Nevada Test Site Site Treatment Plan

and

Federal Facility Compliance Act Consent Order

March 1996

Waste Management
Division

U.S. Department of Energy
Nevada Operations Office

Overview of Site Treatment Plans

U.S. Department of Energy
November 1995

DOE will have 35 Site Treatment Plans and associated Compliance Orders in place covering 38 sites in 20 states that generate or store mixed waste for which treatment capacity must be developed (see Figure 1). Negotiations were completed for 28 Plans on October 6, 1995; one Plan was finalized on October 31, 1995. Negotiations on the remaining 6 sites that require Plans are continuing and are expected to be completed soon. This Overview describes the process used by the sites to prepare the Site Treatment Plans and summarizes the locations, costs, and schedules for the treatment identified in these Plans.

Background

For more than 40 years, the United States has produced materials for nuclear weapons, operated and conducted research on nuclear reactors, and performed various nuclear experiments on reactor equipment. These ac-

tivities generated both radioactive and hazardous wastes. The Department of Energy (DOE) is faced with the challenge of managing these wastes.

Waste that contains both a hazardous and radioactive component is identified as "mixed waste." Mixed waste can be categorized as high-level waste (HLW), mixed-transuranic waste (MTRU), or mixed low-level waste (MLLW). The management of this waste is particularly challenging to the Department. Currently, there is insufficient capacity, and in some cases a lack of available technologies, to treat these wastes to the standards required by the Resource Conservation and Recovery Act (RCRA).

The Federal Facility Compliance Act

The Federal Facility Compliance Act of 1992 (FFCAct) required the Secretary of Energy to develop and submit Site Treatment Plans for the development of capacity

Figure 1. 35 DOE Site Treatment Plans Cover 38 Sites in 20 States

requirement, addresses the environmental liabilities of the DOE complex and provides an estimated cost for all DOE Environmental Management activities. The Report reflects the activities that DOE field offices currently expect to carry out and alternative cases developed by DOE showing the potential cost variations from four key factors: future land use, scheduling, technology development, and the waste management configuration. The Report was first submitted to Congress at the end of March 1995; and is scheduled for a second release in March 1996.

The FFCAct efforts address only mixed waste treatment within the Waste Management program. The Programmatic Environmental Impact Statement, although also evaluating the Waste Management program, has a broader perspective in that it addresses five different waste types and treatment, storage, and disposal alternatives for those waste types. The Baseline Environmental Management Report is broader still, addressing all of the Environmental Management programs, including Waste Management, Environmental Restoration, Technology Development, and Nuclear Material and Facility Stabilization. By estimating total life-cycle costs for Environmental Management programs, including costs of environmental liabilities and regulatory commitments, the Baseline Environmental Management Report highlights the challenges facing DOE in managing its wastes, cleaning up its contaminated property, considering future land use, and budgeting resources to meet these challenges.

Disposal

Established processes are being implemented by DOE for studying, designing, constructing, and ultimately operating disposal facilities for HLW and MTRU wastes (specifically the HLW repository in Nevada, and the Waste Isolation Pilot Plant in New Mexico).

Although the FFCAct does not require DOE to address disposal of treated mixed waste, both DOE and the States recognized that disposal is an integral part of mixed waste management. Currently there are no ac-

tive permitted mixed waste disposal facilities operated by DOE for disposal of residuals from the treatment of MLLW. Through the Site Treatment Plan development process, DOE and State and Federal regulators have formed working groups to evaluate issues related to disposal of treated MLLW. These workgroups have defined criteria to evaluate the sites subject to the FFCAct in order to identify sites that may be suitable for disposal of treatment residuals. Evaluation of these sites and determination of potential disposal locations is continuing. A description of the disposal process and its status is included in the individual site Site Treatment Plans.

Future Activities

In the near term, DOE will continue to work with the states to finalize remaining Site Treatment Plans and Orders.

In the long-term, DOE plans to continue a cooperative process under the FFCAct beyond the release of the Site Treatment Plans to build on the progress that has been made to date. The current process should evolve into a new way of doing business that consists of open communication with the regulators on both a local and national level, joint resolution of issues, and working toward common goals. Much work must still be done to address challenging issues such as implementation, funding, prioritization, and equity. However, there is a solid process in place to move forward through cooperation and regular communication between DOE, its regulators, and the public.

General information on a site's Site Treatment Plan, locations of DOE reading rooms where the Plans may be viewed, and addresses of regulators to whom comments on specific Plans should be sent, can be obtained from the Center for Environmental Management Information at 1-800-7EM-DATA (1-800-736-3282).

Additional information about the FFCAct may also be obtained electronically through the FFCAct Bulletin Board on the Internet at <http://www.em.doe.gov/fcabb>.

Nevada Test Site Site Treatment Plan

March 1996
Revision 2

MASTER

Waste Management
Division

U.S. Department of Energy
Nevada Operations Office

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LIST OF ACRONYMS

ADS	Activity Data Sheet
AEA	Atomic Energy Act
AMEM	Assistant Manager of Environmental Management
ASD	Analytical Services Department
BECAMP	Basic Environmental Compliance and Monitoring Program
BN	Bechtel Nevada
BV	Background Volume
CAB	Community Advisory Board
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
C.F.R.	Code of Federal Regulations
CH	Contact-Handled
CIF	Consolidated Incineration Facility
CO	Consent Order
CSTP	Conceptual Site Treatment Plan
D&D	Decontamination and Decommissioning
DOE	U.S. Department of Energy
DOE/Carlsbad	DOE/Carlsbad Operations Office
DOE/HQ	DOE Headquarters
DOE/NV	DOE Nevada Operations Office
DOE/OR	DOE Oak Ridge
DNA	Defense Nuclear Agency
DSTP	Draft Site Treatment Plan
EIS	Environmental Impact Statement
EM	Office of Environmental Management
EOD	Explosive Ordnance Disposal
EPA	U.S. Environmental Protection Agency
ER	Environmental Restoration
ERD	Environmental Restoration Division
ft ³	cubic feet
FFA CO	Federal Facility Agreement Consent Order

FFCAct	Federal Facility Compliance Act
FOD	Field Operations Department
FR	Federal Register
FWPCA	Federal Water Pollution Control Act
FY	Fiscal Year
GCD	Greater Confinement Disposal
HLMW	High-Level Mixed Waste
HLW	High-Level Waste
HWSU	Hazardous Waste Storage Unit
INEL	Idaho National Engineering Laboratory
LDR	Land Disposal Restriction
LLMW	Low-Level Mixed Waste
LLNL	Lawrence Livermore National Laboratory
LLW	Low-Level Waste
m ³	cubic meters
MEF	Material Evaluation Form
MTRU	Mixed Transuranic
MWDU	Mixed Waste Disposal Unit
MWIR	Mixed Waste Inventory Report
MWSU	Mixed Waste Storage Unit
NDEP	Nevada Division of Environmental Protection
NEPA	National Environmental Policy Act
NGA	National Governors' Association
NRC	Nuclear Regulatory Commission
NTS	Nevada Test Site
OAT	Options Analysis Team
PCB	Polychlorinated Biphenyl
PCTD	Project Control and Technology Development Division
PEIS	Programmatic Environmental Impact Statement
PPOA	Pollution Prevention Opportunity Assessment
PSTP	Proposed Site Treatment Plan
PV	Plan Volume
RCRA	Resource Conservation and Recovery Act

REEC	Reynolds Electrical & Engineering Co., Inc.
RH	Remote-Handled
ROD	Record of Decision
RTR	Real Time Radiography
RWMS	Radioactive Waste Management Site
S&A	Sampling and Analysis
SEG	Scientific Ecology Group
SRS	Savannah River Site
STP	Site Treatment Plan
SWDA	Solid Waste Disposal Act
TCLP	Toxicity Characteristic Leachate Procedure
TRU	Transuranic
TRUPACT-II	Transuranic Package Transporter-II
TSCA	Toxic Substance Control Act
TSD	Treatment, Storage, and Disposal
TTF	Treatability Test Facility
U.S.C.	United States Code
WAC	Waste Acceptance Criteria
WEF	Waste Examination Facility
WIPP	Waste Isolation Pilot Plant
WMin/PP	Waste Minimization and Pollution Prevention
WM	Waste Management
WMD	Waste Management Division
yr	year

EXECUTIVE SUMMARY

Site Treatment Plans (STPs) are required for facilities at which the U.S. Department of Energy (DOE) generates or stores mixed waste, defined by the Federal Facility Compliance Act (FFCAct) as waste containing both a hazardous waste subject to the Resource Conservation and Recovery Act and a radioactive material subject to the Atomic Energy Act. On April 6, 1993, DOE published a *Federal Register* notice (58 FR 17875) describing its proposed process for developing the STPs in three phases including a Conceptual, a Draft, and a Proposed Site Treatment Plan (PSTP). All of the DOE Nevada Operations Office STP iterations have been developed with the state of Nevada's input. The options and schedules reflect a "bottoms-up" approach and have been evaluated for impacts on other DOE sites, as well as impacts to the overall DOE program. Changes may have occurred in the preferred option and associated schedules between the PSTP, which was submitted to the state of Nevada and U.S. Environmental Protection Agency April 1995, and the Final STP (hereafter referred to as the STP) as treatment evaluations progressed. The STP includes changes that have occurred since the submittal of the PSTP as a result of state-to-state and DOE-to-state discussions.

To the extent practicable, the STP identifies specific treatment facilities for treating the mixed waste and proposes schedules as set forth in the FFCAct. When treatment options are not possible due to the lack of characterization data, plans and schedules for characterizing wastes, undertaking technology assessments, and providing the required plans and schedules for developing capacity are provided as appropriate. For new facilities, the schedule is dependent upon decisions made during the design phase and is contingent on funding availability. Assumptions and professional judgments related to the type of treatment technology, location of the treatment facility, contracting mechanism, project approval process, and cost were used to develop the schedules. Any variation of the assumptions will impact the schedules. Cost data used in developing options and schedules are planning estimates only.

DOE faces increasingly tight budgets throughout the DOE complex and anticipates that funding will continue to be constrained. The schedules in this and other STPs reflect those constraints. DOE has asked regulatory agencies to work with DOE and other interested parties at the site and national level to assist DOE in prioritizing its activities.

Emerging or new technologies not yet considered that provide opportunities to manage waste more safely and effectively and at a lower cost than current technologies identified in the STP may be developed in the future. Working closely with regulators and others during the implementation of the STP process, DOE shall continue

to evaluate and develop technologies that offer potential advantages in the areas of public acceptance, risk abatement, performance, and life-cycle cost. Impacts caused by changes to compliance documents and/or improved technologies shall be evaluated for possible modification to this STP. Changes, revisions, and modifications to this STP shall be in accordance with the provisions outlined in the Consent Order.

The Background Volume (BV), in conjunction with the Plan Volume (PV), comprise the STP. The PV provides overall schedules with milestones and interim activity dates for achieving compliance with Land Disposal Restrictions and a general framework for the establishment and review of milestones and interim activity dates. Additional discussion contained in the BV is provided for informational purposes only.

BACKGROUND VOLUME

1.0 Introduction

1.1 Purpose and Scope of the Proposed Site Treatment Plan (PSTP)

The U.S. Department of Energy (DOE) is required by Section 3021(b) of the Resource Conservation and Recovery Act (RCRA), as amended by the Federal Facility Compliance Act (FFCAct), to prepare Site Treatment Plans (STPs) describing the development of treatment capacities and technologies for treating mixed waste. STPs are required for facilities at which DOE generates or stores mixed waste, defined by the FFCAct as waste containing both a hazardous waste subject to RCRA and a source, special nuclear or by-product material subject to the Atomic Energy Act (AEA) of 1954 [42 United States Code (U.S.C.) 2011 *et seq.*]. The Nevada Test Site (NTS) STP is being provided to the state of Nevada for approval in accordance with the FFCAct.

DOE has followed an iterative process in developing the STPs, working closely with state regulatory agencies and the U.S. Environmental Protection Agency (EPA) at the site and national level throughout the process. This STP follows three interim versions -- a Conceptual Site Treatment Plan (CSTP) submitted in October 1993; a Draft Site Treatment Plan (DSTP) submitted in August 1994; and a Proposed Site Treatment Plan (PSTP) submitted in April 1995 -- which were provided to regulatory agencies and made publicly available. DOE initially planned to submit the PSTPs at the end of February 1995. However, DOE revised its submittal date with the support of the states and EPA to allow for additional discussions (see 60 *FR* 10840, February 28, 1995). Based upon comments received from the state of Nevada, the PSTP was revised, submitted again for review in August 1995, and approved with modification by the state of Nevada as the STP. Revision 0 of the STP was submitted for public review and comment in September 1995. Revision 1 of the STP included comments received during the review period for Revision 0 and changes resulting from negotiations with the state of Nevada and other agencies potentially impacted by it and its corresponding Consent Order (CO). Revision 2 of the STP includes comments reviewed and changes resulting from the final negotiation meeting with the Nevada Division of Environmental Protection (NDEP), which was held on February 7, 1996.

The NTS CSTP, DSTP, PSTP, STP and other related information are available at the DOE Nevada Operations Office (DOE/NV) Public Reading Facility located at 2621 Losee Road, Building B-3, Las Vegas,

Nevada. Full sets of the approved STPs [with the exception of Ames Laboratory, Argonne National Laboratory-East, Brookhaven National Laboratory, Lawrence Livermore National Laboratory (LLNL), and West Valley Demonstration Plant] are available at the 11 National DOE Reading Rooms. They are as follows: DOE Headquarters (DOE/HQ) reading room, the Center for Environmental Management Information, Oak Ridge Reservation, Savannah River Site (SRS), Idaho National Engineering Laboratory (INEL), Rocky Flats Plant, Hanford Site, NTS, LLNL, Albuquerque Operations Office, and Mound Plant.

This STP contains DOE's preferred options developed after evaluation and integration of the site-specific treatment options contained in the DSTPs of the other sites with DOE mixed waste. The process DOE followed was coordinated with state and EPA regulators and is described in Section 2.2. DOE believes the treatment options contained in the STPs represent a sensible national configuration for mixed waste treatment systems that balances DOE's interests and concerns and the input DOE received on the DSTPs from the regulatory agencies and others.

The STP also contains schedules for obtaining treatment for mixed wastes. However, the schedules in this STP may not reflect those of other DOE sites from a technical, complex-wide perspective. Moreover, DOE faces increasingly tight budgets throughout the DOE complex and anticipates that funding will continue to be constrained. The schedules in this and other DOE Sites' STPs reflect those constraints.

The schedules contained in this and the STPs for other sites are based on funds currently budgeted and projected to be available for waste management activities. As a result, schedules in the STPs for some facilities, particularly the largest and most costly facilities, may be protracted. Schedules for small sites that are relying on the treatment capacity at larger sites are also affected. DOE anticipates that, at some sites, funds will be shifted from other environmental management activities to support more sensible and integrated schedules for mixed waste treatment.

DOE discussed with the states and the EPA the difficulty DOE faces in providing timely schedules for some new treatment facilities given current budgetary constraints and the need to consider whether funds from other activities should be shifted to support more timely schedules. The states and EPA recommended that the STP be submitted with schedules consistent with current budget and priorities even though they recognized schedules may be extended. As part of its efforts to develop its budget request for Fiscal Year (FY) 1997, DOE has asked regulatory agencies to work with DOE and other interested parties at the site and national level to assist DOE in prioritizing its activities, including mixed waste treatment, and in assessing activities currently

under way and that need to be accomplished at the site. Through this budget development process and discussions on the STPs, DOE and the regulatory agencies expect that some schedules will be revised before the STPs are approved and orders issued.

Even after the STPs are approved, DOE anticipates that modifications and adjustments to the STPs will be necessary because of the technical and funding uncertainties that naturally exist with long-term activities like those covered by the STPs. For example, emerging or new technologies not yet considered may be identified in the future that provide opportunities to manage waste more safely, effectively, and at lower cost than the current technologies that offer potential advantages in the areas of public acceptance, risk abatement, and performance and life cycle cost. Should more promising technologies be identified, DOE may request a modification of its treatment plan in accordance with the provisions found in the CO.

This Background Volume (BV) is one of two volumes that constitute the STP. It provides a detailed discussion of the preferred waste treatment option or options, identifies the waste streams the option addresses, and gives explanatory information for the Plan Volume (PV). The PV identifies the capacity to be developed and associated schedules as required by the FFCAct.

1.2 Site History and Mission

The mission of the NTS is to maintain a state of readiness for nuclear weapons testing. Since 1951, more than 900 nuclear tests consisting of both atmospheric (until mid-1962) and underground have been conducted on the NTS. Other important functions of the NTS include the management and disposal of low-level radioactive waste, storage of mixed transuranic (MTRU) waste, development of low-level mixed waste (LLMW) disposal capacity, environmental restoration (ER) of sites both on and off the NTS, and technology development.

The DOE/NV Assistant Manager of Environmental Management (AMEM) is responsible for comprehensive planning and centralized management of ER and waste management activities at the NTS. Within the Office of the AMEM are three divisions: the Environmental Restoration Division (ERD), the Waste Management Division (WMD), and the Project Control and Technology Development Division (PCTD).

The ERD manages and directs Remedial Investigation/Feasibility Study activities, site characterization and remediation activities, development of RCRA closure plans, closure of inactive hazardous and mixed waste disposal sites, and field efforts to decontaminate and decommission (D&D) facilities contaminated with

radionuclides. The WMD manages and directs defense low-level, hazardous, and mixed waste management operations at the NTS; oversees storage of transuranic (TRU) waste to be sent to the Waste Isolation Pilot Plant (WIPP) in New Mexico; oversees research and analysis studies for disposal operations; and conducts audits of off-site and on-site waste generators to ensure compliance with DOE/NV waste disposal requirements. The PCTD manages and directs field studies; develops scientific and technical measures necessary to extract radionuclides dispersed in the NTS soil media; sponsors demonstrations by private industry and universities for new technologies; and conducts research for remote sensing technologies (ground- and air-based).

1.3 Framework for Developing the STPs

RCRA Land Disposal Restrictions (LDRs) require the treatment of hazardous waste [wastes listed in Title 40 Code of Federal Regulations (C.F.R.) Part 261] to predefined standards prior to waste being land disposed. The requirements also prohibit storage of hazardous wastes that do not meet LDR standards except for the purposes of accumulating sufficient quantities to facilitate proper recovery, treatment, or disposal of the waste. The LDR standards are found in Title 40 C.F.R. 268. DOE is currently storing mixed waste inconsistent with the LDR provisions because the treatment capacity for such wastes, either at DOE sites or in the commercial sector, is not adequate or is unavailable at this time.

The FFCAct, signed on October 6, 1992, waives sovereign immunity for RCRA violations at federal facilities and subjects federal facilities to the same fines and penalties as private mixed waste generators. The FFCAct, however, defers fines and penalties for mixed waste for three years, requiring DOE to prepare plans that identify treatment capacities for each mixed waste stream. Each plan must be approved by the authorized RCRA-regulating state or the EPA. After consultation with other affected states and public comment, a CO shall be issued by the regulatory agency requiring DOE to comply with the STP. As long as the provisions in the approved STP are met, DOE will not be subject to fines or penalties for LDR storage prohibition violations for mixed waste.

The FFCAct requires the STPs to contain schedules for developing mixed waste capacity when identified treatment technologies exist. If treatment technologies do not exist, the plans are to propose schedules for identifying and developing the necessary mixed waste treatment technologies. The FFCAct requires DOE to provide information, such as anticipated volumes, cost analysis of waste treatment and disposal, and assumptions, in the plan where radionuclide separation is proposed. The FFCAct allows DOE to provide for

centralized, regional, or on-site treatment of mixed waste, or any combination thereof, and requires the states to consider the need for regional treatment facilities in reviewing the plans.

The "Schedule for Submitting Plans for the Treatment of Mixed Waste Generated or Stored at Each Site" was published April 6, 1993, in 58 *FR* 17875. In the Notice, DOE committed to providing the STPs in three phases: a "conceptual plan" completed in October 1993, a "draft plan" completed in August 1994, and a "proposed plan" no later than April 1995.

The CSTP focused on identifying treatment needs, capabilities, and options for treating mixed waste at the NTS. The DSTP focused on identifying preferred options for treating mixed wastes at the NTS, when possible, as well as proposed schedules for constructing treatment capacity. The options presented in the PSTP, and now in the STP, represent DOE's best judgment of the available information and expands on the schedules and milestones found in the DSTP. The FFCAct required the PSTP to be submitted to the regulatory agency for review and approval, approval with modification, or disapproval. Each version of the STP reflects discussions among states, as well as site-specific input from the individual regulatory agency and other interested parties on the previous submittal. It is DOE's intent that this iterative process, with ample opportunity for input and discussion, shall facilitate approval of the STP and issuance of the CO required by the FFCAct. DOE's goal is to have all plans and orders in place by October 1995.

Figure 1 illustrates the relationship between the requirements that led to the process DOE is following to prepare the STPs.

Figure 1. Framework For Developing DOE's STPs

1.4 STP Organization

The NTS STP follows the same format as the STPs of other DOE sites to facilitate cross-site comparisons. The STP contains information on the waste streams and treatability groups of the preferred options identified in the DSTP. The individual sections of the STP are described below.

1.4.1 BV

Section 1.0 (Introduction) describes the purpose and scope of the STP, identifies the requirements that drive the development of the document, reviews the STP organization, provides an overview of the NTS mission and history, and references related documents.

Section 2.0 (Methodology) presents the framework for the technology selection process used to evaluate the options in the STP. It provides a description of the criteria used to prioritize the development of treatment capacity and treatment of waste and describes the evaluation criteria for treating waste that currently has no identified treatment option. The section provides an overview of the characterization program at the NTS for both the hazardous and radioactive components of mixed waste and the related waste minimization program.

Section 3.0 (LLMW Streams) describes NTS LLMW and wastes that are potentially LLMW. The activities required to make regulatory status determination, characterize the waste for treatment, perform technology assessment, and treat the waste are also described, as appropriate.

Section 4.0 (MTRU Waste Streams) presents a description of the NTS MTRU waste that has been identified as defense MTRU waste and will be accepted at the WIPP facility for disposal. The NTS MTRU wastes that are destined for WIPP are currently regulated by an agreement between DOE/NV and the state of Nevada. Any MTRU waste not accepted for disposal at WIPP will be analyzed for treatment options using the same criteria described in Section 2.2.2 of the BV.

Section 5.0 (High-Level Mixed Waste Streams) indicates that high-level mixed waste has not been generated in the past at the NTS and none is expected to be generated in the future.

Section 6.0 (Future Generation of Mixed Waste Streams) addresses mixed wastes expected to be generated in the future including waste generated by ER and D&D activities.

Section 7.0 (Storage Report) describes current and future storage activities for maintaining compliant storage while the waste is pending treatment.

Section 8.0 (Process for Evaluating Disposal Issues in Support of the STP Discussions) discusses the overall process developed by DOE for evaluating issues related to the disposal of residues from the treatment of LLMW subject to the FFCAct.

1.4.2 PV

Section 1.0 (Purpose and Scope) describes the purpose of the PV as it relates to the enforceability of the FFCAct.

Section 2.0 (Implementation of the STP and Administrative Provisions) highlights certain administrative provisions appropriate for implementing the STP when finalized. Detailed descriptions of these provisions can be found in the CO.

Section 3.0 (LLMW Streams) gives a brief description of each LLMW stream and those that are potentially LLMW and describes NTS LLMW treatment plans and schedules. This section identifies the activities required to make a regulatory determination, characterize the waste for treatment, and perform technology assessments.

Section 4.0 (MTRU Waste Streams) presents a description of the NTS MTRU waste that has been identified as defense TRU waste and will be accepted at the WIPP facility for disposal. It describes the activities and schedules for handling the NTS MTRU wastes.

Section 5.0 (High-Level Mixed Waste Streams) indicates that high-level mixed waste has not been generated in the past at the NTS and none is expected to be generated in the future.

Section 6.0 (Annual STP Updates) briefly describes the Annual STP and the dates by which the updates are due.

1.4.3 Appendices

Appendix A (Definitions) is a glossary of STP-related definitions.

Appendix B (Potential Treatment Technologies for NTS Mixed Wastes) identifies potential treatment options that could be used or developed for NTS mixed wastes.

1.5 Related Documents

Other DOE efforts are closely linked to the STP development. These include the Mixed Waste Inventory Report (MWIR), activities conducted pursuant to the National Environmental Policy Act (NEPA), and compliance and cleanup agreements, such as the RCRA Part B Permit, that contain commitments relevant to mixed waste.

1.5.1 MWIR

The MWIR, required by the FFCAct, provides an inventory of mixed waste currently stored or generated or expected to be generated over the next five years at each DOE site as well as an inventory of treatment capacities and technologies. The Interim MWIR, published by DOE in April 1993, provided information on a waste stream-by-waste stream basis for each DOE site that generates or stores mixed waste. DOE made updated waste stream and capacity data available to the states and the EPA in July 1995. The July 1995 MWIR represents the best record of DOE's mixed waste inventory at the beginning of 1995. Since data are constantly being refined, waste stream information in the NTS STP may differ somewhat from the latest MWIR data.

1.5.2 NEPA Activities and the Waste Management (WM) Programmatic Environmental Impact Statement (PEIS)

DOE is preparing a WM PEIS, which will be used to formulate and implement a waste management program in a safe and environmentally sound manner and in compliance with applicable laws, regulations, and standards. The WM PEIS is intended to present to the public, states, EPA, and DOE an understanding of impacts to human health and the environment together with the costs associated with a wide range of alternative strategies for managing DOE's environmental program. The WM PEIS is examining the following waste types and activities: high-level, TRU and mixed low-level, low-level, and hazardous. The analysis for the WM

PEIS shall evaluate decentralized, regional, and centralized approaches for storage of high-level waste (HLW), treatment and storage of TRU waste, treatment and disposal of low-level and LLMW, and treatment of hazardous waste.

Development of the WM PEIS is coordinated with the preparation of the STPs under the FFCAct. Information being generated to support the WM PEIS (e.g., hypothetical configurations, preliminary risk analyses, and cost studies) is shared with states to support STP discussions. The Draft WM PEIS will not identify a preferred alternative (e.g., configuration) for mixed waste facilities, because this will involve consultation with the states and EPA through the STP process. However, the WM PEIS analyses of potential environmental risks and costs associated with a range of possible waste management configurations will provide valuable insight as the public, states, EPA, and DOE discuss using existing facilities and constructing new mixed waste facilities to treat mixed waste.

The Draft WM PEIS was released for public comment through a Notice of Availability published in the *Federal Register* on September 22, 1995. The public comment period ended February 19, 1996 and the Final WM PEIS is expected in the summer of 1996. To remain flexible and accommodate potential changes, the WM PEIS Record of Decision (ROD) for mixed waste will be issued after the appropriate regulatory agency has fulfilled their legislative requirement of issuing the COs.

DOE/NV is preparing a site-wide Environmental Impact Statement (EIS) for the NTS, which will expand site-specific details and analyses not covered in the WM PEIS. The NTS EIS will evaluate impacts of major program components including waste management, RCRA closures, D&D, and plutonium-contaminated soils cleanup in addition to defense and other programs at the NTS. NTS mixed waste treatment planning will be an integral part of the NTS EIS process.

1.5.3 . RCRA Part B

In 1992, DOE resubmitted to the state of Nevada the NTS RCRA Part B Permit Application which described the following hazardous waste management units: Pit 3 Mixed Waste Disposal Unit (MWDU) (currently under interim status), Proposed MWDU, Hazardous Waste Storage Unit (HWSU), and the Explosive Ordnance Disposal Unit (EOD) Unit. Subsequent revisions to the Application have been submitted to the state of Nevada in response to comments or changes in operational procedures. In January 1995, the Mixed Waste Storage Unit (MWSU) was added to the Application. In March 1995, the state of Nevada issued a RCRA Permit

(Permit Number HW009) to DOE for the operation of the HWSU and EOD Unit, which became effective on May 1, 1995. Permit status is still pending for Pit 3, MWDU, and the MWSU. In addition, as new facilities are determined to be feasible, they will be added to the RCRA Permit by requesting a modification to the Permit.

1.5.4 Compliance Agreements

As provided in the June 1992 Settlement Agreement for MTRU waste, DOE/NV continues to operate the Area 5 Radioactive Waste Management Site (RWMS) TRU Waste Storage Pad (TRU Pad) in accordance with the Title 40 C.F.R. 265 Subpart I. The MTRU waste is stored in the configuration required under RCRA requirements and inspections are conducted weekly. Any future construction projects or modifications on the TRU Pad will not be initiated by DOE/NV without prior approval from the NDEP. The Agreement also requires that DOE/NV submit a report, to be reviewed triannually, documenting why the current inventory of MTRU cannot be removed until WIPP becomes operational, and an annual report on the progress DOE/NV is making to certify the stored TRU waste to WIPP Waste Acceptance Criteria (WAC). Additional information on the Settlement Agreement for MTRU waste is discussed in Section 7.1 of the BV.

A Mutual Consent Agreement has been established by DOE/NV and the NDEP, allowing available storage capacity on the TRU Pad to be used for the storage of on-site generated LLMW that does not meet RCRA LDR provisions. It was originally established in January 1994, and was updated in June 1995 to incorporate the handling of LLMW generated by DOE/NV activities within the state of Nevada not currently identified in the STPs. The changes also provided DOE/NV with a nine-month period to prepare and submit a plan for the treatment and disposal of such wastes. Additional information on the Mutual Consent Agreement for LLMW storage is presented in Section 7.2 of the BV.

1.5.5 Federal Facility Agreement Consent Order (FFA CO)

The FFA CO is currently being negotiated between the state of Nevada and DOE/NV. The FFA CO, in conjunction with the Mutual Consent Agreement, details how ER wastes will be managed at the NTS. Future schedules for corrective actions at the NTS will be determined based on the results of the characterization activities and on the requirements set forth in the FFA CO. LLMW resulting from ER activities will be stored in accordance with the Mutual Consent Agreement, which is further described in Section 7.2 of the BV.

2.0 Methodology

The NTS is utilizing a standard approach to the development of the STP. This approach is based upon outlines and background information which are being provided by DOE/HQ through the STP Work Group, the FFCAct Task Force, and the FFCAct Policy Coordination Group. This approach will allow for consistency of the NTS STPs with the plans from other DOE Operations Offices.

The methodology for the development of the STP is based on assumptions, a preferred option selection process, coordination with regulatory agencies and other stakeholders, and the characterization process for suspected mixed waste streams at the NTS. In addition, waste minimization plans and procedures were consulted when choosing the treatment process to minimize the generation of mixed waste.

2.1 Assumptions

The following is a combination of assumptions used by all sites and assumptions specifically identified for DOE/NV. These assumptions provide a degree of consistency in the preparation of the STPs. They were developed as a part of the "DSTP Development Framework" and reflect review and comment from the states and the EPA.

- a. High-level mixed waste (HLMW) will continue to be managed according to current plans at each site (e.g., Hanford, West Valley, SRS, and INEL). Primarily due to potential safety concerns, HLMW shall not be transported off site except as a treated waste that meets LDR. The STPs shall not change management strategies for HLMW.
- b. Regarding defense-related MTRU waste, the STPs shall reflect DOE's current strategy that WIPP will open and receive an approval for the no-migration variance. The STPs should identify characterization, processing, and treatment of MTRU waste to meet the WIPP WAC (WIPP-DOE-069 current revision). Consistent with this policy, treatment of MTRU waste to meet LDR standards shall not be included in the STPs at this time. The STPs shall recognize DOE's policy regarding WIPP is under review and may change in the future. As such, the STPs shall provide for the flexibility to modify activities and milestones regarding MTRU waste to reflect potential future changes in DOE policy.

- c. DOE recognizes some states' preference for treatment of all wastes on site. When appropriate, existing on-site capacity will be utilized before new facilities are constructed. When on-site treatment or use of commercial or mobile facilities is not practicable, the use of existing off-site capacity, as well as the construction of new facilities, will be considered.
- d. Sites in the same state will investigate the practicality of consolidated treatment facilities.
- e. Mixed waste resulting from ER and D&D activities will be factored into planning activities and equity discussions. The actual decisions concerning the ER and D&D wastes will be negotiated between DOE and the state of Nevada in a FFA CO independent of the FFCAct process.
- f. The STP shall address all wastes in the updated MWIR. Any changes or corrections to the MWIR waste stream and treatment facility information will be reflected in the STP.
- g. On a volume basis, the large majority of DOE's mixed waste will be treated on site. Because of transportation concerns and costs, this generally includes process wastewater, some explosives, and remote-handled (RH) wastes. In addition, other large volume waste streams will generally be treated on site. At a minimum, Richland, Oak Ridge, INEL, and the SRS shall have on-site facilities to treat the majority of their wastes.
- h. The WM PEIS is being prepared in parallel with the development of the STPs. The STP process shall provide information to the WM PEIS. Each site shall prepare any necessary NEPA documentation before proceeding with a given project or facility ordered by the state or the EPA as a result of the STP process.
- i. In support of DOE's cradle-to-grave waste management policy, disposal site location and criteria, waste treatment facility designs, and the characteristics of the final waste forms will be factored into state equity discussions.

2.2 Treatment Options Selection Process

Because the DSTPs were prepared by the sites using a "bottom-up" approach, the resulting treatment configuration, when viewed from a national level, contained many redundancies and inefficiencies. In developing the STPs, an assessment was performed to determine what accommodations are necessary to blend

the "bottom-up" DSTPs into a more sensible national configuration of treatment systems. To facilitate this assessment, DOE established the Options Analysis Team (OAT) comprised of site representatives and members of the DOE/HQ FFCAct Task Force. The OAT coordinated their efforts with the states, through the National Governors' Association (NGA), to ensure the national mixed waste configuration reflects both the states' and DOE's concerns. As part of this evaluation, the impacts of implementing the emerging DSTP configuration, as well as alternative configurations, were evaluated.

The focus of the OAT's effort has been on LLMW. While HLW and MTRU are also covered by the FFCAct, the strategies for managing these wastes have already been established. However, DOE recognizes that modifications of these strategies may be needed as the programs evolve and new information becomes available.

In combination, the DSTPs formed a mixed waste treatment configuration which was the baseline for the OAT analyses. Changes to the DSTP configuration proposed by the OAT are based on the following analyses:

- a. Review of the DSTP baseline configuration to identify redundant and technically inefficient proposed treatment options:
- b. Identification of alternative treatment configurations that emphasize key state and DOE concerns.
- c. Evaluation of the DSTP baseline and alternate configurations against key evaluation areas to determine what combination of treatment options result in a configuration that best meets the concerns of DOE, the states, EPA, and other stakeholders.

The results of the original OAT analyses were shared with each of the sites and the state regulator, as well as DOE management. The OAT worked for several more months responding to state requests for additional analyses, incorporating ongoing site analysis, and responding to comments. The resulting configuration was DOE's best attempt to balance competing DOE and stakeholder interests.

2.2.1 Preferred Option Selection Process

The Treatment Selection Guides, identified during the development of the DSTP, shall continue to be used as new mixed waste streams are identified at the NTS. Although DOE shall determine which treatment option

is preferred, these selection guides provide information for selecting among treatment options by comparing the options on fundamental criteria. Regulatory compliance, environmental health and safety, treatment effectiveness, implementability, stakeholders' concerns, life-cycle costs, and technology development are all considered in determining a treatment option. Cost and budget information and assumptions for newly identified mixed wastes will be determined using the guidelines provided in the Cost Information Guidance identified for the DSTP. Drafts of these and other technical assistance documents were provided to the states and their comments incorporated into the final revision. These documents are available in the DOE/NV Public Reading Facility located at 2621 Losee Road, Building B-3, Las Vegas, Nevada.

2.2.2 Treatment Option Selection Methodology

At the NTS, there are two types of waste sources:

- larger volume waste sources; and,
- smaller, discrete, or unique waste sources.

A tiered-analysis approach will be used to speed process selection and separate the on-site treatment needed to support the larger waste sources from that needed for the smaller, discrete sources.

The tiered approach used by DOE/NV included three basic steps to identify and analyze treatment options for existing NTS mixed waste streams. The steps include the following:

- a facilitated workshop among the NTS waste and DOE/NV Office of Environmental Management (EM) program managers to bound the treatment requirements and possible technologies;
- an analysis of the workshop outcomes; and,
- a comparison of technologies and treatment requirements against those known to be available or planned at the NTS and other DOE sites.

2.3 Coordination With Regulatory Agencies and Other Stakeholders

The FFCAct offers an opportunity for DOE, state, and EPA regulators who will be approving the STPs to work cooperatively toward defining mixed waste treatment plans. As requested by the states, DOE signed a cooperative agreement in August 1993 with the NGA to facilitate the DOE-to-state interactions. The NGA has sponsored national meetings on a routine basis with DOE, the states, EPA, and the Indian Tribes throughout the development of the STPs.

Officials from the DOE/NV EM program will continue to interact with the NDEP representatives regarding the NTS STP. This interaction includes regular meetings to discuss recent developments and future plans. The FFCAct requires the states and EPA to provide for public involvement after the PSTPs were submitted in April 1995. DOE has provided additional opportunities for public input into the development of the DOE/NV STP through existing public involvement mechanisms.

DOE/NV continues to notify the media and the public of significant STP development milestones. DOE/NV announced the completion of the NTS CSTP, DSTP, and PSTP through news releases, making these plans available to the public upon request. DOE shall announce other major milestones regarding STPs through news releases or other public announcements. In addition, DOE will provide fact sheets describing the STP and other FFCAct initiatives. DOE shall place this information in the local DOE Public Reading Facility for review by all interested parties.

The Community Advisory Board (CAB) for NTS Programs was formed to provide advice and comments on EM activities at DOE/NV. DOE officials asked the CAB to review and comment on the PSTP in May 1995. No comments were received.

The Public Participation Plan for the DOE/NV EM Program contains information about opportunities for community involvement. These activities include public meetings, speaking events, and educational activities. Public involvement opportunities for the NTS STP will be combined with these planned activities, as appropriate.

At the national level, DOE has presented information on the development of the STPs to the Environmental Management Advisory Board and held an open house in Washington, D.C., when the DSTPs were released. DOE also met informally with representatives of Indian Tribes and separately with representatives of other

groups that may have an interest in the STP development. The purpose of the meetings was to determine if there are national issues that may not be identified through site-specific activities. Additional opportunities to obtain input at the national level may be offered in coordination with the state and EPA. The Center for Environmental Management provides information on FFCAct activities at the national level (1-800-736-3283, 202-863-5084 in Washington, D.C.).

2.4 Characterization of Mixed Wastes

Characterization is the key initiating step for developing and implementing treatment processes. In order to design a treatment process, the waste radionuclide content, matrix, and its RCRA constituents must be understood well enough to design a safe and effective treatment system. Shipments of waste to a treatment facility cannot be initiated until it is determined that the facility's WAC are satisfied.

For disposal at the NTS, LLMW is characterized in accordance with the requirements of DOE/NV Report NVO-325 (Rev. 1), *The Nevada Test Site Defense Waste Acceptance Criteria, Certification, and Transfer Requirements*, June 1992. MTRU waste at the NTS shall be certified to the WIPP WAC (WIPP-DOE-069, current revision). The NTS mixed waste generators must have in place a program for characterizing waste that uses process knowledge and/or analytical data to document the characterization of the waste. Characterization is required for both storage and disposal of mixed waste at the NTS Area 5 RWMS.

Mixed waste generators at the NTS are responsible for characterizing their waste. Depending on the type of NTS activity, waste characterization programs have been developed by these generators to provide characterization data to the regulators. Sources of waste generated at the NTS include defense programs-related support activities, ER activities, and activities supporting TRU waste disposal at WIPP. All generators of LLMW must develop characterization programs in accordance with NVO-325 to obtain approval for disposal of waste at the NTS. Compliance with NVO-325 requires development of sampling plans prior to sampling, documented data validation from sample analysis, traceable analyses results, reporting on NVO-325 specific data forms, and independent quality assurance audits of waste certification data.

2.4.1 Approach for Waste Characterization and Regulatory Determination

DOE/NV standards require waste characterization documentation to include specific information about the mixed waste stream, including volume, generation process, known radioactive or hazardous constituents,

storage location, and container type. Upon completion of the waste characterization documentation, the regulatory status of the waste will be determined. Waste characterization determinations will be based on process knowledge or sampling programs outlined in approved sampling and analysis plans. Completed waste characterization documentation is maintained by the characterization group as well as the generating organization.

2.4.2 Approach for Characterizing TRU Waste

It is anticipated that the MTRU waste currently stored at the NTS will be characterized in an on-site certification facility; options for a facility of this nature are currently being evaluated. Characterization at this facility will ensure that the stored MTRU waste is packaged and certified to meet the most current WIPP WAC.

2.4.3 Approach for Characterizing ER Waste

The focus of waste characterization for DOE/NV ER project activities is on confirmation of process knowledge through sampling and analysis and site characterization. By characterizing the site, the waste has, by default, also been characterized. Historical information, in the form of records, reports, and employee interviews, is gathered to obtain process knowledge of previous site activities. This process knowledge allows sampling and analysis to be focused on the most probable contaminants. All LLMW and low-level waste (LLW) is characterized in accordance with the requirements specified in NVO-325 which encompasses the requirements found in RCRA, state of Nevada hazardous waste regulations, and DOE Orders. NVO-325 specifies that process knowledge be adequately documented and that certain analyses be performed. Process knowledge about secondary investigation-derived waste (e.g., personal protective equipment, sampling equipment) is gathered and documented on a Material Evaluation Form (MEF). Additional process knowledge can be gained through implementing a Pollution Prevention Opportunity Assessment (PPOA). This negates the requirement for additional sampling and analyses beyond that required to characterize the site while still complying with the requirements of NVO-325.

2.5 Waste Minimization

DOE/NV has developed a Waste Minimization and Pollution Prevention (WMin/PP) awareness program. The WMin/PP program at the NTS is two-tiered: site-wide and generator-specific. DOE/NV publishes the site-

wide program plan and guidance. Each generator is responsible for developing a generator-specific implementation plan. WMin/PP plans and procedures were consulted and will continue to be consulted when selecting treatment technologies for mixed waste.

The primary focus of WMin/PP awareness planning in response to Executive Order 12856, *Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements*, is goal setting. Criteria for setting goals and establishing baselines are established in the site-wide program. Each generator is required to use these standards for establishing their generator-specific plan. The focus of the DOE/NV WMin/PP awareness program is pollution prevention through source reduction and PPOAs.

Activity Data Sheets (ADSs) are used to budget for environmental management WMin/PP in response to Executive Order 12856, the Defense Programs Pollution Prevention Program Strategic Plan, the DOE 1993 WMin/PP Crosscut Plan, and the Environmental, Safety and Health Management Plan. The ADSs become part of the site-wide WMin/PP awareness plan and provide a tool for funding and tracking the progress and performance of the plan.

In order to minimize generation of mixed waste, plans and procedures have been developed limiting the number and type of hazardous materials that may be purchased or brought into an exclusionary zone. When possible, nonhazardous materials are substituted in place of hazardous materials. Waste minimization is one of the criteria considered in determining the most appropriate remedial action at ER sites. Worker training, employee awareness programs, and award programs for employee waste minimization suggestions all play a part in raising awareness of waste minimization issues. The DOE/NV Waste Minimization Task Force is a multi-contractor committee with a mission of waste minimization problem solving, technology sharing, educating workers, and developing community relations. The Task Force has been nationally recognized as an outstanding example of waste minimization outreach.

3.0 LLMW Streams

This section presents a preliminary compilation of treatment options for NTS LLMW assembled from known treatment technologies and includes DOE/NV's approach for treating and characterizing its current mixed waste inventories. Using the methodology found in Section 2.0 of the BV, several treatment options have been identified that may effectively treat NTS mixed waste streams. Unless otherwise specified, preferred and

alternative treatment option(s) are offered for each waste stream described herein. Treatment technologies and their application to NTS wastes will continue to be reviewed as new information becomes available.

Waste streams resulting from ER activities, or which are expected to be generated from ER activities, will be stored on the TRU Pad under the Mutual Consent Agreement. Within nine months of the date of placement of such wastes on the TRU Pad, DOE/NV will submit to NDEP a plan for the treatment and disposal of such wastes. Upon NDEP's concurrence, this plan will be deemed to be a compliance schedule for the purpose of the LDR storage prohibition. Waste streams resulting from ER activities, therefore, will not be managed under the FFCAct and the STP.

The following are existing waste streams at the NTS that are considered in the STP. More details regarding the status of each of these waste streams is provided in the subsequent sections.

- a. Polychlorinated Biphenyl (PCB) Soil
- b. Lead-Contaminated Soils
- c. Bulk Lead Wastes
- d. Solvent Sludge (Area 12)
- e. Shipping Cask
- f. Treatability Test Facility (TTF) Solvent
- g. Pico Fluor
- h. Analytical Services Department (ASD) Solvent
- i. Basic Environmental Compliance and Monitoring Program (BECAMP) Scintillation Vials
- j. BECAMP Scintillation Vial - Associated Waste
- k. Cotter Concentrate (Population A)
- l. Cotter Concentrate (Population B)

3.1 Mixed Waste Streams for Which Technology Exists

The waste streams included in this section can be treated to LDR standards using proven available technologies or proven available technologies with minor modifications. Potential treatment options evaluated for these waste streams include the use of existing on-site or off-site facilities, commercial facilities, facilities constructed and not currently operating but being brought into operational status, and new on-site or off-site facilities.

3.1.1 PCB Soil

A 30-gallon container holding 0.11 m³ (3.9 ft³) of soil and debris is currently in storage on the NTS, and through sampling and chemical analysis, this waste has been shown to contain not only PCB but also the hazardous constituents methylene chloride, acetone, toluene, and 1,1,1-trichloroethane (see Table 1). As with most cleanup operations, the cleanup materials were added to the drum as a waste material. This material includes rags and protective clothing. The soil was sampled for radionuclide content and determined to be nonradioactive material by the Reynolds Electrical & Engineering Co., Inc. (REECo) [currently Bechtel Nevada (BN)] ASD. The soil was scheduled to be disposed as hazardous waste by Rollins, the company under contract with BN to dispose hazardous waste off site. When prepared for shipment, the drum was monitored for radioactive contamination with a micro-R meter, and a maximum contact reading of 50 micro-R/hour was detected. This reading is above the acceptable 25 micro-R/hour limit allowed by Rollins for disposal. The PCB Soil has remained in storage on the Area 5 TRU Pad since that time, and additional characterization is planned.

Table 1. Waste Data Summary for PCB Soils

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W005	F001, F003, F005	S4100 Soil	0.11

In order for the PCB Soils to be sampled, the drum must be opened and the contents inventoried. Based on information provided, the drum is known to contain soil as well as a plastic bag containing rags. It is assumed that the rags were generated from the cleaning of shovels that were used to place the soil into the drum as well as from wiping the contaminated materials from the transformer and concrete pad. During the inventory of the contents, a radiation survey will be conducted to confirm the presence of radioactivity. In addition, a sample of the soil will be obtained and analyzed for organic constituents, as well as radioisotopes, to provide formal, documented characterization of the drum contents. This sampling and inventory effort will be conducted in accordance with a written sampling and analysis plan.

3.1.1.1 Preferred Option

The current treatment technology under investigation for PCB Soil is incineration at an off-site facility. DOE Oak Ridge (DOE/OR) currently operates the only known Toxic Substance Control Act (TSCA) Incinerator within the DOE complex and is, therefore, the facility of choice for treatment of the PCB Soils. Discussions with DOE/OR and DOE/NV personnel have been initiated, but official acceptance of the waste will require complete characterization as well as the modification of the RCRA Part B Permit for the TSCA Incinerator to accept solid waste. If the PCB Soil is incinerated at the TSCA Incinerator, then the resulting residue will be shipped for disposal to Envirocare, a commercial treatment/disposal facility in Utah.

3.1.1.2 Alternative Option for PCB Soil

Because of the TSCA regulations imposed on this waste stream and the unavailability of another TSCA incinerator that accepts mixed waste, there is no alternate treatment option for PCB Soil except continued storage in the interim until more treatment capacity or technology is developed.

3.1.2 Lead-Contaminated Soil

This waste stream consists of Lead-Contaminated Soil from the Area 3 Field Operations Department (FOD), the NTS T2 Site, Area 12, and the Area 27 EOD Unit.

3.1.2.1 Preferred Option

Based on the existing waste stream data, the method that is currently being investigated for the treatment of the Lead-Contaminated Soil is the on-site screening of the soil to remove the lead shot. After screening the soil, a Toxicity Characteristic Leachate Procedure (TCLP) analysis will be performed on the soil to determine if it still exhibits the characteristic of toxicity due to the presence of lead. If the soil does exceed TCLP for lead, then it will be solidified (e.g., cementation). If the soil does not exhibit the lead toxicity characteristic but is radioactively contaminated, then, in accordance with Title 40 C.F.R. 261.3(d)(1), it is not hazardous waste and will be disposed as low-level radioactive (solid) waste. If the soil requires treatment, it will be solidified and disposed by Envirocare.

The lead shot that has been screened from the soil will first be evaluated to determine if the waste exhibits levels of radioactivity that preclude recycling or disposal off site as hazardous waste. If no detectable radioactivity is found on the lead shot that exceeds the NTS Performance Criteria radioactivity levels, then it will be disposed off site as hazardous waste or recycled. If the lead shot is determined to be mixed waste, treatment will be completed by macroencapsulating it, along with the Bulk Lead Waste, as described in Section 3.1.3 in both the BV and the PV of the STP.

3.1.2.2 Alternative Option

An alternative option for treating the Lead-Contaminated Soil is to solidify it on site at a RCRA-permitted facility, such as the solidification facility proposed in Area 5 as an alternative treatment option for Cotter Concentrate (Population A). This treatment option is discussed further in Section 3.3.1 in both the BV and the PV to the STP.

3.1.2.3 FOD Lead Soil (Area 3)

In storage at the Area 5 TRU Pad is approximately 29.8 m³ (1,050 ft³) of soil contaminated with lead shot and radionuclides (see Table 2). Information based on soil samples taken from the immediate area where this waste was generated and general knowledge of the levels of radioactivity in Area 3 have been used to provide the preliminary assessment that the soil contains radioisotopes and requires management as a radioactive waste. The soil, generated by the REEC Co (currently BN) FOD, was sampled and analyzed for hazardous constituents (metals) and radionuclides. The waste failed the TCLP analysis for lead and also showed a presence of fission products. The FOD Lead Soil contains visible lead shot mixed with soil that has been radioactively contaminated as a result of past atmospheric weapons tests.

Table 2. Waste Data Summary for FOD Lead Soil

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W019	D008	S4100 Soil	29.8

3.1.2.4 T2 Lead

T2 Lead is comprised of Bulk Lead Waste and Lead-Contaminated Soil that originated from the NTS T2 site. The Bulk Lead Waste portion of this waste stream will be discussed further in Section 3.1.3 in both the BV and the PV to the STP.

An estimated 1.0 m³ (36 ft³) of potentially activated (radioactive) lead-contaminated soil is currently stored on the Area 5 TRU Pad (see Table 3) and is contained in drums and B-25 boxes. The material is assumed to be activated based on verbal discussions with personnel involved with its generation. Additional characterization is required to determine if the material is indeed activated and to what level.

Table 3. Waste Data Summary for T2 Lead

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W019 NT-W020	D008	X7211 Nonactivated Lead and Soils	1.0

3.1.2.5 Area 12 Lead Soil

An estimated volume of 0.62 m³ (22 ft³) of soil potentially contaminated with activated lead is currently stored in B-25 boxes on the Area 5 TRU Pad (see Table 4). The material was generated in support of Defense Nuclear Agency (DNA) activities.

Table 4. Waste Data Summary for Area 12 Lead Soil

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W019	D008	S4100 Soil	0.62

3.1.2.6 Area 27 EOD Lead Soil

The Area 27 EOD Lead Soil was generated in September 1994 at the Area 27 assembly facility during the remediation of a burn pit located at that facility. The waste sampled in the burn pit was shown to contain the metals lead and barium above the regulatory threshold. Based on initial radiological characterization, four of the five drums containing Area 27 EOD Lead Soil were determined to be acceptable for disposal as hazardous waste at an off-site waste disposal facility. These four drums have been removed from the TRU Pad, with disposal pending final characterization. The remaining drum is currently stored on the Area 5 TRU Pad (see Table 5). Final characterization must be completed on this drum prior to treatment and disposal.

Table 5. Waste Data Summary for Area 27 EOD Lead Soil

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W021	D008, D005	S4100 Soil	0.20

3.1.3 Bulk Lead Wastes

The Bulk Lead waste stream consists of Spent Batteries (fragmented), DNA Lead Cylinders, the bulk lead portion of T2 Lead, Jr. Hot Cell Mesh, Area 25 Test Cell C Lead, and the lead shot from the Lead-Contaminated Soil waste stream.

3.1.3.1 Preferred Option

Macroencapsulation is the preferred treatment option for elemental lead as specified in Title 40 C.F.R. 268.40. There is currently no on-site treatment available for the Bulk Lead Waste; therefore, macroencapsulation at an off-site facility is the preferred treatment option. Due to the size limitation of the lead pieces that Envirocare can treat, approximately 60 percent of the Bulk Lead Waste will be treated at Envirocare in Utah. Once the Bulk Lead Waste has been encapsulated, it will be disposed at Envirocare as mixed waste meeting LDR.

The remaining 40 percent of the Bulk Lead Waste will be treated at the Scientific Ecology Group (SEG) facility in Oak Ridge, Tennessee or at an equivalent off-site facility. At the SEG facility, the lead will be

decontaminated and the radiologically-clean pieces of lead will be recycled. The recycled lead will either be used within the DOE complex or sold to a commercial recycling company. The waste resulting from the decontamination process will be sent to Envirocare for treatment and disposal. If the lead cannot be decontaminated, then the lead pieces will be melted in SEG's proposed re-melter facility and recycled.

3.1.3.2 Alternative Option

In the event the preferred treatment facilities cannot be used to treat the Bulk Lead Waste, off-site facilities around the nation, such as Pantex's Mobile Macroencapsulation Unit, will be pursued.

3.1.3.3 Spent Batteries (Fragmented)

A 20-gallon drum containing lead-acid batteries generated in Area 15 is currently stored on the Area 5 TRU Pad (see Table 6). This waste stream consists of three automobile lead-acid batteries that were discarded due to deterioration and unacceptable performance.

Table 6. Waste Data Summary for Spent Batteries (Fragmented)

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W020	D008	X7410 Lead-Acid Batteries	0.076

Preliminary characterization has verified the presence of radioactive contamination, and the batteries are being managed as a mixed waste.

3.1.3.4 DNA Lead Cylinders

An estimated 0.21 m³ (7.0 ft³) of material in over-packed drums, consisting of potentially activated lead in the form of four steel-coated lead cylinders and two potentially activated lead bricks, is currently stored on the Area 5 TRU Pad (see Table 7). It will be necessary to evaluate the pieces of lead individually to determine the level of activation and surface contamination. The material consists of solid pieces of lead shielding, which were presumed to be activated during testing activities at the NTS. The level of activation and the potential that sufficient decay has occurred have not been fully evaluated.

Table 7. Waste Data Summary for DNA Lead Cylinders

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W020	D008	X7210 Elemental Lead	0.21

3.1.3.5 T2 Lead

As discussed in Section 3.1.2.4, T2 Lead is comprised of Bulk Lead as well as Lead-Contaminated Soil. An estimated 2.1 m³ (75 ft³) of potentially activated elemental lead is currently stored at the Area 5 TRU Pad (see Table 8). The material consists of bricks, shielding, and bulk material. Additional characterization is required to determine if the material is indeed activated and to what level.

Table 8. Waste Data Summary for T2 Lead

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W019 NT-W020	D008	X7210 Elemental Lead	2.1

3.1.3.6 Jr. Hot Cell Mesh

The Jr. Hot Cell Lead Mesh was removed from between the concrete panels that formed the walls of the Jr. Hot Cell. The Jr. Hot Cell was constructed at the Reactor Maintenance, Assembly and Disassembly Facility in Area 25 of the NTS for use in the development and research of nuclear rockets. The mesh acted as shielding between the walls of the hot cell. It was removed during the decontamination and decommissioning of this facility in September 1995 (see Table 9).

Table 9. Waste Data Summary for Jr. Hot Cell Mesh

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W022	D008	X7210 Elemental Lead	0.37

3.1.3.7 Area 25 Test Cell C Lead

The Area 25 Test Cell C Lead consists of lead bricks that were abandoned at the Area 25 Test Cell C Facility. The bricks have been shown to be radioactively contaminated through a radiological survey conducted with hand-held field instruments (see Table 10).

Table 10. Waste Data Summary for Area 25 Test Cell C Lead

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-023	D008	X7210 Elemental Lead	0.01

3.1.4 Solvent Sludge (Area 12)

Approximately 17 gallons of spent solvent sludge generated from a solvent recovery operation in Area 12 are currently stored in two containers on the Area 5 TRU Pad (see Table 11). Preliminary characterization shows the sludge contains an organic component as well as radiological constituents.

Table 11. Waste Data Summary for Solvent Sludge (Area 12)

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W002	F001, D008 (to be verified through additional characterization)	S3222 Halogenated Organic Sludges	0.11

3.1.4.1 Preferred Option

The existing permitted DOE/OR TSCA Incinerator is currently the preferred treatment facility for the Area 12 Solvent Sludge. Discussions with DOE/OR and DOE/NV personnel have been initiated, but official acceptance of the waste will require complete characterization as well as the modification of the RCRA Part B Permit for the TSCA Incinerator to accept solid waste. If the Area 12 Solvent Sludge is incinerated at the TSCA Incinerator, then the resulting residue will be shipped to Envirocare in Utah for disposal.

3.1.4.2 Alternative Option

The possibility for off-site incineration may, in the future, exist at the SRS Consolidated Incineration Facility (CIF); however, the SRS cannot accept off-site mixed waste at this time. SRS has requested additional information on this waste stream. Treating this waste stream at the SRS CIF is dependent upon forthcoming characterization data, which will verify whether the waste stream meets the CIF WAC. This option will be exercised if the NTS fails to obtain DOE/OR's approval to treat the waste. In addition, treatment at the CIF is contingent upon the facility receiving approval to treat off-site mixed waste and the NTS waste meeting the CIF WAC.

3.1.5 Shipping Cask

Currently stored on the Area 6 Decontamination Pad is a 45,000-pound Shipping Cask (see Table 12) that was used for transporting spent fuel assemblies. The Cask was radioactively contaminated on the external surface. The external surface was decontaminated, but several months after decontamination, it was discovered that radioactivity had wept to the surface. The Cask contains lead shielding, which is completely housed within the stainless steel shell.

Information was provided to the NDEP regarding the physical description and type of contamination. A formal request was made of the state of Nevada on March 22, 1995, asking whether the Cask must be managed as LDR mixed waste based on the information provided. The NDEP requested additional information regarding the fabrication of the Cask and the expected lifetime of the stainless steel shell if disposed of at the Area 5 RWMS. The information was provided to the NDEP in a letter dated August 7, 1995.

On December 7, 1995, the NDEP requested that DOE/NV investigate all possible treatment and disposal options for the Cask. DOE/NV investigated treatment options both on site and off site. Facilities considered included SEG, INEL, Hanford, and Envirocare. After comparing costs, time frames, environmental impacts, advantages, and disadvantages, it was concluded that disposal on site at the Area 5 RWMS was the best option. NDEP was formally notified of these findings by DOE on February 16, 1996.

Table 12. Waste Data Summary for Shipping Cask

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W010	D008	X7211 Nonactivated Lead	2.2

3.1.5.1 Preferred Option

The formal proposal, recommending disposal of the Shipping Cask in Pit 3 of the Area 5 RWMS as mixed waste meeting LDR, has been accepted by the NDEP. DOE/NV and the NDEP have agreed that the Cask, in its present form, meets the definition of macroencapsulated lead as indicated by an NDEP letter of approval dated February 23, 1996.

The Cask has been removed from the PV of the STP because treatment is not required prior to disposal. However, the Cask is still discussed in the FFCA Act CO because of an agreement reached with the NDEP.

3.1.5.2 Alternative Option for Shipping Cask

Alternative options previously considered included sending the Cask off site for dismantling. INEL and SEG were identified as having the ability to perform this work. If problems arise while disposing of the Cask as stated in the preferred option, dismantling will be revisited as an alternative.

3.1.6 TTF Solvent

A drum of liquid (see Table 13) was discovered on the north side of Building 3152 in August of 1994. This drum contained approximately 0.21 m³ (7.4 ft³) of liquid that emitted a strong odor when opened. The drum was sampled in September 1994, and the results indicated the presence of acetone and cesium-137 above levels allowed for off-site shipment as a hazardous waste. The material was determined to be mixed waste and moved to the Area 5 TRU Pad for storage.

Table 13. Waste Data Summary for TTF Solvent

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W015	F003 (to be verified through additional characterization)	L2120 Aqueous/ Nonhalogenated Organic Liquid	0.21

3.1.6.1 Preferred Option

The DOE/OR TSCA Incinerator is currently the preferred treatment facility for the TTF Solvent but additional characterization must be performed to verify that the WAC is met. Discussions with DOE/OR and DOE/NV personnel have been initiated, but official acceptance of the waste will require complete characterization. If the TTF Solvent is incinerated at the TSCA Incinerator, then the resulting residue will be shipped to Envirocare in Utah for disposal.

3.1.6.2 Alternative Option

The possibility for off-site incineration may exist in the future at the CIF SRS; however, they currently cannot accept off-site mixed waste. SRS has been contacted and, in return, has requested additional information on TTF Solvent. This option will be exercised if the NTS fails to obtain DOE/OR's approval to treat the waste, the CIF is approved to treat off-site mixed waste (TTF Solvent), and TTF Solvent meets the CIF WAC.

3.1.7 Pico Fluor

Pico Fluor is used by the BN (formerly REEC Co) analytical laboratory for analysis of tritium in laboratory samples (see Table 14). A 30-gallon container of this material was in storage at the NTS until it was shipped off site for treatment and disposal on October 24, 1994. The shipment eliminated the existing stored volume of this waste stream. However, continued generation of this waste will occur at the NTS until the analytical laboratory ceases to use it to analyze for tritium. This waste stream will not be discussed in the PV because it meets RCRA LDR standards after treatment¹.

¹Only noncompliant or potentially noncompliant RCRA waste are discussed in the PV of the STP.

Table 14. Waste Data Summary for Pico Fluor

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W008	D001	X6400 (Scintillation Cocktails)	0.0

3.1.7.1 Description of Technology and Capacity Needs

The Pico Fluor waste stream requires incineration to destroy the organic component: 1,2,4-trimethylbenzene. A 30-gallon container of existing stored waste volume has been incinerated, although continued generation of this waste stream is expected. As the waste is generated, it is placed into a satellite accumulation area until a sufficient volume is generated to warrant shipment off site for incineration. The annual generation rate of this waste is estimated at 0.060 m³ (2.0 ft³) per year.

3.1.7.2 Preferred Option

Perma-Fix of Florida (formerly Quadrex Environmental Company), located in Gainesville, Florida, was identified as the preferred option for destruction of the vials and disposal of the scintillation liquids. Perma-Fix of Florida is an operational treatment and disposal facility licensed in the state of Florida. Perma-Fix of Florida possesses an active Florida Radioactive License and RCRA Permit.

DOE/NV successfully completed the transfer of the Pico Fluor to Perma-Fix of Florida on October 24, 1994. A uniform waste manifest was utilized for shipment of this waste, and a Certificate of Destruction for this waste stream was received and dated December 1, 1994.

3.1.8 ASD Solvent

ASD Solvent (see Table 15) is a toluene-based scintillation cocktail that is generated by the BN ASD during analysis for the noble gas components krypton and xenon.

Table 15. Waste Data Summary for ASD Solvent

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W013	D001	L2120 Aqueous/ Nonhalogenated Organic Liquid	0.0

3.1.8.1 Description of Technology and Capacity Needs

In December 1994, the REECo (currently BN) analytical laboratory analyzed the spent cocktail to determine if it was a candidate for disposal as a hazardous waste. The analysis proved that radioactivity was below allowable levels and did not meet the definition of a mixed waste; therefore, the spent cocktail was sent off site as a hazardous waste. On December 5, 1994, the existing inventory of ASD Solvent was manifested and transported off site for disposal as hazardous waste. As of December 6, 1994, the inventory of ASD Solvent was zero.

3.1.8.2 Preferred Option

This waste will continue to be generated and current plans call for continued disposal as hazardous waste. In the event that the material is evaluated and shown to have radioactivity above those limits allowed by the off-site disposal facility, the material will be managed as mixed waste and treatment options will be evaluated and implemented. Based on experience with the material, it is not anticipated that a level of radioactivity in this waste stream will ever be detected above those disposal limits allowed by the disposal facility nor will this waste require management as a mixed waste. The ASD Solvent will remain in the BV of the STP for future reference.

3.1.9 BECAMP Scintillation Vials

The BECAMP Scintillation Vials consisted of a xylene-based scintillation cocktail generated from studies conducted at the NTS for tritium migration in the environment (see Table 16). A 55-gallon drum of approximately one thousand 20-milliliter vials was stored at the NTS until it was shipped off site for treatment and disposal on October 24, 1994. This waste stream will no longer be generated but will remain in the BV of the STP for future reference.

Table 16. Waste Data Summary for BECAMP Scintillation Vials

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W004	F003, D001	X6400 (Scintillation Cocktails)	0.0

3.1.9.1 Description of Technology and Capacity Needs

The BECAMP Scintillation Vials required incineration to destroy the organic component of the waste. Approximately 15 liters of scintillation cocktail were contaminated with tritium. Generation of the scintillation vials was terminated in early 1994. No additional tritium-contaminated scintillation cocktails are expected to be located or generated at the NTS from the BECAMP program.

3.1.9.2 Preferred Option

The preferred option for disposition of the scintillation vials was to ship to Perma-Fix of Florida for destruction of the vials and disposal of the scintillation liquids. The WAC for this treatment and disposal facility was met based on analytical data and knowledge of tritium concentrations in the vials. The technology used included crushing the vials; sending the nonradioactive solids to a nonhazardous, nonradioactive landfill; and accumulating the fluids for transportation to a rotary kiln where it was mixed with other kiln fuels and incinerated.

DOE/NV successfully completed the transfer of scintillation cocktails to Perma-Fix of Florida on October 24, 1994. A uniform waste manifest was utilized for shipment of the vials, and a Certificate of Destruction for this waste stream was received and dated December 1, 1994.

3.1.10 BECAMP Scintillation Vial - Associated Waste

The drum liner from the 55-gallon drum where the BECAMP Scintillation Vials were stored, the cardboard vial holders, and the plastic gloves worn by personnel who packaged the material for shipment have remained in storage on the Area 5 TRU Pad since October 24, 1994. The material was stored as potentially mixed waste, pending the determination of its regulatory status.

The characterization process for the BECAMP Scintillation Vial - Associated Waste (drum liner, plastic gloves, and cardboard vial holders) was initiated on June 20, 1995. The material was stored as potentially mixed waste, pending the determination of its regulatory status. This waste was removed from the PV of the STP because DOE and the state of Nevada have concurred that it is not a mixed waste².

3.2 Waste Streams for Which Technology Exists but Needs Adaptation or for Which No Technology Exists

Currently, there is no LLMW identified at the NTS for which no technology exists or for which technology exists but requires adaptation.

3.3 Mixed Waste Streams Requiring Further Characterization or for Which Technology Assessment Has Not Been Done

Currently, two LLMW streams identified at the NTS require further characterization.

3.3.1 Cotter Concentrate (Population A)

Cotter Concentrate, a sludge-like residue resulting from uranium ore processing, was sent to the NTS for storage in 1987 from the DOE Mound Plant in Miamisburg, Ohio. The material is stored in 1,244 55-gallon containers, and the sludge residue is known to contain uranium, thorium, and associated daughter products. Of the 1,244 drums currently stored at the NTS, 1,236 were believed to contain radioactive and inorganic materials that met LDR; therefore, these were awaiting treatment that would bind the free liquid content of the sludge and meet NVO-325 criteria for disposal in the NTS Area 5 RWMS. The remaining eight drums were believed to contain radionuclides, organic constituents, and inorganic constituents below LDR. These drums were being stored at the Strategic Materials Storage Yard until treatment options became available for the organic constituents. In January 1994, the state of Nevada approved a sampling plan for characterizing the Cotter Concentrate. That summer, the sampling and analysis plan was implemented. The results were published and distributed to the state of Nevada in October 1994. Results showed selenium to be the major RCRA constituent, but it was found to be below the LDR thresholds published at the time.

²The regulatory determination of this waste stream was confirmed in a letter submitted from DOE/NV to NDEP dated January 31, 1996 entitled "Regulatory Status of BECAMP Scintillation Vial - Associated Waste."

The sampling and analysis plan split the 1,244 containers (55-gallon drums) into two separate populations. Population A (Table 17) consisted of the 1,236 drums suspected of containing only inorganic constituents and radionuclides. Population B consisted of the eight drums that were suspected of containing inorganic constituents and radionuclides as well as organic constituents. Population B is discussed in Section 3.3.2 of this plan. Single samples were obtained from 20 randomly selected containers from within Population A and evaluated for pH, flash point, free liquid content, radioisotopes, and TCLP metals. The results of the analysis indicated that all 1,236 drums must be managed as mixed waste due to the presence of a hazardous constituent, selenium (exceeds minimum TCLP levels), in addition to the concentrated levels of several radionuclides including uranium, thorium, the associated daughter products, and protactinium-231. The material also exhibits a pH above 12.5 and therefore, has the characteristic of corrosivity (D002). Because this waste has the characteristic of corrosivity, the newly published LDR thresholds (59 *FR* 47980, 48041, September 19, 1994) decreased the allowable selenium concentration for land disposal. The selenium concentrations now exceed the new LDR thresholds, and the waste's underlying hazardous constituents must be analyzed as required by Title 40 C.F.R. 268.40.

Table 17. Waste Data Summary for Cotter Concentrate (Population A)

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-A009	D002, D010	S3129 Unknown Other Inorganic Sludges	260

3.3.1.1 Preferred Option

The preferred option for the treatment of Cotter Concentrate (Population A) is dependent upon the results of a treatability study. The preferred treatment option under investigation is on-site solidification (e.g., cementation) using an outside vendor.

A detailed plan for treating the 1,236 drums of Cotter Concentrate (Population A) was published in October 1994. This plan, titled the *Cotter Concentrate Treatment and Disposal Plan*, contains the requirements for treatability tests, siting for full-scale processing, equipment needs, facility needs, and decontamination and closure of the facility. The plan also contains schedules and projected costs for each activity. Progress on the implementation of the October 1994 plan for the treatment of Cotter Concentrate (Population A) will be included in the Annual Update to the STP.

3.3.1.2 Alternative Option for Cotter Concentrate (Population A)

If cementation on site with an outside vendor is not possible, then a waste treatment facility will be constructed on site using NTS personnel. If cementation on site is not deemed viable, then vitrification at either an on-site or off-site facility will be pursued.

3.3.2 Cotter Concentrate (Population B)

Cotter Concentrate (Population B) consisted of eight drums that were suspected to contain inorganic and organic constituents as well as radionuclides (see Table 18). A single sample was obtained from each drum so that each drum was represented on an individual basis. The samples were analyzed for volatile organic analytes, TCLP metals, pH, flash point, free liquids, and radioisotopes. The results of the analyses indicated that seven of the eight drums must be managed as mixed waste. The eighth drum was deemed to be LLW only. These seven drums exhibit various combinations of toxicity characteristics due to the presence of carbon tetrachloride and selenium as well as the characteristic of corrosivity due to variable pH levels above 12.5 and below 2. Because this waste exhibits the characteristic of corrosivity, it must also be analyzed for its underlying hazardous constituents in accordance with Title 40 C.F.R. 268.40.

Table 18. Waste Data Summary for Cotter Concentrate (Population B)

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-B009	F001, F005, D002, D010	S3229 Unknown/Other Organic Sludge	1.4

The seven drums that contain hazardous organic constituents were over-packed in February 1995 and are being stored on the Area 5 TRU Pad. The drum that contains only low-level waste was also over-packed in February and is presently being stored at the Area 6 Decontamination Facility, pending certification and disposal as LLW at the Area 5 RWMS.

3.3.2.1 Preferred Option

The preferred treatment technology under investigation for Cotter Concentrate (Population B) is incineration at the DOE/OR TSCA Incinerator. Discussions with DOE/OR and DOE/NV personnel have been initiated,

but official acceptance of the waste will require complete characterization, as well as the modification of the RCRA Part B Permit for the TSCA Incinerator to accept solid waste. If the Cotter Concentrate (Population B) is incinerated at the TSCA Incinerator, then the resulting residue will be shipped to Envirocare in Utah for disposal.

3.3.2.2 Alternative Option

If the preferred option is not deemed viable, then organic extraction followed by stabilization will be pursued as the alternate treatment option for Cotter Concentrate (Population B). Fernald has proposed to construct the Mobile Chemical Treatment Unit, which will be capable of such treatment. The facility should be on-line by mid-FY 1996.

4.0 MTRU Waste Streams

The current DOE strategy for management of MTRU waste is to maintain the MTRU wastes in safe storage; to characterize, certify, process if necessary, and package the wastes to meet the WIPP WAC; and to permanently dispose of applicable MTRU waste at WIPP. Compliance with the requirements of the FFCAct for MTRU waste will be achieved by WIPP using the RCRA no-migration variance petition approach provided in Title 40 C.F.R. 268.6. Under this strategy, no treatment other than that necessary to meet the WIPP WAC is anticipated; however, the performance assessment and the EPA no-migration variance determination will ascertain what treatments, if any, will be required to ensure disposal compliance.

The DOE/Carlsbad Operations Office (DOE/Carlsbad) is actively gathering inventory and characterization data for input into the performance assessment and preparing several regulatory submittals to the EPA to demonstrate compliance with no-migration variance petition requirements. A draft compliance certification package was submitted to EPA in May 1995; a draft no-migration variance petition to the EPA in May 1995; and a revised RCRA Part B Permit Application to the New Mexico Environment Department by June 1995. A final compliance certification package (including final performance assessment results) is planned for submission to the EPA by December 1996 with the disposal WIPP WAC finalized by June 1997. DOE plans to declare operational readiness for WIPP by December 1997. Disposal of contact-handled (CH) TRU waste will begin in June 1998 followed by RH TRU waste in FY 2002. These dates are contingent upon Permit approval, availability of funds, certification of disposal compliance, and determination of no-migration from the appropriate regulators.

Site-specific information is included in Section 4.1, *Site MTRU Waste Management Approach*, to outline activities being performed at NTS to maintain safe, compliant storage, waste characterization activities, and other activities planned to support the ultimate goal of shipment to and disposal at WIPP under a no-migration variance petition.

4.1 Site MTRU Waste Management Approach

The MTRU waste stored at the NTS Area 5 RWMS (see Table 19) was generated at LLNL and shipped to the NTS between 1974 and 1990. The waste inventory consists of 58 steel boxes and 1,637 steel drums with a total volume of 610 m³ (21,550 ft³). This waste is stored in the 1,995 m² (21,470 ft²) TRU Pad Cover Building on an asphalt storage pad that is approximately 8,300 m² (89,300 ft²). The area of the TRU Pad Cover Building adequately contains all of the MTRU waste in addition to providing ample aisle space for equipment and personnel.

Table 19. Waste Data Summary for MTRU Waste

Mixed Waste Inventory Report ID Number	RCRA Waste Code	Matrix Code	Current Volume (cubic meters)
NT-W001	D001-D003; D006-D008; D011; F001-F003; P015	S5490 Unknown/Other Heterogeneous Debris	610

The NTS TRU waste stream data is published in the DOE 1995 MWIR as NT-W001: NTS Mixed TRU Waste from LLNL. The waste was declared as potentially mixed by the generator in April 1991. Since most of this waste was packaged before RCRA characterization requirements were imposed, LLNL did not characterize the waste for its hazardous constituents. Isotope content, activity, quantity, and EPA codes were established based on process knowledge provided by the generator. A process flow analysis was conducted for this waste stream based primarily on process knowledge. Currently, none of the MTRU waste is certified for disposal at the WIPP due to deficiencies in characterization data, oversized packaging, possible prohibitive contents, and a lack of headspace gas and volatile organic compound sampling.

4.1.1 Preferred Option for MTRU Wastes Expected To Go To WIPP

All NTS MTRU waste currently stored on the TRU Pad is expected to be certified for disposal at WIPP. A large volume of the NTS MTRU wastes (retrievably stored since mid-to-late 1970) are packaged in containers

that are not acceptable for transport in the Transporter-II (TRUPACT-II). In addition, during real-time radiography operations conducted in the 1980s, several packages were found to contain small volumes of free liquids and unpunctured aerosol cans. This waste will need to be repackaged and prohibitive items stabilized prior to shipment.

The TRUPACT-II will be the preferred shipping package used to transport TRU and MTRU waste from the NTS to WIPP. To ensure compliance with the payload restrictions of the TRUPACT-II, the *Nevada Test Site Compliance Plan for TRUPACT-II - Authorized Methods for Payload Control* was developed. This document identifies the requirements and responsibilities for managing TRU and MTRU waste shipments in the TRUPACT-II while on the NTS. The NTS shall ship waste to the WIPP only during its operations phase, not during its enhanced laboratory test phase.

4.1.1.1 Waste Examination Facility (WEF)

A WEF has been proposed to breach, sample, and certify both the boxes and the drums of NTS MTRU Waste. The facility will be constructed in Area 5 and will be operational in 1997, pending successful completion of a pilot-scale study. The waste will be transported from the Area 5 TRU Pad Cover Building to the WEF, where each container will be inventoried, sampled if feasible, and repackaged into containers acceptable for disposal at the WIPP.

The facility will consist of a Permacon®-type structure housed within a building, using both high efficiency particulate airborne filtration and negative pressure to collect any airborne particulate matter. A glove box will be placed inside the structure and used for sorting activities. Upon repackaging of the MTRU at the WEF, the waste will be placed back into storage on the Area 5 TRU Pad, where it will await transportation to the WIPP.

4.2 MTRU Wastes Not Destined for WIPP

The current strategy for WIPP is to consider only CH TRU and RH TRU wastes generated by defense programs and placed in retrievable storage since 1970. Dispositioning wastes not meeting these criteria (e.g., ER, D&D) and nondefense TRU waste are currently in the planning process.

The NTS emplaced TRU waste in Greater Confinement Disposal (GCD) 120 foot boreholes from 1984 through 1989. Of the 13 GCD holes, three contain nuclear accident residues (classified materials and TRU) and one contains TRU-contaminated material. The waste was emplaced in the bottom 15.2 m (50 ft) of the borehole and the remaining 21.3 m (70 ft) were backfilled with alluvium. Decisions to retrieve or leave the waste in GCDs shall be based on performance assessments required by Title 40 C.F.R. 191, and/or risk assessments required by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) National Contingency Plan or RCRA Corrective Action.

5.0 High-Level Mixed Waste Streams

The NTS has not generated high-level mixed waste in the past.

6.0 Future Generation of Mixed Waste Streams

Most mixed wastes generated in the future are expected to be derived primarily from ER and D&D activities. The treatment of all mixed waste generated by ER and D&D activities shall be enforced and managed by the FFA CO negotiated between DOE/NV and the state of Nevada. In the event that the FFA CO has not been adopted by DOE/NV and the state of Nevada before ER and D&D mixed wastes are generated, the waste shall be stored on the Area 5 TRU Pad under the existing Mutual Consent Agreement. As new waste streams other than those generated by ER and D&D are identified, they shall be managed in accordance with RCRA under the conditions of the Mutual Consent Agreement.

Mixed waste that may be generated during the characterization and/or remediation of the Underground Testing Area and the Area 6 Decontamination Pond projects were discussed in previous versions of the STP. They have been removed from the plan because mixed waste streams that may be generated from ER activities, such as these, will be managed in accordance with the FFA CO, as discussed earlier in Section 1.5.5 of the BV.

7.0 Storage Report

DOE is committed to storing waste in compliance with the RCRA storage requirements pending the development of treatment capacity and implementation of the STPs. If mixed waste is to be shipped off site for treatment, storage of the waste before and after treatment will be arranged on a case-by-case basis between the shipping and receiving sites in consultation with the affected state regulatory agencies. Factors, such as

inadequate compliant storage capacity at the shipping site and the need to facilitate closure of the shipping site, will be considered in proposing shipping schedules.

7.1 State of Nevada and DOE/NV Settlement Agreement for TRU Waste Storage

As provided in the Settlement Agreement for MTRU waste, DOE/NV continues to operate the Area 5 RWMS TRU Waste Storage Pad in accordance with Title 40 C.F.R. 265 Subpart I. MTRU wastes are stored at NTS in a configuration required under RCRA. Weekly inspections are conducted in accordance with Title 40 C.F.R. 265. The Agreement requires DOE/NV to triannually review the "Mixed Transuranic Waste Removal Status Document." This document identifies reasons why the MTRU waste inventory cannot be removed until WIPP becomes operational. DOE/NV is committed to annually submitting a report describing the progress towards certifying the current TRU waste volume stored at the NTS to the WIPP WAC.

A polyvinyl chloride-coated polyester fabric cover building has been constructed to house the MTRU waste inventory on the TRU Pad. The cover building was initiated with prior approval from the state of Nevada, as required in the Settlement Agreement. This building provides ample space for RCRA inspections and emergency response. The building interior was designed with a perimeter curb to prevent potential egress of contaminants should a spill occur. Construction was completed in June 1994. Transfer of the MTRU waste inventory to the cover building was initiated with approval by the state of Nevada.

7.2 State of Nevada and DOE/NV Mutual Consent Agreement for LLMW Storage

A Mutual Consent Agreement has been established by DOE/NV and the state, allowing available storage capacity on the TRU Pad to be used for the storage of on-site generated LLMW that does not meet RCRA LDR provisions. It was originally established in January 1994, and was updated in June 1995 to incorporate the handling of LLMW generated by DOE/NV activities within the state of Nevada not currently identified in the STPs. The changes also provided DOE/NV with a nine-month period to prepare and submit a plan for the treatment and disposal of such wastes. In the anticipation of additional LLMW generated on site, the development of a new MWSU is in progress. As required by the January 1994 Agreement, a RCRA Part B Permit Application was submitted for a new MWSU in January 1995. Although it is the intent of DOE/NV to produce as little LLMW as possible until treatment options are available, future volumes of these wastes are currently unknown.

7.2.1 MWSU

The MWSU, for which a RCRA Permit application was submitted to NDEP in January 1995, is a proposed RCRA storage unit located within the Area 5 RWMS. The MWSU will consist of an epoxy-coated curbed concrete pad approximately 3,020 m² (32,500 ft²) in area with all but approximately 85 m³ (3,000 ft³) covered with a roof. The uncovered portion will serve as an unloading apron and may serve as additional storage area for solid material.

The covered concrete storage-area floor will be 62.2 m (204 ft) long by 44.2 m (145 ft) wide with 15-cm (6-in.) high curbs that extend above the 15-cm (6-in.) thick floor slab. The curbing is continuous around the exterior of the structure. The curbs will divide the floor area into two segregated accumulation areas. Solid waste will be stored on the larger area, and liquid waste will be stored on the smaller area located in the northeast corner. Wastes that are incompatible will be placed on opposite sides of the segregation areas and on separate spill pallets. An attached curbed, covered concrete apron having a storage area of 6.1 m (20 ft) by 44.2 m (145 ft) will be located on the north end of the MWSU. This apron will be used for storing large bulk containers filled with solid mixed waste and will also be used as a staging area.

8.0 Process for Evaluating Disposal Issues in Support of the STP Discussions

This section discusses the overall DOE process for evaluating issues related to the disposal of residuals from the treatment of LLMW subject to the FFCAct. The NTS is one of the 16 sites being analyzed further for potential development as a disposal site for residuals from the treatment of LLMW subject to the FFCAct. This section outlines the disposal planning process developed by DOE, in consultation with the states, for evaluating potential options for the disposal of residuals from the treatment of LLMW. Importantly, because DOE is not currently developing LLMW disposal sites (with the exception of the Hanford Site), preferred alternatives or final destinations for disposal of treatment residuals are not known at this time. The results of this process are intended to be considered during subsequent planning activities and discussions between DOE and regulatory agencies.

8.1 Background

The FFCAct requires DOE to develop a plan for the treatment of mixed wastes. The FFCAct does not impose any similar requirement for the disposal of mixed wastes after they have been treated; however, DOE

recognizes the need to address this final phase of mixed waste management. The following process reflects DOE's current strategy for evaluating the potential options for disposal. The evaluation will increase understanding of the strengths and weaknesses of a site's potential for disposal but is not a site selection process. Ultimately, the identification of sites that may receive mixed waste for disposal will follow state and federal regulations for siting and permitting and will include appropriate public involvement.

HLMW and MTRU are among the mixed waste subject to the FFCAct. Options for disposal of these mixed wastes are not identified by this process because there are established processes for studying, designing, constructing, and operating disposal facilities for these wastes.

The DOE has historically planned to develop LLMW disposal facilities at the six DOE sites currently disposing LLW. These sites are Hanford, SRS, Oak Ridge, INEL, NTS, and Los Alamos National Laboratory. Currently, the Hanford Site has the only active permitted facility operated by DOE for the disposal of residuals from the treatment of LLMW. This plan has been redirected in conjunction with the planning efforts of the FFCAct to include the results of the disposal planning process (Figure 2) and the WM PEIS. The sites subject to evaluation under this process are the 49 sites reported to Congress by DOE in the MWIR (April 1993) that are currently storing or expected to generate mixed waste.

8.2 Disposal Planning Process

Although the FFCAct does not specifically address disposal of treated mixed wastes, both DOE and the states have recognized that disposal issues are an integral part of treatment discussions. A process was established to evaluate and discuss the issues related to the potential disposal of residuals from the treatment of DOE LLMW at the sites subject to the FFCAct shown in Figure 2. The focus of this process has been to identify, from among the 49 sites that currently store or are expected to generate mixed waste, sites that are suitable for further evaluation of their potential as disposal sites. Sites determined to have marginal or no potential for disposal activities have been removed or deferred from further evaluation under this process. The remaining sites are presently being evaluated more extensively. Ultimately, a number of sites are expected to be identified that are technically acceptable for disposal of treated residuals.

Figure 2. Disposal Planning Process

8.2.1 Activities to Date

8.2.1.1 Site Grouping

The initial step in this process was to examine each of the 49 sites to determine which sites, while individually listed in the MWIR, were in such geographic proximity that further analysis could address them as a single site. This grouping reduced the number of sites to 44, as follows:

- INEL and Argonne National Laboratory (West) are located on a single federally owned reservation near Idaho Falls, Idaho;
- The Sandia National Laboratories, California, and LLNL are located on adjoining, federally owned properties near Livermore, California;
- The Inhalation Toxicology Research Institute and Sandia National Laboratories, New Mexico, are located on the same federally owned reservation; and,
- The Oak Ridge National Laboratory, Oak Ridge K-25 Site, and Oak Ridge Y-12 are all located within the federally owned Oak Ridge Reservation near Oak Ridge, Tennessee.

8.2.1.2 Initial Site Screening

At a joint meeting on March 3 and 4, 1994, DOE and the states agreed on three exclusionary criteria for further screening the 44 remaining sites. These criteria were developed by reviewing federal and state requirements regarding the siting of waste treatment, storage, and disposal facilities. In order to be evaluated further, a site:

- must not be located within a 100-year floodplain;
- must not be located within 61 m (200 ft) of an active fault; and,
- must have sufficient area to accommodate a 100-meter buffer zone.

The first criterion (100-year floodplain) is derived from both Nuclear Regulatory Commission (NRC) and RCRA requirements. The second criterion (active fault) was selected from requirements found in RCRA that restrict the location of waste treatment, storage, and disposal facilities. The third criterion (sufficient area for 100-meter buffer) is derived from guidance from EPA, NRC, and DOE for the proper operation of waste facilities.

Evaluation of the 44 sites resulted in identification of 26 sites meeting the above criteria. At a joint meeting on March 30 and 31, 1994, DOE and the states agreed to remove those sites not meeting the screening criteria from further evaluation. Also, at that meeting, DOE agreed to collect additional, more detailed information on the remaining 26 sites to identify additional strengths and weaknesses of the sites. It was agreed that DOE or any affected state may propose further elimination of sites from consideration following site-specific evaluation.

8.2.1.3 Evaluation of the Remaining 26 Sites

DOE and the states met on July 26 and 27, 1994, to discuss the site-specific data on the remaining 26 sites and to consider proposals for eliminating additional sites from further evaluation. The focus of these discussions was to identify sites suitable for further evaluation under this process.

The criteria that DOE and the states used to eliminate sites from further evaluation at this stage were derived from three main groupings of considerations: Technical Considerations, Potential Receptor Considerations, and Practical Considerations. Each of the remaining 26 sites were evaluated against criteria in these groupings that included soil stability and topography, precipitation and evapotranspiration, population, proximity to sensitive environment, land acquisition, government presence at the site, and regulatory constraints.

Sites with marginal or no potential for disposal, based on these criteria, were recommended for removal or postponement from further evaluation. As a result of the meeting, DOE and the states agreed to eliminate five sites from further evaluation due to their limited potential for disposal. These sites are listed as follows:

<u>Site</u>	<u>State</u>
Energy Technology Engineering Center	California
General Atomics	California
General Electric, Vallecitos Nuclear Center	California

<u>Site</u>	<u>State</u>
Pinellas Plant	Florida
Site A/Plot M	Illinois

Additionally, DOE and the states agreed to merge the evaluation of Knolls Atomic Power Laboratory at Niskayuna, New York, and Knolls Atomic Power Laboratory at Kesselring, New York, due to their close, geographic proximity.

While not eliminated from further evaluation, it was agreed to lower the evaluation priority of an additional four sites. Issues, such as the technical capabilities of the site, the volume of mixed waste that may be generated by the sites, and the acceptability of off-site waste, contributed to a conclusion that further evaluation of some sites should not be a high priority. DOE and the states agreed to evaluate these sites in terms of their capability to dispose their own mixed waste if no other off-site disposal options could be identified. These sites will not be considered for disposal of wastes from other sites and may be eliminated from further analysis if sufficient evidence suggests the potential for disposal is too limited. The sites in this category are as follows:

<u>Site</u>	<u>State</u>
Weldon Spring Remedial Action Project	Missouri
Brookhaven National Laboratory	New York
Mound Plant	Ohio
Bettis Atomic Power Laboratory	Pennsylvania

8.2.1.4 Performance Evaluation

The performance evaluation to be conducted for the 16 sites identified for further evaluation entails the collection of more detailed site-specific data related to the site characteristics. The performance evaluation methodology is based on the principles of radiological performance assessments and was developed by DOE performance assessment experts. Additionally, the evaluation will be based on RCRA-compliant engineered facilities. This information will be used to evaluate the sites and estimate the radionuclide concentration limits of waste that may be disposed at a given site. The performance evaluations were initiated in August 1994. The 16 sites for which performance evaluations are being prepared are as follows:

<u>Site</u>	<u>State</u>
Lawrence Livermore National Laboratory, Site 300	California
Rocky Flats Environmental Technology Site	Colorado
Idaho National Engineering Laboratory	Idaho
Argonne National Laboratory	Illinois
Paducah Gaseous Diffusion Plant	Kentucky
Nevada Test Site	Nevada
Los Alamos National Laboratory	New Mexico
Sandia National Laboratories, NM	New Mexico
West Valley Demonstration Project	New York
Fernald Environmental Management Project	Ohio
Portsmouth Gaseous Diffusion Plant	Ohio
Savannah River Site	South Carolina
Oak Ridge National Laboratory	Tennessee
Pantex Plant	Texas
Hanford Site	Washington

8.2.2 Next Steps in Disposal Site Evaluation Process

As illustrated in Figure 2, progress has been made in the planning of the disposal process. The following steps outline future activities that are either ongoing or are to be completed to facilitate an informed decision about the disposal of DOE LLMW. Coordination with the states will continue to ensure stakeholders' input and to resolve concerns at the earliest possible stage.

8.2.2.1 Status of Performance Evaluations

All performance evaluations have been completed with the exception of Knolls Atomic Power Laboratory, which was deleted from the list of the final 16 sites due to discussions with the U.S. Navy.

8.2.2.2 Develop Estimates of Waste Volumes and Radionuclide Concentrations in Treated Residuals

Once treatment methods for the LLMW streams are finalized through the FFCAct process, estimates of the volumes and radionuclide concentrations of the treated residuals will be developed for all waste streams.

These analyses will take place after the STPs have been approved by the appropriate regulatory agencies. These estimates are needed to compare the performance evaluation-derived radionuclide concentration guides.

8.2.2.3 Compare Estimates of Radionuclide Concentration in Treated Residuals to Performance Evaluation-Derived Radionuclide Concentration Guides

Radionuclide concentrations for each site's treated residual will be compared to those disposal values derived in the performance evaluation in this step. Comparing radionuclide concentrations in treated residuals with performance evaluation concentration guides will compare LLMW stream characteristics to potential disposal sites' capabilities. This evaluation will also include off-site DOE and commercial disposal site candidates for those treated waste streams which do not have on-site capabilities. Confirmation of the candidates' waste streams and sites will be attained through detailed performance assessment efforts.

8.2.2.4 Develop Sample Configurations for Disposal of Treated Residuals

An OAT approach will be employed to develop sample complex-wide configurations for the disposal of treated LLMW residuals. These configurations will take into account such technical issues as compatibility of radionuclides (both handled at the site and those considered acceptable by the performance evaluations) and the capacity to handle projected residual volumes, etc. Under the OAT approach, other types of issues will be weighed during configuration discussions such as transportation costs and distances.

8.2.2.5 Develop a Draft Disposal System Configuration

Using the sample configurations as a starting point, DOE will develop with state and stakeholder input, a draft disposal system configuration. This configuration will be the basis for determining future funding and schedules for proposed disposal facilities. The Final WM PEIS will provide bounding analysis of potential environmental impacts for the range of sample configurations considered. It will identify preferred sites for further development as disposal facilities. Following the issuance of the ROD for the WM PEIS, DOE may initiate site-specific NEPA evaluations for the proposed disposal facilities; initiate performance assessment analyses for compliance with DOE Order 5820.2A; and initiate processes for permitting disposal facilities.

8.3 Integration with the STP Process

The FFCAct does not require disposal to be included in the STPs; however, given the complex issues involved, DOE recognizes the importance of state input to facilitate resolution of issues related to disposal. Section 8.0 information is provided in the STP to continue to involve the states and inform them of DOE's continued work in this issue. For more detailed information on the ongoing performance evaluation process, refer to the *Progress Report on Performance Evaluation of DOE Sites' Capabilities for Mixed Low-Level Waste Disposal*. As the disposal planning process moves forward, further information will be provided and coordination with the states will continue.

PLAN VOLUME

1.0 Purpose and Scope

The DOE is required to prepare a plan for developing treatment capacities and technologies for each facility at which DOE generates or stores mixed waste pursuant to Section 3021(b) of the RCRA, 42 U.S.C. 6939c(b), as amended by Section 105(a) of the FFCAct (Public Law 102-386). Upon submission of the plan to the appropriate regulatory agency, the FFCAct requires the recipient agency to solicit and consider public comments and approve, approve with modification, or disapprove the plan within six months. The agency is to consult with the EPA and any state in which a facility affected by the plan is located. Upon approval of a plan, the regulatory agency may issue a CO requiring compliance with the approved plan.

DOE/NV has prepared this STP for mixed waste at the NTS that identifies how DOE/NV proposes to obtain treatment of the site's mixed waste or develop technologies where technologies do not exist or need modification. For some waste streams, a plan and schedules for characterizing wastes, undertaking technology assessments, and providing the required plans and schedules for developing capacities and technologies, as appropriate, are provided.

The purposes of this STP include:

- Fulfilling the requirements of the FFCAct.
- Establishing an enforceable framework in conjunction with the CO in which DOE/NV will develop and treat or otherwise meet RCRA LDR for all covered LDR mixed wastes currently in storage and to be generated or received in the future.
- Allowing for storage of current and projected covered LDR mixed wastes at the NTS during implementation of this STP and the CO.

The PV, in conjunction with the BV, comprises the STP. The PV provides overall schedules with milestones and interim activity dates for achieving compliance with LDR and a general framework for the establishment and review of milestones and interim activity dates. Additional discussion contained in the BV is provided for informational purposes only.

This STP, once approved and a CO issued, fulfills the requirements contained in the FFCAct of 1992, RCRA Section 3021; and therefore, pursuant to Section 105(a) of the FFCAct [RCRA Section 3021(b)(5)], this STP and the Order shall stand in lieu of any other interpretations of DOE/NV's requirement to develop and submit a plan for the development of treatment capacities and technologies pursuant to RCRA Section 3021.

2.0 Implementation of the STP

This section establishes the mechanisms and procedures for administering and implementing the treatment plans and schedules in Sections 3.0 through 5.0 of the PV of the STP.

2.1 Regulatory Framework

It is anticipated that DOE/NV will negotiate a CO with the state of Nevada that will establish the regulatory framework for enforcing and implementing the STP. The Order will address such topics as jurisdiction, definition and procedure for revisions, updating the STP, inclusion and deletion of the waste streams from the STP, and procedures for review and approval.

2.2 Interim Activity Dates, Milestones, and Deadlines

The PV of the STP provides overall schedules for achieving compliance with LDR requirements for mixed wastes at the NTS. The schedules include those activities required to bring existing waste into treatment facilities or technologies into operation, and activities required to develop new facilities and capacities for treatment. The PV presents the steps necessary for treatment technologies and facilities for wastes covered under the STP to treat mixed waste. Other information on the mixed waste streams found in the BV of the STP is provided solely for informational purposes.

The relationship between the dates enforceable by the state of Nevada through the NTS FFCAct CO, enforceable activities in the STP, and activities that support enforceable activities in the STP was based on the concepts of deadlines, milestones, and interim activity dates, respectively. In previous versions of the STP, the terms milestones and target dates were used to describe this relationship.

Deadlines are fixed, firm, and enforceable dates as set forth in the NTS FFCAct CO. Changes or revisions to deadlines are subject to approval, approval with modification, or disapproval by the state of Nevada

according to the process and framework set forth in the NTS FFCAct CO. Deadlines are provided within the FY+2 time frame, and are subject to stipulated penalties as set forth in the CO.

Milestones shall mean an important or critical event, goal, task, and/or activity that must occur in order to achieve the objectives set forth in the STP. The term "deadline" in the CO corresponds with the term "milestone" found in the STP; however, the milestone is the enforceable activity and the deadline is the date by which the milestone is enforceable.

Interim activity dates identify dates or time frames by which a certain activity necessary to treat each waste stream, as set forth in the PV of the STP, is scheduled to occur. Interim activity dates are not enforceable and stipulated penalties do not apply. They are included in the STP as a tool to gauge the status of waste treatment activities.

2.3 Funding

DOE proposes to the states an opportunity to have input into formulating the NTS budget and setting the NTS budget priorities as outlined in the NTS FFCAct CO. DOE will have the option to review interim activity dates, milestones, and deadlines (mandated in the CO), on an annual basis and consider funding availability. Nothing in the STP affects DOE's authority over its budget and funding level submissions. Further, it is DOE's position that any requirement for the payment or obligation of funds by DOE established by the terms of the STP and the Order requiring compliance with the STP would be subject to the availability of appropriated funds and that no provision of the STP or the Order should be interpreted to require the obligation or payment of funds in violation of the Anti-Deficiency Act, 31 U.S.C. Section 1341, as amended. In cases where the payment would constitute a violation of the Anti-Deficiency Act, the dates established requiring the payment or obligation of such funds should be appropriately adjusted. Funding of interim activity dates, milestones, and deadlines will be reviewed on an annual basis.

3.0 Low-Level Mixed Waste (LLMW) Streams

Section 3.0 presents schedules to DOE/NV's approach for treating its current mixed waste inventories.

The overriding approach to all DOE/NV waste is one of minimizing delay by using cost-effective, readily available technologies and systems, whenever possible. For DOE/NV's waste streams, possibilities exist for

on-site and off-site treatment inside the DOE complex, and on-site and off-site commercial treatment. If the treatment options specified for the waste streams cannot be implemented in an acceptable time frame, the state of Nevada will be notified and an alternative waste treatment plan will be provided in forthcoming Annual Update as discussed in Section 6.0.

3.1 Mixed Waste Streams for Which Technology Exists

Section 3.1 details which LLMW streams exist in the current DOE/NV inventory that are characterized sufficiently to determine what technologies and capabilities are required for safe, environmentally sound and compliant treatment and includes those mixed wastes proposed to be shipped off site for treatment.

3.1.1 Plan for Activities and Estimated Schedules for PCB Soil

The characterization of PCB Soil includes preparation of a sampling and analysis plan after reviewing existing waste stream data. During the inventory of the contents, a radiation survey was conducted to determine if radioactivity could be detected at levels previously suspected. A sample of the soil has been obtained and analyzed for organic constituents and radioisotopes to provide formal, documented characterization of the drum constituents. The analytical results of the sampling effort were used to complete the MEF and confirm the regulatory status of the drum as mixed waste.

The current treatment technology under investigation for this waste stream is incineration. There is no existing or planned TSCA-permitted incinerator at the NTS, nor would it be beneficial to construct one for the small volume of PCB-contaminated mixed waste stored at the NTS. Therefore, the proposed treatment for this waste is to utilize an off-site TSCA-permitted incinerator. DOE/OR currently operates the only known TSCA incinerator within the DOE complex and is, therefore, the facility of choice for treatment of the PCB Soil. Discussions with DOE/OR have been initiated, but official acceptance of the waste will require complete characterization as well as the modification of the RCRA Part B Permit for the TSCA Incinerator to accept solid waste.

3.1.1.1 PCB Soil Milestones and Interim Activity Dates

PCB SOIL SCHEDULE Page 1 of 1	
Unless otherwise specified, milestones and interim activity dates are contingent upon the selection of the preferred treatment option. If another treatment option is determined to be feasible and offers advantages in terms of cost and/or resources, then these milestones and interim activity dates will be revised accordingly. These milestones and interim activity dates will be null and void if the assumptions specified in Section 3.1.1.2 do not hold true.	
Complete All Additional Waste Characterization Required by Receiving Site's WAC (milestone)	December 31, 1996
Receive Written Approval of Acceptance from Receiving Site (milestone)	June 30, 1997
If Waste Rejected, Initiate Revision Process Detailed in NTS FFCA Act CO (milestone)	July 31, 1997
Initiate Preparation of Waste for Shipment, If Approved (milestone)	In accordance with receiving site approved schedule
Complete Shipment of Waste (interim activity date)	Dependent upon outcome of negotiations with appropriate parties

3.1.1.2 PCB Soil Milestones and Interim Activity Date Assumptions

The basis for the milestones and interim activity dates for treatment of PCB Soil includes the following:

- Assumes no regulatory changes that would exclude waste from regulation or subject waste to stricter regulatory standards than those now imposed.
- Assumes activity has required funding in place.
- Assumes additional sampling does not produce any "unforeseen" constituents that might impact the ability to ship waste to the DOE/OR TSCA Incinerator.
- Assumes DOE/OR will approve the waste for shipment.

- Assumes DOE/OR pilot test of the TSCA Incinerator will continue on its present schedule and be able to receive solid waste.
- Assumes no other off-site or on-site treatment option is selected.
- Assumes PCB Soil meets DOE/OR's WAC or can be treated to meet the WAC, and DOE/OR's TSCA Incinerator can successfully incinerate the waste.
- Assumes the RCRA Part B Permit for the TSCA Incinerator can be modified to accept the PCB Soil waste stream.
- Assumes no major interruptions with the process that could delay the processing of PCB Soil.
- Assumes no major natural hazards will affect the use of the treatment facility.

The relationship between the milestone and interim activity dates to these assumptions is presented in the logic flow diagram on the following page (see Figure 3).

3.1.2 Plan for Activities and Estimated Schedules for Lead-Contaminated Soil

This waste stream consists of lead-contaminated soil from the Area 3 FOD, the T2 Site, Area 12, and the Area 27 EOD Unit that were combined in this section due to physical similarities³. A sampling and analysis plan has been drafted that includes comprehensive schedules and a budget for characterization. After the characterization data has been returned and reviewed, the MEF will be completed.

The Lead-Contaminated Soil will be screened on site to remove the lead shot from the soil. After screening the waste, a TCLP analysis will be performed on the soil to determine if it still exhibits the characteristic of toxicity due to the presence of lead. If the soil does exceed the TCLP limit for lead, then it will be solidified (e.g., cementation) at Envirocare in Utah. If the soil does not exhibit the lead toxicity characteristic, then it will be disposed at the NTS as low-level radioactive (solid) waste.

³These waste streams appear separately in previous versions of this Site Treatment Plan.

Figure 3. Logic Flow Diagram for PCB Soil

The lead shot that has been screened from the soil will first be evaluated to determine if the waste exhibits levels of radioactivity that preclude disposal off site as hazardous waste. If no detectable radioactivity is found on the lead shot that exceeds the NTS Performance Criteria radioactivity levels, then it will be disposed off site as hazardous waste or recycled. If the lead shot is determined to be mixed waste, treatment at Envirocare in Utah will be conducted using macroencapsulation.

If Envirocare is unable to accept this waste for treatment because of contract constraints⁴, the lead shot will be shipped to SEG in Tennessee, or to an equivalent off-site facility, for treatment. At the SEG facility, the lead will be decontaminated and the radiologically-clean pieces of lead will either be recycled and used within the DOE complex or sold to a commercial recycling company. The waste resulting from the decontamination process will be sent to Envirocare for treatment and disposal. If the lead cannot be decontaminated, then the lead pieces will be melted in SEG's proposed re-melter facility and recycled.

3.1.2.1 Lead-Contaminated Soil Milestones and Interim Activity Dates

LEAD-CONTAMINATED SOIL SCHEDULE	
Page 1 of 1	
Unless otherwise specified, milestones and interim activity dates are contingent upon the selection of the preferred treatment option. If another treatment option is determined to be feasible and offers advantages in terms of cost and/or resources, then these milestones and interim activity dates will be revised accordingly. These milestones and interim activity dates will be null and void if the assumptions specified in Section 3.1.2.2 do not hold true.	
Complete Soil Screening and Initiate Sampling of Screened Soil (milestone)	September 30, 1996
Complete All Additional Waste Characterization Required by Envirocare WAC (interim activity date)	April 1, 1997
Receive Written Approval of Acceptance from Envirocare (interim activity date)	May 30, 1997
Submit Schedule for Processing Backlogged Waste <u>or</u> Initiate Revision Process Detailed in NTS FFCAct CO (milestone)	July 31, 1997
Complete Shipment of Waste to Receiving Site (milestone)	September 30, 1997

⁴Contract constraints may include specific time frames by which Envirocare will accept NTS mixed waste, as well as waste volume limits. If either the established time frames cannot be met or the allowable waste volumes are exceeded, then SEG or another off-site waste treatment facility will be pursued.

3.1.2.2 Lead-Contaminated Soil Milestone and Interim Activity Date Assumptions

The basis for the milestones and interim activity dates identified in Section 3.1.2.1 includes the following:

- Assumes no regulatory changes that would exclude waste from regulation or subject waste to stricter regulatory standards than those now imposed.
- Assumes activity has required funding in place.
- Assumes the lead shot from the Lead-Contaminated Soil, if determined to be mixed waste, can be successfully macroencapsulated.
- Assumes off-site treatment of wastes.
- Assumes a contract with Envirocare of Utah to solidify the mixed waste portion of the lead soil can be successfully negotiated within a reasonable time frame.
- Assumes a contract with SEG, or an equivalent off-site treatment facility, and Envirocare of Utah to treat the bulk lead portion of the Lead-Contaminated Soil waste can be successfully negotiated within a reasonable time frame.
- Assumes no major interruptions with the process that could delay the processing of the Lead-Contaminated Soil.
- Assumes no major natural hazards will affect the use of the treatment facility.

The relationship between the milestones and interim activity dates to these assumptions is presented in a logic flow diagram as Figure 4.

Figure 4. Logic Flow Diagram for Lead-Contaminated Soil

3.1.3 Plan for Activities and Estimated Schedules for Bulk Lead Wastes

This waste stream consists of Spent Batteries (fragmented), DNA Lead Cylinders, the bulk lead portion of T2 Lead, Jr. Hot Cell Mesh, and Area 25 Test Cell C Lead and were combined due to similar physical properties⁵. The characterization process for this waste stream has commenced. Existing data will be collected and evaluated and a determination made regarding the level of radiological contamination.

The proposed treatment method for approximately 60 percent of the Bulk Lead Waste is macroencapsulation and disposal at Envirocare in Utah, with the remaining 40 percent shipped to SEG in Tennessee. Due to the size limitation of the lead pieces that Envirocare can treat, lead pieces that exceed this size limitation will be shipped to the SEG facility, or to an equivalent off-site facility for treatment. At the SEG facility, the lead will be decontaminated and the radiologically-clean pieces of lead will be recycled. The recycled lead will either be used within the DOE complex or sold to a commercial recycling company. The waste resulting from the decontamination process will be sent to Envirocare for treatment and disposal. If the lead cannot be decontaminated, then the lead pieces will be melted in SEG's proposed re-melter facility and recycled.

3.1.3.1 Bulk Lead Waste Milestones and Interim Activity Dates

BULK LEAD WASTE SCHEDULE Page 1 of 1	
Unless otherwise specified, milestones and interim activity dates are contingent upon the selection of the preferred treatment option. If another treatment option is determined to be feasible and offers advantages in terms of cost and/or resources, then these milestones and interim activity dates will be revised accordingly. These milestones and interim activity dates will be null and void if the assumptions specified in Section 3.1.3.2 do not hold true.	
Complete All Additional Waste Characterization Required by Receiving Facility (milestone)	June 30, 1996
Initiate Preparation of Waste for Shipment, If Approved <u>or</u> Initiate Revision Process Detailed in the NTS FFCAct CO (milestone)	September 30, 1996
Submit Schedule of Processing Backlogged Waste Based Upon Completion of Demonstration Project (milestone)	December 31, 1996
Complete Shipment of Waste (interim activity date)	February 28, 1997

⁵These waste streams appear separately in previous versions of this STP.

3.1.3.2 Bulk Lead Milestone and Interim Activity Date Assumptions

The basis for the milestone and interim activity dates identified for Bulk Lead includes the following:

- Assumes no regulatory changes based upon the proposed "Hazardous Soils" rule, which would exclude waste from regulation or subject waste to stricter regulatory standards than those now imposed.
- Assumes activity has required funding in place.
- Assumes the Bulk Lead, if determined to be mixed waste requiring treatment, can be successfully macroencapsulated.
- Assumes a contract with SEG, or an equivalent off-site treatment facility, and Envirocare of Utah to treat Bulk Lead Waste can be successfully negotiated within a reasonable time frame.
- Assumes DOE/NV is exempt under Title 40 C.F.R. 261.4(e) to conduct the treatability study.
- Assumes no major interruptions with the process that could delay the processing of Bulk Lead waste.
- Assumes no other off-site or on-site waste treatment option is selected.
- Assumes no major natural hazards will affect the use of the treatment facility.

The relationship between the milestones and interim activity dates to these assumptions is presented in a logic flow diagram as Figure 5.

3.1.4 Plan for Activities and Estimated Schedules for Solvent Sludge (Area 12)

A sampling and analysis plan for Area 12 Solvent Sludge has been prepared and includes comprehensive schedules and a budget for characterization.

Based on the existing waste stream data, the proposed treatment for the Solvent Sludge is incineration at an off-site facility. Incineration will destroy the organic components that are presumed to exist in the waste (full

Figure 5. Logic Flow Diagram for Bulk Lead Waste

characterization has not yet been completed). There is no existing or planned incineration facility at the NTS, nor would it be beneficial to construct an incinerator for the small volume of organic mixed waste that exists at the NTS. Therefore, the proposed treatment for this waste is to locate an off-site incinerator that treats mixed waste.

The existing permitted DOE/OR TSCA Incinerator is currently the preferred treatment facility for the Area 12 Solvent Sludge. Discussions with DOE/OR personnel have been initiated, but official acceptance of the waste will require complete characterization to determine the DOE/OR WAC is met as well as the modification of the RCRA Part B Permit for the TSCA Incinerator to accept solid waste.

3.1.4.1 Solvent Sludge (Area 12) Milestones and Interim Activity Dates

SOLVENT SLUDGE (AREA 12) SCHEDULE Page 1 of 1	
Unless otherwise specified, milestones and interim activity dates are contingent upon the selection of the preferred treatment option. If another treatment option is determined to be feasible and offers advantages in terms of cost and/or resources, then these milestones and interim activity dates will be revised accordingly. These milestones and interim activity dates will be null and void if the assumptions specified in Section 3.1.4.2 do not hold true.	
Complete All Additional Waste Characterization Required by Receiving Site's WAC (milestone)	December 31, 1996
Receive Written Approval of Acceptance from Receiving Site (milestone)	June 30, 1997
If Waste Rejected, Initiate Revision Process Detailed in NTS FFCACT CO (milestone)	July 31, 1997
Initiate Preparation of Waste for Shipment, If Approved (milestone)	In accordance with receiving site approved schedule
Complete Shipment of Waste (interim activity date)	Dependent upon outcome of negotiations with appropriate parties

3.1.4.2 Solvent Sludge (Area 12) Milestone and Interim Activity Date Assumptions

The basis for the milestones and interim activity dates for treatment of Area 12 Solvent Sludge includes the following:

- Assumes no regulatory changes that would exclude waste from regulation or subject waste to stricter regulatory standards than those now imposed.
- Assumes activity has required funding in place.
- Assumes additional sampling does not produce any "unforeseen" constituents that might impact the ability to ship waste to the DOE/OR TSCA Incinerator.
- Assumes DOE/OR will approve the waste for shipment.
- Assumes that DOE/OR pilot test of the TSCA Incinerator will continue on its present schedule and be able to receive solid waste.
- Assumes no other off-site or on-site treatment option is selected.
- Assumes Area 12 Solvent Sludge meets DOE/OR's WAC, or can be treated to meet the WAC, and that DOE/OR's TSCA Incinerator can successfully incinerate the waste.
- Assumes the RCRA Part B Permit for the TSCA Incinerator can be modified to accept the Area 12 Solvent Sludge.
- Assumes no major interruptions with the process that could delay the processing of the Area 12 Solvent Sludge.
- Assumes no major natural hazards will affect the use of the treatment facility.

The relationship between the milestones and interim activity dates to these assumptions is presented in the logic flow diagram on the following page (see Figure 6).

Figure 6. Logic Flow Diagram for Solvent Sludge

3.1.5 Plan for Activities and Estimated Schedules for TTF Solvent

The characterization process for TTF solvent has been initiated. A sampling and analysis plan has been prepared and includes comprehensive schedules and a budget for characterization. After the characterization data has been evaluated, the MEF will be completed.

The proposed treatment for TTF Solvent is incineration of the waste to destroy the organic constituents. There is no existing or planned incineration facility at the NTS, nor would it be beneficial to construct one for the small volume of organic mixed waste stored at the NTS. Therefore, the proposed treatment for this waste is to use an off-site incinerator that is permitted to incinerate mixed waste containing organic constituents. The DOE/OR TSCA Incinerator is currently the preferred treatment facility for the TTF Solvent, but additional characterization must be performed to verify that the DOE/OR WAC is met. Discussions with DOE/OR personnel have been initiated. If possible, TTF Solvent will be shipped to the TSCA Incinerator with other NTS LLMW to be treated at this facility.

3.1.5.1 TTF Solvent Milestones and Interim Activity Dates

TTF SOLVENT SCHEDULE Page 1 of 1	
Unless otherwise specified, milestones and interim activity dates are contingent upon the selection of the preferred treatment option. If another treatment option is determined to be feasible and offers advantages in terms of cost and/or resources, then these milestones and interim activity dates will be revised accordingly. These milestones and interim activity dates will be null and void if the assumptions specified in Section 3.1.6.2 do not hold true.	
Complete All Additional Waste Characterization Required by Receiving Site's WAC (milestone)	December 31, 1996
Receive Written Approval of Acceptance from Receiving Site (milestone)	June 30, 1997
If Waste Rejected, Initiate Revision Process Detailed in NTS FFCAct CO (milestone)	July 31, 1997
Initiate Preparation of Waste for Shipment, If Approved (milestone)	In accordance with receiving site approved schedule
Complete Shipment of Waste (interim activity date)	Dependent upon outcome of negotiations with appropriate parties

3.1.5.2 TTF Solvent Milestone and Interim Activity Date Assumptions

The basis for the milestones and interim activity dates for treatment of TTF Solvent includes the following:

- Assumes no regulatory changes that would exclude waste from regulation or subject waste to stricter regulatory standards than those now imposed.
- Assumes activity has required funding in place.
- Assumes additional sampling does not produce any "unforeseen" constituents that might impact the ability to ship waste to the DOE/OR TSCA Incinerator.
- Assumes DOE/OR will approve the waste for shipment.
- Assumes no other off-site or on-site treatment option is selected.
- Assumes TTF Solvent meets DOE/OR's WAC, or can be treated to meet the WAC, and DOE/OR's TSCA Incinerator can successfully incinerate the waste.
- Assumes no major interruptions with the process that could delay the processing of the TTF Solvent.
- Assumes no major natural hazards will affect the use of the treatment facility.

The relationship between the milestones and interim activity dates to these assumptions is presented in the logic flow diagram on the following page (see Figure 7).

3.2 Waste Streams for Which Technology Exists but Needs Adaptation or for Which No Technology Exists

There is currently no mixed waste identified at the NTS in this category.

Figure 7. Logic Flow Diagram for TTF Solvent

3.3 Mixed Waste Streams Requiring Further Characterization or for Which Technology Assessment Has Not Been Done

Both Cotter Concentrate (Population A) and Cotter Concentrate (Population B) require further characterization prior to treatment.

3.3.1 Cotter Concentrate (Population A)

A sampling and analysis plan, implemented in June 1994, was written for Cotter Concentrate (Population A) and approved by the state of Nevada. Characterization of the material, according to the plan, was completed in July 1994 with a characterization report released in October 1994.

Changes in the Land Disposal Restrictions, referred to as the Phase II Rule promulgated on September 19, 1994, require a more comprehensive characterization of the Cotter Concentrate. Particularly, specific drums exhibiting the characteristic of corrosivity must be characterized to determine the underlying hazardous constituents. These specific underlying hazardous constituents must be treated to meet the new "universal treatment standards" prior to land disposal.

The treatment option being considered for Cotter Concentrate (Population A) is stabilization (e.g., cementation) at an on-site facility using an outside vendor. A treatability study is currently underway to stabilize the waste. If successful, a request for proposals (RFP) will be issued to commercial facilities for a pilot-scale study of the waste treatment process. If the pilot-scale study is successful, full treatment of the waste will be pursued using an outside vendor. On-site treatment will include the construction/assembly of a RCRA-compliant treatment, storage, and disposal (TSD) facility in Area 5. Progress on the treatment and storage of Cotter Concentrate (Population A) will be updated through the Annual Update, as discussed in PV Section 6.0.

3.3.1.1 Cotter Concentrate (Population A) Milestones and Interim Activity Dates

COTTER CONCENTRATE (POPULATION A) SCHEDULE Page 1 of 1	
Unless otherwise specified, milestones and interim activity dates are contingent upon the selection of the preferred treatment option. If another treatment option is determined to be feasible and offers advantages in terms of cost and/or resources, then these milestones and interim activity dates will be revised accordingly. These milestones and interim activity dates will be null and void if the assumptions specified in Section 3.3.1.2 do not hold true.	
Provide Results of Treatability Study to the state of Nevada (milestone)	April 30, 1996
Issue RFP for Pilot-Scale Study <u>or</u> Initiate Alternative Option (interim activity date) ⁶	June 30, 1996
Award RFP (interim activity date)	August 31, 1996
Initiate Pilot-Scale Study (interim activity date)	October 31, 1996
Complete Pilot-Scale Study (interim activity date)	December 30, 1996
Provide Treatment Results from Pilot-Scale Study to state of Nevada (milestone)	February 28, 1997
If Pilot-Scale Study Successful, Submit Request to Modify RCRA Part B Permit to the state of Nevada or Initiate Revision Process Detailed in NTS FFCAct CO (milestone)	April 30, 1997
State Approves Permit Modification (assumption)	At the discretion of the state of Nevada
Award RFP, Assemble Treatment System, and Initiate Treatment System Testing (milestone)	Within 12 months of permit issuance
Complete Successful System Testing and Submit Schedule for Processing Backlogged Volumes of Cotter Concentrate (milestone)	Within 6 months of completion of previous milestone
Initiate Processing of Cotter Concentrate (interim activity date)	Within 3 months of completion of successful system testing
Complete Cotter Concentrate Processing (interim activity date)	Date will be provided upon submittal of schedule for processing backlogged waste

⁶RFP will include provision for full-scale processing of waste if pilot-scale study is successful.

3.3.1.2 Cotter Concentrate (Population A) Milestone and Interim Activity Date Assumptions

The basis for the milestones and interim activity dates identified for Cotter Concentrate (Population A) include the following:

- Assumes no regulatory changes that would exclude waste from regulation or subject waste to stricter regulatory standards than those now imposed.
- Assumes activity has required funding in place.
- Assumes no underlying hazardous constituents are determined to be in the waste above regulatory limits, or if these constituents are present above regulatory limits, the waste can be successfully treated by the preferred option (cementation).
- Preferred option (cementation) is based upon assumption that treatability study will be successful and that water/cement ratio requires no adjustment to affect stabilization.
- Assumes that state of Nevada will approve treatment by cementation based upon successful results obtained from treatability study.
- Assumes no major interruptions with the process that could delay the processing of backlogged volumes of Cotter Concentrate (Population A).
- Assumes all applicable documentation required by NEPA can be prepared and approval granted by the appropriate agencies.
- Assumes procurement of materials will not negatively impact construction.
- Assumes no other off-site or on-site treatment option is selected.
- Assumes no major natural hazards will affect use of the treatment system.

The relationship between the milestones and interim activity dates to these assumptions are presented in the logic flow diagrams on the following page (see Figure 8).

Figure 8. Logic Flow Diagrams for Cotter Concentrate (Population A)

3.3.2 Planned Activities for Cotter Concentrate (Population B)

Characterization of Cotter Concentrate (Population B) has been conducted. However, changes in the LDRs, referred to as the Phase II Rule promulgated on September 19, 1994, require a more comprehensive characterization of the Cotter Concentrate (Population B). Particularly, specific drums exhibiting the characteristic of corrosivity must be characterized to determine the underlying hazardous constituents. These specific underlying hazardous constituents must be treated to meet the new "universal treatment standards" prior to land disposal.

The proposed treatment for Cotter Concentrate (Population B) is incineration at the DOE/OR TSCA Incinerator. Incineration will destroy the organic components that are present in the waste. Discussions with DOE/OR personnel have been initiated, but official acceptance of the waste will require Cotter Concentrate (Population B) meeting the DOE/OR WAC. In addition, the RCRA Part B Permit for the TSCA Incinerator must be modified to accept solids.

3.3.2.1 Cotter Concentrate (Population B) Milestones and Interim Activity Dates

COTTER CONCENTRATE (POPULATION B) SCHEDULE	
Page 1 of 1	
Unless otherwise specified, milestones and interim activity dates are contingent upon the selection of the preferred treatment option. If another treatment option is determined to be feasible and offers advantages in terms of cost and/or resources, then these milestones and interim activity dates will be revised accordingly. These milestones and interim activity dates will be null and void if the assumptions specified in Section 3.3.2.2 do not hold true.	
Complete All Additional Waste Characterization Required by Receiving Site's WAC (milestone)	December 31, 1996
Receive Written Approval of Acceptance from Receiving Site (milestone)	June 30, 1997
If Waste Rejected, Initiate Revision Process (milestone)	July 31, 1997
Initiate Preparation of Waste for Shipment, If Approved (milestone)	In accordance with receiving site approved schedule
Complete Shipment of Waste (interim activity date)	Dependent upon outcome of negotiations with appropriate parties

3.3.2.2 Cotter Concentrate (Population B) Milestone and Interim Activity Date Assumptions

The basis for the milestones and interim activity dates for treatment of Cotter Concentrate (Population B) includes the following:

- Assumes no regulatory changes that would exclude waste from regulation or subject waste to stricter regulatory standards than those now imposed.
- Assumes activity has required funding in place.
- Assumes an agreement is reached between DOE/OR and DOE/NV for DOE/OR to accept the Cotter Concentrate (Population B) waste for treatment.
- Assumes no other off-site or on-site treatment option is selected.
- Assumes no underlying hazardous constituents are determined to be present in the waste above regulatory limits, or if present above regulatory limits, the waste can be successfully treated by the preferred option (incineration).
- Assumes the Part B Permit for the TSCA Incinerator can be modified to accept Cotter Concentrate (Population B).
- Assumes Cotter Concentrate (Population B) meets DOE/OR's WAC or can be treated to meet the WAC, and that DOE/OR's TSCA Incinerator can successfully incinerate the waste.
- Assumes additional sampling does not produce any "unforeseen" constituents that might impact the ability to ship waste to the DOE/OR TSCA Incinerator.
- Assumes DOE/OR will approve the waste for shipment.
- Assumes that DOE/OR pilot test of the TSCA Incinerator will continue on its present schedule and be able to receive solids.

The relationship between the milestones and interim activity dates to these assumptions is presented in a logic flow diagram as Figure 9.

3.4 Mixed Waste Treatment Facility

A Mixed Waste Treatment Facility, proposed for construction on site, has been evaluated to provide the capability to separate, stabilize (e.g., cementation), decontaminate, and macroencapsulate mixed waste. The facility had been proposed to treat the Lead-Contaminated Soil, Cotter Concentrate (Population A), and Bulk Lead waste streams, pending the results of the treatability studies. Treatment at off-site facilities, such as Envirocare in Utah, have been determined to be faster and less expensive alternatives than constructing a mixed waste treatment facility on site. Accordingly, the Mixed Waste Treatment Facility will not be pursued any further at this time.

3.5 Potential Mixed Wastes Resulting from Characterization Activities

DOE/NV had planned on constructing a system to treat liquid, LLW and LLMW potentially generated from the ER groundwater characterization project. The treatment option for this waste stream was the Liquid Waste Treatment System: a line-item facility designed to evaporate the liquid waste generated from the groundwater characterization activity. The Liquid Waste Treatment Facility will not be constructed because funding has been terminated and anticipated mixed waste volumes are too low to warrant constructing a facility on site. If liquid waste is generated from ER characterization activities, it will be managed under the FFA CO, once approved, and possibly treated at the mobile liquid waste treatment facility proposed at the INEL.

4.0 MTRU Waste Streams

As discussed in greater detail in Section 4.0 of the BV of this STP, DOE plans to achieve compliance with the requirements of the FFCAct and the LDRs for MTRU destined for WIPP by using the no-migration variance petition approach outlined in Title 40 C.F.R. 268.6. Under this strategy, DOE intends to continue interim storage of such MTRU, continue preparation of such wastes for shipment to WIPP, and finally, ship and dispose of such wastes at WIPP. Within 12 months of the Secretary of Energy's decision to operate WIPP as a disposal facility, NTS will submit a supplemental plan outlining schedules and additional activities required to prepare the MTRU waste for shipment to WIPP. The supplemental plan will be prepared if this information is not already included in the WIPP strategy, or in the event that significant changes transpire as a result of

Figure 9. Logic Flow Diagram for Cotter Concentrate (Population B)

the final Permit or the final no-migration determination. In addition, the NTS will provide, at that time, a timetable for submitting a shipment schedule to WIPP for its MTRU waste. NTS will coordinate with the Carlsbad Area Office in developing the shipment schedule to ensure proper throughput and receipt of waste at WIPP.

DOE/NV will begin discussions with the state of Nevada regarding alternative treatment options for MTRU waste in January 1998 if the Secretary of Energy does not decide to operate WIPP as a disposal facility by that time or at such earlier time as DOE determines that (1) there will be a delay in the opening of WIPP beyond 1998, or (2) the no-migration variance petition is not granted by the EPA. DOE shall propose modifications to the STP for approval by the state of Nevada within a time frame agreed upon between DOE/NV and the state of Nevada. These modifications will describe planned activities and schedules for the new MTRU strategy. NTS shall include information regarding progress of MTRU waste management in the Annual STP Update process, as discussed further in Section 6.0. This will include, as applicable and appropriate, the status of the WIPP no-migration variance petition, and information related to characterization, packaging, and/or treatment capabilities or plans for NTS MTRU waste related to WIPP WAC and disposal.

4.1 MTRU Wastes Expected To Go To WIPP

All NTS MTRU waste is expected to be certified at the NTS for disposal at WIPP in Carlsbad, New Mexico. Current DOE strategy for WIPP disposal considers CH and RH TRU wastes generated by Defense Programs and placed in retrievable storage since 1970.

The NTS MTRU has been retrievably stored since mid-to-late 1970 and is managed in accordance with a 1992 Settlement Agreement with the state of Nevada. The MTRU waste inventory is contained in both drums and boxes. A large volume of the NTS MTRU wastes are packaged in the boxes which are not acceptable for transport in the TRUPACT-II.

In addition, during real-time radiography (RTR) operations conducted in the 1980s, several packages were found to contain small volumes of free liquids and unpunctured aerosol cans. This and other WAC concerns will be addressed during the waste certification process required prior to shipment.

4.1.1 MTRU For Which Technology is Available

Several options exist for the NTS MTRU waste stored in drums. Construction of a WEF is under investigation for breaching, sampling, repackaging, and certifying the NTS MTRU to meet the WIPP WAC.

The annual report submitted to the state of Nevada, as required by the June 1992 Settlement Agreement for MTRU waste, will include progress being made in the review of RTR MTRU waste data. The RTR data will be compiled with the existing radionuclide content data for each drum to provide a starting point for characterization. The resulting MTRU waste data compilation will be referenced when selecting drums and will be used to identify hazards and expected contents for each drum prior to opening. Full characterization will be accomplished by opening each drum and identifying, inventorying, and characterizing the contents. The contents will then be repackaged into containers acceptable for disposal at WIPP. Final characterization will be based 100 percent on visual inspection, and by the radiological assay and head space gas samples taken after repackaging.

The Carlsbad Area Office requires a Quality Assurance Project Plan from each DOE site that expects to send MTRU wastes to WIPP. DOE/NV will prepare this document per Carlsbad requirements, noting site-specific measures to assure quality characterization and certification activities are taking place at the NTS. The TRUPACT-II will be the preferred shipping package used to transport TRU and MTRU waste from the NTS off site. To ensure compliance with the payload restrictions of the TRUPACT-II, the *Nevada Test Site Compliance Plan for TRUPACT-II - Authorized Methods for Payload Control* was developed. This document identifies the requirements and responsibilities for managing TRU and MTRU waste shipments in the TRUPACT-II while on the NTS and will be revised as necessary. The NTS shall ship waste to the WIPP only during the WIPP's operations phase, an extension of which is currently being considered.

4.1.1.1 Preferred Option for MTRU Wastes Expected to Go to WIPP for Which Technology Exists

DOE/NV is currently planning for a facility capable of breaching, sampling, repackaging, and certifying containers of TRU waste to meet the WIPP WAC. DOE shall commit to beginning discussions with involved states regarding alternative treatment options for MTRU waste, including treatment to LDR thresholds, if it appears that there will be significant technical delays in the opening of the WIPP. Modifications to the STP shall be provided to the states within 12 months after discussions are completed and a determination is made. In the interim, DOE shall include information in the STP to support activities being performed at the NTS to

maintain safe, compliant storage until treatment to meet the WIPP WAC or disposal is achieved per the requirements of the MTRU waste agreement between DOE and the state of Nevada.

4.1.1.2 Milestones and Interim Activity Dates for MTRU Waste for Which Technology Exists

MTRU WASTE SCHEDULE Page 1 of 1	
Unless otherwise specified, milestones and interim activity dates are contingent upon the selection of the preferred treatment option. If another treatment option is determined to be feasible and offers advantages in terms of cost and/or resources, then these milestones and interim activity dates will be revised accordingly. These milestones and interim activity dates will be null and void if the assumptions specified in Section 4.1.1.3 do not hold true.	
Submit Work Plan to state of Nevada for TRU Waste Characterization Project (milestone)	February 29, 1996
Complete Construction of Facility and Submit Processing Schedule (milestone)	June 30, 1997
Complete Pre-Characterization Activities Required by WIPP with all Required Information Having Been Submitted for Incorporation into the WIPP Waste Information System <u>or</u> Initiate Discussions with state of Nevada if WIPP Does Not Open (milestone)	June 1, 1998
Prepare a Plan to Ship MTRU to WIPP (interim activity date)	Within 12 months of decision to operate WIPP
Provide a Timetable for Submitting a Shipping Schedule (interim activity date)	Within 12 months of decision to operate WIPP

4.1.1.3 MTRU Waste for Which Technology Exists Milestones and Interim Activity Date Assumptions

The basis for the milestones and interim activity dates for the certification of the MTRU waste and final disposition at WIPP includes the following:

- Assumes no regulatory changes that would exclude waste from regulation or subject waste to stricter regulatory standards than those now imposed.
- Assumes activity has required funding in place.
- Assumes WIPP no-migration variance petition will be approved.

- Assumes no other on-site or off-site waste certification option is selected.
- Assumes the NTS MTRU waste meets WIPP's WAC or the waste can be treated accordingly.
- Assumes additional sampling does not produce any "unforeseen" constituents that might eliminate the ability to ship waste to WIPP.
- Assumes no major interruptions in the on-site certification process that could delay processing of the MTRU waste.
- Assumes no major natural hazards will affect the certification system.

4.1.2 MTRU Waste Needing Technological Adaptation

A large volume of the NTS MTRU wastes (retrievably stored since mid-to-late 1970) are packaged in containers (boxes) that are not acceptable for transport in the TRUPACT-II.

4.1.2.1 Preferred Option For MTRU Expected to Go to WIPP Needing Technological Adaptation

The preferred option for the MTRU waste packaged in boxes includes breaching the containers on site, removing any prohibitive items, and repackaging the contents for shipment to WIPP in acceptable containers. If it is determined during the pilot-scale study for the WEF that boxes can not be certified, a certification and repackaging option will be pursued.

4.1.2.2 Milestones and Interim Activity Dates For MTRU Wastes Needing Technological Adaptation

Milestones and interim activity dates for the MTRU boxes are entirely dependent upon the successful completion of the pilot-scale study for the WEF discussed earlier in PV Section 4.1.1. Upon successful completion of the pilot-scale study, a schedule will be prepared for the boxes that will include submission of a work plan to the state of Nevada and a schedule for processing backlogged volumes of waste.

4.2 MTRU Wastes Not Destined for the WIPP

The NTS emplaced TRU waste in GCD boreholes from 1984 through 1989. Decisions to retrieve or leave the waste in GCDs will be based on performance assessments required by Title 40 C.F.R. 191, and/or risk assessments required by CERCLA National Contingency Plan or RCRA Corrective Action.

4.2.1 Planned Activities for MTRU Waste Not Going to the WIPP

The GCD performance assessment required by the recent repromulgation of Title 40 C.F.R. 191 is currently under way by Sandia National Laboratories. A computer model has been developed that will identify the migration, if any, of hazardous and radioactive materials from the GCDs. Once this assessment has been completed, the results shall be reported to the appropriate regulatory agencies and a plan of action developed between the regulator and DOE/NV. A decision to retrieve the TRU waste in the GCDs or retain current GCD conditions will be made upon completion of Sandia's performance assessment modeling and risk assessments.

5.0 High-Level Mixed Waste Streams

There are currently no NTS mixed wastes in this category.

6.0 Annual STP Updates

By January 15 of each fiscal year, DOE/NV shall provide a Draft Annual Update of the STP to the state of Nevada for review and comment. The Draft Update to the STP will bring the STP current to the end of the previous federal fiscal year. It will reflect any proposed changes to the milestones or schedule as well as provide the basis for the proposed changes. The Draft Update will be finalized by April 30 of each federal fiscal year.

APPENDIX A

DEFINITIONS

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DEFINITIONS

Approve - To unconditionally accept, without changes or modification, deliverables or alterations in milestones or interim activity dates submitted to the Nevada Division of Environmental Protection (NDEP) by the U.S. Department of Energy (DOE).

Approve with Modifications - To conditionally accept, with changes or modifications, deliverables or alterations in milestones or interim activity dates submitted to NDEP by DOE .

Aqueous Liquids (as a waste matrix) - Liquids/slurries with a total organic carbon content less than 1 percent. Slurries must be pumpable (i.e., suspended/settled solids can be up to approximately 35 to 40 percent). Only liquids/slurries packaged/stored in bulk form (e.g., tank-stored, drummed bulk-free liquids) are included in this category. Liquids packaged in lab-pack type configuration are categorized as lab packs.

Batteries (as a waste matrix) - This category includes lead acid, cadmium, and miscellaneous batteries.

Capacity (of a facility) - The annual process throughout, in cubic meters per year (m^3/yr), under "normal operating conditions." Normal operating conditions are defined as the shift schedule under which the facility normally operates (e.g., one 8-hour shift/day, 5 days a week; 2 shifts/day, 5 days a week; 24 hours a day, 7 days a week).

Characterization - The determination of waste contents and properties whether by review of process knowledge, nondestructive examination/analysis, or sampling and analysis.

Cleanup - (1) Actions undertaken during a removal or remedial response to physically remove or treat a hazardous substance that poses a threat or potential threat to human health and welfare, the environment, and/or real and personal property. Sites are considered cleaned up when removal or remedial programs have no further expectation or intention of returning to the site and threats have been mitigated or do not require further action. (2) Actions taken to deal with a release or threat of release of a hazardous substance that could affect humans and/or the environment. The term "cleanup" is sometimes used interchangeably with either remedial action, removal action, response action, or corrective action.

Closure: Those actions that are taken upon completion of operations to prepare the disposal site or disposal unit for custodial care (e.g., addition of cover, grading, drainage, erosion control).

Commercial Facility - A non-DOE owned facility that has been licensed by the Nuclear Regulatory Commission (NRC) and/or permitted by the U.S. Environmental Protection Agency (EPA) for hazardous and/or mixed waste operations. DOE has no authority over these facilities unless waste in the facility is currently being generated or was formerly generated by a DOE-funded program. Until waste activities, materials, and cleanup operations have been terminated and the DOE has no further obligations to that facility, the DOE waste in the facility shall be managed by the requirements of applicable DOE Orders and regulations.

Consent Order - Legally binding agreements between regulators and regulated entities that set standards and schedules for compliance with environmental statutes.

Comprehensive Environmental Response, Compensation, & Liability Act (CERCLA) - Provides for cleanup and emergency response for hazardous substances released into the environment and cleanup of hazardous waste sites which present substantial danger to public health and welfare; requires notification of National Response Center and appropriate agencies and officials when release of a reportable quantity of hazardous substance(s) occurs.

Conceptual Site Treatment Plan - The first version of the treatment plans required under the Federal Facility Compliance Act (FFCAct). Its purpose is to identify treatment options for mixed wastes.

Contact-Handled Waste - Waste or waste containers whose external surface dose rate does not exceed 200 millirem per hour at surface of container.

Corrosivity - (1) A solid waste exhibits corrosivity if (a) a sample of the waste is either aqueous and has a pH less than or equal to 2 or greater than or equal to 12.5, or (b) is a liquid and corrodes steel at a rate greater than 6.35 mm (0.250 inch) per year at a test temperature of 55°C (130°F). (2) A chemical agent that reacts with the surface of a material causing it to deteriorate or wear away. (3) Identifies waste that must be segregated because of its ability to extract and solubilize toxic contaminants (especially heavy metals) from other waste; identifies waste that requires the use of corrosion-resistant containers for disposal.

Deadlines - Fixed, firm, and enforceable dates as set forth in the Nevada Test Site (NTS) FFCAct Consent Order (CO). Changes or revisions to deadlines are subject to approval, approval with modification or disapproval by the state of Nevada according to the process and framework set forth in the NTS FFCAct CO.

Debris - Materials that are primarily nongeologic in origin such as grass, trees, stumps, and man-made materials such as concrete, clothing, partially buried whole or empty drums, capacitors, and other synthetic manufacturing items such as liners. (Debris materials do not include synthetic organic chemicals, but may include materials contaminated with these chemicals.)

Decommissioning - (1) Actions taken to reduce the potential health and safety impacts of contaminated DOE facilities including activities to stabilize, reduce, or remove radioactive materials or to demolish the facilities. (2) Preparations taken for retirement of a nuclear facility from active service accompanied by the execution of a program to reduce or stabilize radioactive contamination. (3) The process of removing a facility or area from operation and decontaminating and/or disposing of it or placing it in a condition of standby with appropriate controls and safeguards.

Decontamination - The removal of unwanted material (typically radioactive material) from facilities, soils, or equipment by washing, chemical action, mechanical cleaning, or other techniques.

Disapprove - To unconditionally disallow or not accept deliverables or modifications to milestones or interim activity dates submitted to NDEP by DOE.

Disposal - The permanent isolation of waste with no intent of recovery.

Draft Site Treatment Plan - The second version of the treatment plans required under the FFCAct. Its purpose is to identify the preferred treatment option for mixed waste.

Effluent - (1) Airborne and liquid wastes discharged from a DOE site or DOE facility following such engineering waste treatment and all effluent controls (including on-site retention and decay) as may be provided. This term does not include solid wastes, wastes slated for shipment off site, wastes that are contained (e.g., underground nuclear test debris) or stored (e.g., in tanks), or wastes that are to remain on site through treatment or disposal. (2) Wastewater (treated or untreated) that flows out of a treatment plant, sewer, or industrial outfall. May refer to wastes discharged into surface waters.

Elemental Lead (Activated and Nonactivated) (as a waste matrix) - Both surface-contaminated lead and activated elemental lead. Activated lead includes lead from accelerators or other neutron sources that may result in irradiation. Surface-contaminated lead materials include bricks, counterweights, shipping casks, and other shielding materials.

Environmental Impact Statement - (1) A document prepared in accordance with the requirements of §102(2)(C) of the National Environmental Policy Act (NEPA). (2) A tool for decision making; it describes the positive and negative effects of the undertaking and lists alternative actions. The draft Environmental Impact Statement (EIS) is prepared by the EPA, or under EPA guidance, and attempts to identify and analyze the environmental impacts of a proposed action and feasible alternatives. The draft EIS is circulated for public comment prior to preparation of the final EIS.

Environmental Restoration - Measures taken to clean up and stabilize or restore a contaminated site to previolation conditions.

Explosive - (1) Any chemical compound or mechanical mixture that, when subjected to heat, impact, friction, shock, or other suitable initiation stimulus, undergoes a very rapid chemical change with the evolution of large volumes of highly heated gases that exert pressures in the surrounding medium. The term applies to materials that either detonate or deflagrate. (2) (As a waste matrix) - This category includes waste materials that may explode during normal or extreme handling. This category includes rags that have been soaked in nitric acid and subsequently stored in containers.

Facilities - Buildings and other structures, their functional systems and equipment including site development features such as landscaping, roads, walks and parking areas; outside lighting and communications systems; central utility plants; utilities supply and distribution systems; and other physical plant features.

Federal Facility Compliance Act - Waives sovereign immunity for fines and penalties for Resource Conservation and Recovery Act (RCRA) violations at federal facilities. However, a provision postpones that waiver for three years for mixed waste Land Disposal Restriction (LDR) storage prohibition violations at DOE sites and requires DOE to prepare plans for developing the required treatment capacity for mixed waste. The plan must be approved by the state or EPA, after consultation with other affected states, and an order issued requiring compliance with the plan. The Act further provides that DOE will not be subject to fines and

penalties for LDR storage prohibition violations for mixed waste as long as it is in compliance with an approved plan and order.

Generation - Includes the wastes resulting from new production, rework operations, wastes generated from D&D operations, and wastes resulting from environmental restoration operations; also includes the recovery of pre-1970 wastes should their recovery be determined to be necessary.

Generator - Refers to current or previously operated facilities of the DOE that have produced or are producing waste.

Glove box - (1) A sealed volume penetrated by leaded rubber gloves that allows safe manipulation of some alpha-emitting materials. (2) A windowed, low-leakage enclosure equipped with one or more pairs of flexible gloves to allow personnel on the outside to handle radioactive material within the enclosure.

Groundwater - Liquid water occurring beneath the earth's surface in the interstices between soil grains, in fractures, or in porous formations.

Hazardous Substance - (1)(a) Any substance designated pursuant to §311(b)(2)(A) of the Federal Water Pollution Control Act (FWPCA); (b) any element, compound, mixture, solution, or substance designed pursuant to §102 of CERCLA; (c) any hazardous waste having the characteristics identified under or listed pursuant to §3002 of the Solid Waste Disposal Act (SWDA); (d) any toxic pollutant listed under §307(a) of the FWPCA; (e) any hazardous air pollutant listed under §112 of the Clean Air Act; and (f) any imminently hazardous chemical substance or mixture with respect to which the Administrator of EPA has taken action pursuant to §7 of TSCA. (2) Any material that poses a threat to human health and/or the environment. Typical hazardous substances are toxic, corrosive, ignitable, explosive, or chemically reactive. Any substance designated by EPA to be reported if a designated quantity of the substance is spilled in the waters of the United States or if otherwise emitted into the environment. (3) §101(14) of CERCLA, as amended, defines "hazardous substance" chiefly by reference to other environmental statutes, such as the SWDA, FWPCA, Clean Air Act, and TSCA. The term excludes petroleum, crude oil or any fraction thereof, natural gas, natural gas liquids, or synthetic gas usable for fuel. Under the Act, EPA may also include other substances that it specifically designates as "hazardous."

Hazardous Waste - (1) Those wastes that are designated as hazardous by EPA or state regulations. (2) Production or operation by-products that can pose a potential hazard to human health or the environment when improperly managed and that possess at least one of four characteristics (ignitability, corrosivity, reactivity, toxicity), or that appear on special EPA lists. (3) A solid waste or combination of solid wastes, that, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may (a) cause, or significantly contribute to, an increase in mortality or an increase in serious, irreversible, or incapacitating reversible illness; or (b) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. (4) Those wastes listed by EPA or meeting characteristics specified by EPA in their criteria pursuant to the RCRA. Disposal treatment or storage of hazardous wastes can only take place in a site or facility issued a permit by EPA or a state. Note: Source, special nuclear material, and by-product material, as defined by the Atomic Energy Act (AEA) of 1954, as amended, are specifically excluded from the term "hazardous waste."

Heterogeneous Debris (as a waste matrix) - Wastes with matrices meeting the definition of debris per the August 18, 1992 LDR debris rulemaking (57 FR 37194). This category includes debris that does not meet the criteria for categorization as either Organic Debris or Inorganic Debris. This category also includes mixtures of debris and solid process residues or soil, provided debris comprises no more than 50 percent of the waste.

Ignitability - A waste property describing waste with a flash point lower than 60°C (140°F).

Inorganic Debris (as a waste matrix) - Wastes with matrices meeting the definition of debris per the August 18, 1992 LDR debris rulemaking (57 FR 37194). More specifically this category is defined for wastes that contain greater than 90 percent inorganic debris. Example inorganic debris materials are metal shapes (e.g. equipment, scrap), metal turnings, glass (e.g., light tubes, leaded glass, etc.), ceramic materials, concrete, and rocks.

Interim Activity Dates - Dates that identify time frames by which a certain activity necessary to treat each waste stream, as set forth in the Plan Volume of the Site Treatment Plan, is scheduled to occur. Interim activity dates are not enforceable and stipulated penalties do not apply.

Land Disposal Restrictions - (1) Provisions of the Hazardous and Solid Waste Amendments requiring phased-in treatment of hazardous wastes before disposal. (2) A RCRA program that restricts land disposal of RCRA hazardous wastes and requires treatment to promulgated treatment standards. (See Thirds Rule.)

Leachate - (1) Any liquid including any suspended components in the liquid that has percolated through or drained from hazardous waste. (2) A contaminated liquid resulting when water percolates or trickles through waste materials and collects components of those wastes. Leaching may occur at landfills and may result in hazardous substances entering soil, surface water, or groundwater.

Low-Level Mixed Waste - Low-level waste that also includes hazardous materials as identified in Title 40 Code of Federal Regulations (C.F.R.) 261, Subparts C and D.

Low-Level Radioactive Waste - (1) Waste that contains radioactivity and is not classified as high-level waste, transuranic (TRU) waste, or spent nuclear fuel, or the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level waste, provided the concentration of TRU is less than 100 nanocuries per gram. (2) Radioactive waste not classified as high-level waste, TRU waste, spent nuclear fuel, or by-product material.

Material Evaluation Form, RE-0985 - A form documenting characterization activities and information for the NTS.

Milestones - An important or critical event, goal, task, and/or activity that must occur in order to achieve the objectives set forth in the STP. Milestones in the STP correspond with deadlines in the NTS FFCA Act CO; however, only deadlines are enforceable and subject to stipulated penalties.

Mixed TRU Waste - TRU waste that also includes hazardous materials as identified in Title 40 C.F.R. 261, Subparts C and D.

Mixed Waste - (1) Radioactive waste (as defined by the AEA) that contains material listed as hazardous waste in Subpart D of Title 40 C.F.R. 261 or that exhibits any of the hazardous waste characteristics identified in Subpart C of Title 40 C.F.R. 261. (2) Waste that contains both radioactive and hazardous components, as defined by the AEA and the RCRA. The term "radioactive component" refers only to the actual radionuclides dispersed or suspended in the waste substance.

National Environmental Policy Act - Describes national environmental policy and goals; provides methods for goal accomplishment; defines Council on Environmental Quality responsibilities.

Operable Unit - (1) A discrete action that comprises an incremental step toward comprehensively addressing site problems. This discrete portion of a remedial response manages migration or eliminates or mitigates a release, threat of release, or pathway of exposure. The cleanup of a site can be divided into a number of operable units, depending on the complexity of the problems associated with the site. Operable Units may address geographical portions of a site, specific site problems, or initial phases of an action or may consist of any set of actions performed over time or any actions that are concurrent but located in different parts of a site; (2) A discrete portion of a site consisting of either one or many release sites considered together for assessment and cleanup activities. The primary criteria for placement of release sites into an Operable Unit include geographic proximity, similarity of waste characteristics and site type, and the possibilities for economy of scale; (3) An overall response action that by itself eliminates or mitigates a release, a threat of a release, or an exposure pathway.

Organic Liquids (as a waste matrix) - Liquids/slurries with a total organic carbon content greater than or equal to 1 percent. Slurries must be pumpable (i.e., suspended/settled solids can be up to approximately 35 to 40 percent). Only liquids/slurries packaged/stored in bulk form (e.g., tank-stored, drummed bulk-free liquids) are included in this category. Liquids packaged in lab-pack type configuration are categorized as lab packs.

Package - A barrel, box, or other container into which waste is initially placed. A package is placed in packaging prior to transportation.

pH - (1) Used to describe the hydrogen-ion activity of a system. The logarithm (the exponent indicating the power to which a given number must be raised to produce a given number) of the reciprocal of hydrogen-ion concentration ($-\log_{10}[\text{H}^+]$, where $[\text{H}^+]$ is hydrogen-ion concentration in moles per liter). (2) A symbol for the degree of acidity or alkalinity.

Proposed Site Treatment Plan - The third iteration of the treatment plans required under the FFCAct. This version should identify the actual treatment option to be used and will form the basis for compliance agreements with the states and/or EPA.

Radiation - (1) Ionizing radiation that includes any or all of the following: gamma rays and x-rays, alpha and beta particles, high-speed electrons, neutrons, high-speed protons, and other atomic particles. This definition does not include nonionizing radiations such as sound, microwave, radiowave, or visible, infrared, or ultraviolet light. (2) Refers to the process of emitting energy in the form of rays or particles that are thrown off by disintegrating atoms. The rays or particles emitted may consist of alpha, beta, or gamma radiation.

Radioactive Waste - Solid, liquid, or gaseous material that contains radionuclides regulated under the AEA of 1954, as amended, and of negligible economic value considering costs of recovery.

Radioactivity - (1) The spontaneous nuclear decay of a material with a corresponding release of energy in the form of particles and/or electromagnetic radiation. (2) The property or characteristic of radioactive material to spontaneously "disintegrate" with the emission of energy in the form of radiation. The unit of radioactivity is the Curie (or becquerel).

Radionuclide - (1) A species of atom having an unstable nucleus that is subject to spontaneous decay. (2) Any nuclide that emits radiation. A nuclide is a species of atom characterized by the constitution of its nucleus and hence by the number of protons, the number of neutrons, and the energy content.

Reactivity - (1) A characteristic of a waste that is explosive, reacts violently with water, or generates toxic gases when exposed to water or liquids that are moderately acidic or alkaline. (2) An EPA characterization of hazardous waste that identifies waste which, under routine management, presents a hazard because of instability or extreme reactivity.

Remote Handled Waste - Packaged waste with an external surface dose rate that exceeds 200 millirem per hour.

Resource Conservation and Recovery Act - Regulates management of hazardous wastes, nonhazardous solid wastes, and underground storage tanks; promotes use of recycled/recovered materials; establishes policy to limit land disposal of wastes.

RCRA Land Disposal Restriction Requirements - Require the treatment of hazardous waste (including mixed waste) to certain standards before land disposal and prohibit storage of hazardous wastes that do not meet LDR

standards, except for the purposes of accumulating sufficient quantities to facilitate proper recovery, treatment, or disposal of the waste.

Site - (1) A geographic entity comprising land, buildings, and other facilities required to perform program objectives. Generally a site has all of the required organizational facilities for management functions; that is, it is not a satellite of some other site. (2) For the purposes of the Environmental Management (EM) Five-Year Plan, sites are lands, installations, and/or facilities for which DOE has or shares responsibility for EM activities. (3) An area or a location at which hazardous substances have been stored, treated, disposed of, placed, or otherwise come to be located. This includes all contiguous land, structures, other appurtenances, and improvements on the land used for treatment, storage, or disposal of hazardous substances. A site may consist of several treatment, storage, or disposal facilities (e.g., impoundments, containers, buildings, or equipment).

Site Characterization - The program of exploration and research, both in the laboratory and in the field, undertaken to establish the geologic conditions and the ranges of those parameters of a particular site relevant to the procedures under this part. Site characterization includes borings, surface excavations, excavation of exploratory shafts, limited subsurface lateral excavations and borings, and geophysical testing.

Soil (as a waste matrix) - Soils contaminated with hazardous constituents and radioactivity that are stored in waste containers. Includes soils contaminated with organics, inorganics, or both.

Stabilization - A broad class of treatment processes that immobilize hazardous constituents in a waste. For treatment of metals in low-level mixed waste and for TRU wastes containing low-level radioactive components, stabilization technologies will reduce the leachability of the hazardous metal constituents (regardless of whether the metals are radioactive) in nonwaste water matrices.

Storage - (1) Temporary holding of waste pending treatment or disposal. Storage methods include containers, tanks, waste piles, and surface impoundments. (2) The containment of hazardous waste, either on a temporary basis or for a period of years, in such a manner as not to constitute disposal of such hazardous waste. (3) Retrievable retention of waste pending disposal.

Toxic Substance Control Act - Authorizes data collection by EPA to identify and evaluate potential hazards from chemical substances; establishes regulation of production, use, distribution, and disposal of substances where necessary; establishes asbestos abatement programs in schools.

Transuranic Waste - This core definition appears in modified form in various relevant documents: Waste containing alpha-emitting radionuclides with an atomic number greater than 92 and half-lives greater than 20 years, at concentrations greater than 100 nanocuries per gram of waste. Modifications include the following: (1) For purposes of management, DOE Order 5820.2A (a) considers TRU waste, as defined above, "without regard to source or form" [The proposed revision to the Order ("DOE Order 5820.2A -Major Issues for Revision," May 6, 1992) contemplates removing this clause.]; (b) allows heads of field elements to determine that wastes containing other alpha-emitting radionuclides must be managed as TRU waste; and (c) adds "at time of assay" implying both that the classification of a waste as TRU is to be made based on an assay and that such classification can be superseded only by another assay. (2) For purposes of setting standards for management and disposal, Title 40 C.F.R. 191.02(i) adds "except for: (a) high-level radioactive wastes; (b) wastes that the DOE has determined, with the concurrence of the Administrator [of EPA] do not need the degree of isolation required by this part; or (c) wastes that the Commission [NRC] has approved for disposal on a case-by-case basis in accordance with Title 10 C.F.R. 61 [Licensing Requirements for Land Disposal of Radioactive Wastes]."

Treatability Group - Based on the radioactive characteristics, hazardous components, and physical/ chemical matrices as discussed above, DOE has grouped its wastes to reflect salient treatment considerations for each waste stream. These "treatability groups" are used to relate waste streams and waste quantities to treatment facilities and technology development needs.

Treatment - (1) Any method, technique, or process designed to change the physical or chemical character of waste to render it less hazardous and safer to transport, store or dispose of, or reduce in volume. (2) Any activity that alters the chemical or physical nature of a hazardous waste to reduce its toxicity, volume or mobility or to render it amenable for transport, storage, or disposal.

Treatment Facility - The specific area of land, structures, and equipment dedicated to waste treatment and related activities.

TSD Facility - A hazardous waste treatment, storage, or disposal facility which (1) has received a permit (or interim status) in accordance with the requirements of Parts 270 and 124 of Title 40 C.F.R., (2) has received a permit (or interim status) from a State authorized in accordance with Part 271 of Title 40 C.F.R., or (3) is regulated under §261.6(c)(2) or subpart F of Part 266 of Title 40 C.F.R.

Treatment System - The equipment and processes used for similar waste types at treatment facilities. A treatment system is the unit treatment operation or sequence of unit treatment operations carried out on all wastes that enter the system (i.e., a treatment system may consist of chemical reduction followed by precipitation or an incinerator and a vitrification unit for the ash).

Volatile Organic Compound - (1) Any reactive organic compound as defined in Title 40 C.F.R. 60.2 definitions. (2) An organic (carbon-containing) compound that evaporates (volatilizes) readily at room temperature.

Waste Acceptance Criteria - The criteria used to determine if waste and waste packages are acceptable for treatment, storage, transportation, and disposal purposes.

Waste Characterization - Activities to determine the extent and nature of the waste. Note: Waste characterization may be based on process knowledge, nonintrusive examination, or intrusive examination such as sampling and analysis.

Waste Form - The physical form of the waste such as sludges, combustibles, metals, etc.

Waste Isolation Pilot Plant - (1) The project authorized under §213 of the DOE National Security and Military Applications of Nuclear Energy Authorization Act of 1980 (Public Law 96-164; 93 Stat. 1259, 1265) to demonstrate the safe disposal of radioactive waste materials generated by atomic energy defense activities. (2) A research and development facility, located near Carlsbad, New Mexico, to be used for demonstrating the safe disposal of TRU wastes from DOE activities.

Waste Management - The planning, coordination, and direction of those functions related to generation, handling, treatment, storage, transportation, and disposal of waste as well as associated surveillance and maintenance activities.

Waste Minimization - (1) An action that effectively avoids or reduces the generation of waste by source reduction, improving energy usage, or by recycling. This action is consistent with the general goal of minimizing present and future threats to human health, safety, and the environment. (2) The reduction, to the extent feasible, of hazardous waste that is generated prior to treatment, storage, or disposal of the waste. Waste minimization includes any source reduction or recycling activity that results in either (a) reduction of total volume of hazardous waste, (b) reduction of toxicity of hazardous waste, or (c) both.

Waste Stream - A flow of waste materials with specific, definable characteristics that remain the same throughout the life of the process generating the waste stream. A waste stream is produced by a single process or subprocess; however, that process or subprocess may be one that combines two or more input waste streams together to produce a single output waste stream.

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APPENDIX B

POTENTIAL TREATMENT TECHNOLOGIES

FOR NEVADA TEST SITE MIXED WASTE

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1.0 Potential Treatment Technologies For Nevada Test Site (NTS) Mixed Wastes

The following sections provide possible treatment technologies that may be appropriate for NTS mixed waste streams.

1.1 Biodegradation

Biodegradation is the process of using microorganisms to metabolize and destroy organic hazardous components, especially acids and solvents, entrained in various waste forms. Numerous biological treatment processes are available, including:

- Bioventing
- Bacterial leaching of heavy metals
- In situ treatment, such as biofilters
- Biodegradation by bacteria that require methane as an energy source (e.g., methanotrophic bacteria)
- Enzymatic remediation using fungi, such as white rot fungus
- Above-grade composting
- Biotenitrification
- Biosorbents made from nonliving material derived from microorganisms

The advantages of biodegradation are that microorganisms can metabolize and destroy virtually all types of solvent-bearing waste, and microorganisms are commercially available for selected waste streams. In addition, the biodegradation process can be easily engineered and is highly conducive to safety. The biggest disadvantage of biodegradation is that microorganisms are very sensitive to changes in their environment, so the waste stream to be treated should remain constant in its composition, concentration, temperature, and pH. If any of these variables should change, the microorganisms may die. Other disadvantages of this method

include a large waste stream of biomass is generated, the microorganisms must be adapted to specific waste streams and radionuclides, the biodegradation of specified solid wastes has not been demonstrated, and a long processing time is required for the biodegradation cycle to effectively treat the waste.

The final waste form resulting from the biodegradation process is spent biomass. No major secondary waste forms for the biodegradation process have been identified and none are anticipated. Any secondary liquid waste forms could undergo additional cycles of the biodegradation process.

1.2 Ion Exchange

An ion exchange unit removes metal ions such as Pb^{+2} (lead), Cu^{+2} (copper) and some radionuclides from water. The unit is sized to accommodate a given flow rate. Ion exchange resins that are packed in the column can be selected to accommodate contaminants expected in some waste streams.

The advantages of ion exchange are that it is a proven technology, is relatively easy to permit, and is an excellent technology for the removal of metals and heavy radionuclides such as plutonium. Unfortunately, ion exchange does not remove organic constituents. High total dissolved solids may impede system efficiency; therefore, liquid wastes of medium to low turbidity are preferred.

The final waste form resulting from the ion exchange process is free liquid. Spent resin may be considered secondary waste requiring treatment and disposal.

1.3 Stabilization/Solidification

Stabilization/solidification is the process by which wastes are treated to reduce the leachability of toxic heavy metal constituents and produce a hard, water-resistant solid that is suitable for disposal in a landfill. This treatment minimizes the risk of contaminants transferring to the environment and applies to liquids, semisolids, and solids. Solidification agents include various cement materials (e.g. Portland, gypsum, and masonry), pozzolonic flyash materials, bitumen, and various "plastic" or polymer materials. Cementation and polymer solidification are the two predominant stabilization/solidification processes.

Cementation is the process of using cement materials with various additives to bind up a waste form so that a Toxicity Characteristic Leachate Procedure extract from a representative sample for the treated waste will not contain hazardous contaminants in concentrations greater than the values shown in Title 40 C.F.R. 268.41. The success of this process depends upon the ability for the waste to bind to the cement matrix during the hydration process or "curing" of the cement. If the waste binds well with the matrix, hazardous constituents will not leach out and the waste becomes acceptable for land disposal. If the waste form is merely trapped inside the matrix during curing, hazardous constituents are very likely to leach from the cement during certification testing or in long-term storage after disposal. Hence, this solidification process requires a waste characterization step to determine that the proper additives are used to ensure solidification of the waste.

The advantages of cementation are that it is inexpensive and works well for many metal ions. In addition, this technology has been successfully demonstrated to stabilize heavy metals and radionuclides. Cementation is a commercially available technology and is widely practiced in the hazardous and radioactive waste industries. The major disadvantage of cementation is that, for many waste types, the cement needed to successfully bind the waste results in a final waste loading of 20-40 percent, and, therefore, causes a three- to five-fold increase in the volume of the final waste form. Other disadvantages are that waste with high radioactive content may not be suitable for stabilization, wastes with high organic content may interfere with the setting reaction, and special formulation is necessary for each type of waste requiring treatment.

The final waste form resulting from the cementation process is a solidified mass of various sizes and volumes. No major secondary waste forms for the cementation process have been identified and none are anticipated. Any secondary solid waste forms could be recemented.

Polymer solidification is the process of encapsulating waste in plastic. There are several variations of polymer encapsulation such as impregnating bulk waste with plastic or, alternatively, mixing of waste particulate into plastic. Several polymers and polymer solidification processes should be tested as it is anticipated that one method of encapsulation will not be successful for all waste streams.

The process of polymer solidification by mixing the waste with plastic generally takes place in an extruder. The waste is mixed with low density polyethylene beads, and the mixture is forced through a device that looks like a small corkscrew. As the waste passes through the screw, the compression causes the beads to heat to about 120°C, and the mechanical shear forces in the screw mix the melted beads with the waste. The melted mixture flows into a drum where it cools and solidifies. The waste loading for this process is typically

60-75 percent. The process requires some type of off-gas treatment for volatile compounds that escape from the waste during heating.

The advantages of polymer solidification are its versatility and the ease with which this process could receive permit approval. The disadvantages of the technology are that it has not been tested on all waste forms to determine if the resulting waste can pass all required analyses before land disposal.

The final waste forms resulting from the polymer solidification process consists of waste encapsulated in plastic (polymerized waste). Secondary waste forms for this technology include solvents that were volatilized and contained during the polymerization process and require further treatment.

1.4 Macroencapsulation

Macroencapsulation encloses solid wastes in an inert envelope to reduce their exposure to potential leaching media in a landfill. It is the LDR treatment standard for debris and radioactive lead solids such as lead bricks.

In this process, materials such as resins and plastics are used to surface-coat the waste by spraying or dipping. The waste may also be enclosed in a jacket of inert inorganic material such as in a sealed pipe or in a multi-layer shrinkwrap jacket.

The advantages of macroencapsulation are that it applies to inorganic and organic contaminants in debris, and it is commonly used to contain radioactive lead solids such as lead bricks. The disadvantages of this technology are that the waste must not contain free liquid.

The final waste form for macroencapsulation consists of waste encapsulated in inert material. No major secondary waste forms for this process have been identified, and none are anticipated.

1.5 Vitrification

Vitrification is the process by which high temperatures and fusion are used to make glass or glass-like solids. In this process, the temperature is ramped, causing organic contaminants to be destroyed. Inorganic contaminants are immobilized in the glass-like end product. As vitrification occurs, volatile solvents are driven from the mixture and are often collected within an off-gas containment apparatus for further treatment.

Several different methods of vitrification have been developed such as glass-melting furnaces, in situ vitrification, and high-temperature fluid-wall reactors.

Vitrification is a high-energy process and requires monitoring of effluent conditions, effluent characteristics, and off-gases. The final waste form for the vitrification process consists of glass-like solids. Secondary waste forms include residuals from the off-gas system and liquid residuals which require treatment and/or disposal.

1.6 Separation/Segregation

Separation/segregation of waste is the process by which mixed waste is separated into its hazardous and radioactive components and treated appropriately. Separation/segregation of waste can occur a number of ways, including physically sorting and segregating solid materials; decontaminating solid materials such as lead bricks to remove surface contamination; or by employing pretreatment technologies such as carbon adsorption, ion exchange, ultraviolet oxidation, or pH manipulation to liquid waste streams.

The final waste form resulting from separation/segregation is dependent on the method used. Secondary waste streams such as spent carbon and resins may result when pretreatment technologies are used to separate/segregate the waste.

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THE STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES,
DIVISION OF ENVIRONMENTAL PROTECTION

AND

THE UNITED STATES DEPARTMENT OF ENERGY

IN THE MATTER OF:

FEDERAL FACILITY COMPLIANCE ACT

CONSENT ORDER

March 6, 1996

FFCAct Consent Order

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PART I. INTRODUCTION

This Federal Facility Compliance Act Consent Order (Order) is issued by the Nevada Department of Conservation and Natural Resources, Division of Environmental Protection (NDEP) to require compliance by the United States Department of Energy (DOE) with a Site Treatment Plan (STP) for the treatment of mixed waste at the Nevada Test Site (NTS) pursuant to the Nevada Hazardous Waste Act, Nevada Revised Statutes (NRS) §§ 459.400 to 459.600; and Section 3021(b) of the Resource Conservation and Recovery Act (RCRA), 42 U.S.C. §6939(c), as amended by the Federal Facility Compliance Act of 1992, Pub. L. 102-386, 106 Stat. 1505 (1992).

The NTS is a facility at which DOE generates and stores and is proposing to treat mixed waste. Mixed waste is defined by the Federal Facility Compliance Act (FFCAct) as waste containing both a hazardous waste subject to RCRA and a radioactive material subject to the Atomic Energy Act. As required by the FFCAct and RCRA, the mixed waste streams are subject to the Land Disposal Restriction (LDR) regulations and DOE's treatment and storage of mixed waste at the NTS is subject to regulation by the State of Nevada through NDEP. Specific mixed waste streams are currently being stored at the NTS. These waste streams include: (1) PCB Soil; (2) Lead-Contaminated Soil; (3) Bulk Lead Wastes; (4) Solvent Sludge; (5) Shipping Cask; (6) TTF Solvent; (7) Cotter Concentrate (Population A); (8) Cotter Concentrate (Population B); and (9) Mixed Transuranic (MTRU) Waste. All of these referenced waste streams are hereinafter collectively referred to as "covered waste". This Order is intended to address the required treatment of these specific mixed waste streams. In addition, NDEP intends this Order to establish, in accordance with the States' principles established by the National Governors' Association FFCAct State task force, the process for any mixed waste to be transferred on or off the NTS in the future.

The mixed waste streams are subject to the LDR standards contained in RCRA. On March 31, 1995, DOE Nevada Operations Office issued its Proposed Site Treatment Plan (PSTP) for the NTS. The FFCAct directs states to accept the PSTPs; accept the PSTPs with modifications; or reject the PSTPs as submitted. NDEP found the March PSTP inadequate and insufficient to fulfill the requirements of 42 U.S.C. §6939c(b)(1)(B)(i).

On August 31, 1995, DOE/NV submitted a revised PSTP to NDEP which substantially complies with the FFCAct. The PSTP contains

sufficient detail concerning treatment alternatives, including regionalized treatment alternatives, for the mixed waste streams on the NTS to be evaluated. NDEP requested public input on the revised PSTP. After review and incorporation of comments, the PSTP has been modified and accepted as the Site Treatment Plan (STP). This Order contains schedules derived from the STP and identifies specific treatment facilities for treating the identified mixed waste streams on the NTS. Where treatment options are not available, plans and schedules for characterizing the waste streams, technology assessments and/or options for the development of treatment capacity are contained in this Order.

PART II. PARTIES

II.1. The parties to this Order are persons as defined in NRS 459.010 and include the NDEP and DOE.

II.2. DOE shall provide notice of this Order (including all appendices and any amendments) to every successor in interest and to any successor agency prior to any transfer of ownership or operation of the real property subject to this Order. The provisions of this Order shall be binding on all successors in interest and to any successor agency.

II.3. DOE shall be responsible for ensuring that their respective contractors conduct their activities in conformance with the requirements of this Order. Contractors of each party are not considered parties to this Order.

II.3.a. DOE shall provide copies of this Order to all their respective prime contractors presently retained to perform work related to any part of this Order within thirty (30) calendar days of execution of this Order.

II.3.b. DOE shall provide copies of this Order to all additional prime contractors retained to perform work related to any part of this Order within ten (10) calendar days following their retention.

II.3.c. Copies of this Order shall be made available to all other contractors and subcontractors retained to perform work under this Order.

II.4. This Order shall apply to and be binding upon the parties and their successors in interest and assigns.

PART III. STATEMENT OF PURPOSE

III.1. The purposes of this Order are to:

III.1.a. Fulfill the requirements of the Federal Facility Compliance Act and other applicable requirements of state and federal law relating to the treatment and storage of covered wastes currently being stored on the NTS.

III.1.b. Establish an enforceable framework for compliance with the applicable LDR standards for covered waste identified in this Order or received at the NTS.

III.1.c. Provide for the storage of the covered waste streams at the NTS, pending the refinement and implementation of identified treatment technologies or capacity and ultimate treatment or other disposition of such wastes according to applicable LDR standards in existence during the term of this Order.

III.1.d. Incorporate, for reference purposes, the STP which is comprised of two volumes. The Background Volume (BV) contains general site information, identification of wastes and discussions of alternatives for management of those wastes. The Plan Volume (PV) contains DOE's proposed activities and their associated schedules for achieving compliance with the applicable LDR standards for the identified wastes.

III.2. Require DOE to achieve compliance with the requirements of the FFCAct through the STP which contains schedules and applicable strategies for achieving compliance with the applicable LDR standards. Deadlines, as defined in Part V.8, are established pursuant to this Order. The procedures for reviewing schedules, deleting waste streams, and administrative procedures are contained in this Order. If a need arises to establish an additional deadline(s) as a result of an amendment, revision or extension to this Order, such deadline(s) will be within the FY+2 planning window.

PART IV. LEGAL AUTHORITY

IV.1. This Order is issued pursuant to the Nevada Hazardous Waste Law, NRS §§ 459.400 - 459.600, Nevada Administrative Code (NAC) §§ 444.842 - 444.960, the Solid Waste Disposal Act, as amended by RCRA, 42 U.S.C. §6901 *et. seq.*, the Federal Facility Compliance Act of 1992, Pub. L. No. 102-386, 106 Stat. 1505 (1992), and Executive Order 12088 which requires each department, agency and instrumentality of the federal government engaged in the disposal or management of hazardous waste to comply with all federal and state requirements respecting the control and abatement of hazardous and solid waste disposal and management.

IV.2. NDEP is an agency of the State of Nevada which has (1) authority under state law to prohibit land disposal of mixed waste until the hazardous component of the waste has been adequately treated, (2) authority under state law to regulate the hazardous components of mixed waste, and (3) authorization from the U. S. Environmental Protection Agency (EPA) under Section 3006 of RCRA to regulate the hazardous components of mixed waste, as such authorities are described in Section 3021(b) of RCRA, as amended by the Federal Facility Compliance Act.

IV.3. DOE is a department of the executive branch of the federal government which generates, transports, and manages hazardous waste, including mixed waste, at the NTS and is therefore subject to and must comply with all applicable state and federal requirements applicable to these wastes.

IV.4. This Order fulfills the requirements contained in Section 3021(b)(5) of RCRA, as amended by the Federal Facility Compliance Act, and stands in lieu of any other orders, agreements or interpretations of the requirement for DOE to develop and submit plans for the development of treatment capacities and technologies to treat the covered waste at the NTS to the standards promulgated pursuant to Section 3004(m) of RCRA.

PART V. DEFINITIONS

V.1. Except as stated herein, the terms used in this Order shall have the same meaning as used in NRS §§ 459.400 - 459.600; NAC §§ 444.842 - 444.960; RCRA; EPA's Rules and Regulations, 40 C.F.R. Parts 124, 260-268, and 270; and the DOE/NV STP.

V.2. "Administrator" shall have the meaning given in NRS 445.134.

V.3. "Amendment" shall mean a minor change to the Site Treatment Plan and/or schedules in the Order including but not limited to some extensions in deadlines or clarification of existing language. Amendments are not required to be subject to a public comment period.

V.4. "Background Volume" shall mean the portion of the Site Treatment Plan which contains historic information and other general information about the Nevada Test Site.

V.5. "Contractor" shall mean any person with whom the U.S. Department of Energy has entered into, a contract for services, to include but not limited to operations, maintenance, or remediation, at the Nevada Test Site. This definition includes both prime and subcontractors at the site.

V.6. "Covered waste" shall mean the collective term for the waste streams referenced in Part I of this Order.

V.7. "Day" shall mean a calendar day unless business days are specified. Any submittal that, under the terms of this Order, would be due on a Saturday, Sunday, state of Nevada, or federal holiday shall be due on the next business day.

V.8. "Deadline" shall mean the date by which a milestone established by this Order shall be met. Stipulated penalties may be assessed for failure to meet an established deadline.

V.9. "Department of Energy" shall mean the U.S. Department of Energy and/or any predecessor or successor agency(ies) and/or their authorized representatives.

V.10. "Facilities" shall mean buildings and structures, their functional systems and equipment including site development features such as landscaping, roads, walls, and parking areas; outside lighting and communications systems; central utility plants; utilities supply and distribution systems; and other physical plant features.

V.11. "Federal Facility Compliance Act" shall mean the amendment to the Resource Conservation and Recovery Act of 1976, 42 U.S.C. §6901 et seq., enacted by Public Law 102-386, which, in part, delayed for three years the waiver of sovereign immunity for

enforcement of violations associated with the storage of Land Disposal Restriction prohibited mixed waste at federal facilities, under certain circumstances.

V.12. "Fiscal Year" shall mean the federal fiscal year unless otherwise specified.

V.13. "Hazardous waste" shall have the meaning given in 42 U.S.C. §6903(5) and NRS 459.430.

V.14. "Interim Activity Dates" identify dates or time frames by which a certain activity necessary to treat each waste stream as set forth in the Plan Volume of the STP is scheduled to occur. Those dates for which deadlines in the Order are not established are not enforceable and stipulated penalties shall not apply.

V.15. "Land Disposal Restrictions" shall mean regulations established pursuant to the Hazardous and Solid Water Amendment of 1984 and found at 40 C.F.R. Part 268 which include requirements for the treatment of hazardous wastes to specified standards prior to land disposal in a landfill, surface impoundment, or injection well, or other land-based unit.

V.16. "Macroencapsulation" shall mean the immobilization technique using the application of surface coating materials to reduce surface exposure to potential leaching media.

V.17. "Milestone" shall mean an important or critical event, goal, task, and/or activity that must occur in order to achieve the objectives set forth in the STP.

V.18. "Mixed waste" shall have the meaning given in 42 U.S.C. §6903(41).

V.19. "Nevada Department of Conservation and Natural Resources, Division of Environmental Protection" (NDEP) shall have the meaning given in NRS 445.152 and NAC 444.576.

V.20. "Nevada Test Site" shall mean the U.S. Department of Energy Installation occupying approximately 1,350 square miles in southeastern Nye County, Nevada.

V.21. "Parties" shall mean the parties to this Order. The U.S. Department of Energy and the Nevada Division of Environmental Protection.

V.22. "Person" for the purposes of this agreement shall include the U.S. Department of Energy and the Nevada Division of Environmental Protection within the definition of "person" contained in the Nevada Hazardous Waste Law, NRS 459.000 *et seq.*

V.23. "Plan Volume" shall mean the portion of the Site Treatment Plan which provides overall schedules for achieving compliance with Land Disposal Restriction storage and treatment requirements for covered waste at the Nevada Test Site based on deadlines negotiated between the Nevada Division of Environmental Protection and the U.S. Department of Energy.

V.24. "RCRA" shall mean the Resource Conservation and Recovery Act of 1976, Public Law 94-580, 42 U.S.C. §6901 *et seq.*, as amended by the Hazardous and Solid Waste Amendments of 1984, Public Law 98-616, as amended by the Federal Facility Compliance Act of 1992, Public Law 102-386, and any other amendments thereto.

V.25. "Revisions" shall mean any substantial change to the Plan Volume of the Site Treatment Plan that is proposed by DOE/NV and accepted by NDEP, after public comment in accordance with Section 3021(b) (4) of RCRA, as amended by the Federal Facility Compliance Act.

V.26. "TSCA" shall mean the Toxic Substance Control Act, Public Law 94-469, Title I, §2, Oct. 11, 1976, 90 Statute 2003, redesignated Public Law 99-519, §(c) (1), Oct. 22, 1986, 100 Statute 2989.

PART VI. STATEMENT OF FACTS AND CONCLUSIONS OF LAW

VI.1. DOE is responsible for the operations at the NTS.

VI.2. Pursuant to the provisions of NRS §§ 459.400 - 459.600 and NAC §§ 444.842 - 444.960, hazardous waste, including mixed waste, is subject to LDR provisions. The storage of such waste restricted from land disposal is prohibited unless such storage is solely for the purpose of accumulating sufficient quantities of hazardous waste required to facilitate proper recovery, treatment or disposal.

VI.3. DOE is currently constructing or planning to construct or obtain facilities that shall treat and/or dispose of the mixed

wastes described in the STP to comply with the applicable LDR standards.

VI.4. NDEP has given DOE authorization to temporarily store the identified mixed waste on the NTS until such time as off-site or on-site facilities capable of treating such wastes have been permitted, constructed and these wastes treated or otherwise managed to meet the applicable LDR standards in accordance with the schedules contained in this Order.

PART VII. SITE TREATMENT PLAN

VII.1. The STP contains two volumes and is intended to bring the NTS into compliance with LDR storage prohibitions contained in the Nevada Hazardous Waste Law and RCRA. DOE intends to carry out all activities in accordance with the schedules and requirements contained in the PV of the STP as amended periodically.

VII.1.a. The PV of the STP provides overall schedules for achieving compliance with the applicable LDR standards for covered waste at the NTS based on deadlines established by NDEP. The PV includes a schedule for completion of characterization efforts, the conduct of treatability studies, the submittal of applications for permits, construction of treatment facilities, technology development, off-site transportation for treatment, and the treatment of covered wastes in full compliance with the Nevada Hazardous Waste Law and RCRA including 40 CFR Parts 260 through 270.

VII.1.b. The BV of the STP contains historic information and other general information about the NTS. The BV also contains some of the possible contingency alternatives that DOE/NV will evaluate in the event that the preferred treatment option for which schedules have been established in PART VIII. cannot be implemented due to but not limited to the following:

VII.1.b.(1) The waste characterization analysis shows that the waste does not meet the proposed off-site facility's WAC;

VII.1.b.(2) The proposed DOE sites and the affected States cannot agree upon issues of concern related to waste movement; or

VII.1.b.(3) On-site treatability studies show the proposed treatment will not result in compliance with LDR requirements.

VII.1.c. Implementation of a contingency alternative is subject to Part XII., Revisions.

VII.2. The PV of the STP contains DOE's proposed milestones and interim activities which identify dates or time frames by which a certain activity or submittal is scheduled to occur. For the purposes of this Order, NDEP has assigned deadlines to certain of these milestones. Only those milestones associated with these deadlines are enforceable.

PART VIII. TREATMENT SCHEDULES FOR TREATMENT OF COVERED MIXED WASTE INVENTORIES

VIII.1. The Deadlines contained in this Part have been derived from the milestones identified in the STP. The treatment schedules are based on characterization analyses which verify that the proposed treatment alternatives are appropriate. For mixed waste streams identified for shipment to DOE/OR, it is acknowledged that DOE/OR is not presently capable of nor permitted to receive wastes in the physical form of the NTS mixed waste streams. Based on existing preliminary discussions between the Parties, it is presumed that the NTS mixed wastes will be acceptable upon completion of discussions between the affected States and following permit and facility modification which is anticipated to be by the end of fiscal year 1998.

VIII.2. PCB Soil. The current treatment technology being considered is incineration. The incinerator of choice is the DOE incinerator at Oak Ridge, Tennessee. Treatment of PCB soil is subject to the following schedule:

VIII.2.a. Complete All Additional Waste Characterization Required by Receiving Site
Deadline: December 31, 1996

VIII.2.b. Receive Written Approval of Acceptance
from Receiving Site
Deadline: June 30, 1997

VIII.2.c. If Waste Rejected, Initiate Revision
Process
Deadline: July 31, 1997

VIII.2.d. Initiate Waste Shipment
Deadline shall be in accordance with receiving site
approved schedule

VIII.3. Lead-Contaminated Soil. This waste stream consists of radioactively contaminated Area 12, FOD, and T2 Lead-Contaminated Soils. The treatment currently under investigation is on-site screening of the soil to remove the lead shot. Separated lead shot will be evaluated in conjunction with the Bulk Lead Wastes addressed in Paragraph VIII.4. After screening the waste, a TCLP analysis will be performed to determine if the soil still exhibits the characteristic of toxicity due to the presence of lead. If the soil does not exhibit the lead toxicity characteristic, then it will be disposed of as low-level radioactive (solid) waste. If the soil does exceed the TCLP limit for lead, then it will be solidified (i.e., cementation) at an off-site treatment facility. Treatment of Lead-Contaminated Soil is subject to the following schedule:

VIII.3.a. Complete Soil Screening and Initiate
Sampling of Screened Soil
Deadline: September 30, 1996

VIII.3.b. Submit Schedule for Processing Backlogged
Waste or Initiate Revision Process
Deadline: July 31, 1997

VIII.3.c. Complete Shipment of Waste to
Receiving Site
Deadline: September 30, 1997

VIII.4. Bulk Lead Wastes. This waste stream consists of Spent Batteries (fragmented), DNA Lead Cylinders, the bulk lead portion of T2 Lead, and any lead waste segregated from lead-contaminated soil described in Paragraph VIII.3. These waste streams have been combined because they contain similar physical and hazardous

properties. Treatment of the Bulk Lead Wastes is subject to the following schedule:

VIII.4.a. Complete All Additional Waste
Characterization Required by Receiving Facility
Deadline: June 30, 1996

VIII.4.b. Initiate Preparation of Waste Shipment or
Initiate Revision Process
Deadline: September 30, 1996

VIII.4.c. Submit Schedule for Processing Backlogged
Waste Based Upon Completion of Demonstration
Project
Deadline: December 31, 1996

VIII.5. Solvent Sludge (Area 12). The proposed treatment for the Solvent Sludge is incineration at an off-site facility. The existing permitted DOE/OR TSCA Incinerator is the preferred treatment facility for the Area 12 Solvent Sludge. Discussions with DOE/OR personnel have been initiated but official acceptance of the waste will require complete characterization. The RCRA Part B Permit for the TSCA Incinerator must be modified to accept solids. Treatment of the Area 12 Solvent Sludge is subject to the following schedule:

VIII.5.a. Complete All Additional Waste
Characterization Required by Receiving Site
Deadline: December 31, 1996

VIII.5.b. Receive Written Approval of Acceptance
from Receiving Site
Deadline: June 30, 1997

VIII.5.c. If Waste Rejected, Initiate Revision
Process
Deadline: July 31, 1997

VIII.5.d. Initiate Waste Shipment
Deadline shall be in accordance with receiving site
approved schedule

VIII.6. Shipping Cask. Treatment of the Shipping Cask is subject to the following schedule:

VIII.6.a. Provide Treatment Options and Recommendation to state of Nevada

Deadline: February 16, 1996 **COMPLETED**

VIII.6.b. State of Nevada Concurs/Denies Recommendation

Deadline: February 29, 1996 **COMPLETED**

VIII.6.c. Provide Treatment Schedule to state of Nevada

Deadline: April 29, 1996

VIII.6.d. Initiate Processing of Shipping Cask

Deadline shall be in accordance with approved schedule

VIII.7. TTF Solvent. The proposed treatment for TTF solvent is incineration of the waste to destroy the organic constituents. The DOE/OR TSCA Incinerator is currently the preferred treatment facility for the TTF Solvent, but additional characterization must be performed to verify that the DOE/OR WAC is met. Treatment of the TTF Solvent is subject to the following schedule:

VIII.7.a. Complete All Additional Waste Characterization Required by Receiving Site

Deadline: December 31, 1996

VIII.7.b. Receive Written Approval of Acceptance from Receiving Site

Deadline: June 30, 1997

VIII.7.c. If Waste Rejected, Initiate Revision Process

Deadline: July 31, 1997

VIII.7.d. Initiate Waste Shipment

Deadline shall be in accordance with receiving site approved schedule

VIII.8. Cotter Concentrate (Population A). Treatment of the Cotter Concentrate (Population A) is subject to the following schedule:

VIII.8.a. Provide Results of Treatability Study to state of Nevada
Deadline: April 30, 1996

VIII.8.b. Provide Treatment Results from Pilot Scale Study to state of Nevada
Deadline: February 28, 1997

VIII.8.c. Submit RCRA Part B Permit Modification or Initiate Revision Process
Deadline: April 30, 1997

VIII.8.d. State Approves Permit Modification (Assumption)

VIII.8.e. Award RFP, Assemble Treatment System, and Initiate Treatment System Testing
Deadline: Within 12 months of permit issuance

VIII.8.f. Complete System Testing and Submit Backlogged Waste Schedule
Deadline shall be established within 6 months of completion of Part VIII.8.e.

VIII.9. Cotter Concentrate (Population B). The proposed treatment for Cotter Concentrate (Population B) is incineration at the DOE/OR TSCA Incinerator. Official acceptance of the waste will require Cotter Concentrate (Population B) meeting the DOE/OR Waste Acceptance Criteria. The RCRA Permit for the TSCA Incinerator must be modified to accept solids. Approval of off-site shipment is dependent on Tennessee's approval of permit modifications and this waste meeting that facility's WAC. The treatment schedule for Cotter Concentrate (Population B) is as follows:

VIII.9.a. Complete All Additional Waste Characterization Required by Receiving Site
Deadline: December 31, 1996

VIII.9.b. Receive Written Approval of Acceptance
from Receiving Site
Deadline: June 30, 1997

VIII.9.c. If Waste Rejected, Initiate Revision
Process
Deadline: July 31, 1997

VIII.9.d. Initiate Waste Shipment
Deadline shall be in accordance with receiving site
approved schedule

VIII.10. Mixed Transuranic (MTRU) Waste Streams. DOE plans to
achieve compliance with the requirements of the FFCAct and the LDRs
for MTRU destined for WIPP by using the no-migration variance
petition approach outlined in Title 40 C.F.R. 268.6. MTRU Waste is
subject to the following schedule:

VIII.10.a. Submit Work Plan to state of Nevada for
TRU Waste Characterization Project
Deadline: February 29, 1996 **COMPLETED**

VIII.10.b. Complete Construction of Facility and
Submit Processing Schedule
Deadline: June 30, 1997

VIII.10.c. Complete Pre-Characterization Activities
Required by WIPP with all Required Information
Having Been Submitted for Incorporation into the
WIPP Waste Information System (WWIS) or Initiate
Discussions with state of Nevada if WIPP Does Not
Open
Deadline: June 1, 1998

PART IX. PROGRESS REPORTING

IX.1. Following the effective date of this Order, DOE shall, on
or before the 30th calendar day following the end of each fiscal
quarter, submit a written or electronic progress report to NDEP
that synthesizes the actions taken during the fiscal quarter just
ended. This information will serve as a partial basis for the
discussions at the quarterly meetings.

IX.2. Each quarterly report shall include:

IX.2.a. Sufficient detail to clearly and accurately convey to NDEP the manner and extent to which the requirements and schedules set forth in this Order are being met;

IX.2.b. Any schedule variances along with the cause of the variances and any actions which may be implemented to correct the variances;

IX.2.c. Actions and issues of concern, such as anticipated need for REVISIONS.

IX.3. Quarterly meetings will be held to discuss any issues raised in or by the quarterly progress reports. The parties will attempt to resolve issues during the quarterly meetings.

IX.4. Milestones and deadlines will be evaluated by the parties during the quarterly meetings. The following schedule applies to the quarterly meetings:

IX.4.a. During the quarterly meeting held during the fiscal year first quarter, the parties shall review and if necessary may reconsider established priorities, milestones, and deadlines for the current federal fiscal year in accordance with Part XX.8.

IX.4.b. During the quarterly meeting held during the fiscal year second quarter, the parties may review established priorities, milestones, and associated deadlines in relationship to the development of the FY+2 program and budget in accordance with Part XX.3.

IX.4.c. During the quarterly meeting held during the fiscal year third quarter, NDEP shall review and where appropriate reconsider established priorities, milestones, and associated deadlines for FY+2 in accordance with Part XX.3 through XX.5.

IX.4.d. During the quarterly meeting held during the fiscal year fourth quarter, the parties shall review and where appropriate reconsider established priorities, milestones, and deadlines for FY+1 in accordance with Part XX.7.

IX.5. Unless the parties mutually agree that no amendment to this Order is warranted, the parties shall begin a good faith dialogue

in January 1999 to determine the extent to which the deadlines and funding structure of the Order and the technical plans and schedules should be amended, considering the parties' experience in implementing the Order to date, the most recent information on current and projected funding availability, and the status of major technical issues that are expected to affect the management of mixed waste across DOE sites. If the parties agree that amendment of the Order and associated PV schedules and activities is warranted, the goal of the parties is to finish such amendments no later than September 30, 1999. Changes shall only be made upon consent of both parties.

PART X. ANNUAL SITE TREATMENT PLAN UPDATES

X.1. By January 15 of each fiscal year, DOE shall submit a draft annual update of the STP to the NDEP for review and comment. DOE will then finalize the draft update by April 30 of each year. Each Annual Update shall bring the STP current to the end of the previous federal fiscal year. The Annual Update shall provide a summary of the current status of DOE's progress in implementing the STP as required by this Order, including proposed revisions, technology development, funding and other concerns that may affect the implementation of the PV of the STP as required by this Order.

X.2. The annual update to the Background Volume shall quantify the amount of each covered waste remaining in storage at the NTS and the volume treated, shipped off-site or otherwise reduced the quantity of covered waste in the inventory during the previous fiscal year. In addition it shall include any potential alternative commercial treatment and off-site DOE treatment capacity or technology development being considered for potential plan revision.

X.3. The annual update to the Plan Volume shall include a progress report from the end of the previous year describing treatment progress and treatment technology development for each treatment facility and activity scheduled in the PV of the STP.

X.4. The annual update to the Plan Volume shall also contain a description of waste deleted in accordance with the requirements in Part XI., Deletion of Waste; additional or new milestones or interim activity dates and any other changes to the overall schedules in the STP that have been approved by the NDEP and incorporated.

PART XI. DELETION OF WASTE

XI.1. Mixed waste will cease to be a covered waste subject to this Order when:

XI.1.a. Documentation is provided that the waste has been received at an off-site facility for treatment, disposal, or storage pending treatment or disposal;

XI.1.b. It is determined by NDEP to no longer be subject to LDR provisions under applicable provisions of RCRA or the Nevada Hazardous Waste Law;

XI.1.c. Documentation is provided that the waste has been treated at an on-site facility.

XI.2. DOE shall provide to NDEP, in the Plan Volume at the time of the next regularly scheduled Site Treatment Plan Update, a description of the waste code and applicable waste form, volumes, and other relevant information regarding deleted waste, including schedules for the shipment of hazardous waste, subject to LDR standards, which was previously identified as mixed waste covered by this Order.

XI.3. DOE anticipates that as it characterizes, sorts and surveys mixed wastes currently in storage at the NTS, it will determine that certain waste previously identified as mixed waste is actually hazardous waste without a radioactive component or radioactive waste without a hazardous component. In those cases where the waste is determined to be a hazardous waste without a radioactive component which is subject to LDR standards, within thirty (30) days these wastes shall be transferred to a hazardous waste storage unit, managed in a 90 day area in accordance with 40 C.F.R. §262, or shipped off-site to a permitted facility.

PART XII. REVISIONS TO THE STP

XII.1. A revision is a substantial change to the PV of the STP that is proposed by DOE/NV. After public comment and in accordance with Section 3021(b)(4) of RCRA as amended by the FFCAct, NDEP shall approve, approve with modifications, or disapprove all revisions in accordance with this Part. All revisions which are approved with or without modifications shall have the appropriate

activities and associated schedules incorporated into this Order by NDEP.

XII.2. A revision is:

XII.2.a. The addition of a treatment facility at the NTS;

XII.2.b. The development of treatment technology not previously identified in the PV of the STP and this Order.

XII.2.c. Modification of the PV of the STP proposed alternatives formalized in this Order where waste is shipped for treatment to a location other than the location identified in the PV if such action requires the initiation of regional discussions with affected states and/or would substantially extend a deadline.

XII.2.d. Any other amendment to the PV of the STP which NDEP determines should receive public comment.

XII.3. Revisions shall be made as follows:

XII.3. When DOE proposes a revision, DOE shall provide NDEP with a written proposal which includes:

XII.3.a. A detailed description of the proposed revision;

XII.3.b. The rationale for the proposed revision;

XII.3.c. The expected length of delay in performance that may result from the proposed revision, including all deadlines that would be affected; and,

XII.3.d. Where a proposed revision may result in a delay in performance, DOE shall propose a plan for implementing all reasonable measures to avoid and/or minimize the delay and a schedule for implementing such plan.

XII.4. NDEP will provide DOE with advance written notice of its determination to approve with modifications or disapprove a proposed revision. Such notice will include the rationale for the modification or disapproval. Within thirty (30) days after receipt

of the notice, DOE may respond in writing to the notice and shall have the opportunity to discuss the determination with NDEP. This time period may be extended or shortened by mutual agreement of the Parties. All disputes arising from the revision process will be subject to Part XVI Informal Dispute Resolution/ Appeal Procedure.

XII.5. In making its determination on a proposed revision, NDEP will make every reasonable effort to issue its decision in a timely manner and in all cases will issue its decision within six months from the date of DOE's proposal for a revision.

XII.6. NDEP shall consult with any other state(s) or Regional office(s) of the U. S. Environmental Protection Agency (EPA) which may be affected by revisions to this Order.

XII.7. When considering proposed revisions to the STP, NDEP shall consider the following factors:

XII.7.a. The need for regional treatment facilities;

XII.7.b. Funding availability;

XII.7.c. New or emerging technologies;

XII.7.d. New technical information that may affect waste treatment options;

XII.7.e. Site priorities identified through consultation among DOE, regulatory agencies and other stakeholders; and

XII.7.f. Any other factors which are relevant.

PART XIII. AMENDMENTS TO THE ORDER and STP

XIII.1. Any amendment to the Order and the STP shall be in writing and signed by both Parties. Amendments to the STP, which shall result from an amendment to this Order, shall be considered minor modifications not covered under Part XII and generally not subject to public review and comment.

XIII.2. Amendments to this Order may be proposed by either of the parties.

XIII.3. Amendments to this Order may be proposed for the following reasons, among others:

XIII.3.a. To assure that this Order remains consistent with applicable laws and regulations;

XIII.3.b. To assure that this Order is consistent with changed circumstances.

PART XIV. ENFORCEABILITY/RESERVATION OF RIGHTS

XIV.1. Compliance with the terms and conditions of this Order shall stand in lieu of any administrative or judicial remedies that may be taken for matters covered by this Order.

XIV.2. Except as described in paragraph XV.2, NDEP reserves the right to bring any enforcement action against DOE for noncompliance with the terms and conditions of this Order, including actions to compel completion of a deficient activity.

XIV.3. For all matters outside the scope of this Order, NDEP, within the scope of its authority, reserves the right to bring enforcement actions against any person.

XIV.4. DOE intends to be legally bound by this Order and agrees that the terms and conditions of this Order are enforceable as provided herein.

XIV.5. Nothing in this Order shall be construed to affect any criminal investigations or criminal liability of any person(s) for activities at the NTS.

XIV.6. Nothing in this Order shall constitute, or be construed as a release from any claim, cause of action, or demand in law or equity against any individual, firm, partnership, or corporation not directly identified in this Order for any liability it may have arising out of, or relating in any way, to the generation, storage, treatment, handling, transportation, release, or disposal of mixed waste located at the NTS for matters not covered by this Order.

XIV.7. Nothing in this Order shall constitute or be construed as a waiver by DOE of any claim of jurisdiction over matters related to the covered wastes which may be reserved to DOE by law under the Atomic Energy Act, 42 U.S.C. §2011 et seq.

XIV.8. The parties reserve their appeal rights as set forth in Part XVI., Informal Dispute Resolution and Appeal Procedure.

XIV.9. In the event of administrative or judicial action, all Parties reserve all rights, claims, and defenses available under the law.

PART XV. STIPULATED PENALTIES

XV.1. Stipulated penalties shall be incurred by DOE in the event that DOE fails to meet a deadline established by NDEP in this Order.

XV.2. In the event DOE fails to meet an established deadline contained herein, NDEP may assess a stipulated penalty in the amount of \$5,000.00 per week for the first week or part thereof of such failure, \$10,000.00 per week for the following week or part thereof of such failure, and \$15,000.00 per week for the third and each succeeding week for which the failure to meet an established deadline occurs.

XV.3 NDEP shall notify DOE in writing of any alleged failure to meet an established deadline.

XV.3.a. If NDEP's written notice of a missed deadline cites that the specified deadline was not met, evidence supporting this alleged defense must be submitted to NDEP within thirty (30) calendar days from the date of receipt of NDEP's written notice unless otherwise agreed. No penalty shall be assessed if NDEP accepts DOE's defense. If NDEP rejects the defense, DOE shall be assessed the stipulated penalty from the date of the missed deadline, and DOE may initiate the appeal procedure in accordance with Part XVI.2.

XV.3.b. If a milestone for which a deadline has been established is construed by NDEP to be substantially deficient, and therefore not complete, NDEP shall issue a written Notice of Deficiency to DOE that cites the alleged deficiencies. If DOE accepts NDEP's position, DOE shall, within twenty-one (21) calendar days of receipt of the Notice of Deficiency or such longer time period as specified by NDEP, correct the deficiencies and resubmit or otherwise complete the milestone for which the deadline was established. Any stipulated penalty(ies) connected to

failure to meet the established deadline shall begin upon DOE's receipt of the Notice of Deficiency. The penalty(ies) shall accrue during such twenty-one (21) calendar days, or otherwise specified period, and may, at NDEP's discretion, be waived unless the resubmitted deliverable or completed milestone is determined by NDEP to remain substantially deficient. If DOE is aggrieved by either NDEP's original or subsequent determination of substantial deficiency, DOE may initiate the appeal procedure in accordance with paragraph XVI.2.

XV.4. Stipulated penalties will continue to accrue and may be assessed at NDEP's discretion during pursuit of remedies contained in Part XVI., Informal Dispute Resolution and Appeal Procedure, except accrual of such penalties shall be suspended during any period of time in excess of fourteen (14) calendar days required by NDEP to render its decision under paragraph XV.3 or XVI.2.a. DOE is responsible for stipulated penalties only for the time ultimately determined to be deficient, and stipulated penalties are to be paid within 30 days of a final determination of deficiency unless the parties agree to a different schedule.

XV.5. The provisions of this Part shall not affect DOE's ability to petition NDEP for an extension of a deadline as appropriate as set forth in Part XVII., Extensions.

XV.6. Stipulated penalties for failure to meet established deadlines contained herein are in lieu of statutory penalties otherwise available under the law. For statutory or regulatory violations for actions or outside the scope of this Order, all remedies available to NDEP may be invoked.

XV.7. Payment of any stipulated penalty does not relieve DOE of any other requirements imposed by this Order.

XV.8. Any failure of DOE to remit a stipulated penalty within thirty (30) calendar days after the stipulated penalty is due and payable, unless the Parties agree to a different payment schedule, shall, to the extent allowed by law, cause the addition of interest on the unpaid balance compounded daily at a rate equal to the rate of interest fixed for 1-year United States treasury bills on the date of the commencement of the action, as reported in the "Federal Reserve Bulletin" published by the Board of Governors of the Federal Reserve System or other commonly used business or financial publication. In the event payment of interest is not allowed by

law, DOE shall, to the satisfaction of NDEP, establish the basis of this position.

XV.9. Stipulated penalties that are due and payable shall be paid to the State of Nevada, Division of Environmental Protection.

PART XVI. INFORMAL DISPUTE RESOLUTION AND APPEAL PROCEDURE

XVI.1. Both parties to this Order shall make reasonable efforts to informally resolve outstanding issues and/or disputes. During the informal dispute resolution process, the parties shall meet as many times as necessary to discuss and attempt resolution of the dispute. If resolution at the Project Manager level cannot be reached, efforts may be elevated to immediate supervisors or, if necessary, to the agency executive level. If resolution cannot be achieved informally, the appeal procedures of this Part may be implemented.

XVI.2. In the event DOE is aggrieved by a written determination by NDEP, DOE may appeal the matter as follows:

XVI.2.a. Within fifteen (15) calendar days following DOE's receipt of NDEP's determination being appealed, DOE shall request an informal administrative hearing. Seven calendar days prior to the informal administrative hearing, DOE shall provide NDEP with a witness list, list of exhibits, and summary of evidence intended to be presented. The informal administrative hearing shall be held in the NDEP offices within thirty (30) calendar days of the request, unless otherwise agreed. Following the informal administrative hearing, the NDEP administrator shall issue the final decision.

XVI.2.b. If the informal administrative hearing fails to resolve the issue, DOE may, within twenty (20) calendar days following receipt of the NDEP administrator's final written decision, appeal the administrator's decision to the Nevada State Environmental Commission (SEC). The appeal is made by filing SEC Form #3 with the Secretary of the SEC. SEC Form #3 will be enclosed with the decision document referenced in paragraph XVI.2.a.

XVI.2.c. A hearing before the SEC shall be conducted within twenty (20) calendar days pursuant to the Nevada

Administrative Procedure Act, NRS 233B.010 *et seq.* and the Rules of Practice and Procedure of the SEC, NAC 445.980 through 445.995.

XVI.3. Either of the parties may appeal the final decision of the SEC as provided for in paragraph XVI.2.c by filing a petition for judicial review pursuant to NRS 233B.010 *et seq.*

PART XVII. EXTENSIONS

XVII.1. NDEP shall grant a reasonable extension of a deadline upon receipt of a timely written request from DOE and when NDEP determines that good cause exists for the requested extension. Extensions, although they can be, are not automatically to be considered Revisions under this Order. Any request for extension shall specify:

XVII.1.a. The deadline that is sought to be extended;

XVII.1.b. The length of the extension sought;

XVII.1.c. The good cause(s) for the extension; and

XVII.1.d. Any and all related schedule(s) or deadline(s) that would be affected if the extension were granted.

XVII.2. Good cause for an extension may exist for:

XVII.2.a. An event included in Part XXIV., Force Majeure;

XVII.2.b. A delay caused by, or likely to be caused by, the granting of an extension in regard to another deadline;

XVII.2.c. Any event or series of events mutually agreed to by DOE and NDEP as constituting good cause.

XVII.2.d. Any factor identified in Part XII.7.

XVII.3. NDEP shall, in writing, grant or deny a written request for an extension within thirty (30) calendar days from the date of receipt of the written request.

XVII.4. NDEP may grant the extension for less time than originally requested if it determines that the shorter extension is reasonable in light of the good cause.

XVII.5. If NDEP denies the requested extension, or approves an extension but modifies the length of time requested for the extension, it will include in its written statement of denial or modification an explanation of the basis for its position.

PART XVIII. ACCESS

XVIII.1. Subject to DOE security requirements, applicable health and safety plans, and health and safety officers' instructions, NDEP personnel, with appropriate safety and security clearances, shall have authority to enter work sites and DOE/NV facilities during normal business hours with or without advance notification. Following notification of DOE, NDEP shall to the extent authorized by law have authority to enter contractor facilities to review applicable records and information. Access may be sought for the following purposes among others:

XVIII.1.a. Inspection of records, operating logs, contracts, and other documents related to implementation of this Order;

XVIII.1.b. Reviewing the progress of DOE in implementing the terms and conditions of this Order;

XVIII.1.c. Verification of data related to implementation of this Order; and

XVIII.1.d. Observation of Order-related work in progress.

XVIII.2. Escorts of NDEP personnel to restricted areas where work related to this ORDER is being undertaken shall not be required where facility/locality-specific security, health, and safety requirements are understood and adhered to by the unescorted NDEP personnel. Unescorted NDEP personnel shall sign a release of liability before undertaking any unescorted visit of a restricted site.

XVIII.3. No reasonable access shall be denied NDEP personnel with appropriate certifications and clearances on Order-related business. If access is denied, the stated reasons for any denial

of access to NDEP personnel to any of the facilities or to any of the localities shall be provided to NDEP within one (1) business day.

PART XIX. CLASSIFIED AND CONFIDENTIAL INFORMATION

XIX.1. Personnel designated by NDEP as requiring DOE "Q" clearances who have subsequently been issued such "Q" clearances by the DOE shall be eligible for access to classified information on a "need to know" basis. Only responsible DOE officials, with the authority to do so, may make the determination of the "need to know." Recipients of the information are responsible for protecting all classified information to which they have access or custody. DOE shall provide within ten (10) business days of such refusal a written determination to NDEP requests for information related to the Order for which they have determined that a "need to know" is not justified. The time frame for this determination is hereby established as a mandatory requirement. The response shall be complete and specific as to the information that is nondisclosable.

XIX.2. Those data, documents, records, or files that are nondisclosable pursuant to applicable privileges and laws including the Freedom of Information Act, 5 U.S.C. §552, and the Privacy Act of 1972, 5 U.S.C. §552(a), unless expressly authorized for release by the originating party, shall be handled in accordance with those provisions of law and any implementing regulations. Upon submission of reports, letters, or other Order-related writings to NDEP, DOE shall identify any materials determined by DOE to be exempt from public disclosure pursuant to the Freedom of Information Act and to the extent required by state law, such materials shall be handled as exempt from public disclosure by NDEP. NDEP will notify the appropriate party within 30 days of its intent to release the information should a determination to release the information be made.

PART XX. OBLIGATIONS OF DOE

XX.1. DOE shall take all necessary steps as set forth in paragraphs XX.3-XX.5 to obtain timely funding to meet its obligations under this Order through consultation with NDEP and the submission of timely budget requests.

XX.2. In accordance with the DOE rules and policies applicable to the release of budgetary/contracting information (in effect at the time of the signing of this Order), DOE shall make the scope of work and the Programmatic budgets to be used in implementing the terms of this Order available to NDEP. Upon request by NDEP, DOE shall also provide to NDEP the identity, scope of work, and Order-related budgets of any entity or agency performing work related to this Order.

XX.3. Prior to the annual submission of DOE Nevada Operations Office budget request for FY+2 to DOE Headquarters, NDEP shall be given the following:

XX.3.a. Briefings on the proposed budget requests for waste management for the NTS facilities, any supporting documents, and target funding levels for waste management for the NTS facilities, including an assessment of any impacts on this Order.

XX.3.b. The opportunity to review, comment, and make recommendations on the priorities and budget request.

XX.4. DOE shall, to the extent it deems appropriate, revise its FY+2 budget requests and supporting documents to address or resolve NDEP's comments and recommendations prior to transmittal to its Headquarters. DOE shall forward to DOE Headquarters with its budget requests any comments not fully resolved to the satisfaction of either party related to activities for which deadlines been established in this Order along with the projected budget requirements for such activities.

XX.5. DOE Headquarters shall forward to the Office of Management and Budget for consideration, its FY+2 budget request along with any unresolved comments and additional activities with related budget requirements identified by NDEP pursuant to paragraph XX.4.

XX.6. NDEP agrees not to release confidential budget information to anyone prior to submission by the President of his Budget Request to Congress, unless authorized by DOE or required to do so by court order. DOE may seek to intervene in any proceeding brought to compel or enjoin release of this information. If allowed to intervene, DOE shall assert its interest in and the legal basis for, maintaining the confidentiality of this information.

XX.7. After submission to Congress DOE will provide to NDEP sections of the President's Budget Request to Congress pertaining to mixed waste activities on the NTS in a timely manner. DOE shall notify NDEP of any differences between the proposed budget requests submitted in accordance with paragraph XX.4 and the actual requests included in the President's Budget Request to Congress.

XX.8. If funding has been requested as described in paragraphs XX.2 through XX.5 and in the event that the U.S. Congress has failed to appropriate the funds requested for Order-related milestones, and deadlines, the parties shall review the level of presently available appropriated funds and the estimated cost of meeting all obligations and requirements under this Order. DOE shall transmit to NDEP for its review a proposed alternate schedule and level of activities to satisfy the terms and conditions of this Order. If agreement cannot be reached on an alternate schedule and if NDEP does not approve a modified alternate schedule and level of activity, the appeal procedure contained in paragraph XVI.2 will be followed.

XX.9. The extent to which all of NDEP's costs for inspections of the facilities to determine compliance with this ORDER, which are recoverable in accordance 42 U.S.C. §6961(a), and the costs associated with the permitting of new facilities continues to be compensated for by DOE through other processes, those costs will not be reassessed for matters related to this ORDER.

XX.10. If DOE fails to comply with the terms of this Order NDEP may pursue all available remedies to ensure performance and compliance.

PART XXI. NOTIFICATION AND AGENCY COORDINATION

XXI.1. Documents shall be sent to NDEP in a manner designed to be received by the date due in either the Carson City or Las Vegas office. Formal requests by any party shall be in writing.

XXI.2. Unless otherwise specified by written notice to the project managers, any report, document, or submittal provided to NDEP, pursuant or developed under the provisions of this Order, shall be sent to:

Chief
Bureau of Federal Facilities
Division of Environmental Protection
333 West Nye Lane
Carson City, Nevada 89710

with an additional copy provided concurrently to:

Bureau of Federal Facilities
Division of Environmental Protection
555 E. Washington, Suite 4300
Las Vegas, Nevada 89101

XXI.3. Unless otherwise specified by written notice from DOE to NDEP's project manager, documents sent to DOE relating to this Order shall be sent to:

Director, Waste Management
U.S. Department of Energy
Nevada Operations Office
P. O. Box 98518
Las Vegas, Nevada 89193-8518

with an additional copy provided concurrently to:

Director, Environmental Protection Division
U. S. Department of Energy
Nevada Operations Office
P. O. Box 98518
Las Vegas, Nevada 89193-8518

XXI.4. Within thirty (30) calendar days of the effective date of this Order, the parties shall notify each other in writing of the names and addresses of their respective project managers who shall be the usual day-to-day points of contact for the parties.

XXI.5. Each project manager shall be responsible for overseeing the day-to-day implementation of the provisions of this Order for his/her respective party.

XXI.6. Each project manager oversees the party's activities relating to the management of mixed waste in accordance with this Order and shall be responsible for assuring that all communications from the other party are appropriately disseminated and processed within his/her own organization.

XXI.7. Changes in either of the parties' project managers and their designees shall be followed by written notification to the other party within ten (10) calendar days following the change(s).

PART XXII. RETENTION OF RECORDS

XXII.1. DOE shall establish and maintain a compilation of all work plans, data reports, other data, inspections reports, and other writings generated pursuant to this Order in accordance with DOE records retention procedures.

XXII.2. Such information shall be available to NDEP upon request and shall form the basis for information to be included in the NDEP's Administrative Record. NDEP shall maintain the Administrative Record in accordance with the requirements of NRS Chapter 239.

XXII.3. DOE shall notify NDEP at least one hundred eighty (180) calendar days prior to the proposed destruction or disposal of any such documents or records related to this ORDER.

PART XXIII. SEVERABILITY

XXIII.1. If any provision of this Order or is ruled invalid, unenforceable, unlawful, or unconstitutional by a court of competent jurisdiction, the remainder of this Order shall not be affected by such ruling.

PART XXIV. FORCE MAJEURE

XXIV.1. A Force Majeure shall mean an event arising from unforeseeable factor(s) that is (are) beyond the control of DOE and/or its contractors, subcontractors, and/or operators, which causes delay, or prevents the performance of any task specified under this Order. Force Majeure may include:

XXIV.1.a. Adverse weather conditions, natural disasters, or events that affect the site or non-site locations, preventing or delaying the transportation or delivery of materials or the availability of labor, that could not reasonably be anticipated;

XXIV.1.b. Unanticipated breakage or accident to machinery, equipment, or lines of pipe despite reasonably diligent maintenance;

XXIV.1.c. Restraint by court order or order of public authority;

XXIV.1.d. Inability to obtain, consistent with statutory requirements and after exercise of reasonable diligence, any necessary authorizations, approvals, permits, or licenses due to action or inaction of any governmental agency or authority other than the DOE;

XXIV.1.e. Delays caused by compliance with applicable statutes or regulations governing contracting, procurement or acquisition procedures, despite the exercise of reasonable diligence; and

XXIV.1.f. Any strike or other labor dispute not within the control of the parties thereby affected.

XXIV.2. DOE asserts that its ability to meet obligations under this Order is subject to the Anti-Deficiency Act, 31 U.S.C. §1341, such that unavailability of funding provides a defense pursuant to this Part. Nothing in this Order shall be construed to require a DOE official to violate the Anti-Deficiency Act. NDEP does not recognize that the Anti-Deficiency Act constitutes a Force Majeure or in any way constitutes a defense or an excuse for failure to comply with the terms and conditions of this Order and applicable state and federal laws and requirements. Nothing in this Order shall be construed to authorize a DOE official to violate environmental laws or regulations.

XXIV.3. DOE shall bear the burden of establishing that a delay was caused by an unforeseen or unexpected event or occurrence; that the event was beyond the control of DOE; that the event could not have been avoided or overcome by due diligence; and that the event delayed or prevented performance by a date or in the manner required by this Order.

XXIV.4. To assert a claim of Force Majeure, DOE shall provide verbal notification to the program manager after DOE becomes aware, of the effect of the event on DOE's ability to perform the obligations of the Order creating the claim of Force Majeure, followed by written confirmation. Failure to assert a claim of Force Majeure shall constitute a waiver of DOE's right to dispute any denial of an extension request or assessment of stipulated penalties on the basis of the event giving rise to the Force Majeure.

XXIV.5. NDEP shall accept, accept in part, or reject DOE's claim of Force Majeure within fourteen (14) calendar days of receipt of the written notice of claim. If DOE disagrees with NDEP's rejection on such claim, the dispute resolution and appeal process contained in Part XVI, Informal Dispute Resolution and Appeal Procedure may be initiated. For disputes on Force Majeure issues, if the dispute is not resolved during the dispute resolution process set forth in paragraph XVI.2., the parties agree that the DOE may seek judicial review of the decision of the SEC in Federal District Court for Nevada.

PART XXV. EFFECTIVE DATE OF ORDER

XXV.1. The effective date of this Order shall be the date on which the last party to do so becomes a signatory to this Order.

PART XXVI. DURATION/TERMINATION

XXVI.1. Upon satisfactory completion, as determined by NDEP, of a given portion of the milestones and deadlines contained herein, NDEP shall issue a Notice of Completion to DOE for completion of deadlines.

XXVI.2. When all the terms and conditions of this Order shall be considered, by NDEP, to have been satisfied by DOE, written notice of the same will be forwarded from NDEP to DOE and such written notice will terminate this Order.

PART XXVII. MUTUALITY TO DRAFT CONSENT ORDER

XXVII.1. All terms of this Consent Order have been negotiated and mutually drafted by the parties hereto, including consultation and review by counsel.

PART XXVIII. SIGNATORIES

XXVIII.1. The undersigned representatives certify that they are fully authorized to sign this Order and to execute and legally bind their respective parties hereto.

FOR THE STATE OF NEVADA:

BY:

L. H. Dodgion, Administrator
Nevada Division of Environmental Protection

3/11/96
Date

FOR THE DEPARTMENT OF ENERGY:

BY:

Terry A. Vaeth, Manager
Nevada Operations Office

3/27/96
Date

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