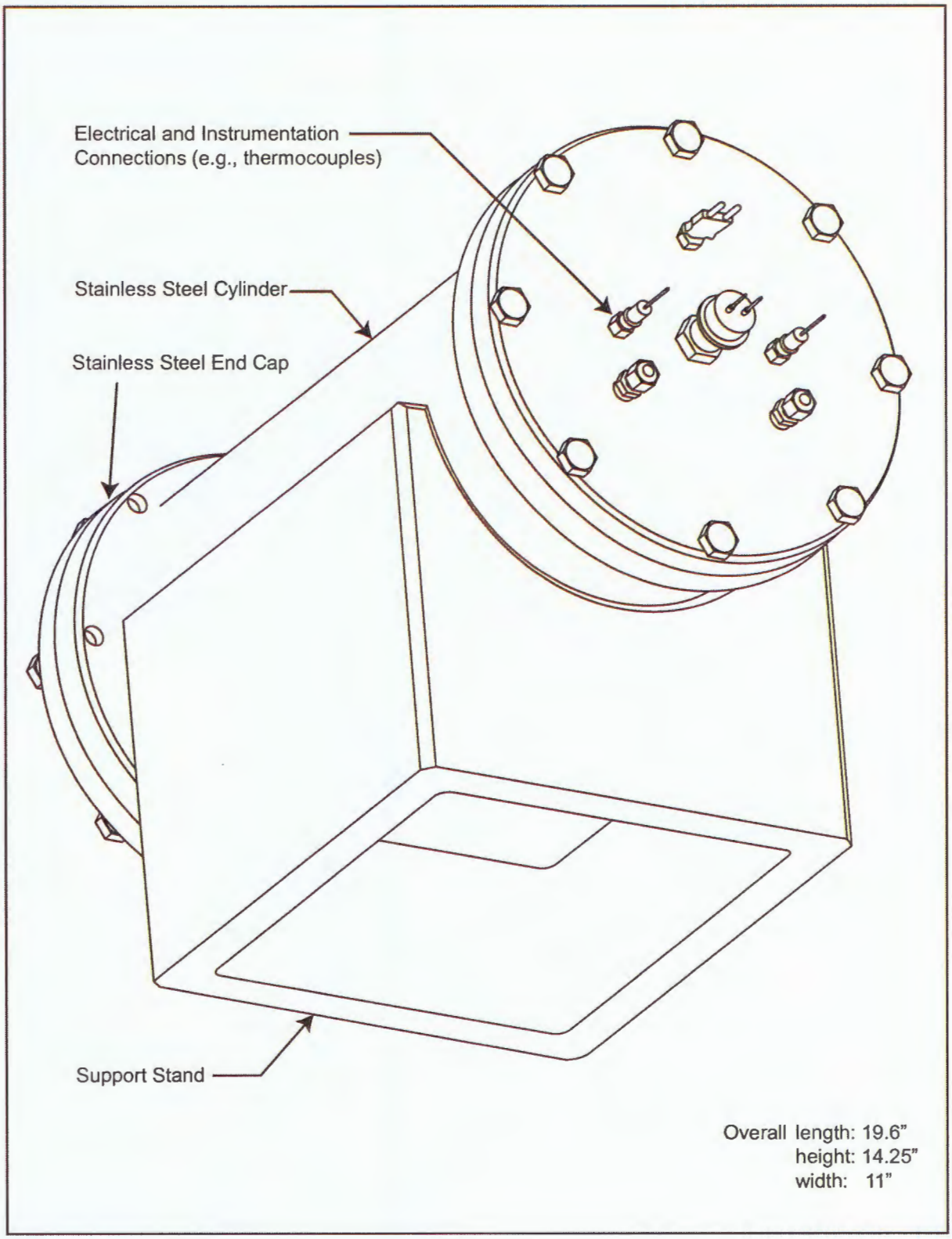


Figure 20

Radioactive and Mixed Waste Management Unit
Thermal Deactivation Device, Exterior Bottom View

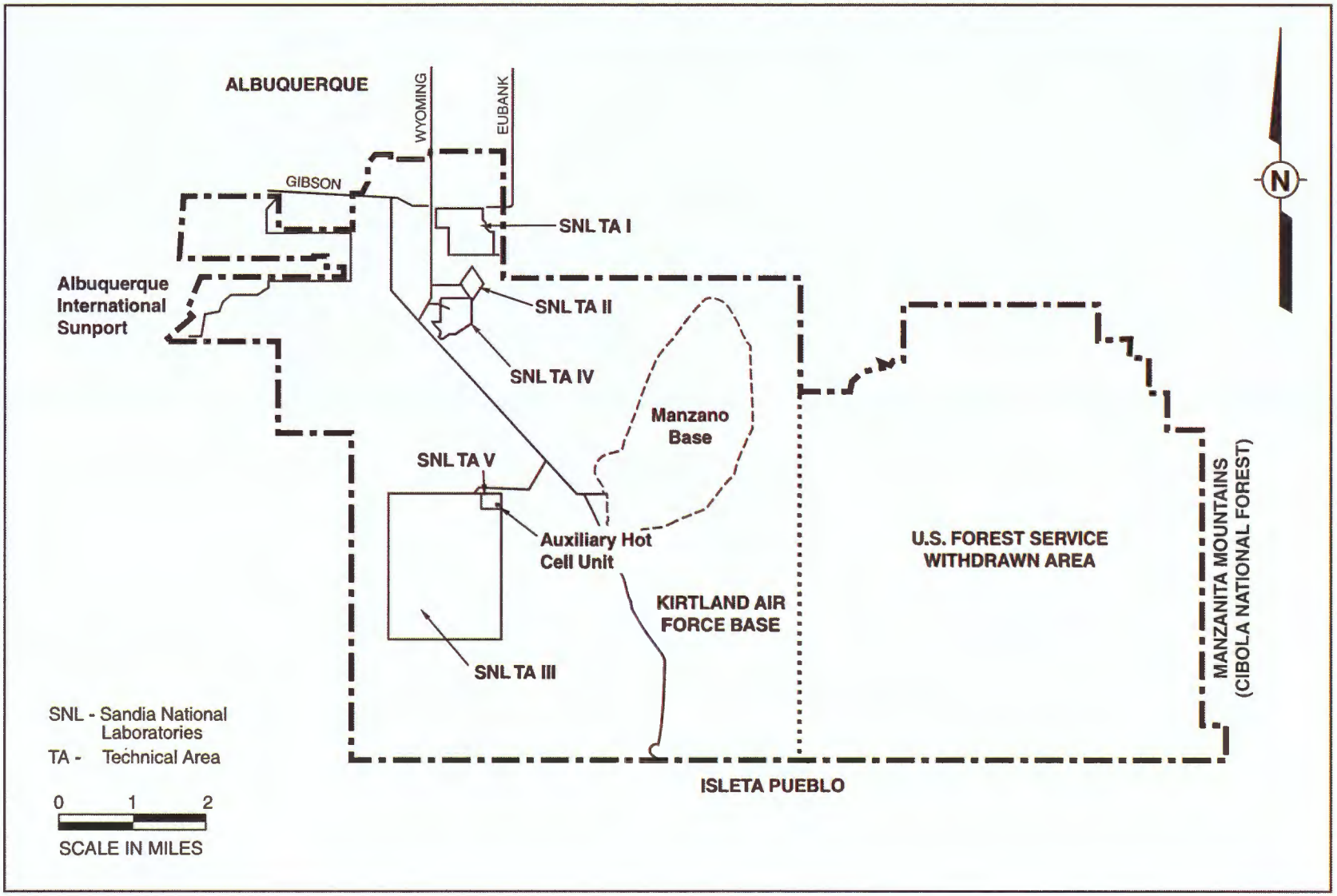


Figure 21-A
Location of the Auxiliary Hot Cell Unit at the Facility

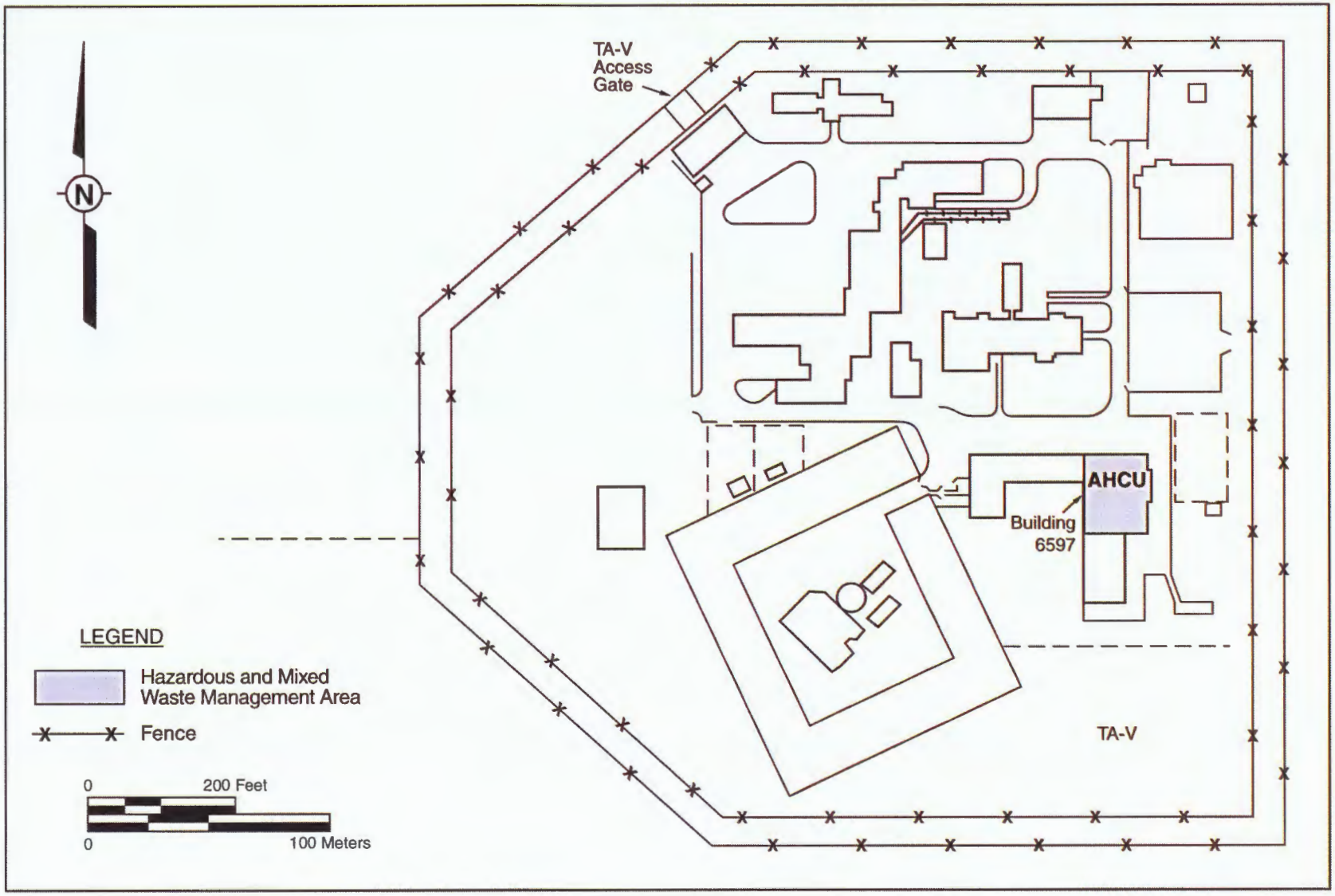


Figure 21-B

Location of the Auxiliary Hot Cell Unit (AHCU) in Technical Area (TA) V

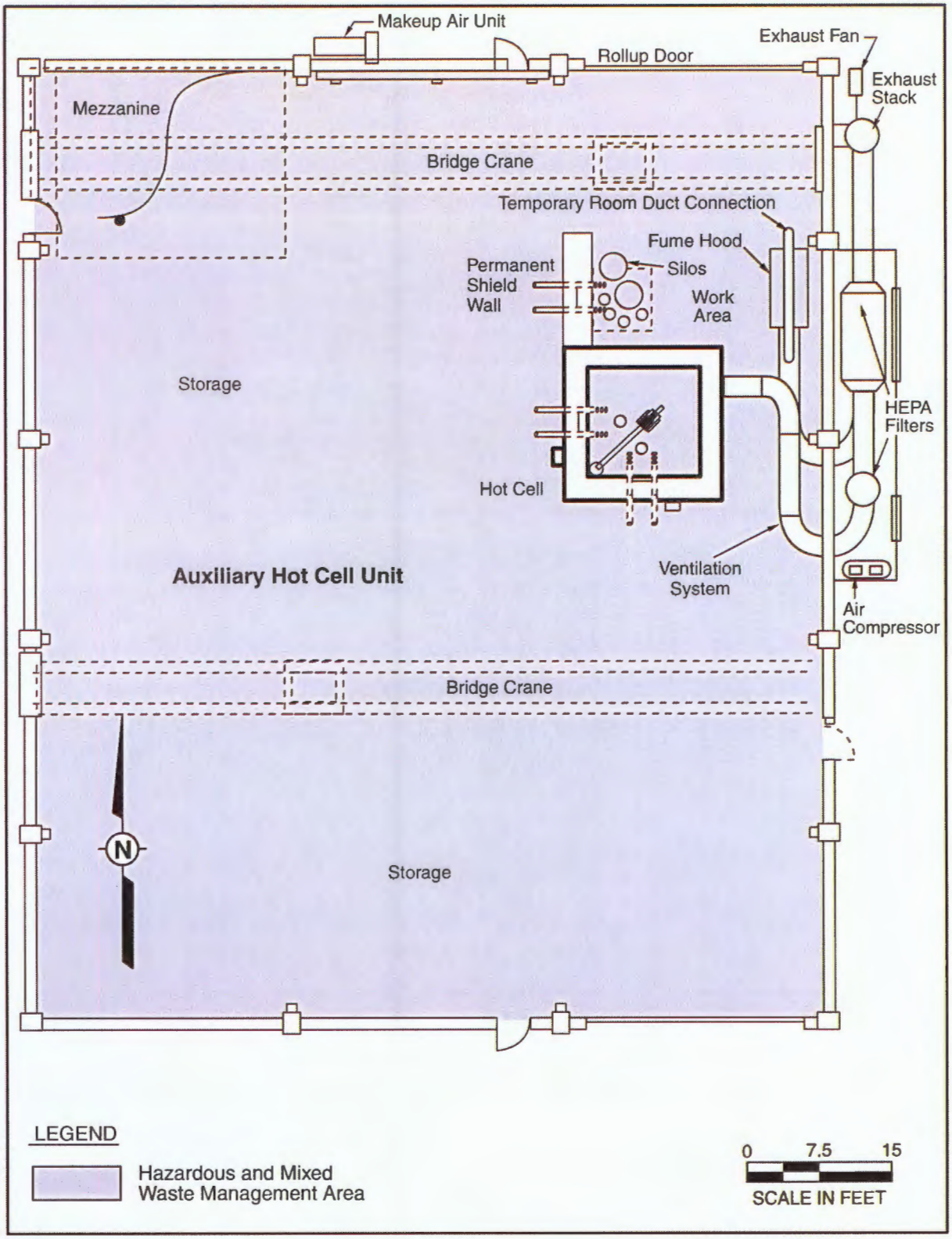


Figure 22

Auxiliary Hot Cell Unit, Waste Management Areas

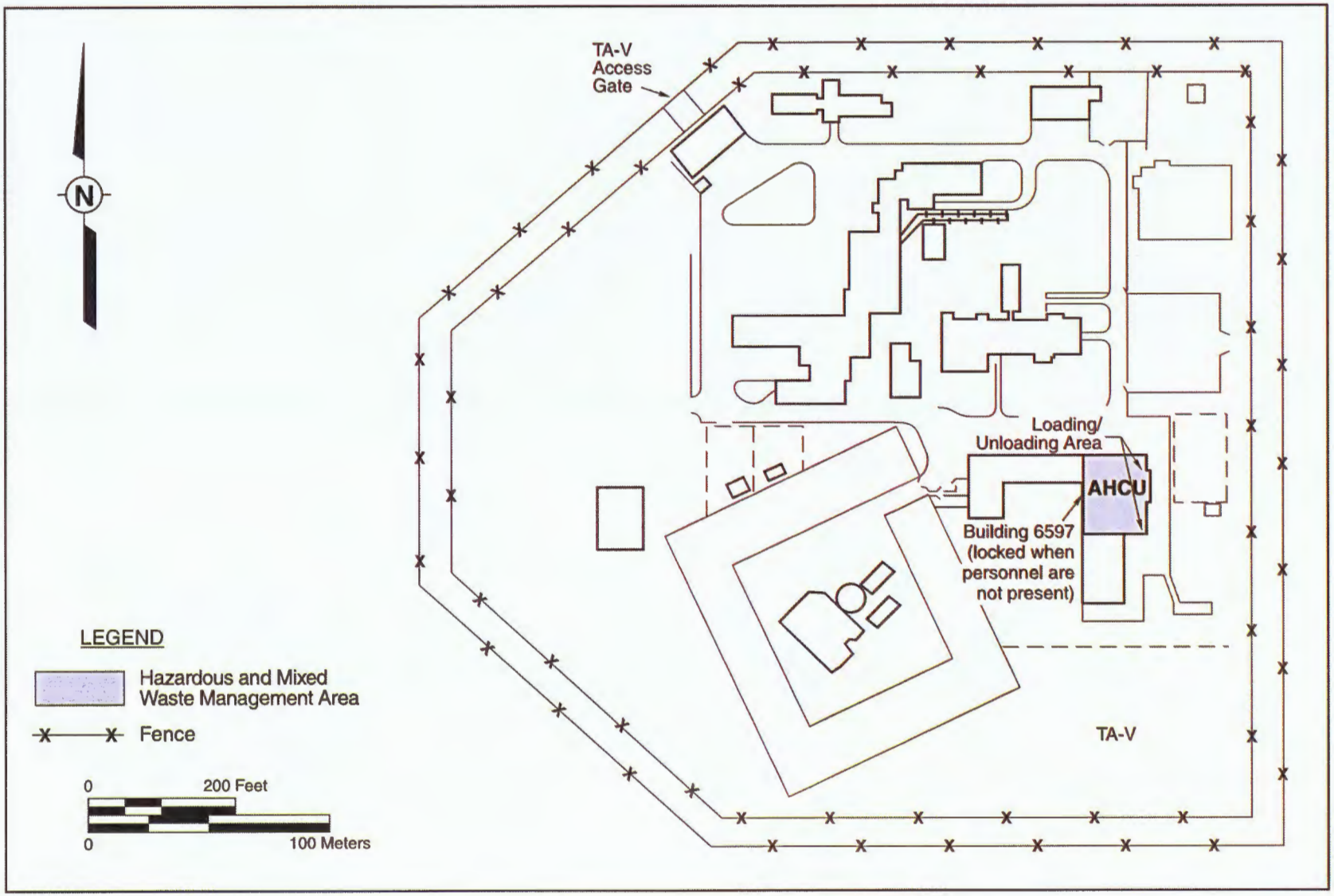


Figure 23

Auxiliary Hot Cell Unit Loading/Unloading and Access Control Features

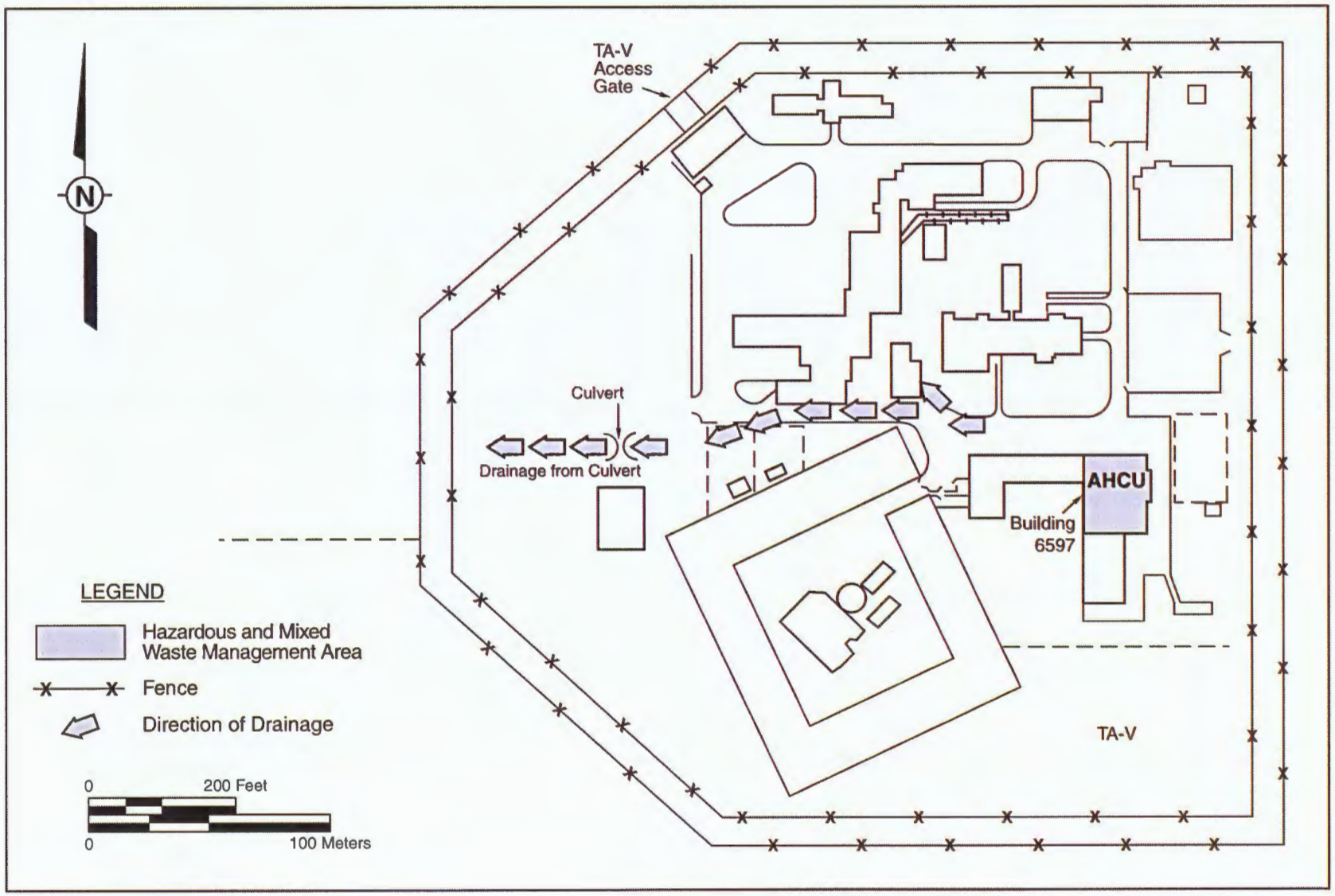


Figure 24
Auxiliary Hot Cell Unit (AHCU), Drainage Control Features

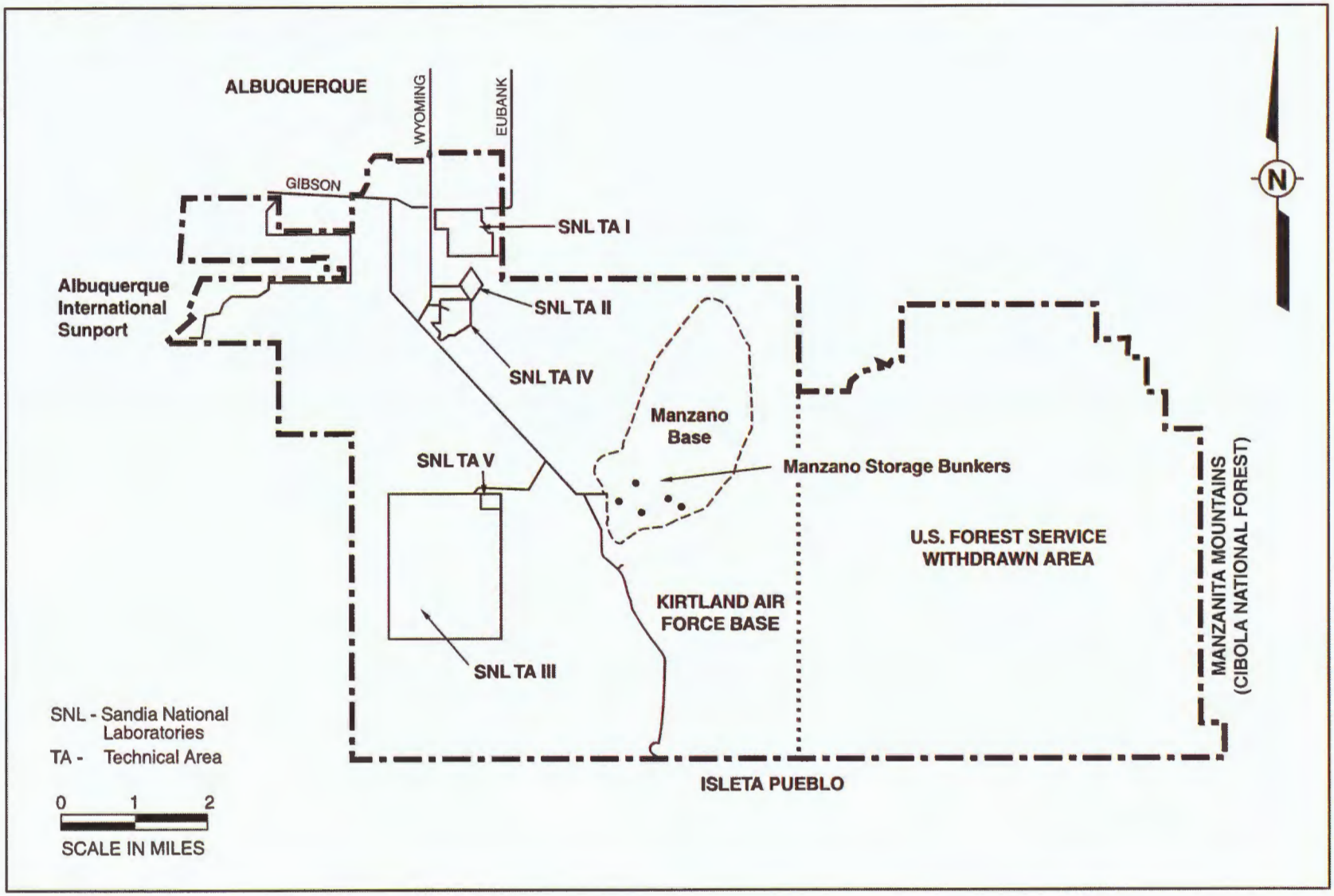


Figure 25
Location of the Manzano Storage Bunkers at the Facility

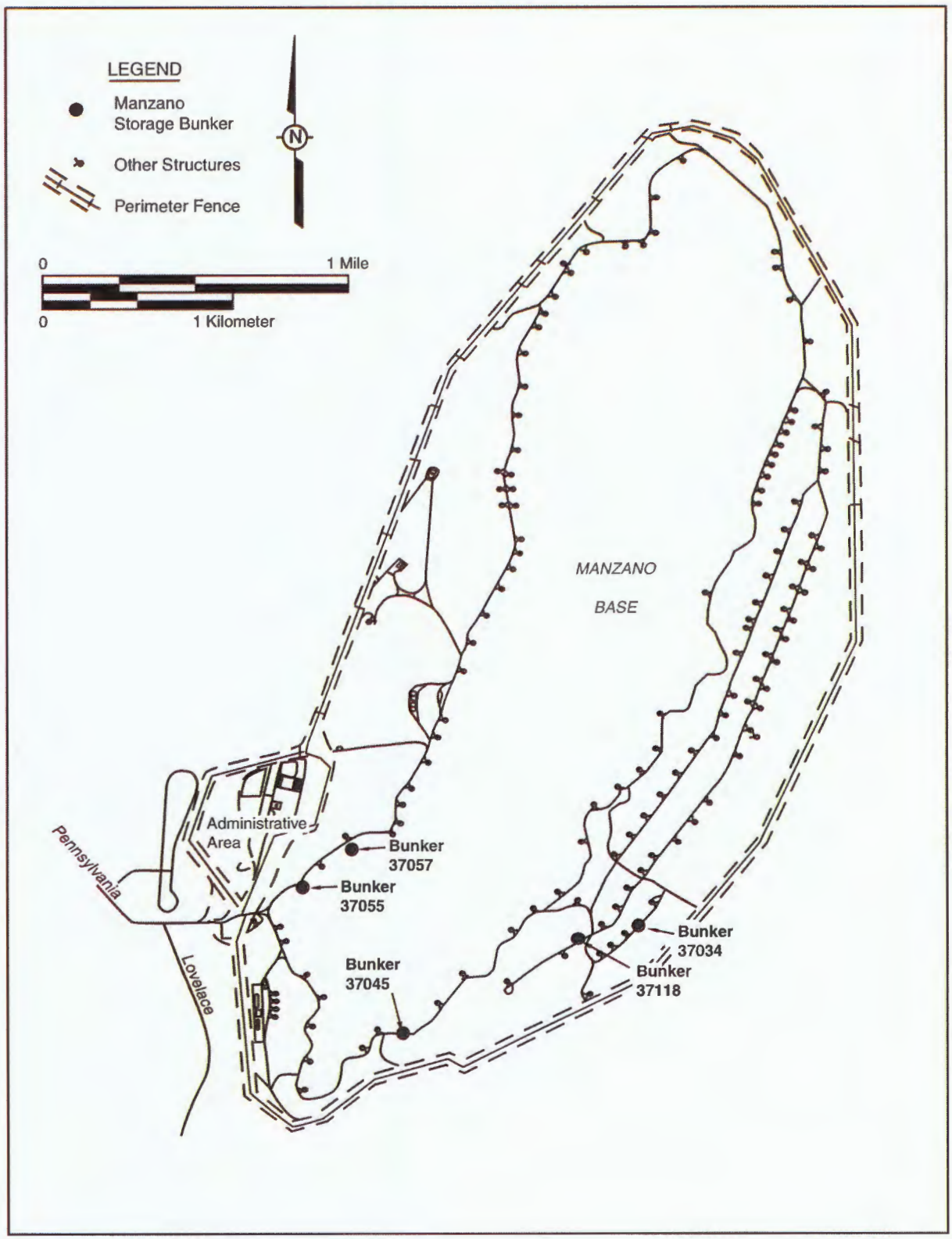


Figure 26
Location of the Manzano Storage Bunkers at Manzano Base

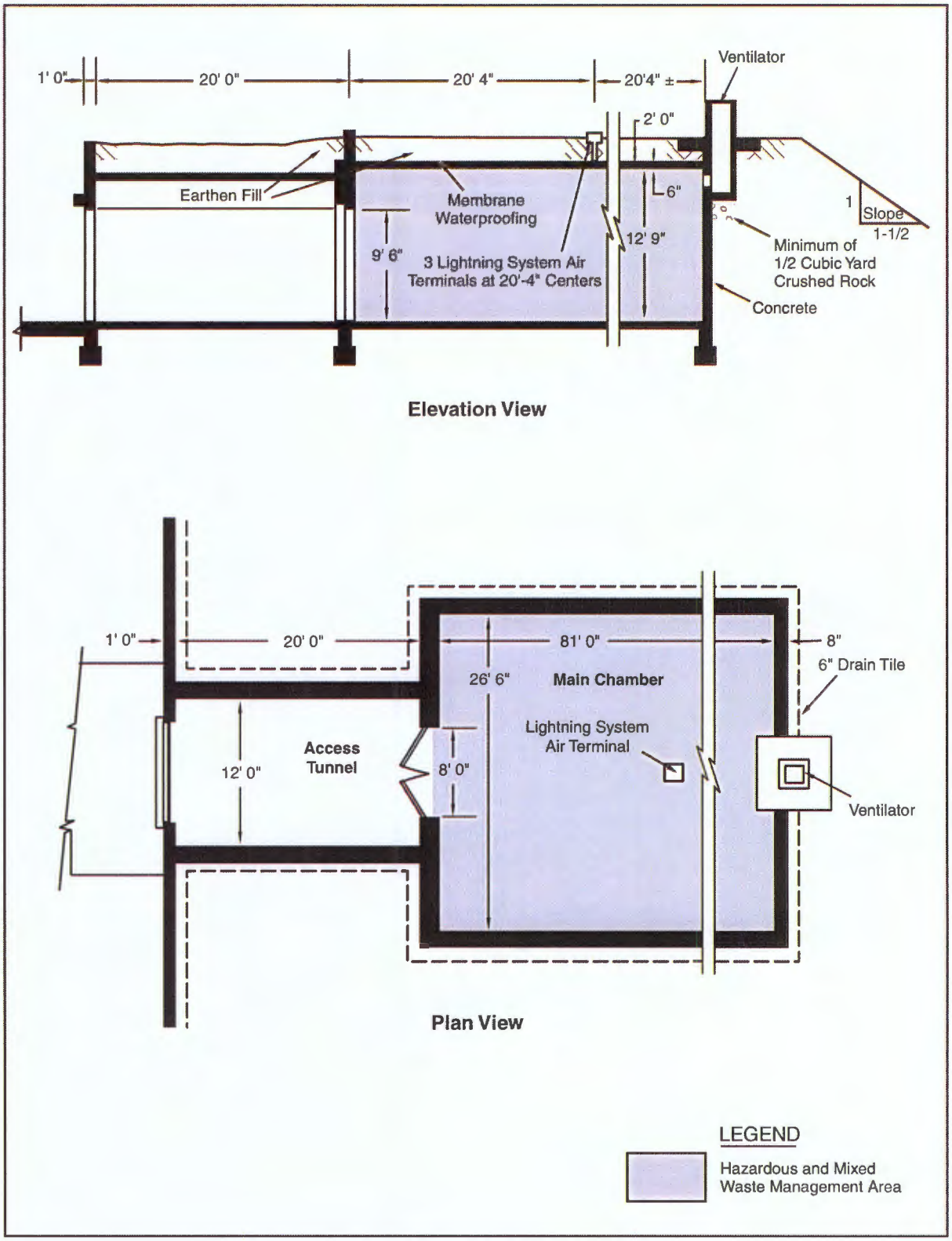


Figure 27

Views, Manzano Storage Bunker, Type B, Bunker 37034

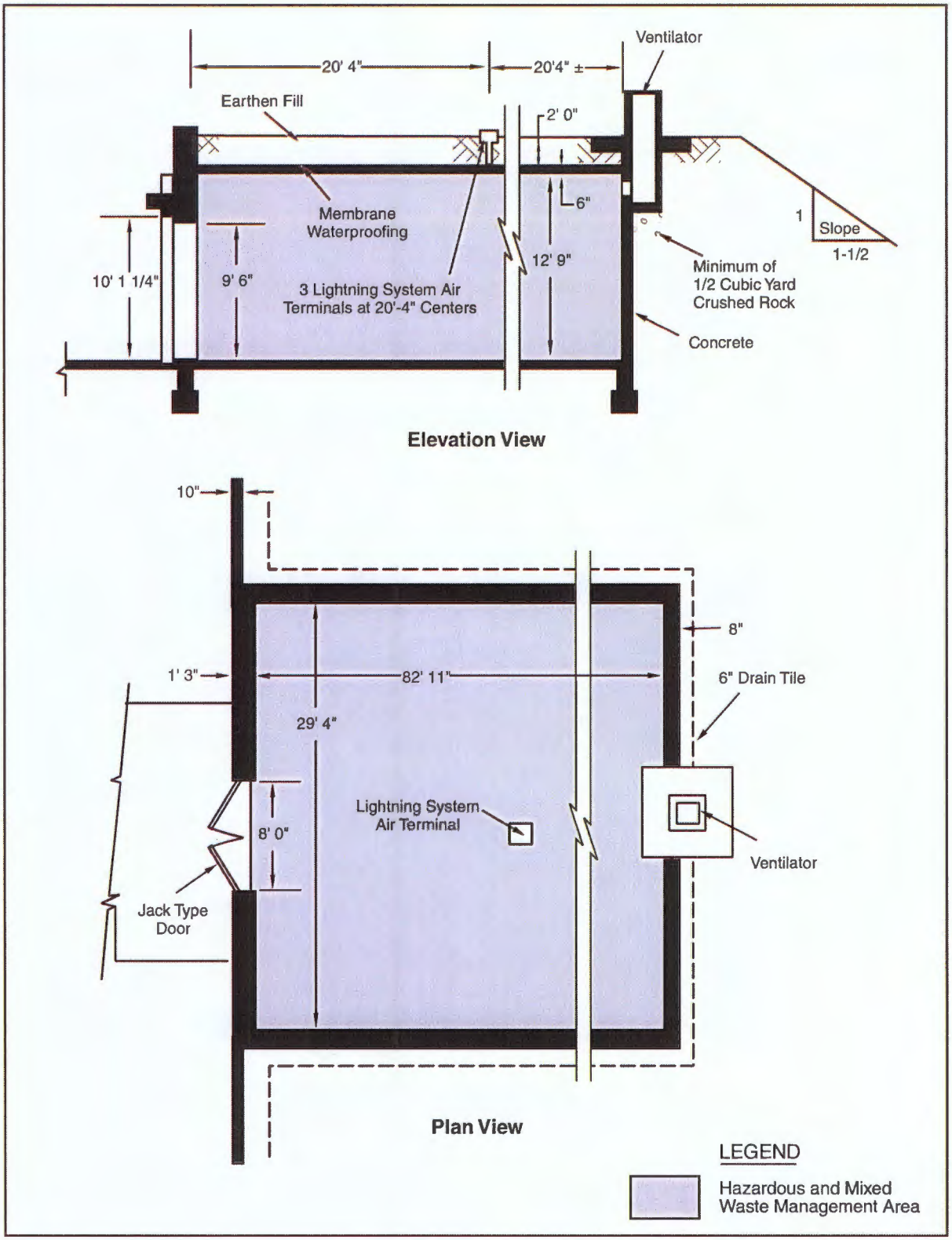


Figure 28

Views, Manzano Storage Bunker, Type C, Bunker 37118

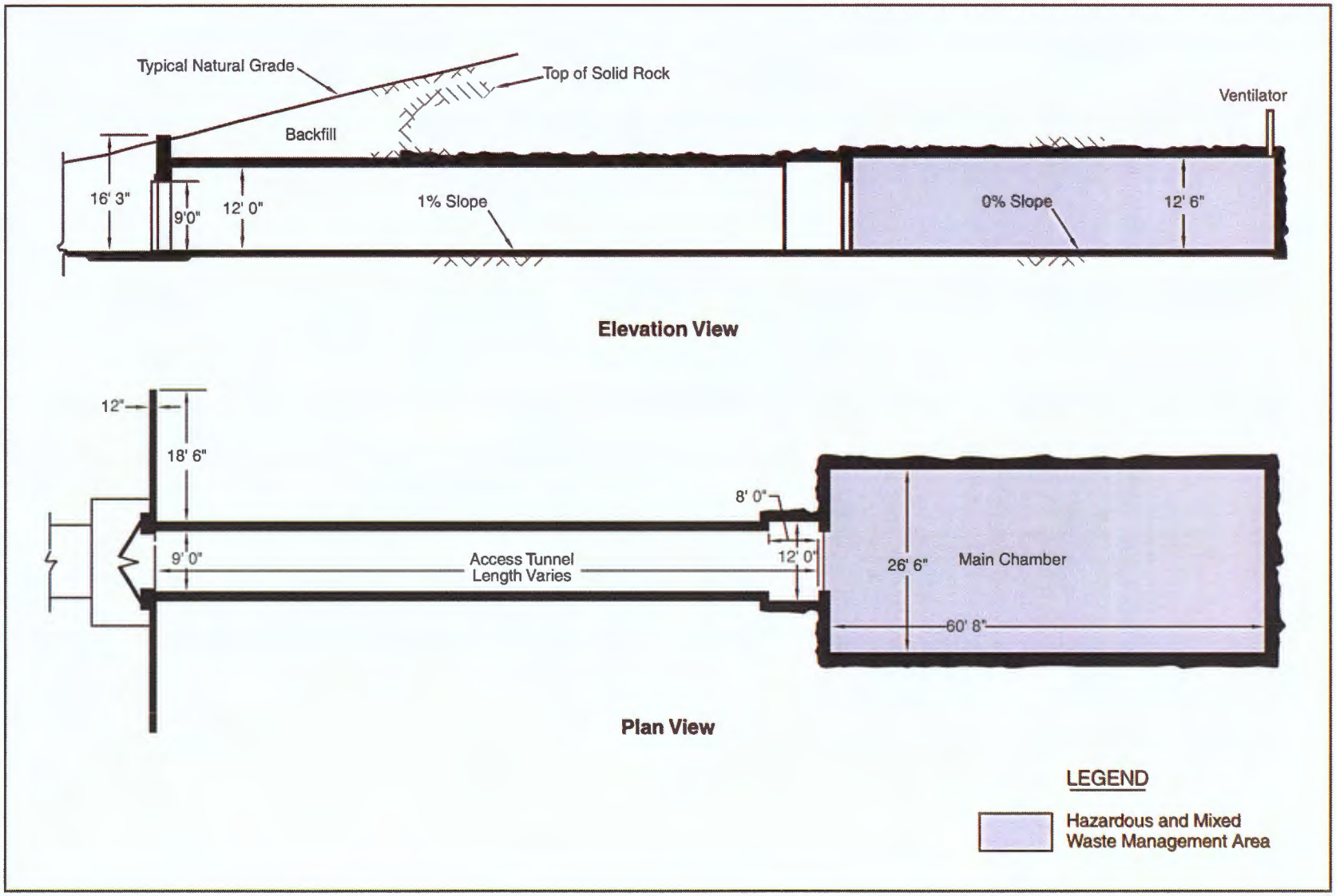


Figure 29

Views, Manzano Storage Bunkers, Type D Bunkers 37045, 37055, and 37057

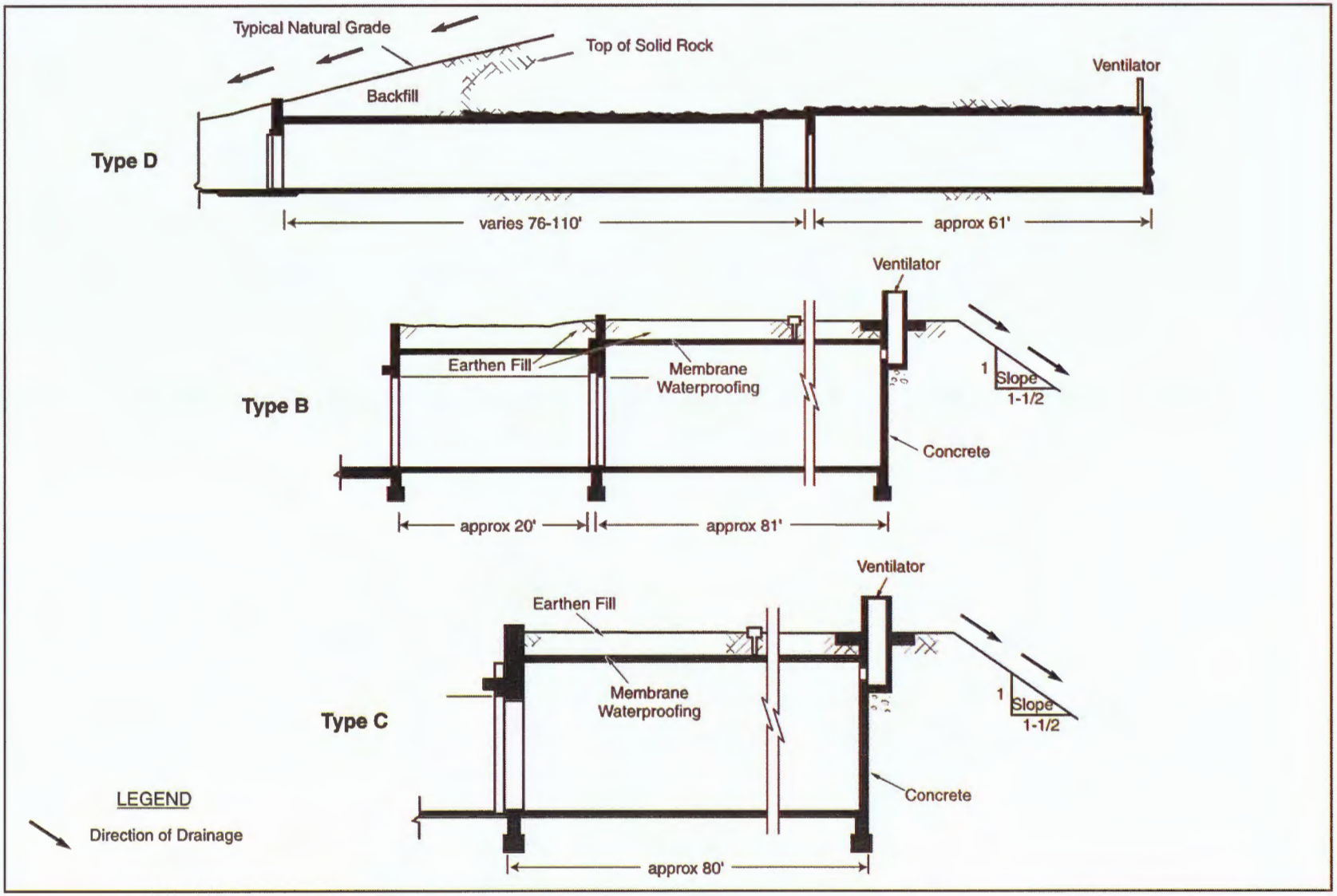


Figure 30

Manzano Storage Bunkers, Drainage Control Features

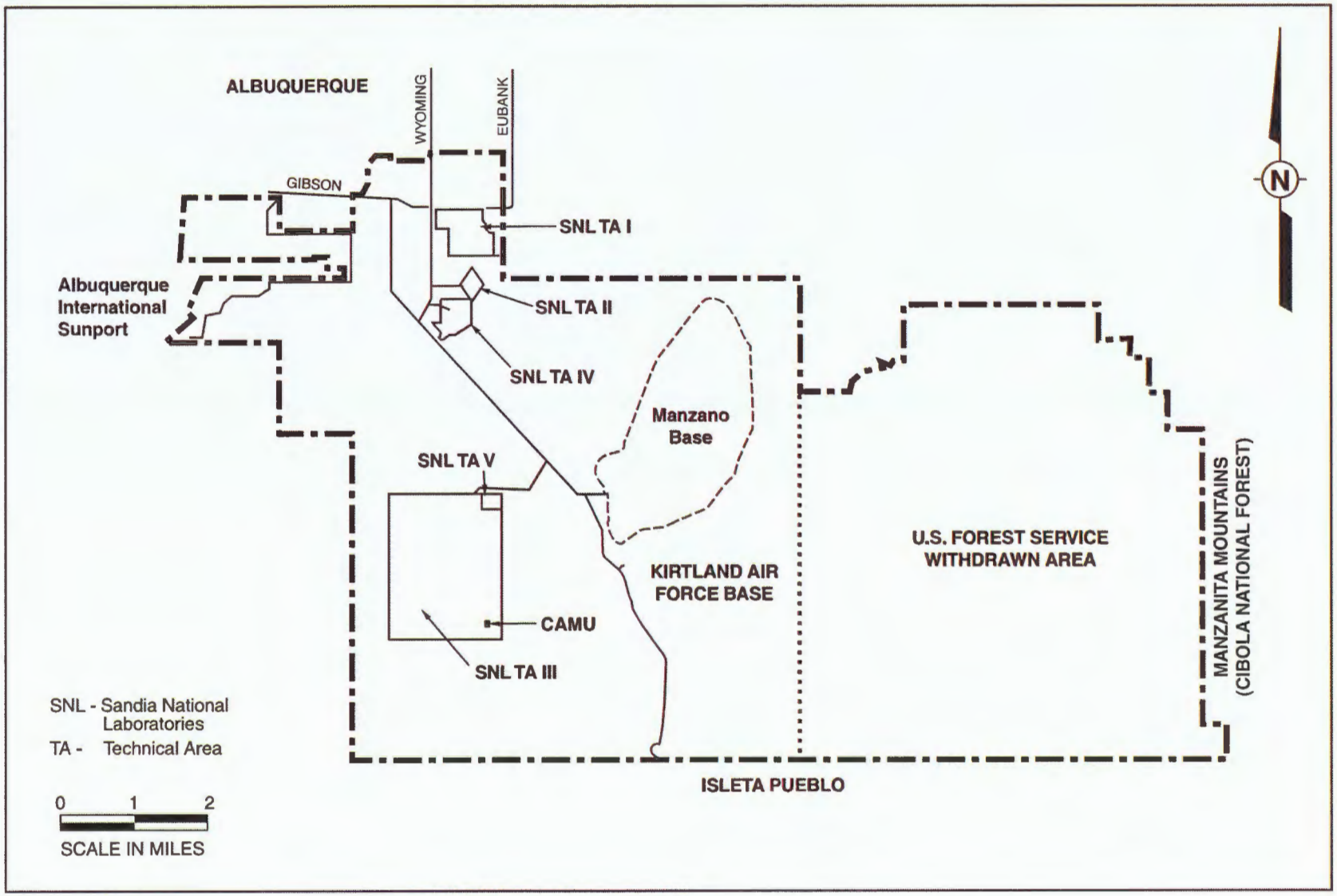


Figure 31

Location of the Corrective Action Management Unit (CAMU) at the Facility

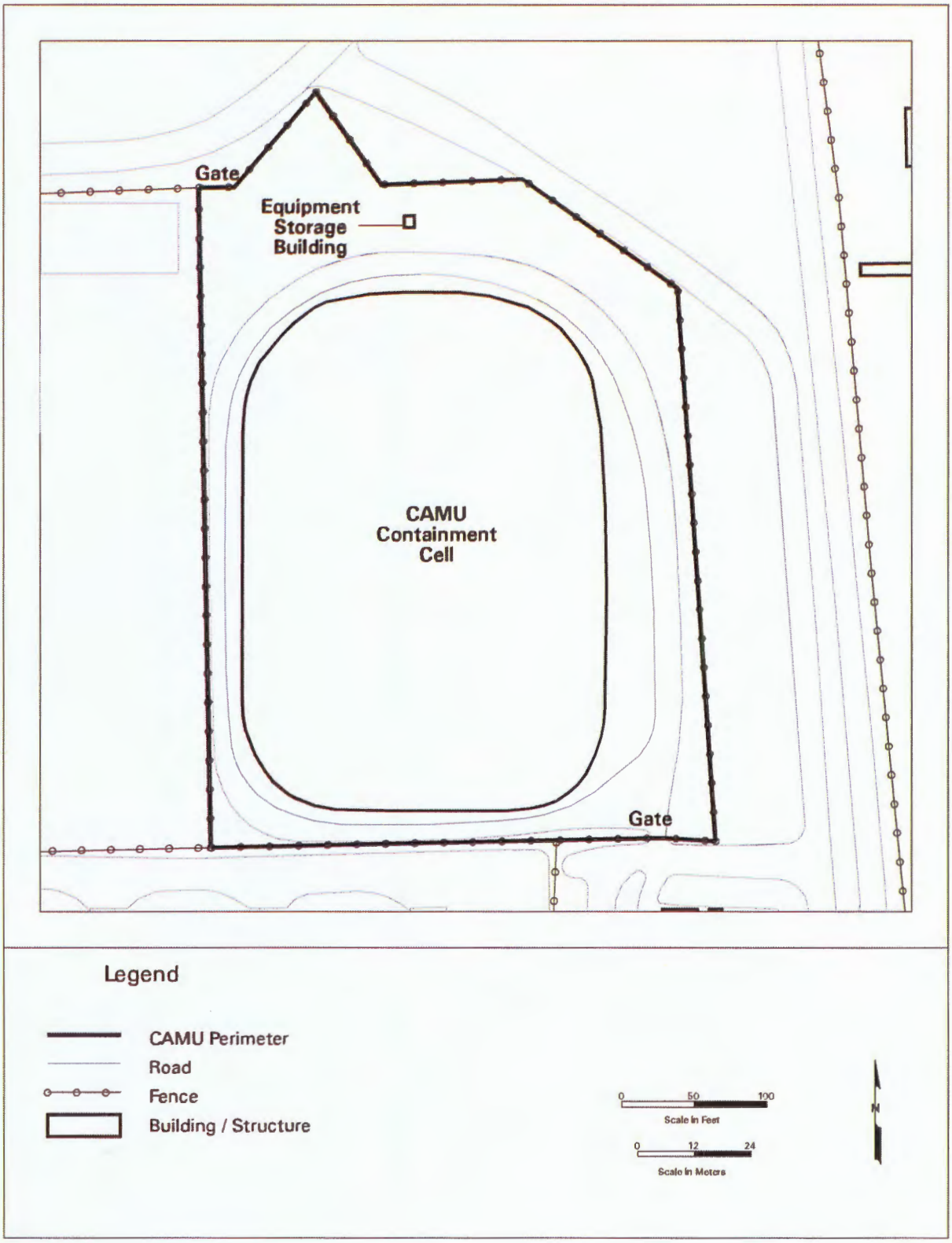


Figure 32
Post-Closure Perimeter
Corrective Action Management Unit (CAMU)

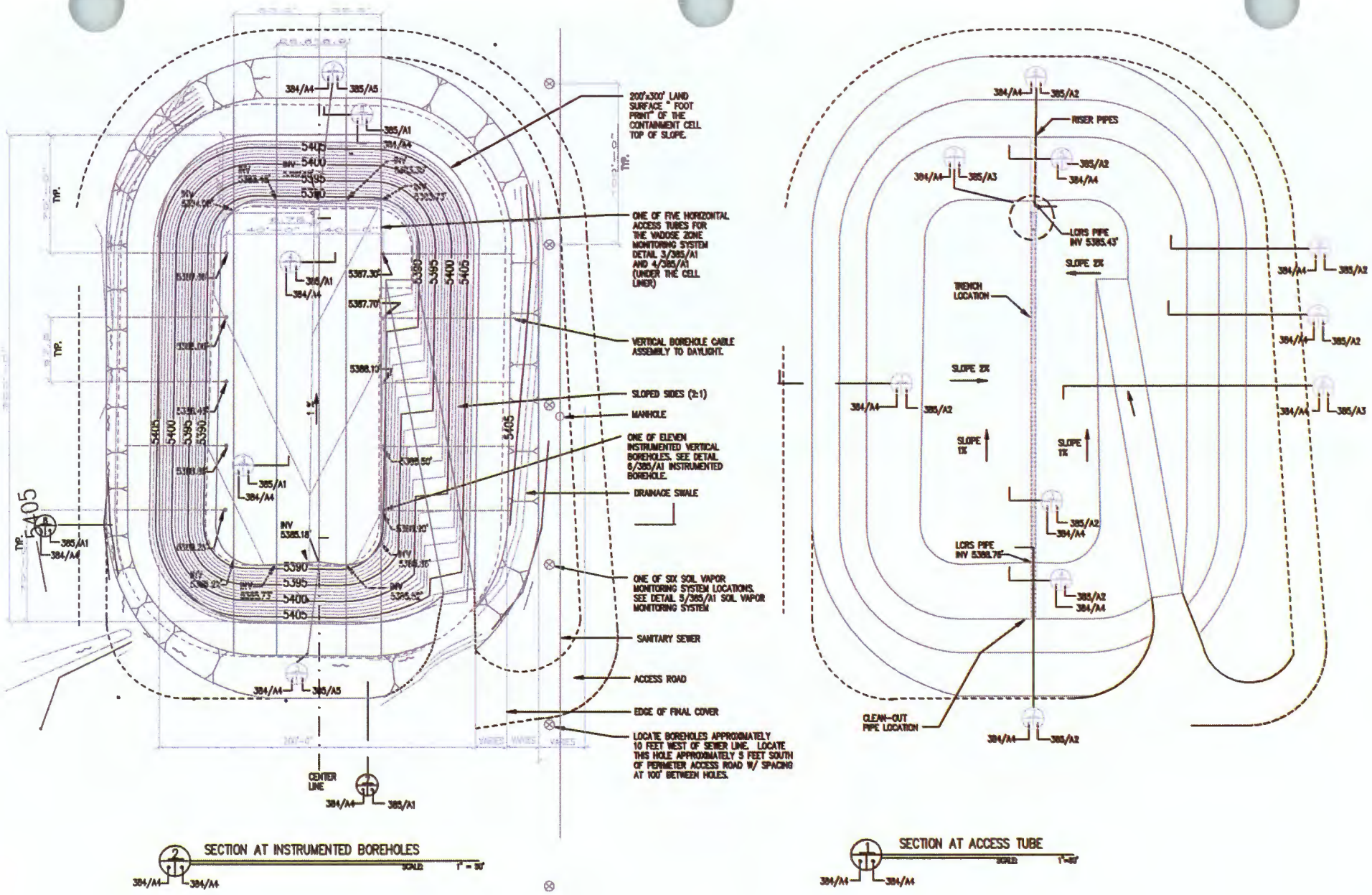


Figure 33
Corrective Action Management Unit
Containment Cell Site Plan

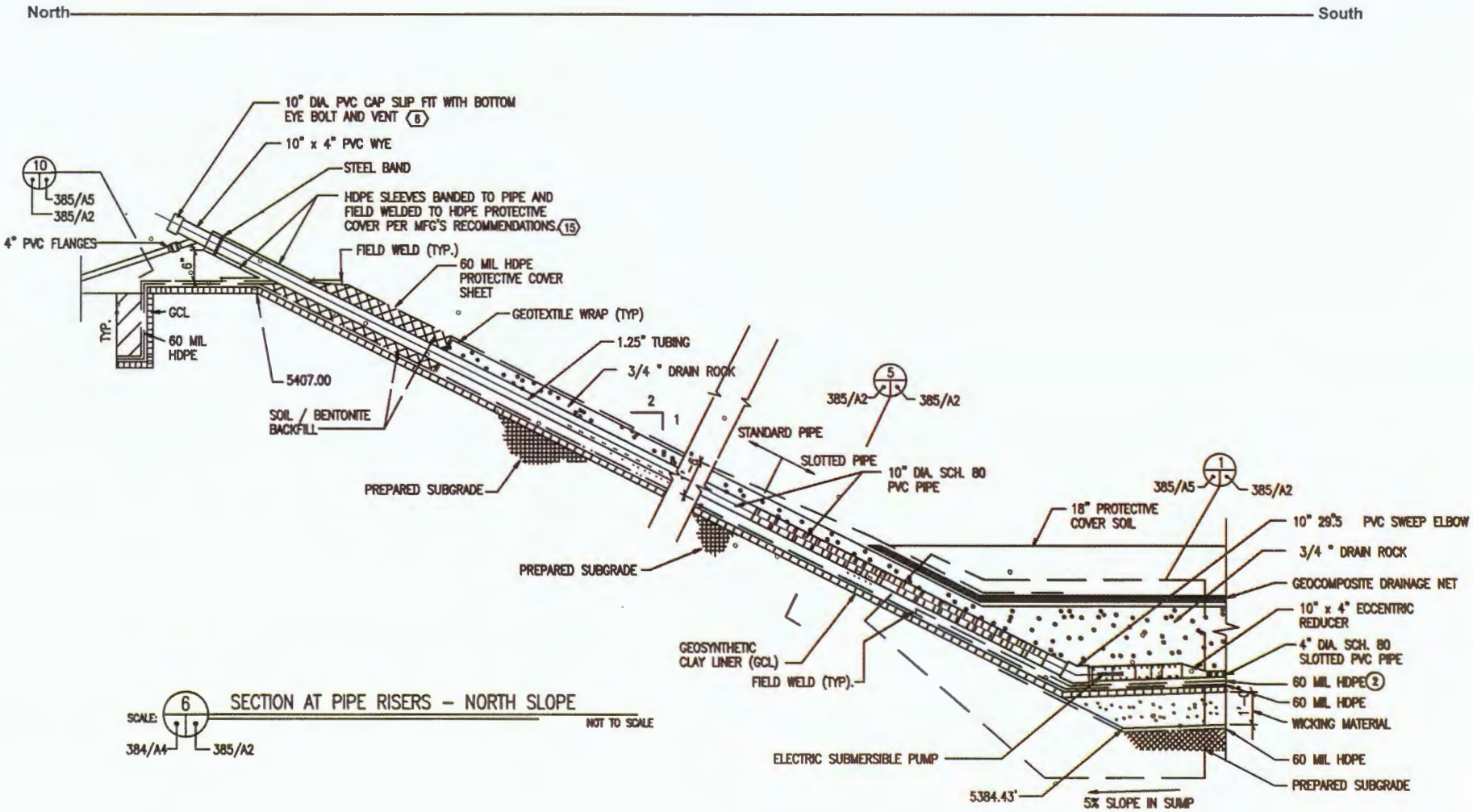


Figure 34
Corrective Action Management Unit
North-South Cross-Section of Leachate Collection and Removal System Sump

West East

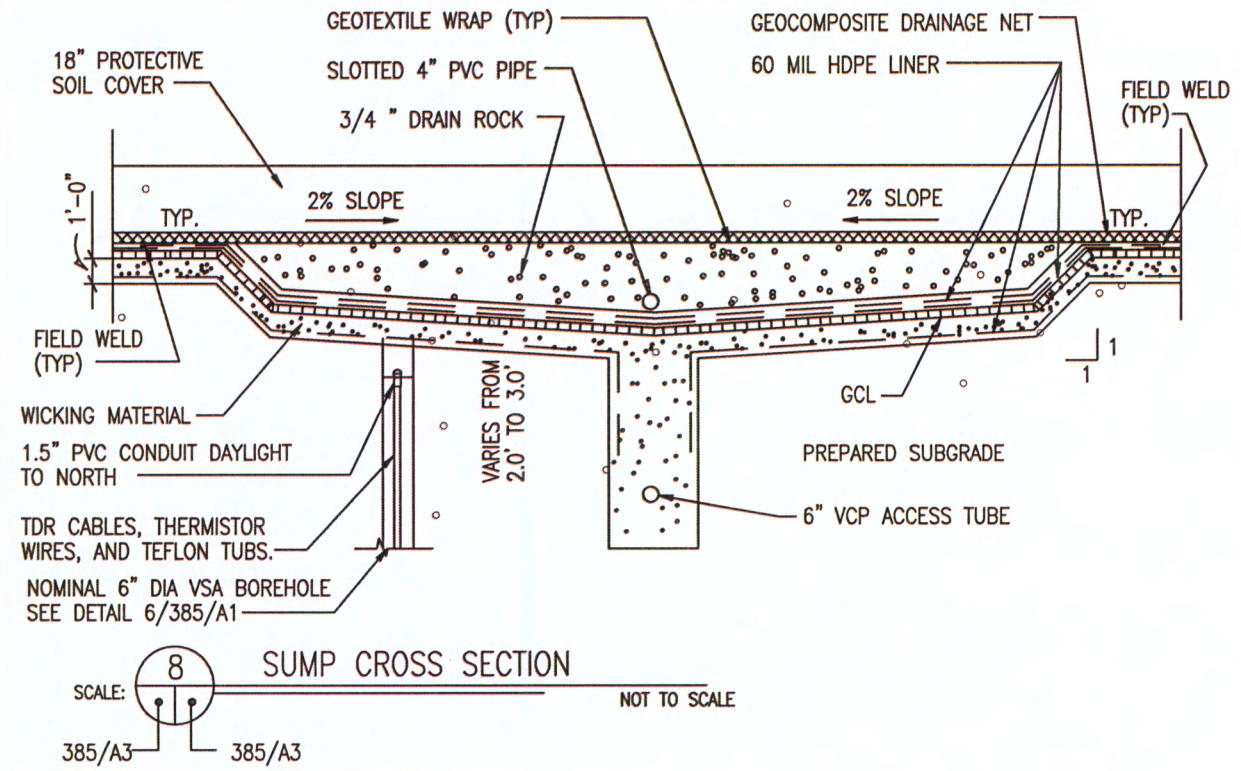


Figure 35
Corrective Action Management Unit
West-East Cross-Section of Containment Cell

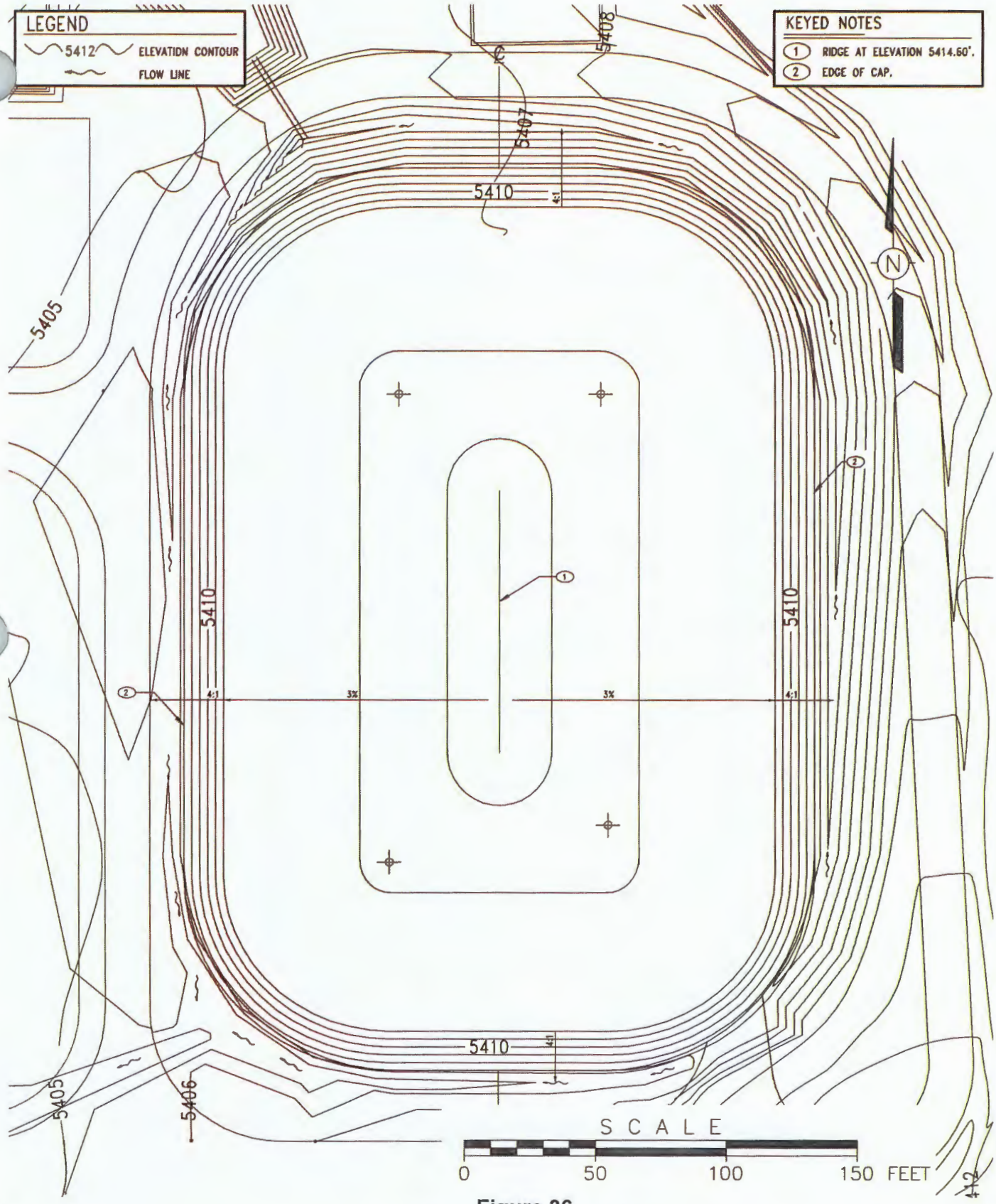


Figure 36
Plan View of Completed
Corrective Action Management Unit (CAMU) Containment
Cell Showing Final Cover Configuration and
Associated Perimeter Drainage Pathways

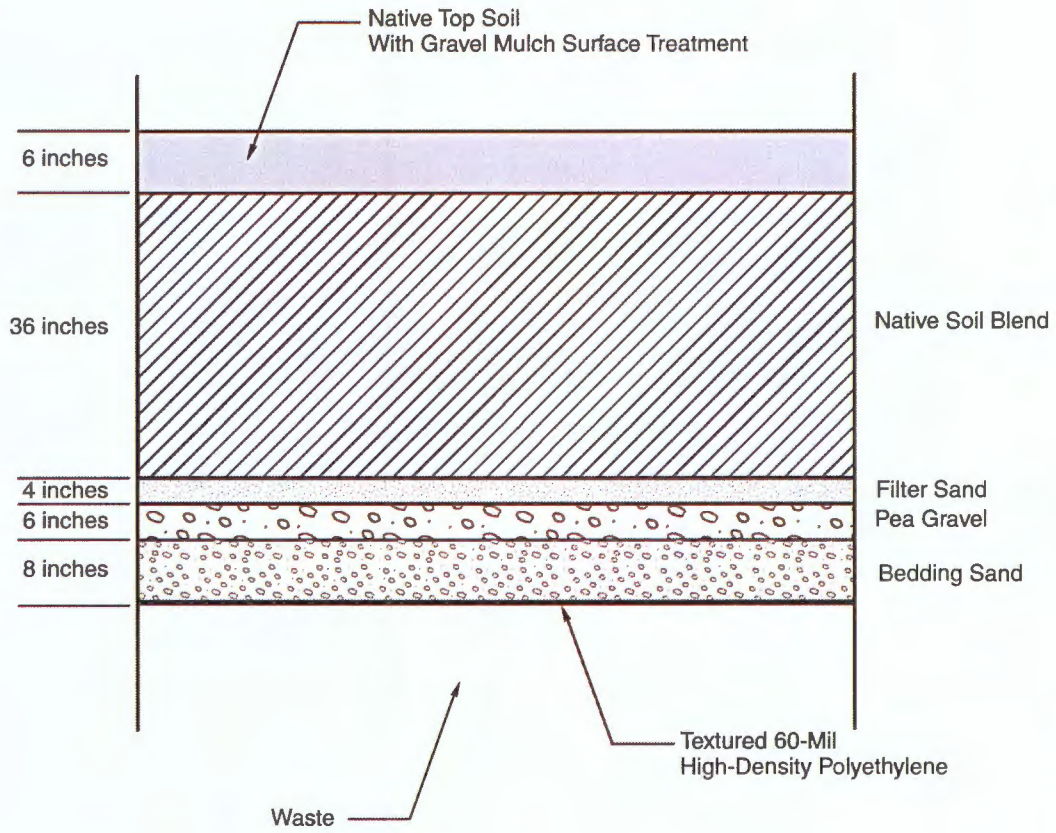


Figure 37

Schematic Cross-Section of Final Cover System, Corrective Action Management Unit Containment Cell

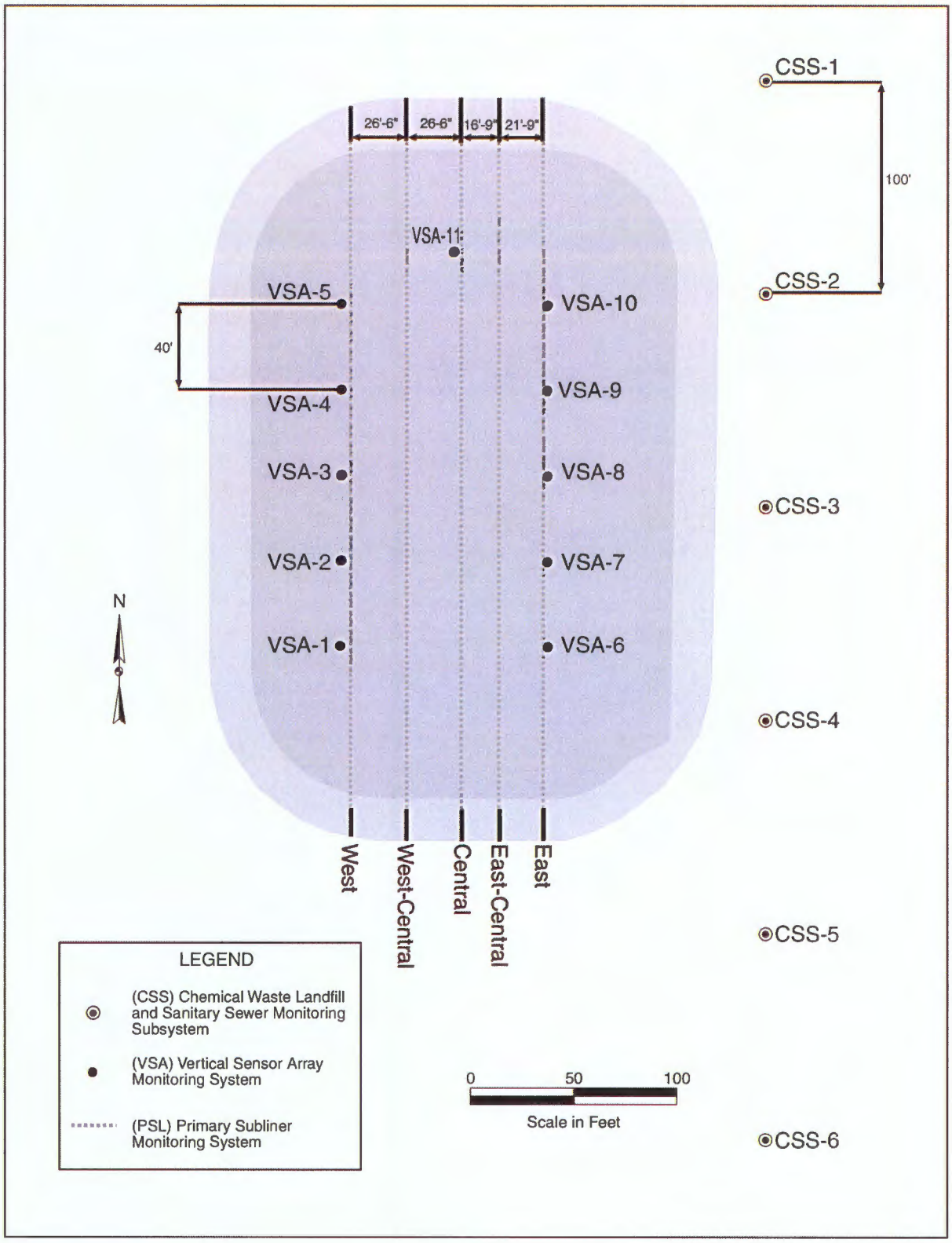


Figure 38

Plan View of Corrective Action Management Unit Containment Cell and Vadose Zone Monitoring System

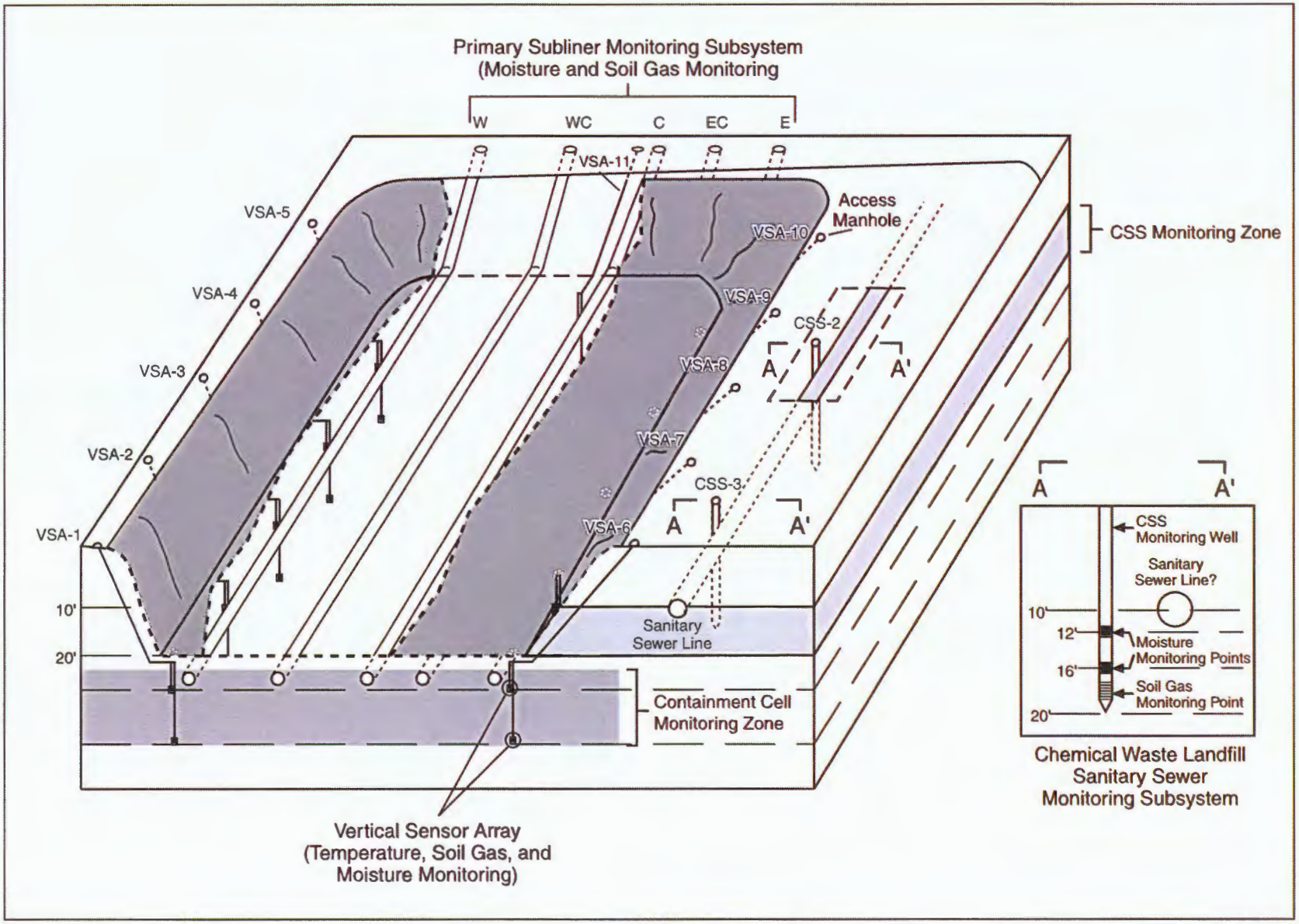


Figure 39

Block Diagram of Corrective Action Management Unit Containment Cell and Vadose Zone Monitoring System

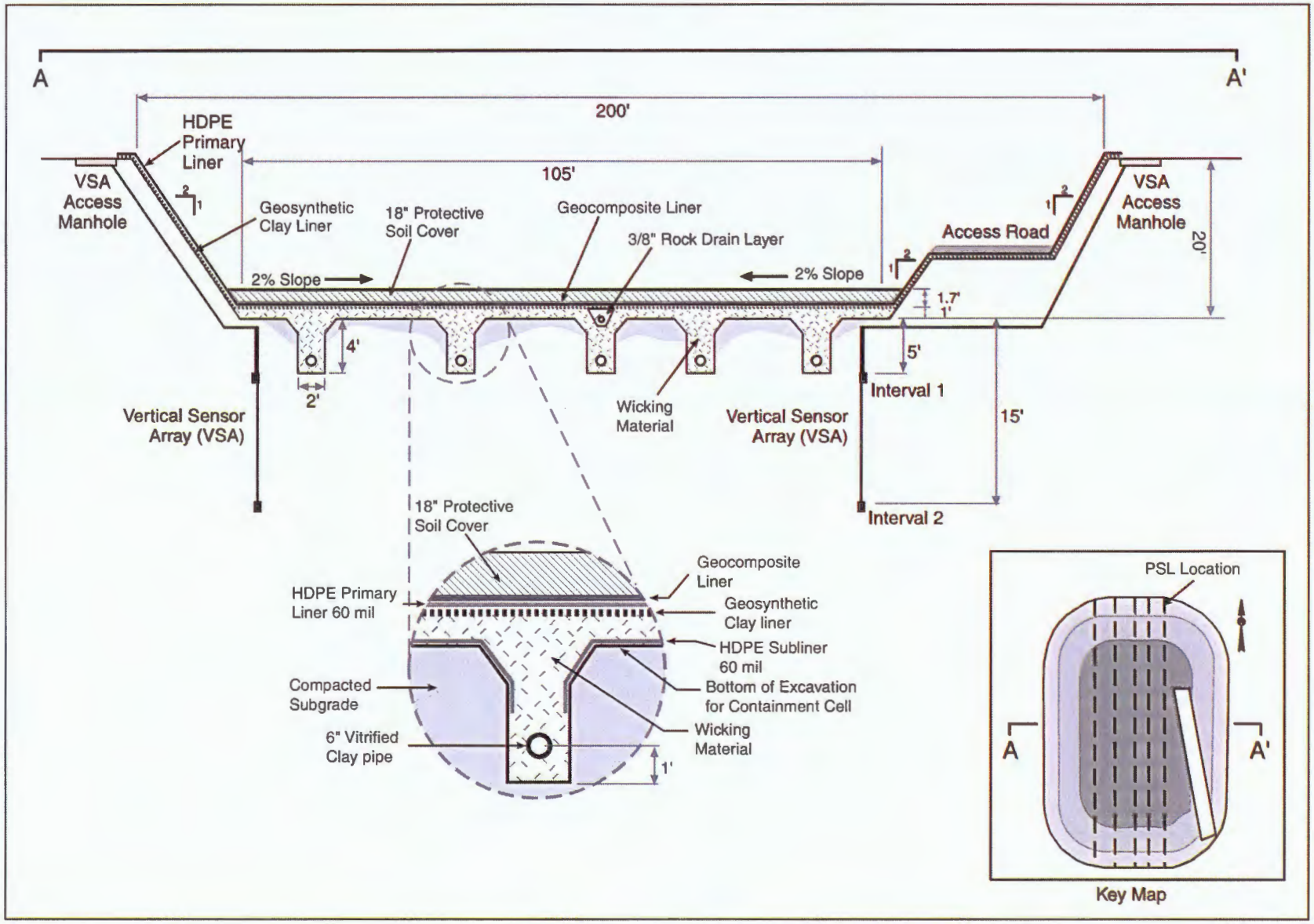


Figure 40

Cross-Section View of Corrective Action Management Unit Containment Cell and Primary Subliner Monitoring Subsystem

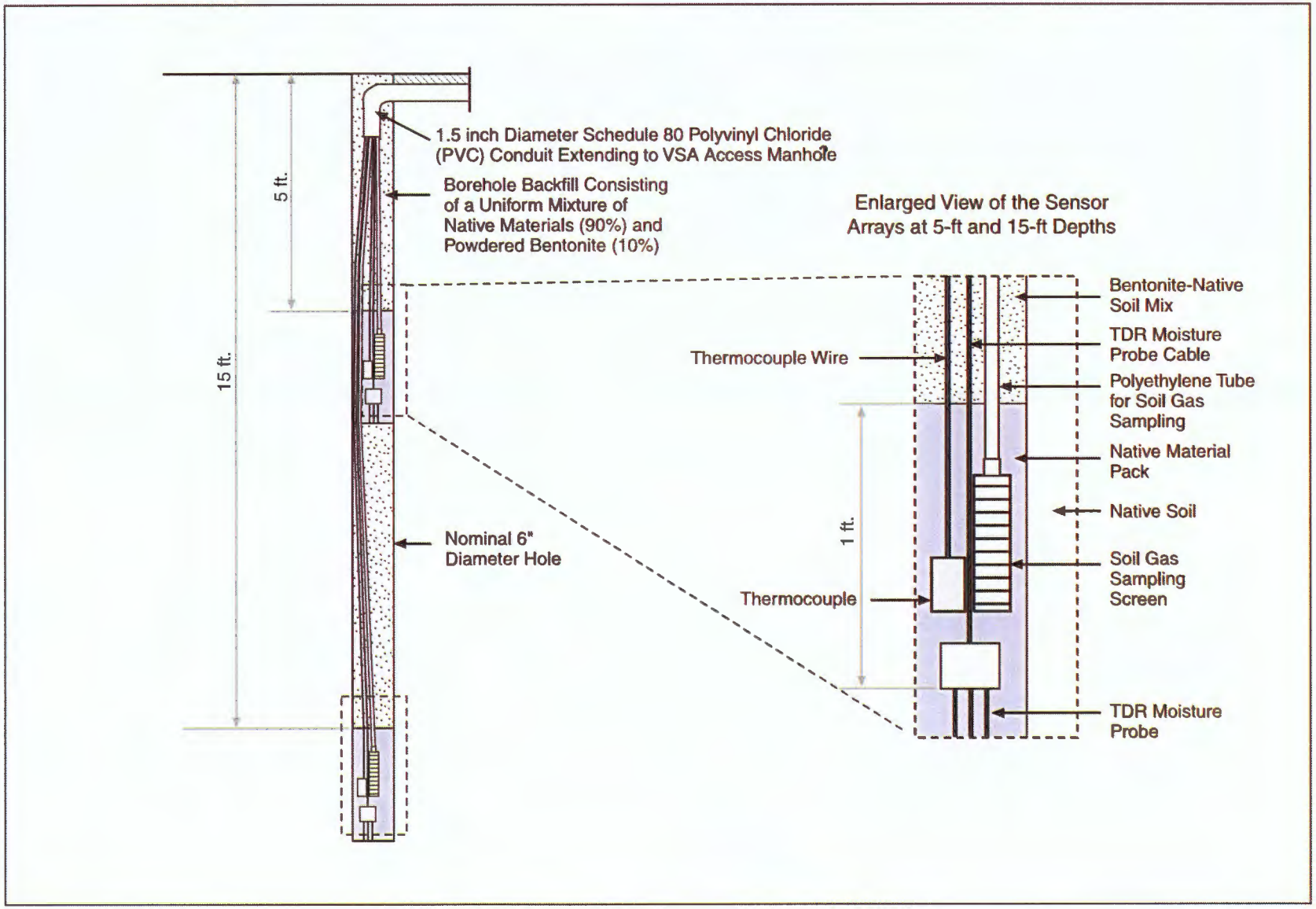


Figure 41

Configuration of Vertical Sensor Array Monitoring Subsystem

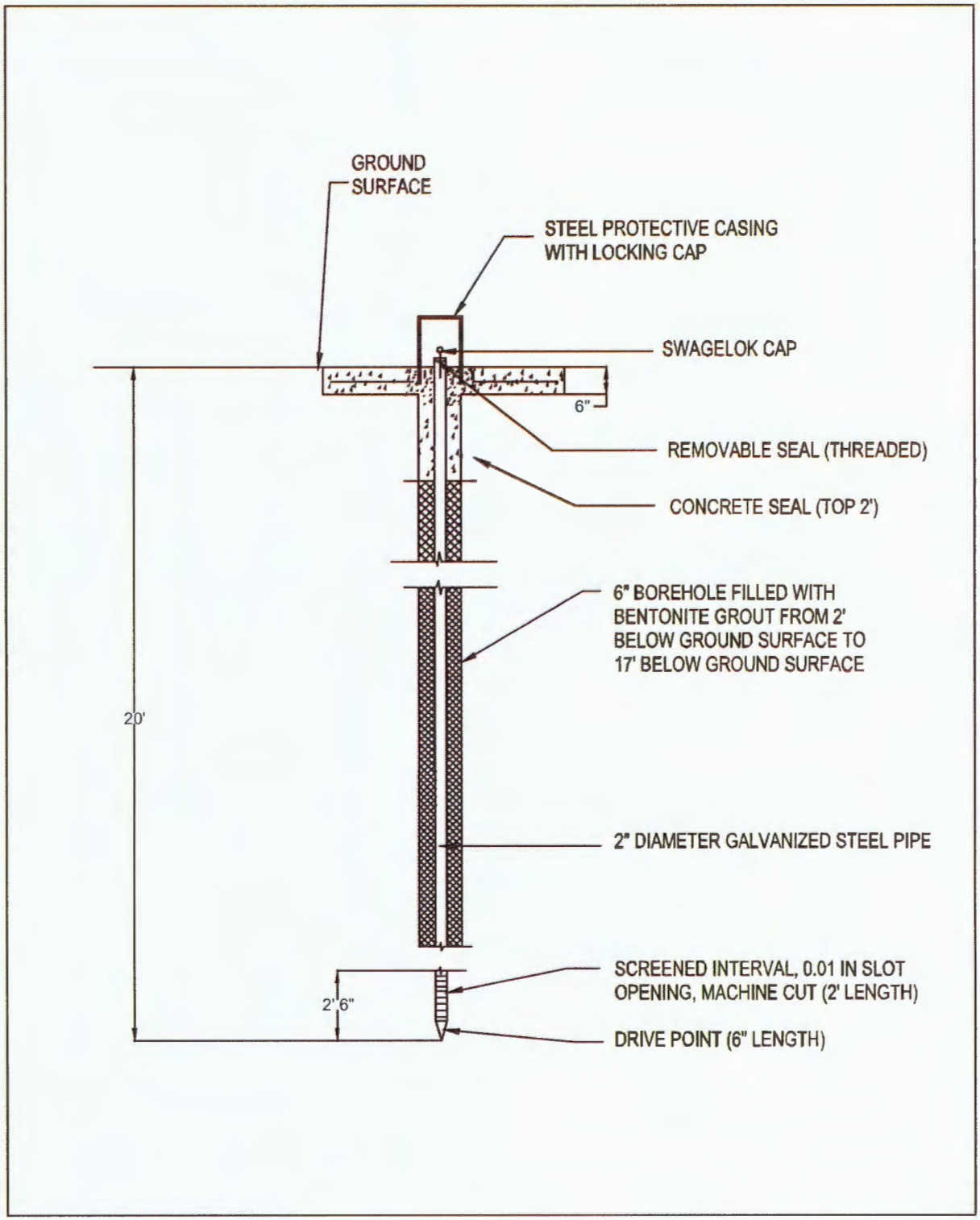


Figure 42

Cross-Section Configuration of Chemical Waste Landfill and Sanitary Sewer Monitoring Subsystem

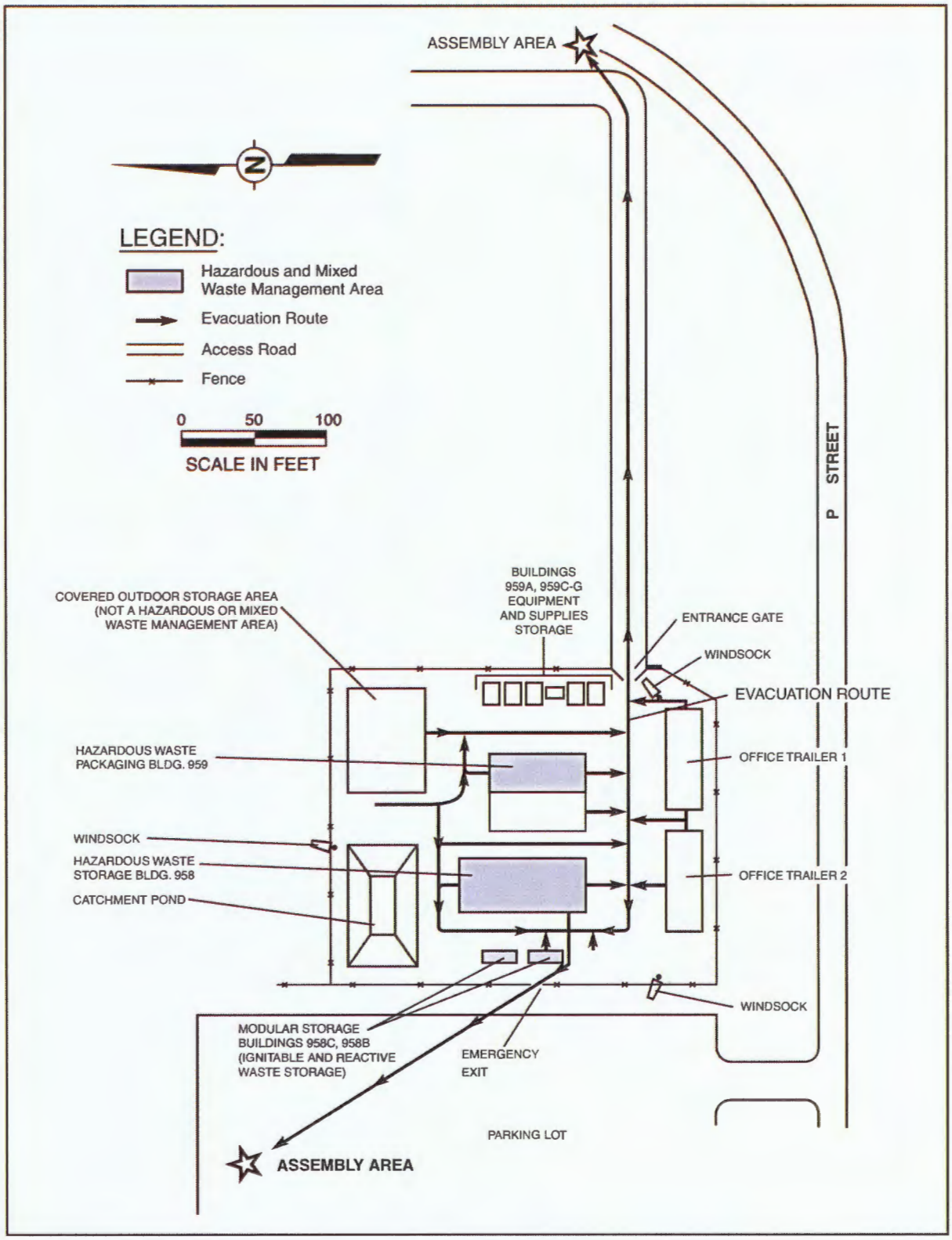


Figure 43

Hazardous Waste Handling Unit Evacuation Routes

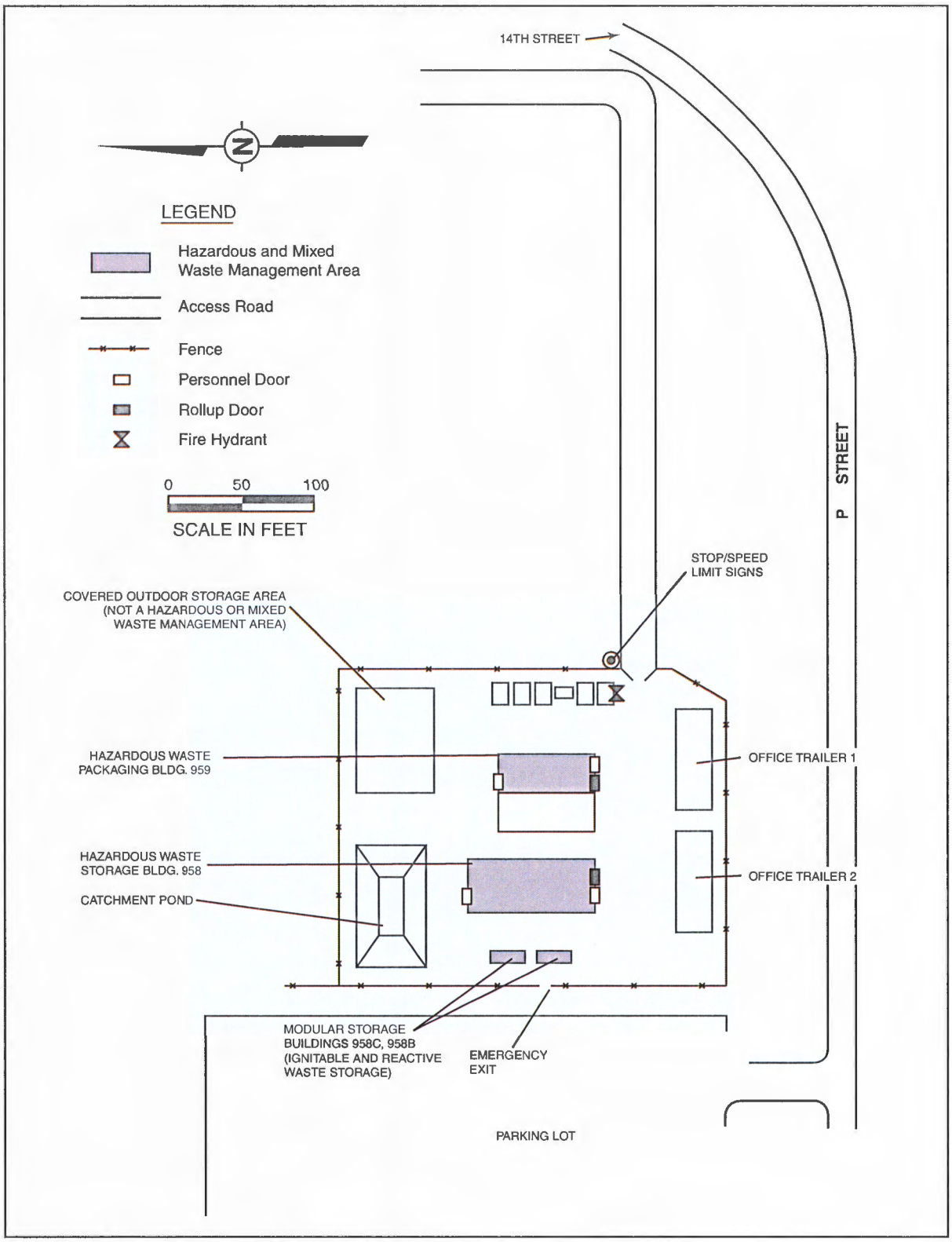


Figure 44

Hazardous Waste Handling Unit Emergency Response and Access Information

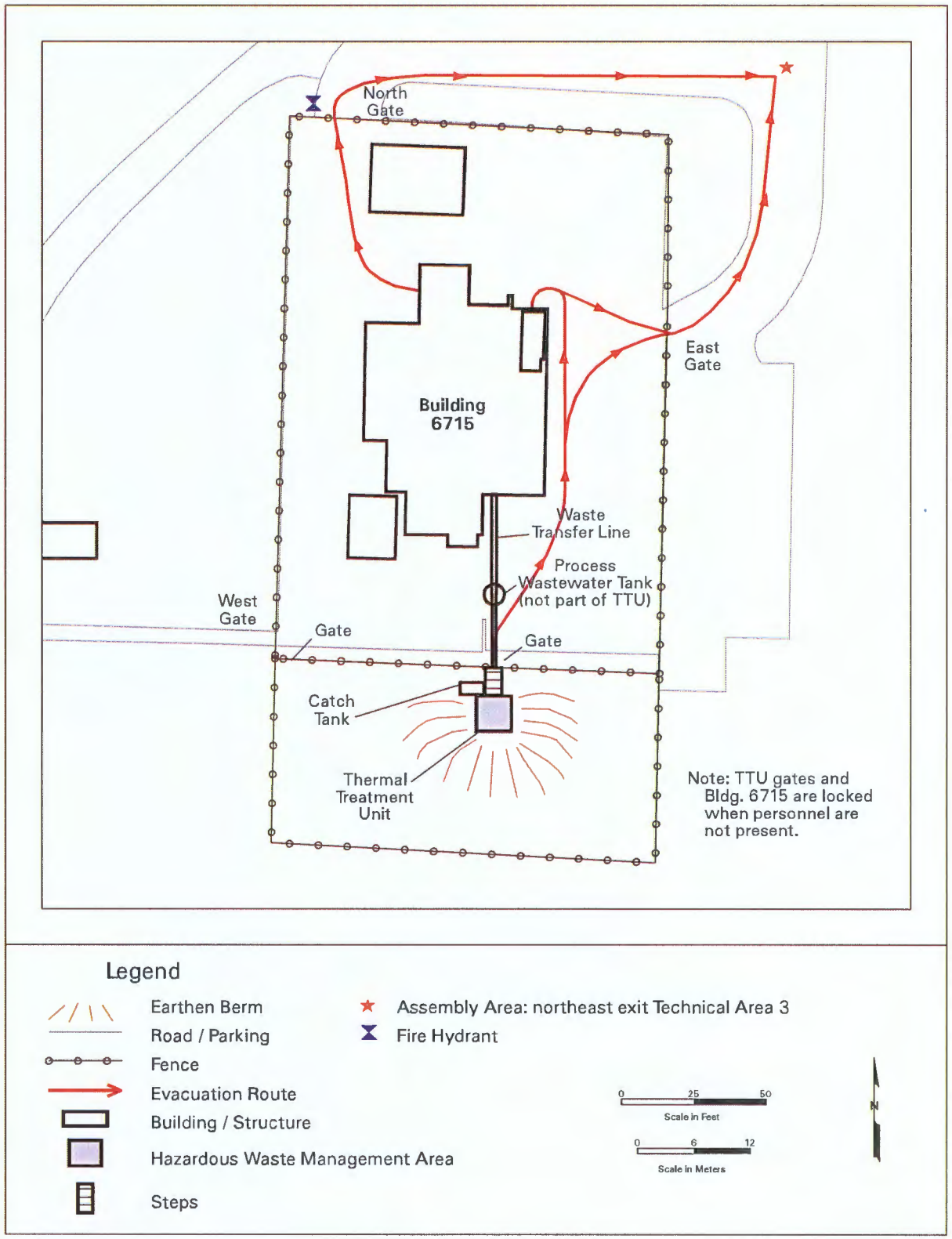


Figure 45
Thermal Treatment Unit (TTU)
Evacuation Route

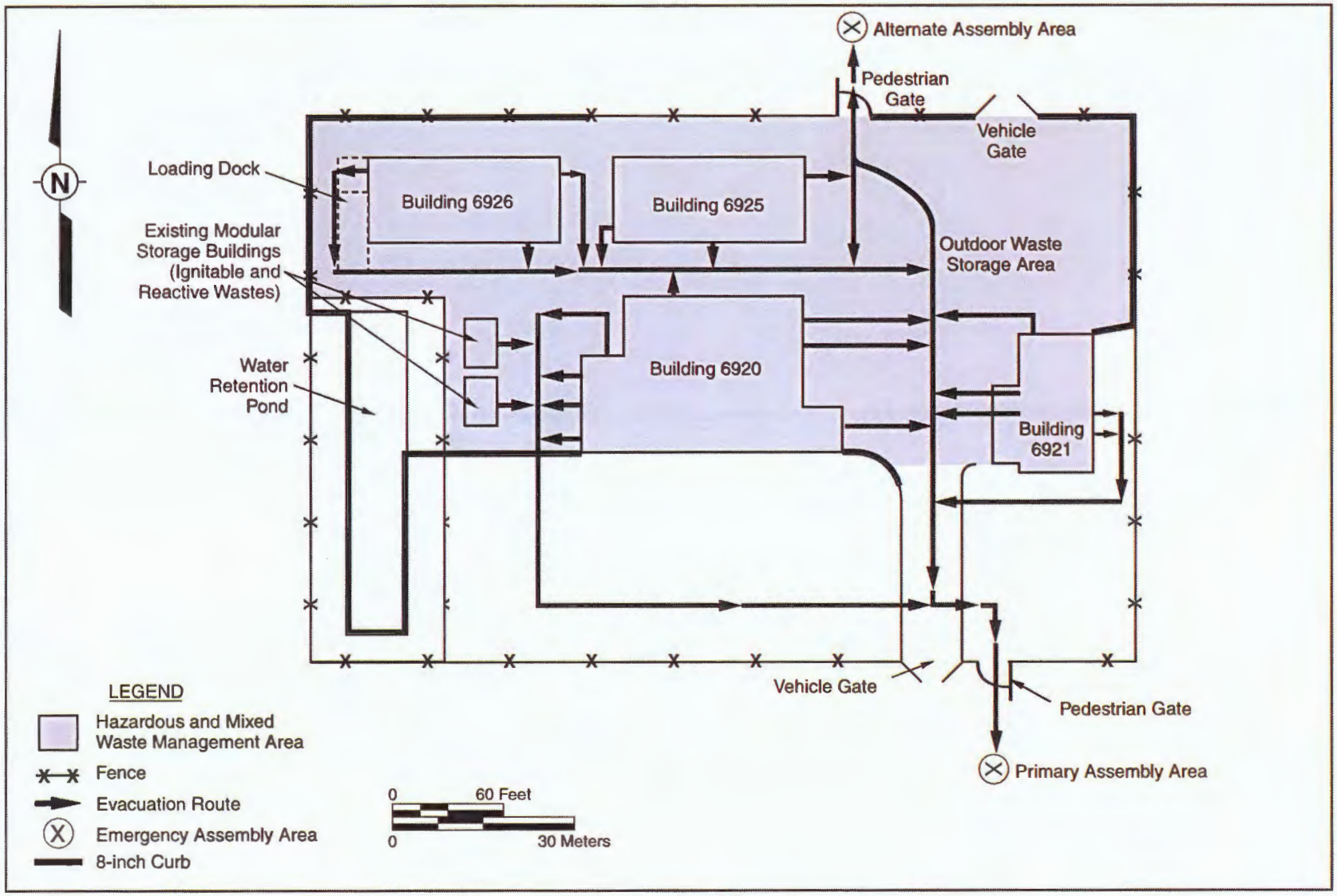


Figure 46

Radioactive and Mixed Waste Management Unit, Evacuation Routes

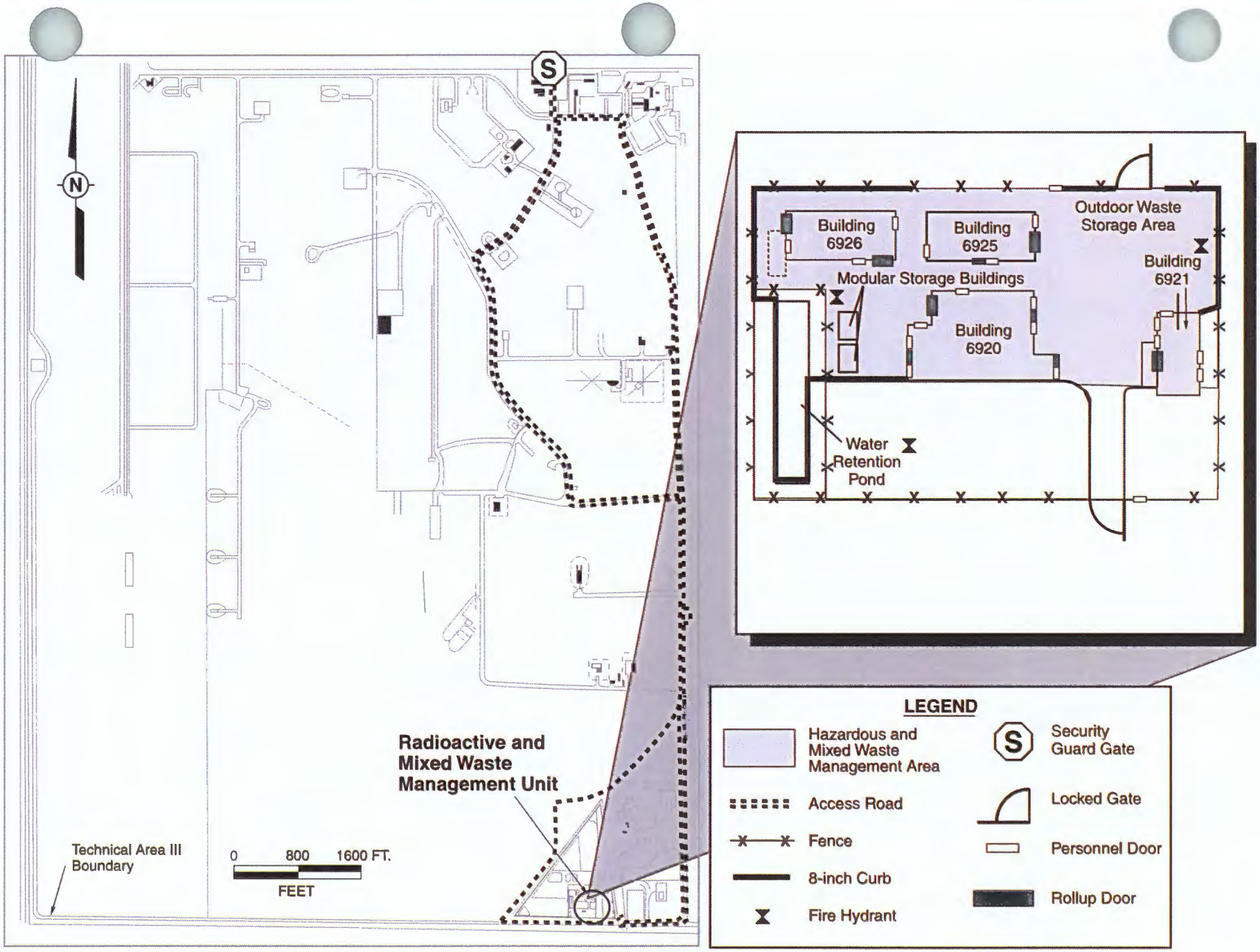


Figure 47

Radioactive and Mixed Waste Management Unit, Emergency Response and Access Information

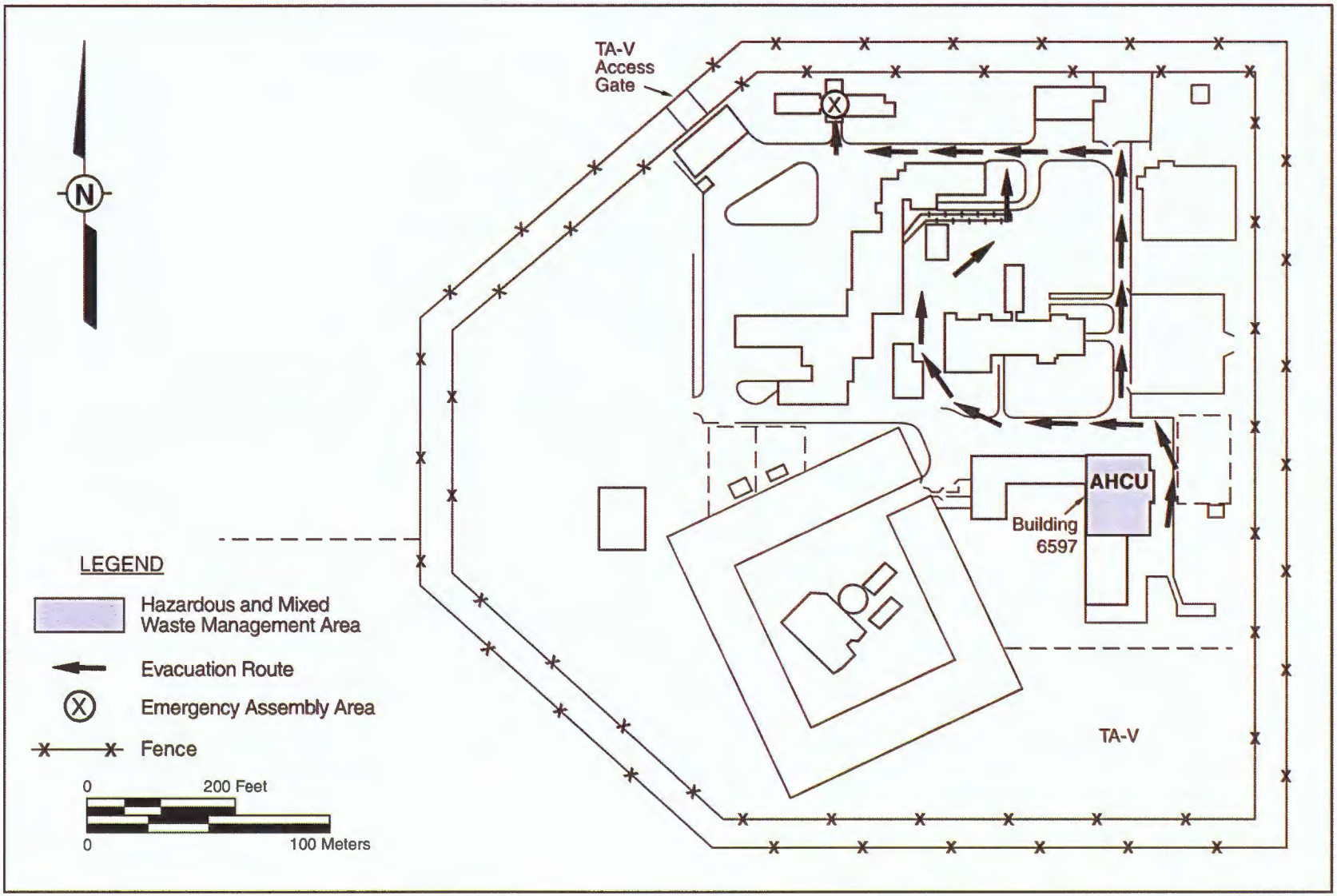


Figure 48
Auxiliary Hot Cell Unit (AHCU), Evacuation Routes

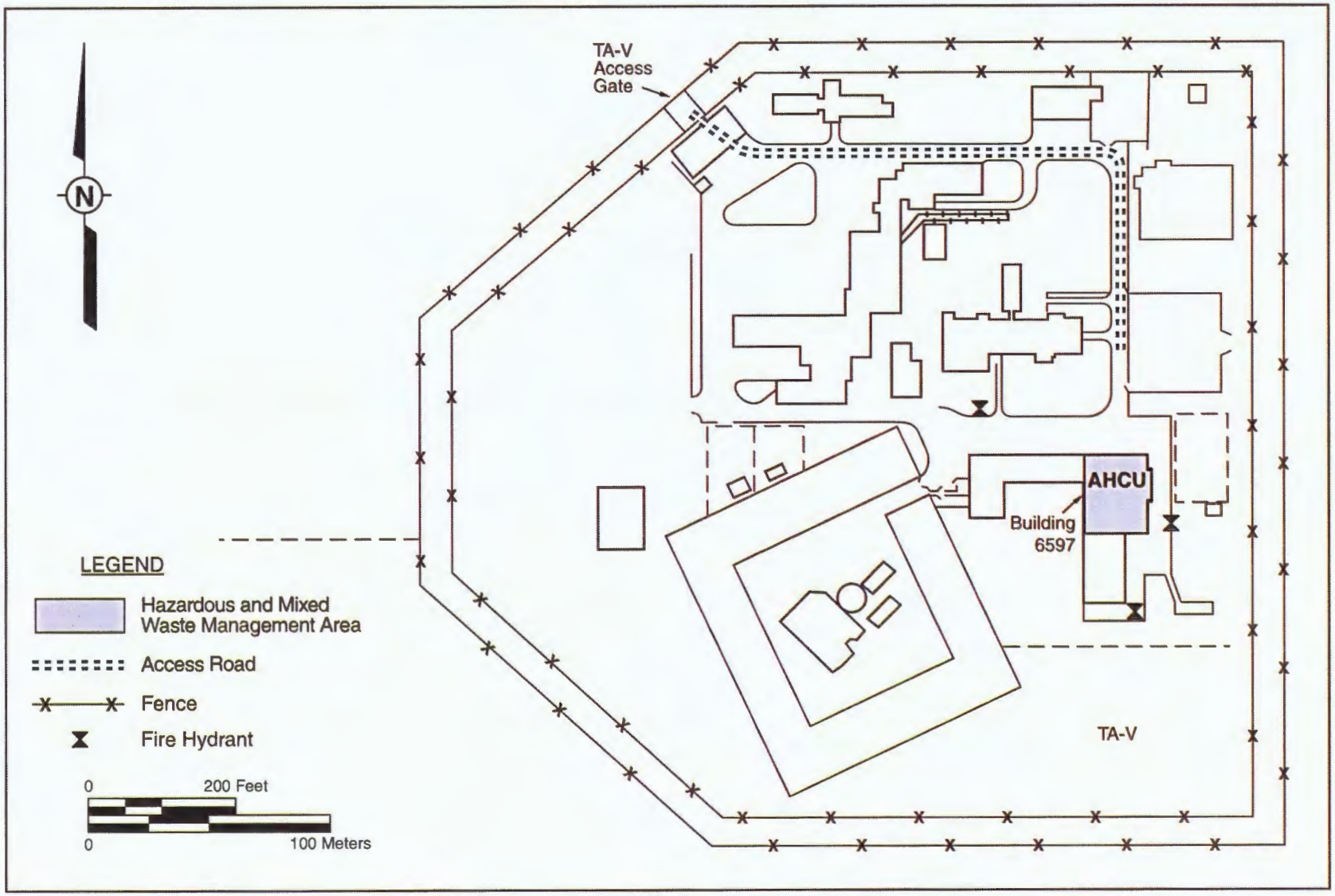


Figure 49

Auxiliary Hot Cell Unit (AHCU), Emergency Response and Access Information

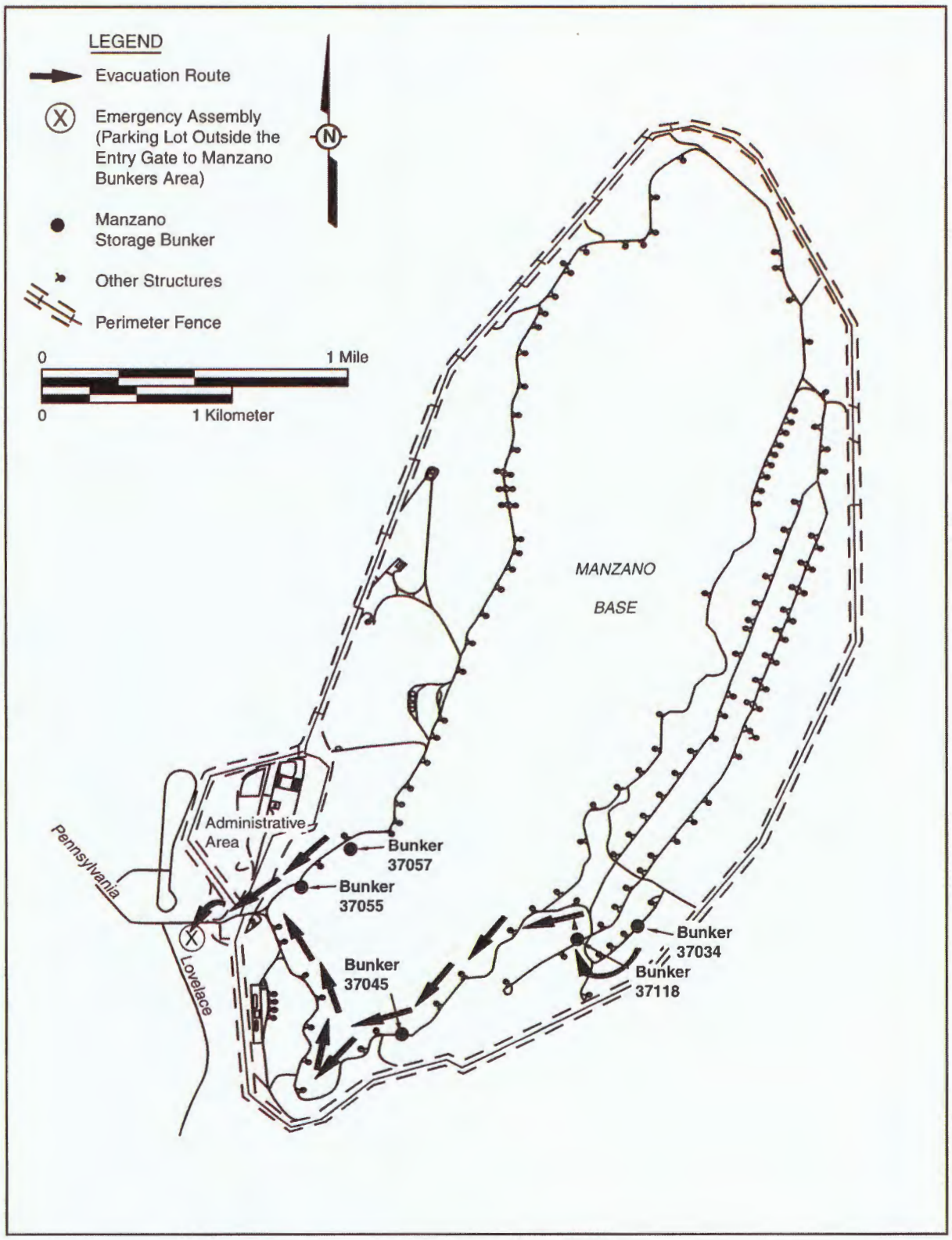


Figure 50
Manzano Storage Bunkers, Evacuation Routes

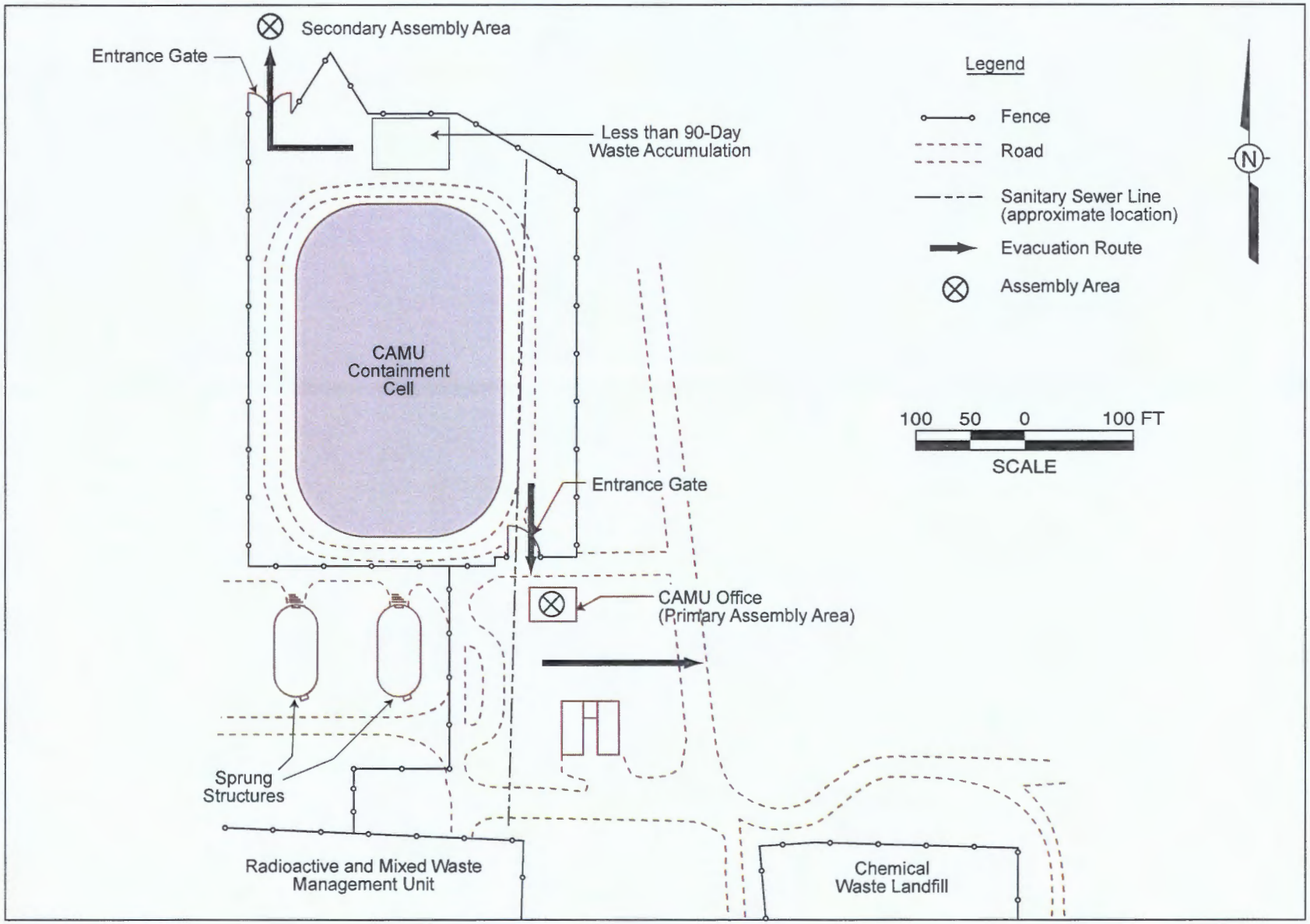


Figure 51

Local Area Map of Corrective Action Management Unit Containment Cell Evacuation Routes

APPENDIX A.1
PHOTOGRAPHS OF THE HAZARDOUS WASTE MANAGEMENT AREAS AT THE HAZARDOUS WASTE HANDLING UNIT

Hazardous Waste Handling Unit, Buildings 958 and 959
Photograph Taken on January 3, 2002
Process Code: S01

Building 958 is on the left, and Building 959 is on the right.

Hazardous Waste Handling Unit, Flammable Waste Storage Bay in Building 958
Photograph Taken on January 3, 2002
Process Code: S01

Hazardous Waste Handling Unit, Waste Storage Bays in Building 959
Photograph Taken on January 3, 2002
Process Code: S01

The drum at the far end of the building near the door contains absorbent for spill control. The bucket on the wall above it contains clean up materials.

Containers of hazardous and mixed wastes (solids and liquids) are segregated into the bays by compatibility and are stored on shelves over secondary containment in the bay

Hazardous Waste Handling Unit,
Modular Storage Buildings (958B and 958C)
Photograph Taken on January 3, 2002
Process Code: S01

APPENDIX A.2
PHOTOGRAPHS OF THE HAZARDOUS WASTE MANAGEMENT AREAS AT THE THERMAL TREATMENT UNIT

Thermal Treatment Unit
Viewed from Roof of Building 6715
Photograph Taken October 23, 2003
Process Code: X01

The sheet metal housing and propane lines for the propane burners are on the left side of the burn cage. The sheets of steel on the right side and the back of the burn cage are attached at the top and provide protection from wind during waste treatment.

The entire surface of the concrete foundation pad and the inside edge of the concrete pad curb are lined with steel. Runoff water is directed toward the right front corner of the pad, through a filter, and into a covered catchment tank that is visible at the lower right corner of the photograph.

The burn pan lid is in the lowered position. The burn cage is surrounded by an earthen berm. The gate in the fence surrounding the TTU is open.

Thermal Treatment Unit
Rear View of Burn Cage from Top of Earthen Berm
Photograph Taken on October 23, 2003
Process Code: X01

The door of the burn cage is open on the left (front) side of the cage. The sheet metal housing for the propane burners is visible on the far side of the burn cage.

Thermal Treatment Unit
Front View of Burn Pan (with Lid Down) Inside Burn Cage
Photograph Taken on October 23, 2003
Process Code: X01

The base of the burn pan sits on the steel beams that run across in the front and back of the burn cage. The pan is 6 inches deep. The lid is lowered and covers the pan. During operation, the lid is raised using the attached cable, and hazardous wastes are placed inside the burn pan or liquid wastes are pumped into the pan. The liquid waste feed system is located on the right side of the cage and is not visible in this photograph. It is temporarily out of service.

The burn cage door is open. The steel sheets on the outside of the burn cage provide protection from wind during treatment. The sheet metal housing for the propane burners is visible to the left of the burn cage.

APPENDIX A.3
PHOTOGRAPHS OF THE PHOTOGRAPHS OF THE HAZARDOUS WASTE MANAGEMENT AREAS AT THE RADIOACTIVE AND MIXED WASTE MANAGEMENT UNIT

Radioactive and Mixed Waste Management Unit, East Side of Building 6920
Photograph Taken on December 5, 2001
Process Codes: S01, T04

Radioactive and Mixed Waste Management Unit, West Side of Building 6920
Photograph Taken on December 5, 2001
Process Codes: S01, T04

Radioactive and Mixed Waste Management Unit, Building 6920, South Bay
Photograph Taken on December 20, 2001
Process Codes: S01, T04

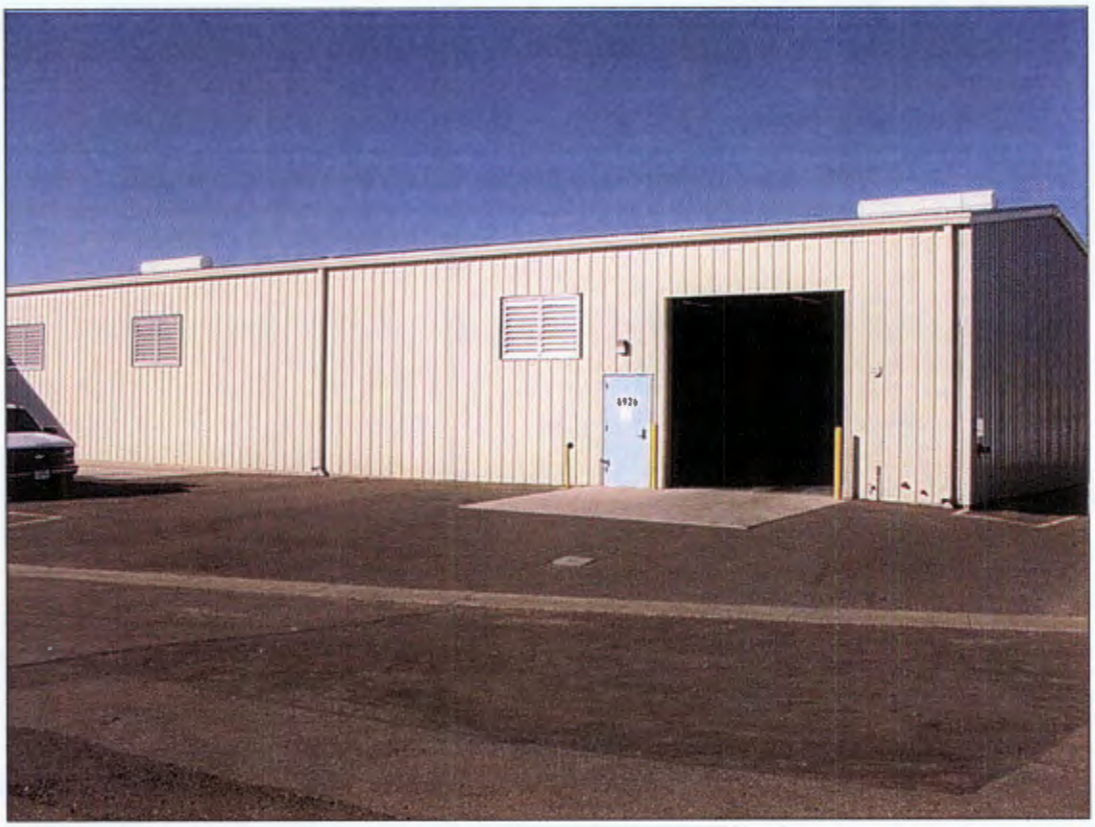
The south bay is used for storage of hazardous and mixed wastes in containers and for treatment. The doors to three of the four rooms in the south bay are visible at the left edge of the picture. Treatment operations typically occur in these rooms. The roll-up door at the far (east) end of the room leads to an additional storage/work area. A secondary containment sump is shown on the right in the photograph.

Radioactive and Mixed Waste Management Unit, Building 6921
Photograph Taken on December 5, 2001
Process Codes: S01, T04

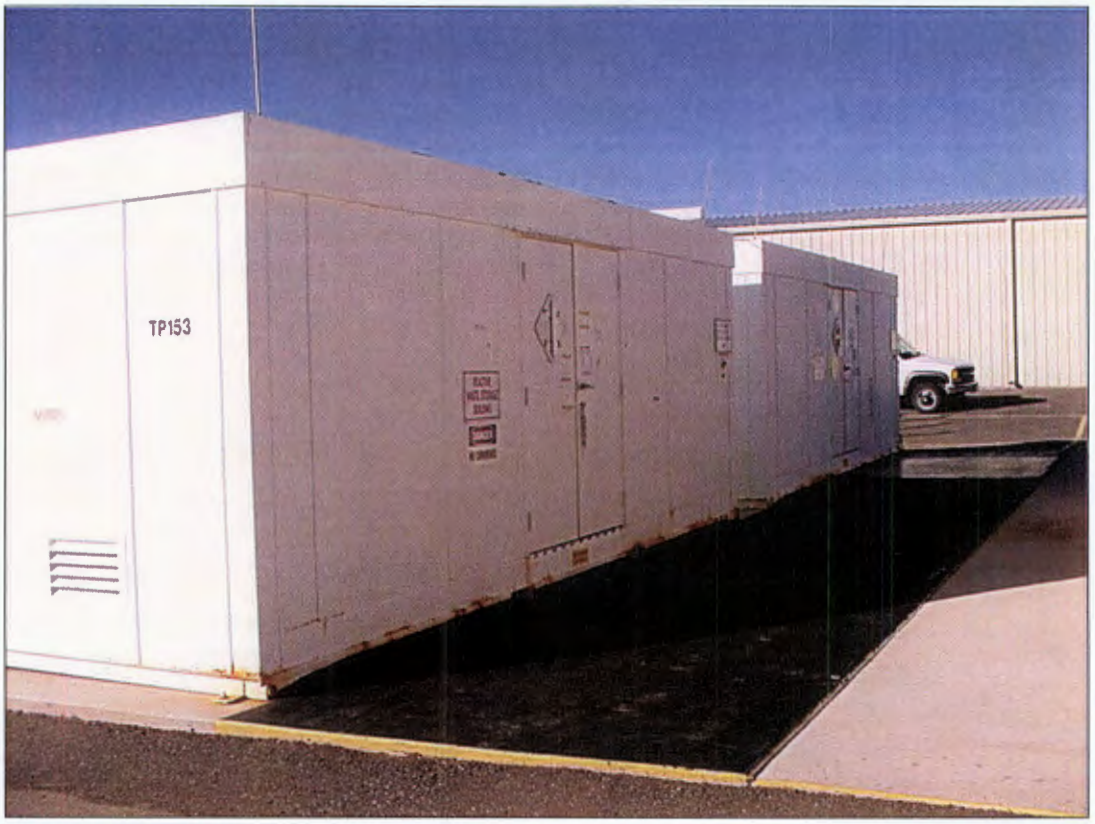
Radioactive and Mixed Waste Management Unit, Building 6925
Photograph Taken on December 5, 2001
Process Codes: S01, T04

Radioactive and Mixed Waste Management Unit, Building 6925, Interior
Photograph Taken on December 20, 2001
Process Codes: S01, T04

The drum in the front of the row on the right contains liquid mixed waste and is stored on a portable spill containment pallet.



Radioactive and Mixed Waste Management Unit, Building 6926
Photograph Taken on December 5, 2001
Process Codes: S01



Radioactive and Mixed Waste Management Unit, Modular Storage Buildings
Photograph Taken on December 5, 2001
Process Code: S01

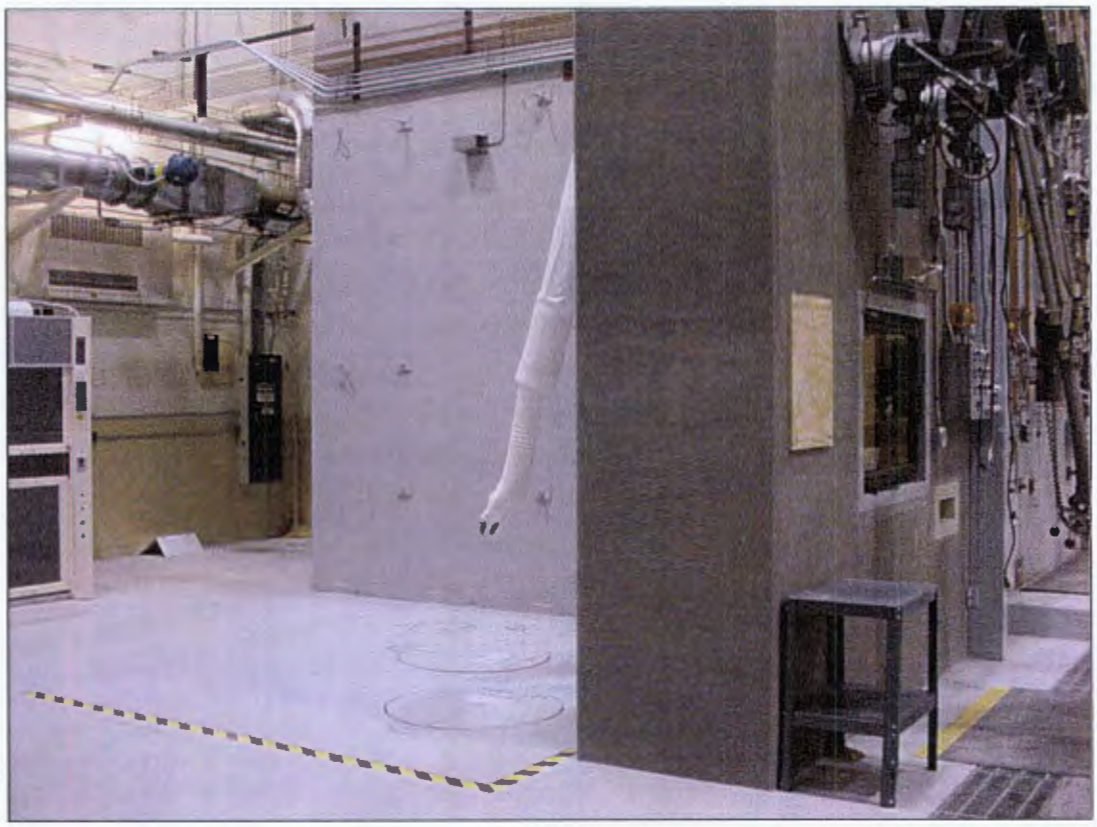
APPENDIX A.4
PHOTOGRAPHS OF THE PHOTOGRAPHS OF THE HAZARDOUS WASTE MANAGEMENT AREAS AT THE AUXILIARY HOT CELL UNIT

Auxiliary Hot Cell Unit, North Side of Building 6597
Photograph Taken on January 7, 2002
Process Codes: S01, T04

The work area and permanent shield wall are visible inside the building.

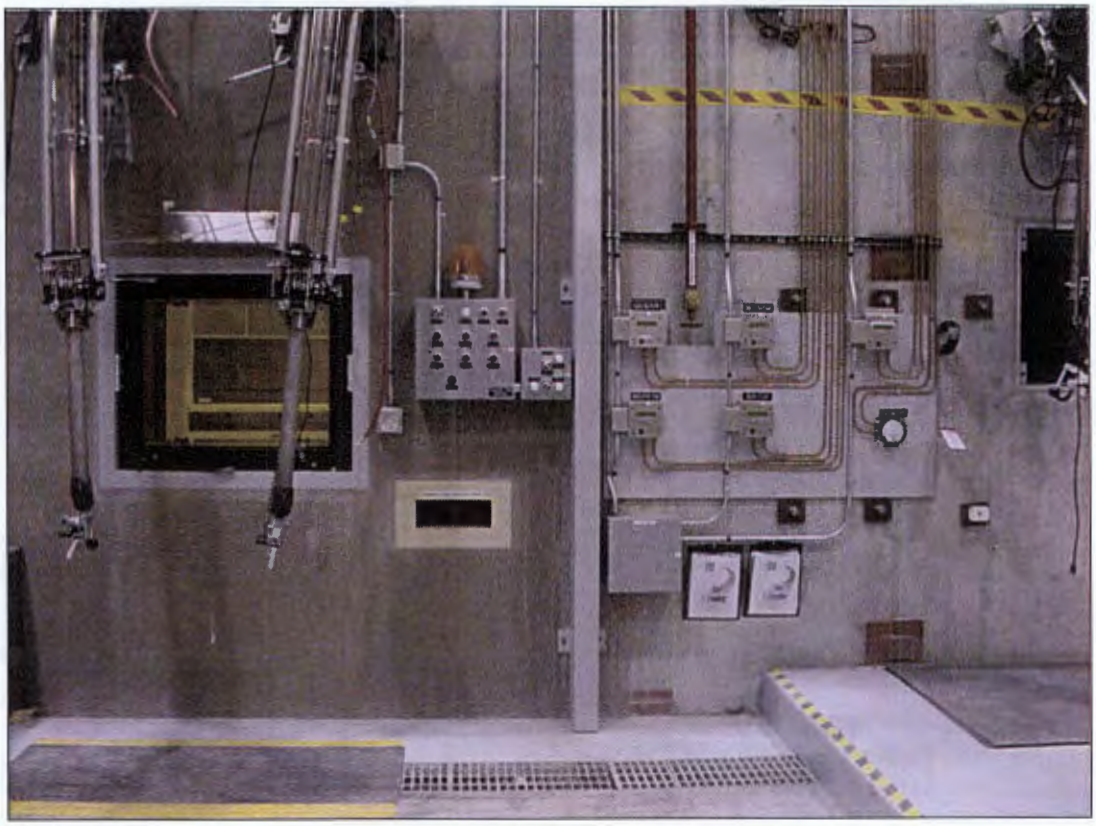
Auxiliary Hot Cell Unit, Work Area North of Auxiliary Hot Cell
Photograph Taken on January 7, 2002
Process Codes: S01, T04

The permanent shield wall is visible inside the building at the right edge of the opening. The manipulator arms extend from the permanent shield wall into the work area. The north wall of the hot cell is visible behind the manipulator arms at the center of the picture. The fume hood is visible at the left edge of the work area.



Auxiliary Hot Cell Unit, Fume Hood and Work Area North of Auxiliary Hot Cell
Photograph Taken on January 7, 2002
Process Codes: S01, T04

One of the manipulator arms is visible. It extends from the permanent shield wall into the work area. The operator controls for the manipulator arms are on the right side (outside) of the permanent shield wall at the right edge of the picture. The fume hood is visible at the left edge of the picture. Covers of two storage silos are visible on the floor of the work area under the manipulator arm.



Auxiliary Hot Cell Unit, Operator Controls for Work Area and Hot Cell
Photograph Taken on January 7, 2002
Process Codes: S01, T04

The permanent shield wall is on the left, and the hot cell is located on the right. The operator controls for the manipulator arms in the permanent shield wall are visible on the left. The fume hood at the back of the work area is visible through the shield wall window. Similar operator controls and a window are located on the hot cell wall to the right.

APPENDIX A.5
PHOTOGRAPHS OF THE PHOTOGRAPHS OF THE HAZARDOUS WASTE MANAGEMENT AREAS AT THE MANZANO STORAGE BUNKERS

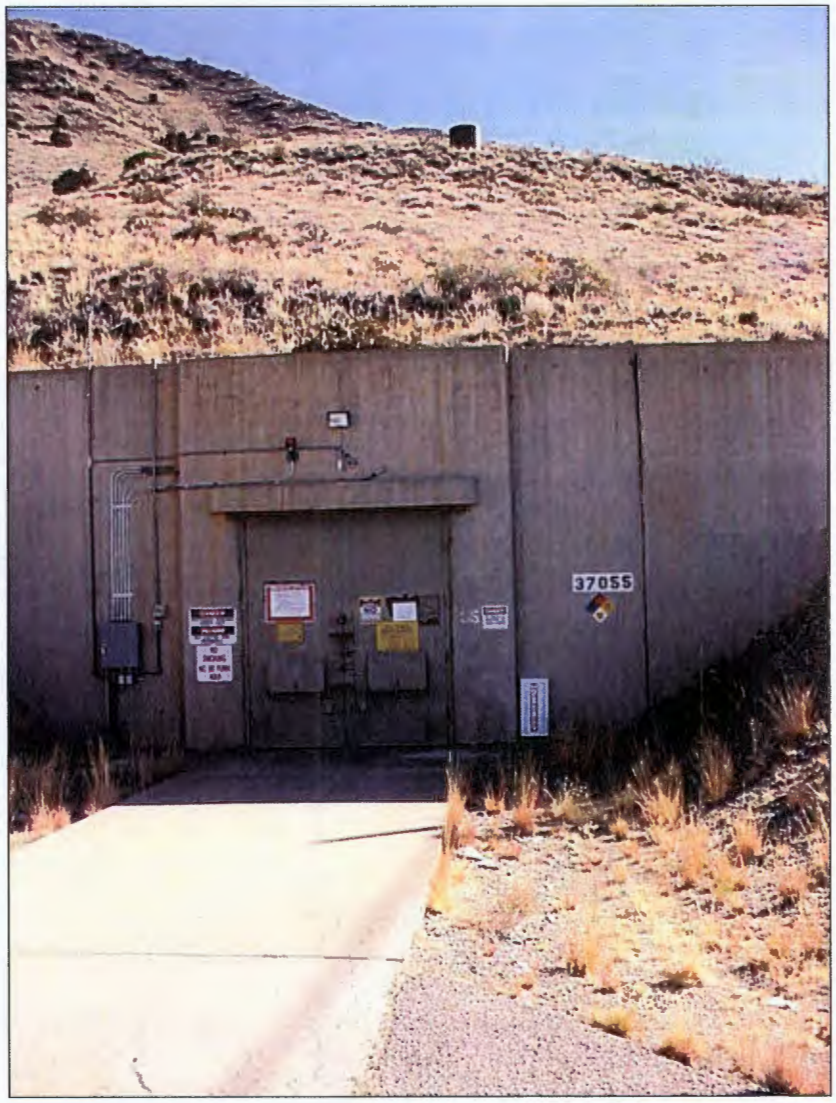
Manzano Storage Bunkers, Type B, Front View of Bunker 37034
Photograph Taken on December 13, 2001
Process Code: S01

The drain shown near the right edge of the picture serves a drain tile on the outside of the bunker, allowing drainage of water (from precipitation) that may accumulate in the soil behind the concrete wall.

The large orange sign indicates that explosive (D003) waste is currently stored in this bunker. A fire extinguisher is located in the white box below and to the left of the orange sign.

The concrete pad in front of the bunker doors is level or slopes slightly away from the bunker, preventing surface water runon into the bunker.

Manzano Storage Bunkers, Type D, Front View of Bunker 37045
Photograph Taken on December 13, 2001
Process Code: S01



Manzano Storage Bunkers, Type D, Front View of Bunker 37055
Photograph Taken on December 5, 2001
Process Code: S01

Manzano Storage Bunkers, Type D, Front View of Bunker 37057
Photograph Taken on December 5, 2001
Process Code: S01

Manzano Storage Bunkers, Type C, Front View of Bunker 37118
Photograph Taken on December 13, 2001
Process Code: S01

APPENDIX A.6
PHOTOGRAPHS OF THE PHOTOGRAPHS OF THE HAZARDOUS WASTE MANAGEMENT AREAS AT THE CORRECTIVE ACTION MANAGEMENT UNIT

Corrective Action Management Unit
South End and Southeast Corner of Containment Cell
Photograph Taken on February 21, 2007
Process Code: S99

The containment cell is comprised of the following elements (from the top down):

- Multi-component engineered cover system.
- Treated waste.
- Leachate collection and removal system.
- Multi-component engineered liner system on sidewalls and bottom of cell.
- Vadose zone monitoring system.

The vadose zone monitoring system is designed to provide information on containment cell performance and early detection of leaks. It is comprised of three subsystems:

- Primary subliner monitoring system for leak detection – five horizontal clay pipes that run the length (north-south) of the containment cell under the bottom liner. The pipes are equipped with access tubes at either end for a probe to monitor moisture; the southern access tubes for four of the five pipes are visible in the photograph.

- Chemical Waste Landfill and sanitary sewer line monitoring subsystem - 6 vertical boreholes near the sewer line east of the containment cell. The boreholes allow access for monitoring equipment and collecting samples to detect leaks from the sewer line or migration of constituents from the former landfill; the top of one of the boreholes is visible at the right edge of the picture. The yellow posts on either side of the borehole provide protection from vehicles.

- Vertical sensor array subystem - 11 monitoring locations below the containment cell. These locations house monitoring equipment and allow access for collecting samples. They are not visible in this photograph.

Corrective Action Management Unit
East Side of Containment Cell
Photograph Taken on February 21, 2007
Process Code: S99

The top of one of the boreholes in the Chemical Waste Landfill and sanitary sewer line monitoring subsystem is visible at the left side of the picture.

Tops of three access points in the vertical sensor array subsystem (small grey boxes on grey posts) are visible along the edge of the containment cell. The boxes house cables and tubing connected to the monitoring and sampling equipment located under the containment cell.

Corrective Action Management Unit
North End and Northeast Corner of Containment Cell
Photograph Taken on February 21, 2007
Process Code: S99

The top of one of the boreholes in the Chemical Waste Landfill and sanitary sewer line monitoring subsystem is visible in the foreground beyond the CAMU perimeter fence.

The northern access tubes for four of the five pipes in the primary subliner leak detection subsystem are visible at the right edge of the photograph.

The larger tube extending from the north end of the cap (with a support brace, visible at the right side of the photograph) is the access point for the leachate collection and removal system. The tube is connected to the leachate collection sump at the bottom of the containment cell, and allows access for a portable pump to remove leachate. The pump is stored in a container near the base of the support brace when not in use.

The tops of two utility poles are visible beyond the top of the containment cell (above the signs in the left side of the photograph.

Corrective Action Management Unit
Containment Cell and Leachate Management
Photograph Taken on February 21, 2007
Process Code: S99

The leachate accumulation area is shown in the foreground. Leachate is pumped from the collection sump at the bottom of the containment cell using a portable pump. The access tube for the collection system is visible in the north end of the cell (near the center of the photograph). The container used for storage of the pump is immediately to the right of the access tube; sunlight is reflected off the container lid.

The blue containers of leachate are stored on a (yellow) portable spill containment pallet. Other wastes are stored in the white containers on a second pallet. Pallets are stored upside down when not in use to prevent rainwater accumulation.

The portable metal building at the right houses electrical equipment and is used for storage of spill cleanup supplies and safety-related items.

The tops of several utility poles are visible beyond the top of the containment cell.

PERMIT ATTACHMENT M LONG-TERM MONITORING AND MAINTENANCE PLAN FOR SOLID WASTE MANAGEMENT UNITS AND AREAS OF CONCERN GRANTED CORRECTIVE ACTION COMPLETE WITH CONTROLS

M.1 INTRODUCTION

This Long Term Monitoring and Maintenance Plan (LTMMP) addresses measures that the Permittees shall perform to provide protection of human health and the environment from constituents of concern present at various Solid Waste Management Units (SWMUs) and Areas of Concern (AOCs) at Sandia National Laboratories/New Mexico (SNL/NM). These SWMUs/AOCs are listed in Permit Attachment K, Table K-3, *Solid Waste Management Units, Areas of Concern, and Hazardous Waste Management Units for Which Corrective Action is Complete with Controls,* and Table 1 of this Permit Attachment.

The SWMUs/AOCs subject to this LTMMP are located within the fenced boundaries of Kirtland Air Force Base (KAFB).

Measures under this LTMMP include surveillance of site conditions and maintenance of institutional controls. The controls are consistent with the risks presented by the site conditions and constituents of concern at each SWMU/AOC. The controls are implemented in an integrated and layered approach to enhance their effectiveness and reliability, and to provide continued protection in the event that one or more controls become temporarily impaired. Administrative and physical controls at the SWMUs/AOCs subject to this LTMMP include:

- Information management,
- Restrictions on future use,
- Awareness,
- Limited access restrictions as described in this LTMMP, and
- Physical features at some SWMUs/AOCs.

Maintenance of control measures, including routine surveillance, is conducted as necessary to prevent deterioration or failure of controls.

The administrative and physical controls are described in Section 2. The scope and frequency of surveillance and maintenance measures are described in Section 3, and periodic reports of SWMU/AOC status are summarized in Section 4 of this LTMMP. Information about the individual SWMUs/AOCs, controls, and maintenance measures is summarized in Table 1. Except for SWMUs 96 and 187, the SWMU/AOC locations are shown in Figures 1 through 7 of this Permit Attachment. The locations of SWMUs 96 and 187 could not be shown on Figures 1-7 due to their large spatial distribution. Instead, the locations for SWMUs 96 and 187 may be found on maps contained in the Investigation Report for each of these SWMUs.

M.2 INSTITUTIONAL CONTROLS

M.2.1 Administrative Controls

The following information about each SWMU/AOC listed in Table M-1 is maintained at SNL/NM: the SWMU/AOC location, characteristics, constituents of concern, corrective action, current conditions, and restrictions on future use.

The SWMUs/AOCs listed in Table M-1 are not approved for residential land use. Plans for future activities by the Permittees within one-half mile of each SWMU/AOC shall be evaluated to identify aspects that are not consistent with land use requirements for that SWMU/AOC.

M.2.2 Physical Controls

Physical controls that shall be implemented for each SWMU/AOC are listed in Table 1. Each of the SWMUs/AOCs listed in Table M-1 is located within the fenced boundaries of KAFB. Public access to KAFB is restricted. Additional physical controls at these SWMUs/AOCs consist of one or more of the following:

- Land use restrictions (primarily industrial),
- Warning and information signs posted at each SWMU/AOC where feasible,
- Fences that restrict access to some or all of each SWMU/AOC, and
- Physical features such as subsurface location (e.g., sewer lines).

Where signs are posted at the SWMUs/AOCs, the signs shall include the following information:

- SWMU/AOC number;
- Site-specific instructions; and
- Contact information for further direction.

The specific controls and maintenance measures for each SWMU/AOC are listed in Table M-1.

Table M-1
Summary of Institutional Controls for Solid Waste Management Units and Areas of Concern Requiring Controls

SWMU/ AOC Number	Site Name	Site Data	Land Use	Signs and Postings	SWMU/AOC Inspections	Additional Information	Figure
OU 1295 Septic Tanks and Drainfields							
137	Bldg. 6540/6542 Septic System (TA-III)	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one each at selected corners of the SWMU	Annual		3
140	Bldg. 9965 Septic System and Drywell (Thunder Range)	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one each at selected corners of the SWMU	Annual		5
OU 1302 TA-I							
96	Storm System Drain	Maintained and tracked	Industrial	Not feasible	None	SWMU consists of underground storm drains throughout TA-I. No signs, postings, or inspections are feasible due to SWMU features.	Not shown
98	Building 863 (TCA, Photochemical Releases: Silver Catch Boxes)	Maintained and tracked	Industrial	Not feasible	Annual	SWMU consists of subsurface area located under a building. No signs, postings, or inspections are feasible due to SWMU features.	1
187	Septic Tank Piping for POTW	Maintained and tracked	Industrial	Not feasible	None	SWMU consists of underground sewer lines throughout TA-I. No signs, postings, or inspections are feasible due to SWMU features.	Not shown
190	Steam Plant Tank Farm	Maintained and tracked	Industrial[a]	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		1
226	Old Acid Waste Line	Maintained and tracked	Industrial	Not feasible	None	SWMU consists of underground drain line throughout TA-I, II, and IV. No signs, postings, or inspections are feasible due to SWMU features.	1 and 2

Table M-1
Summary of Institutional Controls for Solid Waste Management Units and Areas of Concern Requiring Controls

SWMU/ AOC Number	Site Name	Site Data	Land Use	Signs and Postings	SWMU/AOC Inspections	Additional Information	Figure
OU 1303 TA-II							
1	Radioactive Waste Landfill	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one each in selected corners of the SWMU	Annual		2
2	Classified Waste Landfill (TA-II)	Maintained and tracked	Industrial	5 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		2
3	Chemical Disposal Pit	Maintained and tracked	Industrial	Included with SWMU 1	Annual	Located adjacent to SWMU 1.	2
135	Building 906 Drain System	Maintained and tracked	Industrial	1 sign	Annual		2
OU 1306 TA III and V							
105	Mercury Spill (Bldg. 6536)	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		3
196	Bldg. 6597 Cistern (TA-V)	Maintained and tracked	Industrial	1 sign in the middle of the SWMU	Annual		3
OU 1307 Liquid Waste Disposal System							
4	LWDS Surface Impoundments	Maintained and tracked	Industrial	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		3

Table M-1
Summary of Institutional Controls for Solid Waste Management Units and Areas of Concern Requiring Controls

SWMU/ AOC Number	Site Name	Site Data	Land Use	Signs and Postings	SWMU/AOC Inspections	Additional Information	Figure
OU 1309 Tijeras Arroyo							
45	Liquid Discharge (Behind TA-IV)	Maintained and tracked	Industrial	5 signs on SWMU perimeter, one in approximately each corner of the SWMU outside of the TA-IV fence	Annual	Western half of the SWMU is located within the TA-IV fenced boundary	2
46	Old Acid Waste Line Outfall	Maintained and tracked	Industrial	4 signs along the TA-IV fence line and 7 signs posted along the south and west perimeter of the SWMU	Annual		2
229	Storm Drain System Outfall (for TA-II)	Maintained and tracked	Industrial	1 sign at the top of the outfall	Annual		2
OU 1332 Foothills Test Area							
87	Building 9990 Firing Site	Maintained and tracked	Industrial[a]	4 signs, one at the access road and three on the perimeter of the SWMU	Annual		6
OU 1335 Southwest Test Area							
91	Lead Firing Site (Thunder Range)	Maintained and tracked	Industrial[a]	4 signs on SWMU perimeter, one in the approximate middle of each side of the SWMU	Annual		4
Miscellaneous Sites							
1029	Building 6584 North Septic System (TA-III)	Maintained and tracked	Industrial	3 signs on SWMU perimeter	Annual		3

Table M-1
Summary of Institutional Controls for Solid Waste Management Units and Areas of Concern Requiring Controls

SWMU/ AOC Number	Site Name	Site Data	Land Use	Signs and Postings	SWMU/AOC Inspections	Additional Information	Figure
1081	Building 6650 Septic System (TA-III)	Maintained and tracked	Industrial	3 signs on SWMU perimeter	Annual		3
1090	Bldg. 6721 Septic System (TA-III)	Maintained and tracked	Industrial	1 sign, approximately in the middle of the SWMU	Annual		3

[a] The Permittees have separate documentation with KAFB to maintain institutional controls at this location, however, this documentation does not prohibit KAFB uses of the land.

M.3 MAINTENANCE OF INSTITUTIONAL CONTROLS

M.3.1 Maintenance of Administrative Controls

Records and information for each SWMU/AOC listed in Table M-1 are maintained in written or electronic form at SNL. The records are kept current and are updated when new information becomes available or is generated. The records include the following:

- Site location and characteristics;
- Site history and corrective action;
- Land use permits or agreements with KAFB;
- Documentation of current site conditions, including information from annual inspections;
- Type of controls
- Maintenance records
- Planning information, including restrictions on future activities at the site; and
- Copies of reports previously submitted to the Department.

M.3.2 Maintenance of Physical Controls

The Permittees shall periodically inspect and maintain the physical controls at the SWMUs/AOCs. Documented annual inspections include reviews of the following, as applicable:

- Condition of the site;
- Evidence of erosion, seepage, or subsidence;
- Evidence of newly-occurring or newly-visible contamination;
- Condition and location of signs;
- Evidence of activities that are not consistent with restrictions in place; and
- Evidence of residential activities adjacent to the given SWMU/AOC that would necessitate additional awareness measures and access restrictions for the site.

Inspection results are evaluated for necessary maintenance, including repair, replacement, or installation. Maintenance will occur on the following schedule (Table M-2) unless weather or other site-specific conditions require a delay.

Table M-2 Maintenance Schedule	
Maintenance Issue	**Response Schedule**
Erosion, seepage, or subsidence	Evaluate severity and if necessary develop mitigation plan within 120 days Complete in a timely manner
Newly-occurring or newly-discovered contamination	See Permit Part 8
Signs	Begin to address within 30 days Complete in a timely manner
Activities that are inconsistent with site restrictions	Begin to address within 30 days Complete in a timely manner
Awareness measures to address new residential activities adjacent to SWMU/AOC locations	Develop measures within 30 days Implement measures in a timely manner
Access restrictions to address new residential activities adjacent to SWMU/AOC locations	Develop measures within 60 days Implement measures in a timely manner

The Permittees shall perform follow-up inspections to verify completion of corrective actions. Follow-up inspections shall occur within 180 days after the actions are completed and may be combined with annual inspections.

M.4 LTMMP REPORTING REQUIREMENTS

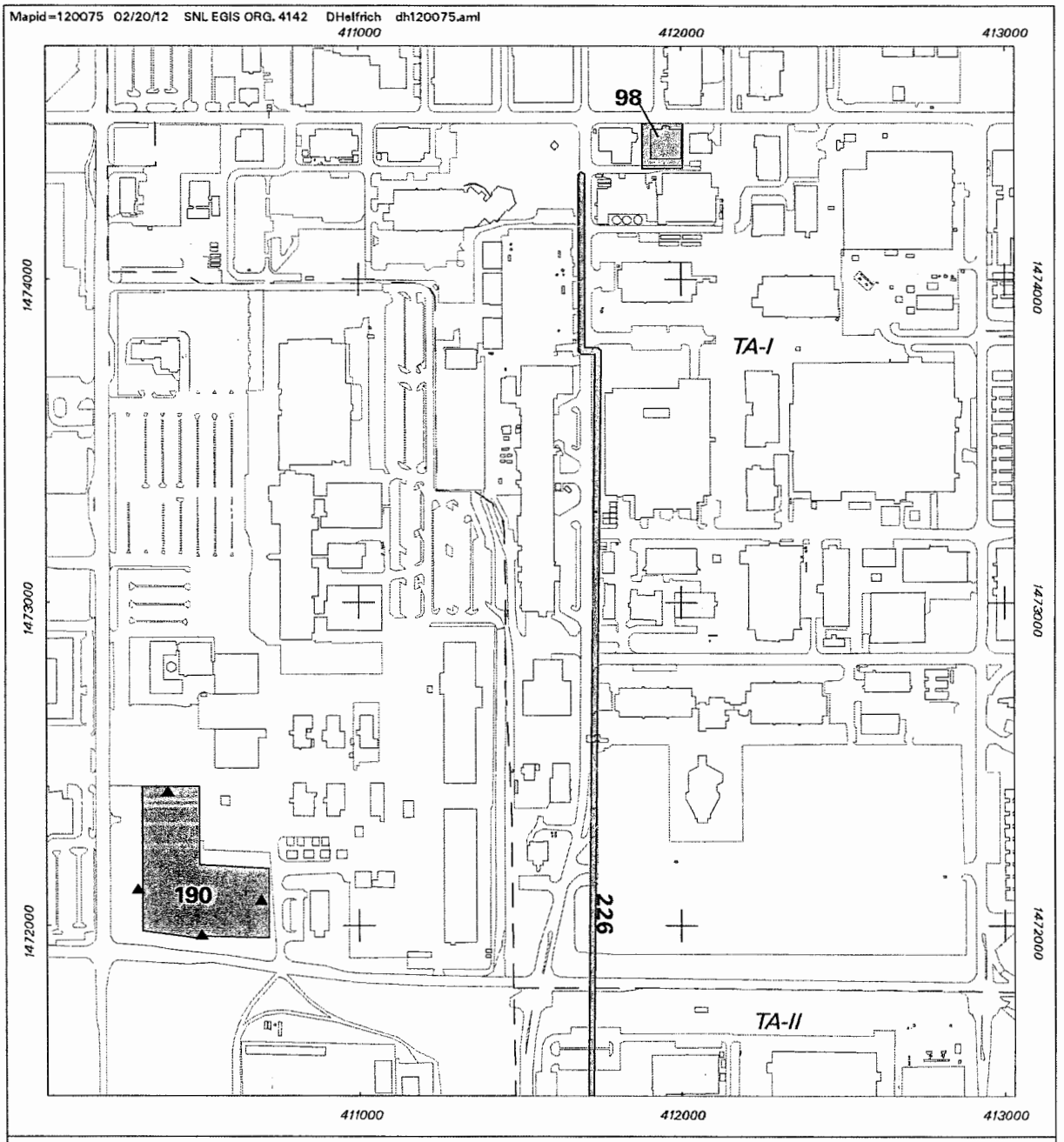
An annual SWMU/AOC LTMMP report shall be prepared to document the following:

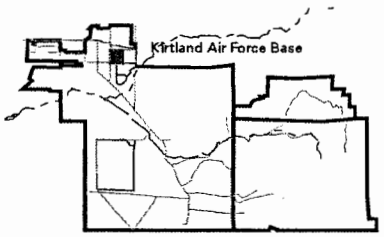
- Annual inspection results;
- Maintenance and repair activities required;
- Status of maintenance and repair activities; and
- Other conditions or events at the site that affect the performance of the controls.

The report shall include all SWMUs/AOCs listed in the Permit Table M-1. The annual report for each calendar year shall be submitted to the Department by March 31 of the following year.

Inset Figure M-1

Insert Figure M-2





Legend

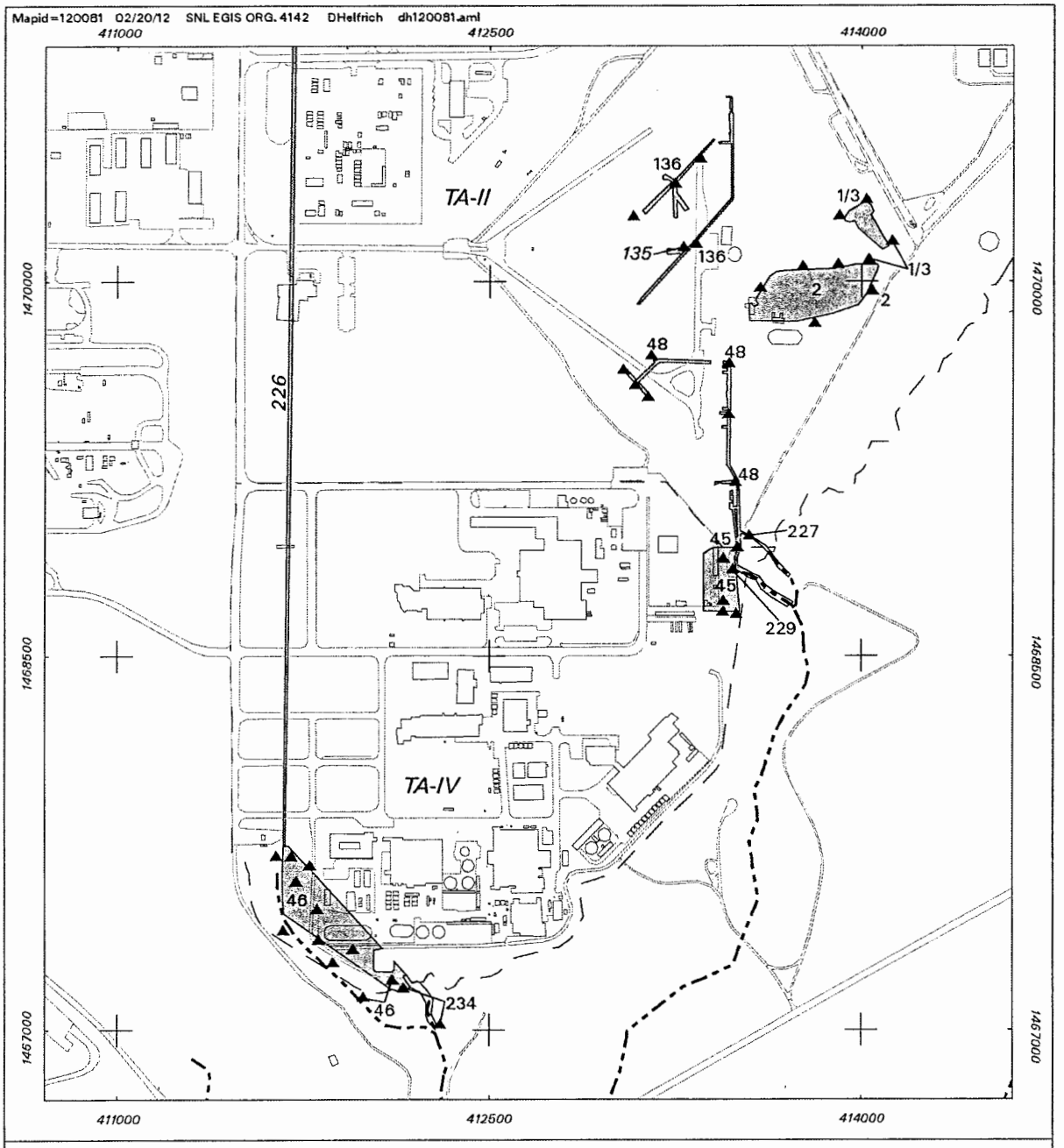
- Sign Location
- Road
- Building / Structure
- SWMU with Controls
- SNL Tech Area I

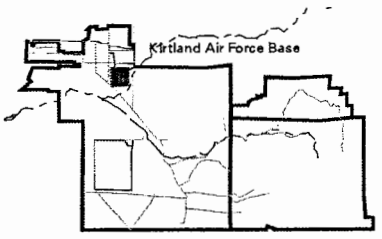
Figure 1
Solid Waste Management Units - Corrective Action Complete with Controls, Tech Area I

0 250 500
Scale in Feet

0 60 120
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System





Legend

- Sign Location
- Road
- Surface Drainage
- Building / Structure
- SWMU with Controls
- SNL Tech Area II & IV

Figure 2
Solid Waste Management Units - Corrective Action Complete with Controls, Tech Areas II and IV

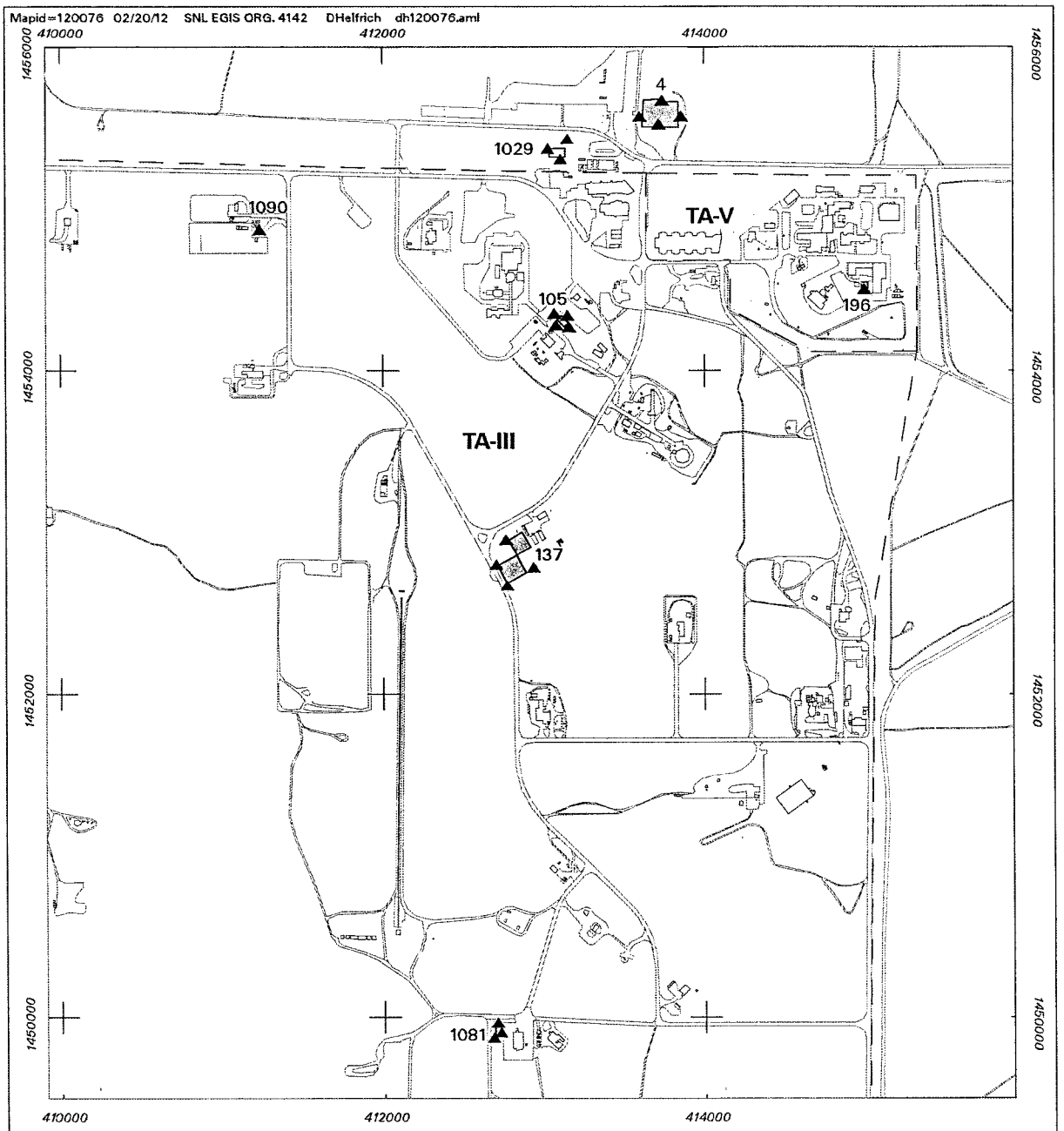
0 325 650
Scale in Feet

0 78 156
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Insert Figure M-3

Insert figure M-4



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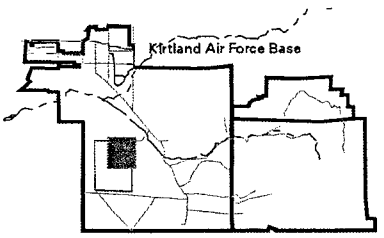


Sign Location

Road

Building / Structure

SWMU with Controls

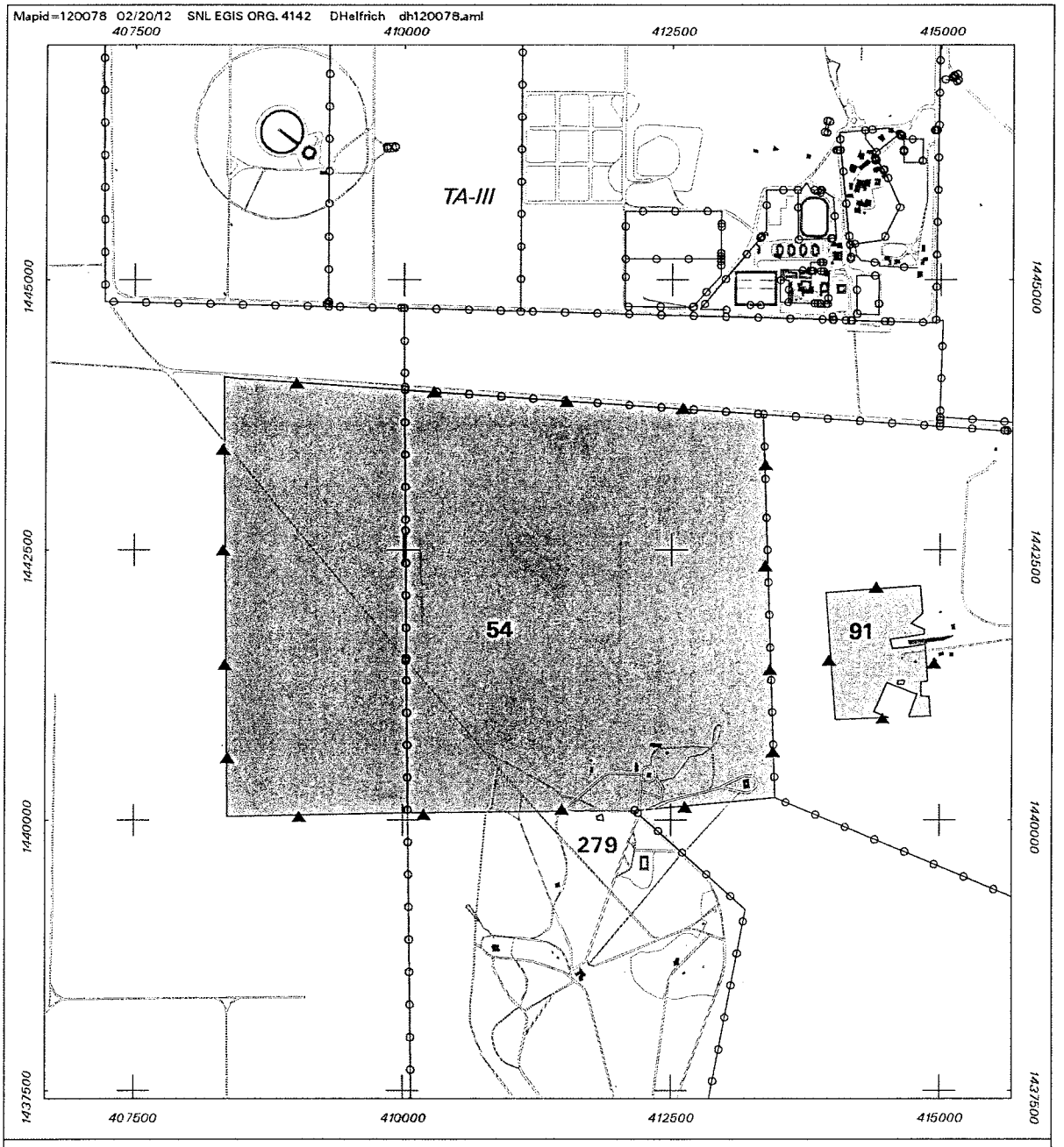
SNL Tech Area III

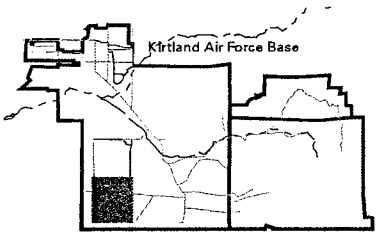
0 500 1000
Scale in Feet

0 120 240
Scale in Meters

Figure 3
Solid Waste Management Units - Corrective Action Complete with Controls, Tech Areas III and V

Sandia National Laboratories, New Mexico
Environmental Geographic Information System





Legend

- Sign Location
- Road
- Fence
- Building / Structure
- SWMU with Controls
- SNL Tech Area III

Figure 4
Solid Waste Management Units 54, 91, and 279 - Corrective Action Complete with Controls

0 750 1500
Scale in Feet

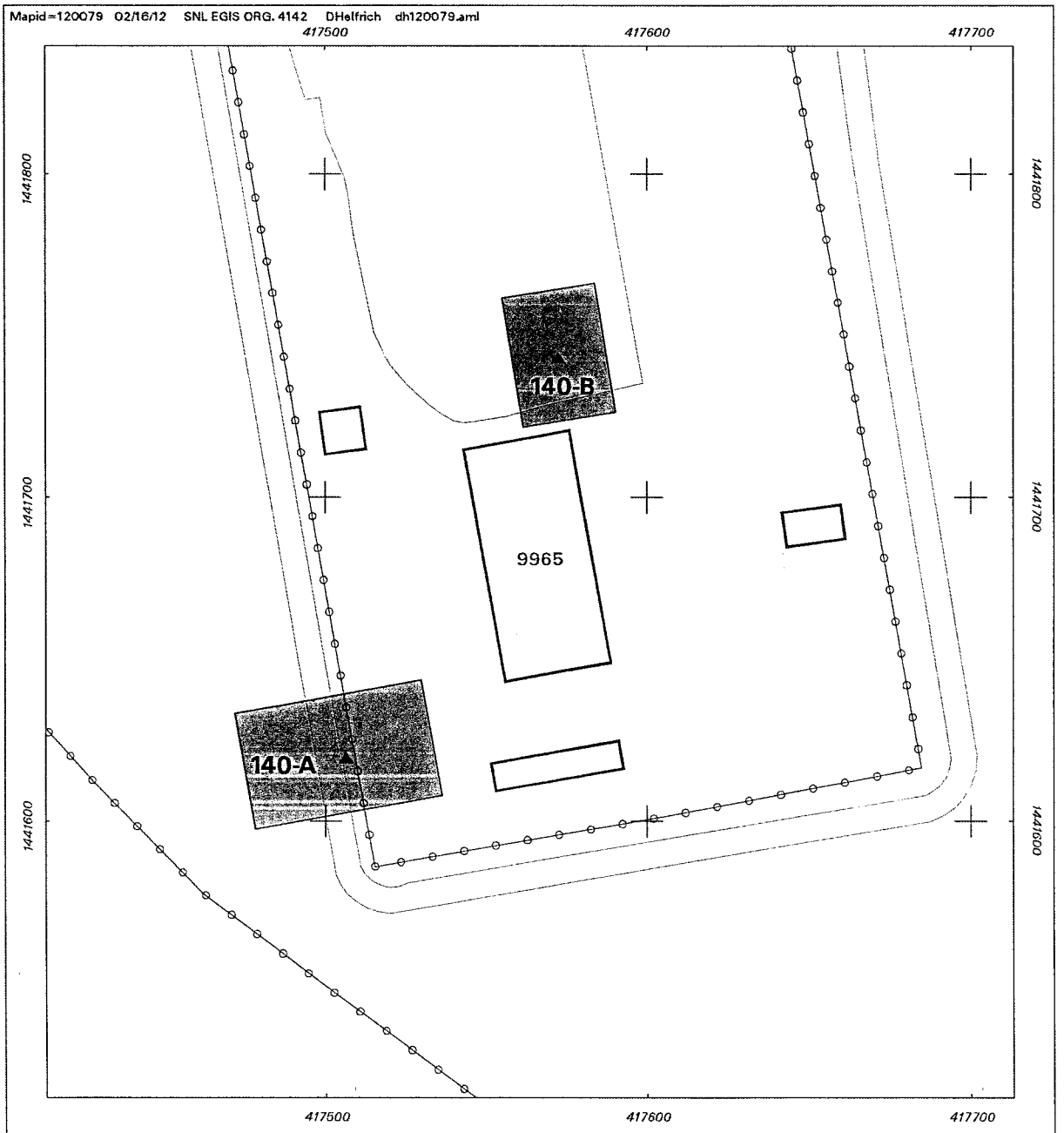
0 180 360
Scale in Meters

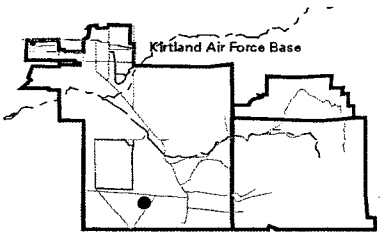
Projection: New Mexico State Plane, Central Zone 3002, 1927 North American Datum

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Insert figure M-5

Insert figure M-6





Legend

- Sign Location
- Unpaved Road
- Fence
- Building / Structure
- SWMU with Controls

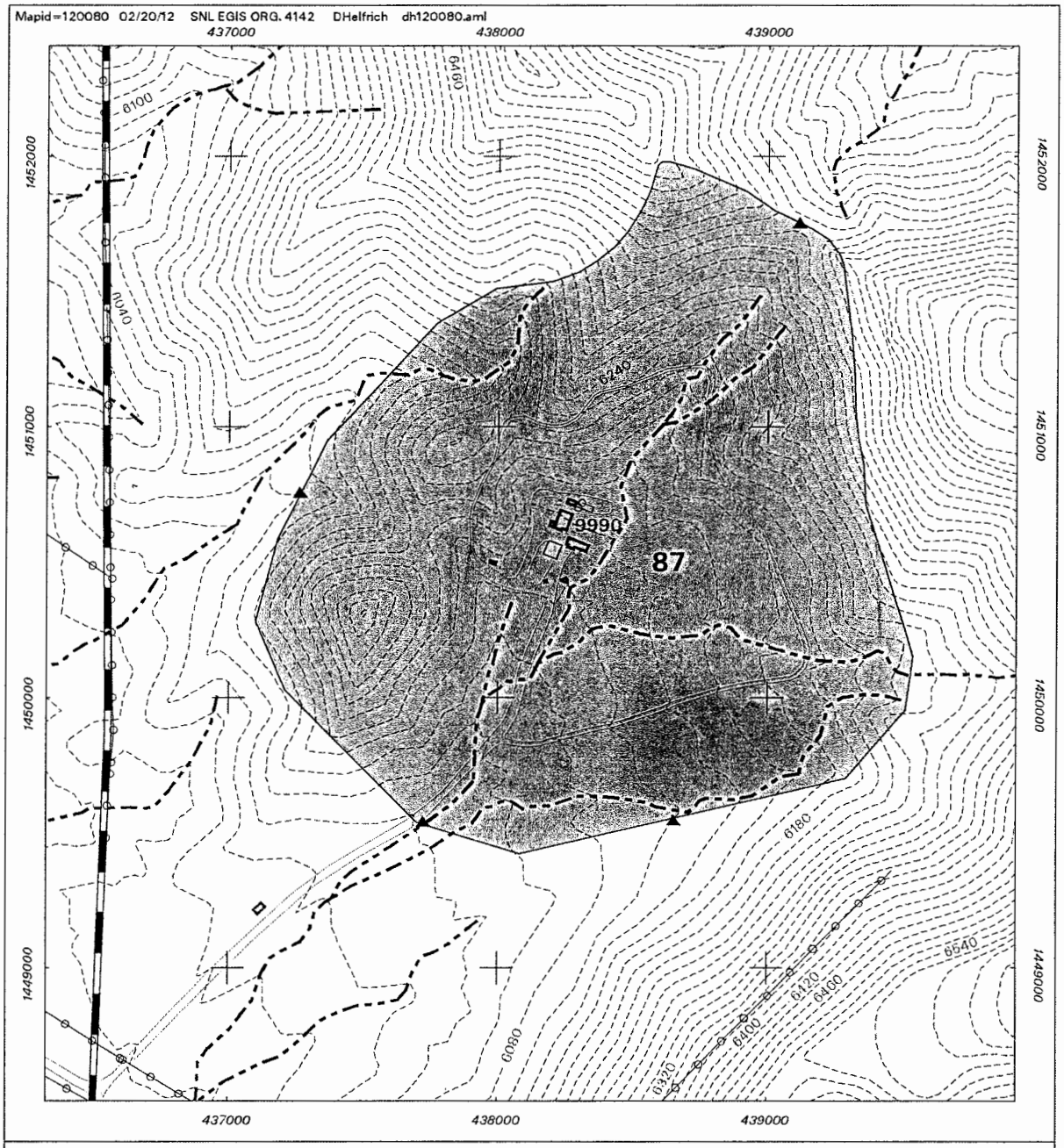
Figure 5
Solid Waste Management Unit 140 - Corrective Action Complete with Controls

0 25 50
Scale in Feet

0 6 12
Scale in Meters

Projection: New Mexico State Plane, Central Zone 3002, 1927 North American Datum

Sandia National Laboratories, New Mexico
Environmental Geographic Information System



Legend

- Sign Location
- Unpaved Road
- 20-ft Contour
- KAFB Boundary
- Building / Structure
- Surface Drainage
- Fence
- SWMU with Controls

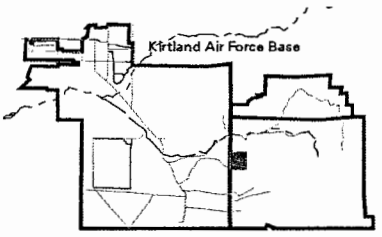


Figure 6
Solid Waste Manangement Unit 87 - Corrective Action Complete with Controls

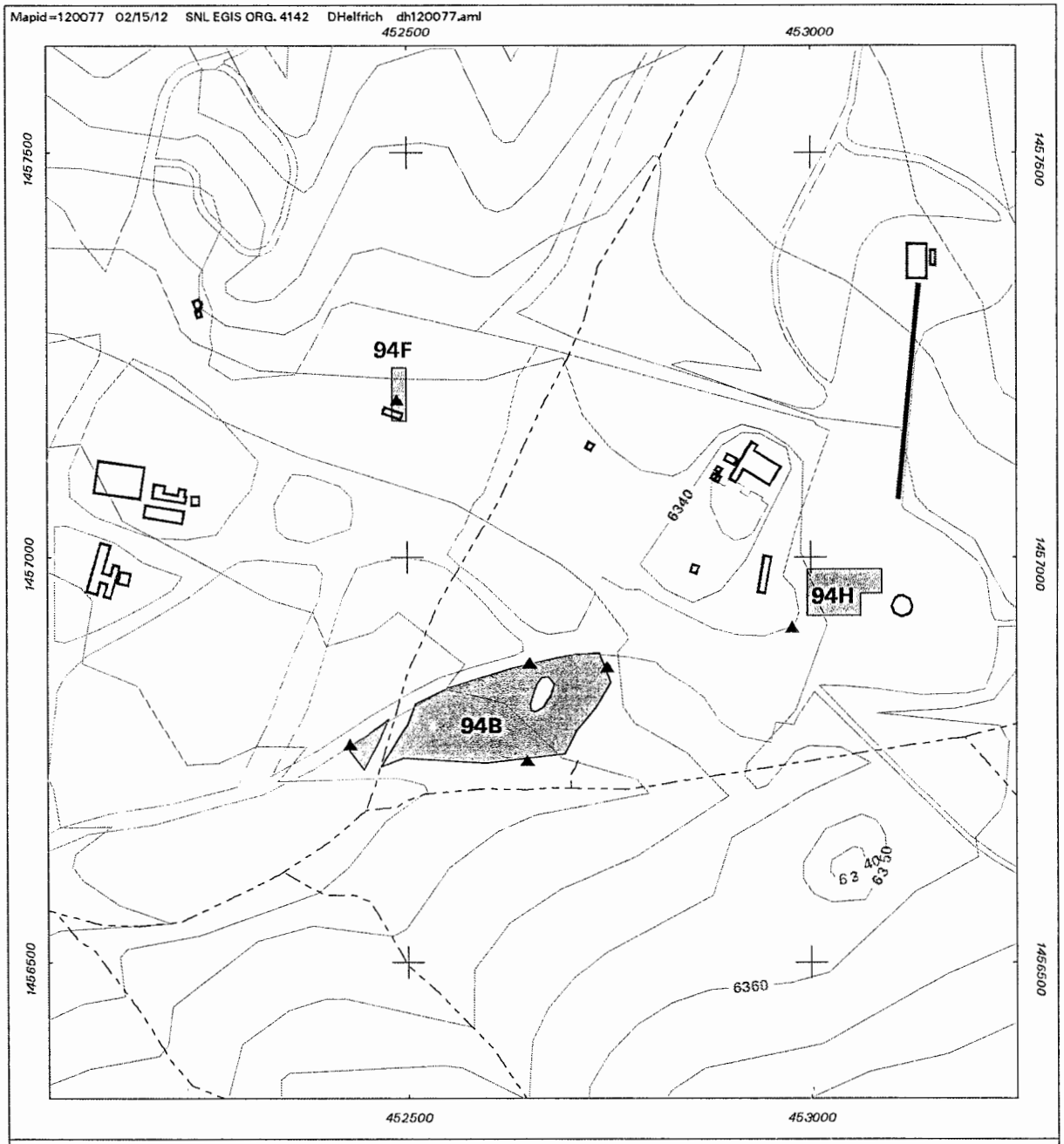
0 300 600
Scale in Feet

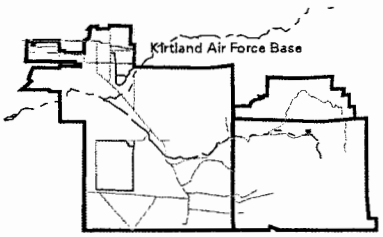
0 72 144
Scale in Meters

Projection: New Mexico State Plane, Central Zone 3002, 1927 North American Datum

Sandia National Laboratories, New Mexico
Environmental Geographic Information System

Insert figure M-7





Legend

- Sign Location
- Unpaved Road
- 10-ft Contour
- Building / Structure
- Surface Drainage
- SWMU with Controls

Figure 7
Solid Waste Management Untits 94-B, 94-F, and 94-H - Corrective Action Complete with Controls

0 100 200
Scale in Feet

0 24 48
Scale in Meters

Sandia National Laboratories, New Mexico
Environmental Geographic Information System