NOTICE

All drawings located at the end of the document.

National Conversion Pilot Project
Stage I

Local Public Outreach Report

Revision 1
23 June 1994

Submitted to:

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23 June 1994

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Revision History

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1.0 Introduction

With the end of the Cold War and cancellation of the nuclear weapons production mission, the Department of Energy (DOE) is faced with the prospect of terminating traditional defense missions at several of its sites around the country. Rocky Flats and other sites have already experienced layoffs and face more in the months ahead. Because of this, there is a need to explore the possibility of converting former defense production facilities to private use in order to help minimize the impact on the local economy by reusing facilities and employing displaced workers.

Rocky Flats has received a new mission focused on waste management, environmental cleanup and planning for potential site conversion to other uses. However, future uses of the site will, in large part, be determined with the assistance and guidance of local community stakeholders.

The purpose of the National Conversion Pilot Project (NCPP) is to explore at Rocky Flats the feasibility of economic development of DOE facilities, in a manner consistent with ongoing site waste management and cleanup activities, and non-prejudicial to future land use planning decisions. This will be done in concert with all stakeholders including regulatory agencies, environmental, city, business and economic development groups, and other interested parties.

2.0 Local Community Public Outreach

The NCPP has been divided into three stages, with decision points at the ends of each stage. This design will help ensure careful consideration of project feasibility and the opportunity for feedback from stakeholders. At the end of each stage, the Project could be revised or terminated, and DOE will only proceed with the support of regulatory agencies and community acceptance.

Stage I, which officially began on April 1, 1994, included detailed planning for cleanup of four buildings and building maintenance activities. Stage I also included additional market analysis, the development of a staffing plan, a regulatory oversight plan, support services agreements, and the appropriate regulatory reviews for Stage II. A decision whether to proceed to Stage II will be made following public outreach activities to obtain feedback on the project.

2.1 Pre-Stage I Stakeholder Meetings

During the months of June, July and August of 1993, Dennis Floyd, Vice President and co-founder of Manufacturing Sciences Corporation (MSC), conducted a deliberate public outreach campaign to educate stakeholders on the proposed NCPP contract between MSC and the U.S. Department of Energy. In addition to providing information, the purpose of these meetings was to solicit comments and questions regarding the proposal.

In response to questions raised during these meetings, MSC prepared answers in order that this information could be shared with all interested parties. A summary of these meetings as well as responses to questions raised by community stakeholders is shown in Appendices A and B, respectively. These responses were based on currently available information and some may have changed as the project progressed.

MSC believed that success of the Project depended on the widest possible stakeholder involvement. Such involvement would cause other questions and issues to be identified, the resolution of which would mold the Project. MSC pledged to work through future questions and issues in an open-minded and responsible manner with a spirit of goodwill and respect. Other interested parties were invited to join in this pledge and have done so.

2.2 Stage I Public Outreach Organizations

The National Conversion Pilot Project (NCPP) utilized a number of different groups in resolving issues concerning its stakeholders. Figure 1 illustrates the organizational structure for the NCPP. These included a Sounding Board composed of several public organizations and interest groups, a Steering Committee composed of those most responsible for the Project, and six Subcommittees composed of representatives from various groups, but with specific knowledge as required by the specific Subcommittee.

Each Board, Committee and Subcommittee convened several times during Stage I of the Project to identify, review, discuss and/or resolve issues as appropriate to their group. The Sounding Board was responsible for identifying, reviewing and commenting on issues brought before it by the Steering Committee.

The Steering Committee was responsible for identifying, reviewing, commenting, distributing, and resolving all issues brought to its attention. Issues identified by the Steering Committee were sent to, or to the appropriate Subcommittee for review and preparation of a proposed resolution and then to the Sounding Board for review and comment. It was the Steering Committee's responsibility, however, to determine the final resolution of all issues. A total of 157 issues were resolved by the Steering Committee during Stage I.

Subcommittee subjects included the human resources, site support services, environmental restoration, waste management, public outreach, and business plan areas of the project. The Subcommittees were responsible for reviewing issues assigned by the Steering Committee and preparing proposed resolutions based on each member's expertise in the specific areas.

2.2.1 Sounding Board

The NCPP Sounding Board was first convened on February 1, 1994, and held additional meetings on March 30, April 27, and May 24. It is an informal public focus group consisting of representatives from community organizations, including city governments and environmental, business and economic development groups.

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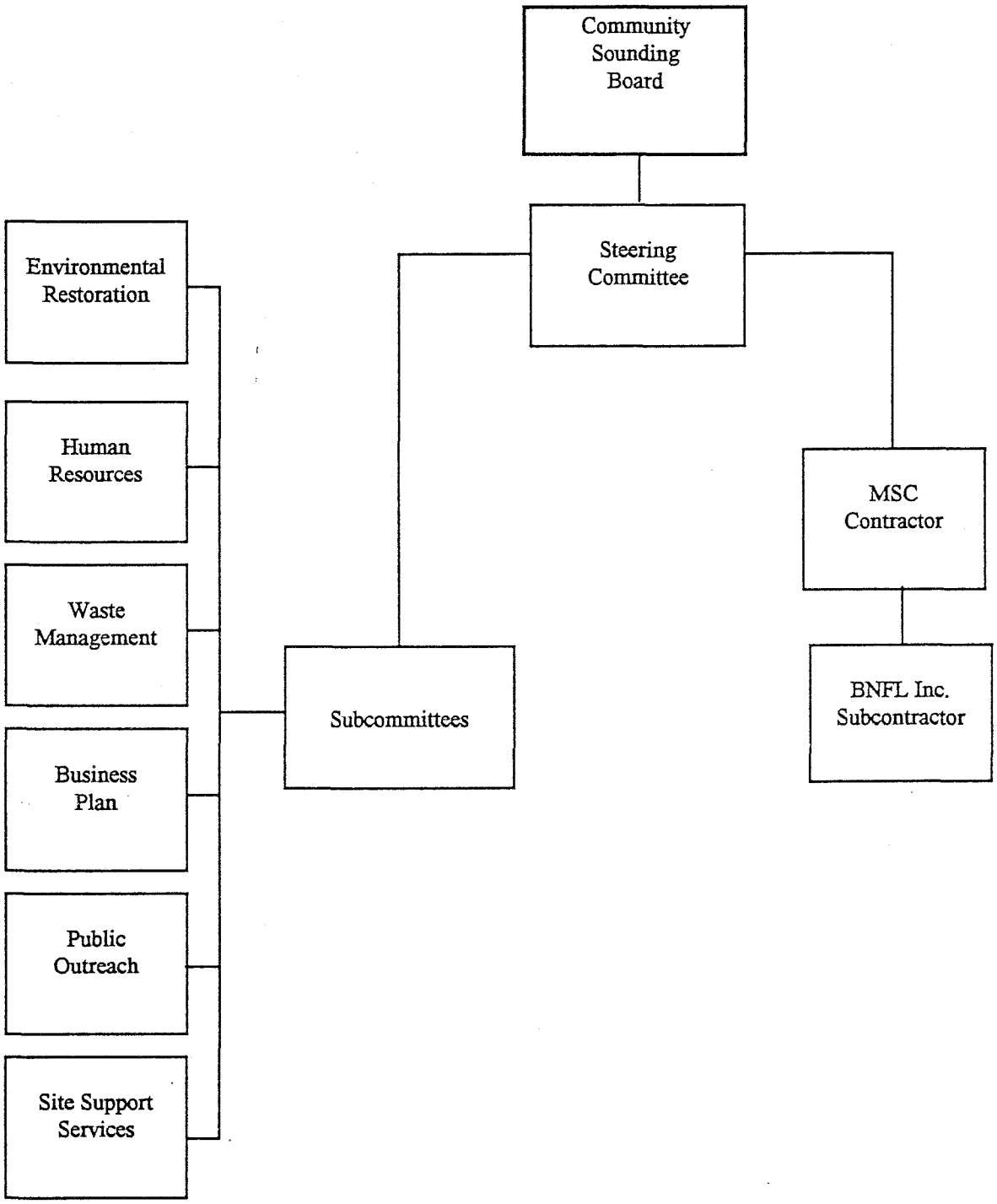
Figure 1
National Conversion Pilot Project
Organizational Structure



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The Sounding Board is intended to provide feedback to the Steering Committee to help identify issues and assess the adequacy of issue closure through the end of Stage I. At its May 24 meeting, the Sounding Board agreed to meet on an ad hoc basis during Stage II at a later date.

The Steering Committee consults the Sounding Board prior to closure on issues, but reserves the right to make the final decision. The Sounding Board will also give the Steering Committee a sense of community acceptance - or lack thereof - considered necessary to determine Project termination or continuation. Steering Committee members attend Sounding Board meetings and present issues and alternatives to the Sounding Board for discussion and feedback.

For the most part, issues were submitted for concurrent review to the Sounding Board by the Steering Committee for two reasons. First, concurrent reviews helped mitigate prejudicial judgment by the Steering Committee or the Subcommittees. Second, parallel reviews reduced the amount of time required to conduct the reviews and resolve the issues.

2.2.2 Other Public Outreach

Other general public outreach efforts are planned in addition to the Sounding Board. A chart showing the Public Involvement Process is shown in Figure 2. A brief status on the Project has been given at several Rocky Flats monthly public meetings since October 1993 to obtain a wider understanding of Project activities.

Additionally, a general public information meeting specifically focused on the NCPP was held on April 6, 1994. This meeting was held in response to stakeholder feedback on the need for a Stand-alone public information meeting on the subject.

A public comment meeting was held on June 15, 1994, at the end of Stage I. All issue resolutions were made available to the public during this meeting. The Steering Committee will consider all general public comments in making a final determination whether to proceed with the Project. In addition, a fact sheet is available to the public, and members of the Steering Committee are available to make presentations to community groups.

2.2.3 Public Outreach Subcommittee

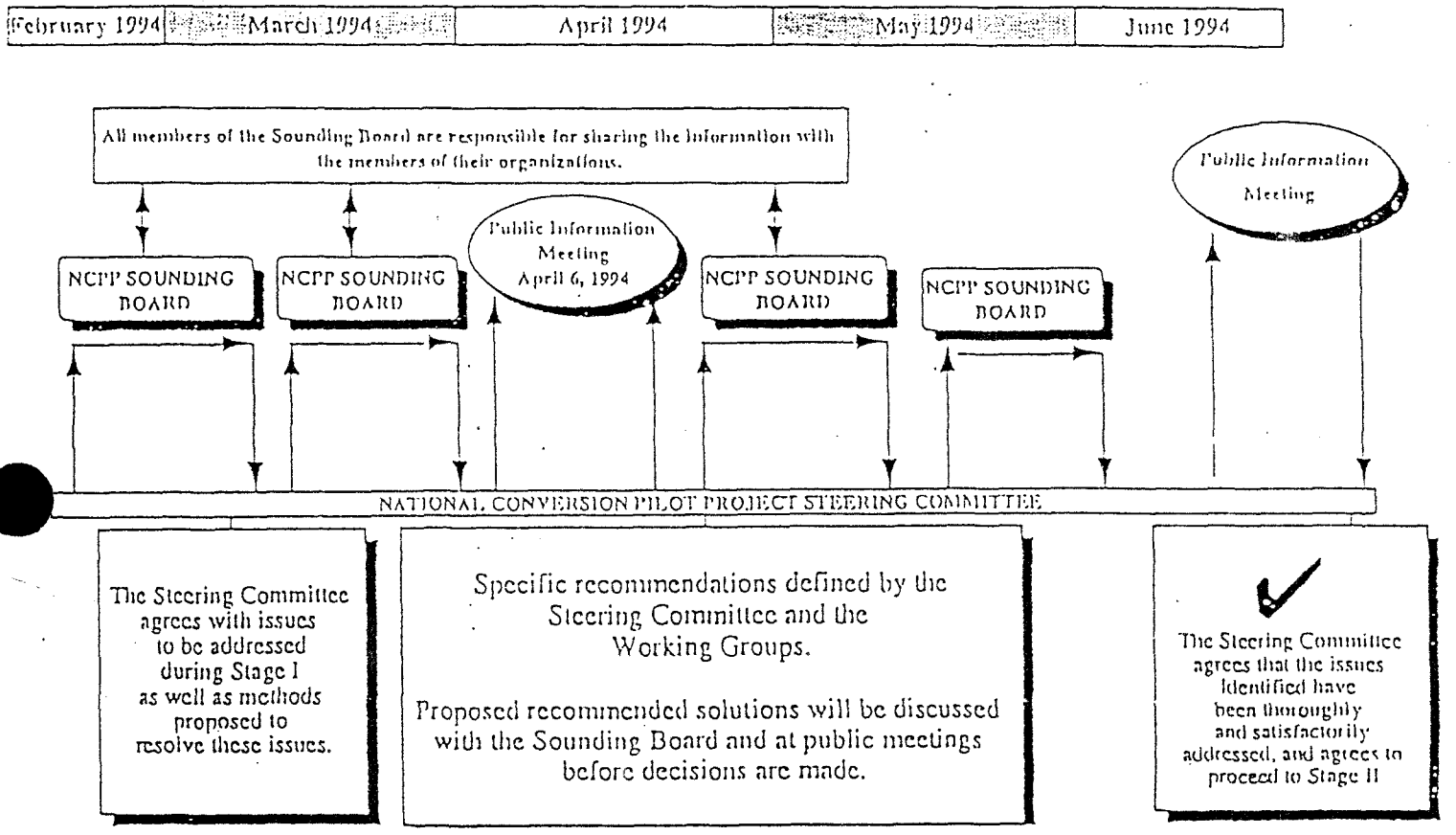
The NCPP Steering Committee developed subcommittees with the expertise to address specific issues including public outreach. The Public Outreach Subcommittee consisted of representatives from the EPA, DOE, the Governor's Office of Business Development, CDH, EG&G, MSC, USWA, Local 8031, and RFLII. A total of 15 issues were considered by this Subcommittee.

The first task for the Subcommittee was to design a public involvement plan for Stages I and II. The plan, which was designed to be flexible to accommodate changes as the Project evolves, provided for the community Sounding Board, public information meetings and a formal public comment process. In addition, the Subcommittee was tasked with evaluating the level of community acceptance for economic development at Rocky Flats.

The Subcommittee supports the activities of the NCPP Sounding Board. It has also arranged NCPP briefings at three Rocky Flats monthly public meetings and the stand-alone NCPP public information meeting on April 6, 1994.

The Public Outreach Subcommittee arranged the June 15, 1994 public meeting at the end of Stage I to present the results of Stage I and have a public discussion on the Project prior to the Steering Committee making a decision on whether or not to proceed to Stage II.

Figure 2
National Conversion Pilot Project
Stage I Public Involvement Process



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Appendix A

Pre-Stage I Stakeholder One-On-One Meetings

STAKEHOLDER ONE-ON-ONE MEETINGS

Individuals (30 Separate Meetings)	Date
Joe Coors, Jr. ACX	12/23/92
Mike Simmons, EG&G, Board Member Rocky Flats Local Impacts Initiative	5/4/93
LuAnne Auble, Chief Executive Officer, Northwest Chamber of Commerce	6/4/93
Skip Spensley, CCEM CATI	6/9/93
Chris Miller, City of Louisville	6/11/93
Charlie McKay, Church Ranch (Adjacent Landowner	6/11/93
Rob Lathrop, Lousivllie City Council Person	6/11/93
Tom Marshall, Rocky Mountain Peace Center	6/13/93
Ken Korkia	6/14/93
Don Dunshee, Kelly Lucy, Jefferson Economic Council	6/14/93
Sam Dixion, Westminster City Council Person	6/14/93
Hank Stovall, Mayor Pro Tem, City of Broomfield, Chairman, Rocky Flats Local Impacts Initiative	6/15/93
Ginger Swartz, Colorado Commission of Rocky Flats	6/15/93
JoAnne Conte, Arvada City Council Person	6/16/93
Sue Damoure, Congressman David Skaggs' staff	6/18/93
Todd Saliman, Boulder County	6/25/93
Jennifer Wilson	6/25/93
Barb Grogran, Denver Chamber of Commerce	6/28/93
DeAnne Butterfield, Rocky Flats Local Impacts Initiative	6/28/93
Steve Tarlton, Colorado Department of Health	7/2/93
Adam Goldberg, Congressman David Skaggs' staff	7/7/93
Michelle Harper, Governor's Office of Defense Conversion	7/9/93
Martin Hestmark, Environmental Protection Agency	7/14/93
Harry Mann, EG&G	7/15/93
Frank Schoengert, Colorado School of Mines	7/28/93
Larry Fuller, Board of Jefferson County Education	8/2/93
John Mullins Governor's Office of Economic Development	8/3/93
Fred Fraikor, CAMI	Numerous
Tim Heaton, Rocky Flats Local Impacts Initiative	Numerous

Community Groups	Date
Greater Denver Corporation	5/27/93
U.S. Steelworkers of America	6/1/93
Rocky Flats Local Impacts Initiative	6/17/93
Jefferson Economic Council	6/18/93
Arvada Urban Renewal Authority	7/7/93
City of Westminster	7/14/93
Joint Chamber/Public Service Company Breakfast	7/15/93

Defense Conversion Groups	Date
Oak Ridge Work Force Structuring Task Force	6/23/93
DOE/ED Workshop, Oakland	7/12-13/93
Ponderosa Industries (Building 460 Proposal)	8/3/93

Appendix B

Response To Questions Raised By Stakeholders

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RESPONSE TO QUESTIONS RAISED BY STAKEHOLDERS

A. WORKERS

A.1 What kind of workers will MSC rehire?

The detailed breakdown of job categories and quantities will not be available until after the assessment of each building gets under way, but the types of skills needed include equipment operators, material handlers, foundry workers, maintenance craftsmen (machinists, electricians, sheet metal, pipe fitters, etc.), carbon shop machinists, health physics technicians, analytical technicians, engineers, etc. The majority of the workers are expected to come from the existing hourly work force.

A.2 Will you give preference to Rocky Flats experienced workers?

Absolutely! In fact, MSC is willing to negotiate a commitment with the DOE for hiring a minimum percentage of its workforce from among current Rocky Flats workers. We expect to hire substantially more than half our work force from this pool.

What makes Rocky Flats so attractive for such a recycling program, as proposed by MSC, is the equipment already in place. Nowhere in the Department of Energy (DOE) Complex is there such a combination of equipment already assembled to complete this mission. This equipment, however, is of no value to a company unless it has skilled operators to run and maintain the equipment. This work force is the existing work force at Rocky Flats.

MSC has already had discussions with DOE and labor representatives to discuss the process for selecting and hiring current Rocky Flats workers.

A.3 What does MSC expect their average salary to be?

The actual wages for MSC employees at RFP will not be known until after an agreement is in place with the Department of Energy and we begin in-depth planning of the Pilot Project. MSC will be driven by the desire to be fair and competitive in compensation as well as by the need for the prices of our products to be competitive in the marketplace.

A.4 Will MSC be saving federal taxpayers money by hiring these employees?

The MSC Pilot Recycling Project at Rocky Flats will also contribute importantly to the Department of Energy's need to recycle its scrap metals. Preliminary analyses show, for example, that if the DOE recycles its steel scrap into waste containers, savings of up to $1.4 billion can be expected compared to using new steel to make these waste containers. Under this Pilot Project, many of these waste containers can be made at RFP from RFP scrap and used to contain and dispose of RFP waste.

B. THE MANUFACTURING PROCESS

B.1 What is the nature of the operation proposed by MSC to be located at Rocky Flats for Stage I of the recycling project?

No operation is proposed by MSC to be located at Rocky Flats for Stage I. The pilot project is expected to proceed in three stages. Stages I is expected to be very brief and consists of beginning the characterization of the clean-up and refurbishment effort that will be conducted in Stage II; establishing an oversight entity comprising DOE, federal and state regulators and local stakeholders; and securing the necessary approvals to proceed with Stage II. During Stage II, characterization will be completed, employees will be hired and trained, and necessary clean-up and refurbishment will be completed. Also during Stage II, the Environmental Assessment (EA) for Stage III, the Operational Stage, will be completed. Assuming approvals are obtained, manufacturing operations will be done in Stage III.

B.2 What are MSC's facilities/equipment needs for each phase?

MSC has asked the DOE to release four buildings for this Pilot Project. The equipment needs within these buildings are summarized as follows:

Building 444	*Eight vacuum induction melting units with supporting facility.*
Building 447	*A vacuum arc melting furnace.*
Building 865	*An extrusion press, forge, spinning machine, hot and cold isostatic presses, forming press and rolling mill with supporting facilities.*
Building 883	*Two rolling mills, five forming presses, a hydroform press and supporting facilities.*

The Phases described in response B.1 apply to each building and it is expected that some operations may enter Stage III ahead of others.

B.3 What are MSC's work force projections for each phase?

MSC expects to commence hiring once Stage II begins, reaching a level of 200 persons in a few weeks. Hiring beyond this level will not occur until Stage III activities begin and the markets for our products dictate more people are needed. The potential capacity of the four building, based on previous RFP experience, is about 500 persons.

B.4 Will Rocky Flats' materials be the only materials used during Stage I?

MSC plans to use only RFP materials until such time as the market for our products consume the available recyclable scrap metals at RFP. We do not yet have an adequate inventory of those metals nor a sufficiently clear definition of the market to be specific in response. However, it is unlikely that additional materials would be needed within the first three years and certainly no outside materials will be needed in Stage I.

B.5 Will materials from elsewhere in the DOE Complex need to be shipped to Rocky Flats in order for Stage II and Stage III?

The MSC proposal is for a pilot project that is intended to demonstrate to other DOE sites how economic conversion can proceed with full participation of regulatory authorities and local stakeholders. The amount of metal that is available for recycling is so large that we expect recycle operations to be established at several other DOE sites, consuming their own scrap, as we intend at RFP. However, few sites have the rolling mills and melting capacity that RFP has, and we envision an optimization of the use of these resources will entail some additional scrap metal being sent to RFP for recycle. Our estimate is that this could be as much as a truckload of material per day, to fully utilize a 500 person work force. The incoming material will be transported in full accord with DOT regulation and will have been previously decontaminated or approved for processing at RFP by our oversight entity. No waste from processing this material will remain at RFP. It will all be disposed of in approved commercial or DOE repositories.

B.6 Will materials from elsewhere in the DOE Complex need to be shipped to Rocky Flats in order to achieve the re-employment numbers projected?
Yes. See answer to B.5

B.7 Describe the materials leaving the site in each phase.
How much?
In what form?
How will it be packaged and transported?
Where will it go to?
How frequent are the trips?

There are two general types of materials that will leave RFP from MSC's operations there: Products and waste streams.

PRODUCTS:

How Much?

Specific detail on the amount must await actual contracts for products. There are three families of materials to be converted into products. Beryllium (Be), depleted uranium (DU), and RSM (mostly steel). Be products will involve the least volume, DU probably intermediate, and RSM the most. At peak production of RSM, we expect 20 tons of products would be shipped per day, which would require one full size 18-wheel tractor trailer rig.

In What Form?

The form will be semi-finished or finished products. For example, extrusions and sheet metal for processing at RFP or elsewhere and some finished components such as waste containers like drums or large metal boxes.

How Will It Be Packaged and Transported?

It will be packaged to conform with DOT standards where applicable or to meet customers' requirements. It will be transported by truck.

Where will it go?

We expect to sell most of our products in the U.S. RFP itself will receive waste containers, as well as will other DOE sites around the country.

How Frequent are the Trips?

At peak production we should average no more than 2 truckloads per day, including Be, DU and RSM products.

WASTE STREAMS:

How Much?
Accurate estimates of the volume of waste streams must await the characterization activities to be done in the initial stage of the Pilot Project.

In What Form?
There are three paths for waste to exit any manufacturing operation, including those contemplated by MSC at RFP: Air, water and solid. Air discharges will be permitted through normal state and federal regulatory authorities. Solids entrained in the process airstreams will be removed by filtration through multiple stages of HEPA (High Efficiency Particle Absolute) filters. MSC plans to collect and treat its waste water within each building and release it only after it meets approved release criteria. In a manner analogous to our Oak Ridge operation, we envision releasing this into the RFP sanitary waste treatment system, but this must first be worked out with DOE. Solid waste will be volume-reduced and, in the case of waste generated during the operation stage, sent to a commercial low level radioactive waste repository or a hazardous waste repository as appropriate. MSC will emphasize waste minimization technology in its RFP activities and will carefully plan its activities to avoid generating any mixed radiological and hazardous waste.

How Will It Be Packaged and Transported?
The solid waste will be packaged and transported in accordance with applicable DOT regulations and the acceptance criteria of the repository.

Where will it go?
Colorado is a member of the Western Pact for disposal of low level radioactive waste. The repository for this waste is in Hanford, Wash., and is operated by U.S. Ecology Inc. Hazardous waste may be shipped to any approved repository and selection of one or more will be made in the future based upon cost and other considerations. Waste from DOE materials may be shipped to DOE low-level waste repositories such as the one in operation at the Nevada Test Site.

How Frequent are the Trips?
The frequency will depend upon the level of activity and nature of operations, matters that will not be defined until further into the project. MSC expects that the frequency of waste disposal will be less that the frequency of either raw material or product, which means less than about one truckload per day.

B.8 In order for Stage I to be cost-effective to MSC and DOE, is Stage II assumed to be necessary?
The further along the three stages that this pilot project proceeds, the greater will be the cost-effectiveness. However, there is no pre-determination that any stage will proceed. Benefits will result regardless of how far the Pilot Project proceeds. Whether those benefits exceed the costs (i.e. are cost effective) remains to be seen.

B.9 Will this operation predetermine the use of certain buildings over the next several years? If so, how does DOE know if those buildings may be needed for other purposes?
The four buildings identified in the MSC proposal all used previously for manufacturing operations that processed materials of the same type proposed for use in this project. The DOE will determine whether this is the best use of these buildings as the project proceeds through its proposed three stages, based on input from the participants, including regulatory agencies.

C. THE MATERIALS USED BY MSC

C.1 Describe the materials coming onto the site in each stage for recycling by MSC.
How much?
In what form (rebar, sheets, ingots, etc.)?
How will it be packaged and transported?
Where will it come from?
How frequent are the trips?

The initial focus will be to recycle scrap metals already located at RFP. These include steel, beryllium and uranium components that must be melted to destroy their security classifications. It will also include additional RFP metal sources that will be identified in Stage I of the project. If the full potential of the four RFP facilities targeted in the proposal is realized, additional scrap metals will be needed. These are expected to come mostly from other DOE sites and to be decontaminated to commercial free-release levels prior to shipment to RFP. No unusual form of transportation will be required. Standard over-the-road trucks complying with DOT regulations will be used. Initial estimates suggest that if we operate on a two shift basis making steel containers, we will need about one truckload of raw material per day. The form of the scrap may vary, but it is likely to be sheet metal, and castings, bulk metal rather than high volume, low mass forms.

C.2 What would happen if this material is not recycled?

If recyclable scrap metal resulting from the clean-up of DOE facilities such as Rocky Flats is not recycled one can expect these adverse consequences:
- *New metals will become contaminated instead of being used for some alternative purpose.*
- *The volume of waste that must be buried will be increased.*
- *The potential for saving "billions" according to recent Congressional testimony by Dr. Clyde Frank, DOE Director of Technology Development for Environmental Restoration and Waste Management, will be lost.*
- *Still-useful resources such as the excellent metal fabrication equipment at Rocky Flats will not be conserved. The cost of decontaminating and relocating this equipment is prohibitive, so if it is not used to recycle these metals, it will probably be cut-up and buried as waste.*

C.3 Discuss beryllium.

Beryllium (Be) is a metal. It is the fourth element on the periodic chart of the 103 known elements. It is chemically similar to aluminum and metallurgically similar to titanium.

Be is not a radioactive element, even though it is used in nuclear applications because of its ability to moderate and reflect neutrons. This characteristic is used to improve the efficiency of a nuclear reaction.

Be is a low density metal, 50 percent less dense than aluminum and only 1/4 as dense as steel. Even so, it is equally as strong and four times as stiff as aluminum and 50 percent stiffer than steel. It has very good thermal and electrical properties and is highly transparent to radiation. Be exhibits a surprisingly high melting point given its low atomic number and density.

Be is very expensive, ranging from $300 per pound for bulk metal to $5,000 in finished-product form. Scrap metal can be recycled and is available in reasonable quantities. Scrap metal prices are in the $50 per pound range.

Beryllium is an aerospace metal. It is often used where weight savings is critical, as in components in air and space craft. Examples include precision inertial guidance components (gyroscopes), window and door frames in the space shuttle. Because of its exceptional thermal properties, Be is used as brakes in certain military aircraft. Modern application include windows in X-ray equipment and as an alloy with aluminum for electronic components.

The danger from beryllium arises primarily when it is breathed into the lungs. Inhaling Be can result in both an acute and a chronic disease (Bertolini, 1989). The acute disease results from exposure to high concentrations and has been made extremely rare with the adoption, in 1949, of a standard for airborne Be of two micrograms per cubic meter of air averaged over an eight-hour work period, with short exposures allowed at concentrations up to 25 micrograms per cubic meter (Newman, 1992).*

Chronic beryllium disease (CBD) is more insidious. About 1% of 3,400 persons exposed to beryllium at RFP have been found to have CBD (Corle, 1993). Nearly all of these persons were diagnosed with CBD, not because of any debilitating effects of the disease but through a recently developed blood test that was administered to this large population on a voluntary basis (Kreiss, 1989). Clinical symptoms of CBD include shortness of breath, weakness during exertion and some weight loss. Treatment consists of avoidance of further exposure and in more severe cases can include use of a steroid based drugs (Hilmas, 1992).

Those who have contracted CBD include both regular Be workers and others who were only casual visitors to beryllium work areas. <u>However, at RFP there are no known cases of anyone contracting CBD without previously having been inside a beryllium work area (i.e. a community member)</u>.

The standard for Be contamination in the air for the general population is 0.01 micrograms per cubic meter of air (Bertolini, 1989). The general population near RFP is not at risk from beryllium because air filtration practices keep the Be concentration far below this level. As part of its refurbishment effort, MSC plans to conduct joint risk assessment studies with our regulators to evaluate the likelihood of such exposure in a "worst case" accident scenario. MSC will then initiate any corrective or preventative measures that such an assessment would suggest to ourselves or to regulatory authorities.

C.4 What is depleted uranium and how safe is it?

Depleted uranium is a low-level radioactive metal, U238, that is the by-product or "tails" left over when naturally occurring uranium is passed through the gaseous diffusion process to remove the isotope U235 to make nuclear fuel.

<u>Depleted uranium is not the highly-radioactive "spent uranium" that is left over after U235 is used in a nuclear reactor.</u>

Depleted Uranium is very dense (19 times the density of water, 2-1/2 times as dense as steel, 70% more dense than lead). Depleted uranium is very strong, equal to high strength steel when alloyed.

Depleted uranium's high density makes DU an excellent shield to absorb radiation. As such, it is used in medical and industrial radiography to contain highly radioactive "sources" of intense radiation. These sources are removed from the DU shield robotically to expose the target to radiation and then replaced in the safety shield for transport or storage. This same property makes DU a candidate material for shielding spent nuclear fuel in transportation and storage. Its combined strength and density make DU an outstanding armor as well as anti-armor (penetrator) material.

* Citations in parenthesis can be found at the end of this report.

The controlling health risk from working with DU is cancer that may be caused by long-term damage of lung and other tissue from bombardment by high-energy alpha radiation emanating from uranium particles in contact with the tissue. This risk is minimized by controlling employee inhalation exposures to the lowest reasonably achievable levels. Experience at MSC has shown that average employee exposure can be managed to a few percent of accepted occupational exposures established by NRC even while working intensively with DU.

Also DU is a heavy metal. As such it can create health problems if ingested or inhaled. In this regard, DU is much the same as lead or other heavy metals. It is different in one important respect, however; its presence is easily detected owing to its slight radioactivity. Thus, with respect to heavy metal poisoning, DU is actually much safer to work with than other heavy metals because steps can be taken to prevent its uptake.

Even though DU's radioactivity is of a very low intensity, it is nonetheless a radioactive material. Accordingly, the same comprehensive radiological protection program required for other, more highly radioactive materials is also practiced with DU. This means that a radiation safety officer and staff must operate a comprehensive exposure monitoring and control program designed to both prevent and record employee exposure. This staff also maintains detailed records and assures compliance with requirements of the radioactive materials license required for working with DU. An important element of the program is a biological monitoring program through which each employee's uptake of DU can be measured and corrective action can be taken if results indicate abnormal exposures.

An abundance of DU is owned by the U.S. government. It is either a significant asset or a major liability, depending on whether sufficient applications can be identified to avoid its disposal as a low level nuclear waste.

Recent publicity about the use of depleted uranium (DU) projectiles in the Gulf War causing health problems to returning soldiers has heightened concerns about this metal. The army reports that 4,300 rounds of DU ammunition were fired during the war and that they "do not think it represents a health problem," in part because radiation levels from DU are very low (Peter Esher, spokesperson for the U.S. Army Surgeon General). The army had developed, produced, tested and deployed DU projectiles for 20 years and conducted extensive health studies during this period. MSC has processed more than 6 million pounds of DU over the past eight years and the DOE has processed DU for nearly 50 years. Acute symptoms of the type reported would come only from ingestion of relatively large quantities of the metal. It is not likely that such exposure would have been experienced in the Gulf War.

C.5 What is recyclable scrap metal (RSM)?

Metals that result from the decommissioning of the U.S. Nuclear weapons complex, including steel, stainless steel, nickel, copper, aluminum, etc. Much of this metal has been radioactively-contaminated and will be recycled into restricted-use applications within the DOE if it cannot be decontaminated to levels that meet free-release criteria.

The properties of recycled scrap metal are no different than the same metal from virgin sources. Thus steel is steel, nickel is nickel, etc. For restricted-use applications where a slight amount of radioactive material is contained within the material, the amount is too slight to alter the basic metal properties.

Recyclable scrap metal placed in restricted use applications will likely be used to make containers for storage and disposing of radioactively-contaminated waste. Many other applications are also possible. Non-radioactive scrap metals can be used in normal commerce.

The level of radiation emitted from the vast majority of DOE RSM is quite low. All of this material qualifies for burial as low level radioactive waste because its radioactivity content is sufficiently low. This is to be distinguished from high level radioactive waste, which must normally be handled remotely because its radioactivity is too high for prolonged human exposure. Our intent will be to manage the RSM radiological health program for our employees to an exposure level no greater than that normally experienced with DU. We will work closely with local, state and federal officials to fully satisfy all regulatory requirements for the safe transportation of such material to and from RFP.

The regulations governing release limits are always subject to change. Presently no amount of bulk internal radioactive contamination is allowed in materials released to unrestricted use.

If recyclable scrap metals are not recycled into restricted use applications, a vast amount of virgin metal will become radioactively contaminated. This will increase the total waste storage volume and needlessly waste a valuable resource.

C.6 How contaminated is the material coming onto the site in each stage? How will MSC verify the contamination levels?

MSC intends to work with the Colorado Department of Health to establish acceptable levels of contamination for material coming into RFP. MSC would prefer to receive only materials that have been previously decontaminated. Since the U.S. has no diminimus standards for bulk contamination levels that allow unrestricted release, we need to agree on a level that would be suitable for recycle into restricted reuse applications such as containers for radioactive waste. MSC will establish quality control procedures both at the source of the raw material and upon its receipt to verify adherence to contamination criteria. Normal radiation detection instrumentation will be used by qualified radiation control technicians for this purpose.

C.7 Will it still be contaminated when it leaves the site?

No contaminated metal products will be shipped from the RFP site for use in unrestricted applications. Some slight bulk contamination will exist in restricted-reuse products that leave the site. This is fixed, not removable contamination and is extremely low level. It is unlikely to require handling precautions. Its only restriction will be its end use. No removable surface contamination in excess of allowable NRC standards will be present on such products.

D. HEALTH AND SAFETY ISSUES

D.1 What kinds of risks would exist to workers and the public through MSC's operation?

MSC intends to make risk assessment and mitigation priorities in its activities at RFP. There will be, of course, some measurable risk to employees and the public as there are with any human endeavor. We intended that the risk to the public be comparable to similar businesses handling conventional materials. We will be open to public view so that independent verification that our actions conform to this policy can be gained. Our workers, by their proximity to the operations, will necessarily be at higher risk than the public. However, risk to our workers will be strictly controlled. Our operations will involve melting metals, rolling and shaping of metals, welding and inspection. This involves heavy equipment, exposure to electrical and thermal energy and many such industrial health and safety issues. MSC has experience operating such equipment safely in its Oak Ridge facilities and will apply that know-how at RFP.

The MSC work force at RFP will also be exposed to low levels of radiation primarily from operations involving depleted uranium and, to a lesser extent, from recycling scrap metals. MSC will implement a full radiological health program to deal with this risk. The requirements for this program will be consistent with our Oak Ridge practices and determined in concert with the radiological health section of the Colorado Department of Health as part of our licensing requirements.

MSC will also work with beryllium at RFP. This has been the most insidious risk because, until recently, a worker could not be completely confident that the ambient air is free of beryllium as is possible with radioactive materials. However, the advent of a real-time detection instrument for beryllium under development at Los Alamos National Laboratory is imminent. MSC will follow the development of this and similar technology and when appropriate will employ it at RFP to further reduce this risk.

D.2 Compare occupational risks of recycling as proposed by MSC compared to other ways of disposing of the material.[1]

A comparative risk assessment is beyond the scope of this document. In a general sense, the products that make use of recycled material will be made regardless, and the risks associated with their manufacture ought to be comparable. Some risk reduction will occur because of the extreme attention to Health and Safety MSC intends that more conventional manufacturers may not practice. On the other hand, some slight increase in radiation exposure compared to the use of virgin materials may increase the risk of recycling somewhat. Disposal of these materials will have attendant risks, but one would expect these to be managed in a similar manner to MSC's intended recycling practice.

D.3 Will there be air emissions through MSC's operation?

MSC intends to follow the practice it has in place in its Oak Ridge facility whereby all air leaving the facility is passed through four-stage filtration system HEPA (High Efficiency Particle Absolute) filters. This effectively removes respirable particulates from the air, eliminating radioactive and beryllium particulates, for example. MSC will assess the adequacy of the RFP filtration systems relative to our system and make improvements as deemed necessary. Some operations may cause other gases than air to be emitted, for example, products from the combustion of natural gas or nitrous oxides from acid fume hoods. The allowable levels for such gases will conform with permitted amounts regulated by air quality control authorities.

D.4 Will any hazardous, low level, or mixed waste be generated through MSC's operation?

Both hazardous and low level waste will be generated, but not mixed. Beryllium contaminated waste will be disposed of in approved hazardous waste repositories. Depleted uranium (DU) and recyclable scrap metal (RSM) wastes will be disposed of at the commercial low level waste repository in Hanford Wash., that is operated by U.S. Ecology. MSC will strive to prevent any forms of mixed waste. For example, MSC intends to physically separate beryllium activity from DU and RSM as done in our Oak Ridge facility. This prevents generation of one form of mixed waste.

D.5 How will occupational safety, emissions and waste be regulated during through MSC's operation?

Each of these will be regulated by authorized local state and federal agencies. Occupational safety will be subject to OSHA regulations and Colorado agencies having similar purview. Emissions will be regulated by air and water quality control authorities. Waste will be regulated in conformance with our radioactive materials license granted by the Colorado Department of Health through its agreement with the NRC. For regulatory purposes, the MSC operations will be treated as if they were located on private land away from RFP, if the MSC proposal is accepted.

D.6 Could the public contract berylliosis through MSC's operation?

The public's risk of contracting berylliosis will not increase as a result of MSC's operations at Rocky Flats. To assure this, MSC will establish a stringent emission control and monitoring program and will cooperate fully with state and local regulatory oversight of this program.

D.7 What kind of advanced health, safety and environmental training will you provide your workers at Rocky Flats?

In the first state of the proposed Pilot Project, MSC and its clean-up subcontract or BNFL Inc. will develop comprehensive training programs to cover clean-up, refurbishment and operational elements of the project. This training will include classroom, simulation and on-the-job components and cover the range of materials and risks attendant to the contemplated MSC/RFP operations. BNFL Inc. is a wholly-owned subsidiary of the British Nuclear Fuels, plc, a United Kingdom company that employs more than 10,000 people. BNFL Inc. has full access to the safety, training and risk analysis techniques developed over several decades by BNFL plc.

D.8 Can MSC officials provide documentation demonstrating that the MSC Oak Ridge facility's safety and health standards are higher than existing regulatory requirements?

MSC is proud of its record of compliance with health and safety requirements in its Oak Ridge facility and welcomes the opportunity to tour any interested Colorado parties through the facility to gain first-hand knowledge of our H&S practices. The best measure of our compliance will be to visit with the Tennessee officials who regulate our activities. We do not want to overstate our standards and practices in the HS&E arena. We are committed to adhering to the letter and the spirit of regulatory standards. In some cases we have chosen to tighten our controls beyond those required by regulatory standards. Beryllium is a good example. We are allowed an airborne concentration of two micrograms per cubic meter but we have designed our operations to achieve a much lover level. We voluntarily elected to control to a level of 0.2 micrograms per cubic meter. Documentation of this control level is available to anyone who visits our facility.

E. THE MSC ROCKY FLATS RECYCLING PROJECT AND OUR ENVIRONMENT

E.1 What steps will MSC take to protect our environment?

The buildings MSC proposes to occupy at RFP have previously been used to process radioactive (depleted uranium) and hazardous (beryllium) materials. The first major action MSC contemplates is to clean these buildings and the equipment within them thoroughly. We plan to clean to a baseline level, agreed to by our regulatory task force and the DOE, and maintain the facilities in a condition such that we can return to this baseline level when control of the facilities passes back to DOE. This is the first action that can be viewed as "protecting our environment."

Next, MSC will refurbish the equipment and facilities to achieve the levels of environmental control and protection we follow in our Oak Ridge operations. This will include such things as improving the foundry set-up to reduce the chance for beryllium becoming airborne and physically isolating beryllium operations from DU operations. This was not always done at RFP.

Also, MSC designs and conducts its operations with waste minimization as a governing philosophy. This philosophy will be applied to RFP operations. For example, where RFP previously cleaned DU by etching in nitric acid, which generates chemical wastes, MSC uses mechanical abrasion with aluminum oxide in a water slurry, recycles this media and collects, treats, holds and certifies to release limits before the water is released into a sanitary sewer system.

E.2 How much clean, virgin steel would have to be mined, milled and contaminated for waste containers if recycled material from DOE were not used?

Published estimates suggest that nearly 1 million tons of steel will be needed for transportation and storage containers for radioactive waste. The DOE estimates that it has 1.5 million tons of radioactive scrap metal, most of which is steel. So there is a nice fit between the supply of and demand for recyclable metal for waste containers. If virgin metal is used, it will presumably add an additional 1 million tons of contaminated metal into the waste burden, an increase of 40% of the estimated current DOE inventory.

E.3 Can MSC provide documentation of its safety and regulatory performances at its Oak Ridge Facility?

The best sources documentation of MSC's safety and regulatory performance are the agencies responsible for regulating our Oak Ridge Facility. These include:

a) The Division of Radiological Health, Tennessee Department of Health and Environment, Licenses number S-01046-E93, Mike Mobley, Division Director.

b) Tennessee Air Pollution Control Board, Operating Permit 028190P, Harold E. Hidges, Secretary. Nashiville Tennessee 37219-5403.

c) South Carolina Radioactive Waste Transport Permit 0358-41-92, Heywood G. Shealy Chief Bureau of Radiological Health. Tennessee is a member state in the Southeast pact and as such MSC's low level waste is buried in Barnwell South Carolina in the licensed commercial repository managed by Chem. Nuclear Services.

d) Tennessee Radioactive Materials Delivery License T-TN003-192, Johnny C. Graves, Licensing and Registration Manager, Department of Environmental and Conversation, 150 Ninth Avenue Nashville TN 37243-1532

e) Waste Water Discharge Permit, Industrial and Commercial User, No. 9-91-SN. Lowell Struck, Director of Public Works City of Oak Ridge TN. 37831

F. MSC'S RECYCLING PROJECT AND THE CLEAN-UP OF ROCKY FLATS

F.1 How will MSC's recycling efforts help DOE with its waste storage activities?

There are a number of ways the Pilot Project can help the DOE at RFP, and therefore the entire stakeholder community, with its waste storage activities, as follows:

a) By continuing to operate the four buildings and most of the equipment therein, MSC will prevent this equipment from becoming waste.

b) MSC plans to create a recyclable storage area within Building 444 by decontaminating and, where possible, recycling old, worthless machine tools into containers for waste generated during the clean-up of the four buildings. If this waste cannot be transported for disposal it will be compacted and stored in the space made available by these activities.

c) MSC will seek recyclable scrap metal already in storage at RFP and use it to make waste containers for non-recyclable waste. This will both free-up existing waste storage sites and decrease the amount of waste in storage.

d) The practical experience gained by MSC in its clean-up activities, gained while cleaning the least problematic materials at RFP (low level waste), can be applied to future clean-up of plutonium contaminated sites if the DOE desires to make use of this know how. It is better to learn the problems and solutions with low level waste clean-up than with plutonium waste clean up.

F.2 Will this operation interfere with existing cleanup (CERCLA) or waste management (RCRA) obligations?

One of the reasons MSC is seeking involvement from the outset by EPA and the Colorado Department of Health (CDH) officials is to make certain that any potential conflicts will CERCLA and RCRA obligations are recognized and accommodated before the clean-up and operating stages of this project kicks in. It is our intent and belief that, by substantive clean-up activities and recycling products for use directly in the RFP clean-up, the MSC Pilot Project will contribute to, not interfere with, DOE clean-up and waste management obligations.

F.3 Will the EPA and Colorado Department of Health oversee the operations?

Yes. MSC believes that the best way for the public to feel confident that our operations at RFP are being carried out in a manner that does not put them at risk is to have regulatory bodies responsible for permitting and verifying those operations that are ultimately accountable to the public and whose primary function is regulatory oversight.

G. MANUFACTURING SCIENCE CORPORATION (MSC)

G.1 What are the credentials of MSC and its management?

MSC has been in the business of recycling DOE scrap metals for eight years. This is done in an environmentally advanced facility that MSC principals designed and had built on a 15-acre site in Oak Ridge, Tenn. The equipment on the site is identical to the major pieces of equipment MSC expects to operate at RFP. The metals MSC recycles are identical to the metals that have been procured at RFP in the four buildings of interest.

The credentials of the MSC staff to run these operations at RFP include the fact that the two founders of the company and the product development manager all previously worked in these buildings with this equipment, and this experience was the basis for the design of their Oak Ridge facility. MSC has successfully produced and sold over $25 million in products and services in the markets that can use recycled DOE metals. MSC has hired and trained a work force to operate their metal working equipment safely and produce high quality products. This experience qualifies them to train their RFP work force in safe and productive manufacturing operations.

G.2 What is MSC and DOE's expected investment in this project?

MSC has already invested heavily in this project by providing its Vice President and Co-founder nearly full time for the past year to work on the many issues that must be dealt with to proceed with the project. The significance of this commitment of a key resource is that many other business opportunities have not been pursued, meaning MSC has risked a great deal of the future of the company to make this project happen.

The DOE will receive many benefits for investing in this project. These include:
a) clean-up of four major buildings;
b) placement of a sizable percentage of workers who would otherwise receive severance, training and unemployment compensation;
c) experiences with converting part of a Superfund site into a productive new activity and the promise of reproducing that experience at other sites;
d) development, demonstration and operating experience manufacturing waste containers from recyclable metals;
e) declassification of nuclear weapons tooling and components;
f) and the base from which to build a recycling enterprise that will minimize waste, utilize otherwise wasted resources and save very large sums of money for the taxpayers.

The precise investment by the DOE and MSC will not be known until the later stages of the project.

G.3 What kind of public process will be used prior to a decision to begin Stage II or Stage III?

MSC intends to work closely with the stakeholder community surrounding RFP throughout the entire project, not just at pre-ordained milestones such as decisions prior to entering new stages. This involvement will include status reports to interested groups, participation in the task force overseeing our operations and access to this operation. Certain public processes will also occur and the details must await further planning. The environmental assessment requirements of the National Environmental Policy Act are an example of one such public process that will occur, but we expect to plan for addition such opportunities to learn the public views about our contemplated operations.

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Appendix C

Stage I Local Presentations List

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Local NCPP Outreach by D.R. Floyd

Date	Place	Topic	Participants
12/7/93	Denver West Marriott	NCPP	MSC-BNFL
12/9/93	Denver West Marriott	NCPP	MSC-Carl Edstrom
12/14/93	Union Hall	Meeting with Union	Dennis Wise, Jim Kelly
12/14/93	CDH Offices	Meeting with CDH	Steve Tarlton and Staff
12/20/93	Gov. Staff Office	Mtg. with Governors Staff	John Mullins, Michelle Harper
12/21/93	Capital Bldg.	Governors Press Release	Governor-Media, etc.
1/4/94	RFLII	NCPP Planning	Tim Heaton
1/7/94	CSM	CSM Technology for NCPP	Dave Olson
1/11/94	Union Hall	Crafts Union meeting	Jim Brown - Staff
1/19/94	Marriott	Brief Monthly Public Meeting	Public
1/20/94	Capitol	CACI Day at Legislature	
1/21/94	RF	Tour 4 NCPP Bldgs.	Steering Committee
1/24/94	RMPC	Rocky Flats Plutonium	Public
1/25/94	Broomfield	Briefing on NCPP	City Council + Cable TV
1/28/94	Marriott	NW Metro Dinner	
1/31/94	RFLII	Public Outreach Mtg.	PO Subcommittee.
2/1/94	RF/371	Briefing on NCPP	EG&G Supv.
2/1/94	RFLII	Sounding Board	
2/2/94	Arvada City Hall	Public Meeting	
2/2/94	RF/771	Briefing on NCPP	EG&G Supv.
2/3/94	RF/750	Briefing on NCPP	EG&G Supv.
2/3/94	Bldg. 881	Mtg. with Dick Stagner (NCPP)	Stagner - Staff
2/16/94	Bldg.	CDH tour bldg. w/Ed Cray	
2/17/94	Arvada	Briefing on NCPP	JoAnne Conte
2/18/94	RMPC	Briefing on NCPP	LeRoy Moore, 4 Associates.
2/23/94	Denver West Marriot	Public Meeting	EG&G, Media, Stakeholders
3/17/94	Union Hall	Presentation at Union Hall	
3/23/94	Golden	Subcontractor Interview	Western Ind. Contractors
3/24/94	USWA	Briefing on NCPP	Sen . Feeley
3/25/94	RF	Secretary Hazel O'Leary's visit	
3/29/94	CSM	Lecture on NCPP	Students
3/31/94	USWA	Briefing on NCPP	PM Shift Workers
3/31/94	USWA	Briefing on NCPP	Day Shift Workers
4/4/94	RFLII	Mtg with Tim Heaton	Tim Heaton
4/5/94	RF	Tour Bldg. 883	Local Stakeholders
4/6/94	Marriott	NCPP Public Mtg.	~150 Stakeholders
4/28/94	RF	Briefing on NCPP	Kelly Luce, JEC
5/4/94	Denver	Briefing on NCPP	Denver Post
5/4/94	RMPC	Briefing on BNFL	LeRoy Moore, et.al.

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Local NCPP Outreach by D.R. Floyd			
Date	Place	Topic	Participants
5/4/94	Gov. Office	Briefing on BNFL, NCPP	John Mullins, COBD
5/4/94	CAB	Briefing on NCPP	CAB Board
5/5/94	Westminster City Hall	CAB Mtg.	
5/17/94	RF	Subcontractor Interview	ICF Kaiser, 3-R's
5/24/94	RFLII	Sounding Board Meeting	
6/6/94	RF	Tour Bldg. 883	AM-Sounding Board
6/6/94	RF	Tour Bldg. 883	PM-Legislators
6/11/94	Arvada	NCPP Display, First Fest	Public
6/15/94	Westminster	NCPP Public Meeting	Stakeholders

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Appendix D

Stage I Public Meeting Minutes

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National Conversion Pilot Project Sounding Board
February 1, 1994 Meeting Notes

The first meeting of the National Conversion Pilot Project (NCPP) Sounding Board was called to order at 4:10 p.m. The following members were in attendance:

Dennis Wise, United Steelworkers of America; Mike Simmons, Rocky Flats employee; Kathy Schnoor, City of Broomfield; Joanne Conte, City of Arvada; Luanne Auble, Jefferson County Coalition of Chambers; Tom Rauch, American Friends Services Committee; Tom Marshall, Rocky Mountain Peace Center; Don Dunshee, Jefferson Economic Council; Ron Harlan, CANDID; Sam Dixion, City of Westminster. Alternate: Amy Marlowe, CANDID. Steering Committee: Mark Van Der Puy, Department of Energy, Rocky Flats Office (DOE-RFO); Steve Tarlton, Colorado Department of Health; Martin Hestmark, Environmental Protection Agency; Dennis Floyd, Manufacturing Sciences Corporation; David Navarro, United Steelworkers of America; Tim Heaton, Rocky Flats Local Impacts Initiative; Gary Francis, EG&G Rocky Flats. Public Outreach Working Group: Rob Henneke, Environmental Protection Agency; Teresa Mikulsky, EG&G Rocky Flats.

Introduction

Dennis Floyd, Vice President of Manufacturing Sciences Corporation (MSC) and Chairman of the NCPP Steering Committee, made introductory remarks and invited participants to introduce themselves. He gave a brief history and update on the NCPP, and an explanation of what the Steering Committee hoped the Sounding Board would provide. He explained that Stage 1 of the project had not officially begun, although the Steering Committee is doing some preliminary work. Dennis Floyd also said if the project continues into Stage 2, Sounding Board members could determine the need for continued meetings.

A representative from the Rocky Mountain Peace Center asked if Dennis Floyd had passed out to the Sounding Board a letter he had written about his organization participating in the group. Dennis Floyd said he had not; that he planned to discuss it at the meeting. The representative from the Rocky Mountain Peace Center explained the organization would accept a position on the Sounding Board only if substantive public involvement were ensured. He said he would decide after this meeting. He also asked whether the Sounding Board or the Steering Committee would define the Sounding Board's role.

Dennis Floyd discussed the formation and purpose of the Steering Committee and the role for the Sounding Board in more detail. He said the Sounding Board was free to change or add to its role. It was suggested that the Sounding Board meet at least two more times during Stage 1 to provide public feedback before a Cooperative Agreement was signed between the DOE and the contractor, MSC (the Cooperative Agreement is a contractual agreement outlining the parties' responsibilities for Stage 1 and Stage 2, if applicable). A timeline was presented for Stage 1, outlining the interaction between the Steering Committee and the Sounding Board through the months of March and April, including a pubic information meeting scheduled toward the end of Stage 1.

The issue was raised that the schedule did not allow adequate time for public review and comment on the project. The Citizens Advisory Board's role in this project was also questioned.

Dennis Floyd discussed public involvement for the project over the past year, including interviews with key stakeholders and presentations at two Rocky Flats monthly public meetings. Mark Van Der Puy, DOE/RFO, said the DOE has committed to complete Stage 1 in a timely fashion and that members of the Steering Committee have agreed to a 90-day duration for Stage 1. Another Steering Committee member said the committee considered asking the Citizen's Advisory Board to act as its Sounding Board, but at the time public involvement was being planned, it was not completely organized. The Steering Committee decided it needed to proceed with development of the Sounding Board immediately . Dennis Floyd also explained that a formal public comment process will occur in Stage 2. It is not known yet what regulatory framework will drive formal public comment (CERCLA or NEPA).

It was stated that an invitation had been extended to the Citizen's Advisory Board to participate on the Steering Committee as a full member. The Citizen's Advisory Board has not yet responded. A member of the Steering Committee who is also a member of the Citizen's Advisory Board said he has informed the Citizen's Advisory Board of the status and activities of the Steering Committee. He distributed information to the Citizen's Advisory Board at its first meeting and also distributed copies of MSC's proposal to the six original members of the Citizen's Advisory Board.

A question was raised about how Stage 1 and 2 activities will affect the cleanup mission of Rocky Flats?

Dennis Floyd said this question will be answered in Stage 1, the feasibility study portion of the project. To address issues such as this in Stage 1, the Steering Committee has convened several working groups focused on specific topics such as waste management, environmental restoration, public outreach, and human resources. The Steering Committee expects to have a waste management plan prepared and sent to the Sounding Board for review and comment prior the next meeting.

NCPP Overview

Dennis Floyd gave a brief presentation on the NCPP. He discussed the stages of the project, the players, the proposed products to be manufactured, the proposed materials to be used in the process, and the re-hiring of Rocky Flats workers. He also stated this project could serve as a model for conversion projects complex-wide.

A question was raised about importation of contaminated metal to Rocky Flats from other sites. A member of the Sounding Board stated Rocky Flats "is not a metal factory."

Dennis Floyd said at this time, the answer to this question is unknown. During Stage 1, the materials at Rocky Flats will be inventoried and the quantity of material needed to proceed with the project will be determined. This information will be shared with the public. The Steering Committee will consider public feedback on this issue in making a decision about importation of materials from other sites. It was also stated that any imported materials would be decontaminated to acceptable regulated levels before being transported to Rocky Flats. A suggestion was made by a Sounding Board member that Rocky Flats not accept materials unless they meet specific standards. Another suggestion was made to establish a limit on the quantity of metals to be imported to Rocky Flats.

A question was raised about who would be responsible for waste generated by this project and how it would be disposed.

Dennis Floyd said that waste generated during Stage 2 would be low level waste and DOE would be the responsible party. The contracted manufacturer for Stage 3 would have the responsibility for waste generated during private operations.

Open Discussion of Issues

Presentations were made by Steering Committee members on potential NCPP issues identified by the Steering Committee. These issues have been gathered over the past year from CDH, EPA DOE, and various stakeholders and community groups. The Sounding Board was asked to comment and add to these issues.

Following are the issues added by the Sounding Board:

Health & Safety:	What rules and regulations cover the importation of contaminated materials? What regulatory agency will have oversight?
Human Resources:	What is the relationship between unions and new employees? Will there be a friendly atmosphere toward labor? What effect will the NCPP have on the existing union at Rocky Flats?
Environmental Restoration:	How will the NCPP affect the re-evaluation of the Interagency Agreement?
General:	What would happen if the agencies (or other players) should come to an impasse?

The Sounding Board was invited to send additional comments, questions, or issues to Teresa Mikulsky at 966-5594 (Fax: 966-6153) or Tim Heaton at 940-6090 (Fax: 940-6088).

The next meeting was scheduled 4:00 to 6:00 p.m., Tuesday, March 1, at the offices of the Rocky Flats Local Impacts Initiative. The meeting was adjourned at 6:00 p.m.

National Conversion Pilot Project Sounding Board
March 30 , 1994 Meeting Notes

The second meeting of the National Conversion Pilot Project (NCPP) Sounding Board was called to order at 4:10 p.m. The following members were in attendance:

Joanne Conte, City of Arvada; Ron Harlin, CANDID; Luanne Auble, Jefferson County Coalition of Chambers; Don Dunshee, Jefferson Economic Council; Ken Korkia, Rocky Flats Cleanup Commission; Sam Dixion, City of Westminster. Steering Committee: Steve Tarlton, Colorado Department of Health; Ken Brakken (for Mark Van Der Puy), Department of Energy, Rocky Flats Field Office; Rob Henneke(for Martin Hestmark), Environmental Protection Agency; Dennis Floyd, Manufacturing Sciences Corporation; Rick Wilson, Office of the Governor; Tim Heaton, Rocky Flats Local Impacts Initiative; Gary Francis, EG&G Rocky Flats. Public Outreach Working Group: Teresa Mikulsky, EG&G Rocky Flats; Joelle Klein, DOE-RFFO Contractor.

Introduction

Rick Wilson, the newly appointed State Director for Defense Conversion and Retention, delivered the introductory remarks. He reiterated the Sounding Board's mission as he understood it and stressed that this Board was an "adjunct to and not exclusive of other public participation vehicles." He also stated that he felt the Sounding Board was best utilized as a focus group and not as a group to set policy.

He further stressed that the Office of the Governor has only approved Stage I at this time. He stated that if there were any reasons why this project should not proceed (i.e. regulatory issues or public acceptance), the Governor would pull his support for this project. He urged Board members to relay the message to their groups that the Steering Committee is not trying to "ram this project down anyone's throat."

He explained that the Steering Committee expected the Sounding Board to meet at least three more times in the next 90 days. To accommodate time constraints, the Steering Committee will try to make sure that information flows to them on a regular basis for them to review.

Video Presentations

Dennis Floyd, Vice President of Manufacturing Sciences Corporation and Chairman of the National Conversion Pilot Project Steering Committee, introduced the video presentation and asked the Board to give their opinion on whether they thought it was presentable to show the public at the April 6 public information meeting.

Comments and questions on the National Conversion Pilot Project video included:

Is everything we saw going to happen in Stage I? (the video showed footage of a proposed building and equipment to be used for the project, not necessarily in Stage I)
The overall general public will be overwhelmed and unable to understand the video.
The narration went too fast and it was difficult to comprehend.
The radiation testing by technicians might be "scary" for the public to witness.
Consider using computer-generated images to explain what the machines will do.

It was agreed that the video would not add to the public's understanding of this project and that it should not be shown at the April 6 meeting.

Steve Tarlton, Colorado Department of Health Steering Committee member, made the comment that what struck him the most during the tour was the amount of machinery that would become waste if the project does not proceed. This generated a discussion of how much waste would result if the project did not proceed. A board member suggested that it would be an interesting statistic to cite exactly how much waste would result. For example, would the waste fit into a landfill the size of New Jersey? Someone suggested using a comparison that would be familiar to the community. For example, would the waste fit into 10 Mile High stadiums.

Rick Wilson pointed out that it would not be a landfill, but would actually be a repository, like the Waste Isolation Pilot Project (WIPP), which would make it even more difficult to dispose of than dumping the waste into a landfill.

The next video the board watched was media coverage of Secretary O'Leary's visit, which lead to a discussion of having more stakeholders tour the buildings to witness the project first hand. Dennis Floyd then invited the group to participate in the same tour of Building 883 that the Energy Secretary experienced. Rick Wilson recommended the tour to the group because it would give them the opportunity to look and see the equipment that is proposed to be used during the conversion process, as opposed to just reading about it.

Teresa Mikulsky, a member of the Public Outreach Working Group, made the point that the same offer must be given to all groups. It was decided that the Rocky Flats Local Impacts Initiative (RFLII) board and the Citizens Advisory Board (CAB) be invited as well. April 5 from 1-4 p.m. was the designated time and date.

Proposed Issue Resolution Discussion

Gary Francis, Steering Committee liaison for the Site Support Services Working Group, made a presentation on the Issue Resolution Process and the documents that the Board received in the mail. He stated that at this point, the Steering Committee has not identified any issues that do not have a resolution path. Some need more time to resolve, others need more money to accomplish, but none are unresolvable.

One board member commented that he liked the format of the documents and that it was clear that there was thought behind the process . He also stated that the blank pages he first noted in the Waste Management reports, due to cross-referencing, "annoyed him." But, it turned out to be OK because the first paper that most of them referred to was a comprehensive answer to the other issues.

A Steering Committee member interjected and explained that some issues are more complicated than others and will take two or three working groups coming together to resolve. Another Board member asked where these issues came from. Gary Francis explained that two years ago when economic development was first proposed , the Rocky Flats Local Impacts Initiative (RFLII) began a process to solicit issues from stakeholder groups regarding possible economic development projects.

Another Board member noted that there was a lot of "beaurocratese" in these documents and from the language in them, it sounded like it would take until the year 2000 before a contractor could come in and actually start recycling. This Board member was also concerned about the

retraining of workers. She questioned why workers would have to be retrained, if they were laid off EG&G workers. Gary Francis explained that they would only be retrained with respect to the recycling project.

This Board member also suggested that utility meters be put in place so that at the end of Stage I, no party receives an unreasonable energy bill for support services that are not necessarily attributed to it. A comment was made regarding the issue of using EG&G's equipment inventory program. It was stated that in the public's eyes, EG&G has a terrible inventory program, and that it should not be stated that this project will use this program.

A Board member questioned whether DOE would reevaluate the waste storage situation in five years. He also asked whether the buildings in question would be better storage facilities if the machinery was removed. A Steering Committee member replied that the surplused machinery would be considered waste that would have to be stored anyway. He also added that anything done on this project will be consistent with ongoing waste operations and regulations.

A board member questioned what the procedures for waste storage and disposal would be and who would be responsible for it during Stages II and III. A Steering Committee member explained that the majority of waste will be generated during Stage II and that DOE planned to store this waste in designated waste storage buildings on an interim basis. The waste generated in Stage III will be considered commercial waste and can be shipped to a commercial disposal facility that has already been identified. The Board member suggested that the Stage III contractor sign an agreement with DOE that the waste generated in Stage II will be out of the buildings before commercialization begins. It was then explained that DOE will still be the landlord after Stage III and that when this project ends the buildings will go back to DOE for ultimate disposition.

A Board member suggested a site support issue be changed to read the "future contractor will be billed by DOE" instead of "MSC will be billed by EG&G for support services."

April 6 Public Information Meeting Suggestions

The last item discussed was the April 6 public information meeting. Dennis Floyd read the proposed agenda and asked the Board members to comment. The Board approved of the agenda which includes a general discussion of the stages and the project, an explanation from each Steering Committee member on who they are and why they are involved in this project, and a question and answer session. Beth Brainard-Jordan, Director of the Office of Communications, will act as facilitator. A Board member asked what the Steering Committee wanted the Sounding Board to do at this meeting. The response was, attend the meeting and available to answer questions. A Steering Committee member suggested that a hand out of the Sounding Board members be available at the meeting.

Wrap-up Remarks

Two members not able to attend the Sounding Board meeting corresponded to the Steering Committee and asked that the Citizens Advisory Board be invited to review all stages of this project. Tim Heaton, Steering Committee liaison for the Public Outreach Working Group, announced that he spoke with Carol O'Dowd from the CAB and she explained that the CAB did not want to take a position for or against the NCPP at this time, but wanted to operate more like a fact finding group.

Rick Wilson asked the Sounding Board for suggestions on how to increase the public's awareness of this project. He also said that he will eventually ask the members to provide the Steering Committee with the opinion of their respective groups' on this project.

One Board member asked for a press release or fact sheet to bring back to her organization. Another Board member stated that he felt that there will be community members who will be philosophically opposed to this project and will never agree and that the Steering Committee should not get "hung up" on this and just move forward.

The next Sounding Board meeting was set for April 27, from 3-5 pm, at the RFLII office.

National Conversion Pilot Project Sounding Board
April 27, 1994 Meeting Notes

The third meeting of the National Conversion Pilot Project (NCPP) Sounding Board was called to order at 3:10 p.m. The following members were in attendance:

Joanne Conte, City of Arvada; Ron Harlan, CANDID; Ken Korkia, Rocky Flats Cleanup Commission; Sam Dixion, City of Westminster; Dave Navarro, United Steelworkers of America; Tom Rauch, American Friends Service Committee. Steering Committee: Steve Tarlton, Colorado Department of Health; Mark Van Der Puy, Department of Energy, Rocky Flats Field Office; Dennis Floyd, Manufacturing Sciences Corporation; Rick Wilson, Office of the Governor; Tim Heaton, Rocky Flats Local Impacts Initiative; Gary Francis, EG&G Rocky Flats. Public Outreach Subcommittee: Teresa Mikulsky, EG&G Rocky Flats; Joelle Klein, DOE-RFFO Contractor.

Introduction and Issue Resolution Discussion

Tim Heaton, Steering Committee Liaison to the Public Outreach Subcommittee, opened the meeting with the suggestion of foregoing the agenda and having an informal discussion of the issue resolution documents that were mailed to the Sounding Board for review. Board members present concurred.

Following this decision, an announcement was made regarding a letter from Dave Navarro, United Steelworkers Union, to Dennis Floyd, Vice President of Manufacturing Sciences Corporation and Chair of the National Conversion Pilot Project Steering Committee, explaining that the Steelworkers Union would prefer a seat on the Sounding Board as opposed to the Steering Committee.

A Sounding Board member began the discussion of the issue resolution documents by asking a general question regarding references to EG&G Rocky Flats throughout the reports. He wanted to know how the Steering Committee was going to deal with the possibility of a new contractor(s) (EG&G Rocky Flats contract is up for renewal in December 1995). A Board member suggested that an explanatory paragraph should be added into the final issue resolutions report stating all references to EG&G performing work would apply to the subsequent contractor(s).

A Board member wanted Environmental Safety & Health (ES&H) Issue Resolution #27 clarified to explain workers and public health and safety measures with respect to radiological exposure. He also wanted to know what was meant by "boundaries" in ES&H #18. Did it refer to buildings, fences, or the whole complex? Is "physical boundary" different from "regulatory boundary"? What are the NCPP's boundaries?

Steve Tarlton, Colorado Department of Health Steering Committee Member, explained that different regulatory boundaries existed for different permits and different permits will have different boundaries, but he did acknowledge that the issue and issue resolution options needed further clarification.

There were several questions regarding the meaning of various acronyms. The Steering Committee stated that future issue resolution forms would be void of acronyms. The following acronyms and phrases were defined:

The Tempest Program: a program to prevent electronic surveillance

FOCI: Foreign Ownership and Control Influence. This referred to British Nuclear Fuels Limited (BNFL), a British owned company to be subcontracted by MSC during Stage II
A positive **FOCI determination** allows BNFL to work on the site as the MSC subcontractor
APEN: Air Pollutant Emission Notice

Referring to Human Resources issues, a Board member asked if the health benefits for the MSC hired workers will be comparable to EG&G and DOE benefits. Dennis Floyd replied that this was not known yet, but that the benefits would probably be consistent with what regional private businesses offer.

General comments on the issue resolution documents were that the issues and the responses were clear and one Board member commended the Steering Committee for taking on so many issues. The Board also agreed that the NCPP informational update was "a good idea and well done."

General NCPP Discussion and Questions

A Board member asked if the NCPP planned on using materials from Rocky Flats that have been contaminated at one time, and, if so, to what degree of contamination. Steve Tarlton explained that a Radioactive Materials Control License will have to be issued to the Stage III contractor and that this license will determine contamination limits and how much waste MSC, or the future contractor, can stockpile at any given time. Dennis Floyd explained that the amount of waste materials existing at Rocky Flats has yet to be determined.

A Board member asked if MSC, or the future contractor, plans on buying the scrap material from DOE. A Steering Committee member explained that they were working on a proposal whereby the scrap metal would be purchased on consignment (when the contractor sold the product, DOE would receive payment). Mark Van Der Puy spoke about another proposed idea -- to give the money from this project back to the community. Normally the money for the scrap materials and the building lease would go back to the Federal Government and into the Federal Treasury.

A Board member stated that he was very concerned that the money for the NCPP may be coming from the workforce restructuring budget and could severely impact the money needed for laid-off workers. He said that he would like to see a budget breakdown indicating budget sources for Stage II.

The Steering Committee restated their understanding that the funding for this project would come from the Bob DeGrasse Community Transition fund at Headquarters. However, the Committee admitted there is a great deal of confusion on funding. It was agreed that a new issue should be added requesting confirmation before moving forward.

Tim Heaton asked the Board if they thought the issue resolution report would be useful or of interest to the public or if the volume would be overwhelming for the public to review. A Board member stated that reviewing these reports turned out to be more rigorous than he originally imagined because of the volume of issues. Another Board member said that he thought the response sheets were well done and understandable, for the most part. The Board agreed that all issue response documents should be made available to the public in reading rooms. A Board member pointed out that if you only make some of the issue response documents available, the public will become suspicious as to why they all were not made available. The Steering Committee agreed to make the reports in final draft form available at the reading rooms. One Board member also asked that the Cooperative Agreement be attached to the final package to be sent to the reading rooms.

Wrap-up

A Board member requested a two-page update of the progress of the project including the status of the issue resolution process. Other Board members said the two page fact sheet and informational update were sufficient if kept up to date. This board member also suggested that the Steering Committee make an effort to get more "people people" to these meetings as opposed to just professional activists. She mentioned that as a city council member, she has time on the public access channel and that her staff would be willing to let the NCPP Steering Committee use that time to report on the NCPP.

Steve Tarlton responded to this Board member by explaining that the opportunity for the "real" public to learn and comment on this project has been extended. If the public is hearing something that they are not interested in, then they usually do not respond. Another Board member said that the "general" public probably is not that interested in the project.

Another Board member suggested that a NCPP video be presented to the local city councils to inform them of the project and ask them to notify their constituencies. One Board member said that her city council did not want to know all of the details about the project and trusted her to tell them what they needed to know to take a position on the project.

Dave Navarro announced that there would be an NCPP presentation to the Citizens Advisory Board on Thursday, May 5 at 6:45 pm at the Westminster City Hall.

One Board member stated that the stand alone public information meeting on April 6 went well.

Joelle Klein, Public Outreach Subcommittee, notified the Board that the Steering Committee was going to offer another tour to the Sounding Board, and the public, of Building 883 and wanted to know what day and time would be most convenient for the Board. Joelle took the action to coordinate dates with interested parties.

The next meeting was set for May 24, from 3- 5 pm, at the RFLII office.

National Conversion Pilot Project Sounding Board
May 24, 1994 Meeting Notes

The fourth meeting of the National Conversion Pilot Project (NCPP) Sounding Board was called to order at 3:15 p.m. The following members were in attendance:

Ronald Harlan, CANDID; Tom Rauch, American Friends Service Committee; David Navarro, United Steel Workers Union; Joanne Conte, City of Arvada; Luanne Auble, Jefferson County Coalition of Chambers; Don Dunshee, Jefferson Economic Council; Ken Korkia, Rocky Flats Cleanup Commission; Sam Dixion, City of Westminster. Steering Committee: Steve Tarlton, Colorado Department of Health; Rob Henneke (for Martin Hestmark), Environmental Protection Agency; DeAnne Butterfield (for Tim Heaton), Rocky Flats Local Impacts Initiative; Gary Francis, EG&G Rocky Flats; Dennis Floyd, Manufacturing Sciences Corporation; John Morris (for Mark Van Der Puy), Department of Energy Rocky Flats Field. Public Outreach Subcommittee: Joelle Klein, DOE-RFFO Contractor.

Introduction

Steve Tarlton, Colorado Department of Health Steering Committee Member, began the meeting by asking the Board what they thought were the "showstopper" issues and which questions they felt have not been adequately answered. The following issues were identified by the Board as the "showstopper" issues:

1. Is the National Conversion Pilot Project the highest and best use of the buildings? Are they needed for waste storage?
2. How are workers and the public going to be adequately protected?
3. If we don't fully know the dangers of the past, how can you justify continuing work with these materials?
4. Will this project help or impair cleanup?
5. Will this project take money away from cleanup?
6. What do CDH and EPA really think of this project?
7. Will this project really provide jobs for at-risk workers?

The second questioned the Steering Committee asked the Board was if they thought the Sounding Board should continue into Stage II and should the public involvement process be similar to Stage I. This question was left to be answered at the end of the meeting.

Issue Resolution Discussion

The issue resolution discussion began with the Environmental Safety and Health (ES&H) documents. A Board member asked if NRC (Nuclear Regulatory Commission) and DOE ALARA (as-low-as-reasonably-achievable) standards are the same? Dennis Floyd, Vice President of Manufacturing Sciences Corporation and Chairman of the National Conversion Pilot Project, answered that they were the same, but ALARA standards are site specific.

One Board member wanted to know what the NRC permit and amendment process was and would the public have opportunity to comment on those processes. The Colorado Department of Health agreed that the public should be able to comment on this process. The Steering Committee agreed to look into this issue

A Board member asked if there was a difference, it terms of exposure limits, between workers and general members of the public. He also questioned what type of training employees, working on

the project, but not working with radioactive material will receive. Steve Tarlton explained that if the site boundaries are moved to reduce DOE controls that Emergency Protection Zone (EPZ) and Safety Analysis Report (SAR) levels will have to be re-evaluated along with other safety and exposure issues. This issue will be looked into further during Stage II, if the project continues.

With regards to ES&H #8, a board member wanted the difference between recyclable waste and waste materials. Are these words interchangeable?

Steve Tarlton, Colorado Department of Health, defined scrap metal, in terms of the NCPP, as recyclable waste because it is waste that would have to be disposed, if it were not recycled. MSC sees the distinction as "waste" being a by-product of materials. But if no recycling it would become waste.

A suggestion was made to use the terms "recyclable waste material" vs. "disposable waste material" for clarification.

A Board member raised the issue that ES&H #9 did not answer question about what rules would cover importation. A Steering Committee member answered that the transportation of non-DOE radioactive waste is regulated by the US Department of Transportation. Additional, a radioactive materials license will have to be issued. This license will govern the amount of waste that can be stockpiled at one time, import and export processes, and processing for DOE waste.

A Board member asked if there will be materials imported or any production of waste containers in Stage II. A Steering Committee member replied that there will be some process development but no importation or production.

Some Board members wanted clarification on the OSHA issue. Should OSHA "kick in" in Stage III, or, when does it apply? Dennis Floyd responded that he believes OSHA will start when DOE orders stop, probably Stage II. All Board and Committee members believed it should begin as possible.

A Board member commented that ES&H #13 answer implies that, currently, there are not any risks involved for the NCPP workers who work with contaminated materials. He felt that this answer should expanded to explain the possible risks and maybe state that they "are below standard". A Steering Committee member suggested that the Plutonium vulnerability assessment, going on at the plant in June, should help with information to expand this answer.

A board members pointed out that ES&H #36 does not discuss what happens in Stage III with regards to cleanup and contamination. Steve Tarlton explain that the Radioactive Materials Control License will regulate waste management during this stage. Dennis Floyd said that he believed that Stage II will reduce contamination in Stage III.

Several Board members asked about the relationship between the NCPP and Site Wide Environmental Impact Statement (SWEIS). Would Stage II and III be encompassed in this SWEIS, would separate NEPA documentation have to be done? Dennis Floyd pointed out that Mark Van Der Puy had written an issue paper covering this topic and that he would try to make it

available to the Sounding Board. He said that as he understood the relationship, the NCPP and the SWEIS were conceptually compatible. Stage II will be completed in two years, the same year the SWEIS is scheduled to be published and the NCPP would be used as input to the alternatives

Business Plan

A Board member asked that the Steering Committee explain what is meant by "competitive excess property system" in Business Plan (BP) issue #9. A Steering Committee member explained that it referred to the system by which government property was sold or offered. The property would first be offered, in order, to DOE sites, other federal agencies, state agencies, local government agencies, and then it would be auctioned to the public.

One board member commented that he felt the BP issue resolution documents were the most forthright documents. He went on to say that they were easier to understand than the more technical documents, and this subcommittee did a good job on capturing the essence of the issue statement.

A Board member commented that the answer to BP issue #18 suggests that materials will only be imported from Colorado or that Colorado will be the only state affected by the NCPP. The Steering Committee agreed that this issue should be clarified.

A Board member wanted to know at what point there would be a complex-wide look at materials. Another Board member wanted to know how ingots will be monitored to assure that the are decontaminated. A Steering Committee member answered that a complex-wide look at materials will happen in Stage II and that ingots are other waste entering the site will be regulated by CDH. The Radioactive Materials Control License will specify what can be accepted. The sender of the materials must measure and document levels of contamination's.

A board member commented that BP issue #26 reflects that basic mistrust of government officials by stakeholders. It questions what provisions are being made for an independent (non-DOE, non-EPA, non-CDH, non-MSC) and felt that this was unfortunate because it does not allow the stakeholders many options for gathering information. He stated that he hoped that some day the distrust of government officials will dissipate.

Another Board member asked about the decontamination of materials already at Rocky Flats, what process were in place to decontaminate the materials on site that would be use for recycling and who was going to pay for it.

The Steering Committee agreed that this was a question that would have to be looked into furhter in Stage II and suggested that DOE would explore the possibility of using cost savings from waste storage.

One Board member wanted to know if the permit applications that will be required if this project proceed will cause CDH staff overload. Steve Tarlton explained that the permit fees will cover the costs.

A Board member commented that looking into Stage IV in BP issue #30 was a good idea. He added that looking ahead at import assumptions was a good way to gain public confidence.

A Board member wanted to know if the question he raised at the last Sounding Board meeting regarding funding for the project and workforce restructuring money was resolved. A Steering Committee member responded that the answer is due from DOE Headquarters by the end of Stage I. He stated that this issue has been listed under the Public Outreach Subcommittee section and that Headquarters has been informed if the funds for the NCPP is taken from any other activity, it will kill the project.

Should the Sounding Board be Continued

Most board members agreed that the Sounding Board was useful and worthwhile process. Members differed in terms of if, and how it should continue. One Board member dissented fromt he group and stated that she felt the Board was a "waste of time" because most of the government officials rarely attended, the information presented was too difficult and technical, and she didn't feel efforts were made to reach the "real public."

Committee and Board members responded to her comments by explaining that there have been articles in the local newspapers, public meetings, and presentations made to many public groups. A Board member stated that "no matter how much you try to involve the public the public doesn't want to involve themselves."

Suggestions for a continued Sounding Board, should the project proceed to Stage II, included tracking the "show stopper" issues or specific issues to ensure that they are being carried out in the best interest of the community, to break down the issue into a few broader issues to concentrate on, and to develop a time line or calendar to track the permitting process for the necessary permits. Most members expressed interest in continuing to participate in a variation of the Stage I Sounding Board for the NCPP if it proceeds into Stage II.

National Conversion Pilot Project
Stage I

National Information Exchange Report

Revision 0
17 June 1994

Submitted to:

U.S. Department of Energy - Rocky Flats Office
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National Conversion Pilot Project
Stage I

National Information Exchange Report

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Approved by:	~~M.E. Anderson, DOE-COR~~ D. E. Nix, DOE COR	Date 7/29/94

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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
0	6/17/94	All	All	First Approved Issue	NR Floyd 6/17/94

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Appendix B - U. S. DOE Land Use Planners

1.0 Introduction

One of the central objectives of the National Conversion Pilot Project (NCPP) is to demonstrate that a DOE weapons production plant can be converted to private-sector manufacturing. In doing so, DOE must transfer the lessons learned in this process to other DOE sites throughout the weapons complex. Standard Project deliverables may not meet DOE's unique needs for this Project. It may be necessary that MSC deliver unique services in transferring lessons learned to other sites. At the direction of DOE and the approval of the Contracting Officer, those unique services and deliverables could include, but are not limited to:

- Conduct lessons-learned workshops at other Department sites;
- Attend public meetings involving economic conversion of other sites;
- Communicate with other DOE offices and regulatory authorities involving economic conversion of other DOE sites;
- Prepare video tapes on economic conversion and the NCPP;
- Conduct tours for visitors interested in obtaining information on the NCPP; and
- Other deliverables and services unique to the NCPP.

These services and unique deliverables will be provided jointly by MSC and DOE. DOE shall make all decisions on the delivery of such unique services and deliverables. MSC shall obtain direction from DOE in the delivery of such services and deliverables.

This Stage I summary report documents the preliminary steps taken by Manufacturing Sciences Corporation (MSC) to show how a Department of Energy (DOE) weapons production plant can be converted to private-sector manufacturing. This report involves the transfer of lessons learned in Stage I to other DOE sites throughout the weapons complex and commercial businesses. This transfer of information is expected to continue into Stage II.

2.0 National Information Exchange Program

An important objective of the National Conversion Pilot Project (NCPP) and other Department of Energy (DOE) offices, is to disseminate information regarding the Project to other DOE offices and commercial businesses to promote conversions of DOE facilities across the country. To accomplish this, Manufacturing Sciences Corporation (MSC) has assisted other DOE offices and businesses in understanding the pilot conversion process by conducting meetings, giving presentations, distributing reports, and providing other additional assistance as approved by DOE.

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2.1 Commercial Businesses

Several firms have contacted MSC to express their interest in providing services to the NCPP during Stage II, the Cleanup stage. MSC and BNFL Inc. met with these firms, at their local office or at the NCPP offices at Rocky Flats, as appropriate. MSC also responded to several phone calls and received information provided by these firms to describe their capability. Some of the firms and personnel expressing interest are included on the following list.

Company	Person	Date	Capability Discussed
ICF Kaiser Engineers	Chris Timm, Bob Richardello Ray Paradigo	Several 5/17/94	Q-Cleared, Strong RF Presence, Environmental Services, Safety Analysis
Jacobs Engineering	Farrell Hobbs	4/28/94	IM/IRA, Wide Site Involvement
CH2M Hill	Vic Mani	Several	
EG&G Instruments	Harold Winslett Val Johnson		Radiation Detection Instruments
Lockwood-Greene Engineering	Jewel Stallions Steve Helms	4/13/94	Ventilation Design, Metalworking Facility Design
Western Industrial Contractors	Barbara Grogan	3/23/94	Materials Handling
Performance Development Corp.	Jack Doyle	1/26/94	DOE Project Management Training
Radian Corp.	Joe Brown	5/9/94	D&D Characterization
Quadna	Doug Ridl		Pumps

2.2 Other DOE Sites

NCPP representatives have visited several other DOE sites to explain the mission of the Project and learn hoe these sites might participate in or benefit from the NCPP.

A partial list of the visits follows:

Site	NCPP Rep.	Person Visited	Date	Topic
Fernald	Dennis Floyd	Gerry Motl, Dan Burns,	3/15/94	RSM, Equipment Recycle
Los Alamos	Dennis Floyd	Ed Joyce Rich Mah Loren Jacobsen		DU Processing Decon Technology
Sandia National Laboratory Albuquerque	Dennis Floyd	Tom Sanders		RSM In the Multipurpose Canister

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Site	NCPP Rep.	Person Visited	Date	Topic
Oak Ridge	Dennis Floyd	Tom Rogers		NCPP Model for OR
Idaho National Engineering Laboratory	Frank Nichols	Ron Mizia	5/8/94	NCPP Status
Fernald	Mel Lundberg Carl Edstorm Tom Muth BT McNeal	Ed Fairman		Examine Equipment that could be recycled, discuss FERMCO RSM plans.
Nevada Test Site	Mel Lundberg		6/28/94	Waste Container Conference, Scrap Metal Inventory Assessment
Hanford	Alan Liby			

2.3 National Forums

MSC participated in several national fora on NCPP related topics. These included the following:

Location	MSC Attendee	Date	Purpose
Gaithersburg, MD	Dennis Floyd		Steering Committee, DOE Seminar on NCPP
Golden, CO	Dennis Floyd	6/1/94	Poster Session on NCPP@ DOE Land Use Conference
Golden, CO	Dennis Floyd	6/2/94	Paper on NCPP @ DOE Land Use Conference

2.4 NCPP Final Technical Report

The NCPP Stage I Final Technical Report will compile a list of all issues considered during Stage I. It will also include an Executive Summary which describes in some detail the major issues in each area of the Project.

2.5 Videotapes

A videotape was prepared during the tour of the NCPP Steering Committee through the four buildings that will be converted at Rocky Flats for commercial manufacturing if the project proceeds. It has been distributed, selectively, to those interested both locally and nationally.

A professional-quality short video explaining the NCPP is in preparation by EG&G video services. It is due for release on June 30, 1994.

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ide pe records were made of :

- The April 6, 1994 NCPP Public Meeting.
- The day-long NCPP session at the Gaithersburg Land Use Planning Conference seminar.
- The NCPP presentation to the Citizens Advisory Board on May 5, 1994 (filmed by DOE headquarters).
- The June 15, 1994 NCPP public meeting.

National NCPP Outreach by D.R. Floyd			
e	Place	Topic	Participants
/94	RF	Tour Bldg. 883	DOE Site managers
28- /94	Las Vegas, NV NTS	Waste Box Standardization	REECO, FERMCO, EG&G INEL, LANL, EG&G RF, MMES Oak Ridge, WHC, WINCO, WSRC, MSC

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Appendix B

U. S. DOE Land Use Planners

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Compatibility of Environmental Restoration and Economic Reuse

The breakout session titled, "Compatibility of Environmental Restoration and Economic Reuse," focused on the National Conversion Pilot Project (NCPP) located at the Rocky Flats Plant, which is located in Golden Colorado. The NCPP is designed to test whether currently unused DOE facilities can be "converted" into commercially attractive manufacturing facilities. It is a model for future economic reuse activities throughout the DOE Complex. If successful, such projects will provide economic benefits to local communities affected by the termination of traditional DOE activities. The NCPP is in its initial stages and has invited a commercial metal recycling firm, Manufacturing Sciences Corporation (MSC), to develop a reuse plan for a portion of the Rocky Flats site.

A large contingent from the NCPP Steering Committee, including representatives from organized labor, the State of Colorado, the Rocky Flats Local Impacts Initiative, the DOE, and MSC, discussed the economic reuse pilot project with a local activist concerned with the NCPP and an economist who has studied the economics of "conversion." The breakout session agenda was devised by Ken Korkia, from the Rocky Flats Cleanup Commission, and the discussion was facilitated by Ginger Swartz, the Manager of the Rocky Flats Citizens Advisory Board.

The breakout session featured very candid discussions and active audience involvement. Consensus was reached on five statements related to the breakout session topic:

1. Economic reuse does not appear, *a priori,* to be incompatible with environmental restoration but it is too early to say whether the NCPP venture (i.e., metals recycling) is compatible with environmental restoration.

> The group noted that economic reuse activities should be considered "temporary" in nature, even though they may persist for a fairly long period of time (e.g., 20 years). They should be seen as an intermediate stage in the restoration of a site. Therefore, economic reuse activities that jeopardize the eventual restoration of the site should not be selected.

2. "Economic" development should not be assumed to be synonymous with "business" development. A community can benefit economically through the establishment of a new park ("open spaces") as well as through the generation of new business activities.

3. It is important to understand the true costs of business development as well as the benefits.

> When analyzing the "cost-benefit" of economic reuse activities, particular attention must be paid to subsidies from DOE for the reuse facility, for materials to be processed, and for products to be made from those materials.

4. In deciding on a course of action such as economic reuse, there can never be enough public involvement, particularly in the earliest stages of a project.

> Perhaps the major objection to the NCPP voiced at the meeting was that some members of the affected community (i.e., "stakeholders") felt that they were not consulted prior to the selection of metal recycling as the "economic reuse" activity to be tested by the NCPP. When stakeholders feel that a process is not fair, the outcomes of that process are equally felt to be unfair.

5. A community's decision to proceed with economic reuse activities cannot be based solely on intellectual grounds, but must also be based on faith and trust.

> The breakout session provided everyone with an opportunity to not only hear the "facts," but to also feel the emotions and examine the belief systems of the participants. It is possible, one audience member suggested, that agreements between the DOE and stakeholder groups can never be totally grounded in factual data. In that sense, such agreements may never be fully "rational." Both DOE and stakeholder groups will have to bridge the chasm that separates them by building mutual faith and trust.

An additional caveat: the Symposium presented an opportunity for advocates and critics of the NCPP to meet and talk frankly in a relatively informal setting. It was generally acknowledged that such meetings, spared of the formality associated with a hearing or appearance before a regulatory body or committee, was, in itself, very valuable.

National Conversion Pilot Project
Stage I

Decontamination and Repair Report

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17 June 1994

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National Conversion Pilot Project
Stage I

Decontamination and Repair Report

Revision 0
17 June 1994

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1.0 Introduction

An important focus of Stage II will be to determine the disposition of surplus equipment within the four buildings of National Conversion Pilot Project (NCPP). That equipment disposition has five paths:

1. Clean and transfer/sell to controlled market, (other DOE facilities or radioactive licensed companies).
2. Clean and sell in open market.
3. Clean and sell as scrap metal in open market.
4. Clean and recycle into waste containers.
5. Dispose of as waste.

The five paths are listed in order of preferred disposition. To determine the applicability of the second disposition path (clean and sell in the open market), it is important to know the market value of the surplused equipment and to compare this value to the cost of decontaminating.

1.1 Approach

The NCPP Facility Cleanup Plan has estimated the time needed to decontaminate the various pieces of equipment in each building. Manufacturing Sciences Corporation (MSC) has hired the services of a National Used Machine Tool Assessor to establish the market value of 170 machine tools located in buildings 865, 883 and 444/7. Market value relates to demand and machine condition more than age and original price. Converting, the decontamination time from the Facility Cleanup Plan to dollars and subtracting this value from the market value provides a net value.

1.2 Results

This report compares the market value of the machine tools to the costs of decontamination. Table 1 provides a list of equipment that has a net value (market value - cleanup cost) that exceeds the cleanup cost by 25%. Table 2 identifies the equipment with a positive net value but with less than the 25% surplus over the cost of cleanup. Table 3 reports the equipment where the cleanup cost exceeds the market value. The 25% net value factor is an arbitrary number used to account for inaccuracies in cost estimates (decontaminating and market value) and to account for cost of sales (commissions and transportation).

1.3 Recommendation

Equipment listed in Table 3 should be disposed of by path 3, 4 or 5. The specific disposition will be determined during stage 2 with concurrence of DOE.

Equipment listed in Table 1 which has not been transferred by the DOE, should be decontaminated and sold during Stage III as a used machine tool with the profit returned to DOE. This equipment if located in a Radiation Control Area RCA will be decontaminated

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during Stage II, enclosed in plastic and left in place for disposition during Stage III. It is important to note that of the 99 pieces of equipment with a market value that justifies, decontaminating to sell, only 18 pieces of equipment are located in a RCA. Seventeen pieces are located in the RCA of building 444 and one in building 883. None of the machining equipment located in building 865 has a positive net value, due to the increased costs for decontaminating both beryllium and depleted uranium.

Equipment listed in Table 2, where the net value provides less than 25% margin error between market value and cleanup costs should have it's disposition reviewed during Stage II. With practical experience in decontaminating, predicting the cost of decontaminating will become more accurate and the value of selling these marginal return machine tools will be better known.

If the predicted net value of machine tools to be sold is correct, this activity can provide a capital equipment return to DOE of $2,320,063. This value is the sum of the net value in Table 1 and could increase if Table 2 equipment can be sold with an assured return.

Machine tools represent the majority of surplus equipment in buildings 444/7, 883 and 865, and, therefore represents the greatest dollar value of surplus equipment for possible sale. Still there is other surplus equipment within the buildings; such as furnaces, and rolling mills which should have a similar market value estimation. That estimation will be performed sometime during Stage II.

Table-1 Equipment Recommended to be Decontaminated and Sold

Building Number	Item Description	Capital Equipment Number	Estimated Value Dollars	Decontamination Dollars	Net Value Dollars
444	BORE JIG MOORE 3	00013189 00	$50,000	$6,899	$43,101
444	MILLING MACHINE 3-AXIS CIN VCM-150	00013386 00	$12,500	$7,885	$4,615
444	DOALL BAND SAW	00013920 00	$12,500	$5,914	$6,586
444	DRILL RADIAL 36 IN FOSDICK	00018928 00	$7,500	$3,942	$3,558
444	WIRECUT ELOX V EDM	00018972 00	$20,000	$7,885	$12,115
444*	MONARCH LATHE	00019001 00	$15,000	$10,842	$4,158
444	LATHE ENGINE MONARCH 25"	00019029 00	$10,000	$6,899	$3,101
444	BORE JIG MORRE 3-B307	00019053 00	$10,000	$6,899	$3,101
444	HYDROPTIC MACHINE 6A SIP	00019061 00	$35,000	$8,870	$26,130
444	GRINDER THREAD PRECISION EXCELLO	00019062 00	$45,000	$10,842	$34,158
444*	T-BASE LATHE EX-CELLO	00019068 00	$20,000	$11,827	$8,173
444*	T-BASE LATHE EX-CELLO	00019069 00	$20,000	$11,827	$8,173
444	LATHE ENGINE 17X30 L&S	00019079 00	$10,000	$6,899	$3,101
444	MILLING MACHINE VERT. BRGT. BR2J	00019089 00	$17,500	$6,899	$10,601
444	BORE JIG MOORE 3 11X24 TABLE	00019098 00	$35,000	$6,899	$28,101
444	GRINDER SURFACE B&S 1024	00019099 00	$10,000	$4,928	$5,072
444	MILLING MACHINE HOR K&T 525TF	00019102 00	$20,000	$6,899	$13,101
444*	T-BASE LATHE EX-CELLO	00019120 00	$20,000	$11,827	$8,173
444	LATHE PRECISION 10" MONARCH EE	00019147 00	$10,000	$5,914	$4,086
444	LATHE MONARCH 2013TX30	00019148 00	$10,000	$7,885	$2,115
444	GRINDING MACHINE UNIVERSAL B&S	00019152 00	$15,000	$5,914	$9,086
444	GRINDER SURFACE G&L 380	00019158 00	$15,000	$4,928	$10,072
444	BORING MILL PRECISION HORZ DEVILIEG	00019159 00	$30,000	$7,885	$22,115
444	LATHE TOOL ROOM L&S	00019163 00	$12,500	$6,899	$5,601
444	GRINDING MACHINE UNIVERSAL RED	00019184 00	$20,000	$3,942	$16,058
444	MILLING MACHINE CINC. DH 307-14	00019201 00	$8,000	$5,914	$2,086
444	LATHE TOOLMAKER 10"	00019209 00	$10,000	$6,899	$3,101
444*	GRINDER HYD 12X24	00019216 00	$20,000	$5,914	$14,086
444	MILLING MACHINE VERT CINC. 420-16	00019279 00	$17,000	$3,942	$13,058
444	LATHE ENGINE 20" MARTIN DS-60	00019292 00	$12,500	$6,899	$5,601
444	LATHE ENGINE 10" EE-50081	00019305 00	$10,000	$4,928	$5,072
444	MILLING MACHINE VERT. K&T	00019336 00	$7,000	$4,928	$2,072
444*	LATHE TOOLRM 9" HARDINGE HLV-H S	00019363 00	$10,000	$2,957	$7,043
444*	MILL, CINCINNATI	00019366 00	$12,500	$4,928	$7,572
444	MONARCH LATHE	00019372 00	$12,500	$7,885	$4,615
444*	MONARCH LATHE	00019373 00	$12,500	$7,885	$4,615
444*	MONARCH LATHE	00019374 00	$12,500	$7,885	$4,615
444	MILL, CINCINNATI	00019384 00	$15,000	$7,885	$7,115
444	GRINDER SURFACE PREC. TAFT-PIER	00019398 00	$8,000	$3,942	$4,058
444	BORE JIG MOORE 3 B-1543	00019400 00	$10,000	$6,899	$3,101
444	BAND SAW DOALL 3612H	00019403 00	$7,500	$4,928	$2,572
444	GRINDER TOOL OPTICAL PROJECTOR	00019408 00	$10,000	$3,942	$6,058
444	GRINDER PRECISION JIG MOORE 4	00019413 00	$60,000	$7,885	$52,115
444	LATHE TOOLMAKER 10" HARDINGE	00019471 00	$12,500	$5,914	$6,586

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Building Number	Item Description	Equipment Number	Value Dollars	Decontamination Dollars	Net Value Dollars
444	GRINDER CYLINDRICAL 24X36 LANDIS	00019483 00	$45,000	$6,899	$38,101
444	GRIND FORM RELIEF WINSLOWMATIC	00019494 00	$10,000	$1,971	$8,029
444*	LATHE TURRET, 2-AXIS	00019563 00	$25,000	$20,698	$4,302
444	POWER TURN LATHE	00019594 00	$30,000	$5,914	$24,086
444	WHITE-SUNSTRAND OMNIMIL	00019603 00	$30,000	$5,914	$24,086
444	LATHE TOOLROOM 10" MONARCH EE-	00019604 00	$30,000	$5,914	$24,086
444	GRINDER SURFACE MICROMASTER B&S	00019606 00	$10,000	$1,971	$8,029
444	GRINDER CYLINDRICAL UNIV. LANDIS	00019610 00	$45,000	$6,899	$38,101
444	GRINDER, JIG MOORE	00019627 00	$150,000	$10,842	$139,158
444	MILLING MACHINE BRGT VERT RAM II	00019637 00	$20,000	$5,914	$14,086
444	MILLING MACHINE BRGT VERT RAM II	00019638 00	$20,000	$5,914	$14,086
444	MILLING MACHINE KNEE 34" HORT.	00019639 00	$17,500	$4,928	$12,572
444	HARDINGE LATHE	00019662 00	$20,000	$9,856	$10,144
444*	COMPARATOR OPTICAL 14" XL 14S	00019746 00	$10,000	$4,928	$5,072
444	COMPARATOR OPTICAL 14" XL 14S	00019747 00	$10,000	$4,928	$5,072
444	LATHE PRECISION 10" MONARCH EE-	00019763 00	$30,000	$5,914	$24,086
444	LATHE PRECISION 10" MONARCH EE-	00019764 00	$30,000	$5,914	$24,086
444	GRINDING MACHINE PREC UNIVERSAL	00019766 00	$50,000	$6,899	$43,101
444*	LATHE TOOLROOM 20" MONARCH 615	00019767 00	$30,000	$8,870	$21,130
444	LATHE TOOLROOM 20" MONARCH 614	00019768 00	$30,000	$8,870	$21,130
444	MONARCH LATHE	00019769 00	$30,000	$7,885	$22,115
444	LATHE T-BASE COMPUTERIZED	00019836 00	$20,000	$8,870	$11,130
444	GRINDER PREC UNIV 10" KELLENBERGE	00019890 00	$50,000	$7,885	$42,115
444	LATHE PRECISION TOOL 20" MONARCH	00019894 00	$20,000	$6,899	$13,101
444	MACHINE JIG BORING 602	00019948 00	$125,000	$9,856	$115,144
444	GRINDING MACHINEROTARY SURFACE	00019981 00	$125,000	$3,942	$121,058
444*	HARDINGE LATHE	00020058 00	$17,500	$8,870	$8,630
444*	HARDINGE LATHE	00020059 00	$17,500	$8,870	$8,630
444	GRINDER PRECISION TOOLROOM B&S	00020162 00	$10,000	$5,914	$4,086
444	GRINDER PRECISION TOOLROOM B&S	00020163 00	$10,000	$5,914	$4,086
444	GRINDER END MILL HUFFMAN HS-87R	00020166 00	$200,000	$19,712	$180,288
444	TURNING CENTER LEBLOND CHUCKER	00020242 00	$100,000	$11,827	$88,173
444	COMPARATOR OPTICAL 20"	00020265 00	$35,000	$4,928	$30,072
444	COMPARATOR OPTICAL 30"	00020266 00	$17,500	$4,928	$12,572
444	COMPARATOR OPTICAL 14"	00020270 00	$10,000	$4,928	$5,072
444	COMPARATOR OPTICAL 14"	00020271 00	$10,000	$4,928	$5,072
444	MILLING MACHINE BRIDGEPORT	00020286 00	$9,000	$5,914	$3,086
444	MILLING MACHINE BRIDGEPORT	00020287 00	$9,000	$5,914	$3,086
444	GRINDER PRECISION UNIVERSAL 10"	00020316 00	$60,000	$4,928	$55,072
444	WIRECUT EDM -26	00020356 02	$80,000	$7,885	$72,115
444	MILLING MACHINE BRGT S2 STD. VERT.	00020357 00	$30,000	$4,928	$25,072
444	HARDINGE SUPSLANT TURRET 3-AXIS	00020358 00	$20,000	$3,942	$16,058
444	ALANTIC SHEAR (DK GREEN)	00020429 00	$15,000	$3,942	$11,058
444	MILLING MACHINE RAM STYLE	00020517 00	$9,000	$4,928	$4,072
444	MILLING MACHINE RAM STYLE	00020518 00	$9,000	$4,928	$4,072
444	LATHE HEAVY DUTY 20 SERIES 614	00020634 00	$40,000	$7,885	$32,115
444	LATHE ENGINE HORT. MOMOSET 16X54	00031150 00	$10,000	$3,942	$6,058
444*	T-BASE LATHE EX-CELLO	00034063 00	$20,000	$11,827	$8,173

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Building Number	Item Description	Capital Equipment Number	Estimated Value Dollars	Decontamination Dollars	Net Value Dollars
444*	T-BASE LATHE EX-CELLO	00034066 00	$20,000	$11,827	$8,173
444	MILLING MACHINE KNEE 34" HORT.	00038439 00	$8,000	$5,914	$2,086
444	CINCINNATI MILL	00038529 00	$60,000	$8,870	$51,130
444	T-BASE LATHE EX-CELLO	00038576 00	$20,000	$11,827	$8,173
883*	Giddings & Lewis Turning Lathe	00043902 00	$400,000	$104,474	$295,526
444	GRINDER SURFACE ROTARY	00088245 00	$90,000	$4,928	$85,072
		TOTAL	$3,111,500	$791,437	$2,320,063

* Located within the Radiological Controlled Area (RCA).

Table-2 Equipment Awaiting Dispositon and Decision

Building Number	Item Description	Capital Equipment Number	Estimated Value Dollars	Decontaminatio n Dollars	Net Value Dollars
444	LATHE SMALL MONARCH	00018934 00	$7,000	$6,899	$101
444	DRILL RADIAL 36 " CARTLON	00019009 00	$8,500	$7,885	$615
444	OPTICAL COMP. BAUSCH & LOMB	00019187 00	$7,500	$6,899	$601
444	GRINDER SURFACE PRECISION	00019217 00	$5,500	$4,928	$572
444	MILLING MACHINE NEW GROTON 1-22	00019275 00	$7,500	$6,899	$601
444	MILLING MACHINE VERT CINC. 420-16	00019279 00	$17,000	$3,942	$13,058
444	ELECT DISCHARGE MACH CHARMILLES	00019331 00	$7,500	$6,899	$601
444	MONARCH LATHE	00019367 00	$12,500	$10,842	$1,658
444	MONARCH LATHE	00019368 00	$12,500	$10,842	$1,658
444	MONARCH LATHE	00019369 00	$12,500	$10,842	$1,658
444	MONARCH LATHE	00019370 00	$12,500	$10,842	$1,658
444	MILLING MACHINE 12X24 BRGT BR2J	00019380 00	$5,000	$4,928	$72
444	SIP MILL	00019389 00	$10,000	$8,870	$1,130
444	GRINDER SURFACE PREC. GALLMEYER	00019393 00	$2,000	$1,971	$29
444	MILLING MACHINE HORT. K&T	00019396 00	$10,000	$8,870	$1,130
444	MILLING MACHINE HORT. K&T	00019489 00	$10,000	$8,870	$1,130
444	DRILL MACHIUNE TURRET	00019516 00	$10,000	$8,870	$1,130
444	MONARCH LATHE	00038539 00	$9,000	$7,885	$1,115
444	HARDINGE LATHE	00040405 00	$15,000	$13,798	$1,202
		TOTAL	$181,500	$151,782	$29,718

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Table - 3 Equipment to be Scrapped

Building Number	Item Description	Capital Equipment Number	Estimated Value Dollars	Decontamination Dollars	Net Value Dollars
444	DOALL GRINDER	00013170 00	$7,500	$10,842	$0
444	AMERICAN TURRET LATHE	00013392 00	$10,000	$15,770	$0
865	Be lathe B	00018936 00	$6,000	$28,582	$0
444	MONARCH LATHE	00018937 00	$6,000	$8,870	$0
444	MONARCH LATHE	00018992 00	$8,000	$10,842	$0
444	MONARCH LATHE	00018993 00	$8,000	$10,842	$0
865	Lathe A	00018994 00	$8,000	$39,424	$0
444	PRATT-WHITNEY DRILL	00018995 00	$5,000	$19,712	$0
444	LEBLOND 16" HEAVY DUTY LATHE	00019004 00	$6,000	$15,770	$0
865	Lathe B	00019005 00	$6,000	$38,438	$0
444	SHAPER	00019010 00	$750	$5,914	$0
444	LEBLOND 12X12 MARK II LATHE	00019011 00	$10,000	$17,741	$0
444	DOALL SAW	00019024 00	$4,000	$4,928	$0
444	MILLING MACHINE K-T B 76800	00019025 00	$2,000	$6,899	$0
444	MILLING MACHINE HARDINGE	00019031 00	$2,000	$4,928	$0
865	Fenn 5F swager	00019038 00	$8,000	$35,482	$0
444	BAND SAW DOALL 2612-1	00019126 00	$4,000	$4,928	$0
444	LATHE PREC. CHUCKING SHELDON CM	00019173 00	$1,000	$5,914	$0
865	Bridgeport (46)	00019182 00	$5,500	$28,582	$0
444	MILLING MACHINE, BRIDGEPORT	00019213 00	$4,500	$8,870	$0
444	LATHE HARDINGE HS12-933-C	00019226 00	$1,000	$5,914	$0
444	HARDINGE LATHE	00019238 00	$8,000	$8,870	$0
865	Hardinge E	00019261 00	$10,000	$28,582	$0
865	Bridgeport (47)	00019273 00	$5,000	$29,568	$0
444	MILLING MACHINE, BRIDGEPORT	00019290 00	$4,500	$8,870	$0
444	DRILL PRESS ALZMETALL AB4 NST	00019293 00	$2,500	$4,928	$0
444	MILLING MACHINE BRGT BRJ 12BR	00019304 00	$5,500	$6,899	$0
444	MILLING MACHINE HORT. VERT. VHF3	00019329 00	$3,000	$4,928	$0
444	MILLING MACHINE, BRIDGEPORT	00019394 00	$5,000	$8,870	$0
444	DELTA ROCKWELL DRILL PRESS	00019429 00	$5,500	$5,914	$0
444	MILLING MACHINE KNEE 36" HORT.	00019481 00	$1,000	$5,914	$0
444	LATHE TOOLROOM 10" MONARCH EE	00019533 00	$20,000	$27,597	$0
444	5-AXIS MILL EXCELLO WORK CENTER	00019552 00	$20,000	$27,597	$0
444	LEBLOND 12X12 MARK II LATHE	00019598 00	$15,000	$20,698	$0
444	LEBLOND 12X12 MARK II LATHE	00019616 00	$15,000	$20,698	$0
444	AMERICAN TURRET LATHE	00019621 00	$10,000	$15,770	$0
444	5-AXIS MILL EXCELLO WORK CENTER	00019719 00	$20,000	$27,597	$0
444	DRILL PRESS TREE MODEL 2UVR	00020054 00	$5,000	$5,914	$0
444	MILLING MACHINE VER DOALL 200V	00020720 00	$500	$4,928	$0
444	LATHE REGAL LEBLOND MAKINO	00020721 00	$1,000	$4,928	$0
865	Hardinge D	00038153 00	$10,000	$28,582	$0
865	Forging Press	00038160 00	$60,000	$94,820	$0

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Building Number	Item Description	Capital Equipment Number	Estimated Value Dollars	Decontamination Dollars	Net Value Dollars
865	Fenn 8F swager	00038180 00	$10,000	$33,510	$0
865	Bridgeport (48)	00038196 00	$6,000	$26,611	$0
865	Bridgeport Series II	00038260 00	$20,000	$29,568	$0
865	Leblonde A	00038261 00	$10,000	$28,582	$0
865	Hardinge B	00038368 00	$2,000	$29,568	$0
444	MONARCH LATHE	00038542 00	$10,000	$10,842	$0
865	Bridgeport mill	00038664 00	$4,000	$28,582	$0
444	MONARCH LATHE	00038854 00	$12,500	$12,813	$0
865	Hardinge C	00043904 00	$17,500	$28,582	$0

National Conversion Pilot Project
Stage I

Manufacturing Process Report

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By B. W. Hoffman u/NU
Date 12-6-94

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National Conversion Pilot Project
Stage I

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Approved by:	DR Floyd D.R. Floyd, MSC PM	6/16/94 Date
Approved by:	D. Elaine Nix ~~M.E. Anderson, DOE~~-COR D. Elaine Nix	7/29/94 Date

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1.0 Introduction

In Stage III of National Conversion Pilot Project (NCPP) the primary focus will be the production of waste containers utilizing contaminated metals as the feed stock. To establish the procedure for this production of waste containers it will be necessary to perform experiments at the Manufacturing Science Corporation (MSC) plant in Oak Ridge, Tennessee, to solicit engineering experience from within and outside the company and to listen to the needs of the customer.

This report outlines the production process for fabricating the B25, 100 cubic foot waste container. With this production outline and the explanation of the process for this one product line, the intent is to provide an example of how the equipment and buildings will be used for commercialization.

The NCPP Preliminary Cost/Benefit Analysis Report dated 6 June 1994 provides many manufacturing scenarios for Stage III. Waste containers identified in that report include:

1. Plutonium waste containers (one pound coffee can size)
2. Plutonium metal containers (12 inch diameter by 12 inch long)
3. 30 gallon stainless steel drums
4. Vitrified high level waste (HLW) containers (18 inch diameter by 54 inch long)
5. Low level waste (LLW) containers of stainless steel and mild steel (3 ft high X 4 1/2 ft wide and 7 1/2 ft deep)
6. Multipurpose canisters (depleted uranium 48 inch diameter by 2 inch thick)
7. Legal weight truck shipping casks of depleted uranium.

This report describes the process for fabricating only the LLW containers of stainless steel and mild steel (3 x 4 1/2 x 7 1/2 feet). The other container manufacturing process will differ in material and utilization of equipment such as forming presses and machining lathes.

2.0 B25 Waste Box Design

By participating in workshops on LLW Container Standardization with DOE waste generators and the waste site operators, input has been gathered about the desires for the standard "B25" waste box. Those comments are:

1. The container should fit within a standard enclosed truck trailer (7 ft 9 in, wide, 8 ft 7 in high x 25 - 48 ft long). Because these trailers are in high demand, the trucking firm can get return loads which reduce transportation costs.
2. The maximum weight for the waste containers are 9,000 pounds. This figure prevents overloading the offramp at the Nevada Test Site waste disposal area. The forktrucks weight 20,000 pounds and the ramp is rated for 30,000 pounds.
3. The container should be designed to avoid air space voids created by fork truck ways, outside flange, etc.
4. There is now a concern about storage and shipment of empty containers. This concern is generated because with radioactive contaminated waste containers, the storage area

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must be controlled, so space will be more costly than outside pads. Also, the manufacturer of waste containers will no longer be close to the generation site so the empty waste containers must be shipped.

5. To improve the packing density of the containers it may be better to lower the sides of the container to give better visual access to the loader. At 4 feet depth the person loading the box can not see where the waste lands.
6. If the depth of the container was reduced to 3 feet, then three of the four DOE facility rolling mills can roll the 36 width, eliminating some welds for the container.
7. The stacking height limitation for Nevada and Idaho LLW sites are 24 and 20 feet, respectively. These allowable heights allow Nevada to stack six boxes high and Idaho five boxes high. With Idaho's maximum box weight at 12,000 pounds and waste boxes at 4 x 8 feet, the structural load requirements are 1875 pounds/ ft^2. With Nevada's maximum box weight of 9,000 pounds the 4 x 6 foot box structural load requirements are 2250 pounds/ft^2.

Based on the these seven guidelines for waste containers, the waste box shown in Figure 1 was designed. This waste box has a taper which allows stacking five high for shipment of empty boxes. That limitation relates to common 4000 pound fork trucks used to load the trucks, five lidless waste containers of 0.140 inch thickness will weigh 3500 pounds. Nine stacks of five boxes each, will weigh 31,500 pounds for the boxes and 9,000 pound for the 45 lids. This provides a total net weight of 41,100 pounds for the standard 45 foot trailer..

Because the 2 1/2 inch high fork truck ways are located in the box bottom, stacked boxes will not stick. The increase in height of 2 1/2 inches will occur with each stacked box. A stack of 10 boxes weighing 7000 pounds would be less than six feet high. The tapered feature offers a big savings for inside storage space with little loss in void space during burial.

The box dimensions of 3 x 4 1/2 x 7 1/2 feet provide the basic 100 cubic foot inside volume.

3.0 B25 Container Production

In the production of the 100 cubic foot waste box it will be necessary to identify feedstock and downsize the stock for melting, melt and cast ingots, roll, form and weld containers. A flow diagram (Figure 2) provides a one page summary of the production flow.

3.1 Segregating Feedstock

Incoming scrap must be segregated by alloy, with particular attention to carbon content (high carbon steels lack ductility). To accomplish this, portable carbon analysis will be employed. Also due to the Vacuum Induction Melting process, it may be necessary to remove much of the paint and other volatiles before melting. In standard scrap melting operations, contaminates such as paint are removed in the melt by a flux (eleven pounds of

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lime per 1000 pounds of scrap). The concern is that either the flux or volatile will contaminate the furnace vacuum system. Segregating the feedstock by alloy will allow making mixed loads for the furnaces and utilize the maximum amount of scrap metal.

Figure 1

B25 LLW Container

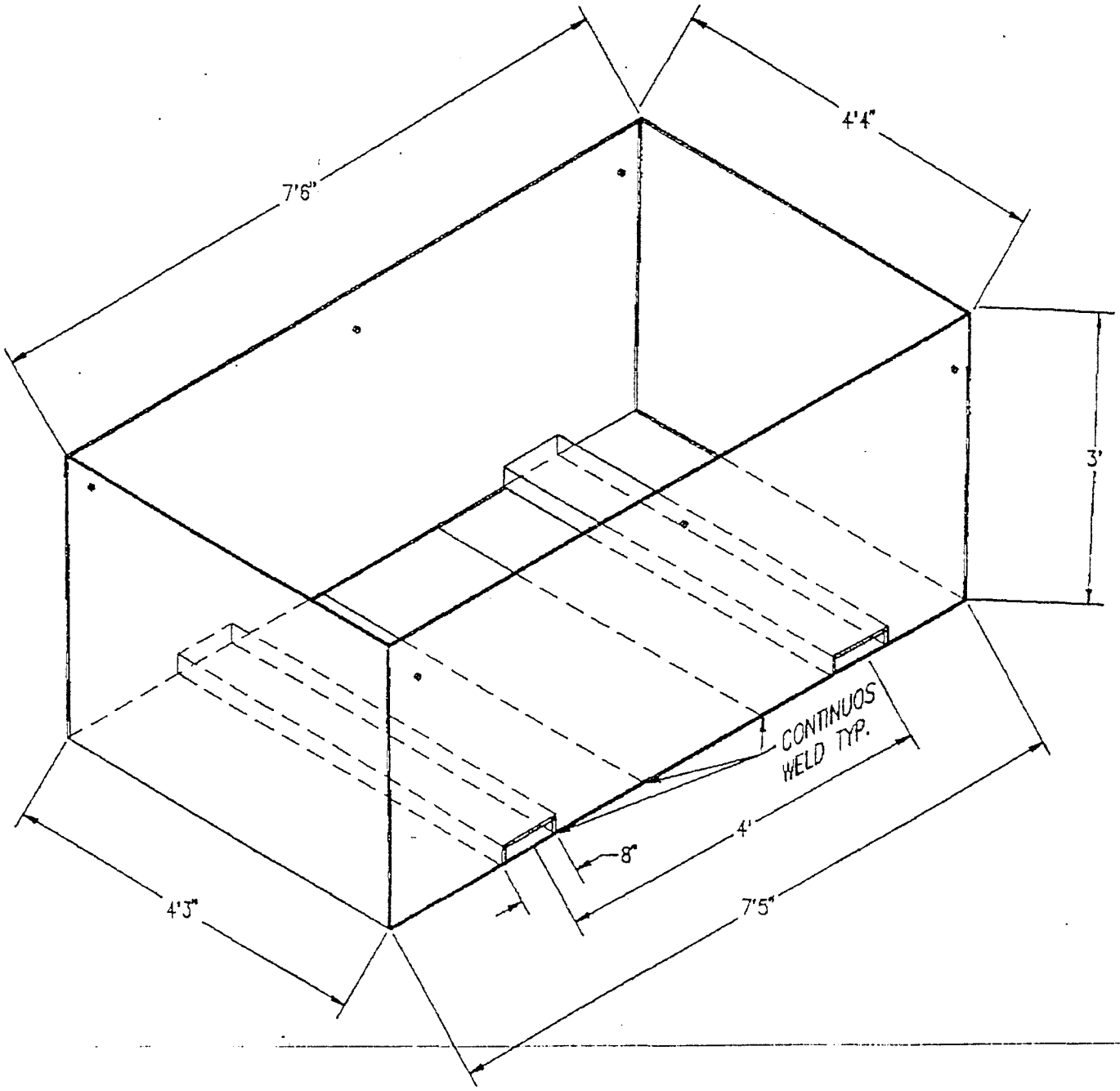

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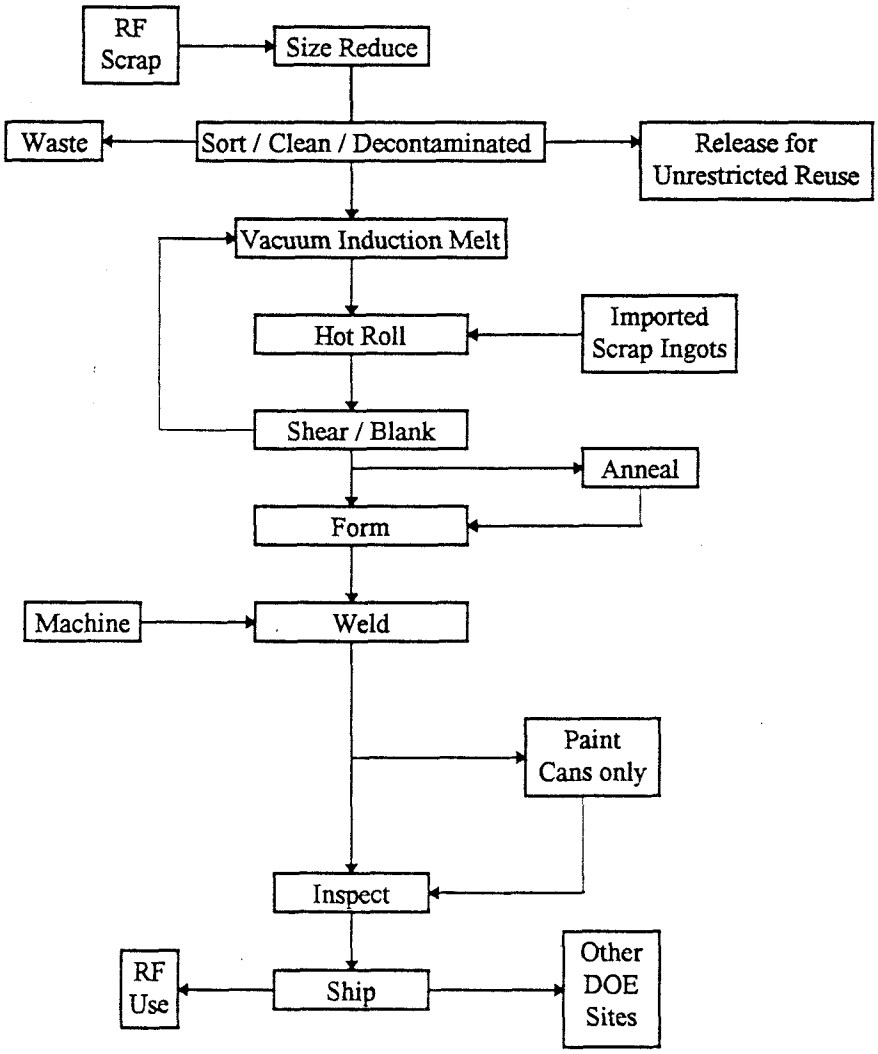
Figure 2



Flow diagram anticipated by MSC for RSM recycling at RF under Stage III of the NCPP.

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3.2 Size Reduction

The scrap must be size reduced to fit the crucible and improve the density of the charge. The charge must meet a 25% density level. The molten volume required for the ingot cast fills a 33 inch inside diameter crucible to an 8 inch depth. A 25% dense 1,750 pound charge would fill the 33 inch inside diameter crucible to a 32 inch height.

Size reducing will be accomplished by plasma torch cutting of thick sections, shearing sections thinner than 5/8 inch and shreddings metal of 1/8 inch thickness or less. If the packing density does not allow for 1750 pound charge, then the charge will be placed in the Vacuum Induction Melting (VIM) furnaces that have been modified to add a hopper feed which will allow feed to be added after the charge becomes molten.

3.3 Melting Process.

Five VIM furnaces in the Building 444 foundry will be used to melt the radioactively contaminated steel. These furnaces have a 42 inch inside diameter by 47 inch long induction coil and are powered by 1000 hertz, 250 kW power supplies.

Induction melting experts recommend the frequency to be lowered to approximately 200 hertz for better power coupling with the metal charge. With the improved coupling, the 250 kW power supplies will melt 1500 pounds of steel in two hours. Currently the plans are to use a coated graphite crucible and to have a melt cycle of sixteen hours; two hours to load and draw the vacuum on the furnace, three hours to melt and pour, ten hours to cool the furnace and one hour to unload the ingots.

The charge will be 1750 pounds of scrap which will produce three ingots 3 x 22 x 31 inch. The ingots will be plasma cut to 27 inch length to remove the four inch deep pipe. This crop operation, where 13% of the ingot becomes recycle feed (4 divided by 31 = .13), may ultimately justify a small continuous caster to save kilowatts of energy for melting and cropping. A small continuous caster will generate 7.5 tons per hour minimum of ingot. The existing VIM furnaces could be modified to generate the molten metal for the continuous caster.

3.4 Top Cropping

Cast ingots for rolling should be top cropped to remove the solidification void. This should be done while the ingot is still hot to reduce the heat input of the plasma cutting torch. The top crops will be identified with the ingots and used for chemical analysis. This identity will be maintained throughout the process to provide the quality data for the product and to segregate the scrap for recycle.

3.5 Preheating for Rolling

The five VIM furnaces will cast 22.5 ingots per 24 hours, so this number of ingots must be preheated and rolled on one shift. The general guideline for preheating is one hour for every

MM

inch of ingot thickness, so the three inch thick ingots will require preheating for three hours. There will be three resistant furnaces available for preheating. Each furnace located near the rolling mill holds four to five ingots. Two of these furnaces have roll tables that will carry the preheated ingot to the rolling mill. These furnaces will be set at the rolling temperature, 2100°F. The third furnace will preheat at 1600°F. The furnaces will be loaded with ingots three hours before rolling. Rolling at a rate of one ingot every fifteen minutes, the morning load at ten ingots in the 2100°F furnaces will require 2 hours 30 minutes to roll. The 1600°F ingots will replace the 2100° F. These four ingots will require an additional one hour to roll which provide 3 1/2 hours to preheat the remaining ingots to make the 22-23 ingot rolling production.

3.6 Rolling

The five VIM furnaces operating 24 hours per day will cast 1 1/2 times in the 24 hour day due to the sixteen hour recycle time. Each furnace will produce three ingots (3 x 22 x 31 inch) per casting, so five VIM furnaces will produce 22.5 ingots in 24 hours (3 ingots x 5 furnaces x 24 hour day / 16 hour cycle = 22.5 ingots) rolling at rate of one ingot every fifteen minutes, 22.5 ingots will require 5.6 hours of rolling time. This time is a appropriate for an eight hour shift allowing for work breaks and unexpected delays. Actual rolling time for the ingots will be approximately five minutes. Using nine rolling passes to reduce the ingot from three inch to 0.140 inch. The aggressive pass schedule is necessary to maintain heat in the steel ingot. With the extra time allowed for rolling, fifteen minutes verses actual five minutes, the rolling mill operators will be loading ingots into the preheat furnace and shearing the sheet to length.

Rolling the 3 x 22 x 27 inch ingot to 0.140 thickness x 38 inch width provides a strip 27.9 feet long. This fits the thirty foot long rolling table nicely and matches the length requirement for a waste box. A 3 x 4 1/2 x 7 1/2 foot waste box requires 51 feet of 36 inch wide sheet. Two ingots will provide 2 x 27.9 = 55.8 feet sheet.

3.7 Shearing

The rolled sheet should be rough sheared to lengths of one 7.75 foot sheet and four five foot sheets. This shearing is to approximately the sizes of sheet needed for the 100 cubic foot box and to facilitate handling for annealing and leveling.

3.8 Annealing

Prior to leveling the rough sheared sheet may require an anneal. This will depend on the chemical composition of the steel and the temperature on the last rolling pass. If the anneal is required this will present a bottleneck in the process because the furnaces required for the ingot preheat prior to rolling will be required for the anneal. The anneal temperature is 1600°F for 1/2 hour followed by a slow cool. If the slow cool can be accomplished outside the furnace, it could be possible to anneal the sheets rolled during the day on an evening shift, using the single furnace set at the 1600°F temperature. With a sheet rack it would

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require five furnace loads of sheet with each load containing sheet from four to five rolled ingots. The cycle time of the load must be less than 2 1/2 hours.

If the annealing process slows production, the ultimate solution is to use the sheet as the resistor and resistant anneal under a controlled atmosphere.

3.9 Leveling

The sheet will be wavy from either the rolling or annealing processes and will require leveling. A two high roller leveler exists in building 883 that works well on 0.160 to 0.250 inch thick sheet. The leveler needs to be tested on thinner 0.140 inch 36 inch wide sheet. There is a surplus four high roller leveler located at the Idaho waste site, so early in Stage II, the capability the roller leveler needs to be established. The roller leveler production rate must match the rolling rate which produces five sheets every fifteen minutes. The roller leveler should level a sheet every minute so there is no bottleneck in this process.

3.10 Final Shearing

The final shearing step will cut the sheet to the required dimensions for the box. That bill of material is:

Box lid	two pieces	36 inch x 57 inch
	one piece	22 inch x 57 inch
Box sides	two pieces	36 inch x 90 inch
Box ends	two pieces	36 inch x 53 inch
	two pieces	36 inch x 53 inch
Box bottom	one piece	27 inch x 53 inch
Box channel	two piece	13 inch x 53 inch
Box weld strips	four pieces	2 1/2 x 53 inch

3.11 Sheet Cleaning

The sheet cleaning process is unknown at this time. The heating of the steel will create oxide during the melting, rolling and annealing processes. The current plan is to remove the loose oxide with the surplus wire scratch brush system located in building 883. If the remaining oxide will allow paint to adhere then the cleaning process has been accomplished. If remaining oxide does not adhere, then more aggressive cleaning will be necessary. This cleaning may involve a belt sander unit or acid cleaning. The acid cleaning process will be a last resort because of the process waste generation.

3.12 Punching

A punching process will cut the corners of the box lid prior to press braking, forklift tines slots, and put the holes in the box for the vent filter and the lifting holes.

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3.13 Press Braking

The press brake will bend the lips on the box lid and form the channel for the fork lift times. That channel includes the depression on the box bottom and the channel that adds additional support to the box bottom.

3.14 Welding

Welding experiments have been performed at Manufacturing Science Corporation in Oak Ridge, Tennessee. The concern has been in warping the level sheet with the shrinkage stress of welding. The warping becomes more visible with thin sheet. Several stiffner designs were formed into 0.105 inch thick sheet and six foot seam welds made. Figure 3 shows the designs tried. Every stiffner design eliminated visible warping. It is thought the warping is there but captured within the brake press V or filler strip and not seen. Designs that kept both sheets on the same plane (#3 and #4) were preferred. However, each brake press's fold design has the same deficiencies; they present welding problems at the box corners and sealing problems between the lid and box body. The box design of Figure 1 assumes the warpage problem to be conquered by the thicker sheet. That assumption needs to be verified.

All welding will be performed with metal filler electrodes. This method helps reduce warpage by adding metal to the weld which reduces shrinkage. The B25 box design in Figure 1 requires 660 inches (55 feet) of welds. Half of this weld length can be made with an automatic welder. These welds are for the lid and bottom of the box. The welding that joins the sides to the bottom of the box will be done manually. At a weld rate of five inches per minute, there are two hours fifteen minutes of welding time per box. Since a box is rolled very thirty minutes it will require five welders to keep up with the rolling rate.

Much of the welding is done manually, so to reduce weld operator fatigue, special welding helmets will be used. These weld helmets will use glass that changes color with the strike of arc and be fitted with a supply of filtered air. The filter air will protect the weld operator from the weld fumes and also offer increased comfort with the cooling effect.

3.15 Painting

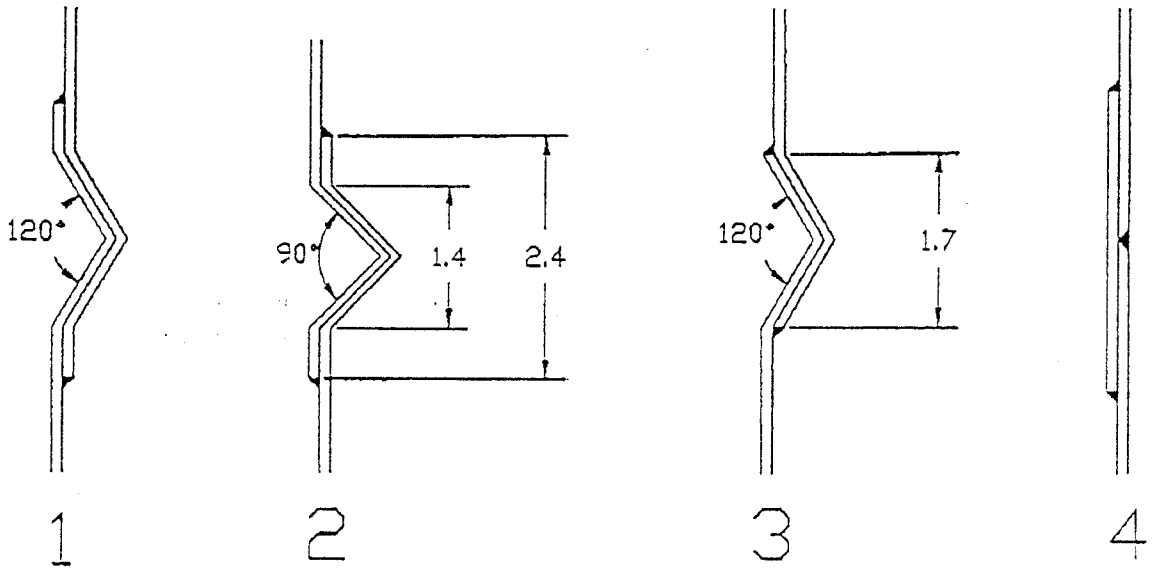
After satisfactory weld inspection, the box will be painted. This painting will be accomplished with a unit that needs to be purchased at the beginning of Stage III. The process is intended to be an electrostatic deposited painting booth so that solvents are minimized.

4.0 Production Summary

In any recycle operation a very important step is the segregation of scrap to maintain product chemistry. Once this system has been established, the five VIM furnaces should be able to cast 22 ingots every 24 hours. At this point of planning the casting furnaces determine the rate of production. The rate of casting can be increased by capital

Figure 3

Weld Joint Stiffner Design
(Weld Distortion Experiment)



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improvements such as forced cooling and hopper feeding. With increased casting capabilities the next production limits will be preheating/annealing capacity before the rolling mill. The current preheating/annealing capacity is limited to approximately 28 ingots per day. Improvements in preheating capacity involve maintaining heat from the casting processes and/or installing an induction heating system.

The present planned production rate is eleven boxes per day. Working five days per week, total production is 2750 boxes per year. This number of boxes matches the current burial rate at the Nevada Test Site of 2500 B25 boxes per year. As the decommissioning rate of DOE site increases and including other burial sites such as Savanna River, Hanford and Idaho it is obvious there is a much greater need for boxes. By eliminating the preheating shortcoming in building 883; a seven day, three shift operation in this facility could produce 11,550 boxes per year. This maximum production rate during Stage II would require importing rolling ingot from other facilities.

One early concern about the production of waste containers at one facility was the cost of transporting empty boxes to the waste sites. The efficiencies of that cost have greatly improved with the tapered waste containers design. By stacking waste containers, trucks can be loaded to the full weight capacity and the space for storage at the waste site is minimized.

5.0 Building Layout For Production, Stage III

Building 883 will be the primary production building used for making the waste containers. To give the building improved production flow, it will be necessary to remove some equipment and to move other equipment. The proposed preliminary layout for this building is attached as Figure 4.

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National Conversion Pilot Project
Stage I

NCPP Management Plan

Revision 1
28 June 1994

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By K. N. Hoffman U/NU
Date 12-6-94

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National Conversion Pilot Project
Stage I

NCPP Management Plan

Revision 1
28 June 1994

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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
0	27 May 94	All	All	First Approved Issue	
1	28 June 94	All	All	Incorporation of DOE comments	DR Floyd

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1.0 Introduction

In April 1994 a Cooperative Assistance Agreement between the Department of Energy Rocky Flats Office and Manufacturing Sciences Corporation was signed, authorizing work to begin on the National Conversion Pilot Project (NCPP). The NCPP is designed to explore the feasibility of utilizing former defense facilities to recycle DOE metals, reuse facilities, and hire displaced Rocky Flats Plant workers.

The NCPP is divided into three stages. Stage I consists primarily of determining present conditions of the facilities and equipment involved, and planning the work to be performed in Stage II. For this reason it is sometimes referred to as the "characterization and planning" stage. The principal activity of Stage II involves cleaning the facilities and equipment to levels acceptable for use in Stage III. Thus it is sometimes referred to as the "cleanup" stage. The term "cleanup" is not intended to exclude important declassification and process development activities that must also be performed in Stage II. In Stage III, metal recycling operations will be performed.

This NCPP Management Plan describes how the work in Stage II (cleanup) will be managed. This will involve the following activities:

- Setting Stage II technical objectives and goals;
- Defining tasks and responsibilities;
- Providing a basis for directing, measuring, and controlling progress; and
- Plotting the path to achieving the Stage II objectives and goals.

The Management Plan is divided into several sections. These sections, and a brief description of the information in them, are as follows:

Mission / Objectives / Goals - For the NCPP to realize the goals set by MSC, the DOE, and Stakeholders, specific objectives must be clearly defined, and methods developed to implement the mission. This section of the Management Plan reiterates the desired results for the NCPP as a whole and for Stage II in particular.

Organization - This section identifies the groups associated with the NCPP and discusses their functions.

Work Definition - The methods that will be used to clean the facilities, and the controls that will be applied to ensure the effective cleanup and operation of the facilities and equipment, as well as the safety of workers will be presented. Additionally, administrative and engineered controls will be utilized within Stage II to ensure that the building and site safety envelope will not be challenged by any Stage II activity, thus ensuring the safety of the facilities, environment, and public. This section discusses how the work will be divided in Stage II, the method that will be used to identify and comply with applicable requirements, the controls (including change controls) that will be imposed to ensure that work progresses according to schedule, and the steps that will be taken to resolve

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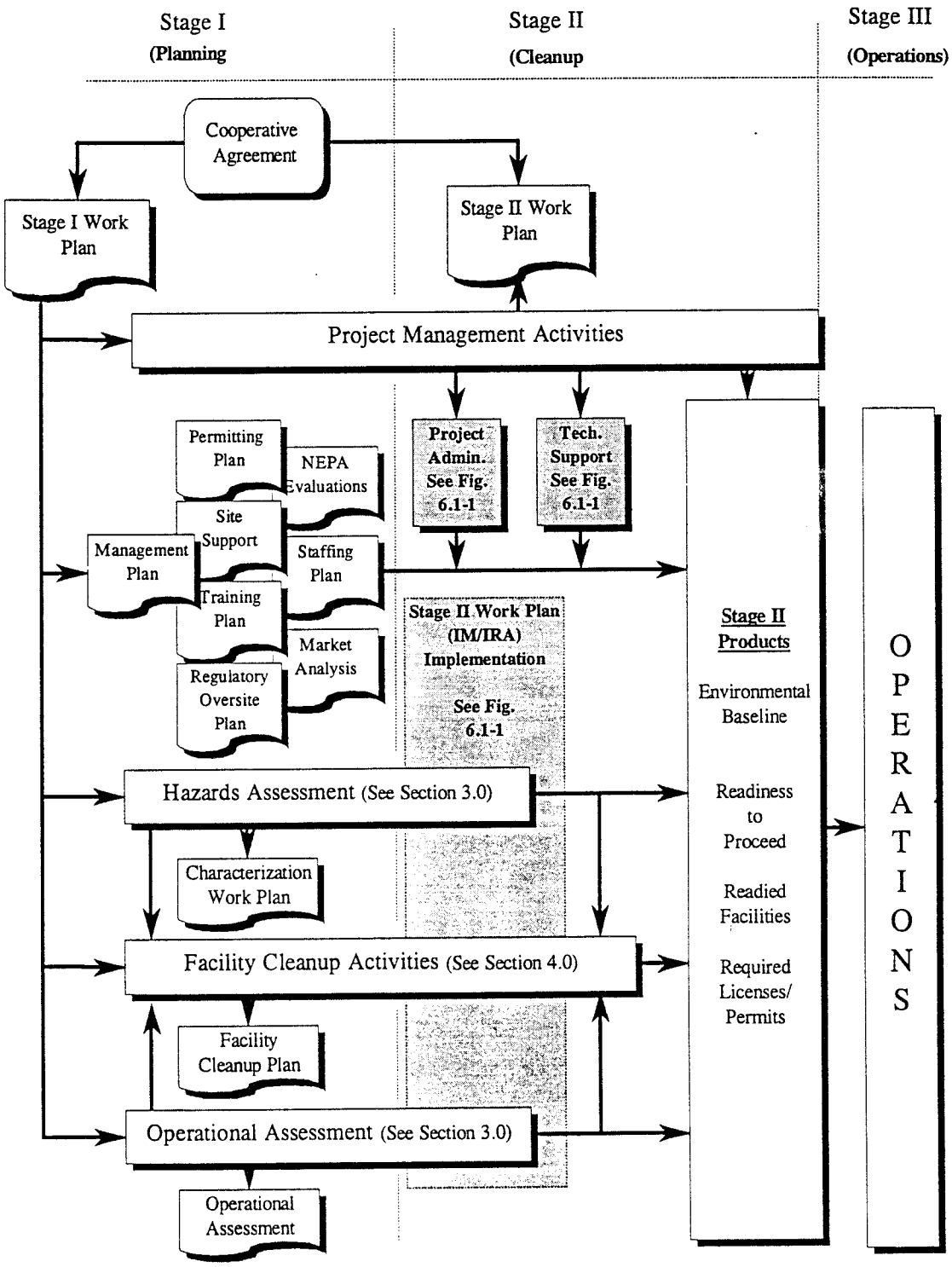
uncertainties and proceed with the cleanup of the facilities and equipment and other Stage II tasks.

Reporting Requirements - A number of reports will be required to demonstrate that control is being maintained over the cost, schedule, regulatory compliance, and progress of the project. Some of these reports are regulatory requirements, and some are management controls applied by MSC to ensure that all parties concerned are kept apprised of the work progress. These reporting requirements are discussed in this section.

Compliance Verification - To ensure the regulators and the public that work is being done correctly, and to meet the standards that MSC sets for its work, compliance with requirements is verified as work progresses. This section describes the process that will be followed to ensure and document that the work being performed meets the applicable requirements.

This Management Plan serves as a "roadmap" to direct the reader to the work effort and associated documents. Additionally, the Management Plan describes how the various work efforts will be coordinated to achieve the Stage II objectives/ goals. By developing this plan, obtaining agreement from all concerned parties, and conducting work according to this plan, the result will be an efficient and effective method to achieve the Stage II objectives and goals. The Stage II work efforts and their interrelationships are depicted in Figure 1.0-1. Each of the five primary efforts is described below.

Figure 1.0-1
Relative Work Progression



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Stage II of the NCPP has four main areas of technical work: the Hazards Assessment, the Facility Cleanup Plan, the Operational Assessment and the Permitting Strategy. Since each of these technical areas is dependent on information gained in another area, their coordination will require considerable effort. The NCPP Management Plan describes the interrelationships of these areas, and contains the basis for managing the NCPP during Stage II. The technical details in each of the four technical areas mentioned above is contained in the associated reports that are a part of the Interim Measure / Interim Remedial Action (IM/IRA), while the NCPP Management Plan addresses how these different pieces of work will be accomplished in order to meet the overall NCPP goals and objectives.

2.0 Mission / Objectives / Goals

The mission of the National Conversion Pilot Project is to "explore and demonstrate at the Rocky Flats site the feasibility of economic conversion at Department of Energy Facilities." As stated above, the NCPP is divided into three stages. This Management Plan applies to Stage II, the cleanup activities. The objective/goal of Stage II is to demonstrate that a former defense production facility can be converted to commercial manufacturing use.

This conversion will consist of determining the current levels of contamination; defining, in conjunction with regulators, the appropriate levels of cleanliness required; achieving the agreed-upon levels of cleanliness; and documenting the process used as well as the results. It also will consist of removing classified metal products and demonstrating that the equipment can be used to perform recycle operations.

In order to achieve these objectives/ goals, the buildings that are associated with the NCPP will need to be maintained. The maintenance of the buildings and the responsibilities of each party are discussed in the NCPP Site Support Services Memorandum of Agreement.

3.0 Organization

The NCPP is the first endeavor of its kind in the DOE complex. It is a cooperative effort between the companies with the technical expertise, the owners and operators of the facility, the federal and state entities that have regulatory oversight, and the public, represented by a number of interest groups. This arrangement is intentional, since the sought-after result is a conversion of the facilities for use by a commercial concern, in a commercial business environment.

Principal participants include officials from the DOE, as proprietor of the Rocky Flats Plant; MSC and its subcontractor BNFL Inc., as project operators; EG&G Rocky Flats, Inc., as the management and operating contractor; Wackenhut Services, Inc., as the site security management and operating contractor; the Environmental Protection Agency (EPA); the Colorado Department of Health (CDH); the Governor's Office of Economic Development; the Rocky Flats Local Impacts Initiative; the Citizens Advisory Board; and other Stakeholders.

The project organization is made up of committees rather than the traditional organization of individuals heading up specific functions. Each committee serves a different purpose in the

decision-making process. An organization chart and brief explanation of the function of these committees follows:

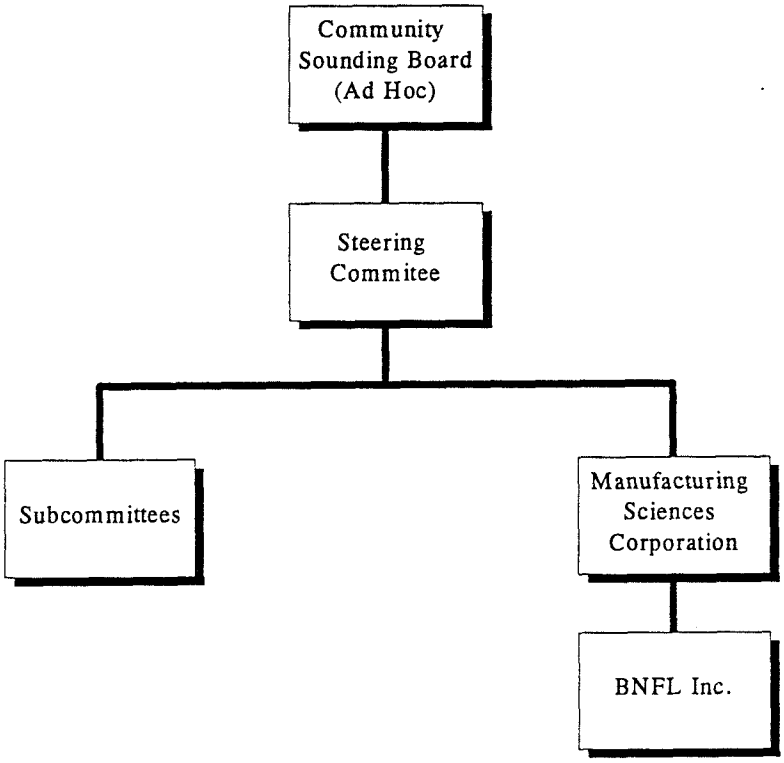
Community Sounding Board - This Board is made up of twelve organizations; their function is to review what the Steering Committee determines to be the direction of the Project and to pass down their observations in the way of advice and suggestions, but the Steering Committee is the decision making body.

Steering Committee - This Committee is made up of the seven organizations most significantly impacted by the NCPP. These are: the Department of Energy; EG&G Rocky Flats, Inc; the Colorado Department of Health; the Environmental Protection Agency; Manufacturing Sciences Corporation; the Colorado Governor's Office of Business Development and the Rocky Flats Local Impacts Initiative. An organization represented on the Steering Committee may not also be represented on the Community Sounding Board. The function of the Steering Committee is to identify issues and resolve them at the committee level or pass them down to a subcommittee for additional information and input. It also provides guidance and oversight to the NCPP Contractor, MSC.

Subcommittees - These are groups comprised of specialists from the various organizations represented on the Sounding Board and Steering committee. The subcommittees titles are: Waste Management; Environmental Restoration; Business Planning; Support Services, Health & Safety; Public Outreach; and Human Resources. Their function is to address issues that fall into categories designed to cover all of the Project issues. When issues require a final decision, the subcommittee will recommend a resolution and send it back to the Steering Committee for a final decision.

NCPP Stage II

Organizational Structure



4.0 Work Definition

The work on the National Conversion Pilot Project will involve three of the buildings on the Rocky Flats site. For reporting purposes, each building will be treated as a separate unit. Plans, work activities, and results will be documented on a building-specific basis.

While the planning, work, and documentation will be building specific, the controls over the work will be the same for all three buildings. Work activities during Stage II will be performed and coordinated in accordance with the Facility Cleanup Plan. This will maintain consistency in the controls, and allow maximization of resource utilization, and increased efficiency of training. The following sections discuss the controls and process to be used to define, plan, conduct, verify and document work in each building.

4.1 Management Controls

To achieve the objectives identified for the NCPP, a comprehensive program of training, implementing/mentoring, self-assessing, and continuous improvement will be embraced as a management philosophy. This philosophy will be identified and controlled within the Quality

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Assurance Program developed for the NCPP at the beginning of Stage II and currently identified in specific work tasks. The program, at the onset, will be based on DOE Order 5700.6C, and applied in a graded fashion to ensure that controls commensurate with the risk of activities are consistently applied to every process.

4.1.1 Reporting Requirements

As currently conceived, two types of reports will be developed to document cost, schedule, regulatory compliance and progress of the project. The first set of these reports will contain information pertaining to the technical aspects of the project, and the other will contain the cost, schedule, and safety status of the project.

The technical reports will be based on the cleanup, declassification, and process development work being performed in the buildings, and will be submitted as agreed upon with the regulators. These reports will address the status of regulatory compliance being maintained in the performance of the work.

The cost, schedule, and safety status of the project will be reported to the DOE on a quarterly basis. If variances in the cost and schedule data (as compared to the cost and schedule estimates) occur, these variances will be identified and a plan for regaining the cost or schedule estimate will be presented in the quarterly report. If changes to the original plan are required, due to cost, schedule, or safety implications, such changes will be reviewed on a case-by-case basis and, based on the associated risk, a solution will be proposed and approved by the appropriate and agreed upon level of authority prior to action being taken.

4.1.2 Compliance Verification

The ability to assure compliance with the agreed to requirements is a primary function of the NCPP management control system. Compliance with requirements is achieved through planning, implementation, and assessment. Specific activities exist within each of these general categories. For example, planning may be further defined as procedure development, training, and associated activities required to effect a successful implementation. Through these activities and the related documentation of activities, compliance will be achieved. Assessment activities will periodically verify that compliance is maintained and that any indication towards a deficiency is quickly identified, corrected, and verified effective.

Since Stage II, as planned, will continue for approximately two years, it is important that compliance with the applicable requirements be verified on a periodic basis. The fact that the applicable requirements could be changing over the course of Stage II (as discussed in Section 4.4, **Requirements Analysis**) makes this ongoing verification all the more critical.

As work progresses in Stage II, the work will periodically be reviewed against the applicable requirements from the Requirements Analysis. The necessary reports and other documentation (as described in Section 4.1.1, Reporting Requirements) will be generated and submitted for

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approval, as appropriate, to demonstrate compliance with the requirements. By verifying compliance on an ongoing basis, deficiencies can be dramatically reduced and resolved in a timely manner.

4.2 Hazard Assessment

Before the details of cleanup work can be planned or conducted, the hazards associated with each building must be determined and documented. A hazard assessment addressing each building was a deliverable of Stage I. The hazards that are addressed in the Hazards Assessment include the radiological, electrical, chemical toxicological, physical, environmental and other safety hazards. Constituent data from the NCPP buildings are reviewed against applicable cleanup standards for the buildings in the Hazards Assessment. The cleanup standards used in this review include the levels of cleanliness agreed to with the regulatory agencies. These standards are used as current practice in a number of other industrial settings similar to those indicated in the NCPP buildings. The details of the process used in the assessment and the results are documented in the Characterization Work Plan.

The Hazard Assessment has three parts: the Characterization Work Plan, the IM/IRA Criteria, and the Survey Report. The information in these documents is based on existing survey data obtained from EG&G and is used as the basis for the proposed actions in Stage II. These data, while providing most of the required information about the relative states of cleanliness in the buildings, do not contain all information on the levels of contamination in all of the buildings. For this reason, additional sampling will be performed early in Stage II. The results of this sampling may require revision to the Facility Cleanup Plan, and will provide a clear understanding of the condition of the buildings prior to initiation of cleanup activities.

The information contained in the Hazard Assessment is reflected in the Facility Cleanup Plan. For example, if there are two pieces of equipment with essentially the same capabilities and levels of operability, but one is uncontaminated, this may affect decisions on which piece to retain.

4.3 Operational Assessment

Another aspect of the NCPP, besides facility cleanup, is determining the repair/maintenance of equipment (and the associated costs) needed to prepare for operations in Stage III. In order to make this determination, an Operational Assessment has been performed for each building. The Operational Assessment which is a part of the IM/IRA addresses the status of the building and support systems (structural, HVAC, process waste lines, etc.) and the equipment needed for Stage III production activities for each of the three buildings involved in the project.

This assessment consisted of interviewing operating and maintenance personnel; conducting physical inspections of the facility and equipment; and reviewing maintenance logs, deficiency reports and repair records. Based on the information gathered, estimates for repair and maintenance costs have been developed and the steps required to prepare the equipment required for Stage III operations have been identified.

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The information contained in the Operational Assessment is reflected in the Facility Cleanup Plan. For example, if there are two pieces of equipment with essentially the same capabilities and levels of contamination, but one is inoperable, this may affect decisions on which piece to retain.

The Operational Assessment will be reviewed and updated as equipment is dismantled to verify the operability of components that were inaccessible before that time. If revision of the Operational Assessment is required due to unforeseen component inoperability, this will occur early in Stage II.

4.4 Requirements Analysis

At the onset of Stage II a comprehensive program of identifying requirements that govern the activities of the NCPP will be initiated. This program will identify the requirements promulgated through DOE Orders and Commercial/Industrial Codes and Standards. During the course of Stage II this program will continue to identify redundancy and applicability issues, culminating in a transition from DOE Orders to Commercial/Industrial Codes and Standards that govern the activities of commercial operations.

As stated above, the regulators for the NCPP are involved in the planning as members on the Steering Committee, and on several of the Subcommittees. By discussing planned work and the impact of applicable requirements with regulators prior to work being started, the NCPP can ensure a thorough, effective, and traceable compliance with applicable requirements. One end result of the NCPP is the conversion of these three buildings for use by a commercial concern, in a commercial business environment. In order to achieve this, there will need to be a transition from the current set of requirements (DOE Orders) to the set of requirements that must be adhered to by non-DOE businesses. This is one principal reason for soliciting the assistance of the EPA, CDH, and the Governor's Office of Economic Development.

At the beginning of the work, the facilities will be subject to the same set of requirements that have applied to them in the past; the list of DOE Orders applicable to the NCPP at the beginning of work is included as Attachment A. As detailed cleanup planning and work progresses, the necessity for the application of these Orders will be considered in light of the requirements from the other regulators (i.e., the EPA and the CDH). In conjunction with all participants, the requirements from the DOE Orders will be replaced, where possible, with the applicable requirements from the other regulators. This transition will be conducted over the duration of Stage II, and will be documented and agreed upon by all of the principal participants.

4.5 Permitting

Based on conversations with the regulatory agencies of jurisdiction, and in conjunction with the currently perceived Stage III operations for the selected facilities and equipment, a preliminary list of permits have been identified as being required. This list is depicted in the Permitting Report. However, since the actual Stage III operating contract is to be competitively bid, deviations from the currently perceived Stage III operations may occur. subsequently, since permitting is partially contingent on the operations proposed in the bidding process, Stage II will selectively develop

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and submit permit applications that are aligned with the operations and assumptions outlined in the IM/IRA component documents.

Since the time required for submission and granting of permits is critical to initiating Stage III, MSC will apply for licenses and permits commensurate with activities it would perform if it were the Stage III contractor. However, since cost effective Stage II operations are of paramount importance, only those permits that have a high probability of being required will be applied for.

4.6 Cleanup Plans

The Facility Cleanup Plan which is a part of the IM/IRA discusses how work within Stage II of the NCPP will be carried out in order to prepare the buildings for Stage III operations. The Facility Cleanup Plan lists all assumptions identified at this time, due to unknowns remaining in the project buildings. The Plan contains a section that discusses the subjects applicable to all three of the buildings (e.g., the identification of cleanup standards, cleanup technologies to be used, compliance with applicable laws and regulations, etc.) The Plan then addresses each of the three buildings separately, taking into account the building-specific conditions and equipment.

This Cleanup Plan will be based on the results of the Hazard Assessment for the buildings, and the subsequent Requirements Analysis. There will still be some level of uncertainty concerning contamination early in Stage II. While the characterization work completed before and during Stage I and early in Stage II provides information on available surfaces, it does not address surfaces that are currently unreachable such as underneath the pieces of heavy equipment and the internal surfaces of equipment, etc.
Due to this uncertainty, the Cleanup Plan will contain a number of options, based on best estimates of contaminants and contamination levels expected to be encountered. As cleanup planning and work provide more definitive information, the corresponding option in the form of a decision tree in the Cleanup Plan will be followed and the uncertainty resolved. This may potentially affect overall project schedule.

In the event that unforeseen conditions require a change to the Facility Cleanup Plan, these changes will be handled using the same graded approach discussed in Section 4.1.1, Reporting Requirements.

4.7 Environmental Baseline

At the end of Stage II, an Environmental Baseline will be developed and delivered to the DOE. The Environmental Baseline is the set of quantifiable physical conditions observed in the NCPP buildings <u>after</u> they have been cleaned up in Stage II. This Environmental Baseline will provide a framework for continued maintenance of the buildings during Stage III activities. After the conduct of Stage III operations, the NCPP buildings would be returned to DOE in the same conditions that will be described in the environmental baseline; that is, the same conditions that the buildings were before Stage III operations began.

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5.0 References

1. Cooperative Agreement No. DE-FC34-94RFO0733, Dated 4/1/94.

2. National Conversion Pilot Project - Stage I Work Plan, Draft dated 4/4/94.

3. National Conversion Pilot Project - Characterization Work Plan, Rev. 0, Dated 5/16/94.

4. National Conversion Pilot Project - Operational Assessment, Rev. 1, Dated 6/14/94.

5. National Conversion Pilot Project - Interim Measure / Interim Remedial Action (IM/IRA) Criteria, Rev. 0, Dated 5/16/94.

6. National Conversion Pilot Project - Facility Cleanup Plan, Rev. 0 Dated 6/10/94.

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ATTACHMENT A

DOE Orders and Directives Applicable to the National Conversion Pilot Project

DOE 1240.2B	8-21-92	Unclassified Visits and Assignments by foreign Nationals Change 1 9-3-92
DOE 1270.2B	6-23-92	Safeguards Agreement with the International Atomic Energy Agency
DOE 1300.2A	5-19-92	Department of Energy Technical Standards Program
DOE 1324.2A	9-13-88	Records Disposition Change 1 4-9-92
DOE 1324.5A	4-30-92	Records Management Program
DOE 1360.1B	1-7-93	Acquisition and Management of Computing Resources
DOE 1360.2B	5-18-92	Unclassified Computer Security Program
DOE 1360.3C	10-19-92	Information Technology Standards
DOE 1360.4B	12-31-91	Scientific and Technical Computer Software
DOE 1360.6A	11-12-92	Automatic Data Processing Equipment/Data Systems
DOE 1370.2A	6-12-92	Computer-aided Design, Engineering and Manufacturing Resources
DOE 1450.3A	9-12-91	Call Control/Verification Programs and Authorized Use of Government Telephone Systems Change 1 4-9-92
DOE 1500.2A	6-7-89	Travel Policy and Procedures Change 11 4-16-93
DOE 1540.1A	7-8-92	Materials Transportation and Traffic Management
DOE 1540.2	9-30-86	Hazardous Material Packaging for Transport - Administrative Procedures Change 1 12-19-88
DOE 1540.3A	7-8-92	Base Technology for Radioactive Material Transportation Packaging Systems
DOE 1700.1	11-19-79	Freedom of Information Program Change 4 8-21-92
DOE 1800.1A	8-31-84	Privacy Act Change 1 5-18-92

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DOE 2030.4B	5-18-92	Reporting Fraud, Waste, and Abuse to the Office of Inspector General
DOE 2200.6A	1-7-93	Financial Accounting Change 1
DOE 2200.7	5-2-88	Cost Accounting
DOE 2200.9B	6-8-92	Miscellaneous Accounting Change 3
DOE 3220.2A	5-14-92	Equal Opportunity in operating and Onsite Service Contractor Facilities
DOE 3220.6A	5-14-92	Federal Labor Standards
DOE 3792.2A	5-14-92	Smoking Regulations
DOE 4210.7B	12-24-91	Indirect Cost Rate Responsibilities
DOE 4330.4A	10-17-90	Maintenance Management Program Change 4 5-18-92
DOE 4600.1A	4-1-87	Financial Assistance Procedures Manual
DOE 5000.3B	1-19-93	Occurrence Reporting and Processing of Operations Information Change 1 7-2-93
DOE 5300.1C	6-12-92	Telecommunications
DOE 5300.2D	5-18-92	Telecommunications: Emission Security (TEMPEST)
DOE 5300.3D	8-3-93	Telecommunications: Communications Security
DOE 5300.4C	5-18-92	Telecommunications: Protected Distribution Systems
DOE 5400.1	11-9-88	General Environmental Protection Program Change 1 6-29-90
DOE 5400.2A	1-31-89	Environmental Compliance Issue Coordination Change 1 1-7-93
DOE 5400.3	2-22-89	Hazardous and Radioactive Mixed Waste Program
DOE 5400.4	10-6-89	Comprehensive Environmental Response, Compensation, and Liability Act Requirements
DOE 5400.5	2-8-90	Radiation Protection of the Public and the Environment Change 2 1-7-93

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DOE 5440.1E	11-10-92	National environmental Policy Act Compliance Program
DOE 5480.1B	9-23-86	Environment, Safety, and Health Program for Department of Energy Operations
DOE 5480.3	7-9-85	Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes
DOE 5480.4	5-15-84	Environmental Protection, Safety, and Health Protection Standards Change 1 1-7-93
DOE 5480.5	9-23-86	Safety of Nuclear Facilities
DOE 5480.7A	2-17-93	Fire Protection
DOE 5480.8A	6-26-92	Contractor Occupational Medical Program Change 1 10-19-92
DOE 5480.9	12-18-80	Construction Safety and Health Program
DOE 5480.10	6-26-85	Contractor Industrial Hygiene Program
DOE 5480.11	12-21-88	Radiation Protection for Occupational Workers Change 3 6-17-92
DOE 5480.16	1-12-88	Firearms Safety Change 2 10-10-90
DOE 5480.17	10-5-88	Site Safety Representatives
DOE 5480.18A	7-19-91	Accreditation of Performance-Based Training for Category A Reactors and Nuclear Facilities
DOE 5480.19	7-9-90	Conduct of Operations Requirements for DOE Facilities Change 1 5-18-92
DOE 5480.20	2-29-91	Personnel Selection, Qualification, Training, and Staffing Requirements at DOE Reactor and Non-Reactor Nuclear Facilities Change 1 6-19-91
DOE 5480.21	12-24-91	Unreviewed Safety Questions
DOE 5480.22	2-25-92	Technical Safety Requirements Change 1 9-15-92
DOE 5480.23	4-10-92	Nuclear Safety Analysis Reports

DOE 5481.1B	9-23-86	Safety Analysis and Review System Change 1 5-19-87
DOE 5482.1B	9-23-86	Environment, Safety, and Health Appraisal Program
DOE 5483.1A	6-22-83	Occupational Safety and Health Program for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities
DOE 5484.1	2-24-81	Environmental Protection, Safety, and Health Protection Information Reporting Requirements Change 7 10-17-90
DOE 5500.1B	4-30-91	Emergency Management System Change 1 2-27-92
DOE 5500.2B	4-30-91	Emergency Categories, Classes, and Notification and Reporting Requirements Change 1 2-27-92
DOE 5500.3A	4-30-91	Planning and Preparedness for Operational Emergencies Change 1 2-27-92
DOE 5500.4A	6-8-92	Public Affairs Policy and Planning Requirements for Emergencies
DOE 5500.7B	10-23-91	Emergency Operating Records Protection Program
DOE 5610.2	8-1-80	Control of Weapon Data Change 1 9-2-86
DOE 5610.11	10-10-90	Nuclear Explosive Safety
DOE 5630.11A	12-7-92	Safeguards and Security Program
DOE 5630.12	6-23-92	Safeguards and Security Inspection and Assessment Program
DOE 5630.13A	6-8-92	Master Safeguards and Security Agreements
DOE 5630.14A	6-9-92	Safeguards and Security Program Planning
DOE 5631.1B	12-31-91	Security Education Briefing and Awareness Program
DOE 5631.2C	9-15-92	Personnel Security Program Change 1 6-7-93
DOE 5631.4A	7-8-92	Control of Classified Visits
DOE 5631.6A	9-15-92	Personnel Security Assurance Program

DOE 5632.1B	9-8-92	Protection Program Operations
DOE 5632.2A	2-9-88	Physical Protection of Special Nuclear Material and Vital Equipment Change 1 1-17-89
DOE 5632.5	2-3-88	Physical Protection of Classified Matter Change 1 7-30-93
DOE 5632.6	2-9-88	Physical Protection of DOE Property and Unclassified Facilities Change 1 12-5-89
DOE 5632.8	2-4-88	Protection Program Operations: System Performance Tests
DOE 5632.9A	9-23-92	Issuance and Control of Security Badges, Credentials, and Shields
DOE 5633.2A	9-23-92	Control and Accountability of Nuclear Materials: Responsibilities and Authorities
DOE 5633.3A	2-12-93	Control and Accountability of Nuclear Materials
DOE 5633.4	2-9-88	Nuclear Materials Transactions: Documentation and Reporting
DOE 5633.5	5-22-87	Nuclear Materials Reporting and Data Submission Procedures
DOE 5634.1B	9-15-92	Facility Approvals, Security Surveys, and Nuclear Materials Surveys
DOE 5634.3	6-14-93	Foreign Ownership Control and Interest
DOE 5635.1A	2-12-88	Control of Classified Documents and Information Change 1 6-14-93
DOE 5635.4	2-3-88	Protection of Unclassified Controlled Nuclear Information (UCNI) Change 1 4-24-92
DOE 5636.1A	6-12-92	Prohibitions on Illicit Wiretapping and Eavesdropping
DOE 5639.7	4-30.92	Operations Security Program
DOE 5650.2B	12-31-91	Identification of Classified Information Change 2 4-28-93
DOE 5650.3A	6-8-92	Identification of Unclassified Controlled Nuclear Information

DOE 5660.1A	7-8-92	Management of Nuclear Materials
DOE 5700.6C	8-21-91	Quality Assurance
DOE 5820.2	9-26-88	Radioactive Waste Management
DOE 5900.2A	3-26-92	Use of the Metric System of Measurement
DOE 6430.1A	4-6-89	General Design Criteria
SEN-6E-92	2-21-92	Departmental Organizational and Management Arrangements
SEN-15-92	2-5-90	National Environmental Policy Act
SEN-20-90	4-9-90	Interaction with Internal and External Oversight Organizations
SEN-22-90	5-8-90	DOE Policy on Signatures of RCRA Permit
SEN-35-91	9-9-91	Nuclear Safety Policy
SEN-38-92	7-8-92	Sexual Harassment

National Conversion Pilot Project
Stage I

Characterization Work Plan

Revision 2

29 September 1994

Submitted to:

U.S. Department of Energy - Rocky Flats Office
P.O. Box 928
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DE-FC34-94RF00733

REVIEWED FOR CLASSIFICATION/UCNI
By
Date 12/06/94 U.U.

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National Conversion Pilot Project
Stage I

Characterization Work Plan

Revision 2
29 September 1994

Prepared by	M.S. Colalancia, BNFL Inc. EH&S	9.29.94 Date
Approved by	M.L. Haupt, BNFL Inc. PM	9/29/94 Date
Approved by	D.R. Floyd, MSC PM	Date 9/29/94
Approved by	E. Nix, DOE-RFFO	10-14-94 Date

This Report was prepared by Manufacturing Sciences Corporation under Cooperative Assistance Agreement No. DE-FC34-94RF00733 with the Department of Energy - Rocky Flats Office.

This Report is intended for DOE-RFO's use. Such use, duplication and disclosure of this Report is to be in accordance with Contract No. DE-FC34-94RF00733.

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National Conversion Pilot Project
Stage I

Characterization Work Plan

Revision 2
29 September 1994

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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
0	16 May 94	All	All	First Approved Issue	
1	30 June 94	All	All	Incorporates DOE Comments and recently received analytical data.	
2	29 Sept. 94	All	All	Incorporates EG&G Comments	D.R. Floyd

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1.0 Introduction

This Characterization Work Plan has been prepared for the purpose of providing useful and applicable hazard assessment information to be used in defining an Interim Measure/Interim Remedial Action (IM/IRA) Proposed Plan. This Characterization Work Plan has been conceptually divided to address a number of activities which are being commonly performed in the NCPP buildings 865, 883, 444, and 447.

MSC will implement and complete activities identified in the Characterization Work Plan.

1.1 The first objective of this Characterization Work Plan is the qualitative identification of the following for the facilities associated with the NCPP:

- EH&S Procedures,
- Discussion of Assessment Strategy,
- Review Existing Documentation,
- Identification of Facilities and Equipment Needed,
- Identification of Maintenance Requirements to Assure Safety and Environmental Protection, Sequence and Timing of Activities (Schedule),
- Analysis of Radiological Conditions,
- Identification of Electrical, Chemical, Toxicological, Physical, Environmental, and Other Safety Hazards,
- Identification of a Quality Assurance Program Plan.

1.2 The second objective of this Characterization Work Plan is the identification of additional Stage II survey requirements within the NCPP buildings to provide more complete supporting data for overall hazards assessment.

2.0 Definitions

Contaminants of Concern: Chemical and/or radiological substances which can contaminate individuals, objects, facilities or the environment with some degree of measurable effect.

3.0 EH&S Procedures Identification

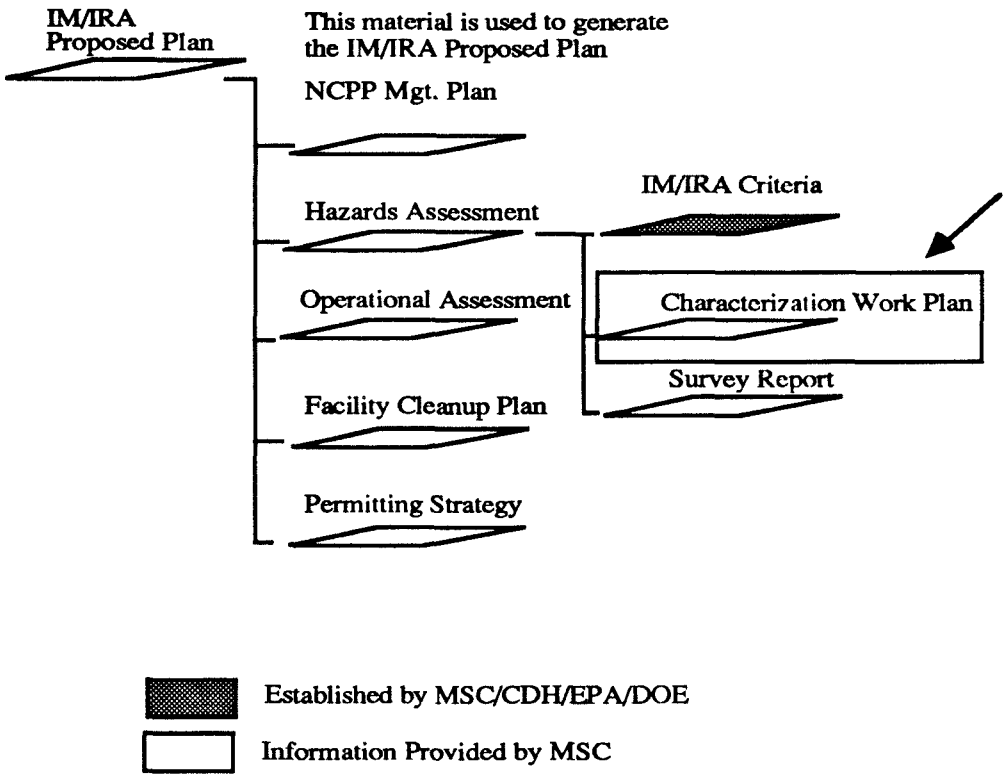
In the bounds of the Cooperative Assistance Agreement, MSC and its subcontractor(s) have been identified as contractors to the US DOE. As a consequence of this classification, MSC will comply with existing US DOE Orders for Stage I and the initial phases of Stage II. In complying with these Orders, MSC will be required to follow the written instructions of the Health and Safety Practices (HSP) Manual as written by the M&O contractor as they are appropriate. A list of H&S Practices Manual (as amended) procedures which will be followed by MSC and its subcontractor(s) for conduct of work during Stages I and initial phases of Stage II is included in Appendix A. Modification to these procedures during Stage II may occur, and MSC may choose to write additional procedures where a Health and Safety Practices Manual Procedure is not currently present to govern the safety aspect of a specific work package. New procedures will be written and approved prior to implementation within NCPP buildings.

4.0 Discussion of Assessment Strategy

This Characterization Work Plan fits into the overall planning of the NCPP as identified below in Figure 4.0-1, "Relationship of the Characterization Work Plan to the Project."

From this figure, it is clear that the Characterization Work Plan plays a significant role in the determination of the eventual Interim Measure/Interim Remedial Action (IM/IRA) Proposed Plan. This Characterization Work Plan initially provides a qualitative assessment of information which is common to the buildings in question (865, 883, 444, and 447), and then an assessment of individual building characteristics. Individual building characteristics must be taken into account due to the differences of historical missions of the buildings. Conclusions and recommendations which result from this Characterization Work Plan will take into account not only common information, but building-specific information as well. The other two components of Hazard Assessment are IM/IRA criteria identification to establish a basis for the IM/IRA Proposed Action, and the Survey Report, which is a gathering point for all data used in the Characterization Work Plan.

Figure 4.0-1. Relationship of Characterization Work Plan to Project



Data from the buildings will be reviewed against applicable draft cleanup standards for the buildings. These draft standards for cleanup have been derived from the following resources:

HSP 13.04 Beryllium Protection

HSP 18.10 Release of Property/Waste for Conditional and Unrestricted Use.

Regulatory Guide 1.86 Termination of Operating Licenses for Nuclear Reactors.

29 CFR 1910.1000. Table Z-1-A. "Limits for Air Contaminants"

These standards have been summarized in a draft table entitled "Draft Potential NCPP Economic Development Inside Building Interim Reuse Occupational/Radiation Worker

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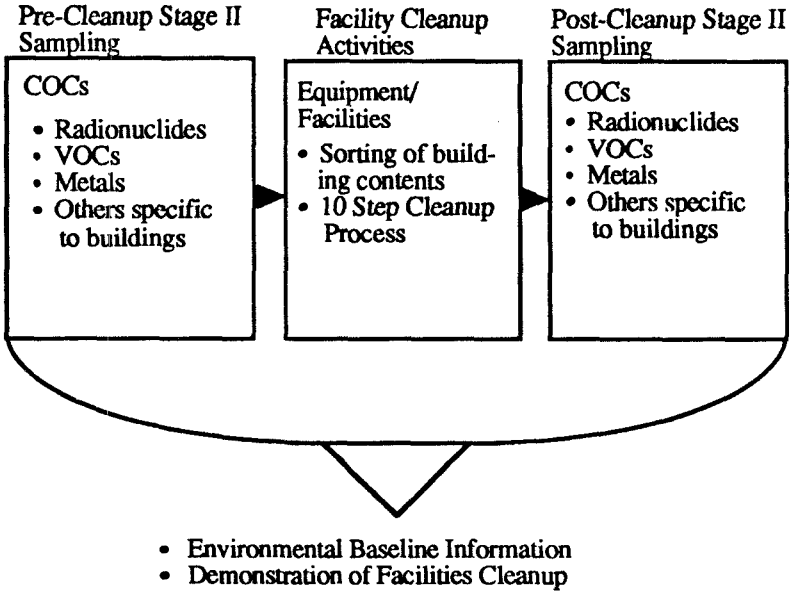
Based Cleanup Standards," which is currently being reviewed and is subject to the approval of the Colorado Department of Health (CDH) and the Environmental Protection Agency (EPA). The draft version of these standards is the set of assumptions for cleanup levels for the characterization of the buildings. Due to the length of this table, it is described in detail, by contaminant of concern, in Appendix B, entitled "Draft Potential NCPP Economic Development Inside Building Interim Reuse Occupational/Radiation Worker Based Cleanup Standards." These standards have been proposed for the interim reuse of the buildings because they are used as current operational practice standards in a number of other industrial settings which are similar to those thought to be present in the NCPP buildings. This draft table is intended to summarize contaminants of concern data in all of the NCPP buildings.

It is recognized that the worker protection standards proposed during cleanup include Personal Exposure Limits (PELs) for the Contaminants of Concern (COCs). In cases where the ambient concentration of a substance in the work place is found to exceed the Action Level for that substance, the operator will undertake an evaluation to establish if it is cost-effective and technically feasible to operate at levels less than the Action Level, employing engineering controls, Personal Protective Equipment (PPE) and Administrative Systems to ensure trained employees qualified to work in the area where the Action Limit is exceeded are utilized. This evaluation will be formal and take into acount toxicological considerations. Surface contamination cleanup values have been included for beryllium and uranium as well as Volatile Organic Chemicals (VOCs), and other organic chemicals such as Polychlorinated Biphenyls (PCBs). The other COCs mentioned do not have such enforceable surface values. However, sampling in Stage II will be performed to determine the pre-cleanup levels of uranium, beryllium and other COCs, as well as the post-cleanup levels of the COCs determined to be present to demonstrate the effectiveness of the cleanup activities. Figure 4.0-2 provides an illustration of this methodology.

Figure 4.0-2. COC Sampling Methodology



The set of standards previously mentioned only applies to the potential COCs in the building which have been initially identified in the Historical Release Report. The

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Historical Release Report identifies chemicals which have been spilled in the vicinity of the buildings. This report therefore represents many of the materials which were used during production operations within the buildings. During additional characterization activities and cleanup, formalized evaluations will be used to eliminate COCs from the previously described list of COCs in this report which are actually not of health concern within the NCPP buildings. Also, previously unidentified COCs which may not have been originally found will be added to the list in this report if identified during the course of the work. This report does not represent; however, the all of the requirements which will be invoked for the conduct of work. The entire set of requirements is much broader than this. It includes environmentally related standards and radiation protection standards for continued protection of the air, water, the public and cleanup workers. The entire set of applicable standards by which workers will conduct activities necessitating encountering and cleaning up COCs shall be specifically described in the Health and Safety Plan which will is to be written during the beginning of Stage II.

5.0 Review of Existing Data

Existing data for buildings 865, 883, 444, and 447 was obtained from several different resources through EG&G Rocky Flats, Inc. and the US DOE Rocky Flats Office. These resources were the following:

- EG&G Rocky Flats Inc. Industrial Hygiene Department (Beryllium Surveys)
- EG&G Rocky Flats Inc. Radiological Protection Department (Radiation Surveys)
- EG&G Rocky Flats Inc. Industrial Engineering (Equipment Layouts)
- EG&G Rocky Flats Inc. Facility Engineering (Building Drawings)

The data in these documents were gathered under several categories. The categories of documents are described below, including the specific resource from which they were obtained:

EG&G Rocky Flats Inc. Industrial Hygiene Department (Beryllium Surveys)

Beryllium surveys obtained from the EG&G Rocky Flats Inc. Industrial Hygiene Department consisted of several survey types. They were the following:

- Special Beryllium Smear Surveys. These surveys were taken specifically for baselining activities within these buildings.

- Routine Beryllium Smear Surveys. These surveys were taken on a routine basis, either monthly, weekly or daily, depending upon the frequency of use of the facility in question.

- Routine Fixed Air Head Beryllium Air Sampling Surveys. These contaminant per air volume samples were taken either monthly, weekly, or daily, depending upon the frequency of use of the facility in question.

EG&G Rocky Flats Inc. Radiological Protection Department (Radiation Surveys)

- Radiological Monitoring Contamination Surveys. These were smear surveys which were taken specifically for baselining activities within these buildings.

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- Direct Surface Radiation Surveys. These surface radiation surveys were taken for the purposes of building baselining. These surface surveys were specifically performed to detect contamination which is not removable by normal cleaning methods.

EG&G Rocky Flats Inc. Industrial Engineering (Equipment Layouts)

- Drawings of the equipment layouts in most of the facilities under consideration for the NCPP had been provided by the EG&G Rocky Flats Inc. Industrial Engineering Department. These drawings illustrate relative floor space of equipment, but not the services that the equipment has been connected to (i.e. electrical, compressed air, ventilation, etc.).

EG&G Rocky Flats Inc. Facility Engineering (Building Drawings)

- Building drawings were provided by the Facilities Engineering Department. These drawings included dimensions of overall building structures, but not the dimensions of specific rooms within the facilities in question. These have been included in Figures 5.1 through 5.4 to allow visual references for the Characterization Work Plan.

These data sets have been reviewed against the draft cleanup standards described above. This assessment indicates that additional characterization work will be necessary to accurately assess contamination levels in these buildings during Stage II. A complete compilation of survey data can be found in the NCPP Survey Report.

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5.1 Beryllium Survey Summary

Table 5.1-1 Beryllium Survey Summary

Survey Type	Total number of Samples	No. Beryllium Samples >Det.Level and <1.07μg/100cm^2	No. Beryllium Samples >1.07μg/100cm^2 and <2.15μg/100cm^2	No. Beryllium Samples >2.15 g/100cm^2 and <2.7g/100cm^2	No. Elevated Beryllium Sample Results* (>2.7 μg/100cm^2)	Locations of Elevated Sample Values
Building 865						
Special Be Smear Surveys	667	223	11	0	7	1750 Ton Press Area, Room 145
Routine Be Smear Surveys	2912	16	4	0	2	Machine Shop, Room 136
Routine Fixed Airhead Be Sampling Surveys† (>0.0005mg/m^3)	2952	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No samples above the Plant Action Level Noted.
Building 883						
Special Be Smear Surveys	1549	400	10	0	2	Thermolyne Furnace, Room 104
Routine Be Smear Surveys	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Known
Routine Fixed Airhead Be Sampling Surveys (>0.0005mg/m^3)	Not Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Known
Building 444/7						
Special Be Smear Surveys	957	787	16	0	13	Lathes in Room 101
Routine Be Smear Surveys	Not Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Known
Routine Fixed Airhead Be Sampling Surveys (>0.0005mg/m^3)	Not Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Known
Total Number of Samples	9037	1426	41	0	24	

*Based upon the standards identified in Health and Safety Practices Manual Procedure No. 13.04.

†Airhead Sampling for Beryllium in Building 865 was suspended in September 1991 due to internal policy changes.

Since the Routine Beryllium Surveys were not yet evaluated in these buildings, it is not known if an area of beryllium contamination exists past the special surveys taken.

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5.1.1 Beryllium Survey Information Summary

For additional information regarding specific beryllium surveys by date, room or equipment piece (if originally surveyed), please refer to the following Survey Report volumes where they have been compiled:

- Survey Report Volume II - Building 865
- Survey Report Volume III - Building 883
- Survey Report Volume IV - Building 444/7

Of the 9037 samples reviewed, 1426 of them were recorded at values greater than detectable levels and less than the value of 1.07μg/100cm^2. This represents approximately 15.8% of the sample set observed. There were 41 elevated samples within the range greater than 1.07μg/100cm^2 and 2.15μg/100cm^2. This represents approximately 0.5% of the entire set of samples observed. No samples fell within the range greater than 2.15 g/100cm^2 and 2.7g/100cm^2. There were 24 sample values observed to have beryllium levels >2.7 μg/100cm^2. This represents approximately 0.3% of the total number of samples taken within all of the buildings combined.

The rest of the samples reviewed were observed to be non-detectable for beryllium contamination. The total number of samples with non-detectable levels was 7537. This number represents approximately 83% of the entire sample set observed.

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5.2 Radiation Survey Summary

Table 5.2-1 Radiation Survey Summary

Survey Type (Taken in Counts Per Minute - cpm)	Number of Radiation Samples Taken	Number of Elevated Sample Values* (>100dpm/100cm^2)	Locations of Elevated Sample Values
Building 865			
Alpha Radiation (Removable) cpm	2855	1428	Room 136 and 145: 1750 Ton Extrusion Press Area
Alpha Radiation (Fixed) cpm	2997	600	Room 145 Southeast Corner
Beta Radiation (Removable) cpm	2850	14	Radiation Control Area, Majority in Southeast Corner of Room 145
Beta Radiation (Fixed) cpm	2664	13	Selected Areas of Room 145
Building 883			
Alpha Radiation (Removable) cpm	1549	341	B-mill and B-mill Pit, A-mill, Erie Press
Alpha Radiation (Fixed) cpm	Not Yet Evaluated†	Not Yet Evaluated	Not Known‡
Beta Radiation (Removable) cpm	1549	565	Underneath B-mill, A-mill, Erie Press
Beta Radiation (Fixed) cpm	Not Yet Evaluated	Not Yet Evaluated	Not Known
Building 444/7			
Alpha Radiation (Removable) cpm	310	6	Overhead in Room 201
Alpha Radiation (Fixed) cpm	Not Yet Evaluated	Not Yet Evaluated	Not known
Beta Radiation (Removable) cpm	310	9	Overhead in Room 201
Beta Radiation (Fixed) cpm	Not Yet Evaluated	Not Yet Evaluated	Not Known
Total Number of Samples	15,084	2976	

* Based upon standards identified in Health and Safety Practices Manual Procedure No. 18.10.

† Those data not evaluated had not been taken during sampling activities.

‡ Since the direct radiation data was not evaluated, it could not be determined where elevated values would occur. These areas are therefore "Not Known".

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For additional, in-depth information regarding specific radiation surveys by date, room or equipment piece (if originally surveyed), please refer to Survey Report volumes where they have been compiled:

- Survey Report Volume II - Building 865
- Survey Report Volume III - Building 883
- Survey Report Volume IV - Building 444/7

Of the 15,084 combined radiation surveys compiled, there were 2976 samples having values >100dpm/100cm^2. Of the set of sample results, the pooled percentage of those samples considered elevated above this level is approximately 20% of all sample values. It is worth noting that this gathering of measurements >100dpm/100cm^2 is meant for project-specific purposes, and is 1/10 of regulated values for control of contamination due to depleted uranium.

5.3 Building 865

5.3.1 Equipment Layouts

Equipment layouts have been obtained for this building. They were used to determine where samples were taken during radiation and beryllium surveys. Relative areas where surveys occurred have been indicated on a copy of the attached equipment layout map (Figure 5.3-1). Also identified on this equipment layout are those pieces of equipment which will not be needed by MSC for Stage III. Equipment to be kept was marked. For a comprehensive list of equipment, please refer to the Facility Cleanup Plan.

5.3.2 Building Drawings

Additional drawings of Building 865 have been obtained and used to determine relative dimensions of the rooms in question.

Those areas considered to have some potential for contamination (Radiation Control Area) has a total approximate area of:

23,205 ft^2 (2155.8 m^2)

The entire approximate floor space area of Building 865 is therefore:

37,980 ft^2 (3557.4 m^2)

Floorspace area is important from the standpoint of determining additional building sampling needs based upon recommended guidance standards available for characterization activities. Please reference Figure 5.3-2.

5.3.3 Summary of Qualitative Review

For Building 865, the Beryllium Smear Survey data was collected at the same time as the Radioactivity Survey data. The smear survey data for both contaminants of concern have been collected in a biased manner toward the uncontaminated portions of the building. The sampling of Room 145 (the highbay area) appeared to be much less intensive compared to sampling taken in what are considered noncontaminated areas. Virtually none of the equipment in the highbay was progressively sampled except for the external areas of the 1750 ton Extrusion Press. Another concern identified is that smear samples only collect surface contamination. It has been a practice to paint over surface

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contamination in the past, leaving the surface contamination under the paint barrier not detectable. This practice, although done to prevent the spread of contamination, makes obtaining an objective characterization of the building more difficult.

Since it is the desire of the NCPP to disposition some equipment during Stage II (Cleanup), it is recommended that additional sampling of the equipment not originally surveyed should occur as it is prudent in early Stage II. The existing sampling data gives the approximate hazard state of the building, but not of the potential hazards of cleaning up the equipment.

Additionally, the electrorefining cell will be problematic from the standpoint of its contamination. The area has been contaminated with beryllium salts. It will be important to ensure that this area is also sampled to identify contamination levels so that the specific problems associated with the cleanup of this area are properly understood.

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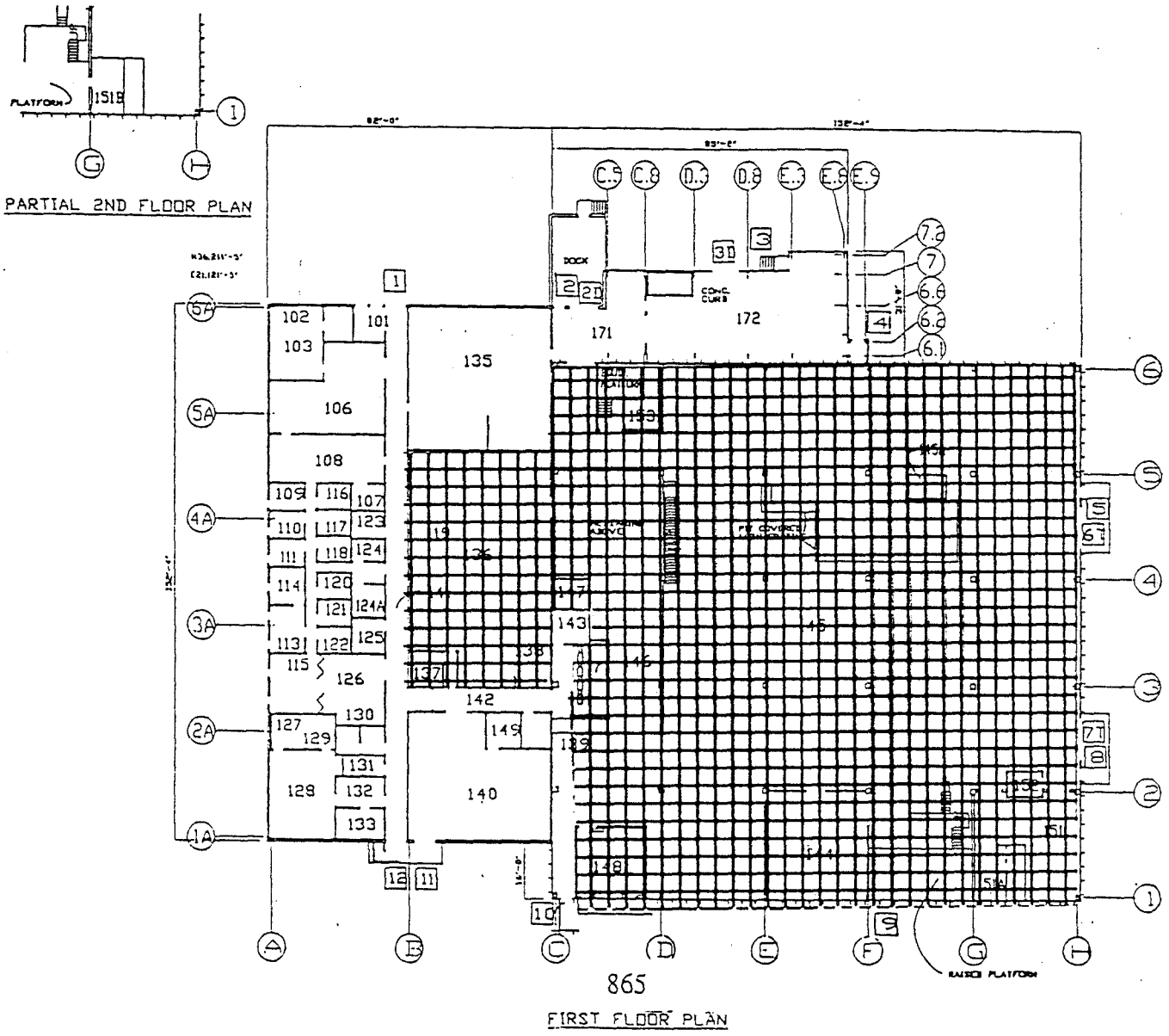
Figure 5.3-2. Building 865 Drawing - First Floor and Partial Second Floor Plan Elevation



Radiation Control Areas

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5.4 Building 883

5.4.3 Equipment Layouts

Equipment layouts have been obtained for this building. They were used to determine where samples were taken during radiation and beryllium surveys. Please reference Figure 5.4-1. For a comprehensive list of equipment, please refer to the Facility Cleanup Plan.

5.4.4 Building Drawings

Drawings of Building 883 have been obtained and used to determine relative dimensions of the rooms in question.

The entire approximate floor space area of Building 883 is therefore:

52,350 ft^2 (4863.5 m^2).

The area of the RCA is approximately:

42,350 ft^2 (3934.4 m^2)

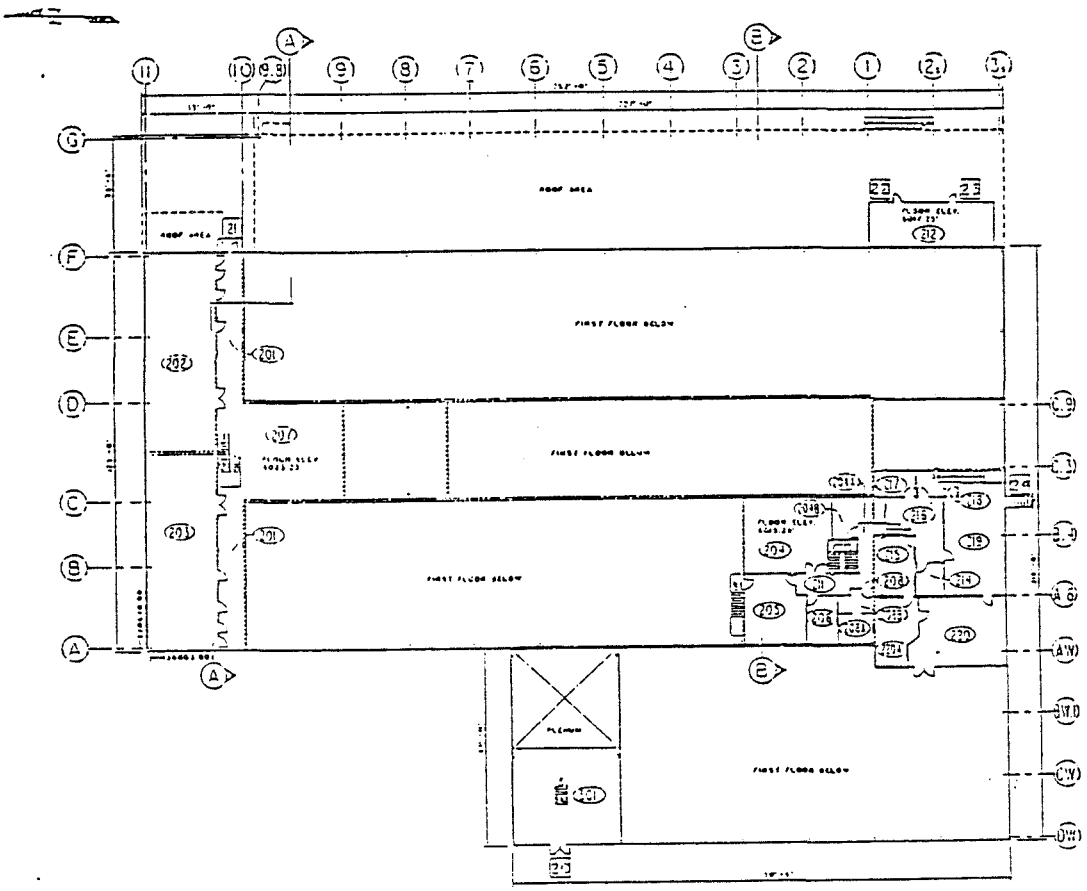
Floorspace area is important from the standpoint of determining additional building sampling needs based upon recommended guidance standards available for characterization activities as they are necessary. Please reference Figure 5.4-2 through 5.4-4.

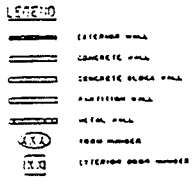
5.4.5 Summary of Qualitative Review

Building 883 Beryllium Smear Survey data and radiological data closely coincided in this specific building. The quality of the data is very useful from the standpoint of the surveying being biased towards equipment in RCA of the building. This biased sampling method gives a better overall feeling of gross contamination levels of the machinery from the standpoint of Beryllium and Uranium contamination (as small particulate solids). It will be much easier to ascertain the necessary decontamination needs for this machinery as compared to Building 865. Additional data was taken on the tops of shelves, and in the highbay of the building. In these areas, there were no elevated values observed regarding beryllium. Regarding uranium, the highest values for uranium contamination were found in the pit under B-Mill. This is not unexpected because B-Mill was used to roll uranium. Additional numbers of elevated uranium contamination were observed underneath A-mill, A-mill pit, and the Erie Press area.

Another concern identified is that smear samples only collect surface contamination. It has been a practice to paint over surface contamination in the past, leaving the surface contamination under the paint barrier not detectable. This practice, although done to prevent the spread of contamination, makes obtaining an objective characterization of the building more difficult, since there may be areas which have contamination underneath painted surfaces.

Figure 5.4-2. Building 883 Drawing - Second Floor Plan Elevation





Radiation Control Areas

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Figure 5.4-3. Building 883 Drawing - First Floor Plan Elevation

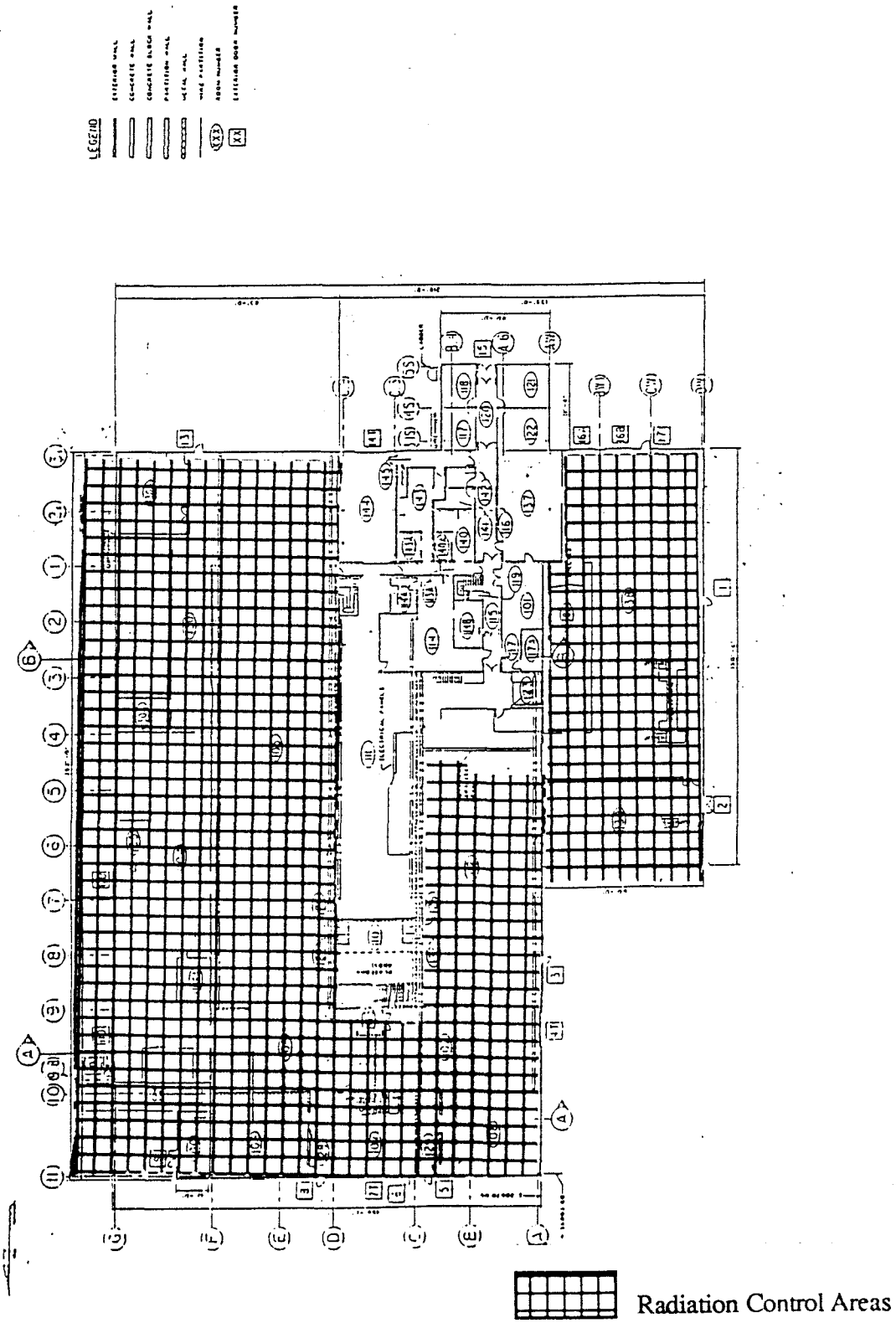

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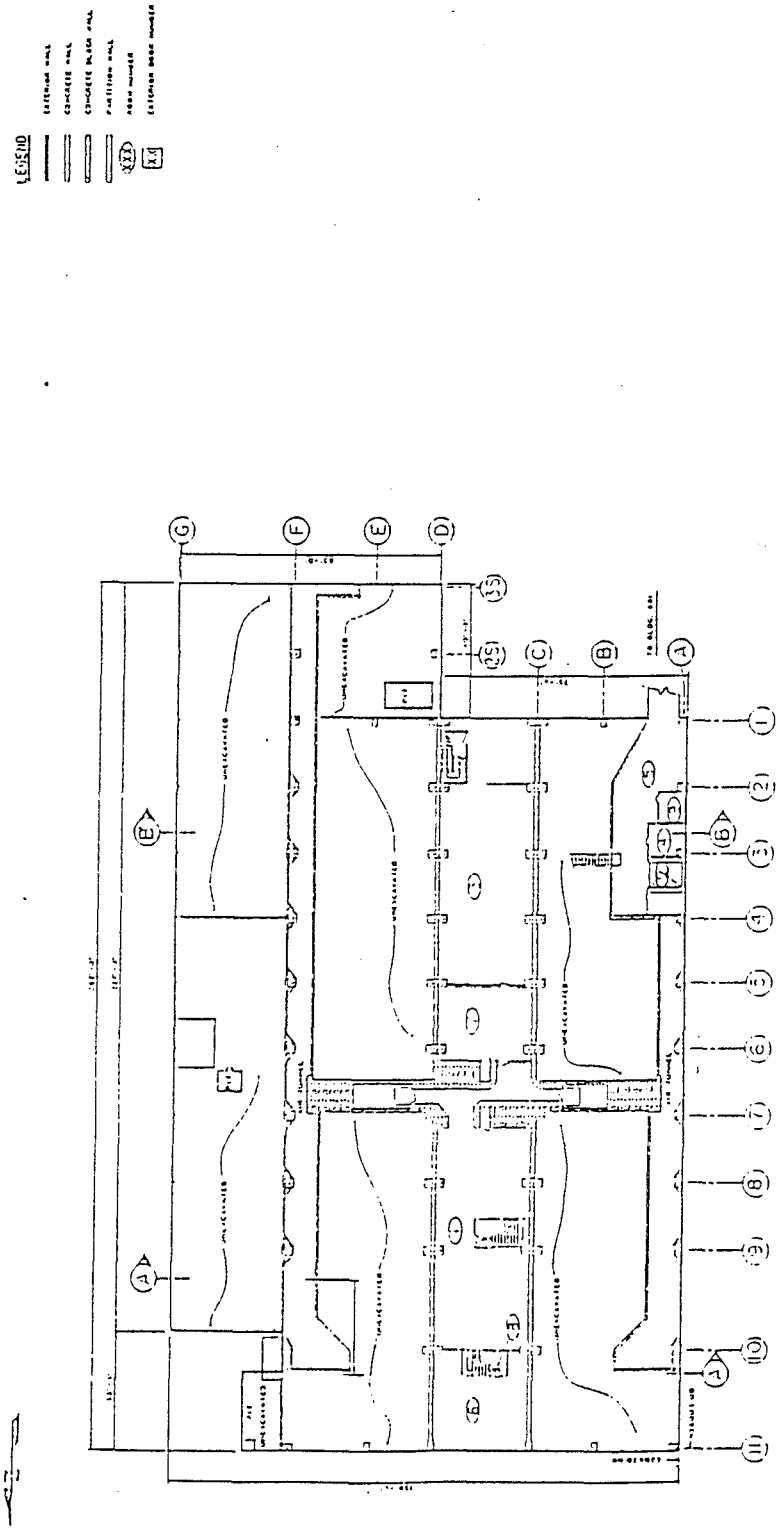
Figure 5.4-4. Building 883 Drawing - Finish Floor Plan Elevation



Radiation Control Areas

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5.5 Building 444

5.5.1 Equipment Layouts

Equipment layouts have been obtained for this building. They were used to determine where samples were taken during radiation and beryllium surveys. Please reference Figure 5.3-1. For a comprehensive list of equipment, please refer to the Facility Cleanup Plan.

5.5.2 Building Drawings

Drawings of Building 444 have been obtained and used to determine relative dimensions of the rooms in question.

The entire approximate floor space area of Building 444 is:

100,000 ft^2 (9290.3 m^2)

The area of the RCA is approximately:

80,000 ft^2 (7432.2 m^2)

Floorspace area is important from the standpoint of determining additional building sampling needs based upon recommended guidance standards available for characterization activities as they are necessary. Please reference Figure 5.5-2 through 5.5-3.

5.5.3 Summary of Qualitative Review

Building 444 Beryllium Smear Survey data and radiological data coincided somewhat in this specific building. The quality of the data is very useful from the standpoint of the surveying being biased towards equipment in the building. There was a bias toward more beryllium sampling for this building because of operational history. This biased sampling method gives a better overall understanding of gross contamination levels of the machinery from the standpoint of Beryllium. Uranium contamination (as small particulate solids) as observed does not appear to be as significant. It will be much easier to ascertain the necessary decontamination needs for this machinery. The remaining sampling analysis for this building has been performed by the Building 559 Laboratory. This data has been used to revise this summary as appropriate. In areas with elevated contamination values, decontamination occurred.

Another concern identified is that smear samples only collect surface contamination. It has been a practice to paint over surface contamination in the past, leaving the surface contamination under the paint barrier not detectable. This practice, although done to prevent the spread of contamination, makes obtaining an objective characterization of the building more difficult and there is the added uncertainty of contamination under surfaces.

In the beryllium shop, where operational beryllium work is still performed, Beryllium Smear Surveys of the overhead area in the shop did not indicate any elevated values for beryllium contamination.

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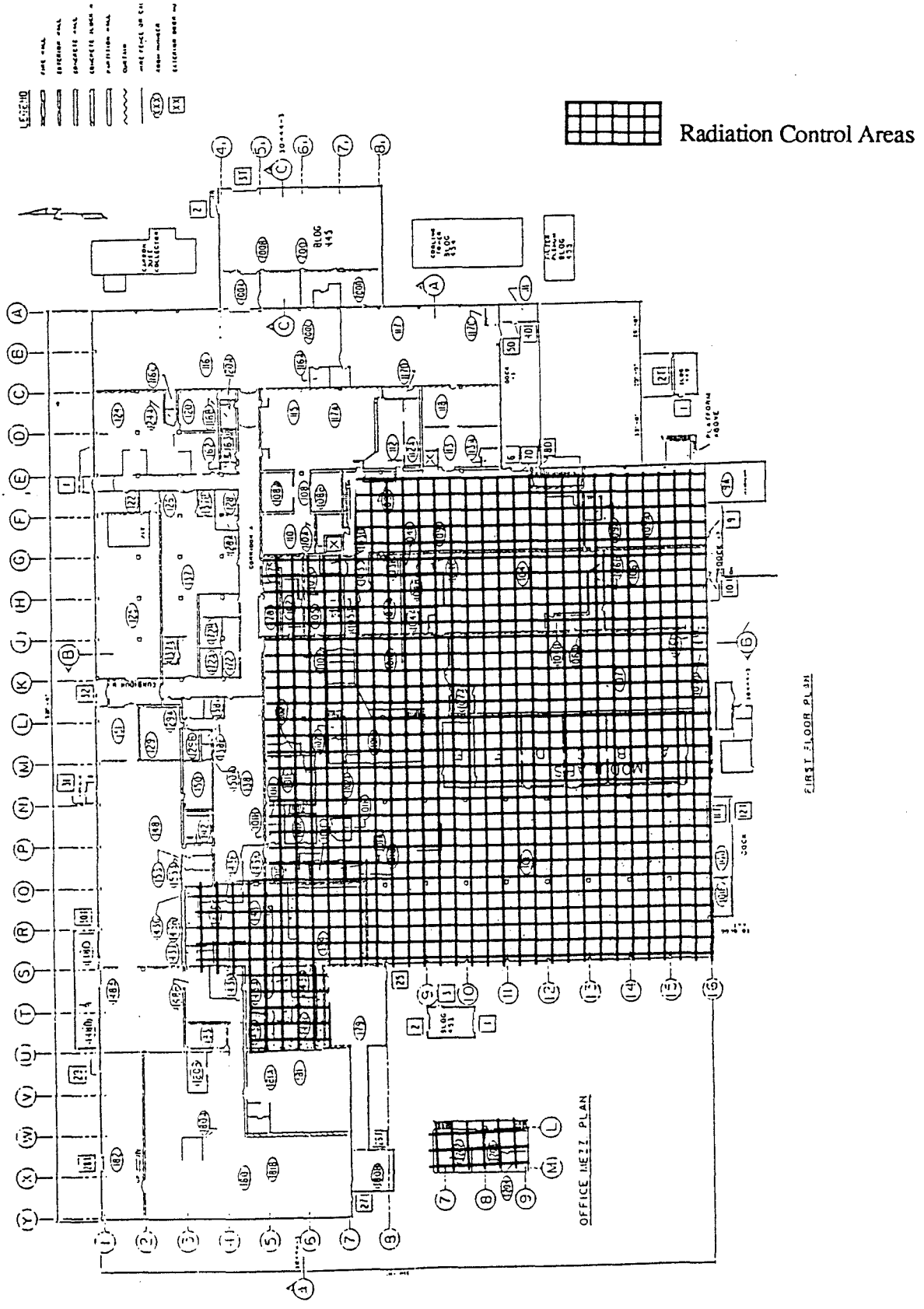
Figure 5.5-3. Building 444 Drawing - First Floor Plan Elevation



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5.6 Building 447

5.6.1 Equipment Layouts

Equipment layouts have been obtained for this building. They were used to determine where samples were taken during radiation and beryllium surveys. Please reference Figure 5.6-1. For a comprehensive list of equipment, please refer to the Facility Cleanup Plan.

5.6.2 Building Drawings

Drawings of Building 447 have been obtained and used to determine relative dimensions of the rooms in question.

The entire approximate floor space area of Building 447 is therefore:

18,000 ft^2 (1672.3 m^2)

The entirety of the floor space in this building is considered RCA since this building is accessed through room 101 of Building 444.

Floorspace area is important from the standpoint of determining additional building sampling needs based upon recommended guidance standards available for characterization activities as they are necessary. Please reference Figure 5.4-2.

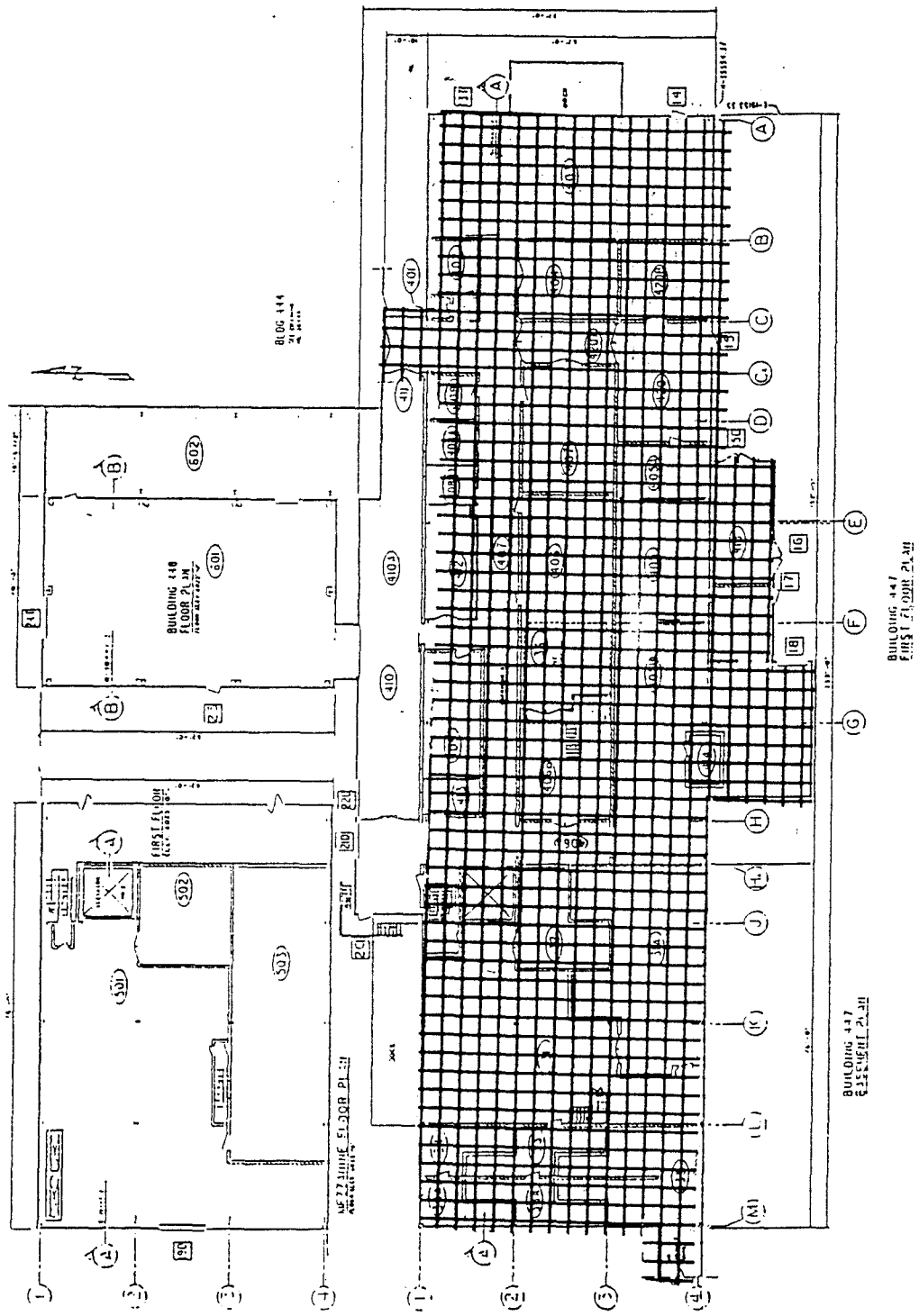
5.6.3 Summary of Qualitative Review

Building 447 Beryllium Smear Survey data and radiological data have been taken but not yet fully analyzed. This summary of qualitative assessment will be completed upon the arrival of the rest of the beryllium survey data and the radiation survey data to the project.

A concern regarding this data is that smear samples only collect surface contamination. It has been a practice to paint over surface contamination in the past, leaving the surface contamination under the paint barrier not detectable. This practice, although done to prevent the spread of contamination, makes obtaining an objective characterization of the building more difficult, as well as adding to uncertainty of the data gathered since painted over surfaces may contain contamination underneath the paint.

Figure 5.6-2. Building 447 Drawing - First Floor and Basement Plan Elevation

Radiation Control Areas



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6.0 Identification of Facilities and Equipment

In Buildings 865, 883, 444 and 447 major equipment has been identified and classified into four different groups. These groups are the following:

1) Equipment, not wanted in Stage III, which is believed to have minor contamination hold up only.
2) Equipment, not wanted in Stage III, which is known to or may contain significant contamination hold up.
3) Equipment, wanted in Stage III, which is believed to have minor contamination hold up only.
4) Equipment, wanted in Stage III, which is known to or may contain significant contamination hold up.

The Facility Cleanup Plan contains the equipment lists for each of the buildings broken down into these groups. The Facility Cleanup Plan will also identify which specific areas are under consideration for the NCPP. Not all areas of all buildings are intended to be cleaned. The areas which are to be cleaned are based upon projected needs.

In addition to this categorization of items, the Facility Cleanup Plan has been divided into a ten step process. This logical progression of work will be applied in a manner which consistently provides for the continuing health and safety of cleanup workers.

Although the Facility Cleanup Plan describes these in depth, they have been included in bulletized form here to provide a process orientation.

- Step 1: Removal of loose waste/unwanted equipment
- Step 2: Cleaning of high contamination areas
- Step 3: Construction of a decontamination facility
- Step 4: Removal and decontamination of low contamination items of equipment/furniture
- Step 5: Removal and decontamination of high contaminated items of equipment/furniture
- Step 6: Decontamination, dismantling and removal of services no longer required
- Step 7: Repairs to structure following from removal of equipment
- Step 8: Dismantling, cleaning and reassembly of retained equipment considered as low contamination risk
- Step 9: Dismantling, cleaning and reassembly of retained equipment considered as high contamination risk
- Step 10: Final decontamination of complete building to operational levels.

These steps will be implemented in appropriate ways for each of the NCPP buildings during their cleanup to handle the industrial aspects of the individual facility cleanups.

Building-specific issues and details pertaining to health and safety of the workers during the conduct of these activities shall be taken into account with the implementation of these ten steps to ensure that deficiencies which may be present in the buildings have been identified and corrected. The Health and Safety Plan will govern the safe conduct of the work activities.

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7.0 Identification of Maintenance Requirements to Ensure Safety and Environmental Protection.

In all of the four conversion buildings, the maintenance requirements are considered to be very much the same. The Stage II maintenance requirements intended to provide safety and environmental protection are the following:

- Continue Stationary Operations Engineering (SOE) surveillance of safety systems to maintain the safety envelope;
  - monitoring systems (including air and water effluents)
  - building services
  - structures
  - HVAC systems
- Continue janitorial services in shower and locker rooms;
- Continue janitorial services in the hallways and common areas;
- Continue safety inspections of fire systems;
- Maintain facility lighting to ensure worker safety; and
- Continue work on previously identified facility maintenance upgrades, as planned, on equipment to be kept for the NCPP.

This list of services is not an all inclusive listing. Other identified services will be added to this section as they are deemed to be appropriate. Additionally, safety provisions for the hazards posed by the identified COCs in Appendix B shall be imposed by the project Health and Safety Plan.

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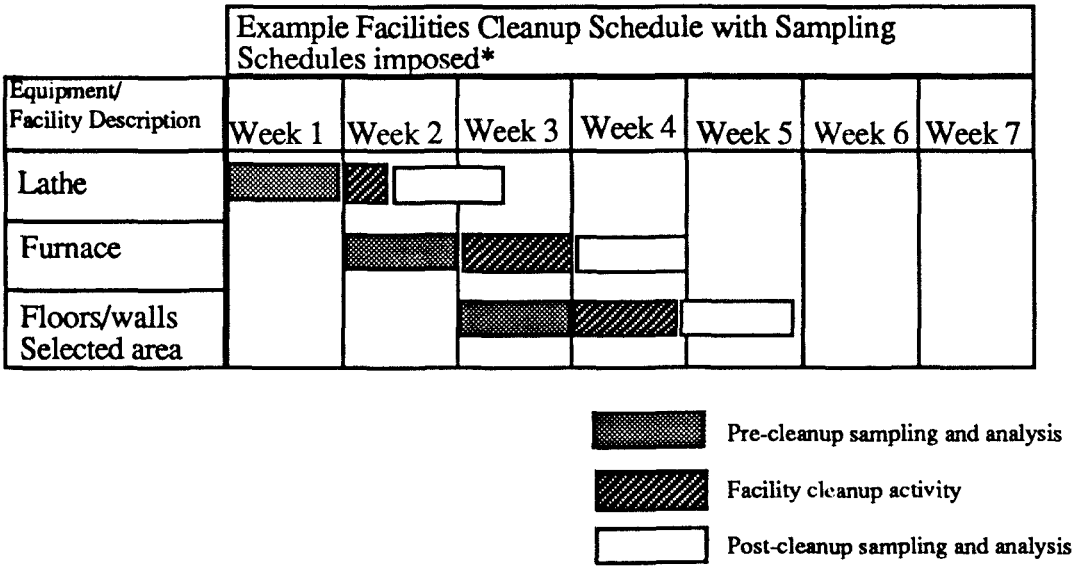
8.0 Sequence and Timing of Activities (Schedule)

Additional characterization surveys required for Stage II will be performed as a pre-activity to cleanup of the machinery and facilities of interest to further characterize them. They would also be surveyed after cleanup activities. The post-cleanup survey data would be used to provide information for the environmental baseline reporting which would describe the cleaned up condition of the buildings prior to Stage III activities taking place.

Additional Stage I samples are not required to prepare a credible Stage II Facility Cleanup Plan. The COCs which are of greatest concern, namely uranium and beryllium have been exhaustively sampled, albeit in a biased manner, to provide a qualitative estimate of the rough contamination values. Therefore, during Stage I additional sampling has not been requested.

For the other COCs which have been identified in Appendix B (other metals, solvents, acids, bases, and salts) additional sampling of these COCs shall be performed in Stage II as a pre-cleanup activity and then again as a post-cleanup activity. This additional data will provide good information for the environmental baseline prior to Stage III activities taking place, and would provide a demonstration of the relative effectiveness of facility cleanup activities. An example of the sequence and timing of characterization surveys required for Stage II has been provided below in Figure 8.0-1. In this figure, a lathe, a furnace, and selected floors and walls are pr-cleanup sampled, cleaned up, and then post-cleanup sampled. A specific sampling plan will be prepared for Stage II.

Figure 8.0-1. Example Schedule for Stage II Sampling Activities



* Facility Cleanup Activities will occur after mandatory Stage II plans have been prepared and approved.

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9.0 Analysis of Radiological Conditions

9.1 Building 865

In building 865, the majority of the measurable contamination found in the building appears to be elevated alpha and beta removable radiation. These radiation types were found in highest quantities in the area of the Bullard Vertical Turret Lathe (VTL) and the extrusion press. Other elevated smear samples were observed in that specific area of the highbay - namely, the southeast corner. This information has been summarized on Figure 9.1-1, which shows in a qualitative way the relative areas of elevated levels of contamination.

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9.2 Building 883

The majority of the measurable contamination found in this building appears to be elevated beta radiation and removable beta radiation. There appears to be very little beryllium in this building in a free form as dust. The most contaminated area of the building appears to be the pit underneath Rolling Mill B. Additional areas exibiting contamination were seen on portions of the A-mill and the pit underneath it, as well as the Erie Press. This information has been summarized on Figure 9.2-1, which shows in a qualitative way the relative areas of elevated levels of contamination.

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9.3 Building 444

Until the rest of the data regarding the removable radiation levels from this building have been analyzed, it is uncertain as to the radiological condition of the building. However, of the samples observed in the Radiation Control Area (RCA) of this building, only a small percentage of the values recorded are above 100 dpm/100cm^2 alpha. For beta removable contamination, the same conclusion appears to be appropriate based upon available information. This information has been summarized on Figure 9.3-1, which shows in a qualitative way the relative areas of elevated levels of contamination. Additionally, Room 202 has stored uranium materials and sampling results in these areas will be obtained early in Stage II.

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9.4 Building 447

Additional data regarding the levels of removable radiation from this building has yet to be obtained from the laboratory. Until this data is obtained, it is uncertain as to the radiological condition of this building. However, a slightly higher observed percentage of contamination appears to exist in this building. This slightly higher observed percentage may be due to the smaller number of samples which had been taken. This information has been summarized on Figure 9.4-1, which shows in a qualitative way the relative areas of elevated levels of contamination. Also recorded are areas already identified as radiation areas with restricted access. This specific area is the Chip Roaster room and its associated support room (Room 502 and 32).

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10.0 Identification of Electrical, Chemical, Toxicological, Physical, Environmental and Other Safety Hazards

10.1 Building 865

10.1.1 Electrical and Physical

The state of the electrical systems in Building 865 have been recently inspected. The results of this inspection are contained in a report entitled: "Building 865 Inspection Summary Report". According to this report, and the conditions of the building as surveyed by Condition Assessment System (CAS) Assessors the electrical systems overall rating for the building is "Good". Using the rating scale of the summary report, this meant that the electrical system in the building was better than acceptable, but not excellent. In other words, work which needs yet to be performed does not have immediately identified safety-related implications. This work should however be performed when possible to add to the current safety rating of the building. The next scheduled inspection under the CAS Program for the electrical system in the building is due September, 1995.

The "Building 865 Inspection Summary Report" done by CAS Assessors identified only one immediate physical hazard in the building. There is a metal ladder with a safety cage that does not comply with OSHA standard, 29 CFR 1910.27. A work order had been generated for its subsequent repair. The repair was suspended when Building 865 work was suspended. However, this repair should be reinstated and the ladder should be inspected to insure that work to correct the noncompliant ladder has been performed. Additional safety hazards should be assessed at earliest convenience. Additional safety hazards identified in the buildings are pits underneath presses and furnaces which may need to be accessed to determine chemical hazard levels in them. Reference the NCPP Operational Assessment for further safety hazards identified in the building.

10.1.2 Chemical

Chemicals used in prior operations by US DOE and its M&O Contractor are in the process of being removed from the building. The types of chemicals currently found in Room 145 have been catalogued in the building's chemical inventory. These chemicals are currently scheduled to be removed from the building. A list of the chemical inventory of the building has been included in the Survey Report, Volume V. Not described in this inventory are the beryllium chloride salts and beryllium which is currently being stored in the beryllium electrorefining cell, room 152.

10.1.3 Toxicological

Based upon the absence of quantifiable beryllium levels in the air in the highbay area, it is unlikely that simply being in building 865 presents a toxicological hazard. This data was obtained between January 1991 and September 1991. On a statistical basis, out of 2952 fixed airhead samples (those samples are taken at fixed areas around machinery in the highbay area), there were no detectable sample values.

In Room 136, however, there were several elevated levels of beryllium around lathes and associated equipment. Historically, in Room 136, beryllium metal was machined under oil. No special ventilation controls were applied to these operations because it had been demonstrated that machining beryllium under oil, if done properly would not release detectable levels of airborne beryllium. Also worth noting is that beryllium machined under oil in this shop remained in the oil of the machine. The elevated values observed

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would be due to remnants of beryllium contaminated oil in the interstices of the machinery.

Once machinery which handled beryllium is opened for decontamination, the likelihood of resuspension of a beryllium hazard may increase, unless this hazard is properly controlled by means of containment procedures. These procedures shall minimize the likelihood of release and be in concert with the ALARA program.

In Building 865, a transformer containing PCBs has been approved for short-term usage as a power supply. This transformer will be removed when prototype trials have concluded. A qualified PCB removal contractor will later remove the transformer.

Damaged asbestos material is present in this building. A summarized list of identified damaged asbestos materials present in this building is provided in Volume V of the Survey Report. A Colorado State certified individual will be retained in Stage II to provide a comprehensive asbestos inventory so that the extent of asbestos within the buildng, along with the best method to handle an asbestos hazard can be determined.

10.1.4 Environmental

Currently, environmental hazards in the building are in the process of being resolved. There is one RCRA storage area for drums and two 90 day accumulation areas. Those areas are in the process of being closed out.

The process waste line which was previously used for the building is in the planning stages for closure. This line does not meet the requirements of process waste lines under RCRA. Since this process waste line is no longer in service, liquid wastes which would be generated in the building would have to be pumped from storage tanks and hauled to Building 374, liquid waste treatment. Otherwise, in order to meet regulatory requirements, the line would have to be replaced by a regulator-approved method. Additionally, the Colorado Hazardous Waste Regulations which are enforced by the Colorado Department of Health (CDH) have primacy for RCRA compliance and RCRA non-compliant tank systems. Therefore, if RCRA regulated waste handling systems would have to be used, their use could be allowed by agreement with CDH. At that time it would be decided whether to upgrade the RCRA non-compliant tank systems or to close them if they wouldn't be used. In no event would these systems be used in a non-compliant, unapproved fashion.

A description of known cross-connections was obtained and reviewed. In this building, there are four active backflow preventors which satisfactorally passed the M&O Contractor's inspection process, and one that didn't pass. The deficient unit has been locked out and tagged out. At this time, no removal or upgrade of the deficient backflow preventor has been scheduled. It will remained locked out and tagged out. Annual inspections on active units are due between January to March. The M&O Contractor maintains responsibility for these units via Memorandum of Agreement.

Although provided information reports that drains within the Radiation Control Area have been plugged with concrete, the status of whether these drains in the Radiation Control Area have been plugged will be verified early in Stage II.

Air effluent monitoring equipment has been evaluated by the M&O Contractor. With regard to Building 865, some deficiencies exist. Among them are two worth note. First, the sampling methodology which DOE uses to measure effluent radiation levels is under scrutiny with the EPA. DOE provided a correlation study to EPA to demonstrate that DOE's sampling methodology complied with EPA requirements. EPA have not yet commented upon this study. The study was performed in direct response to a compliance order from EPA. Second, confirmatory testing should be performed on this building for beryllium air emissions. Additionally, APENS may require revision for Stage II.

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10.2 Building 883

10.2.1 Electrical and Physical

The electrical power systems of Building 883 are housed in the central highbay area. High voltage systems for Rolling Mill A and Rolling Mill B as well as some of the associated electrical control systems are located there. Also located in this area are electrical systems and generators for heavy presses located in the adjacent highbay rooms 112 and 105.

In Building 883, there are two Moffat heavy cranes which should be completely re-inspected and load tested before their use to move any equipment during the NCPP. These cranes are located in highbay areas housing Rolling Mill A and Rolling Mill B. Reference the NCPP Operational Assessment for further safety hazards identified in the building.

10.2.2 Chemical

A number of storage cabinets have been identified in the building, but the chemicals which were stored in some of these cabinets are assumed to have been identified in the building chemical inventory for disposition or storage elsewhere on the site. A list of the chemical inventory of the building has been included in the Survey Report, Volume V.

10.2.3 Toxicological

Very few beryllium samples taken in the building actually demonstrated values above the plant cleanliness standard of 2.70 $\mu g/100\ cm^2$. Beryllium samples were taken in a variety of different areas in the building. These areas and pieces of equipment demonstrated no beryllium contamination above the plant cleanliness standard. Of the 1549 samples taken, only three of these samples had elevated levels. Consequently, it appears that beryllium is not more than a perceived threat as a contaminant of concern from a qualitative standpoint. It may be determined at some later time, however, that beryllium contamination may be found in the inner workings of machines. Building and equipment outer surfaces appear clean.

Damaged asbestos bearing piping and foundry equipment has been identified in the building. To ready this equipment, the method by which the NCPP handles asbestos contamination shall be determined. A summarized list of identified asbestos contamination present in this building is provided in Volume V of the Survey Report. A Colorado State certified individual will be retained in Stage II to provide a comprehensive asbestos inventory so that the extent of asbestos, along with the best method to handle an asbestos hazard can be determined.

10.2.4 Environmental

In Building 883, there are some RCRA non-compliant liquid waste tanks in the basement. These tanks have been identified as RCRA non-compliant by the Environmental Protection Agency, Region VIII. It is assumed that these tanks would not be used for RCRA-controlled liquids during the cleanup. It may be useful, however, to have the proper administrative controls in place prior to the use of these tanks should they be needed to hold decontamination washes. There is a run of process waste piping that is RCRA non-compliant in this building. Decontamination washes from this building would be held in tanks and pumped into a hazardous waste tanker. This tanker would then take the waste to Building 374 for treatment.

A description of known cross-connections was obtained and reviewed. In this building, there is one active backflow preventor which satisfactorally passed the M&O Contractor's inspection process and three which had not and are locked and tagged out and are out of service. There are two additional backflow preventors which have been placed out of commission in this building and have been rescheduled for removal in 1999. Backflow preventors currently locked out and tagged out will remain in that condition until deficiencies can be corrected by the M&O Contractor. Backflow preventors are an important compliance issue from the standpoint of Safe Drinking Water Act compliance, being part of the facility safety systems caretaking, and therefore the M&O Contractor's responsibility to repair through the Memorandum of Agreement.

Although provided information reports that drains within the Radiation Control Area have been plugged with concrete, the status of whether these drains in the Radiation Control Area have been plugged will be verified early in Stage II.

Air effluent monitoring equipment has been evaluated by the M&O Contractor. With regard to Building 883, some deficiencies exist. Among them are two worth note. First, the sampling methodology which DOE uses to measure effluent radiation levels is under scrutiny with the EPA. DOE provided a correlation study to EPA to demonstrate that DOE's sampling methodology complied with EPA requirements. EPA have not yet commented upon this study. The study was performed in direct response to a compliance order from EPA. Second, confirmatory testing should be performed on this building for beryllium air emissions.

APENS may require revision for Stage II.

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10.3 Building 444

10.3.1 Electrical and Physical

The Building 444 electrical system should be reinspected. The relative age of the building, coupled with the building history (a recent fire in a plating laboratory in 1990 traced to faulty wiring) make building 444 an excellent candidate for additional electrical inspections and testing.

Some areas of the building need to have lighting replaced. Areas such as the toolgrinding area had historically been neglected for routine maintenance. Reference the Operational Assessment for further safety hazards identified in the building.

10.3.2 Chemical

Room 204 contains a number of chemicals from the plating lab, Room 245, that were moved there after the plating lab fire in 1990. These chemicals range in potential hazard from caustics and acids in carboys that have never been opened, to metal plating materials (sodium cyanide, chromium trioxide, and additional laboratory chemicals in smaller volumes). It is highly recommended that these chemicals are categorized and removed prior to assumption of this building by the NCPP. Currently, this movement is scheduled, but priority should be placed on it to facilitate Stage II activities. A list of the chemical inventory of building 444 has been obtained and placed in Volume V of the Survey Report.

10.3.3 Toxicological

Of the beryllium data obtained for this building, it appears that there are relatively few areas where beryllium contamination appears to be found. The area having the highest number of beryllium samples close to the plant cleanliness standard of 2.70 $\mu g/100\ cm^2$. would be the beryllium shop. However, Beryllium Smear Surveys taken indicate that none of the samples taken of the overhead are elevated above the plant standard. The beryllium shop is still performing limited activities, therefore, the entire condition of this room is not known at this time.

Asbestos bearing piping and foundry equipment has been identified in the building. To ready this equipment, the method by which the NCPP handles asbestos contamination shall be determined. A summarized list of identified asbestos contamination present in this building is provided in Volume V of the Survey Report.

10.3.4 Environmental

Building 444 has several waste storage tanks in the basement, as well as RCRA roll screen separation units which collect solid wastes and deposits them into barrels for disposition. Portions of the waste process system in building 444 is old and does not fully comply with RCRA standards. Therefore the process pipeline to building 374 is not used. A pumper truck pumps process waste from the building to be eventually treated in building 374. Some of these tanks may however, be used to temporarily store decontamination wash should the need occur. RCRA non-compliant tanks would not be used for even temporary storage of RCRA-controlled liquids without the express permission and guidance of the regulatory authorities at EPA and CDH.

A description of known cross-connections was obtained and reviewed. In this building, there are eight active backflow preventors which satisfactorally passed the M&O

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Contractor's inspection process and seven which had not and are locked and tagged out and are out of service. There are thirteen additional backflow preventors which have been placed out of commission in this building, four of which have been rescheduled for removal in 1999. Another of these placed out of commission has been replaced and is on the active backflow preventor list, having passed the M&O Inspection. Backflow preventors currently locked out and tagged out will remain in that condition until deficiencies can be corrected by the M&O Contractor. Backflow preventors are an important compliance issue from the standpoint of Safe Drinking Water Act compliance, being part of the facility safety systems caretaking, and therefore the M&O Contractor's responsibility to repair through the Memorandum of Agreement. Annual inspections for active backflow preventors are due between February and August.

Although provided information reports that drains within the Radiation Control Area have been plugged with concrete, the status of whether these drains in the Radiation Control Area have been plugged will be verified early in Stage II.

Air effluent monitoring equipment has been evaluated by the M&O Contractor. With regard to Building 444, some deficiencies exist. Among them are two worth note. First, the sampling methodology which DOE uses to measure effluent radiation levels is under scrutiny with the EPA. DOE provided a correlation study to EPA to demonstrate that DOE's sampling methodology complied with EPA requirements. EPA have not yet commented upon this study. The study was performed in direct response to a compliance order from EPA. Second, confirmatory testing should be performed on this building for beryllium air emissions.

APENS may require revision for Stage II.

10.4 Building 447

10.4.1 Electrical

The Building 447 electrical system should be reinspected. The relative age of the building, as well as how the building has been maintained (it is physically connected to building 444) make building 447 an excellent candidate for additional electrical inspections and testing.

Decreased lighting is evident in this building due to lack of continuous maintenance of the fluorescent lighting. Decreased illumination is a physical hazard, since individuals who will perform cleanup work should be easily able to see working surfaces. Refer to the Operational Assessment for further safety hazards identified in the building.

10.4.2 Chemical

Building 447 currently houses few chemicals. Historically, maintenance operations were performed involving painting and paint stripping. Paint stripping is no longer performed in that building, but some is stored there, as well as mortar mix, cement, some gas cylinders, liquid nitrogen and a small quantity of sulfuric acid. A copy of a recently obtained chemical inventory for the building can be seen in Volume V of the Survey Report.

10.4.3 Toxicological

Based upon the limited data available from this building, there is still a possibility of elevated beryllium data values. That, however, is not a consequence of activities, but from the small number of data points taken in the building.

Historically, methylene chloride was used in paint stripping operations, which have ceased. Also present in the building is the uranium chip roaster. The uranium chip roaster has radiological hazards associated with it. It was historically used to oxidize uranium chips into the stable uranium oxide form. Therefore, the primary form of the hazard would be uranium oxide particulate matter with its associated toxicological and radiological hazards. This activity was performed because of the pyrophoric nature of uranium metal chips. This chip roaster has been reported to have high levels of uranium contamination.

Damaged asbestos bearing piping has been identified in the building. To ready this equipment, the method by which the NCPP handles asbestos contamination shall be determined. A summarized list of identified asbestos contamination present in this building is provided in Volume V of the Survey Report. A Colorado State certified individual will be retained in Stage II to provide a comprehensive asbestos inventory so the extent of asbestos, along with the best specific method to handle the building asbestos hazard can be determined.

10.4.5 Environmental

There is a roll screen unit in the basement of this building which collects metallic chips from different sources of machining oils generated in buildings 444 and 447. This roll screen unit appears to be outdated. Depending upon the condition of this unit, as RCRA regulations may apply, it may be necessary to replace it with an alternative mechanism. A specific regulatory analysis of the RCRA units and collection points for RCRA

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regulated wastes will determine whether the roll screen unit in the basement should be identified as RCRA regulated in Stage II.

A description of known cross-connections was obtained and reviewed. In this building, there are two active backflow preventors which satisfactorally passed the M&O Contractor's inspection process and five which had not and are locked and tagged out and are out of service. Two of these deficient backflow preventors have been rescheduled for removal/replacement in 1999 but are locked out and tagged out. One of these deficient backflow preventors would have been replaced but the engineering package is missing. It has been locked out and tagged out. Two others are locked out and tagged out with no additional information known about them. Backflow preventors currently locked out and tagged out will remain in that condition until deficiencies can be corrected by the M&O Contractor. Backflow preventors are an important compliance issue from the standpoint of Safe Drinking Water Act compliance, being part of the facility safety systems caretaking, and therefore the M&O Contractor's responsibility to repair through the Memorandum of Agreement.

Although provided information reports that drains within the Radiation Control Area have been plugged with concrete, the status of whether these drains in the Radiation Control Area have been plugged will be verified early in Stage II.

APENS may require revision for Stage II.

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11.0 Quality Assurance Program Plan Identification

At the onset of Stage II, prior to the commencement of operations, a Quality Assurance Program will be developed to control activities and ensure that products and services meet governing requirements and the requirements of internal and external customers. The program will be designed to meet the intent of DOE Order 5700.6C, Quality Assurance, and will embrace Total Quality Management (TQM) principles that delegate responsibility for process improvement to trained process owners.

DOE Order 5700.6C, Quality Assurance, is functionally organized by management, performance, and assessment. Table 11.1-1 depicts the Stage II Quality Assurance Program Structure and how the functional elements of the Order apply to the structure. While this simplified depiction represents the interaction between program elements and the Order, overlap exists since the Order influences all aspects of the program.

Also, immediately following Table 11.1-1, Figure 11.1-1 accurately depicts the hierarchy of the Quality Assurance Program as being the upper-most program from which all other programs are developed and implemented. Accordingly, the Quality Assurance Program is the means by which Stage II will be developed and implemented.

As indicated in Figure 11.1-1, the assessment function envelops the performance and management activities, and provides a measurable means of determining program effectiveness and compliance. In accordance with the Order, assessment is the broad term that embraces surveillance, audit, and both independent and self assessment activities. Assessment combined with process owner initiated improvements result in continuous improvement of the program and overall effectiveness.

Table 11.1-1 Quality Assurance Program Structure

Management	Performance	Assessment
Program	Work Processes	Management Assessment
Personnel Training & Qualification	Design	Independent Assessment
Quality Improvement	Procurement	
Documents and Records	Inspection & Acceptance Testing	

Development of the Quality Assurance Program, while meeting the intent of DOE Order 5700.6C, Quality Assurance, will also incorporate applicable and relevant requirements from source documents, including, but not limited to:

- ANSI/ASQC E4, Quality Assurance Program for Environmental Programs
- ASME NQA-1, Quality Assurance Program Requirements for Nuclear Facilities
- ASTM C1009, Standard Guide for Establishing A Quality Assurance Program for

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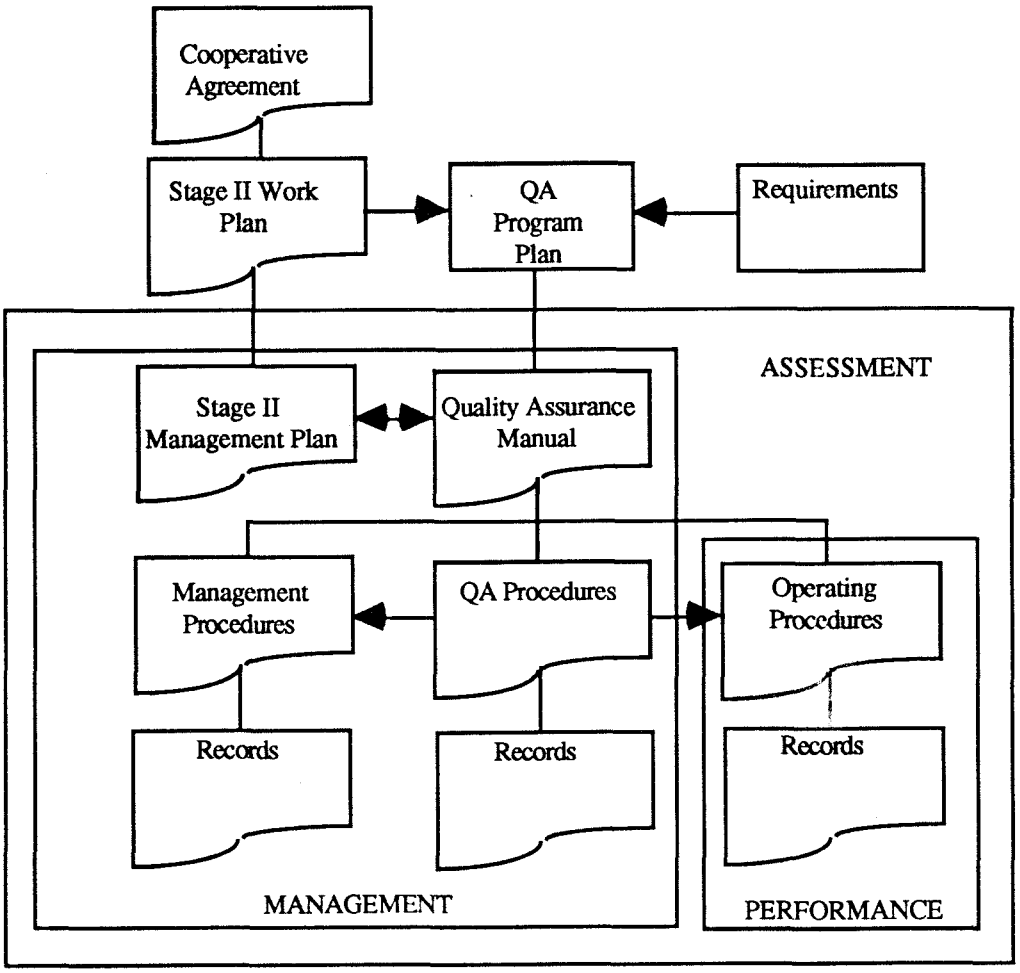
Analytical Laboratories

- DOE-EM, Quality Assurance Requirements and Description
- 10 CFR 71, Subpart H, Quality Assurance
- EPA QAMS 005/80, Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans
- 10 CFR 21, Reporting of Defects and Noncompliance

In addition, development of the Quality Assurance Program will consider control elements, requirements, and guidance from quality assurance programs that are currently being utilized in commercial industries, such as the ISO 9000 (ANSI/ASQC Q90-1987) series.

The procedures depicted in the figure will be developed utilizing a graded approach, by which the degree of control is commensurate with the risk of the activity or process. This approach reduces the cost of program implementation, while insuring safe operations and minimizing the risk to the public, environment, workers and facilities.
Implementation of the Quality Assurance Program will be carried out by employees that have received training that provides them with the appropriate tools and skills to meet the quality objective, and to actively participate in the continuous improvement process.

Figure 11.1-1 Stage II Quality Assurance Program Structure and Basis



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12.0 Recommendations/Conclusions

By building, sampling recommended for completion early in Stage II has been identified. The schedule by which this sampling should be performed has been identified in the Facility Cleanup Plan. The recommended sampling types and equipment descriptions to be sampled for the buildings are described below:

Table 12.1-1. Recommended Additional Sampling

Building	Sample Type(s)	Recommended Number
865	**Equipment surveys** Beryllium smear surveys Uranium Smear Surveys Sampling for other COCs	 10 smear surveys/small piece of equipment, 20 smear surveys/large piece of equipment. 1 smear survey/m^2 (a smear $100cm^2$) per square meter of equipment* To be determined in the H&S Plan and the Sampling Plan.
883	No additional sampling required of equipment required during Stage I. The need for additional Uranium Smear Surveys and Beryllium Surveys may be revisited in further revisions to this document. Sampling for other COCs	None To be determined in the H&S Plan and the Sampling Plan.
444	**Area Surveys** Direct Radiation Surveys Smearable Radiation Surveys Sampling for other COCs	1 direct survey (alpha and beta/m^2) in areas of concern* or identify additional data already taken. To be determined in the H&S Plan and the Sampling Plan.
447	**Area Surveys** Direct Radiation Surveys Smearable Radiation Surveys Sampling for other COCs	1 direct survey (alpha and beta/m^2) in areas of concern* or identify additional data already taken. To be determined in the H&S Plan and the Sampling Plan.

*These recommendations are based on review of sampling protocols described in NUREG/CR-5489 entitled, "Manual for Conducting Radiological Surveys in Support of License Termination. Draft Report for Comment." Published June 1992 (Reprinted December, 1993).

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Asbestos contamination not currently stabilized but still in the buildings should be stabilized in Stage II so that open and potentially friable material may not present a hazard during Stages II and III. A Colorado State certified individual would be retained to provide comprehensive building inventories and the relative state of the asbestos hazards within the building, along with methods to mitigate this specific hazard.

RCRA regulated chemicals in the buildings are currently in the process of being removed or closed out. It is recommended that the M&O contractor accelerate removal of chemicals currently scheduled to be removed in fiscal year 1995 so that they may be completely removed early in Stage II. It is recommended that RCRA Unit closures in the buildings will be effected by Memorandum of Understanding between DOE, EG&G Rocky Flats Inc., EPA, CDH, and MSC.

A description of known cross-connections obtained and reviewed. Backflow preventors present within the NCPP buildings were reviewed and the status of each backflow preventor was determined. Within these buildings, active backflow preventors had been inspected this year. If backflow preventors did not pass inspection, they were placed out of commission or out of service, dependent upon the ultimate fate of the backflow preventor. The M&O Contractor is responsible for finishing removal or replacement of the backflow preventors which are not compliant with the requirements of the Safe Drinking Water Act, or have not passed the M&O Contractor inspection. Backflow preventors which are locked out and tagged out will remain in such a condition unless MSC needs to have them immediately replaced. The M&O Contractor's replacement schedule should be reviewed and it should be determined if it is adequate and timely to support the facility safety systems for which the M&O Contractor is responsible.

Although provided information reports that drains within the Radiation Control Area have been plugged with concrete, the status of whether these drains in the Radiation Control Area have been plugged will be verified early in Stage II.

In conclusion, of the data reviewed regarding the buildings, copious quantities were examined. Consequently a separate Survey Report has been generatedto complile the radiological and beryllium survey data, the chemical inventories and dam ed asbestos materials inventories. The data which was summarized for the purposes s report can be found in its entirety in that Survey Report. Although the characteri during Stage I has been minimal, the characterization of Stage II will be extensiv re the proper documentation of building baseline conditions.

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Appendix A

Health and Safety Practices Manual
List of Procedures Potentially Applicable to the NCPP

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Appendix A

Health and Safety Practices Manual
List of Procedures Potentially Applicable to the NCPP

Number	Title	Effective Date	Revision
1.02	Program Document for ALARA	03/04/91	
1.06	Hazards and Deficiencies Abatement Management Process	03/11/94	
2.01	Safety Meetings and Inspections	10/01/93	
2.02	H&S Area Engineer Safety Teams, Functions and Responsibilities	11/15/90	
2.03	Operational Safety Analysis	05/31/91	
2.04	Employees Working Alone	11/14/88	
2.06	Red Tag Procedures	03/31/90	
2.08	Lockout/Tagout	07/12/92	
2.09	Use of Production Equipment for Development tasks	04/15/91	
2.10	Administration of H&S Design Review	11/15/90	
2.11	Job Safety Analysis	10/15/89	
2.14	Ventilation to Control Hazardous Materials	10/04/90	
3.02	Radiological Deficiency Report	06/10/91	
3.03	Reporting Occupational Injury or illness and Vehicle or Property Damage	06/15/93	Rev. 0
3.04	Request for Variance from DOE-Prescribed OSHA Standards	01/31/90	
4.02	Emergency Medical Response	07/01/91	
4.03	Medical Restrictions	04/30/91	
4.04	Transuranium Registry	NA	
4.05	Access to Employee Medical and Exposure Records	08/01/91	
4.06	Medical Radionuclide Procedure	07/01/91	
4.07	Pregnancy	08/22/88	
4.08	Serious Illness Notification Program	06/15/91	
4.09	Physical Examinations	12/22/92	
4.10	Employee Assistance Program	NA	
4.11	Medical Preparations for Travel to Foreign Countries	NA	
4.14	Ambulance Service	02/28/91	
4.15	Substance Abuse Monitoring	NA	
4.17	Workers Compensation Program	07/01/91	
5.01	Hazard-Safety Training	11/12/93	
5.03	Nuclear Criticality Safety Training Program	NA	
5.05	Occupational Safety Health Rights and Responsibilities	07/10/91	
6.03	Unattended Equipment Operation Permit	05/31/91	
6.04	Confined Space Entry Program	12/10/93	
6.07	Radiation Work Permit	02/28/91	
6.08	Operators Card for Special Equipment	08/30/90	
7.01	Eye and Face Protection Program	03/15/93	
7.02	Occupational Foot Protection	07/26/93	

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7.03	Respiratory Protection	08/01/93	
7.04	Emergency Shower and Eyewash Locations	12/01/93	
7.05	Breathing Air	11/01/93	
7.06	Hearing Conservation Program	04/30/90	
7.07	Head Protection	09/18/91	
8.01	Safe Work Apparel	09/06/93	
9.01	Material Storage Label	11/15/89	
9.02	Storage and Disposal of Nonplutonium metal fines	02/21/90	
9.06	Powered Industrial Trucks	02/18/91	
9.07	Hazard Communication Program	07/30/92	
9.09	Safe Handling of Asbestos	02/05/93	
9.10	Transfer of Hazardous Liquids	12/31/89NA	
9.12	Chemical Tracking	08/15/93NA	
9.11			
9.13	Hazard Assessment Inventory	12/21/92	
10.01	Physical Hazards, Barricades, and Accident Prevention Signs	04/05/93	
10.02	Building Indoctrination and Reindoctrination	06/15/89	
11.01	Compressed Gas Cylinders	03/22/93	
11.02	Aerosol Spray Cans	12/16/86A?	
11.03	Pressure Vessels, Systems and Relief Devices	03/22/93	
12.02	Hoists and Rigging	06/14/93	
12.04	Industrial Robots and Robotic Systems	09/01/87	
12.06	Accident Prevention Signs and Tags		
12.08	Excavations and Trenching	10/29/93	Rev. 0
12.09	Machine Safe Guarding	09/15/91	
12.10	Hand and Portable Power Tools	09/15/91	
12.11	Welding, Cutting, and Brazing	11/06/91	
13.01	Industrial Hygiene	07/15/90	
13.02	Control of Pesticides	NA	
13.03	Carcinogen Control	01/31/91	
13.04	Beryllium Protection	09/27/92	Rev. 0
13.05	Toxic Chemical Control	08/02/91	
13.06	Domestic Water	11/10/92	
13.07	Lead Control Program	NA?	Rev. 0
13.08	Housekeeping and Sanitation	05/03/93	Rev. 0
15.00	Electrical Safety Practices	08/28/91	
15.01	Batteries	05/31/91	
15.02	Electrical Equipment	01/31/89	
15.03	Safety Interlocks and Safety Limiting Devices	05/14/85	
15.04	Forklift Battery-Charging Stations and Emergency Batteries.	01/31/89	
15.08	Power Transmission and Distribution	05/28/92	Rev. 0
15.09	Existing Electrical Utilization Systems	04/05/93	Rev. 0
15.10	Electrical Hazardous (Special Occupancies) Locations.	04/05/93	Rev. 0
15.11	Design Safety Standards for New or Upgraded Electric Utilization Systems and Equipment.	04/13/93	Rev. 0

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16.01	Laser Safety	NA	
17.07	Criticality Alarm System Testing	NA	
18.00	Radiological Control Policy and Responsibilities.	12/15/90	
18.01	Radiation Dose Controls	08/01/91	
18.02	Personnel Contamination Control	12/15/90	
18.03	Radiological Protection Signs, Labels, and Tags	08.20.91	
18.04	Control of Radioactive Sources	NA?	
18.05	Control of Radiation Producing Devices	NA	
18.07	External Radiation Dosimetry	06/15/91	
18.08	Use of Step-Off Pads and H&S Barrier Areas in Radiologically Controlled Areas	12/15/90	
18.09	Self-Monitoring	09/11/91	
18.10	Release of Property/Waste for Conditional and Unrestricted Use	11/10/92	Rev. 0
18.11	Gloveboxes, Hoods, and "B"-boxes	12/15/90	
18.12	Radioactive Contamination Control and Decontamination	12/15/90	
18.13	Field Radiography Using Sealed Radioactive Sources	12/15/90	
18.14	Assessing Radiation Histories	12/15/90	
18.15	Emergency Alarms and Response	12/15/90	
18.17	Radiological Assistance Plan	06/15/91	
18.18	ALARA Goals in Reducing Personnel Radiation Doses		
18.19	Criteria and Actions for Potential Intakes	09/18/91	
18.20	Routine Bioassay Monitoring Program	03/18/94	
19.03	Explosives Safety	NA	
20.01	Access to and Use of the Rocky Flats Plant Buffer Zone	NA	
20.02	Surface Water Monitoring and Control	NA?	
21.02	Disposal of Cooling Tower Sludge	NA	
21.03	Hazardous Waste Operations	12/24/92	
21.04	Emergency Response and Spill Control	07/14/93	Rev. 0
22.01	Exits	11/04/88	
22.02	Ladders	04/01/88	
22.03	Scaffolds	07/30/93	Rev. 0
22.04	Freight Elevators	06/11/87	
22.05	Fall Protection and Equipment	10/01/91	
22.06	Work Platforms	09/13/91	
22.07	Floor Load Protection	02/15/93	Rev. 0
23.01	Vehicular Traffic and Pedestrians	04/26/93	Rev. 0
23.02	Use of Seat Belts	04/26/93	Rev. 0
23.04	Control of Vehicle Parking	06/02/92	Rev. 0
24.01	Safety and Health Responsibilities for Contractors	07/30/93	Rev. 0
30.01	Program Administration	07/31/89	
31.01	Smoking Precautions	07/31/89	
31.02	Electrical Precautions	07/31/89	
31.04	Controlling Introduction of Combustibles	06/15/91	
31.05	Construction Site Fire Safety Inspections	07/31/89	
31.06	Fire Prevention Inspections	07/31/89	

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31.08	Roofing Operations	NA	
31.09	Portable Fuel-fired Heaters	NA	
31.10	Welding Permits	07/31/89	
31.11	Transfer and storage of Plutonium for Fire Safety	NA	
31.12	Transfer and Storage of Pyrophoric Metals other than Plutonium for Fire Safety	07/31/89	
31.13	Occupancy Restriction Order	09/15/93	Rev. 0
32.01	Handling and Storage of Flammable and Combustible Liquids for Fire Safety	07/31/89	
32.02	Flammable Liquid Storage Cabinets	06/15/91	
32.03	Fire Signs and Symbols	06/15/91	
32.04	Fire Reporting	07/31/89	
32.05	Fire Lane Identification	07/31/89	
32.06	Temporary Outside Above-ground Fuel Storage	NA	
32.07	Building Emergency Support Team	A?	Rev. 0
32.08	Non-Emergency Use of Fire Hydrants	07/31/89	
33.01	Fire Walls	07/31/89	
33.02	Fire Doors	07/31/89	
33.03	Fire Hose, Hose Reels, and Cabinets	07/31/89	
33.04	Exits and Egress Routes	07/31/89	
33.05	Interior Finish	07/31/89	
34.01	Fire Systems Impairment	07/31/89	
34.02	Portable Fire Extinguishers	02/21/94	Rev. 0
34.03	Spray Painting Using Toxic, Flammable, and Combustible Materials	07/31/89	
34.04	Application of Floor Paint and Sealers	07/31/89	
34.05	Systems Operational Testing Frequency	07/31/89	
34.06	Fire Watches	05/03/93	
34.07	Glovebox Fire Protection	08/01/91	
34.08	Computer Facility Fire Protection	NA	
34.09	Plastic House Fire Protection	07/31/89	
34.10	Fire Dampers	07/31/89	

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Appendix B

Draft Potential NCPP Economic Development
Inside Building Interim Reuse/Occupational/
Radiation Worker Based Standards

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SUBSTANCE	SURFACE LIMITS	SOURCE	AIR LIMITS	SOURCE	REMARKS
Metals					
Aluminum (as Al metal)			Occupational Worker 15 mg/m^3 TWA (total dust) 5 mg/m^3 TWA (respirable fraction)	29CFR1910.1000	
Arsenic (as As)			Occupational Worker 0.5 mg/m^3 TWA (Organic Compounds) 10 µg/m^3 TWA (Inorganic Compounds)	29CFR1910.1000 29CFR1910.1018	Inorganic Arsenic is a Confirmed Carcinogen.
Barium (as Ba)			Occupational Worker 0.5 mg/m^3 TWA (soluble)	29CFR1910.1000	
Beryllium and Beryllium Compounds (as Be)	Occupational Worker 25 µg/ft^2	HSP 13.04	Occupational Worker 2 µg/m^3 TWA 5 µg/m^3 (Acceptable Ceiling Conc.) 25 µg/m^3 for 30 min. (Acceptable Max. Peak) 2 µg/m^3 TWA 0.5 µg/m^3 (action level)	29CFR1910.1000 HSP 13.03 HSP 13.04	Industry consensus standard, not codified.
Cadmium (as Cd)			Occupational Worker 0.1 mg/m^3 TWA (fume) 0.3 mg/m^3 Ceiling (fume) 0.2 mg/m^3 TWA (dust) 0.6 mg/m^3 Ceiling (dust)	29CFR1910.1000	
Chromium			Occupational Worker 0.1 mg/m^3 Ceiling (as CrO_3) 0.5 mg/m^3 TWA (as Cr compounds.) 1 mg/m^3 TWA (as Cr metal)	29CFR1910.1000	Hexavalent Chromium is a Confirmed Carcinogen.
Lead (as Pb)			Occupational Worker 30 µg/m^3 Action Level 50 µg/m^3 TWA	29CFR1910.1025	
Lithium (as a hydride)			Occupational Worker 0.025 mg/m^3 TWA	29CFR1910.1000	

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SUBSTANCE	SURFACE LIMITS	SOURCE	AIR LIMITS	SOURCE	REMARKS
Silver (as Ag)			Occupational Worker 0.01 mg/m^3 TWA (metal & soluble compounds)	29CFR1910.1000	
Niobium (as Se) (See Remarks)			Occupational Worker 0.2 mg/m^3 TWA (compounds)	29CFR1910.1000	Selenium values used in place of Niobium.
Nickel (as Ni)			Occupational Worker 0.1 mg/m^3 TWA (metal and soluble compounds) 1 mg/m^3 TWA (metal and insoluble compound)	29CFR1910.1000	
Salts					
Cyanides (as CN)			Occupational Worker 5 mg/m^3 TWA	29CFR1910.1000	
Sodium Cyanide			Occupational Worker 5 mg/m^3 TWA (as CN only)	29CFR1910.1000	
Barium Cyanide			Occupational Worker 0.5 mg/m^3 TWA (as Ba soluble compounds) 5 mg/m^3 TWA (as CN)	29CFR1910.1000	
Cadmium Cyanide			Occupational Worker 0.1 mg/m^3 TWA (as Cd fume) 0.2 mg/m^3 TWA (as Cd dust) 0.3 mg/m^3 Ceiling (as Cd fume) 5 mg/m^3 TWA (as CN)	29CFR1910.1000	
Barium Chloride			Occupational Worker 0.5 mg/m^3 TWA (as Ba soluble compound)	29CFR1910.1000	
Solvents					
Trichloro-ethylene			Occupational Worker 50 ppm TWA 270 mg/m^3 TWA 200 ppm STEL 1080 mg/m^3 STEL	29CFR1910.1000	
Chloroform (Trichloro-ethane)			Occupational Worker 2 ppm TWA 9.78 mg/m^3 TWA	29CFR1910.1000	Suspected Carcinogen

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SUBSTANCE	SURFACE LIMITS	SOURCE	AIR LIMITS	SOURCE	REMARKS
Methyl Chloroform (1,1,1-Trichloro-ethane)			Occupational Worker 350 ppm TWA 1900 mg/m^3 TWA 450 ppm STEL 2450 mg/m^3 STEL	29CFR1910.1000	
1,1,2-Trichloro-ethane			Occupational Worker 10 ppm TWA 45 mg/m^3 TWA	29CFR1910.1000	Protection from skin contact required.
Carbon Tetra-chloride (Tetra-chloro-methane)			Occupational Worker 2 ppm TWA 12.6 mg/m^3 TWA	29CFR1910.1000	Suspected Carcinogen
Ethylene Dichloride			Occupational Worker 1 ppm TWA 4 mg/m^3 TWA 2 ppm STEL 8 mg/m^3 STEL	29CFR1910.1000	
Acetone			Occupational Worker 750 ppm TWA 1800 mg/m^3 TWA 1,000 ppm STEL 2400 mg/m^3 STEL	29CFR1910.1000	
Benzene			Occupational Worker 0.5 ppm Action Level 1 ppm TWA 5 ppm in 15 min. max.	29CFR1910.1028	Confirmed Carcinogen
Toluene			Occupational Worker 100 ppm TWA 375 mg/m^3 TWA 150 ppm STEL 560 mg/m^3 STEL	29CFR1910.1000	
Methyl Ethyl Ketone Peroxide (MEKP)			Occupational Worker 0.7 ppm Ceiling 5 mg/m^3 Ceiling	29CFR1910.1000	
Methylene Chloride (Dichloro-methane)			Occupational Worker 500 ppm TWA 1,000 ppm Acceptable Ceiling 2,000 ppm 5 min in any 2 hrs (Acceptable Maximum Peak)	29CFR1910.1000	Suspected Carcinogen
Xylenes (m-, o- & p-isomers)			Occupational Worker 100 ppm TWA 435 mg/m^3 TWA 150 ppm STEL 655 mg/m^3 STEL	29CFR1910.1000	

SUBSTANCE	SURFACE LIMITS	SOURCE	AIR LIMITS	SOURCE	REMARKS
2-Butanone [Methyl Ethyl Ketone (MEK)]			Occupational Worker 200 ppm TWA 590 mg/m^3 TWA 300 ppm STEL 885 mg/m^3 STEL	29CFR1910.1000	
Perchloro-ethylene (Tetra-chloro-ethylene)			Occupational Worker 25 ppm TWA 170 mg/m^3 TWA	29CFR1910.1000	
Ethylene oxide (Oxirane)			Occupational Worker 0.5 ppm TWA (Action Level) 1 ppm TWA (Permissible Exposure Limit) 5 ppm in 15 min. STEL (Excursion Limit)	29CFR1910.1047	Confirmed Carcinogen
Di-sec octyl phthalate (Di-2-ethylhexyl-phthalate)			Occupational Worker 5 mg/m^3 TWA 10 mg/m^3 STEL	29CFR1910.1000	
Ethylene Glycol			Occupational Worker 50 ppm Ceiling 125 mg/m^3 Ceiling	29CFR1910.1000	Suspected Carcinogen
Hydrazine			Occupational Worker 0.1 ppm TWA 0. 1 mg/m^3 TWA	29CFR1910.1000	Suspected Carcinogen Protection from skin contact required.
Benzidine			Occupational Worker No allowable exposure limits have been defined.	29CFR1910.1010	Confirmed Carcinogen
Formalde-hyde			Occupational Worker 0.5 ppm Action Level 1 ppm TWA 2 ppm STEL in 15 min.	29CFR1910.1048	Confirmed Carcinogen
Butadiene (1,3-Butadiene)			Occupational Worker 1,000 ppm TWA 2,200 mg/m^3 TWA	29CFR1910.1000	Suspected Carcinogen
Penta-chloro-phenol			Occupational Worker 0.5 mg/m^3 TWA	29CFR1910.1000	Protection from skin contact required.
Pyridine			Occupational Worker 5 ppm TWA 15 mg/m^3 TWA	29CFR1910.1000	

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SUBSTANCE	SURFACE LIMITS	SOURCE	AIR LIMITS	SOURCE	REMARKS
Ethyl Alcohol (Ethanol)			Occupational Worker 1,000 ppm TWA 1,900 mg/m^3 TWA	29CFR1910.1000	
Methyl Alcohol (Methanol)			Occupational Worker 200 ppm TWA 260 mg/m^3 TWA 250 ppm STEL 325 mg/m^3 STEL	29CFR1910.1000	Protection from skin contact required.
Fuel, Fuel Oils, Oils and Oil Sludges Gasoline Oil Mist, Mineral			Occupational Worker 300 ppm TWA 900 mg/m^3 TWA 500 ppm STEL 1,500 mg/m^3 STEL 5 mg/m^3 TWA	29CFR1910.1000 29CFR1910.1000 29CFR1910.1000	
Acids					
Sulfuric Acid			Occupational Worker 1 mg/m^3 TWA	29CFR1910.1000	
Nitric Acid			Occupational Worker 2 ppm TWA 5 mg/m^3 TWA 4 ppm STEL 10 mg/m^3 STEL	29CFR1910.1000	
Hydrochlor-ic Acid (Hydrogen Chloride)			Occupational Worker 5 ppm Ceiling 7 mg/m^3 Ceiling	29CFR1910.1000	
Hydrofluor-ic Acid (as F) (Hydrogen Fluoride)			Occupational Worker 3 ppm TWA 6 ppm STEL	29CFR1910.1000	Etchant Solution
Chromic Acid and Chromates			Occupational Worker 0.1 mg/m^3 Ceiling (as CrO_3) 0.5 mg/m^3 TWA (as Cr)	29CFR1910.1000	Plating Solution
Bases					
Sodium Hydroxide			Occupational Worker 2 mg/m^3 Ceiling	29CFR1910.1000	
Potassium Hydroxide			Occupational Worker 2 mg/m^3 Ceiling	29CFR1910.1000	

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SUBSTANCE	SURFACE LIMITS	SOURCE	AIR LIMITS	SOURCE	REMARKS
Aluminum Sulfate			Occupational Worker 2 mg/m^3 TWA (as Al)	29CFR1910.1000	
Nickel Carbonyl			Occupational Worker 0.001 ppm TWA 0.007 mg/m^3 TWA (as Ni)	29CFR1910.1000	
Particulates, Fibers and dusts					
Asbestos			Occupational Worker 0.1 fiber/cc TWA(Action Level) 0.2 fiber/cc TWA 1 fiber/cc in 30 min. period (Excursion Limit)	29CFR1910.1001	Confirmed Carcinogen
Inert Particulate Material			Occupational Worker 15 mg/m^3 TWA (total dust) 5 mg/m^3 TWA (respirable fraction)	29CFR1910.1000	
TSCA Chemicals					
PCBs	Occupational Worker High-Contact Areas, and Low-Contact Indoor Impervious & Non-Impervious Surfaces 10 mg/100 cm^2 Encapsulated Low-Contact Indoor Impervious Surfaces 100 mg/100 cm^2	OSHA	Occupational Worker 0.5 mg/m^3 ChlorodiphenylTWA (54% chlorine) 1 mg/m^3 Chlorodiphenyl TWA (42% chlorine)	29CFR1910.1000	Protection from skin contact required.
DDT (Dichlorodiphenyltri-chloro-ethane)			Occupational Worker 1 mg/m^3 TWA	29CFR1910.1000	Protection from skin contact required.

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SUBSTANCE	SURFACE LIMITS	SOURCE	AIR LIMITS	SOURCE	REMARKS
Radionuclides					
Uranium (U-235&238) (α)	Occupational Worker 1,000 dpm/100 cm^2 (removable) 5,000 dpm/100 cm^2 (fixed plus removable) 1,000 dpm/100 cm^2 (removable) 5,000 dpm/100 cm^2 (average) 15,000 dpm/100 cm^2 (max.)	DOE 5480.11 Reg. Guide 1.86	Occupational Worker 0.05 mg/m^3 TWA (as U) (soluble compounds) 0.2 mg/m^3 TWA (as U) (insoluble compounds) 0.6 mg/m3 STEL (as U) (insoluble compounds) U^{235} and U^{238} $6x10^{-10}$ µCi/ml (very soluble) $3x10^{-10}$ µCi/ml (soluble) $2x10^{-11}$ µCi/ml (insoluble) U^{235} and U^{238} (DACs) $6x10^{-10}$ µCi/ml (very soluble) $3x10^{-10}$ µCi/ml (soluble) $2x10^{-10}$ µCi/ml (insoluble)	29CFR1910.1000 10CFR835, Appendix A DOE 5480.11 6CCR 1007-1, Pt. 4 Appendix B	
Beta-Gamma (w/cx Sr^{90}) ($\beta-\gamma$)	Occupational Worker 1,000 dpm/100 cm^2 (removable) 5,000 dpm/100 cm^2 (fixed plus removable) 1,000 dpm/100 cm^2 (removable) 5,000 dpm/100 cm^2 (average) 15,000 dpm/100 cm^2 (max.)	DOE 5480.11 Reg. Guide 1.86	Based upon the values for the individual Alpha emitting elements, i.e., Th^{234}.		Sr^{90} has the same surface contaminat ion values as Radon.

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SUBSTANCE	SURFACE LIMITS	SOURCE	AIR LIMITS	SOURCE	REMARKS
Radon (Rn^{220}, Rn^{222}) and its daughter products	Occupational Worker 200 dpm/100 cm^2 (removable) 1,000 dpm/100 cm^2 (fixed plus removable) 200 dpm/100 cm^2 (removable) 1,000 dpm/100 cm^2 (average) 3,000 dpm/100 cm^2 (max.)	DOE 5480.11 Reg. Guide 1.86	Occupational Worker Rn^{220} (Immersion DAC) $8x10^{-9}$ µCi/ml or 1.0 WL (annual average including background) Rn^{222} (Immersion DAC) $3x10^{-8}$ µCi/ml or 0.33 WL (annual average including background)	10CFR835, Appendices A&C DOE 5480.11 10CFR835, Appendices A&C DOE 5480.11	

Abbreviations:

DAC = Derived Air Concentration
WL = Working Level (100 pCi/l)
IAW = In Accordance With
PEL = Permissible Exposure Limit
TWA = Time Weight Average (over an 8 hour workshift)
STEL = Short Term Exposure Limit

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National Conversion Pilot Project
Stage I

Interim Measure/
Interim Remedial Action
(IM/IRA) Criteria

Revision 1
July 1, 1994

Submitted to:
U.S. Department of Energy - Rocky Flats Office
P.O. Box 928
Golden, Colorado 80402-0928

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Cooperative Assistance Agreement No:

DE-FC34-94RF00733

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National Conversion Pilot Project
Stage I

Interim Measure/
Interim Remedial Action
IM/IRA Criteria

Revision 1
July 1, 1994

Prepared by	M.S. Colalancia, BNFL Inc. EH&S	Date 7-1-94
Approved by	for M.L. Haupt, BNFL Inc. PM	Date 7-1-94
Approved by	D.R. Floyd, MSC PM	Date 7/1/94
Approved by	E. Nix, DOE-RFFO	Date

This Report was prepared by Manufacturing Sciences Corporation under Cooperative Assistance Agreement No. DE-FC34-94RF00733 with the Department of Energy - Rocky Flats Office.

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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
0	16 May 94	All	All	First Approved Issue	
1	1 July 94	All	All	Incorporates DOE comments	DR Floyd

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1.0 Introduction

The purpose of this document is to provide a set of bases for the IM/IRA Proposed Plan which will be used for the conduct of Stage II work of the NCPP. The criteria established have been reviewed and accepted by involved parties, namely, DOE-Rocky Flats Field Office (DOE-RFFO), the Colorado Department of Health (CDH) and US Environmental Protection Agency, Region VIII (EPA).

The NCPP evolved over an eighteen month period following a 1992 Secretary of Energy announcement that the DOE needed to begin looking at economic development as one of its post-production missions. Given this general direction, DOE-RFFO began considering economic development ideas for the Rocky Flats Plant which would be allowable under the provisions of the Interagency agreement in force between DOE-RFFO, CDH and EPA. Within three weeks, DOE-RFFO received an unsolicited proposal from MSC to conduct metals recycling at the Rocky Flats Plant. As part of establishing the criteria for this IM/IRA Proposed Plan, it is necessary to note that this IM/IRA Proposed Plan does not address the final cleanup action to be taken within the NCPP buildings. The final cleanup action would be covered by a closure plan at the conclusion of Stage III activities.

Also in 1992, the Rocky Flats Local Impacts Initiative (RFLII) was established as a Stakeholder group to help displaced workers and minimize community impacts resulting from the change in the Rocky Flats Plant mission. As a response to the former Secretary's announcement in June 1992, RFLII convened a process to develop community economic development criteria for projects proposed at Rocky Flats. In October, 1992, RFLII convened the first regulatory task force consisting of CDH, the EPA, and DOE-RFFO, and others to discuss questions raised within the community regarding economic development at Rocky Flats.

The NCPP was given approval by Secretary of Energy Hazel O'Leary on December 15, 1993, in a memorandum authorizing exploration of the MSC proposal. The memo provided for three stages within the pilot project, depending on Stakeholder support. The first two stages involve MSC under a cooperative agreement, and the third stage is to be competitively bid for recycling work.

Since this IM/IRA Criteria Document has been written for the purpose of providing a basis for the IM/IRA Proposed Plan used for Stage II activities, it is necessary to define what those activities are. The activities which will be performed in Stage II are the following:

- Cleanup of the described NCPP buildings to agreed upon standards;
- Declassification activities; and
- Process Verification activities.

2.0 Identification of Objectives/Directives/Criteria

2.1 Objectives

Based on the purpose and the activities which have been described above, it is necessary to define objectives, directives and criteria which surround it. The objective of the cleanup activity which will be performed during Stage II is to have operationally ready buildings for the conduct of Stage III operations by a private contractor. This includes the removal of extra machinery not required for eventual Stage III operations. The

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effectiveness of the cleanup activity will be demonstrated by post-cleanup surveying of the NCPP buildings. This post-cleanup survey information will be used to provide an environmental baseline for each NCPP building. This environmental baseline state of cleanliness will prevail through Stage III activities and at the conclusion of those activities, the buildings will be returned to DOE in that environmental baseline condition.

The objective of the declassification activity is to declassify remaining classified materials which may be present in the NCPP buildings. This declassification process is both metal parts and tooling declassification, as well as declassification of documentation which pertains to the prior production mission existing in a number of the NCPP buildings. The measure of success of the declassification activity is that the NCPP buildings would be open for use by non-Q Cleared individuals. Metals from declassification activities will be used eventually as feedstock materials for the Stage III activities.

The objective of the process verification activities is to verify that metals processing activities which may occur during Stage III could be successfully performed using equipment already set up in one of the NCPP buildings. The process verification activities are experimental in nature. The measure of success of the process verification activity is that the equipment which would be used for Stage III process would provide successful experimental results allowing for an envisioned metals manufacturing process to occur.

2.2 Compliance with Laws, Codes, Standards, Directives, and the Protection of Human Health and the Environment.

Compliance with laws, codes, standards, and directives is a function of the NCPP management system that is imbedded in the NCPP Quality Assurance Program. The primary elements that ensure compliantoperations consist of trained individuals, utilizing controlled and approved procedures that can be directly traced to the applicable requirements, and verifying procedural compliance through assessment activities.

NCPP activities shall not exceed current Air Operating Permits or their derivative APENs which are in force within the NCPP buildings. These activities will not violate the National Pollutant Discharge Elimination System (NPDES) permit which has been approved for these buildings. It is intended that any NCPP activities will not challenge the established building safety envelopes. Additionally, Interagency Agreement (IAG) activities will take precedence over NCPP activities. Therefore, the safety of the public and the environment are maintained.

Stage I of the NCPP identified standards which relate to the cleanup of the identified buildings and requirements concerning health and safety of the worker during remediation activities. These standards for cleanup have been described in the Characterization Work Plan and have had review by CDH and EPA. The IM/IRA Proposed Plan cleanup activities would have the NCPP buildings cleaned up to these agreed upon standards.

3.0 Hazard and Operational Assessment

For the IM/IRA Proposed Plan, Hazard and Operational assessments are necessary criteria in preparing this document. They are necessary because they provide useful background information regarding the potential for personnel exposures within these buildings due to the presence of production residues. Hazards Assessment also allows for recognition of chemical hazards, and hazards other than chemicals, such as physical

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hazards, and environmental hazards. Also identified during Hazard Assessment are the current engineering controls necessary to maintain the building safety envelopes, administrative procedures to maintain the health and safety of workers during Stage II activities, and the necessity to perform additional characterization of these facilities so that an environmental baseline report can be made. This environmental baseline report will provide the baseline condition that the buildings will be maintained in and returned to DOE in at the completion of recycling activities by the private contractor at the end of Stage III.

Operational Assessments are performed to determine the current operating condition of the equipment within the NCPP buildings. This IM/IRA Proposed Plan criterion must be met so that individuals who will be performing declassification activities and process verification activities are not jeopardizing their health or safety by doing so. Operational assessments therefore describe physical hazards, such as electrical safety shortcomings, stored energy issues, broken equipment, or equipment needing replacement. All of these issues must be addressed during operational assessment so that the health and safety of workers is ensured.

4.0 Proposed Action

As previously mentioned, the Proposed Action for this IM/IRA Proposed Plan is to clean up NCPP buildings, to declassify classified parts, tooling and other materials, and to perform process verification activities (for Stage III). These activities are the basis of the IM/IRA Proposed Plan. This Proposed Action will allow for privatization of processes within these buildings. These buildings are currently considered surplus, having no future defense mission. Therefore, this Proposed Action will allow for use of otherwise idle equipment and facilities.

5.0 Comparison of Proposed Action with "No Action" Alternative

The reason for comparing the proposed action with the "No Action" alternative is so that National Environmental Policy Act (NEPA) values can consider the impacts of the proposed action and the "No Action" alternative on human health and the environment. Traditionally, NEPA values such as wetlands and flood plains threatened and endangered species and cultural resources are addressed. However, this project is located in an industrial area and the activities involved are virtually the same as the activities which were performed in these buildings in the past. The specific impacts considered for this IM/IRA Proposed Plan have been outlined below:

- Air quality impacts
- Water quality impacts
- Personnel exposure
- Socioeconomic impacts
- Transportation impacts
- Cumulative impacts

6.0 NCPP Stage II Work Plan Implementation

The IM/IRA Proposed Plan shall be implemented via Stage II Work Plan. These criteria is important to have established because the method by which work is performed must be specifically controlled. The Stage II Work Plan is written as a Project Management Plan (PMP). This PMP sets forth with DOE the plans, organization and systems that will be utilized by those responsible for managing a project. The PMP is developed by the DOE Project Manager and concurred with by the Program Secretarial Officer and approved by

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the Head of the Field Element. The PMP is essentially the scope of work, or the specification to be performed by a contractor. For the purposes of the NCPP, the Stage II PMP was developed by the DOE, Stakeholders, MSC, regulators and other project participants. The NCPP Stage II PMP describes DOE's work scope to be completed by MSC during Stage II for the IM/IRA Proposed Plan

7.0 Public Involvement Process

The public must be involved during public comment periods. The comments and acceptance of the public regarding this project is a very important criterion. Without public acceptance, this project would not occur. To meet this criterion, MSC has been involved with public outreach programs, and has taken active roles during all of the planning to ensure that the public has been kept informed. This IM/IRA Proposed Plan can be reviewed and commented upon by the public. These public comments will be resolved as part of the public involvement process.

8.0 Bibliography

To ensure that the IM/IRA Proposed Plan has a technically acceptable basis, a bibliography of the reference materials is included within it. Additionally, the bibliography includes the supporting documentation produced during Stage I.

National Conversion Pilot Project
Stage I

Survey Report Volume I - Summary

Revision 2
29 September 1994

Submitted to:
U.S. Department of Energy - Rocky Flats Office
P.O. Box 928
Golden, Colorado 80402-0928

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REVIEWED FOR CLASSIFICATION/UCNI
By [illegible] U/NU
Date 12-6-94

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National Conversion Pilot Project
Stage I

Survey Report Volume I - Summary

Revision 2
29 September 1994

Prepared by	M.S. Colalancia, BNFL Inc. EH&S	9.29.94 Date
Approved by	M.L. Haupt, BNFL Inc. PM	9/29/94 Date
Approved by	D.R. Floyd, MSC PM	Date 9/29/94
Approved by	E. Nix, DOE-RFFO	9/30/94 Date

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National Conversion Pilot Project
Stage I

Survey Report Volume I - Summary

Revision 2
29 September 1994

Prepared by	M.S. Colalancia, BNFL Inc. EH&S	Date 9.29.94
Approved by	M.L. Haupt, BNFL Inc. PM	Date 9/29/94
Approved by	D.R. Floyd, MSC PM	Date 9/29/94
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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
0	16 May 94	All	All	First Approved Issue	
1	30 June 94	All	All	Incorporates DOE Comments and recently received analytical data. Chemical Inventories and Damaged Asbestos issued as Volume V.	
2	29 Sept. 94	All	All	Incorporates EG&G comments	

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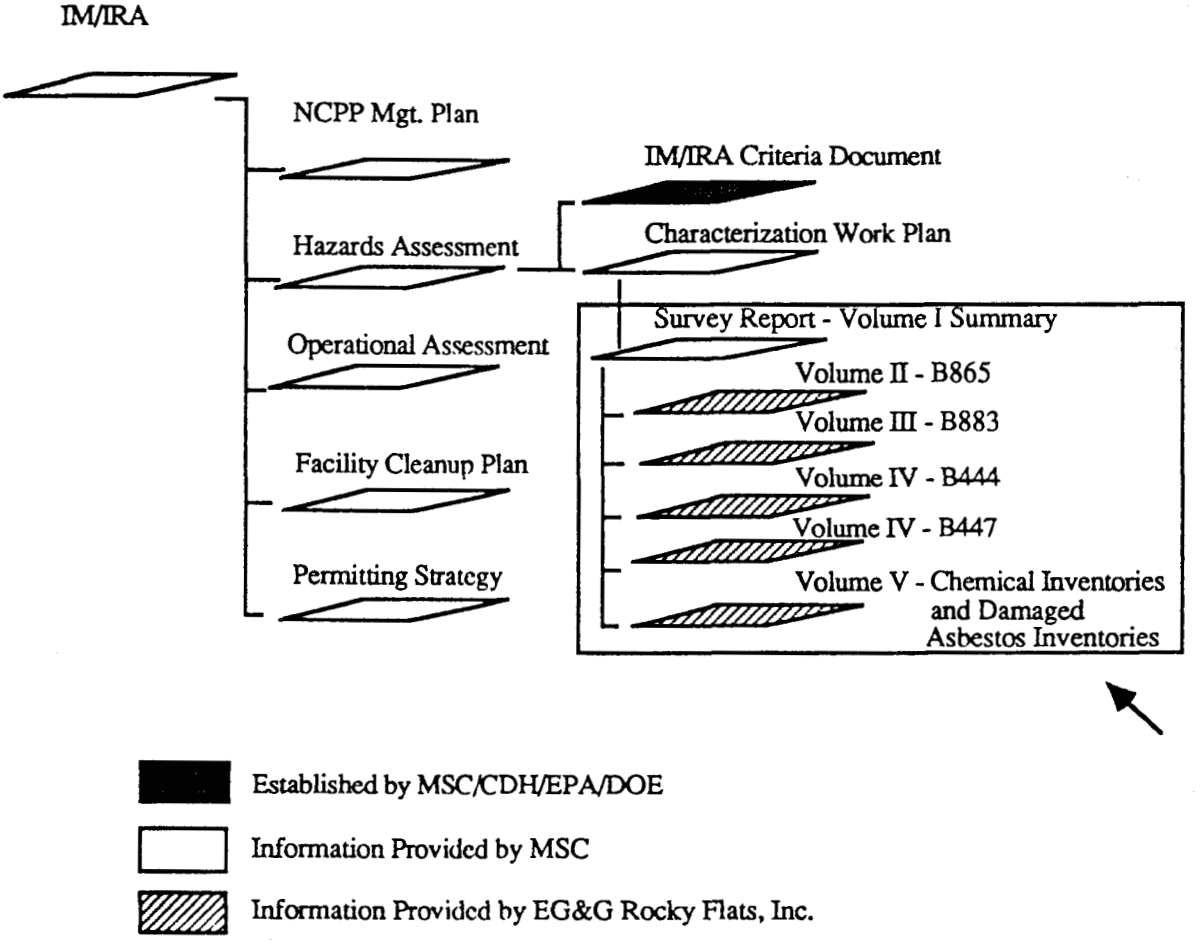
1.0 Introduction

The purpose of this report is to compile and summarize existing hazards information gathered from EG&G Rocky Flats, Inc., the M&O Contractor for the NCPP Buildings. This information is supplied in Volumes I to V. The middle four volumes of this information compile, on a building-specific basis, beryllium surveys and radiation surveys which had been taken to support other activities of EG&G Rocky Flats, Inc. However, the survey information is also useful to this project. Volume V compiles chemical inventories and damaged asbestos inventories for all NCPP buildings. Combined, the information contained in Volumes II to V will be used to formulate responsibly planned activities to perform an Interim Measure/Interim Remedial Action (IM/IRA). This method has been chosen as the vehicle to perform cleanup for interim reuse of the NCPP buildings. A conceptual description of where the Survey Report fits into Stage I of the project is illustrated in Figure 1.0-1. This Survey Report constitutes the foundational component of qualitative Hazards Assessment for the NCPP buildings. The second, complementary component of the Hazards Assessment is the Characterization Work Plan, which identifies additional characterization needs for the NCPP buildings and equipment based upon analysis of the data summarized in this Survey Report-Volume I Summary. Third component of the Hazards Assessment activity is the determination of IM/IRA Criteria. The IM/IRA Criteria document takes into account criteria established by MSC, DOE, CDH and EPA Region VIII.

Figure 1.0-1. Relationship of the Survey Report to the Project



From this Survey Report, portions of its content have been reproduced in other reports intentionally, so that the flow of ideas between documents can be enhanced.

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2.0 Beryllium Survey Summary

Table 2.1-1 Beryllium Survey Summary

Survey Type	Total number of Samples	No. Beryllium Samples >Det.Level and <1.07µg/100cm^2	No. Beryllium Samples >1.07µg/100cm^2 and <2.15µg/100cm^2	No. Beryllium Samples >2.15 g/100cm^2 and <2.7g/100cm^2	No. Elevated Beryllium Sample Results* (>2.7 µg/100cm^2)	Locations of Elevated Sample Values
Building 865						
Special Be Smear Surveys	667	223	11	0	7	1750 Ton Press Area, Room 145
Routine Be Smear Surveys	2912	16	4	0	2	Machine Shop, Room 136
Routine Fixed Airhead Be Sampling Surveys† (>0.0005mg/m^3)	2952	Not Applicable	Not Applicable	Not Applicable	Not Applicable	No samples above the Plant Action Level Noted.
Building 883						
Special Be Smear Surveys	1549	400	10	0	2	Thermolyne Furnace, Room 104
Routine Be Smear Surveys	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Known
Routine Fixed Airhead Be Sampling Surveys (>0.0005mg/m^3)	Not Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Known
Building 444/7						
Special Be Smear Surveys	957	787	16	0	13	Lathes in Room 101
Routine Be Smear Surveys	Not Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Known
Routine Fixed Airhead Be Sampling Surveys (>0.0005mg/m^3)	Not Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Yet Evaluated	Not Known
Total Number of Samples	9037	1426	41	0	24	

*Based upon the standards identified in Health and Safety Practices Manual Procedure No. 13.04.

†Airhead Sampling for Beryllium in Building 865 was suspended in September 1991 due to internal policy changes.

Since the Routine Beryllium Surveys were not yet evaluated in these buildings, it is not known if an area of beryllium contamination exists past the special surveys taken.

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For additional information regarding specific beryllium surveys by date, room or equipment piece (if originally surveyed), please refer to the following Survey Report volumes where they have been compiled:

- Survey Report Volume II - Building 865
- Survey Report Volume III - Building 883
- Survey Report Volume IV - Building 444/7

Of the 9037 samples reviewed, 1426 of them were recorded at values greater than detectable levels and less than the value of 1.07μg/100cm^2. This represents approximately 15.8% of the sample set observed. There were 41 elevated samples within the range greater than 1.07μg/100cm^2 and 2.15μg/100cm^2. This represents approximately 0.5% of the entire set of samples observed. No samples fell within the range greater than 2.15 g/100cm^2 and 2.7g/100cm^2. There were 24 sample values observed to have beryllium levels >2.7 μg/100cm^2. This represents approximately 0.3% of the total number of samples taken within all of the buildings combined.

The rest of the samples reviewed were observed to be non-detectable for beryllium contamination. The total number of samples with non-detectable levels was 7537. This number represents approximately 83% of the entire sample set observed.

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3.0 Radiation Survey Summary

Table 3.1-1 Radiation Survey Summary

Survey Type (Taken in Counts Per Minute - cpm)	Number of Radiation Samples Taken	Number of Elevated Sample Values* (>100dpm/100cm^2)	Locations of Elevated Sample Values
Building 865			
Alpha Radiation (Removable) cpm	2855	1428	Room 136 and 145: 1750 Ton Extrusion Press Area
Alpha Radiation (Fixed) cpm	2997	600	Room 145 Southeast Corner
Beta Radiation (Removable) cpm	2850	14	Radiation Control Area, Majority in Southeast Corner of Room 145
Beta Radiation (Fixed) cpm	2664	13	Selected Areas of Room 145
Building 883			
Alpha Radiation (Removable) cpm	1549	341	B-mill and B-mill Pit, A-mill, Erie Press
Alpha Radiation (Fixed) cpm	Not Yet Evaluated†	Not Yet Evaluated	Not Known‡
Beta Radiation (Removable) cpm	1549	565	Underneath B-mill. A-mill, Erie Press
Beta Radiation (Fixed) cpm	Not Yet Evaluated	Not Yet Evaluated	Not Known
Building 444/7			
Alpha Radiation (Removable) cpm	310	6	Overhead in Room 201
Alpha Radiation (Fixed) cpm	Not Yet Evaluated	Not Yet Evaluated	Not known
Beta Radiation (Removable) cpm	310	9	Overhead in Room 201
Beta Radiation (Fixed) cpm	Not Yet Evaluated	Not Yet Evaluated	Not Known
Total Number of Samples	15,084	2976	

* Based upon standards identified in Health and Safety Practices Manual Procedure No. 18.10.

† Those data not evaluated had not been taken during sampling activities.

‡ Since the direct radiation data was not evaluated, it could not be determined where elevated values would occur. These areas are therefore "Not Known".

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For additional, in-depth information regarding specific radiation surveys by date, room or equipment piece (if originally surveyed), please refer to Survey Report volumes where they have been compiled:

- Survey Report Volume II - Building 865
- Survey Report Volume III - Building 883
- Survey Report Volume IV - Building 444/7

Of the 15,084 combined radiation surveys compiled, there were 2976 samples having values >100dpm/100cm^2. Of the set of sample results, the pooled percentage of those samples considered elevated above this level is approximately 20% of all sample values. It is worth noting that this gathering of measurements >100dpm/100cm^2 is meant for project-specific purposes, and is 1/10 of regulated values for control of contamination due to depleted uranium.

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6.0 NCPP Building Chemical Inventories

The chemical inventories for the NCPP buildings were taken by EG&G Rocky Flats, Inc. personnel. In each of the buildings, the Operations Manager is responsible for the inventory of chemicals, therefore, there is a slight variation in the formats in which the inventories were compiled. In any event, the chemical inventories in these buildings are in the process of being removed by EG&G Rocky Flats, Inc. The dates of the inventories have been provided below:

- Building 865, taken on 02/18/94
- Building 883, taken on 04/12/94
- Building 444, taken on 06/06/94
- Building 447, taken on 06/06/94

In priority of chemical removal, those chemicals being regulated by RCRA are being removed first, followed by the remainder of the chemicals in the building. It is recommended that these chemicals be removed so that the Stage II work can be simplified. These inventories have been included in Volume V of this report.

7.0 Damaged Asbestos Inventories

Damaged asbestos materials inventories were historically compiled by EG&G Rocky Flats, Inc. within the NCPP buildings. Volume V contains these inventories of materials. These inventories only include damaged materials thought to contain asbestos. It is recommended that a Colorado State-certified subcontractor is retained in Stage II to develop comprehensive building inventories of asbestos and provide additional guidance to mitigating this potential hazard. These inventories of damaged materials were taken in the NCPP buildings on the following dates:

- Building 865, taken on 03/16/92
- Building 883, taken on 05/01/92
- Building 444, taken on 02/13/92
- Building 447, taken on 02/13/92

The current condition of the damaged materials as well as their characteristic identity which has been reported should be verified. It is the current plant practice; however, to identify materials which may contain asbestos, to contain them and to label them. It is not known whether State-certified Inspectors are currently used. Since the true extent of asbestos contamination is not known at this point, it should be determined early in Stage II.

8.0 Survey Conclusions

A variety of historical information was supplied by EG&G Rocky Flats Inc. The intent of the Survey Report was to compile and summarize this information. This information includes beryllium survey data, radiation survey data, chemical inventories and asbestos inventories. Combined, the information will be used to formulate responsibly planned activities to perform the IM/IRA. Therefore, conclusions provided here have direct utility in planning activities and have been included in that planning as it is appropriate.

Beryllium smear survey data and radiation survey data were compiled and compared between buildings. There were a variety of methods employed for specific survey data gathering between buildings. The data had been generated from various studies and activities. However, the way in which individual samples were taken in the field remained consistent throughout the buildings, using approved data gathering procedures. Since the emphasis of various studies and activities varied, it is inappropriate to compare this data in anything other than a qualitative way.

In Building 865, radiation smear surveys were taken in areas within the building in the Radiation Control Areas (RCA) including the general highbay area and some concentration around the 1750 ton extrusion press. Smear surveys were also taken of non-RCA areas which consisted of the office areas, maintenance areas, janitors' office, locker rooms and the cafetine. These same smear surveys were saved for further analysis of beryllium. Inadequate chain-of-custody protocols, as well as maps which were sometimes not directly linkable to the surveys in question, or illegible, made a complete evaluation of the data for this building difficult. The numbers of elevated results above indicate that only 9 elevated samples were found. Also worth noting is that of the baseline surveys taken, they included areas such as overheads, the tops of fluorescent lights, and the ceiling. None of these areas demonstrated elevated values.

In Building 883, however, surveys were taken to better discern beryllium contamination levels of the equipment in the building, the cabinetry, electrical panels and boxes, overhead walls, and ceiling areas. These beryllium samples were counted for radioactive contamination, and adequate chain-of-custody protocols were followed to ensure that data quality was controlled. Those samples were then analyzed at the Building 123 laboratories if their radiological contamination was not appreciable (<100 dpm/100cm^2). Those samples which had higher levels of radioactivity were taken to Building 559 laboratories for analysis. Additionally, where these samples were taken, maps were more easily relatable to the approximate area of the equipment, the highbay, the cabinetry and electrical control panels because greater care was taken when this data was gathered and because better descriptions of the data points were furnished. A more complete evaluation of this building was possible because the data was taken with better care.

In Building 444, surveys were taken to better discern beryllium contamination levels of the equipment in the building. Additional beryllium surveys were taken of the overhead areas in many of the rooms. A number of the samples never left the building. They were measured via the Beryllium Activated Swipe Tester (BeAST) which provides analytical capability for beryllium smear surveys in one of the rooms in the basement of the building. Additional beryllium samples were taken to Building 123 laboratory for analysis to expedite the effort. These beryllium samples were counted for radioactive contamination, and adequate chain-of-custody protocols were followed to ensure that data was quality controlled and that the samples could be removed from Building 444.

In Building 447, surveys were taken to better discern beryllium contamination levels of the equipment and structural areas of the rooms including their overheads. Some of the samples were analyzed via the BeAST, and some of the samples were taken to Building 123 laboratories for analysis. The fewest samples were taken in this building because of the relatively few historical operations involving beryllium or depleted uranium, as well as the small size of the building.

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In all NCPP buildings, it has been arranged that all chemicals which would be of no use to the NCPP would be removed. These chemicals are in the active process of being removed.

The nature and extent of asbestos in each of the buildings is speculative. The damaged asbestos material inventories obtained do not list asbestos containing material which is not damaged. An entire inventory of this material is therefore absent in all of the buildings.

In summary, although there was a variety of methods by which data was analyzed in the NCPP buildings, these samples were collected in a consistent manner, i.e. via smear techniques which are performed in a standard way throughout the plant site. It does not appear necessary to perform additional surveys for beryllium or radiation to augment the data already taken prior to the end of Stage I. However, some additional sampling should occur early in Stage II to provide a clearer understanding of the pre-cleanup condition of the buildings prior to initiation of cleanup activities. This sampling recommendation should be generated as part of the Characterization Work Plan. Chemical inventories should be verified to have been removed from the NCPP buildings, leaving only those materials useful in Stage II if they are present. Additionally, the damaged asbestos inventories obtained shall be improved upon to contain a comprehensive, complete asbestos inventory in each building. Further development work on these inventories, coupled with recommendations to mitigate the specific asbestos problems in the buildings should be performed using a State-certified Asbestos Identification, Removal and Isolation subcontractor. This will allow the NCPP to properly mitigate the asbestos containing materials within the buildings.

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National Conversion Pilot Project
Stage I

Operational Assessment

Revision 2
8 August 1994

Prepared for:

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DE-FC34-94RF00733

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Date 12-6-94

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National Conversion Pilot Project
Stage I

Operational Assessment

Revision 2
8 August 1994

Prepared by:	Carl M. Edstrom C. M. Edstrom, MSC	10/14/94 Date
Approved by:	M.L. Haupt M.L. Haupt, BNFL Inc. PM	10/14/94 Date
Approved by:	DR Floyd D.R. Floyd, MSC PM	10/14/94 Date
Approved by:	Elaine Nix E. Nix, DOE-COR	11-2-94 Date

This Report was prepared by Manufacturing Sciences Corporation (MSC) under Cooperative Assistance Agreement No. DE-FC34-94RF00733 with the Department of Energy - Rocky Flats Office.

This Report is intended for DOE-RFO's use. Such use, duplication and disclosure of this Report is to be in accordance with Contract No. DE-FC34-94RF00733.

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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
0	5/14/94	All	All	First Approved Issue	
1	6/14/94	All	All	Second Approved Issue	
2	8/8/94	All	Section 2 and 3	Expand Work Description on Section 3.1, 3.2, 3.3 and 4.0. Delete schedule to avoid duplication with Facility Clean Up Plan. Change Section 2 priority to numbers rather than letter to avoid confusion with EG&G maintenance packages priorities, also change priority on continuous air monitoring and fire door corrections.	DR Floyd 10/14/94

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1.0 Introduction

The Operational Assessment prepared during the National Conversion Pilot Project (NCPP) is performed to evaluate the building envelope and production equipment operating condition (Building and Equipment Readiness) and to prepare the buildings and equipment for private operation (Operational Preparedness). The current building envelope and equipment condition was assessed and a cost estimate for correction made. To prepare the buildings and equipment for private operation it will be necessary to declassify the four buildings and to verify the operating condition of the equipment. This operating condition verification will be accomplished in major part by testing the equipment through prototype production. This report data is incorporated in the IM/IRA, and has input in the overall budget of the project. The work activity of process verification and declassification is integrated into the work activities of the clean up and hazard assessment. Therefore; the work schedule of "Operational Assessment" has been integrated into the Facility Cleanup Plan Schedule.

2.0 Building and Equipment Readiness

In assessing the building envelope readiness, structure, Heating Ventilation and Air Conditioning (HVAC), process waste lines etc., were considered. Production Equipment readiness relates to the operational condition of the equipment needed for Stage II process verification and proposed Stage III activities. The data presented in this report was gathered from interviews with equipment operators, longtime building residents, building ventilation operators, and an offsite company that designed some of the HVAC systems. Review of existing maintenance work orders, building assessment reports from engineering maintenance surveys and facility engineering work estimates were also used to establish building and equipment condition.

The deficiencies noted are classified into three categories:

High Priority	Action I
Medium Priority	Action II
Low Priority	Action III

The criteria for establishing priority on building envelope deficiencies are:

Priority I - Items concerned with worker safety and primary environmental controls
Priority II - Items that improve the functionality of the building or add additional assurance of environmental protection
Priority III - Items that improve the appearance of the building or aid in maintaining the building cleanliness

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The criteria for establishing the priority on equipment deficiencies are:

Priority I - Equipment that needs repair to perform either the cleanup or declassification activities of Stage II

Priority II - Equipment needed during Stage II to fabricate prototype parts in process verification activities

Priority III - Deficiencies on equipment that may or may not be used during Stage III. Decision to proceed or cancel these deficiencies will occur late in Stage II.

This report summarizes the known deficiencies. It is important to note that none of the deficiencies in the buildings are critical issues where the environment or workers are at great risk. As work progresses, undoubtedly, more deficiencies in building systems and production equipment will be uncovered. EG&G has the responsibility for the building systems during Stage II and will be asked to address these deficiencies. Those deficiencies in building systems not resolved in Stage II will carry over into Stage III. Stage III will also address additional production equipment deficiencies.

Estimated costs have come from three sources. 1) Some deficiencies have been addressed by EG&G engineering and are in two levels of completion; some have outside contractor bid values, and others have facilities engineering estimates. 2) Outside inspections have been previously performed and the cost estimates are based on past charges. 3)The last category is the estimate by the report writer on the time and material needed to complete the job.

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2.1 Building 865 Envelope

Item#	Deficiencies	Action	Estimated Cost
2.1.1	Air supply fans for the HVAC are located over the Radiation Control Area (RCA). The intake should be relocated to a less suspect area.	I	ESO 402026 Est . $ 143,000
2.1.2	Cooling towers need rebuilding to remove both asbestos and bacteria. Contractor is Karley Co., Kansas City, MO. DOE's concern over asbestos has delayed project.	I	$100,000
2.1.3	Doors in the building are not fire rated due to penetrations of sign holes and windows.	I	Provided by OSHA Inspector
2.1.4	Cracked coupling in the health physics vacuum lines may affect flow of air through the sample filters.	II	$1600 labor
2.1.5	The steam heating system show signs of corrosion. Preheating coils need replacement Same problem in Building 883.	II	$20,000, materials $12,000 labor
2.1.6	Floor surfaces are damaged in the annex.	III	$1000, materials $4000 labor
2.1.7	Domestic hot water system needs evaluation. It will not match the demand for hot water at shower time, yet at times back flows into the toilet water.	I	$500, materials $4000 labor
2.1.8	The roof to wall joint between the main building and annex (room 172) allows rain and snow to leak within the Radiation Control Area (RCA). This presents a contamination control problem if the water flows back out of the buildings.	II	$500, materials $4000 labor
2.1.9	Air flow mapping of the building is required, with and without the shipping doors open.	I	$2000 (subcontract)
2.1.10	Repair and upgrade process waste system for the use of non-hazardous waste water.	I	Costs $30,000 (refer to Section 2.7)
2.1.11	Berm the exit doors and seal the wall and floor joints of the Building to contain contaminated water from a fire sprinkler head release.	II	$3000 materials $16,000 labor
2.1.12	Paint cleaned floors and walls.	III	$1000 materials $30,000 labor
2.1.13	Subcontract hoist and crane inspection.	I	$8000
2.1.14	Continuous air monitoring of building exhaust	I	$10,000
	Subtotal		$369,000, materials $61,600 labor

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2.2 Building 865 Production Equipment

Item#	Deficiencies	Action	Estimated Cost
2.2.1	ABAR vacuum furnace has a vacuum leak, probably in the door or heating element which passes through seals.	I	$4000 labor
2.2.2	Vacuum induction melting furnace needs rebricking before operating because lack of operation and no vacuum has introduced water in the bricks.	I	$12,000 labor $1000 material cost
2.2.3	The extrusion press has hydraulic leaks, that require emptying the oil storage tank to fix. Hydraulic oil can be reused.	I	$12,000 labor
2.2.4	The electron beam melting furnace has 1964 electronic controls which include a transformer with PCB's. For continued operation the power supply and controls should be replaced.	III	Quotes range from $70,000 to $300,000 depending on vendor.
2.2.5	Additional ventilation will be added to the rolling mill, Erie forming press, extrusion press and possible machine tools to better contain beryllium powder.	I	$96,000 engineering and materials. $30,000 labor
	Subtotal		$167,000 - $370,000 $58,000 labor

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2.3 Building 883 Envelope

Item#	Deficiencies	Action	Estimated Cost
2.3.1	C Side requires new preheat coils because the ammonia in the steam line has attacked the copper coil and brass valves. A & B side coils were recently replaced with steel coils which resist the ammonia but will corrode with the air in the lines and last about 10 years. A substitute material is needed.	II	$10,000 materials $4000 labor
2.3.2	The deminster filter brackets on the exhaust of C side are badly corroded due to improper operation setting when the caustic scrubber was in operation.	I	$500 material $4000 labor
2.3.3	Doors in the building are not fire rated due to penetrations of sign holes and windows.	I	Provide after OSHA inspection
2.3.4	Repair and upgrade process waste system for the use of non-hazardous waste water..	I	Cost $30,000 (refer to section 2.7)
2.3.5	Paint cleaned floors and walls.	III	$3000 materials $64,000 labor
2.3.6	Improved industrial floor lighting.	II	$16,000 materials $32,000 labor
2.3.7	Berm the exit doors and seal the wall and floor joints of the building to contain contaminated water resulting from fire sprinkler head release.	II	$8000 materials $32,000 labor
2.3.8	Air flow mapping of the buildings is required, with and without the shipping doors open.	I	$4000 (subcontract)
2.3.9	Subcontract hoist and crane inspection.	I	$15,000
2.3.10	Continuous air monitoring of building exhaust.	I	$10,000
	Subtotal		$96,500 $140,000 labor

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2.4 Building 883 Production Equipment

Item#	Deficiencies	Action	Estimated Cost
2.4.1	The motor on the roll grinder needs replacement.	II	Estimated cost $60,000 motor, installation and relocation.
2.4.2	The hydraulic pumps on both A & B side HPM presses are leaking and need replacement. B side Press requires electrical repair at on/off switch.	II	New pumps are on hand. $12,000 labor replacement & clean up.
2.4.3	The End Line preheat furnace on A side mill needs new heating elements and brick lining repair.	II	Heating elements on hand, new brick needed. $8000 labor plus $2,000 materials.
2.4.4	Reheat furnace on A side mill requires new thermocouples and heating element examination.	II	$2400 labor
2.4.5	A side rolling mill requires preventative maintenance operations (PMO) including gas charging at accumulator.	II	$2400 labor
2.4.6	Large die cart needs repair or replacement.	III	$2,000 - $15,000. $15,000 with used equipment replacement.
	Subtotal		$64,000-$77,000 $24,800 labor

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2.5 Building 444/7 Envelopes

Item#	Deficiencies	Action	Estimated Cost
2.5.1	The prefilters on the air intake of the HVAC system have been removed because in snow storms the filters plug and shut off the air supply. The fix is to extend the intake hooding, add a heater before the filter or move the filters behind the steel heating coils. With the filters behind the heating coils it will be necessary to clean the coils periodically.	I	No estimate of costs. A guess would be $200,000 to fix all five systems based on Building 865 estimate.
2.5.2	Only one fan is exhausting air from Bldg 444. The others are not functioning because the vanes are stuck shut. J. A. Jones should fix by July 1994.	I	Fix is in process.
2.5.3	The plating lab stills has residual chemicals left in the tanks. EG&G is scheduled to make the facility chemically neutral by end of FY1994.	I	Fix is in process.
2.5.4	Room 501 may have loose asbestos.	II	Fix is in process.
2.5.5	Repair and upgrade process waste system for use of non-hazardous wastewater..	I	Cost $30,000 (refer to section 2.7).
2.5.6.	EG&G Facility Engineering is designing berms for each building exit to contain any radiological spill.	I	Design is 90% complete. Cost estimate included in the completed design. $10,000, Materials $44,000 labor
2.5.7	Create a separate vacuum induction melting (VIM) area to melt beryllium. Utilize the existing air supply system of the 444 plating lab and increase the furnace hooding. Prepare plating lab for mold coating for beryllium casting.	II	$250,000 materials, engineering installation $184,000 labor
2.5.8	Air flow mapping of the building.	I	$10,000
2.5.9	Subcontract hoist and crane inspection.	I	$6,000
2.5.10	Continuous air monitoring of building exhaust.	I	$25,000
	Subtotal		$531,000 $228,000 labor

2.6 Buildings 444/7 Production Equipment

Item#	Deficiencies	Action	Estimated Cost
2.6.1	Each of the 8 Vacuum Induction Melting Furnaces require rebricking, since the brick has absorbed moisture during the three year shutdown.	I	$100,000, materials available
2.6.2	The vacuum system for the graphite shop is not working. The ducting needs modification at the beginning of Stage III and the vacuum will be fixed after this modification.	II	Engineering, installation $16,000 labor
	Subtotal		$100,000 $16,000 labor

2.7 Summary of Building and Equipment Readiness

Each building has deficiencies noted on the process water system. During the NCPP cleanup and production operations no hazardous wastewater will be generated, so the interim tanks and

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associated ancillary equipment in each building will undergo RCRA closure. The RCRA closure costs are not estimated, since the closure will be performed by EG&G Rocky Flats, Inc. The closure will satisfy the regulatory deficiencies; however, there are functional deficiencies that must be corrected to get the systems on line and to meet Liquid Waste Operations Waste Acceptance Criteria. Examples of these deficiencies include integrity of sumps, operation of pumps, checks on seals and valves on lines that have not been used for years. Also purchases of equipment to remove oil from the process water, and to remove suspended matter are required to meet the release standards of Building 374 waste water treatment.

The following table provides a summary of the predicted costs for correcting the deficiencies in each building. The table combines the material and labor costs.

The table reports the estimated costs per action category.

High Priority	Action I
Medium Priority	Action II
Low Priority	Action III

Bldg.	Action I		Action II		Action III	
	Bldg. Envel.	Prod Equip.	Bldg. Envel.	Prod Equip.	Bldg. Envel.	Prod Equip.
865	$297,500	$155,000	$57,100	-	$36,000	$70,000 to $300,000
883	$63,500	-	$106,000	$86,800	$67,000	$2,000 to $15,000
444/ 447	$325,000	$100,000	$434,000	$16,000	-	-
Total	$686,000	$255,000	$597,100	$102,800	$103,000	$100,000
	Grand total					$2,438,000

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3.0 Operational Preparedness

Part of the objective of Stage II is to prepare for Stage III operations. To accomplish this there are two major tasks to be performed:

1. Declassify the buildings by eliminating the classified parts and tooling from Buildings 883 and 444/7.

2. Establish the operational state of the equipment needed for Stage III and verify proposed processes for Stage III by fabricating prototype parts.

3.1 Declassification

The amount of parts and tools that need declassification is estimated (part inventory weights come from Production Control and tooling weights are estimated by the writers inventory) as:

Item	Bldg 883	Bldg 444
Stainless steel parts		70,000 lbs
Beryllium parts	70,000 lbs	
Uranium parts	20,000 lbs	18,000 lbs
Steel tooling	85,000 lbs	5,000 lbs
Aluminum tooling		4,000 lbs

To declassify this material will require one or two steps. With some of the large parts and tooling, it will be necessary to reduce the size before melting. Other parts can go directly to melting.

3.1.1. Beryllium Parts

Many of the beryllium parts will require stripping a coating and crushing to downsize. The stripping is done in an alkaline bath which will require installation of two 2x3x4 foot baths one for the alkaline liquid and the other for the rinse. These tanks will be located in room 245 of Building 444. This room is the old plating laboratory. The hoods and air system in this room are designed for chemical exhausting and beryllium has been previously coated in this room so no new contaminates will be added to the ventilation system. The room can also provide a method to confine any contamination that would occur. The cost of this decoating installation would include approximately $1000 for tanks and hood modification and 10 man days of labor to install.

The stripping is planned to be accomplished with 105 man days of effort, processing approximately 700 pounds per day. There will also be a charge of 30 man days to dismantle the equipment after performing the task.

After decoating, the parts will be crushed to size reduce. This will be accomplished on a 25 ton press that will be moved from Building 883 to Building 444. The press will be located in the

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beryllium machine shop and shrouded to contain the broken pieces and the powder created during the crushing. The beryllium filters and controlled air flow in the beryllium machine shop will assure that the beryllium is contained. The cost of moving and installing the press plus the enclosure/shroud to contain the beryllium is $3,000 for materials plus 45 man days of design and labor. The estimated effort to accomplish the crushing of the 70,000 pounds of beryllium parts is 280 man days; crushing an average of 500 pounds per day.

Melting will fully declassify the beryllium and would require 900 man days. To meet this schedule would require two 250 pound melts every 3 days. Prior to melting it will be necessary to rebrick two Vacuum Induction Melting (VIM) furnaces, modify the induction coil to accommodate the non-reactive ceramic crucibles, and build a wall to isolate the two furnaces. Building the wall will assure separation of the beryllium from the radioactivity contaminated scrap and utilitize a completely separate ventilation system. There are two ventilating systems for the former plating lab. The plans are to use the non arsenic ventilation system by constructing temporary vent lines from the vacuum pump and furnace exhaust. The cost for design, construction of the wall, modifications of the exhaust lines, and dismantling is 160 man days plus $4000 for materials.

It is estimated that 6 crucibles will be required to accomplish the 280 melting runs and that these crucibles will cost $3000 each plus an initial cost of $12,000 per furnace for the coil modifications to accommodate the ceramic crucible. Rebricking the two furnaces will require 100 man days. This rebricking cost is accounted for under the equipment repair costs.

3.1.2 Stainless Steel

To melt the stainless steel and steel tooling the VIM furnace will require rebricking, induction coil modification and installation of a ceramic crucible. The rebricking cost is 50 man days, but this cost is accounted for under equipment repair. The induction coil modification will be more expensive than the beryllium modification because the higher melt temperature of the stainless steel dictates more crucible support and a different crucible material. That cost is estimated to be $20,000 for the one furnace.

To melt the stainless steel parts, 70 melts of 1000 pounds each are required. Industry plans on 30 melts per crucible, so 3 crucibles will be required. The cost of a crucible is approximately $3000.

3.1.3 Uranium Parts

There are approximately 20 uranium parts that require compacting to reduce the volume. This work should be accomplished in 30 man days. The work is currently planned to be accomplished by EG&G under the work package entitled "Production Cessation and Disposition Program" to be completed by the end of November 1994. Complete declassification of all the uranium parts, including those compacted, will be accomplished by melting. MSC will accomplish this task in approximately 20 furnace runs with 40 additional man days. Melting the uranium will require a fourth VIM furnace to be rebricked and prepared for melting.

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3.1.4 Steel Tooling

The 90,000 pounds of classified tooling could be melted in approximately 90 furnace loads. This would require 180 man days plus 20 man days for record keeping and set up. It will also require 3 crucibles costing $9000 to make the 90 melts.

3.1.5 Aluminum Tooling

The classified aluminum tooling located in building 444 would be melted in 8 furnace loads and require a total of 20 man days.

3.1.6 Miscellaneous Classified Parts

The tantalum, vanadium, copper, titanium, etc. classified parts (quantity unknown), would be compacted and rolled to eliminate the classified aspects. The intended final disposition would be to sell as scrap metal. It is currently planned that EG&G will accomplish this task under the "Production Cessation and Disposition Program" as work progresses to compact the uranium and declassify Building 883.

3.1.7 Summary on Declassification

The total man day effort for eliminating the classified tooling and parts in buildings 883 and 444 would be approximately 2,155 man days. This estimate includes 1,475 man days of melting, 435 man days for size reduction and 245 man days for equipment modifications. The melting would require four melting furnaces, two for beryllium, one for uranium and one for steel and aluminum.

With this arrangement the casting days are:

Material	Furnace Loads	Days
Beryllium	280	150
Uranium	20	20
Stainless Steel, Steel, Aluminum	168	188

The forming press days for declassification are:

Material	Press (Bldg.)	Operation Days
Beryllium	Press (444)	140
Uranium *	Erie (883)	15
Miscellaneous Parts *	Erie (883)	5
* This work performed by EG&G personnel.		

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Man power requirements and material costs are:

Cost Summary for Declassification

Operation	Labor Estimate	Material Estimate
Beryllium - Strip coating from parts: Prepare Equipment Stripping Operation Remove Tanks	man days 10 105 30	$1,000
Beryllium - Crushing to downsize Prepare Equipment Crushing Operation	man days 45 280	$3,000
Beryllium Melting: Construct wall and modify ventilation Rebrick the two furnaces Melting Operation	man days 160 (100) [1] 900	 $4,000 ($2,000)[1] $42,000 (6 crucibles)
Stainless steel Melting Rebrick the furnace Modify Induction Coil Melting Operations	man days (50)[1] 315	 ($1,000)[1] $20,000 $9,000 (3 crucibles)
Uranium Parts: Rebrick the Furnace Downsize Operations Melting Operations	man days (50)[1] 30 40	$1,000[1]
Steel tooling melting	man days 200	$9,000 (3 crucibles)
Aluminum tooling melting	man days 20	
Miscellaneous Classified Parts	man days 20	
Total	2145 man days	$89,000

[1] The cost of rebricking the furnaces are previously accounted for in the equipment repair.

3.2 Process Verification Plan

In Stage II of the NCPP it will be necessary to identify and develop some processes for production as well as test the equipment. The selection of the processes to verify is influenced by the desires to test the operating condition of the equipment under load and to establish fabrication procedures for certain products. This will be done (for the most part) by prototype production of waste containers.

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3.2.1 Waste container prototype

Prototype fabrication of waste containers from radioactive contaminated steel would test the reheat capacity for rolling, establish rolling procedures, create the forming sequence and test the welding equipment. Participation in waste container process verification will also answer questions about leveling and cleaning the rolled steel.

Timing on this activity is difficult to predict because it relates to customer needs. Presently FERMCO is ordering 700 tons of radioactively contaminated B25 (100 cubic foot) waste boxes and supplying the carbon steel. Savanna River is ordering 200 tons of stainless steel drums and B25 waste boxes. Savanna River will also supply radioactive contaminated scrap for this order. These are the first orders for radioactively contaminated waste containers. Rocky Flats will not participate in any of these orders, but should consider partial participation in future orders using Rocky Flats generated material, so that the complete process (melting to fabricating) can be tested. The current order from Savanna River requires minimum participation to be 20 tons. Twenty tons is enough material to produce forty B25 waste boxes. This will require 1000 man days of effort to set up the equipment, establish the process, and fabricate the boxes. The box fabrication will begin the second year of Stage II and be completed before Stage III.

Rocky Flats will require coffee can size storage containers. Fabricating a part of these needs (approximately 50 containers) from recycled stainless steel will test the forming press and Hydrospin capability and establish a process. This will test the Hydrospin after the move from Building 865 to 883. It is estimated that 100 man days will be required to test and operate the moved machine, plus an additional 80 man days to roll sheet, machine tooling, form (utilizing 4 presses), and accomplish the heat treatments.

3.2.2 Beryllium-aluminum casting experiment

During Stage II a melting experiment will be performed utilizing the Electron Beam (EB) melting furnace to produce the Beryllium-Aluminum (Be-Al) alloy. This experiment is necessary to test the theory that solidification of the Be-Al alloy improves the grain structure. The EB melting furnace maximum size ingot is 6 inch diameter which is too small for commercial products; however, the Vacuum Arc Remelter (VAR) furnace located in Building 447 can cast 10 inch diameter ingot which matches commercial needs. The concept is to verify the theory on the beryllium contaminated EB furnace to justify contaminating the $3,000,000 VAR furnace. Forty man days of effort is planned to complete the experiment.

3.2.3 Beryllium-copper bonding experiment

The development of the International Thermonuclear Experimental Reactor (ITER) requires tiles of beryllium bonded to copper plate. By producing two 11 inch squares, several pieces of equipment within Building 865 can be operationally tested under load of fabrication. A preheating furnace and rolling mill is required to produce the plate. Trials to determine the bonding parameters require the operation of the Brew Vacuum Hot Press. Plate and bonding container preparation will test milling and lathe machines. Vacuum anneals of the plate require the ABAR

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vacuum furnace, and the final bonding will develop the operating procedure for the Hot Isostatic Press (HIP). The estimated cost of the process verification and equipment check is 55 man days.

Cost Summary for Process Verification

Operation	Labor Estimate
Protype Fabrication of forty 100 cubic foot boxes	1000 man days
Coffee can size storage containers (50)	180 man days
Beryllium-aluminum EB casting experiment	40 man days
Beryllium-copper bonding experiment	55 man days
TOTAL	1275 man days

3.3 Additional Equipment Assessment

The declassification and process verification activities test the operating conditions of most of the major pieces of equipment that will be retained for privatization. However,equipment remains that will not be tested by these two operations; since 390 inventoried items have been identified as needed to be retained. To account for the majority of the major pieces of equipment not fabrication tested, the following categories of equipment will be assessed by dry run operation:

1. Machining equipment (mills, lathes, grinders, etc.) will have all movement functions tested. (10 equipment items = 30 man days)
2. Metallurgical laboratory equipment (metallographs, hardness testers, tensile testing machine, grinder/polisher). Checks include light source on metallographs, calibration on hardness testers, movement speeds on the tensile tester, and waste water collection on polishers. (9 equipment items = 18 man days)
3. Annealing furnaces will be operated at 800°C to check temperature control and atmosphere. (4 furnaces = 12 man days).
4. The four identical vacuum induction melting furnaces (VIM) not used in declassify melts will not be tested. Their operational assessment will be assumed to be the same as the four put into operation. (2 man days recording).
5. The vacuum arc remelting (VAR) furnace is new and the operating acceptance test will be recorded as the operational assessment. (4 man days recording).
6. The extrusion press requires replacement of a gasket to prevent the oil reservoir from leaking. When this deficiency is corrected the press will be operated to check for proper ram movement and freedom of hydraulic leaks. There will be no extrusion because this requires heating a billet. When there is heat involved in the extrusion press operation the carbon dioxide fire extinguisher system must be charged and operable. (20 man days)
7. Pressurizing the cold isoatatic press (CIP) will verify the proper valve and limit switch operation. (10 man days)
8. Forming tests on the Hydroform press in Building 883. (8 man days)

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The additional equipment assessment activity will provide the data to create a file on all major pieces of equipment. That file will include the manufacturer's operating and maintenance manuals, the preventive maintenance operation (PMO) procedures, safety analysis for each operation, and operating procedures or instructions. Also the additional equipment assessment activity will assure that the drawings of each building are red lined to reflect the utility modifications made during Stage II.

Cost Summary for Additional Equipment Assessment

Operation	Labor Estimate
Correction of Existing Deficiencies	Refer to Section 2
Report of Operating condition of Major Equipment	
Equipment not tested by Process Verification or Declassification	104 man days
Equipment tested by Process Verification (22 items)	44 man days
Equipment tested by Declassification (8 items)	12 man days
Red Lined Building Utility Drawings	40 man days
TOTAL	200 man days

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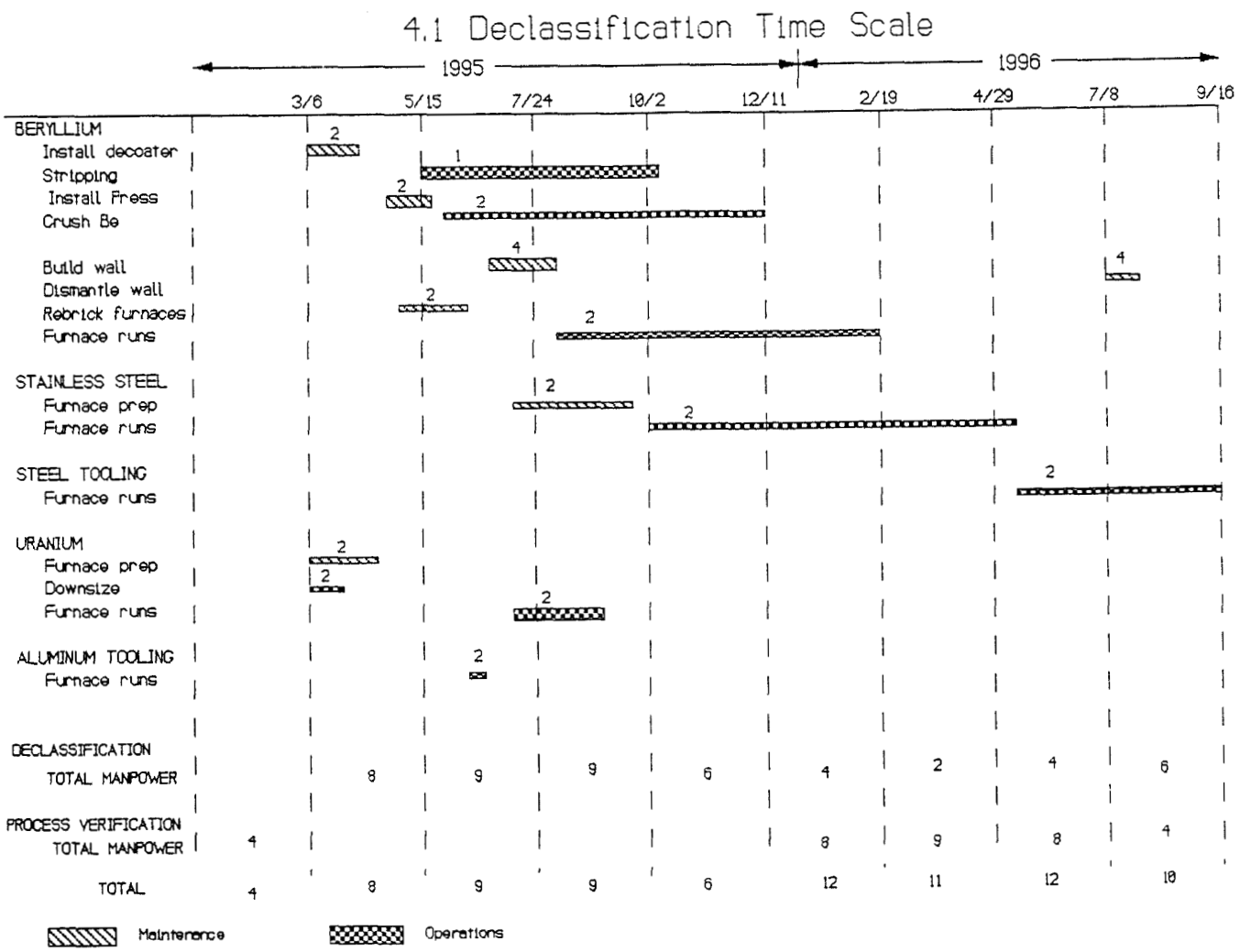
4.0 Schedule of Declassification and Process Verification Activities

The schedule for each activity of declassification is time line presented. These activities will begin March of 1995 and will be completed by September 1996. The work primarily involves melting in the foundry and will not interface with facility cleanup.

The schedule for the prototype fabrication during process verification is more flexible because the duration is shorter. The current plans have these activities beginning after the equipment involved has been cleaned and prepared for operation. The schedules of equipment cleanup have been meshed with these process verifications so that there are minimum interferences.

Each time line activity shows the planned man power requirements and by adding the manpower requirements for both the declassification and process verification, the total people requirement is known by quarter.



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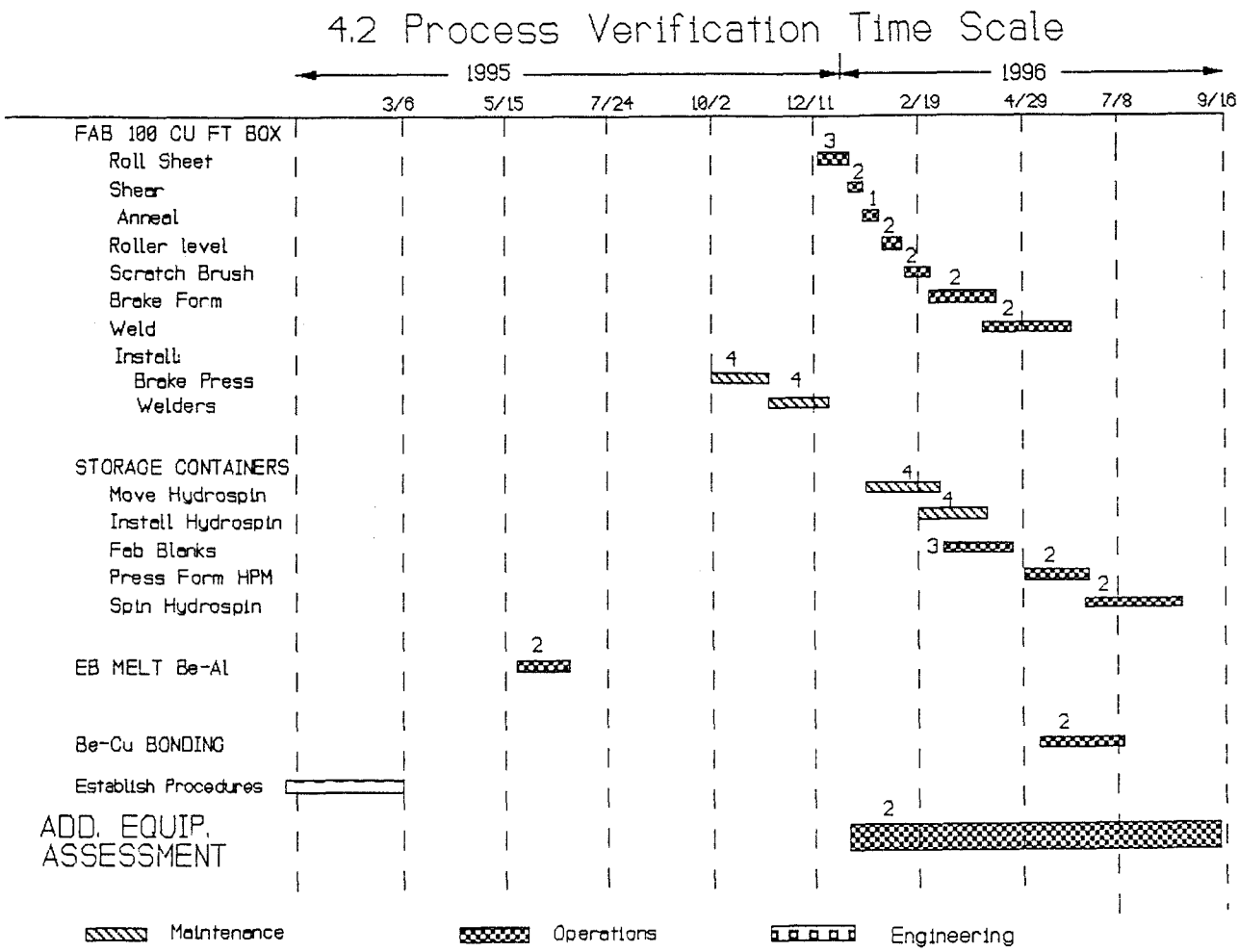

5.0 Summary of Operational Assessment

Deliverables resulting from Operational Assessment activities:

1. Four buildings with all classified removed and the scrap beryllium in a marketable form.
2. Reports on the process verification results including the procedures of fabrication.
3. Equipment operational assessment results will include the correction of the building and equipment deficiencies reported in Section 2, report of the operating condition of the major pieces of equipment (including a file on the manufacturers maintenance and operating manual, preventive maintenance operation (PMO) procedures, safety analysis for each operation, and operating procedures), and building drawings red lined to reflect the current utility and equipment condition of the building.

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National Conversion Pilot Project
Stage I

Facility Cleanup Plan
Buildings 865, 883 & 444/7

Revision 2
October 12, 1994

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National Conversion Pilot Project
Stage I

Facility Cleanup Plan
Buildings 865, 883 & 444/7

Revision 2

October 12, 1994

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Revision History

Rev	Date	Page	Para	Explanation	Approval Signature
0	10 June 94	All	All	First Approved Issue	
1	30 June 94	All	All	After incorporation of DOE comments	
2	12 October 94	Appen-dices		Figures, tables and drawings made into new appendices (A,B & C)	
		Appendix B		Now renumbered Appendix D	
		12	3.5	"requirements" added.	
		13	3.7	QAPP section rewritten in accordance with IM/IRA QAPP section.	
		25	Table 3.9-1	Step description column added. Table repositioned after section 3.9.1 for clarity.	
		25	3.9.3	Incorporation of DOE comments	
		26, 27, & 28	3.9.3.1	Section of wastewater cleanup rewritten and updated.	
		29	3.9.3.2	"managed in accordance with all waste requirements" added	
		30	3.9.3.4	"potential treatment" added to scrap metal paragraph.	
		30	3.9.4	Reference to Characterization Work Plan corrected.	
		58	12.0	Reference list updated	
		Appendix A	Figures A1-12	Logic diagrams modified. New logic diagram/matrix added. Text in section 3.3.1 (pg.10) modified/enlarged accordingly.	
		Appendix B	Tables B-1,2 & 3	Costs removed from tables and associated text.	
		Appendix B	Table 17	Updated	
		Appendix C	C-10, C-11 & C-12	Drawings modified to show extent of Option #2 coverage for building 444/7.	

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1.0 Introduction

This Facility Cleanup Plan for Buildings 865, 883, and a portion of Buildings 444 and 447 (the last two hereafter being referred to as Building 444/7) discusses how work within Stage II of the National Conversion Pilot Project (NCPP) will be carried out in order to prepare the buildings for Stage III operations. The three stages of the NCPP are:

Stage I - Planning
Stage II - Cleanup
Stage III - Metal recycling

This plan was prepared during Stage I of the NCPP.

The objectives (in order of priority) of Stage II operations in Buildings 865, 883, and 444/7 are:

1) to decontaminate and maintain identified equipment in Buildings 865, 883, and 444/7 for metal recycling operations in Stage III and to decontaminate and refurbish the building structure and internal areas suitable for those operations.
2) to decontaminate and remove any remaining equipment suitable for use elsewhere.
3) to decontaminate and store any remaining equipment suitable for use in Stage III as NCPP feedstock.
4) to decontaminate any suitable remaining equipment for disposal through government procedures.
5) to prepare and dispose of/store as waste any remaining equipment not falling into any of the above categories.

This Facility Cleanup Plan has been written to meet the above objectives. Specifically, this Plan is composed of the following elements:

1) Aims and objectives of Stage II Facility Cleanup Plan.

   i) Identification of Stage III start requirements.
   ii) Identification of cleanup standards.
   iii) Integration of cleanup standards with Stage I characterization results creating a decision tree for cleanup activities.
   iv) Provision of procedures to assure protection of human health and the environment.
   v) Identification of applicable and elimination of redundant requirements.
   vi) Formulation of a Quality Assurance Program Plan.
   vii) Identification of applicable cleanup technologies.

2) Identification and resolution of waste related issues.

   i) Identification of secondary waste streams.
   ii) Estimation of other quantities and types of waste/recycle material generated.
   iii) Identification of waste storage issues.
   iv) Identification of methods of disposal for hazardous chemicals.

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3) Current building condition.

4) Sequence and schedule/cost of operations.

   i) Schedule estimates
   ii) Cost estimates

This Cleanup Plan covers work in all the buildings comprising the NCPP. General issues affecting all buildings are considered initially followed by building-specific issues.

2.0 Assumptions Necessary in Stage II

Due to the nature of the NCPP and the unknowns remaining in the project buildings, a number of assumptions have been made in producing this Facility Cleanup Plan. In addition, a number of pre-requisites should have occurred before the start of Stage II operations. These are listed in the sections on waste (3.9) and labor requirements (4.0).

The assumptions made during the planning of Stage II are:

1) for planning purposes, DOE has exercised the opportunity to retain equipment deemed necessary for continued mission support.
2) that Stage II dismantling and removal will take place on the basis of the projected plans and estimates for Stage III manufacturing and that:
   i) DOE, as facility owners, retain first priority on any item for use either on or off plantsite.
   ii) the Stage III contractor has the next priority on any remaining items for Stage III operations.
   iii) any item having an appraised resale value in excess of the projected cost of decontamination will be considered for free release by DOE.
   iv) any remaining iron based items of suitable size and which can be adequately decontaminated, will be considered by the Stage III operator as feedstock.
   v) any remaining material will be prepared and disposed of as waste, with any decontamination as necessary to ensure it falls within LLW acceptance criteria.
3) none of the activities planned for Stage II will challenge the established safety envelope defined in applicable building Preliminary Safety Analysis Reports (PSARs).

This Facility Cleanup Plan is based on projected Stage III requirements, building information and the above assumptions.

3.0 General Cleanup Issues Applicable To All Buildings

3.1 Identification of Stage III Start Requirements

Equipment has been identified for projected Stage III operations in the NCPP buildings. Equipment has been inspected on plant and marked accordingly. The identification of equipment

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has been based upon the current operational plan for Buildings 865, 883, and 444/7 production operations. Minor items have not been identified at this stage although an allowance for handling these smaller items has been built into the time and waste estimates appearing in this plan..

3.2 Identification of Cleanup Standards Necessary

Equipment and buildings comprising the NCPP will be decontaminated as part of Stage II operations. Equipment will be cleaned down to contamination levels appropriate to whether the equipment is to be used by a private operator in Stage III, used by DOE elsewhere, retained for use as feedstock in Stage III, made available for transfer off-site or disposed of as waste. A cleanup standard has been identified for each of the above options. It should be noted that these cleanup standards represent the minimum cleanup standards acceptable and that lower contamination levels should be attained wherever financially practicable to meet As Low As Reasonably Achievable (ALARA) programmatic goals.

Cleanup standards appropriate for use during Stage II of the NCPP are as follows:

Table 3.2-1 .Cleanup Standards Applicable to the Stage II Cleanup Plan

		Uranium α & β/γ [1], [2], [3]			
	Beryllium $\mu g/100\ cm^2$	α Removable ($dpm/100\ cm^2$)	α Total (Fixed & Removable) ($dpm/100\ cm^2$)	β/γ Removable ($dpm/100\ cm^2$)	β/γ Total (Fixed & Removable) ($dpm/100\ cm^2$)
Stage III operations	2.7	1000	5000	1000	5000
Transfer to other Radiologically Controlled Areas on plantsite	2.7	1000	5000	1000	5000
Transfer to other DOE facilities	2.7	1000	5000	1000	5000
Decontamination for use as Stage III feedstock [4]	2.7	1.11×10^6	1.11×10^6	1.11×10^6	1.11×10^6
Release for unrestricted use off-site	2.7	1000	5000	1000	5000
Disposal as waste if not in the above categories	Refer to RFP Waste Management Requirements	Refer to RFP Waste Management Requirements	Refer to RFP Waste Management Requirements	Refer to RFP Waste Management Requirements	Refer to RFP Waste Management Requirements

[1] These values were obtained from the Health & Safety Practices Manual, EG&G Rocky Flats, Inc. Procedure No. HSP-18.10, Table I Radioactive Surface Contamination Limits for Unrestricted Release and Table II Radiological Surface Contamination Limit for Conditional Release/Transfer, Revision 0, November 1992.

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(2) These values are consistent with those found in DOE/EH-0256T, US DOE Radiological Control Manual, Revision 1, April 1994.

(3) These values are consistent with values practiced by the NRC in Regulatory Guide 1.86, Termination of Operating Licenses for Nuclear Reactors, June 1974.

(4) These values have been derived from calculations concerning the maximum allowable curie content of a waste product container in Stage III of 2 nCi/g. Based upon a container weight of approximately 1166 lbs. and considering an average feedstock item size of 12" x 6" x 6", a value of 1.11×10^6 dpm/100 cm^2 maximum allowable surface contamination for feedstock has been calculated. This is an initial estimate of the allowable contamination for feedstock and prior to recycle operations beginning, this figure will be revised in light of the information available at that time. In practical terms, this limitation on surface contamination is exceedingly unlikely ever to be approached since, firstly, current knowledge of the facility condition indicates no surface contamination levels anywhere near this figure and, secondly, the ALARA principle will be applied during Stage II operations ensuring contamination levels are maintained at a low level and reduced wherever reasonably achievable.

The above standards are the minimum to which decontamination work in Stage II will have to achieve for operations in Stage III to commence. These standards will be achieved and exceeded wherever possible and practical.

3.3 Integration of Cleanup Standards with Stage I Characterization Results Creating a Decision Tree for Cleanup Activities

One of the major unknowns included in the planning of Stage II operations during Stage I is that there are areas in all buildings which have not been completely surveyed for radiological or toxicological contamination. Examples of such areas are inside items of equipment, beneath equipment, in inaccessible areas due to height, in the bottoms of sumps, etc. Furthermore, total decontamination may, in some cases, turn out to be prohibitively expensive to achieve or impractical considering the projected usage of the equipment. As such, to explore the options open during Stage II of the NCPP, it is considered necessary to create a number of decision trees to guide decontamination work teams through the options open to them during the cleanup stage of the project. It should be noted that, despite the absence of full contamination information, analysis of operational history has indicated areas where high contamination is either known to exist or where it is probably present. The durations allowed for dismantling and decontamination in the Cleanup Plan allow for these expected contamination levels.

Section 3.2 noted the cleanup standards applicable for the various streams of equipment coming from Stage II of the project. It is the intention of the project to meet these criteria as a minimum and to exceed them (i.e., clean further) wherever practicably and financially feasible to meet ALARA programmatic goals.

The decision trees, referred to above, center around the decontamination necessary to achieve the appropriate cleanup standards (i.e., for use in Stage III operations, reuse elsewhere within the

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DOE, recycle, free release, and categorization as Low Level Waste (LLW) or Low Level Mixed Waste (LLMW)). These decision trees are based upon decontamination operations occurring in Steps 1-10 as detailed later and appear as Figures A1 to A10 in this plan.

The decision trees show how the need to comply with the various acceptance criteria for contamination affects the degree of contamination tolerable for an item of equipment or the degree to which successively more aggressive decontaminants are used to decontaminate equipment. Furthermore, it shows how contamination considered incapable of decontamination may be fixed in position so as to reduce the level of smearable contamination to acceptable levels. In this situation, administrative or engineered barriers will be implemented to ensure the contamination remains fixed. In each decision tree where materials are released from the buildings a series of decision points are included to help in ascertaining the route that equipment will take out of the building. These decision trees will be used in Stage II as guides to finalize work plans and schedules for equipment removal/maintenance.

An example of the requirement for decision trees is Building 865. The radiological and toxicological data for that building is incomplete for exposed surfaces. In all buildings there are inaccessible areas that cannot be monitored. Consequently, there are a significant number of areas with unknown contamination levels. This Cleanup Plan cannot be written with absolute knowledge of the scope of the contamination issue. Therefore, a means of deciding upon a course of action is necessary during the implementation of the plan. The decision trees will act as an aid for decision making during Stage II operations.

3.3.1 Decontamination Logic Diagram

In the decision trees for the 10-step process, the description of the decontamination method was left unspecified. The decontamination method was unspecified to simplify the diagram, as there are a number of decontamination technologies that can be applied to each step of the process.

Figure A11 represents the logic that is applied to the selection of the appropriate cleanup technique for each step (or item within a step if they are of varied contamination level, construction, or covering). Figure A11 shows the process to be in four basic phases:

Phase I From existing knowledge of the items to be cleaned within a cleanup step, a number of decontamination methods can be identified as being (or probably being) applicable and effective in decontaminating the item (by this stage, all the methods available will have been deemed appropriate for use in the project, particularly in reference to effluent compatibility with downstream processes). From a list of available methods, an order of application can be established. This order or preference will be based upon using the simplest (and least expensive) method first, then building up to sophisticated (and expensive) methods if all else fails. At this stage of project planning, it is not possible to say, categorically, what will and what will not be the method of decontamination. What can be determined is the order of application of decontamination methods. At the start of the cleanup process, all methods will be tried in order of preference to achieve the required cleanup standard. As experience

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is gained in cleanup techniques, some methods of decontamination of a particular item may be dropped from the applicability list if they are shown to be ineffective in achieving the required cleanup standard.

Phase II Phase II examines the application of a chosen decontamination method on an item or surface. Applications may be repeated or single action but in this representation, it is the same method that is being applied.

Phase III This phase concerns the evaluation of the effectiveness of the chosen decontamination technique. Depending upon how the contamination is believed to be attached to the item, this may be visually apparent (e.g., if contamination is held within a painted surface, and that painted surface has been removed using a chemical paint stripper, the progress of the decontamination will readily be apparent). True progress, however, will require evaluation via contamination samples taken from the item being cleaned. The evaluation of the smears may, in the case of radiological contamination, be readily made by a team worker with an instrument for measuring radioactivity. Measurement of other contaminants (e.g., beryllium) will require a more sophisticated measurement technique. As these types of measurements may take a significant period of time, it may be the case that such samples are only taken when the end result is believed to have been achieved. If the evaluation of effectiveness shows that the cleanup method is achieving results that are likely, by itself, to achieve the required cleanup standard, then re-application of that decontamination method will continue. If the method is shown to be ineffective, then a more aggressive/effective method will be selected.

Phase IV Phase IV allows for a re-evaluation of the ongoing decontamination process. Decontamination methods may be non-destructive or destructive. For example, washing is non-destructive, as an item can be washed indefinitely without it being harmed (exceptions to the basic rules can always be found). Grit blasting or scabbling, on the other hand, are destructive methods, as they both remove a surface layer from the item or area being cleaned. This phase allows for a re-evaluation of the proposed decontamination plan for an item or area. If a piece of equipment is being prepared for reuse in another location and fixed contamination remains at a level above that which is acceptable for reuse, then it is possible that, without destroying or damaging the item (and rendering it unusable), the item may never be suitable for reuse. If this is the case, then the item will be considered for recycle or disposal as waste. The effect of destructive decontamination on each item being cleaned for reuse will be assessed before application takes place. An example of this type of decision making process could be a precision item required for the operation of machinery to be used off site. If decontamination is required and the only effective method would render the piece unusable, then a decision will be made at that time on whether to continue with the decontamination process or whether to discard that item into the recycle or waste routes. A further example concerns engrained contamination in a concrete structural support member. Because grinding to remove the contamination may weaken the member, it may be preferable to leave the contamination in place and to protect workers and the environment from any

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residual hazard by fixing the contamination in place. In instances such as these, technical assistance from the appropriate person (e.g., structural engineer, health and safety manager) will be sought before proceeding with isolation or removal.

3.3.2 Decontamination Technique/Application Matrix

Figure A12 is a Decontamination Technique/Application Matrix that shows the order of preference in using suitable decontamination methods at each step of the cleanup process. The matrix is generic for each step, although it is anticipated that the identified suitable techniques will, in use, allow the required cleanup standard to be achieved. It may be possible, however, that a technique previously considered unsuitable may achieve cleanup in the case of particularly stubborn contamination. This table is not intended to state the only methods to be used for cleanup at each step but to indicate the preferred order of use of each method. The table does not preclude the use of any technique identified at any step of the cleanup process.

By examining the Decontamination Technique/Application Matrix in conjunction with the Decontamination Logic Diagram, it is possible to establish the process of decontamination method selection and the order in which these methods will be applied.

A more comprehensive description of each of the proposed decontamination methods for use in Stage II is given in Section 3.8 of this Plan.

3.4 Provision of Procedures to Assure Protection of Human Health and the Environment

Procedures have been identified in the EG & G Health and Safety Practices Manual which comply with DOE Orders regarding worker health and safety as they relate to these types of activities. These procedures will be adapted for the conduct of Stage II activities as they are applicable. Manufacturing Sciences Corporation (MSC) will provide additional procedures to Stage II as necessary.

3.5 Demonstration of how Proposed Work is in Accordance with Applicable Laws and Regulations

The proposed work is demonstrated to be compliant with applicable laws, requirements and regulations in the following way:

1) all applicable permits in force will be reviewed by the appropriate personnel responsible for compliance with them prior to conducting cleanup work in Stage II.
2) work is to be performed by trained employees who have demonstrated cognizance with workplace hazards. (Satisfies CFR 1910. 120 Hazards Communications).
3) wastes that will be produced are going to be handled according to applicable laws and regulations (40 CFR 260), DOE low level radioactive waste regulations and the Rocky Flats Environmental Technology Site (RFETS) Low Level Waste Management Plan.

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4) the Colorado Department of Public Health and Environment (CDPH&E) and the Environmental Protection Agency (EPA) will be given access to cleanup operations as they proceed.
5) project oversight of activities will be performed by MSC corporate and site quality assurance organization through the use of self assessment processes.
6) records will be generated during data gathering activities which are implicit to cleanup activities to provide a record of the safe work performance.

3.6 Identification of Applicable, and Elimination of Redundant, Requirements

Applicable requirements are provided in the NCPP Characterization Work Plan (Reference 1) and are applied as Occupational Safety and Health Administration (OSHA) worker protection requirements. Additional requirements to limit exposure to radiological substances are provided through the Health and Safety Practices Manual in force, as well as DOE approved radiological safety programs. These protection standards are consistent with other codified representations of standards for protection currently available.

Since the eventual aim of Stage II is to go from DOE Orders to commercial requirements, an example of this transition would be a change between the requirements of DOE Order 5480.11 to the requirements of 10 CFR 835 to the requirements of 10 CFR 20. In this example, DOE Order 5480.11 is replaced by DOE with the codified regulation in 10 CFR 835. The codified regulation under DOE would then transition to regulations for commercially licensed activities in 10 CFR 20, 'Standards of Protection Against Radiation'.

3.7 Formulation of a Quality Assurance Program Plan

At the onset of Stage II, prior to the commencement of operations, a Quality Assurance Program will be developed to control activities and ensure that products and services meet governing requirements and the requirements of internal and external customers. The program will be designed to meet the intent of DOE Order 5700.6C, Quality Assurance, and will embrace Total Quality Management (TQM) principles that delegate responsibility for process improvement to trained process owners.

DOE Order 5700.6C, Quality Assurance, is functionally organized by management, performance, and assessment. Table 3.7-1 depicts the Stage II Quality Assurance Program Structure and how the functional elements of the Order apply to the structure. While this simplified depiction represents the interaction between program elements and the Order, overlap exists since the Order influences all aspects of the program.

Figure 3.7-1 accurately depicts the hierarchy of the Quality Assurance Program as being the upper-most program from which all other programs are developed and implemented. Accordingly, the Quality Assurance Program is the means by which Stage II will be developed and implemented.

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As indicated in Figure 3.7-1, the assessment function envelops the performance and management activities, and provides a measurable means of determining program effectiveness and compliance. In accordance with the Order, assessment is the broad term that embraces surveillance, audit, and both independent and self assessment activities. Assessment combined with process owner initiated improvements result in continuous improvement of the program and overall effectiveness.

Table 3.7-1 Quality Assurance Program Structure

Management	Performance	Assessment
Program	Work Processes	Management Assessment
Personnel Training & Qualification	Design	Independent Assessment
Quality Improvement	Procurement	
Documents and Records	Inspection & Acceptance Testing	

Development of the Quality Assurance Program, while meeting the intent of DOE Order 5700.6C, Quality Assurance, will also incorporate applicable and relevant requirements from source documents, including, but not limited to:

- ANSI/ASQC E4, Quality Assurance Program for Environmental Programs
- ASME NQA-1, Quality Assurance Program Requirements for Nuclear Facilities
- ASTM C1009, Standard Guide for Establishing a Quality Assurance Program for Analytical Laboratories
- DOE-EM, Quality Assurance Requirements and Description
- 10 CFR 71, Subpart H, Quality Assurance
- EPA QAMS 005/80, Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans
- 10 CFR 21, Reporting of Defects and Noncompliance

In addition, development of the Quality Assurance Program will consider control elements, requirements, and guidance from quality assurance programs that are currently being utilized in commercial industries, such as the ISO 9000 (ANSI/ASQC Q90-1987) series.

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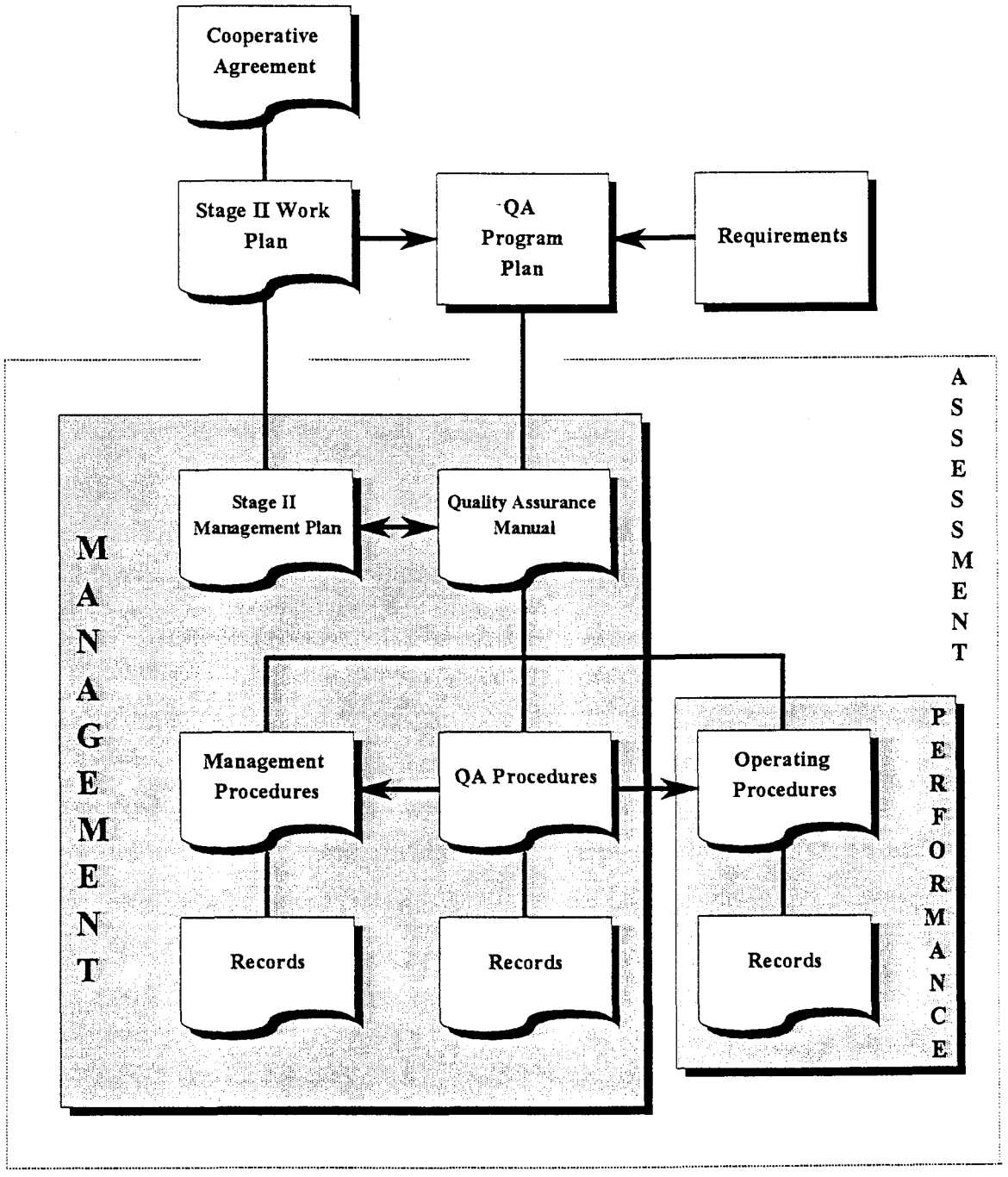
Figure 3.7-1 Stage II Quality Assurance Program Structure and Basis



The procedures depicted in the figure will be developed utilizing a graded approach, by which the degree of control is commensurate with the risk of the activity or process. This approach reduces the cost of program implementation, while insuring safe operations and minimizing the risk to the public, environment, workers and facilities.

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Implementation of the Quality Assurance Program will be carried out by employees that have received training that provides them with the appropriate tools and skills to meet the quality objective, and to actively participate in the continuous improvement process.

3.8 Identification of Cleanup Technologies to be Used

The Characterization Work Plan (Reference 1) qualitatively identifies the extent of the radiological and toxicological contamination known to exist throughout the surveyed areas of the NCPP buildings. Indications from this document show that in Buildings 865, 883 and 444/7 radiological surface contamination levels are generally <100 dpm/100cm^2 α and <100 dpm/100cm^2 β) i.e., less than the cleanup standards required for Stage II operations. Beryllium contamination levels are also generally <2.7μg/100 cm^2, i.e., less than the cleanup standards required for Stage II. The contamination levels referred to in the table in Section 3.2 are contamination levels above which decontamination is normally considered necessary.
The table below lists those areas having elevated contamination values as described above.

Table 3.8-1 Areas in NCPP Buildings Identified as Having Elevated Contamination Values

Building	Contaminated Area
Building 865 (see drawing C1)	Area surrounding the 1750 Ton extrusion press, Harper Pit Furnace, 34" abrasive cut-off. Area surrounding the Bullard Turret Lathe Forging Hammer Area. Surrounding area of the Electro-Refine Area. Induction Furnace Area. Area surrounding the Hydrospin, the Be glovebox and #1 Lindberg Furnace. Room 136.
Building 883 (see drawing C2)	Area surrounding and beneath A and B Rolling Mills. Erie Press.
Building 444/7 (see drawings C3, C4 & C5)	Part of Room 104 Room 201 and 202 Room 32, 410 and 502

Examination of the available results from the Characterization Work Plan also indicate that most of the contamination present is not fixed. The choice of decontamination processes has been made based upon the following factors:

1) as most contamination is not fixed, it can be removed by simple washing techniques,
2) most items to be cleaned are metallic in nature and will respond to surface dissolution/cleaning techniques,
3) a significant amount of equipment in the four buildings is to be removed for recycle or disposal thereby allowing a more aggressive decontamination regime,
4) radiation levels are low permitting a hands-on approach,

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5) contamination is expected to be in dust/powder form and therefore may have penetrated cracks, joints etc.,
6) restrictions upon liquid effluent disposals from the building exist,
7) time,
8) cost.

The following table outlines decontamination techniques considered for the NCPP buildings:

Table 3.8-2 Decontamination Techniques Considered for the NCPP Buildings

Method	Proposed area of use
Wiping/Washing/Scrubbing	metal surfaces, walls, floors
Vacuuming	surfaces, floors
Paint Stripper	painted surfaces
CO_2 Blasting	all surfaces, inside containment
High Pressure Water/Steam Cleaning	walls, ceilings, floors
Foam Decontaminants	walls, ceilings, metallic components
Grit Blasting	small, metallic components
Grinding/Scabbling	concrete floors
Chemical Decontamination	concrete floors
Electropolishing	small metallic components
Strippable Coatings	modular containments, other areas as required
Ultrasonic Cleaning	small components
Modular Containments/PVC Tenting	significantly contaminated equipment dismantling
Exit Showers/Water Cleanup Systems	washing suited operators after work inside contaminated containments and subsequent cleaning of water effluent
Foam Filling	pipework/ductwork contamination fixation

The above selection of equipment is intended to cover most if not all eventualities regarding decontamination of building equipment. As other technologies become available and undergo development, they will be evaluated and applied to this project if appropriate.

The general decontamination approach will be as follows:

1) Washing, wiping and scrubbing are expected to remove significant quantities of contamination since most contamination is indicated as being loose or smearable,. This method is particularly effective on smooth metal and other hard material surfaces (e.g., painted concrete). This method is relatively ineffective on rough or absorbent surfaces such as unpainted concrete or wood. The method can be 'hands on' using swabs, cloths, mops etc. or it can be mechanized for instance using scrubbing machines or polishers. This method, due to its simplicity, low cost, and the absence of significant radiation zones or contamination level, will be the primary decontamination method used in Stage II. It is particularly suited to flat plate applications such as

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the surfaces of the furnaces and presses. It is unsuitable for recovering contamination out of crevices, cracks or holes located within the item being decontaminated. Other methods are more suited in these instances. To increase the effectiveness of this method, solvents or reagents can be used although compatibility with downstream effluent/waste handling systems must be ensured.

2) Vacuum cleaning can be used to recover contaminants either wet or dry. Dry vacuuming using long extension handles can be particularly effective in removing loose contamination from semi-distant surfaces (e.g., ventilation ductwork). If handling potentially radiologically or toxicologically contaminated substances, the air discharge on the cleaner must be fitted with an appropriately rated HEPA filter for the contaminants encountered. Wet vacuuming is useful for recovering washdown liquids (e.g., water) which have accumulated on the floor of the decontaminated area. In the case of the NCPP buildings, machinery, walls and ceilings will be washed down. It is proposed that wet vacuum cleaners will be utilized to recover this wash water. Recovered liquids can be removed from the cleaner and, after sampling, discharged to a process waste drain within the buildings or treated before discharge to the waste water treatment plant.

3) Paint stripping is utilized to remove paint (and hence contamination) from metallic items being decontaminated. In many instances, items in a contaminated environment are painted specifically such that any contamination becomes attached to the paint rather than the metal substrate. One advantage of paint stripping is that, if using chemicals, it is not a hands-on process. The paint stripper can be applied and left to work. Subsequent washing of the item then removes the paint and contamination. Any paint stripper (or other potentially harmful chemical) will only be used in Stage II with the appropriate personal protection to minimize the hazard to any individual. It is proposed that paint stripper is used on this project to decontaminate relatively small painted items. Furthermore, it is possible that any material destined for use as feedstock in Stage III of the project may need to have paint removed to avoid generation of corrosive fume during melting operations and to reduce the carbon content of cast metals. This method of decontamination will be used in conjunction with others to remove paint (e.g., CO_2 blasting). It is to be noted that chemicals used must be compatible with downstream effluent/waste handling processes. Mechanical or heat generating methods of paint stripping may be used if necessary.

4) CO_2 blasting is a relatively new technology which uses pellets formed from dry ice (CO_2) fired at high pressure at an object to be decontaminated. The advantage of this process over wet ice blasting is that after contacting the item, the CO_2 pellets vaporize leaving behind the contamination in the vicinity of the decontamination. There is no liquid effluent produced from this process and, consequently, has no effect on any downstream liquid effluent or waste process. It is necessary to monitor CO_2 levels in the area while using the equipment. In Stage II of the NCPP it is proposed that each building have a decontamination facility assembled which includes a CO_2 blasting system. The facility will be used to decontaminate items either prior to leaving the building (for reuse, resale, recycle or as waste) or prior to reassembly for use in Stage III. The system is particularly effective on steels, plastics, ceramics and composites. If used with porous materials, it can push contamination further into the material. The cooling effect with using dry ice also assists in releasing contamination from the surface. It will be necessary to check the effect of the process on items to be utilized in Stage III to ensure against potential damage. The decontamination facility will be constructed from insulated (for sound deadening) panels, capable of decontamination after use, complete with windows. Air from the decontamination facility will

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be extracted from the work area through HEPA filters before discharge at a point near the building exhaust system. The system comprises a CO_2 source (tank), a pellet manufacturing system and pellet transporter, a discharge system (i.e., hose and nozzle) and a compressor/dryer which provides the motive force for the pellet discharge. Noise and other workplace environmental controls will be implemented as appropriate.

CO_2 alone is not regulated in the State of Colorado as a hazardous material and, therefore, is not expected to result in any permitting difficulties associated with the operation of the CO_2 blasting unit and the discharge of CO_2 to the environment. As the discharge is through a local HEPA filter bank near the point of generation and through the building HEPA filter bank, any particulate material entrained in the CO_2 stream by the decontamination process will be filtered out from that stream by these two HEPA filter banks prior to discharge into the environment.

5) High pressure water/steam cleaning can be effective in removing contaminants from building and equipment surfaces. The decontamination is achieved by the effect of the kinetic energy of the pressurized spray and the solubility of the contaminant in water. The use of steam increases the solvent action of the water. Steam also generates a lower effluent volume requiring recovery and treatment over high pressure washing. It is intended that water and steam decontamination techniques are used for decontaminating the building structures (e.g., walls and roof). Noise control may be necessary using this method.

6) Foam decontaminants may be used effectively to decontaminate complex metallic structures externally and internally. It produces low effluent volumes in comparison with liquid based systems. The effluent produced must be compatible (with or without treatment) with effluent handling processes on site.

7) Grit blasters exist within the buildings. It is intended that they are retained as long as possible and used as required to decontaminate small metallic objects. It is fairly labor intensive work and is not expected to be extensively used as a technique. Noise control may be necessary using this method.

8) Grinding or scabbling may be necessary for decontaminating concrete floors in the buildings. In general, the concrete appears in good condition in the buildings with most of the paint coat intact (whether the visible coats are the original or whether it has been painted over contamination remains to be seen). It is possible that contamination may be embedded into the concrete where it is unpainted or where heavy objects have been resting. In both methods, a thin layer of concrete is removed along with any contamination present. Dust and noise control is essential in these methods, the usual method being to incorporate a HEPA filter and exhaust system near to the dust source. The condition of the floor areas beneath the paint is unknown and will remain so until the paint is removed. The contamination levels of the floors will determine whether the requirement exists to strip paint off these floors.

9) Chemical decontamination of concrete surfaces may be an alternative to grinding/scabbling. While the process may be less physically aggressive than grinding/scabbling it does potentially generate decontaminating solutions which require treatment. It is a less labor intensive method as the chemical is applied and left to impregnate the surface before another chemical is applied. The

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resultant mixture is vacuumed away after treatment time. While not proposed for use at present, it remains an option which may be utilized depending upon the surface area of concrete that may eventually require decontaminating.

10) Electropolishing usually involves immersing relatively small conductive metallic items in an electrolyte while passing an electric current through the solution. Nitric acid based systems offer good decontamination effectiveness while frequently being compatible with effluent handling processes. As the current passes through the electrolyte, a layer of the metal substrate is removed into the electrolyte solution. This method is very effective in handling complex shaped items often without disassembly due to the penetrative nature of the medium. Electropolishing units are proposed for use in Stage II of the project. Units will be sized to handle small items of equipment particularly small metal tools and similar objects. Since the process is particularly effective at reducing contamination levels from low to very low, these units will not be used for gross contamination removal but for final decontamination prior to reuse, recycle, release or disposal.

11) Ultrasonic cleaning will be used to aid the decontamination of small pieces of equipment. Most materials with the exception of plastics, concrete and rubber are generally suitable for decontamination in an ultrasonic bath. This process will only remove loose contamination from a surface. Wetting agents can be used to increase effectiveness of the process.

12) Strippable coatings are intended to be used on surfaces which may be subject to future contamination. In particular, modular containments (see below) constructed around more heavily contaminated equipment prior to dismantling, will have their internal surfaces coated with a strippable coating before dismantling begins. Then, as work progresses and the need to decontaminate or reduce the level of loose contamination on the internal walls of the containment appears, applications of an appropriate tie-down coating will take place sandwiching the contamination between layers. After operations in the containment have ceased, a final coat of tie-down coating will be applied and left to cure before all layers are removed as one. The aim of these materials is to reduce levels of loose contamination inside working environments without carrying out full decontamination. These strippable and tie-down coatings will be water based and applied using airless spraying equipment.

13) Modular containments will be utilized wherever practicable to achieve waste minimization concerning the use of protective containments when handling radioactive or toxic materials. In place of using plastic tenting materials, it is proposed that Fiberglass Reinforced Plastic (FRP) panels are used in conjunction with strippable paints and ventilation systems to provide rigid containments which can readily be decontaminated by removing the strippable coating, described above, leaving the uncontaminated modular unit for disassembly and reuse elsewhere. Waste requiring disposal is minimized since only the compressible strippable coating is disposed of instead of the plastic sheeting. If circumstances require, containments may be provided using PVC sheeting. This could be the case if the item to be contained was of an unusual shape or difficult to access. Modular containments will, however, be used wherever possible due to the requirement to minimize waste generation wherever possible.

14) Exit showers will be used for all personnel leaving areas in which contaminated work has taken place. These showers will be of simple design and are intended to wash off loose particulate

material from protective clothing used during decontamination/dismantling operations. Showers will be located at the entrance/exit of the containments. Effluent generated during the showering of workers will be treated either in the plantsite effluent treatment system using, as far as possible, installed systems and pipework. If local treatment is required, it is proposed that water cleanup systems are installed to remove contaminants from the effluent prior to discharge elsewhere on plantsite. Ion exchange systems are available which can filter water effluents from showers to a high level of efficiency with the filtered water reused in the shower system.

15) Foam filling will be used to fix radioactive or toxic materials to the inside surface of the piping in instances where pipes are to be cut which contain or may contain those materials. To prevent resuspension of such materials during cutting it is planned to inject setting foam into the pipe at the point to be cut. The pipe is then cut, through the foam, minimizing spread of any material out of the pipe.

It should be noted that some of the above techniques are aids to decontamination, such as modular containments, foam filling and strippable coatings, rather than decontamination methods themselves. Foams intended for this process will be fully assessed for any hazardous effects on workers prior to use. Less hazardous materials will be used wherever practical.

It is proposed that all of the above decontamination methods will be used at one point or another during Stage II. Refer to the Decontamination Technique/Application Matrix (Figure A12) for a guide to order of technique use for each step.

The above section discusses general decontamination technologies to be used during Stage II. Specific requirements for individual buildings are noted under each building section later in the plan.

Dismantling methods used during Stage II will be intended to allow safe yet rapid sectioning of materials for either recycle or disposal as waste. A variety of methods and equipment will be used in the dismantling operations. A brief list of the proposed equipment is provided below:

Portable Power tools

Band saw
Reciprocating saw (Sawzall)
Abrasive saw
Angle grinder
Electric shears
Power nibbler
Drills
Hydraulic Wire Rope (Cable) Cutters
Hydraulic Cylinder & Pump Set
Demolition Hammer
1/2" Impact Wrench
Hydraulic Rod & Bar Cutter
Hydraulic Pipe Cutter (2-4")
Oxy-acetylene torch
Plasma arc torch
Hurst Jaws of Life

It is anticipated that all dismantling work in Stage II will be carried out using the above equipment in conjunction with the decontamination methods listed earlier. It is further proposed that a number of scabblers are obtained for use in concrete decontamination as required in Stage II.

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The full list of all capital equipment required for decontamination and dismantling operations in Stage II is given in Table B1 of this document. Revisions to this list of equipment may undergo modification in the future depending upon the decontamination or dismantling situations encountered (i.e. if a more aggressive or specialized decontamination method is considered necessary).

Some of the proposed cutting equipment will generate fume and smoke. This is not expected to cause an airborne effluent problem since all exhaust air from the working areas in each building is exhausted through a HEPA filtered outlet. In addition, localized extract and HEPA filtration will be provided where fume and/or smoke are generated. This may be achieved by working within a fully enclosed structure or by use of portable fume collection/filtration equipment.

Localized exhaust systems will generate filtered exhaust air. It is proposed that this exhaust is fed into the building exhaust system where it will undergo further filtration before discharge to the environment. Since the localized extract will be generated using a fan system, it is not proposed to connect the local exhaust directly to the building exhaust since this method increases the risk of building exhaust duct pressurization should the building exhaust system fail. Instead, the localized exhaust will discharge filtered air in the vicinity of the building exhaust, close enough to ensure all exhaust air is transferred

3.9 Identification and Resolution of Waste Related Issues

Waste will be generated during NCPP Stage II operations. This Facility Cleanup Plan has been written based upon the best available knowledge at this time. To allow the development of the plan, a number of pre-requisites associated with waste generation and handling are assumed to have occurred. These pre-requisites are listed below:

1) waste currently packaged and residing in the buildings will have been removed before Stage II operations begin. In the case of Building 883, in particular, the quantity of waste currently present is significant, there being a number of crates and drums containing a variety of materials (oil, uranium chips and uranium oxide).
2) the uranium chips in Building 883 will have been designated as waste and not as feedstock material.
3) all excess chemicals will have been removed by the plant operators before Stage II operations begin.
4) agreement will have been reached that all wastes generated during Stage II of the NCPP remain under the ownership of DOE and, as such, they are responsible for designating suitable storage and disposal locations.
5) agreement will have been reached for the removal of waste generated during Stage II as, or soon after it is generated.
6) approval will have been received for the recovery, filtration and drumming of used oils from equipment and that disposal is able to take place during Stage II.
7) approval will have been given for the storage of 'cleaned' equipment within the buildings comprising the NCPP or in suitable interim storage facilities outside some or all of the buildings.

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As a result of the nature of the decontamination and dismantling work to be carried out in Stage II, a significant quantity of waste will be produced. This waste will need to be either temporarily stored or disposed of. Waste will arise from a number of sources and can be categorized into two basic groups:

Primary Waste-i.e., waste directly arising from dismantling operations such as cut up equipment, fire bricks, oil, plastics, etc.

Secondary Waste-i.e., waste arising from the decontamination/dismantling operations themselves such as materials used for decontamination (swabs, decontamination liquors, etc.) and waste arising from dismantling operations (protective clothing, saw blades, etc.).

Table 3.9-1 lists the estimated quantity of primary and secondary waste and oil arising from each major item being decontaminated or decontaminated/dismantled. This information has been summarized from the equipment lists appearing in Tables B4 to B15 later in this document. As would be expected, the primary waste arising from equipment being dismantled forms the majority of the primary waste quantities noted. Primary waste from items subject to cleaning and maintenance only will, in general, be limited to those materials replaced during the maintenance of the equipment (e.g., firebricks, seals, hydraulic hoses). Secondary waste, in general, arises during decontamination operations as contamination is transferred from one medium to another.

It should be acknowledged that small, unspecified items of equipment have not been included as listed items in the equipment listings in Tables B4 to B15. An allowance, however, has been built into the estimates for small tools (wrenches, clamps, etc.,) to cover the decontamination and disposal of these items (recycle, reuse or waste).

Table 3.9-1 Estimated Quantities of Waste Generated in Stage II

	Primary waste (ft^3)	Secondary waste (ft^3)	Used oil (gal)
Building 865	7,712	1,864	305
Building 883	14,180	1,590	307
Building 444/7	40,773	5,458	932
Total	62,665	8,912	1,544

3.9.1 Identification of Secondary Waste Streams Resulting From Cleanup Technologies Selected.

Secondary waste arising from decontamination operations in Stage II will consist of the following:

1) paper from smear surveying.
2) any contaminated clothing or footwear considered unsuitable for laundering.
3) cloths/towels arising from washing operations.

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4) liquids arising from operation of ultrasonic/vibratory cleaners.
5) solids arising from operation of vacuum cleaners.
6) liquids arising from floor, wall washing or decontamination operations.
7) aerial effluent arising from cutting operations involving plasma arc torches.
8) HEPA filters arising from operation of decontamination and dismantling facilities.
9) tape and compressed strippable coating from containment operations.
10) grit from grit blasting operations.

Typically, the primary and secondary waste forms which will arise during the cleanup operations will be of the types already described. Table 3.9-2 below shows the expected types of waste to be generated during each of the 10 steps of the decontamination plan for each building. Those ten steps are described in Section 3.10.

Table 3.9-2 Primary and Secondary Waste Types Generated During Stage II Activities

Step No.	Step Description	Primary Waste Type	Secondary Waste Type
1	Removal of loose waste/unwanted equipment	tools, benches, cupboards, toolboxes, pallets	minimal
2	Cleaning of high contamination areas	minimal	swabs, decontaminating solutions, cloths, protective clothing
3	Assembly of a decontamination facility	none	swabs, decontaminating solutions, excess construction materials
4	Removal and decontamination of low contamination items of equipment	equipment removed from building (whole or sectioned)	swabs, decontaminating solutions, protective clothing.
5	Removal and decontamination of high contaminated items of equipment	equipment removed from building (whole or sectioned)	swabs, decontaminating solutions, protective clothing, strippable coatings, HEPA filters.
6	Decontamination, dismantling and removal of services no longer required	equipment removed from building (whole or sectioned)	swabs, decontaminating solutions, protective clothing, strippable coatings, HEPA filters
7	Repairs to structure following removal of equipment	dust, removed building materials	swabs, flushing solutions, protective clothing.
8	Dismantling, cleaning and reassembly of retained equipment considered as low contamination risk	materials discarded during maintenance operations (belts, hydraulic hoses, seals)	swabs, decontaminating solutions
9	Dismantling, cleaning and reassembly of retained equipment considered as high contamination risk	materials discarded during maintenance operations (belts, hydraulic hoses, seals)	swabs, protective clothing, decontaminating solutions, HEPA filters
10	Final decontamination of complete building to operational levels	minimal, possibly small items removed for contamination reduction purposes	swabs, decontaminating solutions, containment materials.

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3.9.2 Estimation of Other Quantities and Types of Waste/Recycle Material Generated

Estimates have been made of the waste types and quantities generated during Stage II of the project. As already discussed, only solid materials not wanted by the Stage III contractor or the DOE, and those not suitable for decontamination to free release or use as Stage III feedstock will be consigned as waste. Two categories of solid waste will be generated from operations in Stage II; LLW which will be packaged and disposed of at the Nevada Test Site and LLMW which will be packaged, stored, and disposed of at another site, possibly Envirocare in Utah.

Liquid effluents will be generated during decontamination operations. They will arise from washing operations and from operation of the ultrasonic and electropolishing units. These effluents will be collected in tanks in each building and processed within that building before transfer to an approved treatment location. It is intended that processing removes or reduces radioactivity, toxins or solids content before transfer out of the building. In the case of water used for washing purposes, this processing may consist of treatment in an ion exchange unit.

Estimates of the quantities of waste/recycled material produced during Stage II are given in the table below on a building by building basis. The first table does not include any size/volume reduction.

Table 3.9-3 Baseline Waste Generation Quantities

Building	Recycle Materials (ft^3)	Low Level Waste (ft^3)	Low Level Mixed Waste (ft^3)
865	139,060	7,118	2,763
883	108,889	13,490	2,587
444/447	88,304	32,886	14,276
Total	336,253	53,494	19,626

If an allowance is made for size or volume reduction then these quantities are reduced. Assuming a volume reduction of 33% for recycle materials and a mix of volume reduction percentages for low level waste (due to the variation in compressibility of this type of waste) the following estimate of waste volume generated may be made.

Table 3.9-4 Waste Generation Quantities with Size/Volume Reduction

Building	Recycle Materials (ft^3)	Low Level Waste (LLW) (ft^3)	Low Level Mixed Waste (LLMW) (ft^3)
865	92,707	1,394	502
883	72,593	3,298	481
444/447	58,869	7,908	2,858
Total	224,169	12,600	3,841

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3.9.3 Waste Generation, Characterization, Storage, and Disposal

Primary and secondary wastes will be segregated into LLW and LLMW. The volume of wastes generated as identified above are approximations and do not include aqueous cleanup waste. The waste characterization for LLW and LLMW will, in most cases, be based on process knowledge. Where process knowledge is not sufficient to characterize the waste, the waste will be managed by MSC as defined under RCRA until analytical data is available to complete the characterization.

Section 3.8 of the Facility Cleanup Plan identifies all potential cleanup methods to be used. The selection of the cleanup methods is contingent on the presence or absence of hazardous constituents identified in the pre-cleanup survey, historical production use of the equipment, and proposed future use of the equipment.

To effectively manage all generated waste MSC will employ the following steps:

- Identify equipment and proposed future use.
- Determine previous process use.
- Evaluate pre-cleanup survey data for the presence or absence of RCRA hazardous constituents.
- Describe equipment in the WSRIC building books. Each section of the book will identify the waste generation associated with the equipment.
- Characterize waste stream based on process knowledge and/or chemical analysis.

Guided by those waste products a decision will be made to classify the wastes generated in cleaning the equipment as LLW or LLMW.

Cleanup waste generated during Stage II will be subject to DOE approved waste acceptance criteria for the purpose of treatment, storage and/or disposal. It is not expected that the cleanup waste will interfere with Rocky Flats waste management activities currently being performed. It is anticipated that additional storage space outside the NCPP buildings may be needed during the first year of Stage II. As the removal of unwanted equipment occurs however, storage space for feedstock and waste will become available in the buildings.

Major consideration will be given to minimize the generation of waste by removing and reusing as much material of economical value as possible without impacting workers safety and health.

Size reduction of LLW will take place during Stage II without additional permitting and licensing requirements. A Waste Analysis Plan will be required by CDPH&E if LLMW is crushed inside a tank or a container.

Primary waste generated during dismantling and decontamination activities can be divided into the following three waste streams: LLMW, LLW and non-radioactive waste.

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3.9.3.1 Low Level Waste

As described in the table above, more LLW will be generated than any other waste type. All LLW will be segregated by item description codes (IDCs). Most of the waste will fall into the category that meets the conditions of the Nevada Test Site (NTS) Defense Waste Acceptance Criteria, Certification, and Transfer Requirements NVO-325, Revision 1, as defined by the Low Level Waste Management Plan. For those waste streams that do not meet these conditions, the NCPP Waste Management Plan will address on how to manage these non-compliant waste streams.

Primary Waste:

Non-hazardous equipment parts not required for future use in Stage III and for which decontamination is not cost effective will be managed as LLW. Included in this waste stream are: belts, hydraulic hoses, glass and ceramics, wiring, graphite, firebricks, and plastics.

Waste Oil:

All waste oils will be drained from equipment, consolidated in 55 gallon drums, and managed under 6CCR 1007-3, 261.6 - "Special Requirements for Hazardous Waste which is Used, Reused, Recycled or Reclaimed".

Secondary Waste:

The secondary waste originates from decontamination operations and consists mainly of personal protective clothing, combustible materials, and HEPA filters.

Cleanup Wastewater:

Industrial cleanup will focus first on specific equipment within a room within a building. As a last step in cleaning a room, the walls and ceiling of a room will be cleaned after all equipment is cleaned. The cleanup of the areas immediately surrounding equipment will generate small volumes of waste water, several tens of gallons per day, while the cleaning of the walls, floors and ceilings could generate, during times of high pressure water cleaning, an estimated maximum of 3,000 gallons a day. However, MSC plans to use steam cleaning which will produce substantially less wastewater, approximately 300 gallons per day.

The State of Colorado Hazardous Waste Regulations require generators to characterize their waste (6 CCR 1007-3, 261.11). MSC, based on evaluation of individual waste streams, determined that the industrial wastewaters generated from NCPP cleaning operations will be non-hazardous. The characterization was based on process knowledge and implementation of administrative controls described in the following decision making steps:

- MSC reviewed the Shift Superintendents Log (1980 - 1992) to confirm whether solvent spills occurred in the buildings. The search indicated no reported releases of waste

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solvents. Consequently, trace amounts of solvents, below regulatory levels, will not render the wastewater hazardous.

- MSC reviewed the analytical data generated from the analysis of the cleanup water from IHSSs located in the NCPP buildings. The characterization identified the wastewater as non-hazardous.

- MSC will only use non-hazardous cleansers in the cleanup of equipment and rooms and/or will use chemicals that can be rendered non-hazardous by using elementary neutralization.

- MSC will prescribe cleanup methods for individual pieces of equipment based on the results of the pre-cleanup survey. The pre-cleanup survey will indicate the presence or absence of hazardous constituents and the extent of cleanup necessary.

- MSC will have administrative controls in place to ensure proper waste management. For example, MSC will provide information to be included in the WSRIC Building Books providing directions to control waste-producing processes. This will be accomplished by specifying cleaning methods and the management of waste forms generated from these cleaning methods.

During the initial weeks, during which a specific aqueous waste stream is generated for the first time, the wastewater will be analytically characterized in accordance with the WSRIC Program to determine if any of the four characteristics, as defined in 6 CCR 1007-3 Subpart C - Characteristics of Hazardous Waste, are present or absent. The four characteristics consist of ignitability, corrosivity, reactivity and toxicity. This subpart defines the analytical criteria and the regulatory levels for the maximum concentration of the contaminants. Additional characterization of each aqueous waste stream may be performed on an annual basis.

While these industrial wastewaters are analyzed they will be temporarily stored as hazardous waste until the characterization can be finalized. Discharge of the wastewater to Building 374 will be through the process waste lines in the four NCPP buildings. EG&G Liquid Waste Treatment Operations (LWTO) controls all discharges to Building 374, but in almost all conceivable cases, wastewaters will be transferred to Building 374 via the process waste lines.

As described, the wastewaters will be temporally stored and sampled to ensure that the (LWTO) waste acceptance criteria are met before transfer arrangements are made. The storage tanks are currently classified as Interim Status tanks. Since these wastewaters will be non-hazardous, the tanks in the NCPP buildings will undergo RCRA closure and then be immediately opened as non-hazardous industrial wastewater storage tanks. Through this RCRA closure process, the tanks and adjacent piping will not require up-grading and will meet compliance requirements.

To accommodate the volume of wastewater generated during cleanup activities the following listed tank storage capacity was identified in each NCPP building. The storage tanks will hold effluent awaiting approval to discharge to LWTO in building 374. The capacity of the storage tanks will suffice for the volume of wastewater generated during cleanup activities.

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On the basis that some accumulation of liquid effluents will be necessary during Stage II, some of the liquid effluent storage tanks in the NCPP building will be utilized as buffer storage. These tanks will be used to collect effluent prior to sampling and to hold effluent awaiting approval to discharge to Building 374. Current effluent buffer storage capacities in each building are listed in Table 3.9.3.1-1.

Table 3.9.3.1-1 Liquid Effluent Buffer Storage Capacity

Building	Buffer capacity low level effluent
865	3,600 gals
883	4,600 gals
444/447	11,350 gals

3.9.3.2 Low Level Mixed Waste

The LLMW contains depleted uranium and materials regulated under RCRA and by the Colorado Department of Health. Presently there is no disposal site for LLMW, but the possibility exists that in the near future mixed waste can be disposed of at Envirocare in Utah. Until shipment for disposal, the waste will be stored in accordance with the applicable regulations in the NCPP buildings.

Primary Waste:

Several pieces of equipment were identified, in which metal parts were coated with silver, chromium or cadmium; this equipment and scrap metal generated during dismantling are destined for recycling in Stage III. This waste will be stored to comply with regulatory requirements until Stage III commences. After start of recycling activities the scrap metal that is to be recycled should not be subject to these regulations.

Scrap metal of no economical value, such as scrap contaminated with lead solder, circuit boards, and paint chips removed from feedstock which may contain lead or chromium pigment, will be managed as RCRA regulated waste.

Dust and particulate matter from dry or wet vacuuming may require analytical characterization to determine if hazardous constituents are present and to identify storage and/or disposal requirements.

Secondary Waste:

Secondary waste will be generated during decontamination but volume and type will depend on the level of cleanup. If, for example, waste solvents are not compatible with the process waste system they will be characterized and managed in accordance with all waste requirements.

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3.9.3.3 Beryllium and Asbestos Contaminated Waste Streams

Asbestos Waste:

Asbestos will be stabilized or stripped from pipes and items of equipment before they are dismantled. Low level asbestos waste may be transported to Hanford for disposal with special approval.

Beryllium Contaminated Waste:

Waste from areas where beryllium work was performed will contain traces of beryllium. Even so, the beryllium does not impact waste storage and disposal. The waste will be segregated from other waste streams and managed to minimize the spread of beryllium dust.

3.9.3.4 Recyclable Materials

Freon Gas:

Freon gas will be removed from equipment by certified and State registered personnel before the equipment is dismantled. The gas is reclaimed into cylinders for reuse in air-conditioning equipment on plantsite.

Scrap Metals:

Non-hazardous copper piping, aluminum, nickel, and brass that cannot be used in Stage III but is of economical value will be decontaminated wherever practicable to levels for unconditional release.

Waste management for Stage II dismantling and decontamination activities is to reduce the amount and toxicity of waste. A comprehensive NCPP Waste Management Plan will be written early in Stage II to implement the requirements and responsibilities for waste management. The plan will specify regulatory guidelines for waste stream characterization, packaging, potential treatment, storage, quality assurance and waste minimization.

3.9.4 Identification of Methods of Disposal for Hazardous Chemicals in the Facilities.

The Characterization Work Plan (reference 1) has identified and listed the chemicals used during the operational phase of each of the NCPP buildings. One of the pre-requisites listed in this document that are required prior to Stage II, is that all excess chemicals will be removed before Stage II operations begin in any of the buildings. Should this not be the case, a plan for the disposal of these chemicals will be generated by EG & G.

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3.10 Sequence of Operations in Stage II

By considering the list of unwanted equipment in each of the buildings (Tables A4,A 5,A8,A9, A12,A13,A14), the suitability of an unwanted item of equipment for recycle and the known or suspected contamination levels on (or in) that equipment item, an estimate has been made of the amount of time and cost for Stage II cleanup operations in each of the four buildings. For planning purposes, the major items of equipment in the buildings were divided into four categories:

1) Equipment, not wanted in Stage III, which is believed to have minor contamination hold up only.
2) Equipment, not wanted in Stage III, which is known to or may contain significant contamination hold up.
3) Equipment, wanted in Stage III, which is believed to have minor contamination hold up only.
4) Equipment, wanted in Stage III, which is known to or may contain significant contamination hold up.

The philosophy of Stage II operations is based upon clearing the buildings of unwanted equipment first, allowing more room for the decontamination and maintenance of equipment needed for Stage III operations.

The proposed broad sequence of the generic cleanup plan for the buildings is presented below. It shows a sequence of operations progressing from one step to another, however, operational constraints may require concurrent working on a number of steps or it may require that steps may be reorganized if unforeseen circumstances arise. The following sequence is shown for planning purposes only.

Building assessment has allowed an initial assessment of the potential for contamination of each item of equipment. This is necessary due to the absence of comprehensive radiological and toxicological data for each item of equipment and the inaccessibility of internal areas of equipment for contamination measurement (it should be noted, however, that throughout all work steps under Stage II of the NCPP contamination monitoring and control will be ongoing to ensure that cleanup standards are met during all phases of Stage II in the buildings concerned).

Major unknowns at this time include the **full** extent of either radiological or beryllium contamination in the buildings and the ease/difficulty in decontaminating equipment or the facility. The estimates for step completion times in this Plan are based upon currently available information concerning the status of the buildings. While there is a degree of flexibility in this Plan which will cater for unexpected findings, any significant deviation from the current understanding of the facility condition (e.g., the discovery of increased contamination, dismantling difficulties) may affect the project schedule.

One pre-requisite for the project adhering to the proposed schedule is that all classified parts are removed or declassified before Stage II operations as described in this Plan commence. If this

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does not take place, movement and/or access restrictions on NCPP personnel may be imposed inhibiting the work program.

The facility cleanup plan for each building is divided into a number of steps as summarized below:

Table 3.10-1 The 10 Step Cleanup Process to be used in Stage II

Step 1	Removal of loose waste/unwanted equipment
Step 2	Cleaning of high contamination areas
Step 3	Assembly of a decontamination facility
Step 4	Removal and decontamination of low contamination items of equipment
Step 5	Removal and decontamination of high contaminated items of equipment
Step 6	Decontamination, dismantling and removal of services no longer required
Step 7	Repairs to structure following removal of equipment
Step 8	Dismantling, cleaning and reassembly of retained equipment considered as low contamination risk
Step 9	Dismantling, cleaning and reassembly of retained equipment considered as high contamination risk
Step 10	Final decontamination of complete building to operational levels

These steps are described in the following section:

Step 1: Removal of Loose Waste/Unwanted Equipment

Current understanding of the condition of each building is that most small loose items are either waste or tools, etc., and unlikely to be contaminated above action levels for either radioactive materials or beryllium. Step 1 of the cleanup plan involves the collection and packaging of waste/unwanted equipment to make room for future operations, to avoid (re)contamination of relatively clean materials during future operations, to demonstrate good housekeeping procedures and so workers can begin processing waste in accordance with MSC procedures. There is a significant quantity of unwanted tools, benches, cabinets etc., which are to be removed either for disposal or reuse. Only lightly contaminated items are to be considered at this stage. Any significantly contaminated items should be left to later. At this stage, all waste is to be removed from the building since available space in each building is to be set aside for storage of scrap to be recycled in Stage III. Particular areas to clean out are rooms designated as future waste handling/decontamination/dispatch areas.

Step 2: Cleaning of High Contamination Areas

The Stage I Characterization Work Plan indicates any areas of high contamination still remaining in the building. These are to be cleaned next. This is to reduce the potential for resuspension during future operations with subsequent health implications; to reduced clothing and respiratory requirements for upcoming work to as little as practically achievable; and to demonstrate good housekeeping. Knowledge of previous operations in each building points to areas of potential contamination. These include the channels/sumps beneath presses, the beryllium electro-refining

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cell, the beryllium glovebox and certain machines used for machining/other metal operations. The sumps will be considered at this stage for clean out, as will some machines known to be contaminated. The beryllium glovebox requires further investigation as to the extent of any cleaning possible prior to future dismantling and removal to another location/disposal. If the glovebox cannot be cleaned without dismantling, this will not be a major issue since it retains its integrity and so potential for future beryllium release is low. This is not the case for the channels/sumps or machines.

Areas requiring decontamination at this stage may not be significant in size. The technique therefore may only require localized washing. The use of temporary containments will be considered at the time of cleaning. Such a containment could simply consist of a PVC tent or modular containment with a localized exhaust allowing operators to clean an area without risk of spreading the contamination. The clothing and respiratory requirements for this work will be determined at the time based on consultation with a Contamination Control Technician (CCT). Step 2 will be complete when there are no areas of any of the NCPP buildings with actionable levels of contamination capable of being resuspended causing a radiological or toxicological hazard. Any repairs to floor or other surface necessary after this decontamination step (e.g., if floor scabbling has taken place) will be carried out now, if required, or left to Step 7.

Step 3: Assembly of a Decontamination Facility

Prior to unwanted equipment being removed for reuse, recycle or disposal, some degree of decontamination will almost certainly be necessary. Even if externally clean, dismantling and internal monitoring will be required particularly for any equipment intended for free release (resale or disposal). Step 3 involves the assembly of a decontamination facility to process equipment leaving each building. Instead of opening up equipment in-situ and risking release of contamination, equipment is to be transferred (as intact as possible) to the facility where it can be dismantled under controlled conditions before transfer to interim store or exiting the building. If some dismantling is necessary prior to transfer to the facility, each case will be assessed on its merits and localized containment provided as necessary. The facility would be simple in design, assembly, and be semi-permanent. After its role in decontaminating equipment during Stage II it can be retained if required for any future decontamination operations requiring containment during Stage III. The facility would need to be ventilated with controlled access. It will have to be capable of receiving and dispatching large items of equipment. The internal surfaces of the facility must be constructed from appropriate materials to allow application of strippable/tie down coatings and subsequent decontamination. The decontamination facility will remain operational throughout Stage II and only removed when the Stage III operator considers that there is no further use of the structure.

Step 4: Removal and Decontamination of Low Contamination Items of Equipment

Items of equipment not required for future operations will be removed next. Priority in this section of the work will be given to items of low contamination (which have been identified for removal) which do not require the use of containment for cleaning and dismantling. It should be noted that the risk of uncovering contamination of a significant nature will exist and, should this occur, steps to contain the contamination (beryllium or radiological) will be taken. Prior to any

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dismantling and/or removal, each item of equipment will be permanently disconnected from any services supplied to that item. This includes electrical, water, air, reagent and steam supplies. Ventilation ducts will remain in place until the latest time possible to allow the continued ventilation (and hence assist in containing contamination) of the equipment. After Step 1, these items will be identified and monitored in-situ before dismantling. Typical equipment to be handled in Step 4 includes items which have rarely or never handled uranium or beryllium materials. In a pre-agreed sequence, these items will be disconnected from ancillary equipment, services, supports or other attachments, and dismantled in situ. Any contamination found on the equipment will be removed at this stage. Should any persistent contamination be found, the equipment will be wrapped and transferred to the decontamination facility for more thorough decontamination. When the item has achieved a standard of cleanliness at or approaching the appropriate criteria, it will be transferred to a suitable location for detailed monitoring prior to disposal or interim storage.

The reasoning behind the above approach is that:

1) This category includes a significant amount of equipment in the buildings, particularly Building 865. Removal will significantly improve access to other equipment.
2) Low contamination risk items are easier to handle since they should not require containment for dismantling. The risk of uncovering contamination of significance remains though, by analysis of previous operations, this risk should largely be predictable. The option to add containment remains open during this stage.

It is an assumption that areas will be available in each building suitable for interim storage of cleaned materials from this step. Items awaiting processing will almost certainly need to be wrapped to avoid cross contamination.

Step 5: Removal and Decontamination of High Contaminated Items of Equipment

With unwanted low contamination risk equipment removed from the working areas, work can commence dismantling and removing the unwanted equipment which has known or which it is considered to have the potential for significant contamination content. It is assumed at this stage that ventilated containments will be necessary for work in Step 5. Current plans indicate that a number of containments will be necessary in order to process this category of equipment. Containments will be semi-permanent, fabricated from a material capable of construction into an enclosure in modular form and of decontamination following use. Since the use of containments significantly adds to the time taken to remove this category of equipment, any practical steps possible to prevent equipment falling into this category should be considered. The general principle of operation in this step is to construct a containment around a significantly sized item of equipment. After preparation of the containment, the equipment will be dismantled with gross contamination removed. The workers will dismantle as much of the equipment as necessary in order to move it to the decontamination facility for final decontamination ready for ultimate use/storage. This dismantling technique will allow reassembly outside of the containment for equipment to be reused or more aggressive techniques (i.e., cutting, size reduction) if the item is for disposal or recycle. When complete, each item will be transferred to the decontamination

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facility. The containment will be cleaned (by application of tie-down coatings or standard decontamination techniques) and the next identified item brought into it. It will then be resealed and the operation repeated. Each containment will be ventilated with worker access provided.

This sequence will proceed logically as determined by accessibility, radiological and toxicological potential and other requirements as set by external bodies (e.g., if a customer is found for an item, it may be necessary to decontaminate and remove it from the building out of sequence).

Step 6: Decontamination, Dismantling and Removal of Services no Longer Required.

With all unwanted equipment now out of the building, services to those items will be removed as considered practical. Ventilation ducts will be cut and capped and sectioned for transfer to the decontamination facility. In the case of ventilation ductwork, techniques for fixing any contamination onto the internal and external surfaces of the ductwork will be considered prior to cutting. This should remove the need for localized containment during cutting, however the implications of the fixing will be considered in relation to the final destiny of the ductwork and a judgment made at the time on the basis of measured loose contamination in the duct. Service supply lines will be cut back as far as possible. Electrical connections will be removed back to junction boxes/disconnects.

Step 7: Repairs to Structure Following Removal of Equipment.

With all the unwanted equipment removed (or, practically, after each item is removed) repairs to floor, walls or ceiling will be made. This work may consist of filling bolt securing holes in the floor or filling in channels/sumps. This is unlikely to be a major work package though it is considered important since this action will help in reducing areas for future contamination to accumulate.

Step 8: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as Low Contamination Risk.

Equipment to be retained as operational or stand-by in each building has been assessed whether or not it has known or potential internal contamination. Step 8 involves the cleaning of those items of equipment required for future building operations which are considered to be low risk in terms of beryllium or radiological contamination. Equipment in this category will be decontaminated as far as practicable with the opportunity taken at this time for any necessary maintenance for the item prior to Stage III operations commencing. This step, therefore, amounts to disassembly, decontamination, maintenance and reassembly/testing. As in Step 6, should unexpected contamination be uncovered, work will cease and containment erected around the equipment to allow work to proceed without risk of contamination spread to surrounding cleaner areas. Step 8 can proceed concurrently with Step 9 since all equipment at this stage will remain in the building.

Step 9: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as High Contamination Risk.

Step 9 involves the work necessary to clean and maintain equipment required for Stage III operations but which is considered to have known or potential contamination to a significant degree. Similarly to Step 7, equipment will be contained, dismantled and decontaminated in a controlled environment minimizing the potential spread of any contamination. Containment will be constructed around a significant item of equipment and it will be dismantled and decontaminated inside the containment. Once cleaned, the item will be maintained ready for Stage III operations. This operation could take place inside the containment or, preferably, after it has been removed as this eases access and improves working conditions. In the case of smaller items of equipment (for example, lathes) a centralized containment will be built and prepared with equipment brought into the containment as necessary. Once cleaned, the opportunity will be taken to reposition equipment as considered appropriate. This step of the work is likely to be relatively lengthy due to the need to construct and prepare the containment followed by decontamination and dismantling once work is complete. As in Step 7, any practicable action which will allow dismantling, cleaning and maintenance of equipment without the need for a containment should be considered.

Step 10: Final Decontamination of Complete Building to Operational Levels.

With all the above completed, final decontamination of the building and equipment will take place. It should be noted that, throughout Stage II operations, regular surveys of the building at agreed reference points will take place. Any elevated contamination levels will be detected and decontaminated with the source of the increase identified and stopped. The final decontamination in Stage II will aim to achieve agreed contamination levels for radiological materials and beryllium for continued operations in the building. The sequence of operations will progress logically and will include all surfaces. This step may take some time since it will involve ceilings, walls, floors and equipment decontamination to low levels. The deliverable at the end of Step 10 will be a fully characterized building with contamination levels as low as reasonably achievable but below the limit for the operations expected in Stage III.

The above cleanup plan will be followed for each of the buildings comprising the NCPP. Specific building issues and details appear below.

4.0 Labor Requirements

Labor requirements for Stage II of the project have been derived taking into account the following parameters:

1) As employees hired in Stage II are expected to become process operators in Stage III, the number hired in Stage II should not exceed Stage III expected labor requirements.
2) The duration of Stage II operations will not exceed two years from the official start of Stage II. Any delay to the start of decontamination operations will reduce the available time for completion of Stage II. It is assumed that hands-on work commences on 3/1/95.

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3) A work team size of seven Decontamination Workers with one Team Leader has been identified as being a manageable and efficient sized team.

Estimates of Step durations have been made using the best available information at the time of writing. These estimates take into account the expected work conditions for each task (e.g., whether wearing personal protective equipment, the need for containments) but do not account for additional factors which may extend the duration of the Stage such as:

1) Restricted working times resulting from heat related issues.
2) The requirement to avoid lone working/use the 'buddy system' (e.g., in confined spaces, when using ladders).
3) Reductions in working time due to personal monitoring issues and changing/showering times.

For the purposes of Stage II planning, it is assumed that the equivalent of one of the seven Decontamination Workers will be absent for a significant proportion of the Stage duration for any of the following reasons:

1) Ongoing training,
2) Sickness,
3) Vacation,
4) Personal monitoring.

On the basis of the above, estimates of Step durations in the form of Work Team weeks have been made and are discussed in the following sections for each building. The individual building data are integrated into an overall labor plan in Section 9 later in the Plan.

5.0 Capital and Operational Requirements for all Buildings

Before describing the building specific labor and material/equipment estimates, there are a number of items common to all three buildings which are to be identified. These items fall into three basic categories; Decontamination Capital Equipment, Health Physics Equipment and Consumable Materials. All three buildings are expected to require all of the equipment or materials listed below to some degree. Account has been taken of the expected differing rates of usage within each of the NCPP buildings.

5.1 Decontamination Equipment

Decontamination equipment items required in Stage II are provided in Table B1. These figures have been derived based on engineering judgment of the decontamination methods to be used in Stage II, previous experience of these methods, current experience on plantsite of some of these methods and information/prices from manufacturers and suppliers. The table refers to equipment required for all three buildings (i.e., the whole of Stage II).

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5.2 Health Physics

Health Physics equipment considered necessary for safe operations during Stage II is listed in Table B2. Again, this list of items have been derived from experience on plantsite, off-site and from manufacturers/suppliers information. As in Table B1, these items are intended to cover all cleanup operations in Stage II.

5.3 Consumable Material

Table B3 lists consumable items required during Stage II for all three buildings. These items have been derived from current usage on plantsite and elsewhere. Quantities of materials have been estimated based upon current usage expectations.

6.0 Building 865

Specific issues concerning Building 865 are discussed below.

6.1 Current Building Condition

Formal operations in Building 865 ceased in September 1993 with the building subsequently used for minor operations involving beryllium. Since that time, the building has been subjected to some clean out with gross uranium contamination removed. However, because there has been no formal decontamination, some uranium contamination still exists. Beryllium contamination in the form of pieces and powder remains in Building 865. The building continues to be monitored for radiological and toxic contamination on a regular basis both by smear and air sampling. The results from these samples are monitored by the current operator with decontamination or isolation carried out as necessary. Beryllium contamination is largely below action level for decontamination but there are spots identified which will require decontamination. Equipment within Building 865 remains operable although some items will require a degree of maintenance before operation. The HVAC system is operating. Building fabric condition is good with no readily identifiable repairs being considered necessary before Stage II begins.

6.2 Sequence and Duration of Operations

Based upon the above general 10 step work plan the following estimates of time taken to achieve each step can be made:

Step 1: Removal of Loose Waste/Unwanted Equipment

Building 865 contains a significant quantity of loose waste and unwanted equipment. It is assumed that all waste currently packaged will have been removed from the building before the start of Step 1 operations in Stage II however, there will be items not considered as waste by the current operator but which will become waste in Stage II. Such items are cupboards, tool boxes, and miscellaneous tools. These items are not expected to be contaminated to any significant degree considering their previous use however they will all be surveyed for radiological and toxicological

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contamination prior to removal. Any minor contamination will be removed at this stage. Items removed in Step 1 will be dispatched for reuse elsewhere, stored in the building for recycling in Stage III or removed as waste. In Building 865 it is proposed that equipment to be retained for Stage III is stored in Room 145. As a consequence, some existing equipment in this room may need to be relocated at an early part of Step 1.

Based upon a Work Team (WT) size of seven Decontamination Workers and a Team Leader as discussed in Section 4 , it is estimated that Step 1 will take approximately 4 WT weeks to complete.

Step 2: Cleaning of High Contamination Areas

The Characterization Work Plan has reviewed the radiological and toxicological survey data for Building 865 and has concluded that further surveying should take place in Stage II as a result of incomplete data existing for this building. It is proposed that further surveying work takes place during Steps 1 and 2 in the Building 865 Cleanup Plan. That surveying will concentrate on those areas considered to be high risk which were omitted in the pre-Stage I surveying. Step 2 will then concentrate on cleaning contamination considered as in excess of the levels compatible with ongoing operations in Building 865 (the levels to which the building is to be decontaminated down to were defined in the Characterization Work Plan and are stated in Section 3.2 of this Plan). Existing data show that high contamination areas in Building 865 are known to exist (see Section 3.8). Based upon the estimated time taken to clean these areas out and dispose of any waste generated (primary or secondary) and with an allowance for cleaning other areas not currently characterized but which could be in excess of acceptable limits, a total of 4 WT weeks should be allowed for Step 2.

Step 3: Assembly of a Decontamination Facility

Equipment destined not to remain in Building 865 (i.e., for reuse or recycle) will be subjected to decontamination as determined by acceptable criteria as listed in the Characterization Work Plan. Materials destined for disposal as Low Level Waste, while decontamination may not be necessary or desirable, may be cleaned, for instance, to collect any recoverable materials. While some equipment with significant contamination will have been partially decontaminated during dismantling or cutting, it will be necessary to further decontaminate equipment prior to leaving Building 865. This final decontamination will take place in an assembled facility in Building 865 located in Rooms 171 and 172. It is planned that the facility will contain CO_2 blasting equipment and electropolishing or ultrasonic cleaning equipment as well as space for conventional hands-on decontamination work. The facility will be equipped with HEPA filtration, lighting and a shower entry/exit area. Including clearing the area of miscellaneous material before construction, it is estimated that it will take 2 WT weeks to assemble and test ready for use.

Step 4: Removal and Decontamination of Low Contamination Items of Equipment

Table B4 lists the major items of equipment considered as low or zero contamination which are not required for Stage III operations. The table also gives an estimate of how long each item will take to disconnect from service lines or other equipment, to remove peripheral equipment and to

dismantle or cut up. An allowance is also included for final decontamination in the decontamination facility prior to removal of the equipment from the building or storage as feedstock for Stage III inside the building. The table shows that 213/5 = 42.6 WT weeks (43) are required for the dismantling with a further 96/5 = 19.2 WT weeks (20) required for decontaminating and packaging of the waste.

Step 5: Removal and Decontamination of High Contaminated Items of Equipment

Step 5 operations are summarized in Table B5. This table lists the items known to contain or suspected of containing radiological or toxicological contamination at a level which requires use of a containment for dismantling operations. This step, therefore, allows time for the construction of containment, its preparation and final decontamination and disassembly as well as the dismantling time. The containment used will be modular in form constructed from fiberglass reinforced plastic panels which can be decontaminated after the work is complete. Alternately, PVC sheeting (or similar) can be used. While this is more suited for containing irregularly shaped equipment, its decontamination potential after the work is more limited. A total of 464/5 = 92.8 WT weeks (93) are allowed for the dismantling and removal operations with a further 98.5/5 = 19.7 WT weeks (20) required for decontaminating and packaging of the waste.

Step 6: Decontamination, Dismantling and Removal of Services No Longer Required

Steps 4 and 5 involved the removal of unwanted equipment from Building 865. During those steps equipment was disconnected from services with the minimum of service line removed at that time. Step 6 involves removing those service lines back to a suitable point consistent with Stage III operations (i.e., the removal of all redundant lines minimizing scope for future contamination potential).

Lines to be removed include ventilation exhaust, process waste, steam, compressed air, and reagent feeds. It is estimated that this step will take up to 8 WT weeks of effort to complete.

Step 7: Repairs to Structure Following Removal of Equipment

With the removal of certain items of equipment, a number of sumps, channels or depressions on the site of that equipment will be revealed. Likewise, with the removal of service lines, holes in the building walls may be opened. These structural issues will be resolved in Step 7. Depressions in the floor will be decontaminated if necessary and filled with concrete or similar to the level of the surrounding area. Holes in the building walls will be filled or covered with a suitable material. Several large items of equipment, when removed from Building 865, will reveal floor channels or depressions. These include the Forging Hammer and the Pit Furnace. In addition, any redundant channels will be filled in this step such as the grating covered channel adjacent to the 1750 ton Extrusion Press.

The current known list of areas to be filled are given below:

1) Bullard Turret Lathe
2) Harper Pit Furnace

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3) Forging Hammer
4) 1750 ton Extrusion Press
5) Be Electro-Refining Area

It is estimated that this step will take 6 WT weeks of effort to complete.

Step 8: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as Low Contamination Risk

Step 8 involves dismantling, cleaning and maintaining (as necessary) equipment of a clean (i.e., uncontaminated) nature ready for use during Stage III operations. Table B6 lists the major items of equipment processed during this step. The relative low contamination nature of this equipment (information based upon available survey data and operational history) indicates that containments should prove unnecessary for this step and that dismantling will be undertaken with minimal protective clothing requirements. Should, however, contamination above levels requiring protective systems be detected, dismantling work will cease and the situation will be evaluated before continuing.

It is estimated that 74.5/5 = 14.9 WT weeks (15) are required for the completion of this step. Waste packaging may take up to 10/5 = 2 WT weeks to complete.

Step 9: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as High Contamination Risk

Step 9 concerns the decontamination, disassembly and maintenance of equipment which either has measurable contamination levels requiring containment and/or protective clothing or which may be contaminated to these levels on the basis of operational history. Table B7 lists the items of equipment to be handled in this step. Since these items are expected to be contaminated to a level requiring protective measures. containments will be provided for each operation. In some cases (for the larger items of equipment such as the EB furnace, the forming press and the United mill) the containment will be specifically built around the equipment while in cases involving smaller pieces of equipment (e.g., lathes, drills) a containment will be built with the equipment transported into it and the containment resealed. It is estimated that a total of 242/5 = 48.4 WT weeks (49) of effort will be required to clean and maintain all the identified items of equipment. An additional 26/5 = 5.2 WT weeks (6) of effort will be required to decontaminate and package waste arising from the operation.

Step 10: Final Decontamination of Complete Building to Operational Levels

At the end of Step 9, all redundant equipment in Building 865 will have been removed with service lines cut back as appropriate. All equipment required for Stage III will have been cleaned and maintained. Step 10 is concerned with the final cleanup of Building 865 to reduce any remaining contamination down to levels commensurate with continuing operations in the building. As Step 2 was concerned with the removal of high contamination areas and providing there have been no unexpected spread of contamination arising from Stage II operations, Step 10 should be of short duration. If this is the case, then additional time may be spent in decontaminating the

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more inaccessible areas. However, if there is contamination of significance to remove, these areas may not be addressed.

It is estimated that Step 10 in Building 865 will take up to 6 WT weeks of effort to complete.

The table below provides a summary of step durations for Building 865:

Table 6.2-1 Summary table for Stage II operations, Building 865

Step Number	WT weeks of effort
1	4
2	4
3	2
4	43 + 20
5	93 + 20
6	8
7	6
8	15 + 2
9	49 + 6
10	6
Total	278

Drawings C-6 and C-7 represent the layout of Building 865 before and after completion of the work described in this Plan.

6.3 Maintenance Costs Associated with Building 865 Stage II Operations

The Operational Assessment of Building 865 (Reference 2) indicates that maintenance will be required for a number of pieces of equipment. The Operational Assessment lists those maintenance tasks which are judged to be required prior to the commencement of Stage III operations. The Assessment describes those tasks as A (must be corrected), B (need fixing) and C (correction can be delayed). For the purposes of this plan, it is assumed that tasks under A, B and C are carried out by MSC personnel in Stage II and a budget for this work has been prepared. The table below lists the cost of maintenance items required for these tasks. An allowance for the estimated maintenance costs for unspecified minor maintenance (gaskets, seals, hoses) appears in Table B1 under the title of Equipment Maintenance Supplies. This document only includes maintenance costs associated with production equipment. It does not include costs for the maintenance of the building envelope. These are detailed in the Operational Assessment. The labor cost for these maintenance items are included here for completeness only since they are formally accounted for in the Operational Assessment (Reference 2).

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Table 6.3-1 Maintenance Required for Production Equipment, Building 865

Item number	Description	Category	Estimated Cost
Building 865, 2.2.1	ABAR vacuum furnace has a vacuum leak, probably in the door or heating element which passes through seals.	A	40 hours
Building 865, 2.2.2	Vacuum induction melting furnace needs rebricking before operation because lack of operation and no vacuum has introduced water into the bricks.	A	120 hours $1,000
Building 865, 2.2.3	The extrusion press has hydraulic leaks, that require emptying the oil storage tank to fix. Hydraulic oil can be reused.	A	120 hours
Building 865, 2.2.4	The electron beam melting furnace has 1964 electronic controls which include transformers with PCB's. For continued operation, the power supply and controls should be replaced.	C	Quotes range from $70,000 to $300,000 depending upon vendor
Building 865, 2.2.5	Additional ventilation for rolling mill, Erie press, extrusion press and possibly machine tools to better contain beryllium powder.	A	300 hours $96,000
Total			580 hours $167,000 - $370,000

7.0 Building 883

7.1 Current Building Condition

Some limited operations in Building 883 are continuing. As a result, the building continues to be routinely monitored for radiological contamination by the M & O contractor. Areas of significant potential contamination are known to exist, for example within the pits beneath the rolling mills.

The current plant operator has recently surveyed the building for contamination levels both radiologically and for beryllium. The results of this survey were made available to MSC prior to Stage I commencement and have been summarized in the Characterization Work Plan. Beryllium surveying was discontinued in Building 883 a few years ago due to the minimal operations involving beryllium in the building at that time and the lack of contamination found during surveying. As part of the preparatory work for Stage I, available survey results have been obtained and examined. The results have been used to formulate the cleanup plan in Stage I.

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7.2 Sequence and Duration of Operations

Specific issues concerning Building 883 are discussed below.

Based upon the general 10 step work plan the following estimates of time taken to achieve each step can be made:

Step 1: Removal of Loose Waste/Unwanted Equipment

Building 883 contains a significant quantity of loose waste and unwanted equipment. It is assumed that all waste currently packaged will have been removed from the building before the start of Step 1 operations in Stage II however, there will be items not considered as waste by the current operator but which will become waste in Stage II. Such items are cupboards, tool boxes, and miscellaneous tools. These items are not expected to be contaminated to any significant degree considering their previous use however they will be all surveyed for radiological and toxicological contamination prior to removal. Any minor contamination will be removed at this stage. Items removed in Step 1 will be dispatched for reuse elsewhere, stored in the building for recycling in Stage III or removed as waste. In Building 883 it is proposed that equipment to be retained for Stage III is stored in suitable storage areas in Building 883 in compliance with all applicable regulations. This may mean that, as a consequence, existing equipment in identified rooms may need to be relocated at an early part of Step 1.

Based upon a Work Team (WT) size of seven Decontamination Workers and a Team Leader as discussed in Section 4, it is estimated that Step 1 will take approximately 4 WT weeks to complete.

Step 2: Cleaning of High Contamination Areas

The Characterization Work Plan has reviewed the radiological and toxicological survey data for Building 883 and has concluded that further surveying is unnecessary prior to Stage II hands-on operations commencing in Building 883. Step 2 will concentrate on cleaning any contamination found on closer examination to be in excess of the levels compatible with ongoing operations in Building 883. Section 3.8 lists the known high contamination areas in Building 883. Any easily accessible areas will be decontaminated to less than action levels in this step. Any areas requiring machine dismantling will not be cleaned until the machine itself is cleaned/dismantled. Based upon the estimated time taken to clean these areas out and dispose of any waste generated (primary or secondary) and with an allowance for cleaning other areas not currently characterized but which could be in excess of acceptable limits, a total of 2 WT weeks should be allowed for Step 2.

Step 3: Assembly of a Decontamination Facility

Equipment destined not to remain in Building 883 (i.e., for reuse or recycle) will be subjected to decontamination as determined by acceptable criteria as listed in the Characterization Work Plan. While some equipment with significant contamination will have been partially decontaminated during dismantling or cutting, it will be necessary to further decontaminate equipment prior to leaving Building 883. This final decontamination will take place in an assembled facility in

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Building 883 located in the vicinity of one of the loading bays in Building 883. It is planned that the facility will contain CO_2 blasting equipment and electropolishing or ultrasonic cleaning equipment as well as space for conventional hands-on decontamination work. The facility will be equipped with HEPA filtration, lighting and a shower entry/exit area. Including clearing the area of miscellaneous material before construction, it is estimated that it will take 2 WT weeks to assemble and operational test.

Step 4: Removal and Decontamination of Low Contamination Items of Equipment

Table B8 lists the major items of equipment considered as low or zero contamination which are not required for Stage III operations. The table also gives an estimate of how long each item will take to disconnect from service lines or other equipment, to remove peripheral equipment and to dismantle or cut up. An allowance is also included for final decontamination in the decontamination facility prior to removal of the equipment from the building or storage as feedstock for Stage III inside the building. The table shows that 87/5 = 17.4 WT weeks are required for the dismantling with a further 41/5 = 8.2 WT weeks (total 26) required for decontaminating and packaging of the waste.

Step 5: Removal and Decontamination of High Contaminated Items of Equipment

Step 5 operations are summarized in Table B9. This table lists the items known to contain or suspected of containing radiological or toxicological contamination at a level which requires use of a containment for dismantling operations. This step, therefore, allows time for the construction of containment, its preparation and final decontamination and disassembly as well as the dismantling time. The containment used will be modular in form constructed from fiberglass reinforced plastic panels which can be decontaminated after the work is complete. Alternately, PVC sheeting (or similar) can be used. While this is more suited for containing irregularly shaped equipment, its decontamination potential after the work is more limited. A total of 377/5 = 75.4 WT weeks are allowed for the dismantling and removal operations with a further 111/5 = 22.2 WT weeks (total 98) required for decontaminating and packaging of the waste.

Step 6: Decontamination, Dismantling and Removal of Services No Longer Required

Steps 4 and 5 involved the removal of unwanted equipment from Building 883. During those steps equipment was disconnected from services with the minimum of service line removed at that time. Step 6 involves removing those service lines back to a suitable point consistent with Stage III operations (i.e., the removal of all redundant lines minimizing scope for future contamination potential)

Lines to be removed include ventilation exhaust, process waste, steam, compressed air, and reagent feeds. It is estimated that this step will take up to 8 WT weeks of effort to complete.

Step 7: Repairs to Structure Following Removal of Equipment

With the removal of certain items of equipment, a number of pits or depressions on the site of that equipment will be revealed. Likewise, with the removal of service lines, holes in the building walls

may be opened. These structural issues will be resolved in Step 7. Depressions in the floor will be decontaminated if necessary and filled with concrete or similar to the level of the surrounding area. Holes in the building walls will be filled or covered with a suitable material. Several large items of equipment, when removed from Building 883, will reveal floor pits or depressions.

It is estimated that this Step will take 4 WT weeks of effort to complete.

Step 8: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as Low Contamination Risk

Step 8 involves dismantling, cleaning and maintaining (as necessary) equipment of a clean (i.e., uncontaminated) nature ready for use during Stage III operations. Table B10 lists the major items of equipment processed during this step. The relative low contamination nature of this equipment (information based upon available survey data and operational history) indicates that containments should prove unnecessary for this step and that dismantling will be undertaken with minimal protective clothing requirements. Should, however, contamination above levels requiring protective systems be detected, dismantling work will cease and the situation will be re-evaluated before continuing.

It is estimated that 163/5 = 32.6 WT weeks are required for the completion of this step. Waste packaging may take up to 21/5 = 4.2 WT (total 37) weeks to complete.

Step 9: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as High Contamination Risk

Step 9 concerns the decontamination, disassembly and maintenance of equipment which either has measurable contamination levels requiring containment and/or protective clothing or which may be contaminated to these levels on the basis of operational history. Table B11 lists the items of equipment to be handled in this step. Since these items are expected to be contaminated to a level requiring protective measures, containments will be provided for each operation. In some cases (e.g., for the rolling mills) the containment will be specifically built around the equipment while in cases involving smaller pieces of equipment (e.g., lathes, drills) a containment will be built with the equipment transported into it and the containment resealed. It is estimated that a total of 174/5 = 34.8 WT weeks of effort will be required to clean and maintain all the identified items of equipment. An additional 24/5 = 4.8 WT weeks (total 40) of effort will be required to decontaminate and package waste arising from the operation.

Step 10: Final Decontamination of Complete Building to Operational Levels

At the end of Step 9, all redundant equipment in Building 883 will have been removed with service lines cut back as appropriate. All equipment required for Stage III will have been cleaned and maintained. Step 10 is concerned with the final cleanup of Building 883 to reduce any remaining contamination down to levels commensurate with continuing operations in the building. As Step 2 was concerned with the removal of high contamination areas and providing there has been no unexpected spread of contamination arising from Stage II operations, Step 10 should be of short duration. If this is the case, then additional time may be spent in decontaminating the

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more inaccessible areas. However, if there is contamination of significance to remove, these areas may not be addressed.

It is estimated that Step 10 in Building 883 will take up to 6 WT weeks of effort to complete.

Table 7.2-1 Summary table for Stage II operations, Building 883

Step Number	WT weeks of effort*
1	4
2	2
3	2
4	18 + 8
5	76 + 22
6	8
7	4
8	33 + 4
9	35 + 5
10	6
Total	227

* some rounding of WT weeks has been incorporated for presentation purposes

Drawing C8 and C9 represent the layout of Building 883 before and after completion of the work described in this Plan.

7.3 Maintenance Costs Associated with Building 883 Stage II Operations

The Operational Assessment of Building 883 (Reference 2) indicates that maintenance will be required for a number of pieces of equipment. The Operational Assessment lists those maintenance tasks which are judged to be required prior to the commencement of Stage III operations. The Assessment describes those tasks as A (must be corrected), B (need fixing) and C (correction can be delayed). For the purposes of this plan, it is assumed that tasks under A, B and C are carried out in Stage II. The table below lists the cost of maintenance items required for these tasks. An allowance for the estimated maintenance costs for unspecified minor maintenance (gaskets, seals, hoses) appears in Table B1 under the title of Equipment Maintenance Supplies. This document only includes maintenance costs associated with production equipment. It does not include costs for the maintenance of the building envelope. These are detailed in the Operational Assessment. The labor cost for these maintenance items are included here for completeness only since they are accounted for in Reference 2.

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Table 7.3-1 Maintenance Required for Production Equipment, Building 883

Item number	Description	Category	Estimated Cost
Building 883, 2.4.1	The motor on the roll grinder needs replacement.	B	$60,000 for motor, installation and relocation
Building 883, 2.4.2	The hydraulic pumps on both A & B side HPM presses are leaking and need replacement. B side press requires electrical repair on/off switch.	B	120 hours (new pumps on hand)
Building 883, 2.4.3	The End Line preheat furnace on A side mill needs new heating elements and brick lining repair.	B	80 hours $2,000
Building 883, 2.4.4	Reheat furnace on A side mill requires new thermocouples and heating element examination.	B	24 hours
Building 883, 2.4.5	A side rolling mill requires preventative maintenance operations (PMO) including gas charging at accumulator.	B	24 hours
Building 883, 2.4.6	Large die cart needs repair or replacement.	C	$2,000 - $15,000
Total			248 hours $64,000 - $77,000

8.0 Building 444/7

A number of options for the cleanup of Building 444/7 were considered as part of the Facility Cleanup Plan. This was prompted by the size of the building, the quantity of equipment in those buildings and the uncontaminated nature of a significant portion of that equipment.

Three options were examined concerning the cleanup of Building 444/7 and were associated with the degree of cleanup to take place.

The three options considered for Building 444/7 were:

Option #1 - to remove all unwanted equipment from the entire building and clean/refurbish the remainder for Stage III operations.

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Option #2 - to remove all unwanted equipment from the building and clean/refurbish the remainder for Stage III operations excluding that in the Precision Shop, Heat Treat, NDT and the Vacuum Furnace Rooms.

Option #3 - to remove all unwanted equipment and clean/refurbish the remainder for Stage III operations from the section of the building that is east of Column G.

Data from Building 444/7 were collected and segregated into each option. Areas considered were quantities of feedstock, primary waste, secondary waste, oil, cleanliness, refurbishing time, and decontamination time. Consideration was given to the potential use by other parties if complete specialized fabrication shops were left intact for future use.

These options are discussed in more detail in Appendix D.

Based upon the aforementioned criteria, it was decided that Option #2 would yield the highest return for all parties involved for the following reasons:

1) Potential exists for the Precision Shop, NDT, Tool Crib and Heat Treat to be operated as a separate identity based upon the type and condition of equipment.
2) The Precision Shop, NDT, Tool Crib and Heat Treat areas are considered as having low to zero radionuclide and beryllium contaminants.
3) The above areas would generate considerable amounts of primary and secondary waste and oil in comparison to the amount of feedstock available.

Full details of Option #2 are given in the main text of the Facility Cleanup Plan. Details of Options #1 and #3 are given in Appendix D.

The remainder of this Cleanup Plan therefore is concerned with Option #2. This option is detailed in Section 8.2 below.

8.1 Current Building Condition

As in Building 883, some limited operations (e.g., machining and inspection) continue in Building 444/7. Consequently, the building continues to be routinely monitored for radiological and beryllium contamination by the M & O operator. Areas of significant potential contamination are known to exist, for example in the beryllium machining shop.

The current plant operator has surveyed the building for contamination levels both radiologically and for beryllium. Results of the full survey of the building by the operator are given in the Characterization Work Plan and have already been discussed in Section 3.8. The fabric of the building appears sound with no significant repairs or modifications apparently required. The building monitoring and HVAC systems appear adequate for Stage II operations. Some maintenance work is required before Stage III operations can commence. These are planned for and included in Steps 8 and 9 of the Cleanup Plan for Building 444/7.

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8.2 Sequence and Duration of Operations

Based upon the general 10 step work plan the following estimates of time taken to achieve each step can be made:

Step 1: Removal of Loose Waste/Unwanted Equipment

Building 444/7 contains a significant quantity of loose waste and unwanted equipment. It is assumed that all currently packaged waste will have been removed from the building before the start of Step 1 operations in Stage II, however, there will be items not considered as waste by the current operator but which will become waste in Stage II. Such items are cabinets, tool boxes, and miscellaneous tools. These items are not expected to be contaminated to any significant degree considering their previous use however they will be all surveyed for radiological and toxicological contamination prior to removal. Any minor contamination will be removed at this stage. Items removed in Step 1 will be dispatched for reuse elsewhere, stored in the building for recycling in Stage III or removed as waste. In Building 444/7 it is proposed that equipment to be retained for Stage III is stored in suitable storage areas in Building 444/7 in compliance with all applicable regulations. This may mean that, as a consequence, existing equipment in identified rooms may need to be relocated at an early part of Step 1.

In addition to the general waste/unwanted equipment removed in Step 1, in the case of Building 444/7 there is a significant quantity of miscellaneous equipment of an relatively uncontaminated nature which also is to be dismantled and removed. Table B12 lists the equipment falling into this category. Step 1 for Building 444/7 also includes the processing of this equipment. This equipment is low contamination risk and this work is scheduled to be carried out in Step 1. However, in reality, this work may be retained as a fall back job should work elsewhere be suspended for any reason.

Based upon a Work Team (WT) size of seven Decontamination Workers and a Team Leader as discussed in section 4, it is estimated that Step 1 in its entirety will take approximately 31 WT weeks to complete.

Step 2: Cleaning of High Contamination Areas

The Characterization Work Plan has reviewed the radiological and toxicological survey data for Building 444/7 which is considered to be largely complete and representative of contamination levels within Building 444/7. Existing data show that known high contamination areas in Building 444/7 are minimal as described in Section 3.8. Based upon the estimated time taken to clean these areas out and dispose of any waste generated (primary or secondary) and with an allowance for cleaning other areas not currently characterized but which could be in excess of acceptable limits, a total of 2 WT weeks should be allowed for Step 2.

Step 3: Assembly of a Decontamination Facility

Equipment destined not to remain in Building 444/7 (i.e., for reuse, recycle or as waste) will be subjected to decontamination as determined by acceptable criteria as listed in the Characterization Work Plan. While some equipment with significant contamination will have been partially decontaminated during dismantling or cutting, it will be necessary to further decontaminate equipment prior to leaving Building 444/7. This final decontamination will take place in an assembled facility in Building 444/7 located in the modules located in Room 101. It is assumed that at least one of these modules will remain available for use as a decontamination facility. It is planned that the facility will contain CO_2 blasting equipment and electropolishing or ultrasonic cleaning equipment as well as space for conventional hands-on decontamination work. The facility will be equipped with HEPA filtration, lighting and a shower entry/exit area. Including clearing the area of miscellaneous material before installation and modification of the existing module, it is estimated that it will take 2 WT weeks to assemble and operational test.

Step 4: Removal and Decontamination of Low Contamination Items of Equipment

Table B13 lists the major items of equipment considered as low or zero contamination which are not required for Stage III operations. The table also gives an estimate of how long each item will take to disconnect from service lines or other equipment, to remove peripheral equipment and to dismantle or cut up. An allowance is also included for final decontamination in the decontamination facility prior to removal of the equipment from the building or storage as feedstock for Stage III inside the building. The table shows that 615/5 = 123 WT weeks are required for the dismantling with a further 254/5 = 50.8 WT weeks (total 174) required for decontaminating and packaging of the waste.

Step 5: Removal and Decontamination of High Contaminated Items of Equipment

Step 5 operations are summarized in Table B14. This table lists these items known to contain or suspected of containing radiological or toxicological contamination at a level which requires use of a containment for dismantling operations. This step, therefore, allows time for the construction of containment, its preparation and final decontamination and disassembly as well as the dismantling time. The containment used will be modular in form constructed from fiberglass reinforced plastic panels which can be decontaminated after the work is complete. Alternately, PVC sheeting (or similar) can be used. While this is more suited for containing irregularly shaped equipment, its decontamination potential after the work is more limited. A total of 12.5/5 = 2.5 WT weeks are allowed for the dismantling and removal operations with a further 1/5 = 0.2 WT weeks (3) required for decontaminating and packaging of the waste.

Step 6: Decontamination, Dismantling and Removal of Services No Longer Required

Steps 4 and 5 involved the removal of unwanted equipment from Building 444/7. During those steps equipment was disconnected from services with the minimum of service line removed at that time. Step 6 involves removing those service lines back to a suitable point consistent with Stage III operations (i.e., the removal of all redundant lines minimizing scope for future contamination potential).

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Lines to be removed include ventilation exhaust, process waste, steam, compressed air, and reagent feeds. It is estimated that this step will take up to 2 WT weeks of effort to complete.

Step 7: Repairs to Structure Following Removal of Equipment

With the removal of certain items of equipment, a number of pits or depressions on the site of that equipment will be revealed. Likewise, with the removal of service lines, holes in the building walls may be opened. These structural issues will be resolved in Step 7. Depressions in the floor will be decontaminated if necessary and filled with concrete or similar to the level of the surrounding area. Holes in the building walls will be filled or covered with a suitable material. Several large items of equipment, when removed from Building 444/7, may reveal floor pits or depressions.

It is estimated that this step will take 4 WT weeks of effort to complete.

Step 8: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as Low Contamination Risk

Step 8 involves dismantling, cleaning and maintaining (as necessary) equipment of a clean (i.e., uncontaminated) nature ready for use during Stage III operations. Table B15 lists the major items of equipment processed during this step. The relative low contamination nature of this equipment (information based upon available survey data and operational history) indicates that containments should prove unnecessary for this step and that dismantling will be undertaken with minimal protective clothing requirements. Should, however, contamination above levels requiring protective systems be detected, dismantling work will cease and the situation will be re-evaluated before continuing.

It is estimated that 195.25/5 = 39.05 WT weeks are required for the completion of this step. Waste packaging may take up to 39.5/5 = 7.9 WT weeks (47) to complete.

Step 9: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as High Contamination Risk

Step 9 concerns the decontamination, disassembly and maintenance of equipment which either has measurable contamination levels requiring containment and/or protective clothing or which may be contaminated to these levels on the basis of operational history. There are no items of equipment in Building 444/7 falling into this category. All equipment considered to have a higher potential for contamination is removed in Step 5 above. As a consequence, a total of 0 WT weeks of effort are planned for this step.

Step 10: Final Decontamination of Complete Building to Operational Levels

At the end of Step 9, all redundant equipment in Building 444/7 will have been removed with service lines cut back as appropriate. All equipment required for Stage III will have been cleaned and maintained. Step 10 is concerned with the final cleanup of Building 444/7 to reduce any remaining contamination down to levels commensurate with continuing operations in the building.

As Step 2 was concerned with the removal of high contamination areas and providing there have been no unexpected spread of contamination arising from Stage II operations, Step 10 should be of short duration. If this is the case, then additional time may be spent in decontaminating the more inaccessible areas however, if there is contamination of significance to remove, these areas may not be addressed.

It is estimated that Step 10 in Building 444/7 will take up to 8 WT weeks of effort to complete.

A further 16 weeks of Work Team effort are planned to carry out building modifications required before the start of Stage III operations. These modifications for the chosen option are listed below:

Table 8.2-1 Building 444/7 Modifications

Work description	Labor in Team Weeks	Primary Waste ft^3	Secondary Waste ft^3
Remove crane rails	0.6	100	25
Remove utilities Col.S-Q in Room 101	5	1900	50
Remove Inspection Modules A-F	7.8	5166	50
Remove T101 Structure	2.5	2880	50

This list of modifications does not include the construction of the block wall between furnaces in Room 201. It is expected that a sub-contractor will be employed to construct this.

Table 8.2-2 Summary table for Stage II operations, Building 444/7

Step Number	WT weeks of effort*
1	31
2	2
3	2
4	123 + 51
5	2.5 + 0.5
6	2
7	4
8	39 + 8
9	0
10	8
Building Mods.	16
Total	289

* some rounding of WT weeks has been incorporated for presentation purposes

Drawings C10-C15 represent Building 444/7 before and after the Cleanup Plan is implemented as described above.

8.3 Maintenance Costs Associated with Building 444/7 Stage II Operations

The Operational Assessment of Building 444/7 (Reference 2) indicates that maintenance will be required for a number of pieces of equipment. The Operational Assessment lists those maintenance tasks which are judged to be required prior to the commencement of Stage III operations. The Assessment describes those tasks as A (must be corrected), B (need fixing) and C (correction can be delayed). For the purposes of this plan, it is assumed that tasks under A, B and C are carried out in Stage II. The table below lists the cost of maintenance items required for these tasks. An allowance for the estimated maintenance costs for unspecified minor maintenance (gaskets, seals, hoses) appears in Table B1 under the title of Equipment Maintenance Supplies. This document only includes maintenance costs associated with production equipment. It does not include costs for the maintenance of the building envelope. These are detailed in the Operational Assessment. The labor cost for these maintenance items are included here for completeness only since they are accounted for in Reference 2.

Table 8.3-1 Maintenance Required for Production Equipment, Building 444/7

Item number	Description	Category	Estimated Cost
Building 444/7, 2.6.1	Each of the 8 Vacuum Induction Melting Furnaces require rebricking, since the brick has absorbed moisture during the three year shutdown.	A	$100,000
Building 444/7, 2.6.2	The vacuum system for the graphite shop is not working. The ducting needs modification due to the removal of equipment at which time the vacuum system will be repaired.	B	160 hours engineering installation
Total			160 hours $100,000

9.0 Sequencing of Activities Among Buildings

Sections 6, 7 and 8 of this plan detail the work expected to be carried out during Stage II of the NCPP. The data from the three buildings can be combined into a single chart which depicts how the three buildings may be sequenced together taking into account the following parameters:

1) hands-on work is expected to begin in March 1995.
2) Stage II is assumed to be complete within 2 years of the start of Stage II (i.e., within 18 months after hands-on work begins).

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3) a period of two weeks is allowed between each step for training/refresher training purposes. The exception to this is between Steps 4 and 5 where 3 weeks is allowed. This is an additional training period considered necessary due to the training requirements for Step 5 over Step 4.
4) work teams will each be comprised of 5 Decontamination Workers (DWs) with an additional DW with mechanical maintenance experience (a Decontamination and Maintenance Worker (D&MW)) and a further DW with CCT experience (a Decontamination and Contamination Control Worker (D&CCW). Any specialized support will be available from a centralized pool of personnel.
5) work team recruitment and training will match the proposed work schedule and that work teams are recruited sequentially to allow a steady flow through initial and subsequent training courses.
6) work teams are released sequentially from the Stage II work so they may be processed at a controlled pace through training to Stage III work.

Table B16 and Table B17 represent how the Work Teams can be phased together to meet the projected work load and time constraints. Table B16 lists the labor numbers and hours required at each week step of Stage II while Table B17 is a schedule showing the sequence of operations and how each Work Team will be employed. Also included in Table B17 is an allowance for the limited facility operations during Stage II when some process verification, declassification and other work is scheduled to take place in Buildings 883 and Building 444/7. This work is separate from the work described in this plan and is not anticipated as impacting upon decontamination work due to the size of the buildings and the numerous work fronts open at any one time to Work Teams.

The figure shows that, on the basis of the individual work tasks identified in Tables B4 to B15, the work can be accomplished within the 18 month time span using up to 14 Work Teams each with seven decontamination workers. Table B17 shows that the end of Stage II is scheduled for 9/30/96. If hands-on work were to begin before March 1995, the end date for Stage II could be brought forward.

10.0 Discussion on Work Team Management

The Work Teams are expected to be composed of seven personnel. This is not a fixed figure but is taken as a workable team size which could be split or combined with other personnel for specific tasks. Each team would contain up to five DWs with two workers with specialist knowledge who would add to the strength of the team. It is expected that one of these two would have training in health physics techniques (a D&CCW) with the other trained in mechanical handling and maintenance methods (a D&MW). Any further specialized knowledge would need to be sought outside the Work Team from a central pool for Stage II. The size and composition of this pool or any other maintenance workers (e.g., for building maintenance) is not accounted for in this Cleanup Plan.

The intention, wherever possible, is to introduce Work Teams to Stage II work gradually commencing with less complex tasks such as general waste removal. Dealing with higher

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contamination items and the use of more sophisticated decontamination and dismantling techniques is introduced in Steps 4 and 5. The Training Plan is being written in conjunction with this Cleanup Plan to provide suitably trained personnel for the scheduled start of each step of the plan. The Training Plan contains more details of the staggered recruitment designed to meet the requirements of the Cleanup Plan.

11.0 Stage II Cleanup Schedule

One of the deliverables in the Facility Cleanup Plan is to provide an estimation of the labor of the work described in the Plan. This section summarizes labor costs as follows:

NCPP Stage II estimate for Facility Cleanup

	Total Stage II estimate	Sum spent in calendar year 1994
Decontamination Workers[1]	257,880 hours	none
DW training pre-work[2]	11,200 hours	2,800 hours (25%)
D&MWs training pre-work[3]	6,720 hours	1,680 hours (25%)
D&CCWs training pre-work[4]	2,800 hours	700 hours (25%)
Team Leaders	36,840 hours	1,842 hours (5%)
TL training pre-work[5]	4,704 hours	2,352 hours (50%)
Product Verification/ Declassification work	28,080 hours	1,404 hours (5%)
R/D training pre-work[6]	1,920 hours	1,536 hours (80%)

Notes:

Assumes a 3/1/95 start date for hands-on work in accordance with current schedule.

The above figures for labor are based on the projected plans for decontamination and dismantling of Buildings 865, 883 and Building 444/7. No allowance at this time is made for reduced working times due to adverse working conditions (i.e., heat, height).

The above assumes a 40 hour week.

No contingency, has been applied to any of the above figures.

[1] This includes hands-on work for DWs, D&MWs and D&CCWs.

[2] Training for 70 DWs is estimated as taking a total of approximately 47 days per trainee over the two year period. With an average of 6 weeks of training time included during the early part of Stage II, there is a requirement for approximately 20-25 training days/person to be undertaken before the hands-on start of Stage II. For planning purposes, a figure of 20 days has been used.

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(3) Training for 14 D&MWs is estimated as taking a total of approximately 97 days per trainee over the two year period. With an average of 6 weeks of training time included during the early part of Stage II, there is a requirement for approximately 50-60 training days/person to be undertaken before the hands-on start of Stage II. For planning purposes, a figure of 60 days has been used.

(4) Training for 14 D&CCWs is estimated as taking a total of approximately 51 days per trainee over the two year period. With an average of 6 weeks of training time included during the early part of Stage II, there is a requirement for approximately 25-30 training days/person to be undertaken before the hands-on start of Stage II. For planning purposes, a figure of 25 days has been used.

(5) Training for 14 Team Leaders is estimated as taking a total of approximately 72 days per trainee over the two year period. With an average of 6 weeks of training time included during the early part of Stage II, there is a requirement for approximately 40-45 42 training days/person to be undertaken before the hands-on start of Stage II. For planning purposes, a figure of 42 days has been used.

(6) Training for 12 Product Verification/Declassification Workers is assumed to last 4 weeks prior to hands-on work commencing. There is currently no provision for specific on-the-job training during this work package.

Note that waste handling labor is not included in the estimate. It is a pre-requisite of this Plan that existing waste is removed from each building before Stage II commences (see Section 3.9) and that the costs of interim storage and final disposal of these solid and liquid wastes are charged directly to DOE. Waste characterization, packaging and handling will be conducted by MSC Waste Management Technicians outside the Work Teams.

12.0 References

1. National Conversion Pilot Project Stage I Characterization Work Plan, Revision 2, 29 September 1994.

2. National Conversion Pilot Project Stage I Operational Assessment, Revision 2, 8 August 1994.

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APPENDIX A

Figures A1 -A12

Figure A1	Decision Tree, Stage II Operations, Step 1
Figure A2	Decision Tree, Stage II Operations, Step 2
Figure A3	Decision Tree, Stage II Operations, Step 3
Figure A4	Decision Tree, Stage II Operations, Step 4
Figure A5	Decision Tree, Stage II Operations, Step 5
Figure A6	Decision Tree, Stage II Operations, Step 6
Figure A7	Decision Tree, Stage II Operations, Step 7
Figure A8	Decision Tree, Stage II Operations, Step 8
Figure A9	Decision Tree, Stage II Operations, Step 9
Figure A10	Decision Tree, Stage II Operations, Step 10
Figure A11	Decontamination Logic Diagram
Figure A12	Decontamination Technique/Application Matrix

Figure A1

Step 1: Removal of Waste/Unwanted Equipment

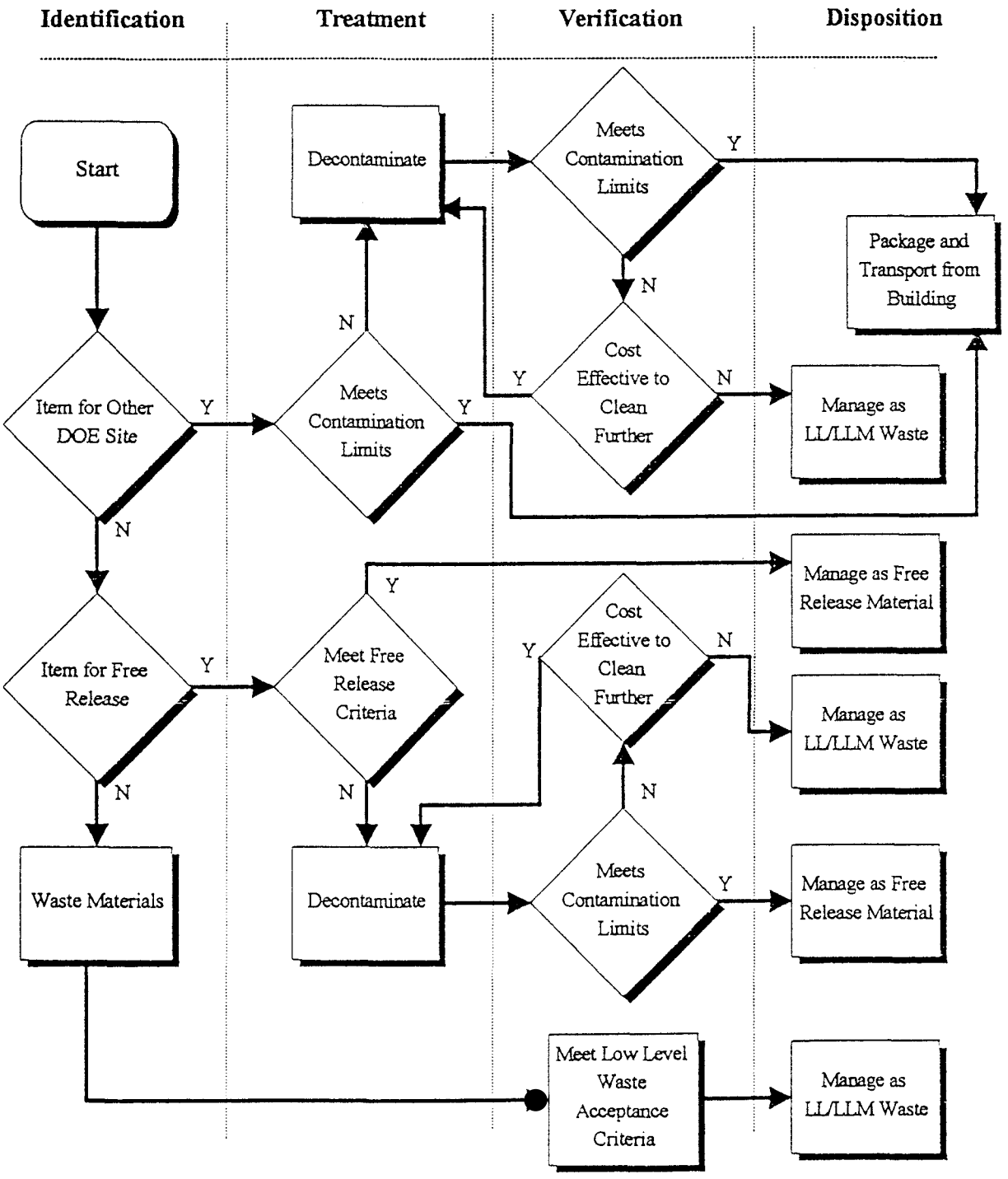

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Figure A2

Step 2: Cleaning of High Contamination Areas

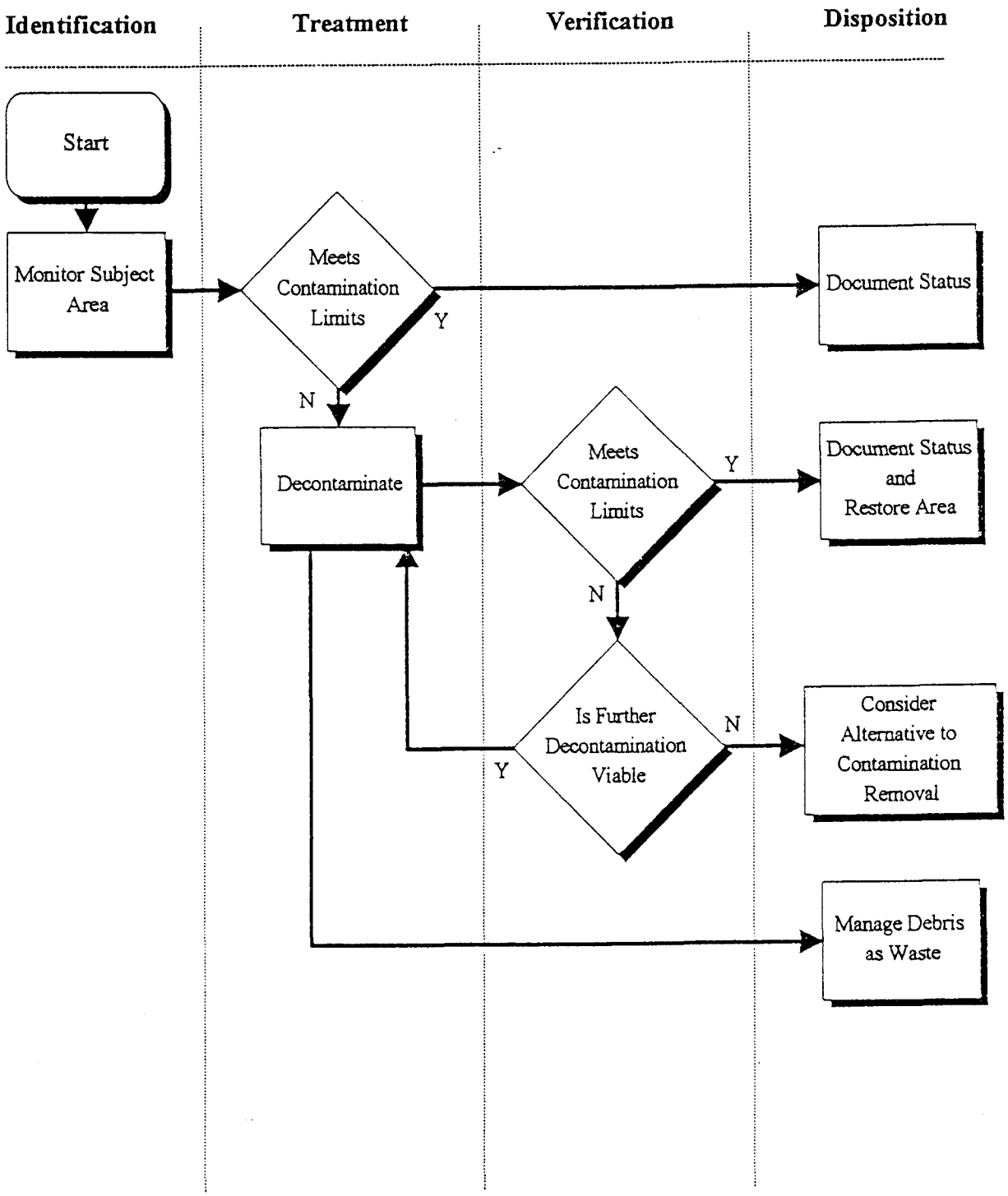

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Figure A3

Step 3: Build Decontamination Facility

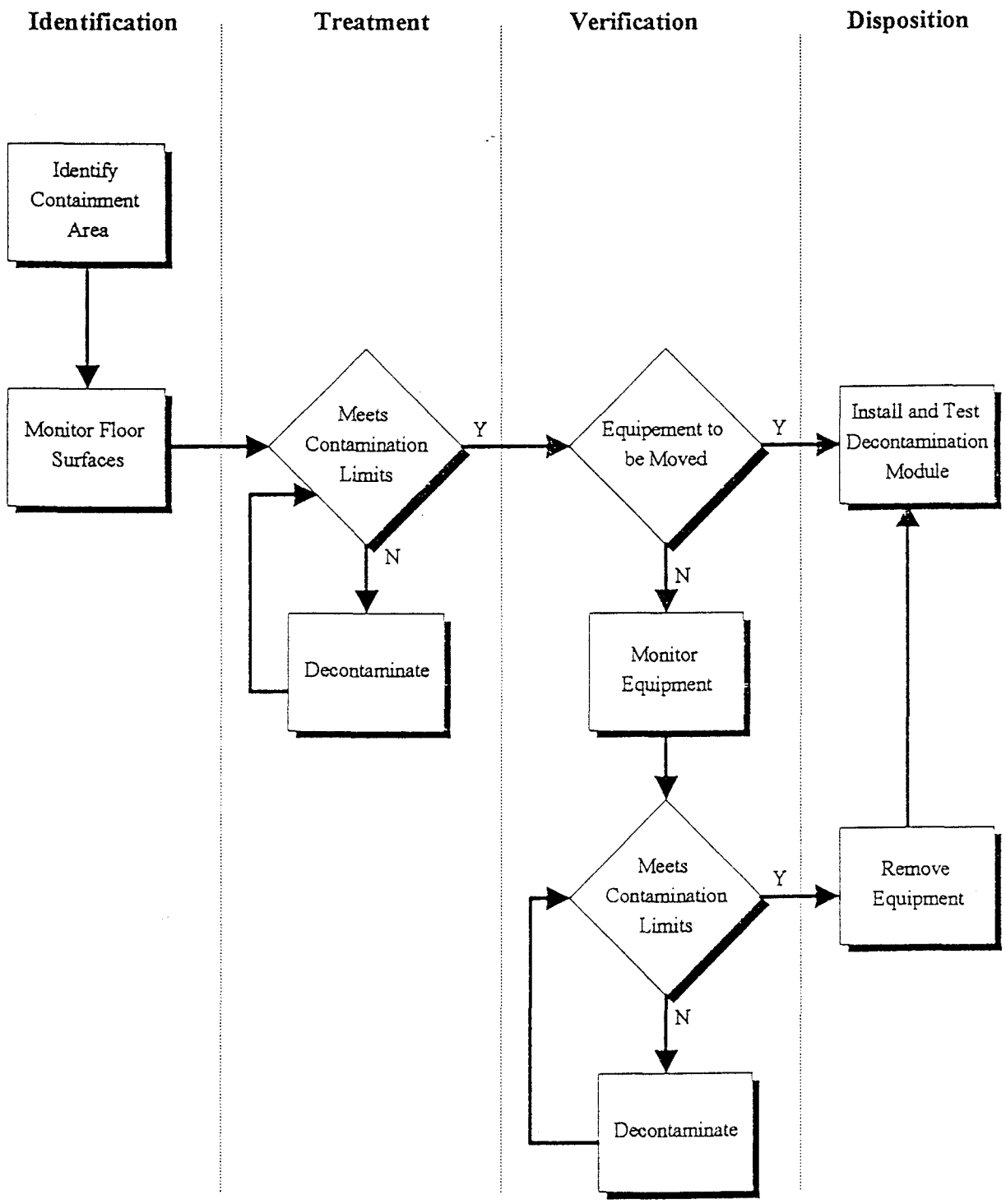

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Figure A4

Step 4: Removal and Decontamination of Low Contaminated Items of Equipment and Furnishings

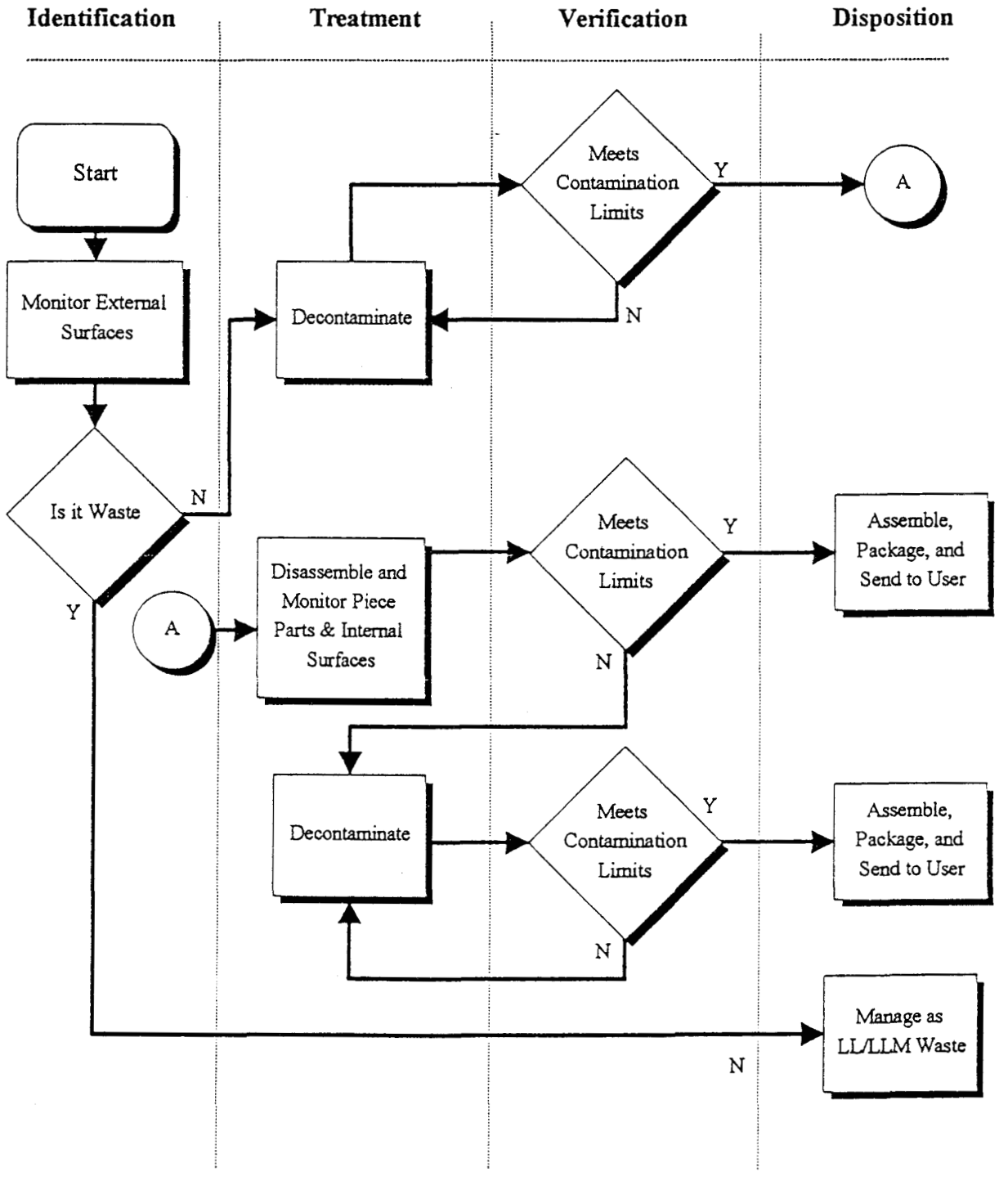

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Figure A5

Step 5: Removal and Decontamination of Highly Contaminated Items of Equipment and Furnishings

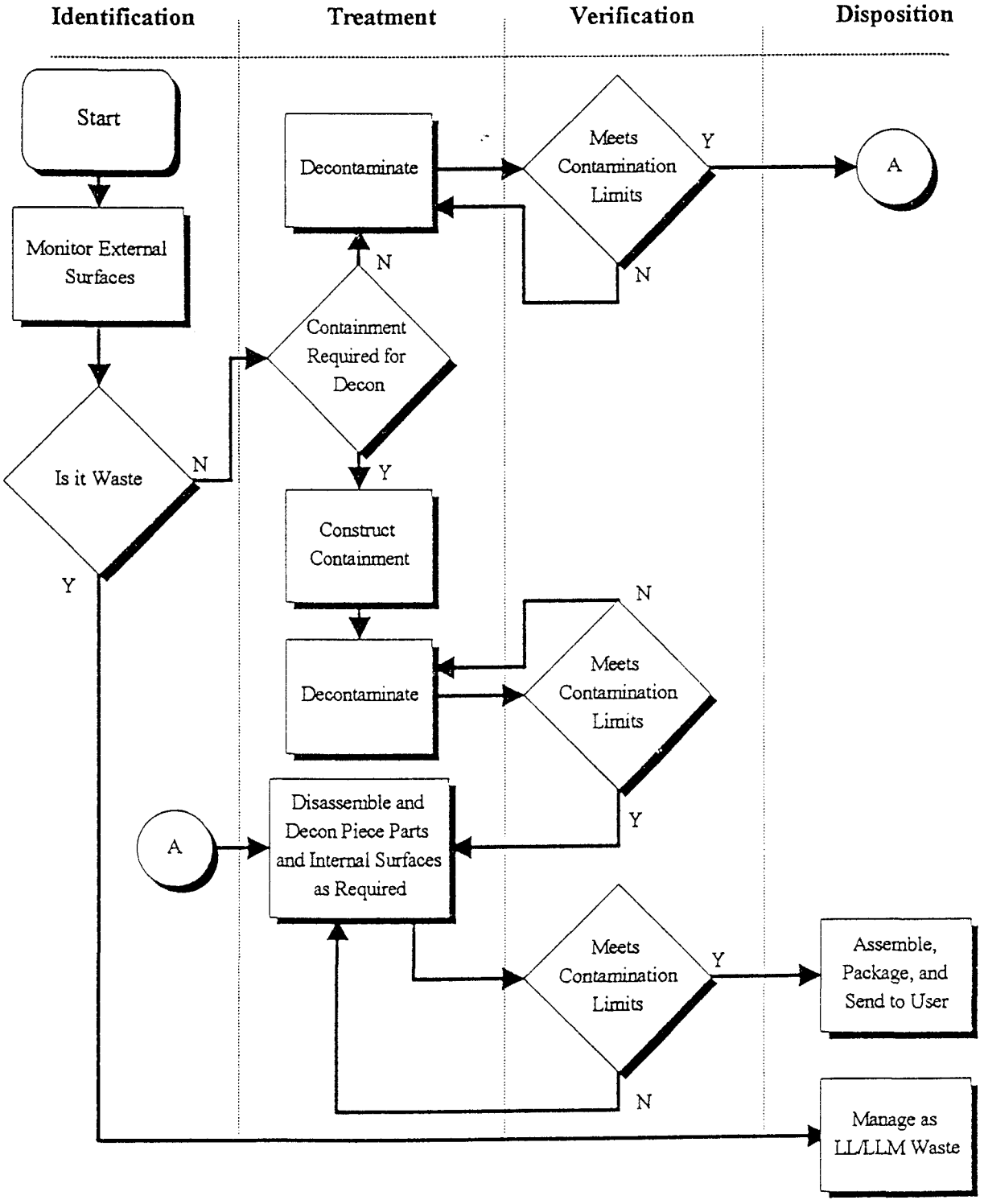

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Figure A6

Step 6: Decontamination, Dismantling, and Removal of Services

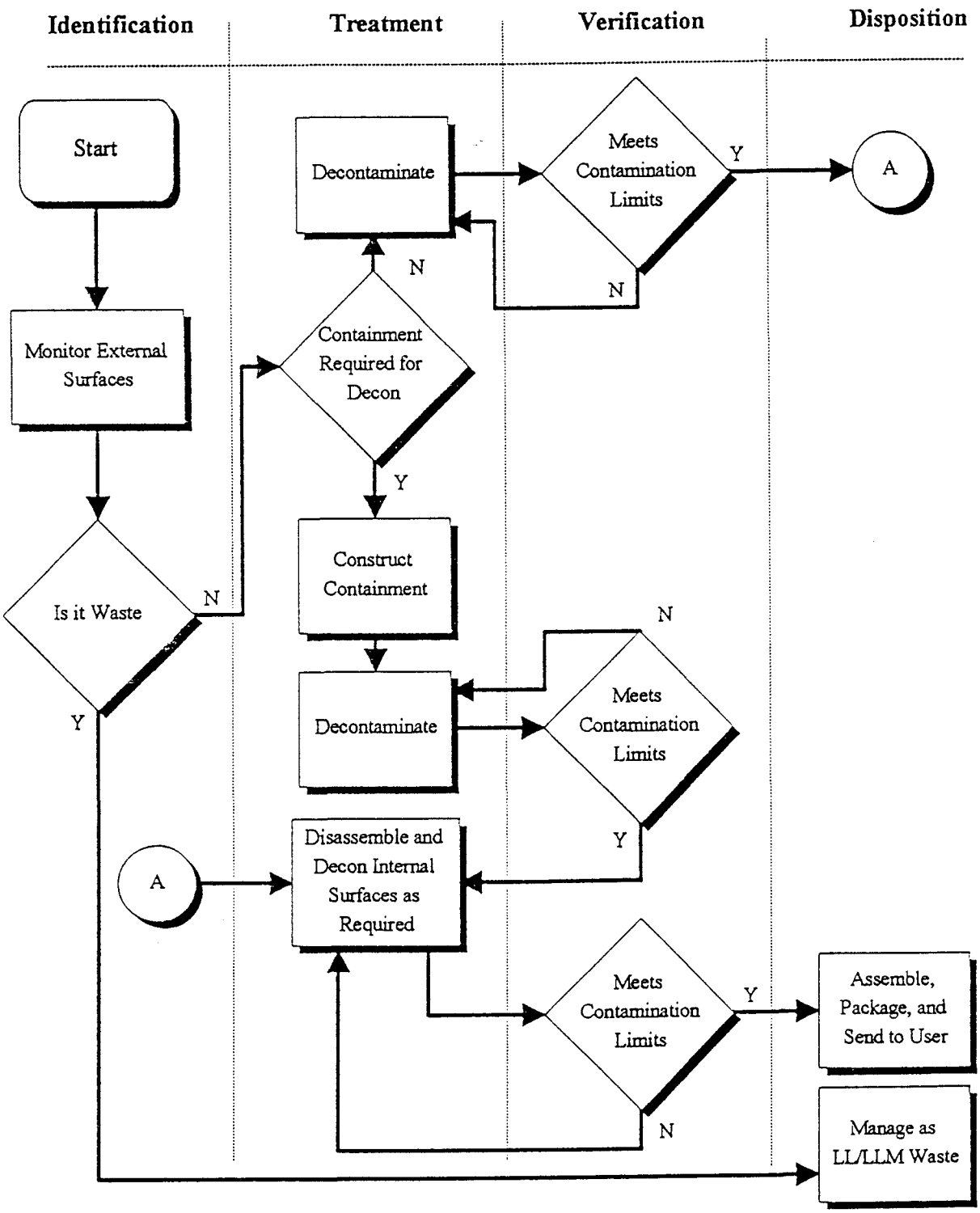

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Figure A7

Step 7: Repairs to Structure Following Removal of Equipment

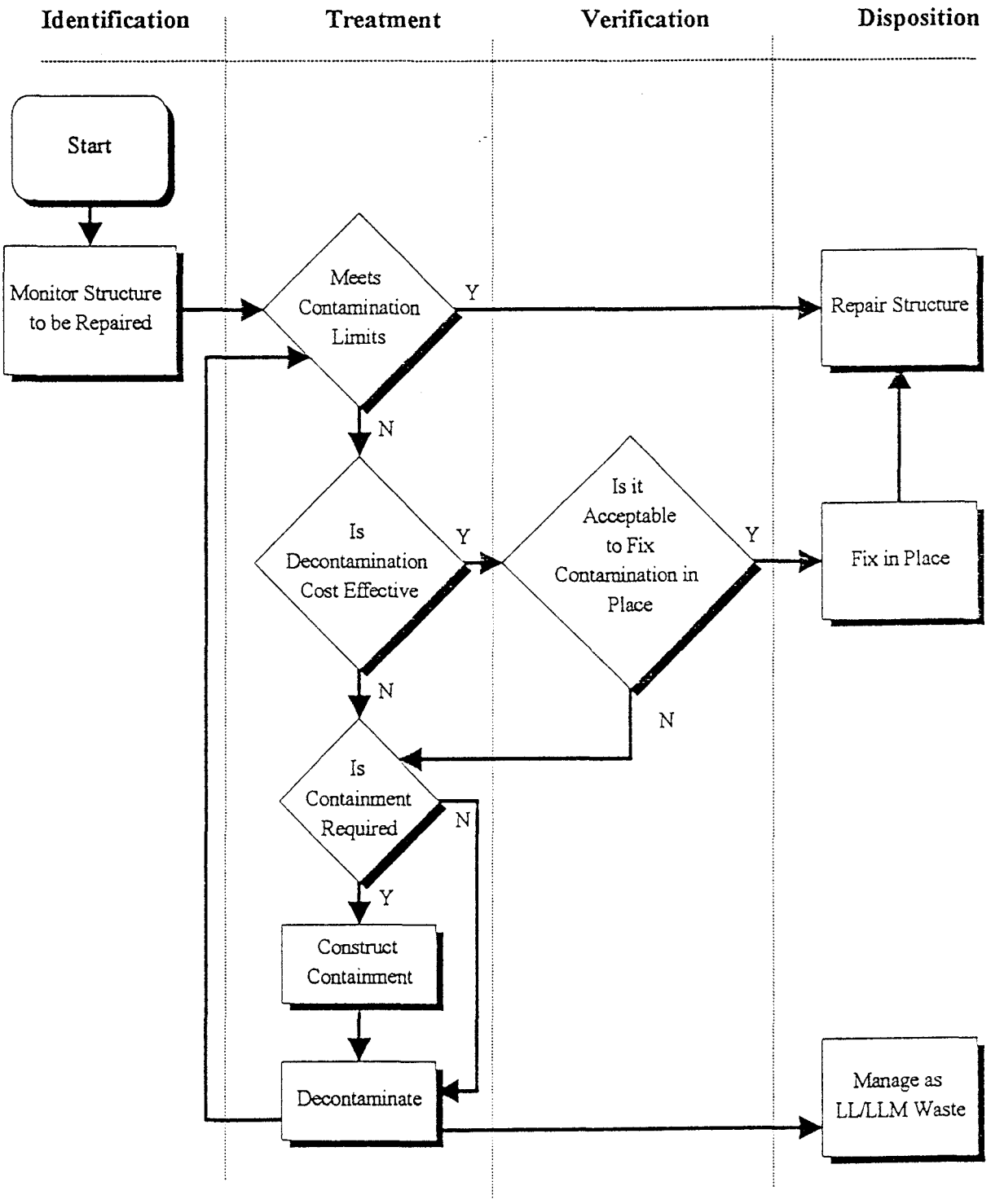

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Figure A8

Step 8: Dismantling, Decontamination, and Reassembly of Retained Equipment Considered to be a Low Contamination Risk

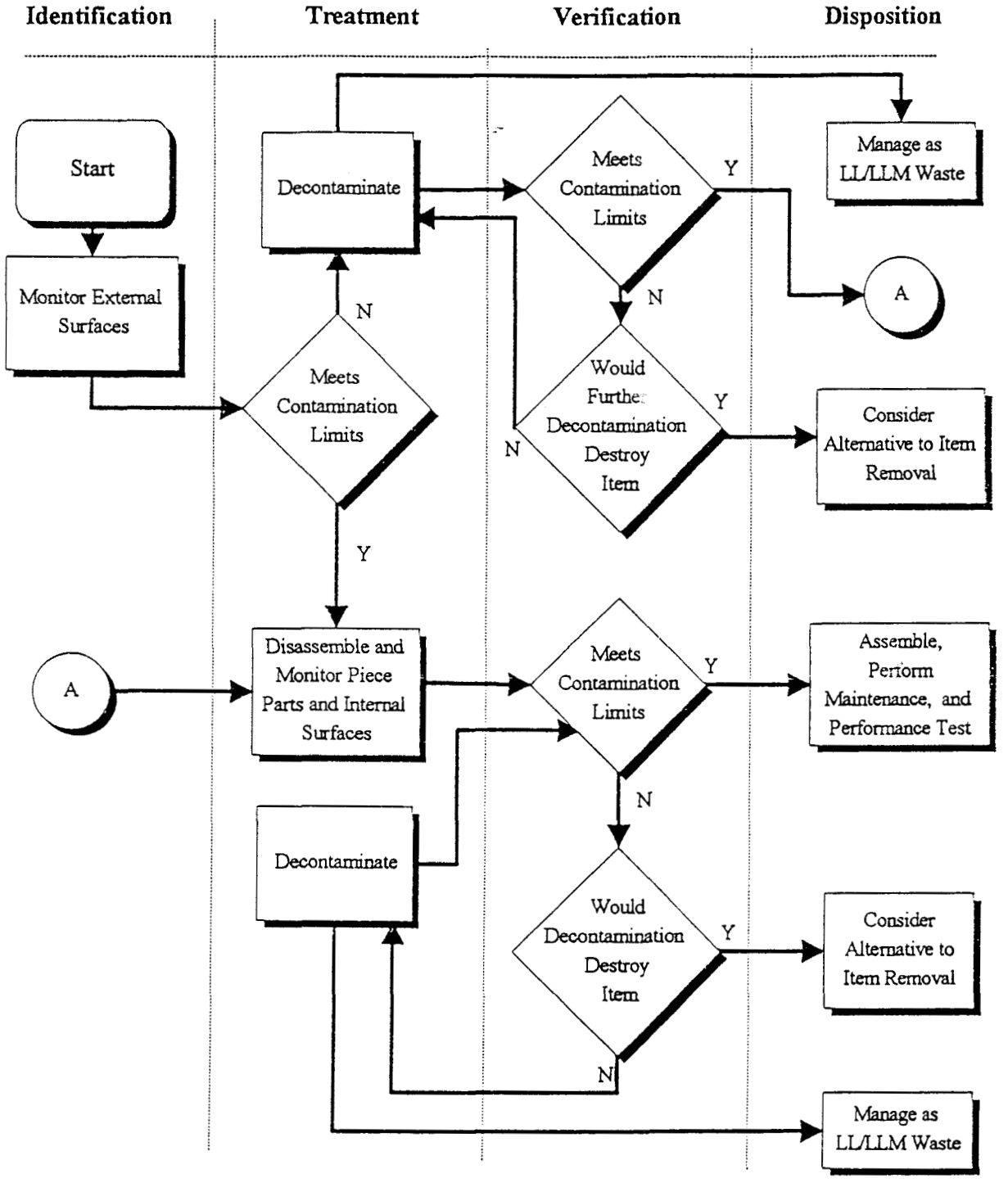

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Figure A9

Step 9: Dismantling, Decontamination, and Reassembly of Retained Equipment Considered to be a High Contamination Risk

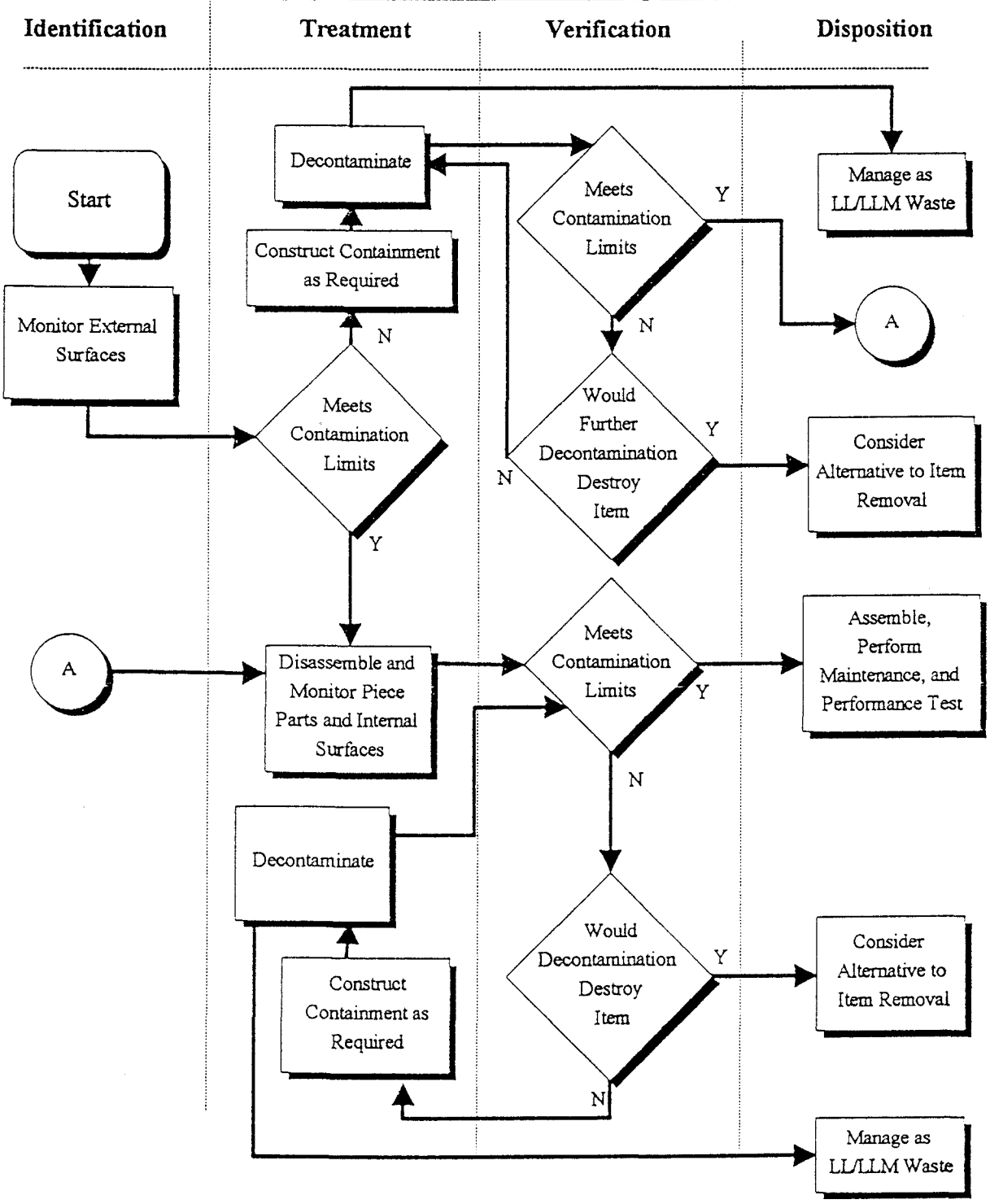

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Figure A10

Step 10: Final Decontamination of Building to Operational Levels

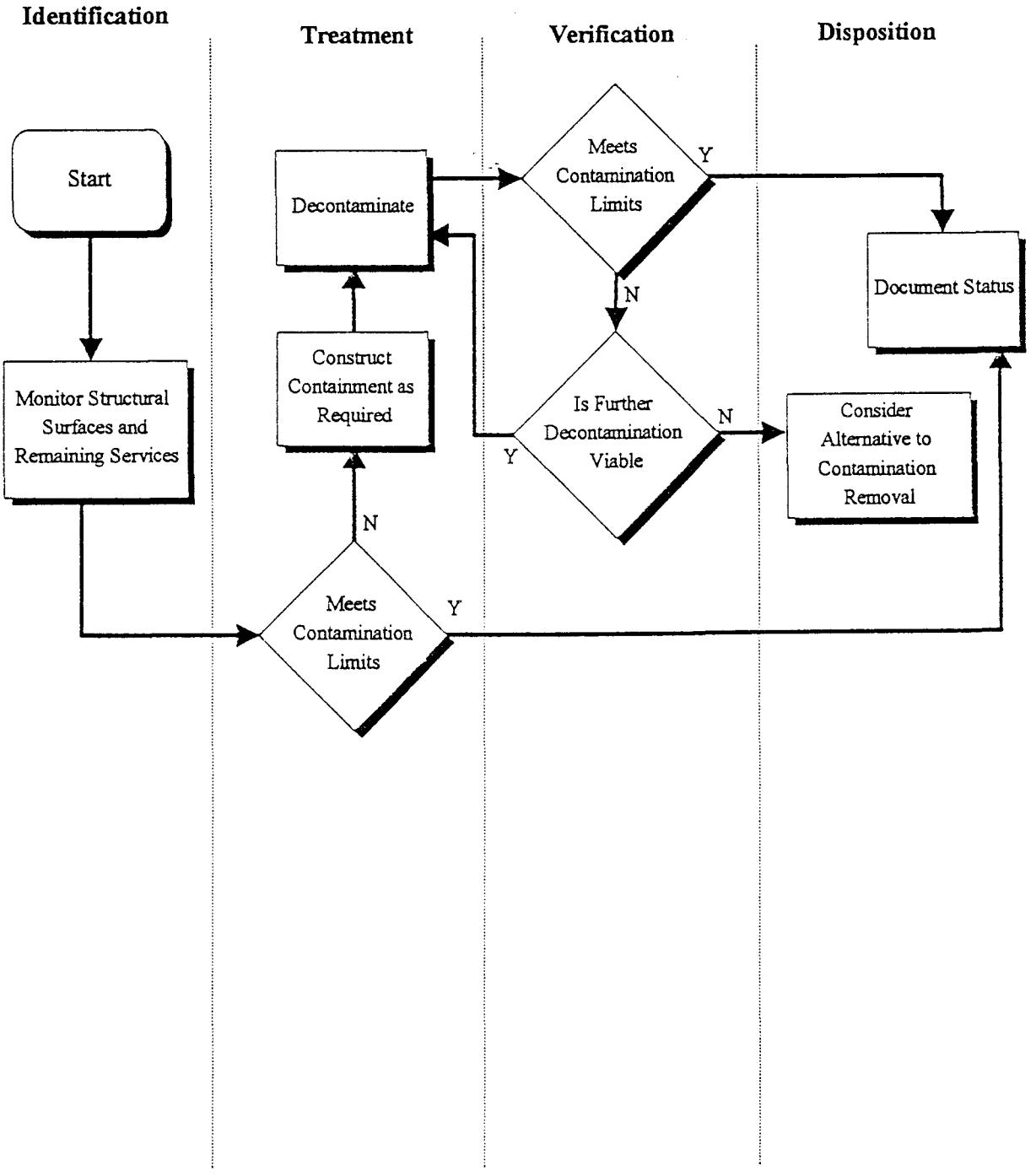

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Figure A11

Decontamination Logic Diagram

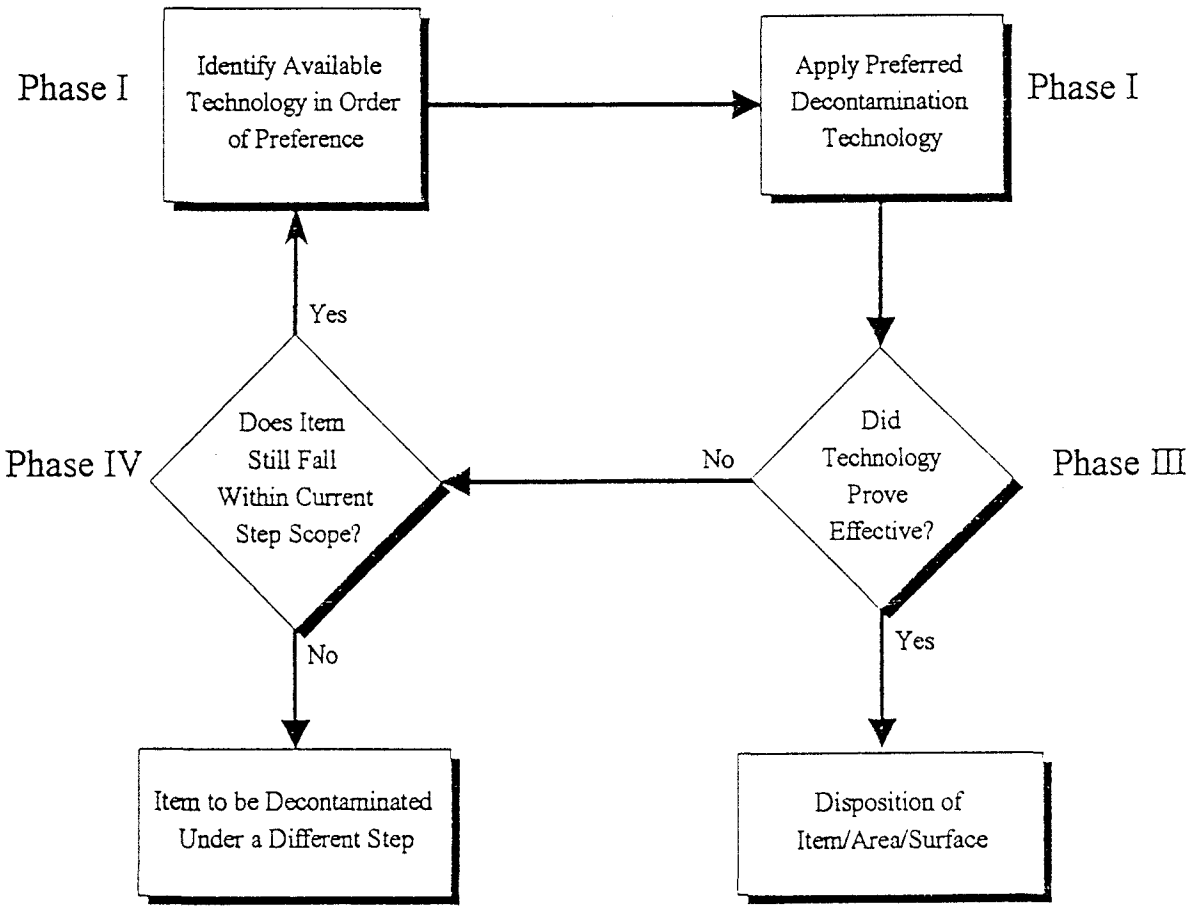

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Figure A12

Decontamination Technique/Application Matrix

	Washing wiping & scrubbing	Vacuum cleaning	Paint stripping	CO_2 blasting	High Pressure Water/ steam cleaning	Foam decontaminants	Grit blasting	Grinding & Scabbling	Chemical decontamination	Electro-polishing	Ultrasonic cleaning	Strippable coatings[1]	Modular containments/ PVC tenting[2]	Exit showers/ water cleanup systems[2]	Foam filling[2]
STEP 1 Loose waste unwanted equipment office type, tools and ancillary	1	3	5	6	N	N	4	N	N	7	2	N	N	N	N
STEP 2 Clean areas of high contamination	2	1	5	N	6	3	N	4	P	N	N	N	1	1	N
STEP 3 Assembly of Decontamination Facility	N	N	N	N	N	N	N	N	N	N	N	Y	N	Y	N
STEP 4 "Clean" equipment for removal	1	5	6	2	N	8	7	9	N	4	3	P	N	N	N
STEP 5 "Contaminated" equipment for removal	1	P	2	4	P	P	P	P	N	P	Y	Y	Y	P	N
STEP 6 "Clean" equipment to stay	1	3	4	7	N	N	5	6	N	2	N	N	N	N	N
STEP 7 "Contaminated" equipment to stay	1	2	3	P	4	5	N	7	N	N	6	Y	Y	Y	N
STEP 8 Remove services	1	2	3	7	6	5	N	4	N	N	N	P	P	P	Y
STEP 9 Structural repair	1	2	3	N	5	6	N	4	7	N	N	P	P	P	N
STEP 10 Final building decontamination and decontaminate tools used in decontamination	B-1 T-1	B-2 T-2	B-3 T-N	B-6 T-3	B-4 T-4	B-4 T-N	B-5 T-5	B-4 T-4	B-7 T-N	B-8 T-5	B-8 T-4	B-4 T-N	B-1 T-P	B-1 T-P	N

[1] Strippable coatings could be used to remove contamination or avoid the spread of contamination by applying this product around area to be decontaminated.
[2] These are not direct decontamination methods, but aids in the decontamination process.

Y = Yes, N = No, P = Possibly or has potential

Numbers represent preferred order of application with 1 being first and 10 last.

In Step 10, B & number is for building decontamination; T & number is for tool decontamination.

APPENDIX B

Tables B1 - B17

Table B1	Equipment and Tools Required for Decontamination
Table B2	Health Physics Equipment Requirements for Stage II, NCPP
Table B3	Consumable Items - Estimates of Types and Quantities required
Table B4	Clean Equipment for Removal, Building 865
Table B5	Contaminated Equipment for Removal, Building 865
Table B6	Clean Equipment to Stay, Building 865
Table B7	Contaminated Equipment to Stay, Building 865
Table B8	Clean Equipment for Removal, Building 883
Table B9	Contaminated Equipment for Removal, Building 883
Table B10	Clean Equipment to Stay, Building 883
Table B11	Contaminated Equipment to Stay, Building 883
Table B12	Building 444/7 Rooms, Miscellaneous
Table B13	Clean Equipment for Removal, Building 444/7
Table B14	Contaminated Equipment for Removal, Building 444/7
Table B15	Clean Equipment to Stay, Building 444/7
Table B16	Stage II Weekly Labor Hours
Table B17	Stage II Work Plan Schedule

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Table B1

Capital Equipment
Equipment and Tools Required for Decontamination

Equipment & Tools	Quantity Required for Stage II
CO_2 Cleaning Equipment	
Pelletizer & Discharge Station	1
Discharge Station	2
Pellet Transporter	2
Compressor/dryer	3
Liquid CO_2	
CO_2 Tank Lease	24 months
Liquid CO_2 40T/month	960 tons
FRP Decontamination Module (Fiberglass Reinforced Plastic) 10't x 20'w x 12'l	6
Air movers/filtration 3000cfm HEPA (NQA1)	6
Decontamination module for CO_2 Cleaning 10't x 20'w x 12'l	3
Air movers/filtration 3000cfm HEPA (NQA1)	3
Portable Power tools (5 each per building)	
Band saw	15
Reciprocating saw (Sawzall)	15
Abrasive saw	15
Angle grinder	15
Electric shears	15
Power nibbler	15
Drills	15
Portable Power tools (1 each per building)	
Hydraulic Wire Rope (Cable) Cutters	3
Hydraulic Cylinder & Pump Set	3
Demolition Hammer	3
1/2" Impact Wrench	3
Hydraulic Rod & Bar Cutter	3
Hydraulic Pipe Cutter (2-4")	1

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Table B1
(continued)

Equipment & Tools	Quantity Required for Stage II
Moving Equipment (1 each per building)	
Lift Tables	3
Hydraulic Pallet Trucks	3
Swivel Top Roller Skid Dolly Kit	3
Lever Dollies	3
Drum and Barrel Trucks	3
Hydraulic Cylinder & Pump Set	3
Ratchet Lever hoist	3
Hydraulic Floor (engine) crane	3
Scabblers	3
Wet/Dry Vacuum	6
Floor Scrubber/containment	6
Airless Sprayer	6
Plasma arc torch	9
22 gal Ultrasonic Bath	3
50 gal Electropolishing Unit & chemicals	3
25' Telescoping Work Platform for Buildings 883 & 444/47	2
Gantry or "A" frame and electric chain hoist 1 ton capacity; 1 on floor & 1 in Dismantling Module.	6
Hurst Jaws of Life	3
Portable Decontamination Step-off Showers	6
Waste water treatment equipment	3
Isokinetic Stack Samplers & Installation	3
Oil-water Emulsion Separators	3
Scales (0-10,000 pound)	3
Foam Guns	6
Equipment Maintenance Supplies	

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Table B2

Capital Equipment

Health Physics Equipment Requirements for Stage II, NCPP

Description	Quantity Required for Stage II
Portable alpha/beta/gamma monitors	12
Full body radiation monitors	6
Portable air sampler units (activity)	12
Portable air sampler units (beryllium)	6
Multi Gas (5) Analyzer/cal kit	9
Installed air sampler system (activity)	4
Smear counters, alpha	6
Smear counters, beta/gamma	6
Personnel Contamination Monitors (hand/foot/clothing), alpha/beta/gamma	6
Atomic Absorption (Spectrophotometer) Unit & Supporting Equipment	4
Personnel Lapel Sampling pump/filters/chargers/cal. unit	120

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Table B3

Consumable Items - Estimates of Types and Quantities Required

Consumable	Quantity required for Stage II
GLOVES	
Latex @ 10pr/day	360,000
Chemical (Ansell Edmont Petroflex®)	1,800
Leather (Gauntlet Cuff)	1,800
Armordillo (Kevlar)	1,800
PROTECTIVE SUITS (3/wk)	
Tyvek	21,600
Tyvek Hoods	21,600
HARD HATS	120
SAFETY SHOES	
Metatarsal	120
Rubber boots	36
WELDING/CUTTING	
Hoods	18
Gloves	45
Aprons	24
Portable Welding Screen	24
SAFETY HARNESS	
Full Body/shoulder "D" ring	12
Manyards	15
HEARING PROTECTION	
Ear Plugs	37500
Earmuffs	50
RAIN GEAR	18
SAFETY GLASSES	
Non-Prescription	60
Prescription	60
GRINDING/SPLASH SHIELDS	50
RUBBER APRONS	12
CLEANING FLUIDS	
Nitric Acid	300 gal
Hydrite 4000 Electropolish	200 gal
Liquid Cleaner Concentrate (Surfactant)	540 gal
Foam Decontaminates	50 gal
1,1,1 Trichloroethane	100 gal

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Table B3
(continued)

Consumable	Quantity required for Stage II
WIPING TOWELS	30,000 boxes
SAMPLE SWABS	1,000,000
PAINTS	
Strippable Paints	100 gal
Paint Stripper	300 gal
Tie Down Coatings	400 gal
Wall Paint	586 gal
Floor Paint	250 gal
Floor Resurfaces	480 gal
PLASTICS	
Sealable Plastic Bags	5,000
Flame Retardant Vinyl Sheeting	30
Stretch Film 80 Gauge	540
TENT FRAMES	8
SAW BLADES/DISCS	
Dry Diamond Blades	10
Band Saw Blades	180
Reciprocating Saw Blades	900
Metal Grinding Wheels	180
STRETCH FILM HAND WRAPPERS	9
FIREBRICK, VACUUM FURNACES, Building 444	
FIREBRICK FURNACES, Buildings 865 883	
DUCT FOAMING MATERIAL	50 units
TENT FRAMING	8
DEPRESSION REPAIR	
Concrete	30 cubic yards
Backfill Dirt	200 tons

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Table B4

Building 865, NCPP 'Clean' Equipment for Removal

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	Holden salt bath	145/G3	38174 & 38191	0	0	2	1	3	4	7	170	100	10	7750	1
2	Lindberg salt bath	145/G3	00002100 00	0	0	2	1	3	4	7	72	40	10	500	0
3	Peerless hacksaw	145/G3	00038400 00	0	1	2	0.5	3.5	2	5.5	18	5	5	750	5
4	Toolrack/counter tops	145/H4	NO CE#	0	0	3	0.5	3.5	2	5.5	432	5	5	600	0
5	Fenn rolling mill & controls	145/E3		1	2	2	1	6	5	11	170	75	20	3000	2
6	Pit furnace controls	145/E4	00038177 00	1	2	2	1	6	2	8	300	250	10	10000	0
7	Harper pit furnace	145/E4	00038177 00	1	2	10	2	15	5	20	1150	700	25	20000	0
8	Circle shear & roll form	145/E3	00045088 00	0.5	1	3	0.5	5	2	7	38	2	5	400	1
9	Fenn draw bench	145/F2-G2	00038202 00	1	2	7	1	11	5	16	625	25	15	2000	75
10	Gradient bar furnace	145/F2	NO CE#	0.5	0.5	2	0.5	3.5	2	5.5	45	10	5	200	0
11	Lindberg tube furnace	145/G3		0	0	1	0.5	1.5	0.5	2	38	5	5	300	0
12	Fire cabinets	144/F1	NO CE#	0	0	1	0.5	1.5	0.5	2	108	0	5	100	0
13	Norton furnace	145/D2	00043803 00	0	2	7	1	10	5	15	324	160	15	3000	0
14	Classified tooling shelves	145/D1	NO CE#	0	0	3	1	4	2	6	270	0	5	3200	0
15	Battery charging station	145/C1	NO CE#	0	0.5	2	0.5	3	2	5	27	20	3	100	0
16	Arc furnace control panels	145/D2	12551	1	2	2	1	6	2	8	96	20	4	500	0
17	Abar 90	145/D3-4	00010284 00	1	3	3	1	8	4	12	288	15	15	2650	5
18	Bullard turret lathe	145/E5	00038189 00	2	10	15	4	31	10	41	8000	100	50	100000	200
19	Tinius Olsen	145/F5	00018960 00	0	0.5	5	0.5	6	2	8	108	20	5	3000	5
20	Tooling shelves	145/H4	NO CE#	0	0	3	0.5	3.5	2	5.5	144	0	5	750	0
21	Forging hammer	145/G5		3	10	20	5	38	10	48	10827	3800	50	250000	0
22	Tongs	145/G5	NO CE#	0	0	2	0.5	2.5	2	4.5	54	0	5	350	0
23	Tooling	145/G5	NO CE#	0	0	2	0.5	2.5	2	4.5	144	0	5	500	0
24	Drill press(2)	145/H5	00023154 00	0.5	0.5	1	0.5	2.5	2	4.5	250	5	5	2500	0
25	Table	145/G5	NO CE#	0	0	0.5	0.5	1	1	2	45	5	5	100	0
26	Erie tooling & shelves	145/F6	NO CE#	0	0	2	0.5	2.5	2	4.5	144	0	5	750	0
27	Metals rack	145/H6	NO CE#	0	0	2	0.5	2.5	2	4.5	216	0	10	400	0
28	Magnl-whirler oil bath	145/G4	NO CE#	0	0.5	1	0.5	2	2	4	27	10	10	300	10
29	Bench grinder	145/C2	NO CE#	1	0.5	1	0.5	3	2	5	90	20	5	300	0
30	Fenn 6F swager hyd. feeder	145/G3	00038107 00	1	1	3	0.5	5.5	3	8.5	72	50	20	10000	150
31	Hydrospin	145/D1-E1	00038141 00	2	5	8	2	17	5	22	3600	50	100	75000	300
							Total	213	Total	300	27888	5492	442	490000	754

Table B5

Building 865, NCPP Contaminated Equipment for Removal

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Install Containment (Days)	Prepare and Test Containment (Days)	Dismantle Equipment (Days)	Initial Equipment Decontamination (Days)	Clean and Open Containment (Days)	Remove Containment (Days)	Move Equipment (Days)	Total (Days)	Final Decontaminate and Package Waste (Days)	Total (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	24" abrasive cut off	146/F3	00038158 00	1	2	6	3	6	4	3	N/A	1	24	6	30	1728	76	30	15000	20
2	Fann 8F swager	146/F3	00019038 00	0.5	1	N/A	3	3	3	3	N/A	0.5	14	4	18	96	26	10	14000	6
3	Burn hood	146/F3	00038171 00	1	1	N/A	3	1	2	3	N/A	0.5	11.5	4	15.5	27	20	10	500	0
4	Fann 8F swager	146/G3	00038180 00	1	1	N/A	3	2	2	3	N/A	1	13	4	17	640	20	15	25000	6
5	Thermolyne furnace (2 off)	146/G5 & D3		0.5	0.5	N/A	3	2	2	3	N/A	1	12	2	14	100	75	10	600	0
6	Despatch furn. & controls	146/E3	00038161 00	0.5	0.5	N/A	3	2	2	3	N/A	1	12	2	14	320	126	10	2000	0
7	Vacuum industrial furnace	146/C2	00012681 00	1	2	N/A	3	4	3	3	N/A	1	17	4	21	486	30	16	6500	30
8	#1 Lindberg furnace	146/D2	00038178 00	0	1	N/A	3	7	4	3	N/A	1	19	4	23	2250	0	60	10000	0
9	#2 Lindberg furnace	146/G4	38212, 38334	0	1	N/A	3	7	4	3	N/A	1	19	4	23	2250	0	60	10000	0
10	#3 Lindberg furnace(1)	146/D4	38213, 38333	0	1	N/A	3	7	4	3	3	1	22	4	26	2250	0	60	10000	0
11	Lathe B	136	00019005 00	0.5	0.5	6	3	2	2	3	N/A	0.5	16.5	3	19.5	160	10	10	2000	10
12	Be lathe B	136	00018938 00	0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	3	14.5	160	10	10	2000	10
13	Saw	136	00013164 00	0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	3	14.5	24	6	6	200	0
14	Lablonde A	136	00038261 00	0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	3	14.5	160	15	10	2000	10
15	Bridgeport (48)	136	00019162 00	0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	3	14.5	128	15	10	2000	6
16	Hardinge C	136	43904 00	0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	3	14.5	72	15	6	2000	10
16	Hardinge D	136	00038163 00	0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	3	14.5	72	15	6	2000	10
17	Hardinge E	136	00019261 00	0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	3	14.5	72	15	6	2000	10
18	Bandsaw	136	NO CE #	0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	2	13.5	18	5	2	160	0
19	Cincinnati mill	136	00018941 00	0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	3	14.5	96	10	10	2500	15
20	Cincinnati mill			0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	3	14.5	96	10	10	2500	6
21	Bridgeport mill	136	00038164 00	0.5	0.5	N/A	3	2	2	3	N/A	0.5	11.5	3	14.5	128	10	10	2000	6
25	Bridgeport (48)	136	00038196 00	0.5	0.5	N/A	3	2	2	2	N/A	0.5	10.5	3	13.5	650	10	10	2000	6
22	Small cut off	146/F2	00045087 00	0.5	0.5	N/A	3	2	2	3	3	0.5	14.5	2	16.5	216	20	10	5000	10
23	Scrap metal barrels (2)	146/F2 &	NO CE #	0	0	N/A	0	1	1	0	0	0	2	1	3	48	0	6	50	0
24	Be glovebox	146/E2	00038166 00	3	4	6	3	2	4	3	3	1	28	2	30	650	60	50	11350	10
26	Arc furnace (Rm 148)	148	00012561 00	2	4	3	2	6	6	4	2	1	28	6	34	1728	300	100	15000	30
27	Be electro refine (Rm 151)	61,151A & 1	M.A.T. CE #s	6	10	8	4	20	16	8	2	2	68	12	80	18000	600	200	60000	10
28	Coulter counter	147	M.A.T. CE #s	1	1	0	0	1	1	0	4	1	9	1	6	26	20	10	50	0
	(1) #1 & #3 Lindberg to go to 88, one for disposal											Total	463.5	Total	552.5	32616	1516	727	196400	210
	(2) removed with one of above items																			

Table B6

Building 865, NCPP 'Clean' Equipment to Stay

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	Tooling (VIDMAR STACKER)	145/E5	00038184 00	0.5	0.5	0.5	0.5	2	6000	0	20	5000	0
2	CIP press	153	00043709 00	1	1	1	1	4	4500	0	25	75000	100
3	HIP press	145/C5	00080853 00	1	1	1	0.5	3.5			10		100
4	Rolls United	145/E5.5	00019313 00	2	2	3	1	8	200	0	10	10000	250
5	1750 Te extrusion press	145/F4	00038287 00	5	4	7	1	17	10500	100	100	117000	300
6	Stant rollong mill	145/E3	00043804 00	1	1	1	1	4	320	10	20	10000	5
7	Lodge & Shipley shear	145/E3	00038159 00	2	1	2	1	6	512	15	20	20000	100
8	Abar vacuum furnace	145/D3	00038182 00	2	2	2	1	7	1440	20	25	50000	100
9	HIP/Molybdenum furnace (148)	148/C1	38227 38242 38294	2	2	3	1	8	78	40	20	1000	5
10	Fork & scissor lifts (5 ea)	145		5	5	10	1	21	972	50	20	17450	50
11	Induction Heater	145/F5	00043824 00	1	1	1	1	4	320	20	20	10000	0
						Total (days)	10	84.5	33842	255	200	315450	1010

Table B7

Building 865, NCPP Contaminated Equipment to Stay

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Install Containment (Days)	Prepare and Test Containment (Days)	Dismantle Equipment (Days)	Initial Equipment Decontamination (Days)	Maintain and Reassemble (Days)	Clean and Open Containment (Days)	Dismantle Containment (Days)	Total (Days)	Final Decontaminate and Package Waste (Days)	Total (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	Lathe A	136	00018094 00	5	3	3	2	2	3	N/R	18	2	20	160	10	10	2000	10
2	Lathe C	136	00038544 00	N/R	3	3	2	2	3	N/R	13	2	15	160	10	10	2000	10
3	Drill, Atlmetall	136	00019330 00	N/R	3	1	1	1	3	N/R	9	1	10	36	5	10	1500	2
4	Bridgeport (47)	136	00019273 00	N/R	3	3	2	2	3	N/R	13	2	15	128	10	10	2000	5
5	Hardinge B	136	00038368 00	N/R	3	3	2	2	3	N/R	13	2	15	72	10	10	2000	10
6	Hardinge C	136	00043904 00	N/R	3	3	2	2	3	N/R	13	2	15	72	10	10	2000	10
7	Bridgeport Series II	136	00038260 00	N/R	3	3	2	2	3	N/R	13	2	15	240	10	15	2000	15
8	Benches/shelving	136		N/R	3	1	1	1	3	N/R	9	1	10	684	0	25	1300	0
9	Bs vacuum	136	00038418 00	N/R	0	0.5	0	1	0	N/R	1.5	1	2.5	64	5	5	60	0
10	Do-All Band saw	136	00038178 00	N/R	3	2	2	2	3	N/R	12	2	14	200	5	10	2000	0
11	Grinder (Brown & Sharp)	136	NO CE #	N/R	3	2	2	2	3	N/R	12	2	14	120	5	10	1000	0
12	Racine power hacksaw	145/C5	00019188 00	5	3	0.5	0.5	0.5	3	3	12.5	1	13.5	216	10	10	3000	6
13	EB furnace	145/C5	00020741 00	5	3	2	2	2	3	3	17	1	18	37280	50	30	20000	10
14	United mill	145/D4	00019313 00	5	3	3	2	2	3	3	18	1	19	912	50	50	80000	100
15	Erie forming press	145/F5	00038187 00	5	3	2	2	2	3	3	17	1	18	3000	50	25	100000	100
16	Induction furnace	145/F1-G1	[illegible]	5	3	4	4	3	3	3	22	1	23	8000	100	50	20000	20
17	Hot brew Hyd. Press	145/F3	[illegible]	5	3	2	2	3	3	3	18	2	20	1000	10	15	15000	10
										Total	231	Total	257	52324	350	305	255860	307

Table B8

Building 883, NCPP 'Clean' Equipment for Removal

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	Niagara Press		00043815 0	1	1	3	1	6	2	8	200	10	10	8000	5
2	Small Marshall Town Press	104/G-7		0 5	1	2	0 5	4	2	6	50	10	10	1500	50
3	Lift Truck (orange)	104/F-5	00044787 0	0	0	4	0 5	4 5	2	6.5	36	10	10	1000	5
4	Clark lift truck (yellow)	104/F5	00043811 0	0	0	4	0 5	4 5	3	7.5	36	10	10	100	10
5	Lodge & Shipley Lathe	104/G-9 5		1	2	3	0 5	6.5	2	8.5	120	20	20	2500	15
6	Scotchman Nibbler	104/G-5	440-0125-10	1	1	2	1	5	2	7	80	10	10	2000	5
7	Fenn Swager 3F	104/G-6	00020730 0	1	1	4	1	7	3	10	72	10	10	1500	5
8	Lift Truck (orange)	104/G-5	00043733 0	0	0	4	0 5	4 5	2	6 5	36	10	10	1000	5
9	Clark Lift, narrow aisle (green)	104/F-5		0	0	4	0 5	4 5	2	6 5	135	20	10	3000	5
10	Allis Chambers Fork Lift	104/F-5	00013403 0	0	0	4	0 5	4 5	2	6.5	150	20	10	3000	5
11	Hack saw (blue, corner)	105/F-3S	00013210 0	0.5	1	2	0 5	4	2	6	32	5	5	400	3
12	Inducto-50 Induction heater	105/E-9 5	D44-3209	1	2	4	1	8	4	12	120	50	20	1000	0
13	Stanat Rolling Mill	138/BW-3	00013175 0	1	1	3	1	6	3	9	90	20	20	1500	10
14	Inspection table/2-roll lines	138/CW-1	44042 & 44043	2	2	3	1	8	5	13	402	30	15	3000	5
15	West U grey storage rack	138/BW-1-4		1	0	7	2	10	5	15	3600	10	10	8000	0
							Total	87	Total	128	5249	245	180	33500	128

Table B9

Building 883, NCPP Contaminated Equipment for Removal

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Install Containment (Days)	Prepare and Test Containment (Days)	Dismantle Equipment (Days)	Initial Equipment Decontamination (Days)	Clean and Open Containment (Days)	Remove Containment (Days)	Move Equipment (Days)	Total (Days)	Final Decontaminate and Package Waste (Days)	Total (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	Vacuum Cleaner System (3 Re	TK BSMT	3751 & 4375	2	1	2	3	4	3	2	2	1	20	5	25	162	75	50	1000	0
2	S/B Heat-Duty Rotary Furnace	104/G-5	00043797 00	2	2	3	3	7	4	3	2	2	28	9	37	888	150	50	6500	0
3	Thermolyne Furnace (2)	104/G 5		0	1	2	3	3	3	2	2	0	16	3	19	128	30	10	1000	0
4	Pacific Scientific Furnace	105/D-1	00043817 00	2	3	3	3	4	5	3	2	1	26	8	34	720	280	25	5000	6
5	Pacific Scientific Furnace	105/E-2 5	00043818 00	2	3	3	3	4	5	3	2	1	26	8	34	720	280	25	5000	6
6	Pacific Scientific Furnace	105/E-2 5	00043819 00	2	3	3	3	4	5	3	2	1	26	8	34	720	280	25	5000	6
7	Gisdinge & Lewis Turning Lath	105/E-2	00043902 00	3	10	3	3	10	5	3	2	2	41	12	53	4500	100	50	100000	150
8	Thermolyne Furnace	104//F-4	00043806 00	0	1	2	3	2	3	2	2	0	15	2	17	64	15	6	500	0
9	Linberg Pit Atmosphere Furnac	105/F-7	00043788 00	2	2	3	3	4	4	3	2	0	23	8	31	384	150	20	3000	0
10	Monarch Lathe	105/F-2-3	00019000 00	1	2	2	3	3	3	2	2	1	19	3	22	288	25	10	5000	20
11	Lift Truck (orange)	105/F-5	00043734 00	0	0	0	3	4	3	2	2	0 5	14 5	2	16 5	36	20	10	1000	6
12	Small Lindberg	105/F-8	00043791 00	1	3	2	3	4	3	2	2	1	21	6	27	360	100	20	3000	0
13	Holden Salt Bath	105/E-4-5	739, 53, 56,	2	4	2	3	8	3	2	2	2	28	13	41	3600	200	20	20000	0
14	Quick Work Cycle Shear	105/F-8	00043789 00	1	1	2	3	3	3	2	2	1	18	3	21	192	20	20	2500	20
15	Heavy-Duty Furnace on rollers	112	NO CE #	0 5	2	3	3	4	4	3	2	1	22.5	6	28 5	480	150	15	1500	0
16	Nitric Acid Bath	138//DW-3-4		2	6	2	3	10	3	3	2	2	33	15	48	6750	500	50	2000	0
												Total	377	Total	488	19792	2375	405	162000	210

Table B10

Building 883, NCPP 'Clean' Equipment to Stay

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	Infratrol radiant oven/rollers	138/CW1-2	00002472 00	2	2	5	1	10	840	20	20	5000	0
2	East U grey storage racks	138/AW1-4		0	3	0	1	4	2880	10	20	6000	0
3	HPM (B) press	112/B4-9		3	10	6	2	20	2880	10	20	75000	200
4	HPM (A) press	105/E4-9		3	10	5	2	20	3600	10	20	75000	200
5	Erie press	105/F9 5		3	5	6	2	15	1400	30	30	50000	150
6	Heavi Duty oven	105/D-6		2	3	5	1	11					
7	Roller/leveller			2	3	5	1	11	450	15	10	3500	10
8	Cinncinnatti Roller Grinder	105/E-2		2	2	8	1	13	1620	20	20	7500	50
9	Clearing press #1	105/E-1		3	8	5	2	18	1440	20	20	60000	200
10	Clearing press #2	105/E-1		3	8	5	2	18	1440	20	20	60000	200
11	Startrite band saw	104/G-6		1	2	2	1	6	120	10	10	300	0
12	Hydroform press	104/F-8		3	3	5	1	12	2000	15	20	7500	200
13	Platen press	104/G-7		2	2	2	1	7	128	10	5	1500	20
14	CAW tank & filters	TK BSMT		1	1	1	1	4	300	100	20	3000	0
15	RCRA tanks	TK BSMT		1	10	2	2	15	900	200	50	9000	0
							Total	184	19998	490	285	363300	1230

374

Table B11

Building 883, NCPP Contaminated Equipment to Stay

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Install Containment (Days)	Prepare and Test Containment (Days)	Dismantle Equipment (Days)	Initial Equipment Decontamination (Days)	Maintain and Reassemble (Days)	Clean and Open Containment (Days)	Dismantle Containment (Days)	Total (Days)	Final Decontaminate and Package Waste (Days)	Total (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	Sheet scrubber	138/CW--4	00023250 00	5	5	4	3	3	5	2	27	4	31	720	20	20	10000	20
2	B Rolling mill & salt bath	112/E-4-9		4	4	4	8	4	3	2	29	4	33	27000	100	100	150000	300
3	Cincinnati shear	105/E-7	00043802 0	5	5	3	3	2	4	2	24	3	27	1920	20	20	15000	20
4	A Rolling mill	105/E-4-9		4	4	4	8	4	3	2	29	4	33	27000	100	100	100000	300
5	Cincinnati shear			5	5	3	3	2	4	2	24	3	27	1920	20	20	15000	20
6	Heavy Duty oven	105/E-12		3	3	3	3	2	3	2	19	3	22	1400	20	20	50000	0
7	Bullard turret lathe	105/E-3		5	5	2	2	3	3	2	22	3	25	2250	20	10	30000	25
										Total	174	Total	198	82210	300	290	370000	685

Table B12

BUILDING 444/7 Rooms and Miscellaneous

OPTION #2

Room Function	Room Number	D&D Material Team Days	Total Material Cubic Feet	Primary Waste Cubic Feet	Secondary Waste Cubic Feet	Total Pounds	Oil Gallon
Util., Hse. vac., tanks, air comp.	1	2	1200	200	50	3000	0
Electrical shop	2	3	700	300	15	7000	0
Electronics shop	3	3	400	100	25	1500	0
Library	6	2	700	100	15	1000	0
Maintenance Machine shop	7	1	200	25	25	1200	0
Storage	8	2	1000	200	20	2000	0
Paint shop	9	1	200	50	15	1000	0
Storage	10	4	1800	300	50	15000	25
Sheet metal shop	11	2	500	200	20	3000	10
Production Machine Shop	101	6	2000	200	50	15000	25
Coaters & offices, 104 &a,b,c,d	104	4	800	200	25	1000	0
Second coatings shop	109	3	450	50	25	3500	0
Carbon Shop	116	4	500	200	40	3000	10
Tool Grind	117	3	450	50	30	3500	0
Tool Grind	118	3	450	50	30	3500	0
Furnace area & Storage for Plating Lab	201	4	1200	200	25	5000	0
D-38 storage and racks	202	5	1500	100	15	10000	0
Storage area	204	10	4800	1200	50	25000	0
Storage area & offices 205,6,7,8,9,10	205	2	500	200	25	1500	0
New plating lab	212	10	650	650	30	7500	0
Plating Lab	245	15	960	900	100	10000	0
Offices	101A,B &C	1	300	100	25	550	0
PMEL (Calibration Shop)	101K	1	300	100	25	550	0
Offices	10A	1	250	50	10	600	0
Offices	13 & 14	1	450	100	20	1500	0
Offices	205A	1	300	50	25	1200	0
Misc. in Di/Wash room	212B	1	100	75	10	1200	0
Plating Lab office	245A	2	300	100	25	1000	0
Surface Finishing lab	245B	2	225	100	25	10000	5
Chemical Lab	245C	2	225	200	35	2000	0
Tool Crib	7B	4	2000	200	25	7000	25
Plating lab (Rm. 245) over flow tanks (4)	9A	3	3140	200	35	4000	0
Inspection Module	MOD A	2	600	200	20	10000	5
Inspection Module	MOD B	2	600	200	20	10000	0
Inspection Module	MOD C	2	600	200	20	10000	0
Inspection Module	MOD D	2	600	200	20	10000	0
Inspection Module	MOD E	2	600	200	20	10000	0
Inspection Module	MOD F	2	600	200	20	10000	0
High Pressure Test Cell (HPTC) pumps	T101	3	200	50	15	3500	30
High Pressure Test Cell & Console	T101A	4	2000	600	50	15000	25
Volume Determination	T102A & B	3	600	350	20	3500	20
Parts Storage	412	2	400	20	20	6000	0
Parts Storage	409	2	400	20	20	6000	0
EB Welder Stiegerwald	406	5	550	100	20	7500	25
Cleaning Area	406B	3	525	200	25	4500	0
New Chip Roaster	31A	5	2400	300	50	8000	25
Old Chip Roaster	32 & 52	5	2100	250	50	8500	25
Offices above HPTC	T101	2	600	200	30	4500	0
	Totals	154	41925	10040	1360	279800	255

Office equipment (desks & filing cabinets) in offices within the specified work area were calculated in total room material.

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Building 444/7, NCPP 'Clean' Equipment for Removal
Option #2

Table B13 1/4

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	RACINE HACK SAW	101/S-16		0.5	0.5	1	0.5	2.5	1	3.5	90	25	20	2000	10
2	KASCO HACK SAW	101/S-15		0.5	0.5	1	0.5	2.5	1	3.5	36	10	10	1000	10
3	DO-ALL BAND SAW	101/S-15		0.5	0.5	1	0.5	2.5	1	3.5	150	20	20	1500	0
4	LEBLOND 12X12 MARK II LATHE	101/S-15	00019618 00	0.5	2	4	1	7.5	3	10.5	830	100	25	30000	20
5	LEBLOND 12X12 MARK II LATHE	101/S-14	00019598 00	0.5	2	4	1	7.5	3	10.5	830	100	25	30000	20
6	T-BASE LATHE EX-CELLO	101/S-13	00038576 00	0.5	1	2	0.5	4	2	6	900	150	20	20000	15
7	T-BASE LATHE EX-CELLO	101/S-12	00019120 00	0.5	1	2	0.5	4	2	6	900	150	20	20000	15
8	T-BASE LATHE EX-CELLO	101/S-11		0.5	1	2	0.5	4	2	6	900	150	20	20000	15
9	T-BASE LATHE EX-CELLO	101/S-10		0.5	1	2	0.5	4	2	6	900	150	20	20000	15
10	T-BASE LATHE EX-CELLO	101/S-9	00034053 00	0.5	1	2	0.5	4	2	6	900	150	20	20000	15
11	T-BASE LATHE EX-CELLO	101/S-9	00034066 001	0.5	1	2	0.5	4	2	6	900	150	20	20000	15
12	PRATT-WHITNEY DRILL	101/Q-8		1	2	2	1	6	4	10	750	75	30	45000	20
13	BURN BOX	101/S-12	00019358 00	0.5	0.5	1	0.5	2.5	1	3.5	500	30	10	750	0
14	BURN BOX	101/Q-11		0.5	0.5	1	0.5	2.5	1	3.5	500	30	10	750	0
15	AMERICAN TURRET LATHE	101/Q-10	00013392 00	1	1	2	1	5	3	8	875	100	15	25000	15
16	AMERICAN TURRET LATHE	101/Q-11	00019621 00	1	1	2	1	5	3	8	875	100	15	25000	15
17	OPTICAL COMP. BAUSCH & LOMB	101/Q-12	00019187 00	0.5	0	1	1	2.5	1	3.5	300	200	20	2000	0
18	LEBLOND 18" HEAVY DUTY LATHE	101/Q-12	00019004 00	1	1	3	1	6	2	8	300	125	15	15000	10
19	MONARCH LATHE	101/Q-12	00019367 00	0.5	0.5	2	0.5	3.5	2	5.5	300	125	20	17000	10
20	MONARCH LATHE	101/Q-13	00019368 00	0.5	0.5	2	0.5	3.5	2	5.5	300	125	20	17000	10
21	WHITE-SUNSTRAND OUNMIL	101/Q-9	00019533 00	1	2	5	2	10	4	14	2350	150	30	75000	50
22	MONARCH LATHE	101/R-16	00019369 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
23	MONARCH LATHE	101/R-16	00038542 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
24	MONARCH LATHE	101/R-16	00018992 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
25	MONARCH LATHE	101/R-17	00019001 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
26	MONARCH LATHE	101/R-17	00019370 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
27	MONARCH LATHE	101/R-18	00018993 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
28	MONARCH LATHE	101/R-19	00019371 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
29	HARDINGE LATHE	101/Q-16	00019370 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
30	6 AXIS MILL EXCELLO WORK CENTER	101/Q-8	00019552 00	1	2	5	2	10	4	14	4800	150	35	50000	25
31	6 AXIS MILL EXCELLO WORK CENTER	101/N-8	00019719 00	1	2	5	2	10	4	14	4800	150	35	50000	26
32	MONARCH LATHE	101/R-16	00038054 00	1	1	2	0.5	4.5	2	6.5	300	25	10	5000	20
33	LEBLOND 12X12 MARK II LATHE	101/R-16	00019011 00	1	2	2	1	6	3	9	300	76	25	20000	20
34	SUMP CLEANER (TANK ON WHEELS)	101/R-16		0.5	1	1	0.5	3	2	6	100	25	10	2300	0
35	OIL SEPERATOR (TANK, NEW)	101/R-16		1	1	1	0.5	3.5	2	5.5	200	75	25	3500	40
36	HARDINGE LATHE	101/Q-16	00040405 00	1	1	2	1	5	2	7	100	40	10	5500	16
37	MENNICK WELDERS (2 EA)	104A	19729, 19734	1	1	1	1	4	1	5	300	200	10	1500	0
38	LEAK DETECTION SYSTEMS (2 EA)	104B	19785, 19604	1	1	1	1	4	1	5	300	150	10	2000	10
39	HOT HOLLOW COATER #6	104		1	1	2	1	5	2	7	360	300	10	2000	16
40	HOT HOLLOW COATER	104/E WALL N	00019868 00	2	2	2	1	7	2	9	360	300	10	2000	16
41	HOT HOLLOW COATER	104/SOUTH	19840, 20204	2	2	2	1	7	2	9	360	300	10	2000	16
42	TITANIUM COATER	104	00028209 00	2	2	2	1	7	2	9	1100	500	10	2000	15
43	BAKEOUT OVEN SYSTEM (6)	104		1	2	2	1	6	2	8	750	700	10	3000	5
44	VACUUM BREW	104	00038054 00	1	1	2	1	5	2	7	550	200	10	3000	10
45	AVS FURNACE	100A/E-16	00019515 00	2	2	4	2	10	3	13	1440	500	25	30000	20
46	TOUCH BRAZE	100A/E-15	00019498 00	1	1	2	1	5	2	7	200	150	10	1500	10
47	CHROME COATER #1	100A/E-15	00029910 00	1	1	2	1	5	2	7	480	400	10	3000	10
48	INDUCTION BRAZER	100A/E-14	00035122 00	1	1	2	1	5	1	6	400	350	10	2500	10
49	ALUMINUM COATER	100A/E-14	00019497 00	1	1	1	1	4	1	5	360	300	10	2000	15
50	BENDIX CONTOUR PROJECTOR	100A/E-13	00034905 00	0.5	0	1	0.5	2	1	3	150	100	10	2500	0
51	ROOM, HOOD, WASH. & CHEM. (RCRA)	100B		1	2	2	1	6	3	9	300	300	50	1000	0
52	HARDINGE LATHE	101/Q-14		0.5	1	1	0.5	3	2	5	300	125	10	7000	16
53	HARDINGE LATHE	101/Q-15		0.5	1	1	0.5	3	2	5	300	125	10	7000	16
54	ANOCUT (ECM)	447/407		2	2	3	2	9	3	12	2250	2000	50	7000	0
55	CHARMILLES ELECT. DISC. (EDM)	447/407		1	1	1	1	4	2	6	150	25	25	6000	0
56	BURST CHAMBER	447/408	00038862 00	0.5	1	2	1	4.5	2	6.5	150	25	15	15000	16
57	BURST CHAM. PUMPS 7K, 30K)	447/408A		1	1	2	1	5	2	7	125	75	15	5000	16
58	STEIGERWALD EB WELDER	101H	00020234 00	2	2	5	2	11	3	14	3300	300	50	15000	200
59	RACINE SAW	101/R-18		0.5	1	1	0.5	3	1	4	75	25	10	3000	10
60	SIP MILL	101/N-8	00019389 00	1	1	1	0.5	3.5	1	4.5	70	25	10	5000	10
61	DEVLIEG LATHE	101/N-8		1	1	1	0.5	3.5	1	4.5	70	25	10	1500	10
62	INSPECTION TABLES (8 EA)	101/N-10		0	0	0	0.5	0.5	1	1.5	250	200	10	3000	0

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Building 444/7, NCPP 'Clean' Equipment for Removal
Option #2

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
63	MONARCH LATHE	101/N-12	00019372 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
64	MONARCH LATHE	101/N-12	00019373 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
65	MONARCH LATHE	101/N-12	00019769 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
66	MONARCH LATHE	101/N-12	00019374 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
67	MONARCH LATHE IN HOT	101/N-14	00038538 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
68	MONARCH LATHE	101/N-14	00038539 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
69	HARDINGE LATHE	101/N-14	00020059 00	0.5	0.5	2	0.5	3.5	1	4.5	75	20	10	3500	10
70	HARDINGE LATHE	101/N-14	00019238 00	0.5	0.5	2	0.5	3.5	1	4.5	75	20	10	3500	10
71	HARDINGE LATHE	101/N-14	00020058 00	0.5	0.5	2	0.5	3.5	1	4.5	75	20	10	3500	10
72	HARDINGE LATHE	101/N-14	00020060 00	0.5	0.5	2	0.5	3.5	1	4.5	75	20	10	3500	10
73	KINNEY VACUUM	101/N-15		1	2	2	0.5	5.5	2	7.5	720	100	10	5000	20
74	CARRIER AIR COND 4 EA (HOP MOD)	101		2	2	3	1	8	2	10	75	100	30	4000	FREON
75	BUILDING VACUUM SYSTEM (DK GREY)	BSMT		1	2	10	2	15	3	18	1000	200	50	15000	0
76	AFE VACUUM FURNACE (SELL)	447/403	00020755 00	2	4	5	2	13	3	16	6500	100	100	50000	15
77	VACUUM INDUCTRIES	447/403		2	1	2	1	6	2	8	550	100	25	15000	10
78	VACUUM SPECIALTIES	447/403	00019171 00	2	1	2	1	6	2	8	1200	200	10	17500	10
79	GRIT BLASTER	447/404	00035102 00	1	1	2	1	5	2	7	275	75	10	4500	0
80	VACUUM SEPERATOR	447/404	00035101 00	1	1	2	1	5	1	6	250	25	25	3500	0
81	WESTINGHOUSE DEGREASER	447/404		1	1	1	0.5	3.5	1	4.5	75	25	10	500	0
82	RGA (RES GAS AN) CUSTOM ENG	447/404	00020420 00	0	0	1	0.5	1.5	1	2.5	100	100	10	1500	2
83	VACUUM MELT ARC FURNACE (VMAF)	447/405	00034019 00	2	2	5	2	11	3	14	3400	900	30	20000	60
84	CONTROL PANEL FOR VMAF	447/405A		0.5	0	1	0.5	2	1	3	80	50	10	700	0
85	2 TANKS FOR VMAF	447/405A		0	0	1	0.5	1.5	1	2.5	400	10	10	3000	0
86	POWER SUPPLY FOR VMAF	447/405A		1	0	1	0.5	2.5	1	3.5	160	160	20	5000	0
87	COMPRESSORS 2K 30 60K	T103		1	1	2	1	5	1	6	300	100	20	6000	20
88	TEST CELL	T101A		2	2	3	1	8	2	10	300	100	20	5000	5
90	ANALIZER TOOL	TG	00020175 00	0	0	1	0.5	1.5	1	2.5	110	20	15	6500	0
91	CAROUSEL MOTORIZED VERTICAL	TG	00020167 00	0.5	0	0.5	0.5	1.5	0.5	2	175	20	10	4000	0
92	COMPARATOR OPTICAL J&L A-7237	TG	00019881 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2000	0
93	COMPARATOR OPTICAL J&L A-7237	TG	00019945 00	0	0	1	0.5	1.5	1	2.5	30	15	5	300	0
94	COMPARATOR OPTICAL J&L A-7237	TG	00019946 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2000	0
95	COMPARATOR OPTICAL 14"	TG	00020271 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
96	COMPARATOR OPTICAL 14"	TG	00020270 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
97	COMPARATOR OPTICAL 14" W/10X20 MAG	TG	00019514 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2500	0
98	COMPARATOR OPTICAL 14" XL 148	TG	00019748 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
99	COMPARATOR OPTICAL 14" XL 148	TG	00019747 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
100	COMPARATOR OPTICAL 20"	TG	00020265 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2500	0
101	COMPARATOR OPTICAL 30"	TG	00020266 00	0	0	1	0.5	1.5	1	2.5	250	150	10	2500	0
102	COMPARATOR OPTICAL KLOOR NIKON III	TG	00019007 00	0	0	1	0.5	1.5	1	2.5	250	150	10	2500	0
103	CUTTER MASTER HOT, W/AIR SPINDLE	TG	00020106 00	0.5	0	0.5	0.5	1.5	0.5	2	75	15	5	5000	0
104	GRINDER CARBIDE SAW SHARPENER ACME	TG	00019480 00	0	0	0.5	0.5	1	0.5	1.5	55	10	5	1500	0
105	GRINDER CBD TOOL 6" XL 044	TG	00018961 00	0	0	0.5	0.5	1	0.5	1.5	50	15	10	700	30
106	GRINDER CBD TOOL 6" XL 044	TG	00018963 00	0	0	0.5	0.5	1	0.5	1.5	50	15	10	700	30
107	GRINDER CUTTER CINC, MONOSET	TG	00019122 00	0	0	0.5	0.5	1	0.5	1.5	50	15	10	700	0
108	GRINDER CUTTER UNIVERSAL DORTON 37	TG	00019390 00	0	0	0.5	0	0.5	0.5	1	25	5	50	150	0
109	GRINDER DRILL BLACK DIAMOND BW-90	TG	00019726 00	0	0	0.5	0	0.5	0.5	1	25	5	50	150	0
110	GRINDER DRILL BLACK DIAMOND BW-70	TG	00019748 00	0	0	0.5	0	0.5	0.5	1	25	5	50	150	0
111	GRINDER DRILL SELECT-O-MATIC ALINA	TG	00020026 00	0	0	0.5	0	0.5	0.5	1	30	10	50	600	0
112	GRINDER DRILL SELECT-O-POINT ALINA	TG	00019334 00	0	0	0.5	0	0.5	0.5	1	30	10	50	600	0
113	GRINDER END MILL HUFFMAN HS-87R	TG	00020166 00	1	2	3	2	8	2	10	1500	25	10	25000	250
114	GRINDER FORM RELIEF SHOLOMATIC FR	TG	00019494 00	0	0	0.5	0	0.5	0.5	1	50	10	5	2000	0
115	GRINDER OPTICAL FROM 2-AXIS WASINO	TG	00019646 00	0.5	0	1	0	1.5	1	2.5	150	15	10	5400	50
116	GRINDER OPTICAL FROM 2-AXIS WASINO	TG	00019647 00	0.5	0	1	0	1.5	1	2.5	150	15	10	5400	50
117	GRINDER PRECISION UNIVERSAL 10"	TG	00020318 00	0.5	0	1	0	1.5	1	2.5	150	15	10	5400	50
118	GRINDER SURFACE MICROMASTER B42	TG	00019606 00	0	0	0.5	0	0.5	0.5	1	35	10	5	3000	0
119	GRINDER SURFACE PRECISION DALLMEYER	TG	00019393 00	0	0	0.5	0	0.5	0.5	1	100	15	10	4000	80
120	GRINDER TOOL CUTTER	TG	00019320 00	0	0	0.5	0	0.5	0.5	1	40	10	5	700	700
121	GRINDER TOOL CUTTER CINC	TG	00019185 00	0	0	0.5	0	0.5	0.5	1	40	10	5	700	700
122	GRINDER TOOL CUTTER CINC.	TG	00019608 00	0	0	0.5	0	0.5	0.5	1	40	10	5	700	700
123	GRINDER TOOL CUTTER CINC MONOSET 31	TG	00019386 00	0	0	0.5	0	0.5	0.5	1	60	15	5	1200	0
124	GRINDER TOOL CUTTER COMPACT	TG	00020483 00	0	0	0.5	0	0.5	0.5	1	5	5	5	70	0
125	GRINDER TOOL CUTTER HAMO 12	TG	00019337 00	0	0	0.5	0	0.5	0.5	1	40	10	5	600	0
126	GRINDER TOOL CUTTER CINC MONOSET	TG	00019931 00	0	0	0.5	0	0.5	0.5	1	40	10	5	600	0

Building 444/7, NCPP 'Clean' Equipment for Removal
Option #2

TABLE B13 3/4

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
127	GRINDER TOOL CUTTER CINC. MONOSET	TG	00019932 00	0	0	0.5	0	0.5	0.5	1	40	10	5	600	0
128	GRINDER TOOL CUTTER CINC. MONOSET	TG	00019933 00	0	0	0.5	0	0.5	0.5	1	40	10	5	600	0
129	GRINDER TOOL CUTTER OLIVER	TG	00019142 00	0	0	0.5	0	0.5	0.5	1	55	15	5	700	0
130	GRINDER TOOL MICROPOINT DEVLIEG	TG	00019067 00	0	0	0.5	0	0.5	0.5	1	50	10	5	700	0
131	GRINDER TOOL MICROPOINT DEVLIEG	TG	00019340 00	0	0	0.5	0	0.5	0.5	1	50	10	5	700	0
132	GRINDER TOOL OPTICAL PROJECTION BAC	TG	00019408 00	0.5	0	0.5	0.5	1.5	0.5	2	150	15	10	5400	50
133	GRINDER TOOL PRECISION DEVLIEG	TG	00033988 00	0	0	0.5	0	0.5	0.5	1	50	10	5	700	0
134	GRINDER TR79	TG	00056486 00	0	0	0.5	0	0.5	0.5	1	5	5	5	40	0
135	GRINDER MACHINE DRILL CHRISTEN 06-8	TG	00019346 00	0	0	0.5	0	0.5	0.5	1	75	10	5	550	0
136	HEATER INDUCTRION BRAZING TOCCO	TG	00020052 00	0.5	0	0.5	0.5	1.5	0.5	2	50	40	10	600	0
137	LATHE TOOLROOM HARDINGE HLV-H	TG	00019245 00	0	0	0.5	0	0.5	0.5	1	80	10	5	1700	5
138	MARKHOT MACHINE HYD. PWR. OT SCHMOT	TG	00010347 00	0	0	0.5	0	0.5	0.5	1	25	10	5	450	0
139	MILLING MACHINE PLAIN RAM STYLE BAJO 3	TG	00019486 00	0	0	0.5	0	0.5	0.5	1	10	5	5	200	0
140	MILLING MACHINE SWIVEL HD. TURRETT TREE	TG	00019394 00	0	0	0.5	0	0.5	0.5	1	80	10	5	1200	20
141	PROBE OPTICAL VIDEO WSTANDARD LENS	TG	00076515 00	0	0	0.5	0	0.5	0.5	1	25	10	5	550	0
142	SHARPENER DRILL AUTO MOHAWK 48	TG	00019488 00	0	0	0.5	0	0.5	0.5	1	40	10	5	1500	30
143	SHARPENER EXACTAMATIC DRILL WHISLOW	TG	00019259 00	0	0	0.5	0	0.5	0.5	1	25	10	5	550	0
144	COMPARATOR OPTICAL J&L	CS	00019454 00	0	0	0.5	0	0.5	0.5	1	25	10	5	550	0
145	DRILL RADIAL 36" CARTLON	CS	00019009 00	0.5	1	1	0.5	3	1	4	140	30	10	4000	10
146	DRILL MACHINE TURRET 3 AXIS NC BURNOMASTER	CS	00019518 00	0.5	1	2	0.5	4	1	5	550	35	20	10000	10
147	LATHE ENGINE 20" MARTIN DS-60	CS	00019292 00	0.5	1	1	0.5	3	0.5	3.5	200	15	10	8000	10
148	LATHE ENGINE HORT. MONOSET 16X64	CS	00031150 00	0.5	0	0.5	0.5	1.5	0.5	2	110	15	10	6000	10
149	LATHE HARDINGE SUPERSLANT TURRET 3 AXIS	CS	00020358 00	0.5	0	0.5	0.5	1.5	0.5	2	70	15	10	2000	5
150	LATHE REGAL LEBLOND MAKINO	CS	00020721 00	0.5	0.5	0.5	0.5	2	0.5	2.5	170	20	15	5000	5
151	LATHE TOOLROOM 9" HARDINGE HLV-H B	CS	00019383 00	0.5	0	0.5	0	1	0.5	1.5	95	15	10	2500	0
152	LATHE TURRET 42" VERTICAL BUL	CS	00018029 00	0.5	0.5	2	1	4	2	6	200	35	10	8000	15
153	LATHE TURRET 9X36 & HOR GIS	CS	00018944 00	0.5	1	1	0.5	3	1	4	300	20	10	8000	15
154	MILLING MACHINE BROT BRJ 120M	CS	00019304 00	0.5	0.5	1	0.5	2.5	1	3.5	128	10	10	4000	5
155	MILLING MACHINE BROT 32 STD VERT RAM H	CS	00020357 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	20	10	1500	5
156	MILLING MACHINE CINC. 4	CS	00019036 00	0.5	0	0.5	0.5	1.5	0.5	2	120	10	5	5000	5
157	MILLING MACHINE HORT. K&T	CS	00019306 00	0.5	0.5	2	0.5	3.5	1	4.5	128	10	10	4000	8
158	MILLING MACHINE KNEE 34" HORT. BAJO	CS	00019039 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	20	10	3000	10
159	MILLING MACHINE KNEE 34" HORT. CINC.	CS	00038439 00	0.5	0.5	0.5	0.5	2	1	3	75	15	10	3000	5
160	MILLING MACHINE VERT CINC. 420-16	CS	00019279 00	0.5	0	0.5	0.5	1.5	0.5	2	120	15	10	5000	5
161	MILLING MACHINE VER DOALL 200V	CS	00020720 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	20	10	3000	5
162	TURNING CENTER LEBLOND CHUCKER 20	CS	00020242 00	0.5	0.5	2	1	4	2	6	350	50	20	15000	30
163	MILL, CINCINNATI	CS	00019368 00	0.5	0.5	0.5	0.5	2	0.5	2.5	120	20	10	5000	10
164	MILL, CINCINNATI	CS	00019384 00	0.5	0.5	0.5	0.5	2	2	4	120	20	10	5000	10
165	MILL OE	CS		0.5	0.5	0.5	0.5	2	0.5	2.5	145	20	10	3000	10
166	DOALL SAW	CS	00019024 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	10	5	1500	0
167	FURNACE/CONTROLLER	205	00020724 00	0.5	0.5	0.5	0.5	2	1	3	144	55	15	4500	0
168	TUMBLER	205	00020219 00	0	0	0.5	0	0.5	0.5	1	12	10	5	300	0
169	PRESS, FRAME, HYD, BLUE	205		0	0	0	0	0	0.5	0.5	80	5	5	650	2
170	GRIT-BLASTER WHITE	205	00020095 00	0	0	0.5	0.5	1	0.5	1.5	80	25	5	2500	0
171	SQUARE TANK ON WHEELS	205		0	0	0	0	0	0.5	0.5	50	5	0	300	0
172	WASH SYSTEM (NEW)	212B		0.5	0	1.5	0.5	2.5	0.5	3	500	250	10	2500	0
173	WATER FILTRATION SYSTEM	212B	00020213 00	0.5	0	0.5	0.5	1.5	0.5	2	85	85	10	2000	0
174	BRIDGEPORT MILL	7/C-7	NO CE#	0.5	0.5	2	0.5	3.5	1	4.5	128	10	10	4000	8
175	CINCINNATI MILL	7/C-7	00038529 00	0.5	0.5	2	0.5	3.5	1	4.5	128	10	10	4000	8
176	DOALL GRINDER	7/C-7	NO CE #	0.5	0.5	2	0.5	3.5	2	5.5	128	10	10	4000	5
177	MONARCH LATHE	7/C-8	00018937 00	0.5	1	2	1	4.5		4.5	200	20	10	4500	10
178	LATHE 14", LODGE & SHIPLEY	7/C-8	38440	0.5	1	1	1	3.5	1	4.5	200	20	10	4500	15
179	DOALL BAND SAW	7/D-8	00013920 00	0.5	0.5	0.5	0.5	2	1	3	200	15	10	1500	0
180	LATHE SMALL MONARCH	7/D-8	00018934 00	0.5	0.5	1	0.5	2.5	1	3.5	100	15	10	2500	10
181	DRILL PRESS TREE MODEL 2UVR	7/E-8	NO CE #	0.5	0.5	0.5	0.5	2	1	3	150	20	15	2500	0
182	SIDLEY DRILL PRESS	7/E-8	00019013 00	0.5	0.5	1	0.5	2.5	1	3.5	150	15	10	2500	10
183	DELTA ROCKWELL DRILL PRESS	7/E-8	NO CE #	0.5	0.5	0.5	0.5	2	1	3	75	20	10	1500	0
184	BRIDGEPORT MILL	7/E-8	00019297 00	0.5	0.5	1	0.5	2.5	1	3.5	100	15	10	2500	10
185	DRAKE PRESS (GREEN LARGE)	7/E-8	00020586 00	0.5	0.5	0.5	0.5	2	1	3	90	10	10	2000	5
186	DRAKE PRESS (GREY SMALL)	7/E-8		0.5	0.5	0.5	0.5	2	1	3	50	10	10	1000	2
187	DAYTON GRIT BLASTER	7/E-7	00020603 00	0.5	0.5	1	0.5	2.5	2	4.5	130	30	10	1500	0
188	ULTRASONIC CLEANER, WESTINGHOUSE	10/J-15	00035009 00	0.5	0.5	1	0.5	2.5	2	4.5	75	25	10	750	0

Building 444/7, NCPP 'Clean' Equipment for Removal
Option #2

TABLE B13 4/4

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
189	FILTER DRYING BOX	10/H-15	NO CE #	0.5	0	0.5	0.5	1.5	0.5	2	60	10	10	250	0
190	ELECTRO ETCHER + TANK & POWER SUPPLY	203	00019490 00	1	1	2	1	5	2	7	400	250	50	4500	0
191	B-BOX W/HOOD (SS)	203	00019378 00	0.5	0	1	0.5	2	1	3	150	50	20	500	0
192	B-BOX W/HOOD	203	NO CE #	0.5	0	1	0.5	2	1	3	300	50	15	500	0
193	B-BOX W/HOOD WATE ON SS STAND	203	00020207 00	0.5	0	1	0.5	2	1	3	550	50	15	500	0
194	B-BOX W/HOOD	203	00034035 00	0.5	0	1	0.5	1	1	2	300	50	15	500	0
195	PEXTO SHEAR	11	NO CE #	0	0	0	0.5	0.5	0.5	1	40	5	5	300	0
196	ESSLEY DRILL PRESS	11	00018997 00	0.5	0	0.5	0.5	1.5	0.5	2	130	20	5	1750	0
197	TENNISMITH ROLL	11	00020564 00	0	0	0.5	0	0.5	0.5	1	130	10	5	2500	0
198	BUFFALO PUNCH	11	00013342 00	0.5	0	1	0.5	2	0.5	2.5	100	20	10	5500	10
199	ALANTIC SHEAR (DK GREEN)	11	00020429 00	0.5	0	0.5	0.5	1.5	0.5	2	300	15	10	6500	8
200	BREAK (DK BLUE)	11	NO CE #	0	0	0.6	0.6	1	0.5	1.5	100	10	10	4500	.
201	HACKSAW POWER	11	NO CE #	0.5	0.5	1	0.5	2.5	1	3.5	90	25	20	2000	10
202	WELDERS (2)	11	NO CE #	0	0	0	0.5	0.5	0.5	1	100	100	10	3000	0
203	FORKLIFT	10/F-12	00010091 00	0	0.5	0.5	0.5	1.5	0.5	2	60	40	10	4000	15
204	HEALD LATHE, BOREMATIC, AMERICAN	101E/N-8	19041, 19218	0.5	1	3	1	5.5	2	7.5	1800	300	25	100000	150
205	6PH FRICTION WELDER (NEW)	204A		0.5	0	1	1	2.5	0.5	3	240	50	10	35000	20
			TOTAL	107.5	118	275.5	117	615	254	869	73332	17050	2875	1349010	4486
Equipment and material for the following production areas and rooms are not included in this data base.															
Tool Heat Treat, Room 125															
Furnace area and storage, Room 137															
Non Destructive Testing (NDT), Rooms 138 & 143															
Precision Shop or Tool Engineering, Rooms 161, 148, 180, 181															
Tool Crib for all aforementioned shops, Room 138															

Table B14

Building 444/7, NCPP Contaminated Equipment for Removal
Option #2

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Install Containment (Days)	Prepare and Test Containment (Days)	Dismantle Equipment (Days)	Initial Equipment Decontamination (Days)	Clean and Open Containment (Days)	Remove Containment (Days)	Move Equipment (Days)	Total (Days)	Final Decontaminate and Package Waste (Days)	Total (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	Lathe Monarch	101/N-13	000385380	0.5	0.5	2	3	1	1	2	2	0.5	12.5	1	13.5	162	25	20	5000	15
			Total	0.5	0.5	2	3	1	1	2	2	0.6	12.5	1	13.6	162	25	20	5000	16

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Table B15 1/3

Building 444/7, NCPP 'Clean' Equipment to Stay
Option #2

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Oil (Gallons)
1	MORI-YASNAC LATHE	101/Q-13		1	1	2	1	5	10	10	10
2	HOT HOLLOW COATER	104/E WALL-S		2	2	3	1	8	300	10	15
3	HOT HOLLOW COATER	104/E WALL-MID		2	2	3	1	8	300	10	15
4	HARDINGE LATHE	101/Q-14		1	1	2	1	6	125	20	15
5	KINNEY VACUUM	101/N-15		1	2	2	1	6	100	10	20
6	INSTRON TENSILE /COPM TESTER	447/420	00002457 00	1	1	1	1	4	75	10	10
7	ELECTRODE WELDER/WELDER	447/405B		1	1	2	1	5	150	25	0
8	FREON DISTILLER	447/405B		1	1	1	1	4	80	10	0
9	SCISSORS LIFT	101H	00020323 00	1	1	1	1	4	100	25	50
10	SCALE PLATFORM DIGITAL 3142	RM205	00018172 00	0	0.25	0.25	0.25	0.75	2	1	0
11	DISPLAY DIGITAL DUAL CONTACT	RM205	00018173 00	0	0.25	0.25	0.25	0.75	5	2	0
12	SYSTEM LASER MARKING	RM101	00018217 00	0	0.25	0.5	0.25	1	10	5	0
13	LATHE TURRET 42 IN VER BUL GRAPHITE MOLD	RM116	00018929 00	1	1	2	0.5	4.5	25	15	50
14	LATHE TURRET 9X36 5 HOR GIS	RM116	00018944 00	1	1	1	0.25	3.25	20	10	10
15	HOIST HYD FURNACE GLOBE	RM109	00018964 00	0.5	0.5	1	0.25	2.25	10	5	5
16	HOIST HYD FURNACE GLOBE	RM109	00018965 00	0.5	0.5	1	0.25	2.25	10	5	5
17	HOIST HYD FURNACE GLOBE	RM109	00018966 00	0.5	0.5	1	0.25	2.25	10	5	5
18	HOIST HYD FURNACE GLOBE	RM109	00018967 00	0.5	0.5	1	0.25	2.25	10	5	5
19	CHARGER BATT BERG-GIBSON M31518	RM179	00018974 00	0	0.25	0.5	0.25	1	5	5	0
20	TANK S/S 60X58 500 GAL	RM009	00018978 00	0	0.25	0	0.25	0.5	5	5	0
21	FURNACE INDUCTION HI VAC 66 IN	RM201	00018984 00	1	1	3	1	6	125	20	150
22	FURNACE INDUCTION HI VAC 66 IN	RM201	00018985 00	1	1	3	1	6	125	20	150
23	FURNACE INDUCTION HI VAC 66 IN	RM201	00018986 00	1	1	3	1	6	125	20	150
24	FURNACE INDUCTION HI VAC 66 IN	RM201	00018987 00	1	1	3	1	6	125	20	150
25	FURNACE INDUCTION HI VAC 66 IN	RM201	00018988 00	1	1	3	1	6	125	20	150
26	FURNACE INDUCTION HI VAC 66 IN	RM201	00018989 00	1	1	3	1	6	125	20	150
27	FURNACE INDUCTION HI VAC 66 IN	RM201	00018990 00	1	1	3	1	6	125	20	150
28	FURNACE INDUCTION HI VAC 66 IN	RM201	00018991 00	1	1	3	1	6	125	20	150
29	HOIST ELEC 2T MOORE	RM201	00019002 00	0	0.5	0.5	0.25	1.25	15	5	5
30	CRANE BRIDGE 4000# WHITING	RM101	00019016 00	0	0.5	0.5	0.25	1.25	15	5	5
31	CRANE BRIDGE 2000# WHITING	RM101	00019017 00	0	0.5	0.5	0.25	1.25	15	5	5
32	CRANE BRIDGE 2000# WHITING	RM101	00019018 00	0	0.5	0.5	0.25	1.25	15	5	5
33	HOIST ELEC 4000# ROBBINS F620	RM202	00019019 00	0	0.5	0.5	0.25	1.25	15	5	5
34	CRANE BRIDGE 2000 WHITING	RM101	00019103 00	0	0.5	0.5	0.25	1.25	15	5	5
35	DRYER AIR COMPRESSED	R001	00019350 00	0.5	0.5	0.5	0.25	1.75	15	5	5
36	SYSTEM VAC PUMPING HERAEUS 3500	RM109	00019352 00	0.5	0.5	1	0.25	2.25	15	5	15
37	SYSTEM VAC PUMPING HERAEUS 3500	RM109	00019353 00	0.5	0.5	1	0.25	2.25	15	5	15
38	COLLECTOR CHIP BE EXHAUST SYSTEM OUTSIDE	SSIDE	00019584 00	0	1	1	0.5	2.5	25	15	0
39	PUMP ROOTS LEYBOLD-HERAEUS RA300	RM109	00019626 00	0	0.5	0.5	0.25	1.25	15	10	20
40	LATHE CHUCKER HARDINGE CHNC-16 W	RM101	00019661 00	0.5	0.5	0.5	0.25	1.75	20	10	20
41	PROGRAMMER PROCESS L N 1300	2NDFL	00019699 00	0	0	0.25	0.25	0.5	5	5	0
42	RECORDER TEMP FOXBORO	RM201	00019709 00	0	0	0.25	0.25	0.5	5	5	0
43	RECORDER TEMP FOXBORO	RM201	00019710 00	0	0	0.25	0.25	0.5	5	5	0
44	RECORDER TEMP FOXBORO	RM201	00019711 00	0	0	0.25	0.25	0.5	5	5	0
45	RECORDER TEMP FOXBORO	RM201	00019712 00	0	0	0.25	0.25	0.5	5	5	0
46	MILLING MACH 5-AXIS CNC EX-CELL-	RM101	00019719 00	2	2	2	0.5	6.5	20	15	50
47	COULOMETER DIGITAL 379 25102	RM201	00019751 00					0			
48	CRANE BRIDGE W/500# HOIST DEMAG MB	RM245	00019848 00	0	0.5	0.5	0.25	1.25	20	10	10
49	PUMP ROOTS LB RA-3001S	RM204	00019856 00	0	0.5	0.5	0.25	1.25	15	10	20
50	PUMP ROOTS LB RA-3001S	RM109	00019857 00	0	0.5	0.5	0.25	1.25	15	10	20
51	LATHE 2-AXIS CNC MORI SEIKI SL-1	RM101	00019902 00	1	1	2	0.25	4.25	20	10	15
52	BLOWER LEYBOLD-HERAEUS RA3001S	109	00019947 00	0	0.5	0.5	0.25	1.25	15	10	20

Table B15 2/3

Building 444/7, NCPP 'Clean' Equipment to Stay
Option #2

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Oil (Gallons)
53	BLOWER ROOTS	109	00020061 00	0	0.5	0.5	0.25	1.25	15	10	20
54	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020074 00	0.25	0.5	1	0.25	2	20	5	0
55	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020075 00	0.25	0.5	1	0.25	2	20	5	0
56	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020076 00	0.25	0.5	1	0.25	2	20	5	0
57	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020077 00	0.25	0.5	1	0.25	2	20	5	0
58	POWER SUPPLY INDUCTION COIL 2	RM109	00020078 00	0.25	0.5	1	0.25	2	20	5	0
59	POWER SUPPLY INDUCTION COIL 2	RM109	00020079 00	0.25	0.5	1	0.25	2	20	5	0
60	POWER SUPPLY INDUCTION COIL 2	RM109	00020080 00	0.25	0.5	1	0.25	2	20	5	0
61	POWER SUPPLY INDUCTION COIL 2	RM109	00020081 00	0.25	0.5	1	0.25	2	20	5	0
62	SUB-STATION INDOOR 1500KVA	RM015	00020083 00	0	0	0	0	0	0	0	0
63	SCAFFOLD ELECTRIC LIFT XL-19	107	00020125 00	0.5	0.5	0.5	0.25	1.75	15	5	10
64	CHUCKING MACHINE HARDINGE NUMERI HANSEN	RM101	00020186 00	0.5	0.5	1	0.25	2.25	15	5	20
65	SUB-STATION INDOOR 1500KVA	RM015	00020199 00	0	0	0	0	0	0	0	0
66	TONGS RANGE 20"-34" 3 TON	RM205	00020206 00	0	0.25	0.25	0.25	0.75	15	5	0
67	SCALE TOLEDO 2300	RM202	00020214 00	0	0.25	0.25	0.25	0.75	15	5	0
68	SYSTEM VACUUM PUMPING	RM204	00020218 00	0	0.5	0.5	0.25	1.25	15	10	20
69	FORKLIFT TRUCK SIT DOWN ELEC	RM205	00020228 00	0.5	0.5	0.5	0.25	1.75	20	15	20
70	PUMPING SYSTEM KINNEY LIQ RIMS V STECKLINE	101	00020231 00	0	0	0	0.25	0.25	20	10	0
71	AIR CONDITIONING UNIT SELF-CONT	BLCNY	00020232 00	0	0.25	0.25	0.25	0.75	10	5	0
72	AIR CONDITIONING UNIT SELF-CONT INS OFFICE	RM202	00020233 00	0	0.25	0.25	0.25	0.75	10	5	
73	COIL HEATING INDUCTION	RM204	00020269 00	0	0.25	0.25	0.25	0.75	20	5	0
74	GRIPPER INGOT	RM201	00020294 00	0	0.25	0.25	0.25	0.75	10	5	0
75	GRIPPER INGOT	RM204	00020297 00	0	0.25	0.25	0.25	0.75	10	5	0
76	FURNACE VACUUM BRAZING	R109A	00020522 00	1	1	2	0.5	4.5	25	10	0
77	ANALYZER BERYLLIUM (THE BEAST)	RM014	00020621 00	0	0	0.25	0.25	0.5	10	5	0
78	MACHINE MILLING DOALL 200V VERTI	RM116	00020720 00	1	1	2	0.5	4.5	25	10	25
79	HOIST ELEC 2T**T-180	RM205	00020742 00	0	0.5	0.5	0.25	1.25	15	10	5
80	CRUSHER/SHREDDER 1000 LB/HR ARBO	RM204	00020746 00	1	1	1	0.25	3.25	25	10	30
81	ANALYZER BERYLLIUM #440		00021002 00	0	0.25	0.5	0.25	1	5	5	0
82	UNIT NORSAIRE EVAPORATIVE COOLIN	ROOF	00023216 00	0.5	0.5	1	0.25	2.25	25	10	0
83	FAN EXHAUST VENTILATION	ROOF	00023228 00	1	1	1	0.25	3.25	25	15	20
84	LIFT SCISSOR MARK SN 1284-10656		00024273 00	0.5	0.5	1	0.25	2.25	25	10	20
85	XFORMER 1500 KVA 3PH 60HZ DR PLT PWR		00028114 00	0	0	0	0	0	0	0	0
86	XFORMER 1500 KVA 3PH 60HZ DR PLT PWR		00028115 00	0	0	0	0	0	0	0	0
87	XFORMER 1500 KVA 3PH 60HZ DR PLT PWR	R015	00028116 00	0	0	0	0	0	0	0	0
88	DEGREASER ULTRASONIC VAPOR CDG1K PIPE SHP	MAINT	00035099 00	0	0.25	0.5	0.25	1	20	5	0
89	PUMP VAC MICROVAC STOKES 412	RM015	00038149 00	0	0.5	0.5	0.25	1.25	15	10	20
90	TANK S/S 48X64 450GAL***	RM09A	00038461 00	0	0	0	0	0	0	0	0
91	TANK S/S 48X64 450GAL***	RM09A	00038462 00	0	0	0	0	0	0	0	0
92	TANK S/S 42X42 200GAL***	RM09A	00038494 00	0	0	0	0	0	0	0	0
93	DETECTOR LEAK (HE) VARIAN 936-66	RM06B	00039974 00	0.25	0.25	0.5	0.25	1.25	15	5	5
94	COLLECTOR TITANIUM DUST PTBL	2NDFL	00055132 00	0.5	0.5	0.5	0.25	1.75	20	10	0
95	XFORMER SIEMENS-ALLIS 1500 K PLT POWER	0	00085859 00	0	0	0	0	0	0	0	0
96	XFORMER SIEMENS-ALLIS 1500 K PLT POWER	0	00085860 00	0	0	0	0	0	0	0	0
97	FORKLIFT DATSUN ET-3000	RM410	00019888 00	0	0.25	0.25	0.25	0.75	20	10	20
98	READOUT DUAL CHANNEL FOR 1120	RM420	00020457 00	0	0	0	0.25	0.25	5	5	0
99	HOIST ELEC IT HAHN	RM403	00020729 00	0.25	0.25	0.25	0.25	1	5	10	5
100	TESTER TENSION COMPRESSION INSTR	RM420	00020757 00	0	0.25	0.25	0.25	0.75	5	5	5
101	SHREDDER INDUSTRIAL AZ-15	RM31B	00020764 00	0	0	0	0.25	0.25	0	5	0
102	HOIST TROLLEY 500	RM406B	00020767 00	0	0.25	0.25	0.25	0.75	5	10	5
103	CRANE MONORAIL	RM502	00020769 00	0.25	0.25	0.25	0.25	1	10	10	0
104	HOUSING HEPA FILTER BAG IN-OUT	RM406A	00020778 00	0	0.5	0	0.25	0.75	20	15	0
105	SCALE M2300 TOLEDO 500KG 30X30"		00020779 00	0	0	0.25	0.25	0.5	5	10	0

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Table B15 3/3

Building 444/7, NCPP 'Clean' Equipment to Stay
Option #2

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Oil (Gallons)
106	CLEANER ULTRASONIC WESTINGHOUSE	RM403	00026785 00	0	0	0.25	0.25	0.5	10	10	0
107	XFORMER 1000 KVA 3PH 60HZ DR PLT PWR		00028117 00	0	0	0	0	0	0	0	0
108	FURNACE MELTING ARC ELEC VAC	RM405	00034019 00	2	3	6	1	12	25	25	300
109	CRUSHER DRUM 55AR W/ COMPACTION	RM501	00034609 00	0.5	0.25	0.25	0.25	1.25	20	15	5
110	DETECTOR LEAK (HE) VARIAN 936-66S	HALL	00039972 00	0	0	0.25	0.25	0.5	5	5	5
111	CONTROLLER IONZN GAUGE G-P	RM407	00040852 00	0	0	0	0.25	0.25	0	5	0
112	XFORMER SQR D 1500/2000 K PLT PWR	447-2	00085689 00	0	0	0	0	0	0	0	0
113	COMPUTER DIGITAL DECMATE	0408B	00099420 00	0	0	0.25	0	0.25	0	5	0
114	PRINTER INTEGRAL DATA PRISM 800	RM420	00099421 00	0	0	0.25	0	0.25	0	5	0
115	COMPUTER MONITOR HP	RM414	00099422 00	0	0	0.25	0	0.25	0	5	0
116	PRINTER HP	0	00099423 00	0	0	0.25	0	0.25	0	5	0
117	KEYBOARD IBM	0	00099424 00	0	0	0.25	0	0.25	0	5	0
			Total	40.25	57.25	97.75	39.5	234.75	3412	933	2215

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Table B16

Labor requirements for Stage II Cleanup Operations

Week No.	865	883	Building 444/7	Total	Lab.Hrs	Hires
1	1	0	0	1	280	7
2	1	0	0	1	280	7
3	2	0	0	2	560	14
4	2	0	0	2	560	14
5	3	1	0	4	1120	28
6	3	1	0	4	1120	28
7	4	2	0	6	1680	42
8	4	2	0	6	1680	42
9	5	3	0	8	2240	56
10	5	3	0	8	2240	56
11	5	3	1	9	2520	63
12	5	4	1	10	2800	70
13	5	4	2	11	3080	77
14	5	4	2	11	3080	77
15	5	4	3	12	3360	84
16	5	4	3	12	3360	84
17	5	4	4	13	3640	91
18	5	4	4	13	3640	91
19	5	4	5	14	3920	98
20	5	4	5	14	3920	98
21	5	4	5	14	3920	98
22	5	4	5	14	3920	98
23	5	4	5	14	3920	98
24	5	4	5	14	3920	98
25	5	4	5	14	3920	98
26	5	4	5	14	3920	98
27	5	4	5	14	3920	98
28	5	4	5	14	3920	98
29	5	4	5	14	3920	98
30	5	4	5	14	3920	98
31	5	4	5	14	3920	98
32	5	4	5	14	3920	98
33	5	4	5	14	3920	98
34	5	4	5	14	3920	98
35	5	4	5	14	3920	98
36	5	4	5	14	3920	98
37	5	4	5	14	3920	98
38	5	4	5	14	3920	98
39	5	4	5	14	3920	98
40	5	4	5	14	3920	98

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Table B16 (continued)

Week No.	865	883	Building 444/7	Total	Lab.Hrs	Hires
41	5	4	5	14	3920	98
42	5	4	5	14	3920	98
43	5	4	5	14	3920	98
44	5	4	5	14	3920	98
45	5	4	5	14	3920	98
46	5	4	5	14	3920	98
47	5	4	5	14	3920	98
48	5	4	5	14	3920	98
49	5	4	5	14	3920	98
50	5	4	5	14	3920	98
51	5	4	5	14	3920	98
52	5	4	5	14	3920	98
53	5	4	5	14	3920	98
54	5	4	5	14	3920	98
55	5	4	5	14	3920	98
56	5	4	5	14	3920	98
57	5	4	5	14	3920	98
58	5	4	5	14	3920	98
59	5	4	5	14	3920	98
60	5	4	5	14	3920	98
61	5	4	5	14	3920	98
62	5	4	5	14	3920	98
63	5	4	5	14	3920	98
64	5	4	5	14	3920	98
65	5	4	5	14	3920	98
66	5	4	5	14	3920	98
67	5	4	5	14	3920	98
68	4	4	5	13	3640	91
69	4	4	5	13	3640	91
70	4	4	5	13	3640	91
71	4	4	5	13	3640	91
72	4	4	5	13	3640	91
73	2	3	5	10	2800	70
74	0	2	5	7	1960	49
75	0	2	5	7	1960	49
76	0	1	5	6	1680	42
77	0	0	4	4	1120	28
78	0	0	3	3	840	21
			Total man hours		257880	

Note: Table does not include pre-work training.

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Table B17 1/4

Preliminary NCPP Stage II Cleanup Schedule

Task Name	Duration	Start	Finish
Start of NCPP Stage II	0w	10/1/94	10/1/94
11 Building 865	73.4w	4/11/95	9/6/96
112 Building 865 Facility Cleanup	73.4w	4/11/95	9/6/96
1121 Step 1	0w	4/11/95	4/11/95
11211 Complete Step 1	0w	4/11/95	4/11/95
1122 Step 2	0w	4/11/95	4/11/95
11221 Complete Step 2	0w	4/11/95	4/11/95
1123 Step 3	0w	4/25/95	4/25/95
11231 Complete Step 3	0w	4/25/95	4/25/95
1124 Step 4	0w	8/23/95	8/23/95
11241 Complete Step 4	0w	8/23/95	8/23/95
1125 Step 5	0w	3/8/96	3/8/96
11251 Complete Step 5	0w	3/8/96	3/8/96
1126 Step 6	0w	3/29/96	3/29/96
11261 Complete Step 6	0w	3/29/96	3/29/96
1127 Step 7	0w	3/15/96	3/15/96
11271 Complete Step 7	0w	3/15/96	3/15/96
1128 Step 8	0w	4/30/96	4/30/96
11281 Complete Step 8	0w	4/30/96	4/30/96
1129 Step 9	0w	7/18/96	7/18/96
11291 Complete Step 9	0w	7/18/96	7/18/96
11210 Step 10	4.6w	8/6/96	9/6/96
112101 Complete Step 10	0w	8/6/96	8/6/96
112102 Issue *Facility Cleanup Report*	0w	9/6/96	9/6/96

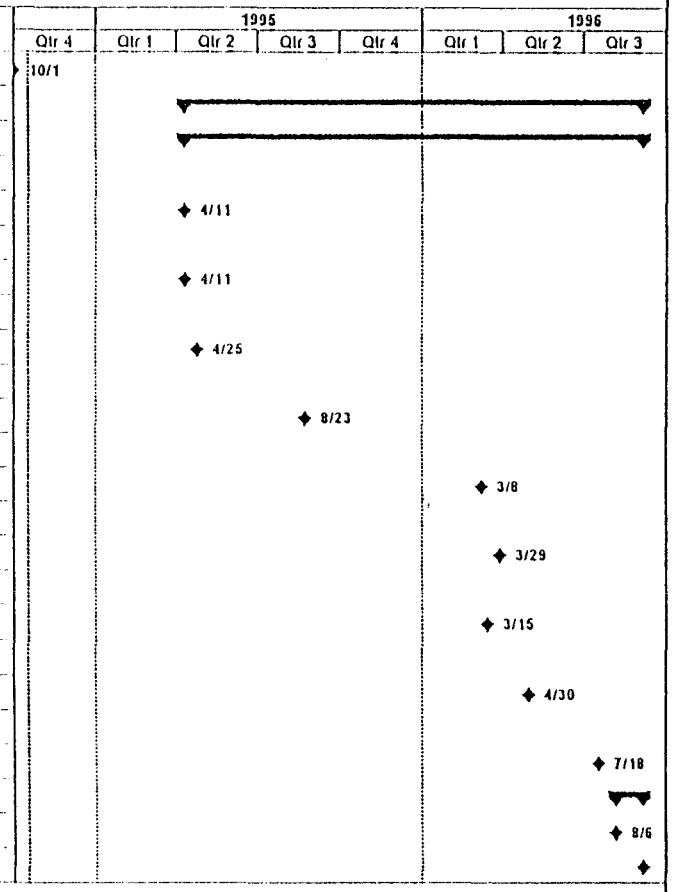

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Table B17 2/4

Preliminary NCPP Stage II Cleanup Schedule

Task Name	Duration	Start	Finish
12 Building 883	73.4w	4/25/95	9/20/96
122 Building 883 Facility Cleanup	73.4w	4/25/95	9/20/96
1221 Step 1	0w	4/25/95	4/25/95
12211 Complete Step 1	0w	4/25/95	4/25/95
1222 Step 2	0w	4/25/95	4/25/95
12221 Complete Step 2	0w	4/25/95	4/25/95
1223 Step 3	0w	5/9/95	5/9/95
12231 Complete Step 3	0w	5/9/95	5/9/95
1224 Step 4	0w	7/26/95	7/26/95
12241 Complete Step 4	0w	7/26/95	7/26/95
1225 Step 5	0w	2/27/96	2/27/96
12251 Complete Step 5	0w	2/27/96	2/27/96
1226 Step 6	0w	2/8/96	2/8/96
12261 Complete Step 6	0w	2/8/96	2/8/96
1227 Step 7	0w	2/9/96	2/9/96
12271 Complete Step 7	0w	2/9/96	2/9/96
1228 Step 8	0w	5/10/96	5/10/96
12281 Complete Step 8	0w	5/10/96	5/10/96
1229 Step 9	0w	8/6/96	8/6/96
12291 Complete Step 9	0w	8/6/96	8/6/96
12210 Step 10	4.6w	8/20/96	9/20/96
122101 Complete Step 10	0w	8/20/96	8/20/96
122102 Issue Facility Cleanup Report	0w	9/20/96	9/20/96

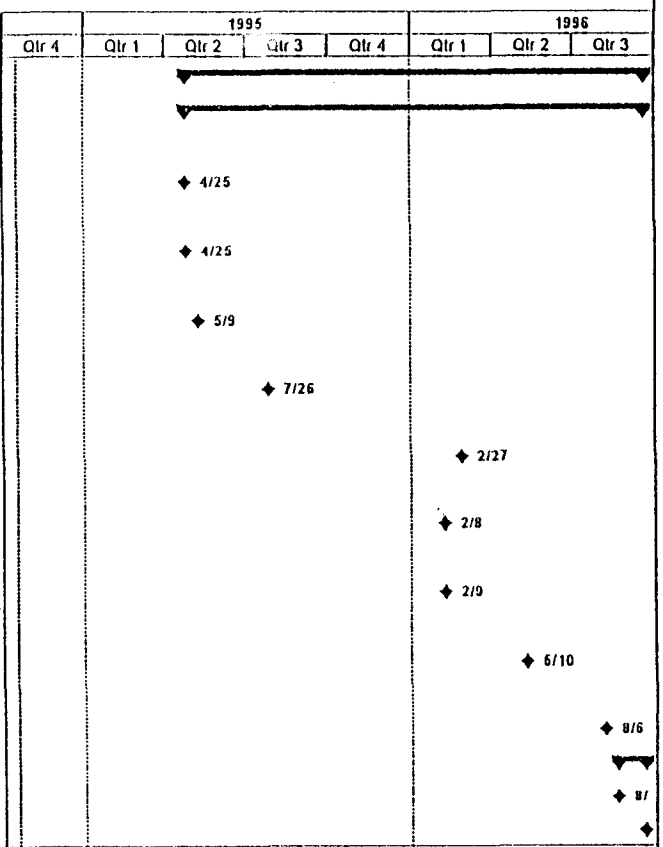

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Table B17 3/4

Preliminary NCPP Stage II Cleanup Schedule

Task Name	Duration	Start	Finish
13 Building 44407	104.19w	10/1/94	9/30/96
132 Building 44407 Facility Cleanup	104.19w	10/1/94	9/30/96
1321 Step 1	0w	8/10/95	8/10/95
13211 Complete Step 1	0w	8/10/95	8/10/95
1322 Step 2	0w	8/24/95	8/24/95
13221 Complete Step 2	0w	8/24/95	8/24/95
1323 Step 3	0w	9/8/95	9/8/95
13231 Complete Step 3	0w	9/8/95	9/8/95
1324 Step 4	0w	5/10/96	5/10/96
13241 Complete Step 4	0w	5/10/96	5/10/96
1325 Step 5	0w	5/13/96	5/13/96
13251 Complete Step 5	0w	5/13/96	5/13/96
1326 Step 6	0w	5/6/96	5/6/96
13261 Complete Step 6	0w	5/6/96	5/6/96
1327 Step 7	0w	6/4/96	6/4/96
13271 Complete Step 7	0w	6/4/96	6/4/96
1328 Step 8	0w	9/5/96	9/5/96
13281 Complete Step 8	0w	9/5/96	9/5/96
1329 Step 9	0w	10/1/94	10/1/94
13291 Complete Step 9	0w	10/1/94	10/1/94
13210 Step 10	4.2w	8/30/96	9/30/96
132101 Complete Step 10	0w	8/30/96	8/30/96
132102 Complete Building Modifications	0d	9/30/96	9/30/96
132103 Issue Facility Cleanup Report	0w	9/30/96	9/30/96

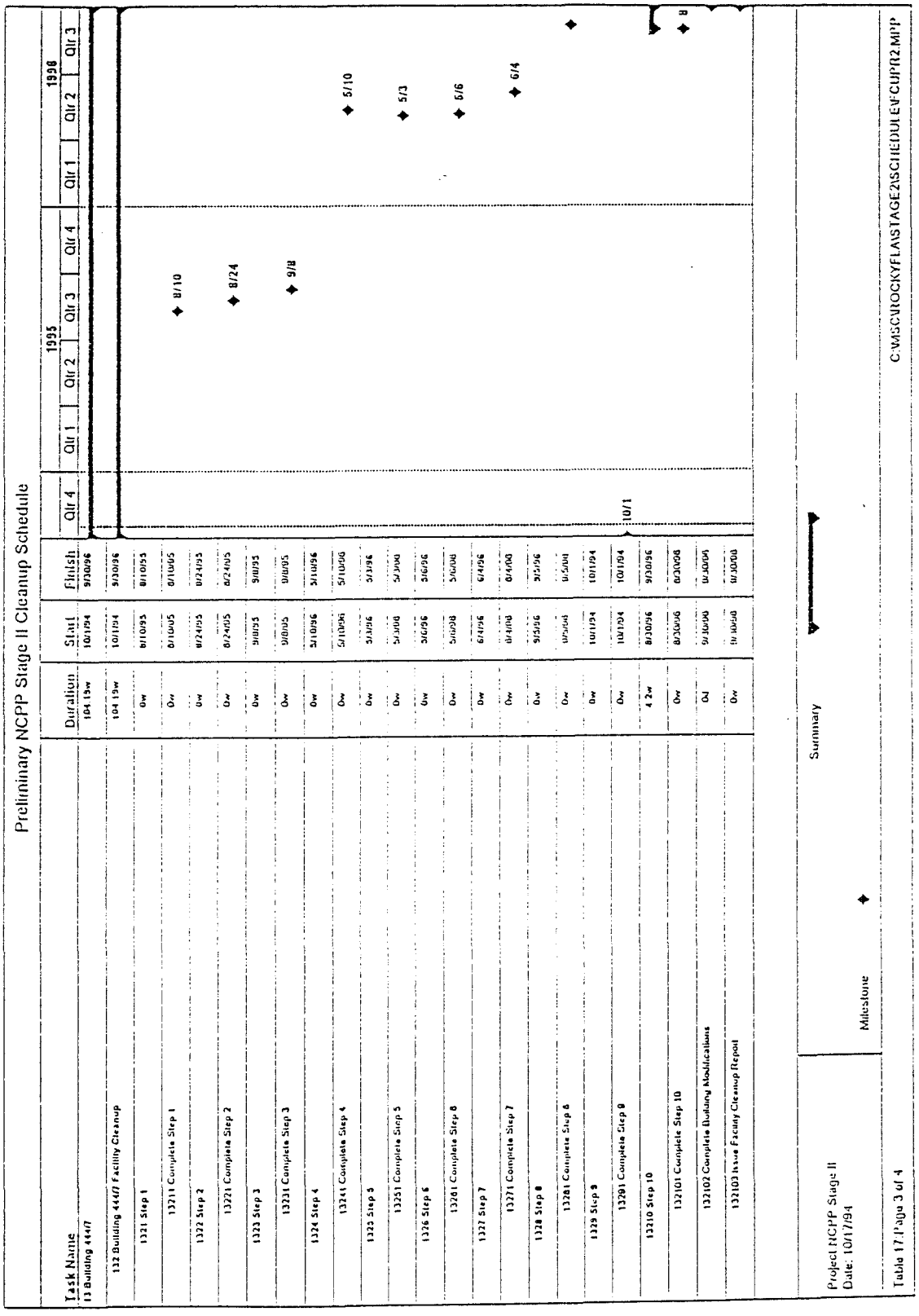

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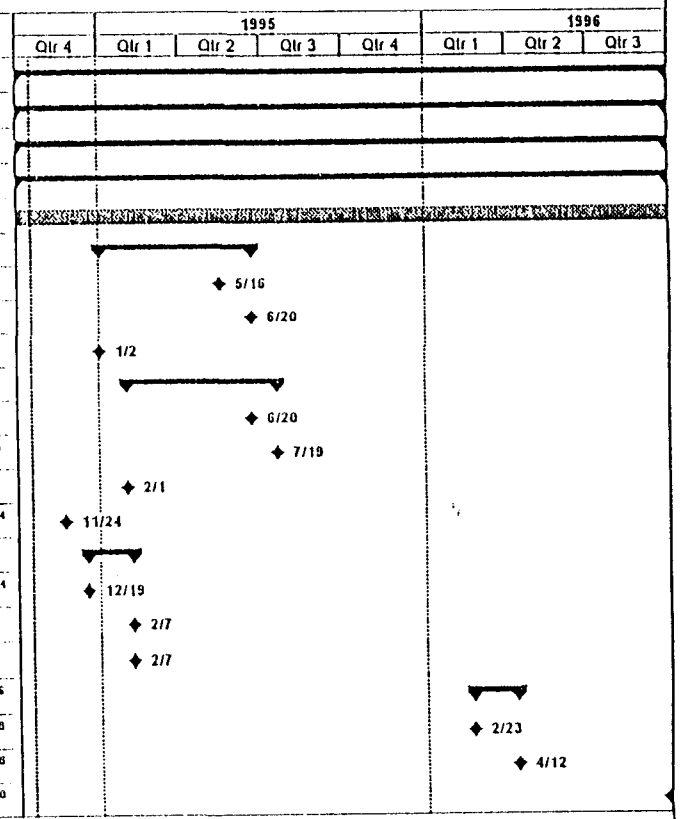
Table B17 4/4

Preliminary NCPP Stage II Cleanup Schedule

Task Name	Duration	Start	Finish
14 Operations Support	104.19w	10/1/94	9/30/96
142 Project Technical Support	104.19w	10/1/94	9/30/96
1428 Cleanup Program	104.19w	10/1/94	9/30/96
14281 Cleanup Program Management	104.19w	10/1/94	9/30/96
142811 Ongoing Cleanup Program Management Activities	104.19w	10/1/94	9/30/96
14282 Cleanup Group Recruitment	24.2w	1/2/95	6/20/95
142821 Complete Team Leaders Recruitment	0w	5/16/95	5/16/95
142822 Complete Decontamination Workers Recruitment	0w	6/20/95	6/20/95
142823 Complete Other Cleanup Group Recruitment	0w	1/2/95	1/2/95
14283 Cleanup Group Training	24w	2/1/95	7/19/95
142831 Complete Team Leaders Training	0w	6/20/95	6/20/95
142832 Complete Decontamination Workers Training	0w	7/19/95	7/19/95
142833 Complete Other Cleanup Group Training	0w	2/1/95	2/1/95
14284 Cleanup Management Plan	0w	11/24/94	11/24/94
14285 Cleanup Procedures	7.2w	12/19/94	2/7/95
142851 Complete Determination of Procedure Requirements	0w	12/19/94	12/19/94
142852 Issue Operational Procedures	0w	2/7/95	2/7/95
142853 Issue Management Procedures	0w	2/7/95	2/7/95
14286 Cleanup Group Procurement	7w	2/23/96	4/12/96
142861 Complete Cleanup Group Ordering	0w	2/23/96	2/23/96
142862 Complete Cleanup Group Delivery	0w	4/12/96	4/12/96
Completion of NCPP Stage II	0w	9/30/96	9/30/96



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APPENDIX C

Facility Cleanup Plan Drawings C-1 to C-15

Page	Title
C-1	Building 865, Areas of Elevated Surface Contamination
C-2	Building 883, Areas of Elevated Surface Contamination
C-3	Building 444, Areas of Elevated Surface Contamination
C-4	Building 444, Basement & Mezzanine, Areas of Elevated Surface Contamination
C-5	Building 447, Areas of Elevated Surface Contamination
C-6	Building 865, Current Layout
C-7	Building 865, Projected Final Layout
C-8	Building 883, Current Layout
C-9	Building 883, Projected Final Layout
C-10	Building 444, Main Floor, Current Layout Option #2
C-11	Building 444, Basement & Mezzanine, Current Layout Option #2
C-12	Building 447, Current Layout Option #2
C-13	Building 444, Projected Final Layout
C-14	Building 444, Basement & Mezzanine, Projected Final Layout
C-15	Building 447, Projected Final Layout

Appendix D

Discussion of Cleanup Options Considered for Building 444/7

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D1 Introduction D3
D2 Brief Discussion of Options D3
D2.1 Option #1 ..... D3
D2.2 Option #2 ..... D4
D2.3 Option #3 ..... D4
D3 Option #1 ..... D4
D3.1 Current Building Operations D4
D3.2 Sequence and Duration of Operations D5
D3.3 Maintenance Costs Associated with Building 444/7 Stage II Operations D8
D4 Option #3 ..... D9
D4.1 Current Building Operations D9
D4.2 Sequence and Duration of Operations D9
D4.3 Maintenance Costs Associated with Building 444/7 Stage II Operations D12
D5 Labor Requirements for Options #1 and #3 ..... D13
Tables D1 - D8 ..... D14
Drawings D36 - D38 ..... D35

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Appendix K - Chart Indicating How NCPP Stage II Training Systems Relate to the Appropriate DOE Orders

SUMMARY

It is a declared aim of the NCPP to establish systems which satisfy federal and state regulations and align with best business practice. The route for this in Stage II of the NCPP is to convert Quality Assurance from DOE order 5700.6C to the ISO 9000 system.

The later includes low level procedures which enable personnel to perform their roles. As the high level principles of DOE order 5700.6C and ISO 9000 are the same, (ie: initial and ongoing training for personnel, of appropriate quality, with auditable records), then it should be possible to over-lay the two systems.

The "mapping" exercise covering DOE Orders 5480.18A & 5480.20, detailed on the attached pages, shows that this is in fact the case.

Based on initial advisory discussions with DOE Training Department personnel, this approach is welcomed. It also contributes to the evolution of the NCPP Stage II Quality Assurance Program Plan.

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US DOE Order 5480.18A
July 19th 1991

Clause	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
1	Purpose	Information	None
2	Cancellation	Information	None
3	Scope	Information	None
4	Application	Information	None
5	Exemptions	Information	None
6	Background	Information	None
7	Objectives	a) develop & evaluate PBT programs that produce well-qualified, competent personnel.	Mgt Procedure A4/T50 - Need Analysis T70 - Production of PCP's T80 - Programming T60 - Skill Unit Production T90 - Control of Delivery T120 - Competence Currency

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US DOE Order 5480.18A
July 19th 1991

Clause	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
7	Objectives (Cont.)	b) standards by which we systematically develop, evaluate, maintain and improve training.	Mgt Procedure A4/T50 - Need Analysis T60 - Skill Unit Production T90 - Control of Training Delivery - Verification - Trainer Training - Assessor Training T120 - Competence Currency
		c) standards match the criteria in TAP Manual 1 of 2-4-91.	A more detailed mapping of this sub-clause has not been pursued because: 1: The principles of:- Analyses, Design, Plan, Deliver, Assess, Record ...for training is followed for Additional Skilling (as it is for PBT) and TAP Manual 1 criteria are exactly these. 2: DOE Order 5480.18A may not apply to RFP in the future.

US DOE Order 5480.18A
July 19th 1991

Clause	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
8	References	Information	None
9	Definitions	Information	None
10	Responsibil-ities & Authorities	Several posts exist within the DOE which have responsibility for some aspect of training, with a particular focus on standards. A "liaison officer" may be assigned to the NCPP.	The NCPP personnel will respond in a co-operative manner towards the DOE regarding standards or any other matter, within the cordial, day-to-day professional working relationships that exist now or in the future.
11	Implement-ation Schedule	a) Existing Facilities & b) New Facilities.	None
		c) Stand-by Facilities & d) New Positions	Both sub-clauses require the submission of a Training Program Accreditation Plan, the NCPP Training Plan is this. Under (c) a Self-Evaluation Report should be submitted within 3 years of Plan approval. Under (d) the report should be submitted within 1 year. For NCPP Stage II timescale reasons it is suggested that in this case the report is submitted at the end of Stage II.

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US DOE Order 5480.18A
July 19th 1991

Clause	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
12	Training Accreditation Program	a) Performance Based Training b) Accreditation	The whole NCPP competence concept is equivalent to PBT (Para. 1 of DOE 5480.18A page 9 refers to "Other approaches"). As for 7 (a) & (b) above and 11 (c) & (d) above. Under item 3 of this sub-clause (Training Program Accreditation Plan) it is possible to have an exception to DOE Order 5480.18A. Justification for such an exception for the NCPP exists in section 4.0 of the NCPP Training Plan. However, it is a better perception that the NCPP **parallels** this (and many other) clauses with an approach which is fundamental to the success of the NCPP, but is different to DOE Order 5480.18A, yet with the same primary aim - ie: competent workers. Exception for the NCPP from clause 12 (b) should be explored. Because of the special, in depth scrutiny which all NCPP activities receive, is in itself a most comprehensive review / accreditation process.

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US DOE Order 5480.20
February 20th 1991 / June 19th 1991

General Requirements

Clause	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
1	Purpose	Information	None
2	Cancellation	Information	None
3	Scope	Information	None
4	References	Information	None
5	Background	Information	None
6	Definitions	Information	None
7	Application	Information	None
8	Responsib-ilities / Authorities	Several posts exist within the DOE which have responsibility for some aspect of training, with a particular focus on applicability of DOE Order 5480.20 and procedures which control exceptions or qualifications. A "liaison officer" may be assigned to the NCPP.	The NCPP personnel will respond in a co-operative manner towards the DOE regarding applicability of Orders and procedures or any other matter, within the cordial, day-to-day professional working relationships that exist now or in the future.

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

General Requirements

Clause	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
9	Program Requirements	PBT is the way forward.	PBT is based on DOE, NRC & related industry standards, and as such the NCPP will enthusiastically align with the standards and better them if it is cost effective to do so.
		a) General requirements	See response to Chapter I of the order, below.
		b) Cat. A Reactor Personnel & c) Cat. B Reactor Personnel	Not applicable to NCPP.
		d) Non-Reactor Facility Personnel	See response to Chapter IV of the order, below.
10	Implement-ation Schedule	Timespan and actions between the submission of a Training Implementation Matrix and it's approval. The Matrix defines & describes selection, qualification, and training compliance with the Order, including exceptions.	The Staffing Plan and Training Plan (especially Appendix E - Gantt Chart) generated as part of the NCPP Stage I work plan are equivalent to a Training Implementation Matrix. These plans have been approved by the DOE. This document sets out the detailed links between DOE Orders and NCPP Management Procedures and thereby clarifies the route to compliance with the NCPP equivalent of PBT, ie: Additional Skilling.

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter I

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
1	Purpose	Information	None
2	Training Organization Requirements	Clear management structure and responsibilities required.	See Staffing Plan and Appendix G of the Training Plan regarding structure. Responsibilities are set out in QA documentation and management procedures.
3	Sub-contractor Personnel Qualification Requirements	Sub-contractors must have qualification criteria.	MSC selects it's sub-contractors by a process which includes the scrutiny of contact staff. Also, as set out in Section 6 of the Training Plan, Managers and Technologists may be sub-contractors (eg: BNFL Inc.) and are encompassed by the personnel qualification process, see:- Mgt Procedure A4/T20 - Verification of Base Competence T30 - Screening T40 - Competence Record Keeping T70 - Production of PCP's T120 - Competence Currency
4	Personnel Selection Requirements	A process for employee selection, based on competence, is required.	Mgt. Procedure A4/T20 - Verification of Base Competence T30 - Screening

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter I

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)	
5	Qualification Process Requirements	A qualification process must exist:-		
		a) Competence requirements match the role	Mgt Procedure A4/T20 -	Verification of Base Competence
			T70 -	Production of PCP's
		b) Qualification assurance is by testing	Mgt. Procedure A4/T30 -	Screening
			T100 -	Workplace Competence Assessment
		c) Ongoing qualification (2 yearly) is necessary.	Mgt. Procedure A4/T120-	Competence Currency
6	Certification Process Requirements	Evidence of qualification of workers is needed:-		
		a) A procedure is needed which includes documentation of qualification	Mgt. Procedure A4/T40 -	Competence Record Keeping
		b) Assurance needed for qualification requirements are satisfied	Mgt. Procedure A4/T30 -	Screening
			T20 -	Verification of Base Competence
			T100 -	Workplace Competence Assessment**

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter I

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)

** Special Note:

Item 6 (b) states "satisfactory completion of qualifications which result in certification shall be verified by a person or group other than the person or group that provided the training or the candidates immediate supervisor". This is interpreted as requiring the following for the NCPP: Assessment will be carried out in a structured way by those who are conversant with the assessment procedure and the subject matter. Being an Assessor does not preclude a person from being a Trainer on the same course and vice versa. When assessment documentation is completed by the Assessor a verification of the documentation (for completeness, legibility, etc.) will be carried out by a person other than the Assessor. For the NCPP the Trainer or Assessor may well be the assessee's immediate supervisor, at the time of assessment, before or after. The logic for this is; a) cost effectiveness, b) minimization of scheduling difficulties, and c) increased ownership of the competence process by <u>all</u> involved parties.

6	Certification Process Requirements (Cont.)	c) Who is certified.	All those who under-go some form of Additional Skilling will be certificated to that extent. Those who have sufficient base competence for their role will not under-go Additionally Skilling. Mgt. Procedure A4/T20 - Verification of Base Competence T40 - Competence Record Keeping

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter I

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
7	Training Requirements	a) General: Training must be fit-for-purpose, current and related to individual or team as appropriate. The extent of training on a topic should be commensurate with hazards and risks associated with the topic.	These principles are entirely consistent with the NCPP approach. The NCPP Training Plan is equivalent to the Training Implementation Matrix mentioned in this Order, and the Plan has been approved by the DOE.
		b) Training Process: Training will be based on "entry-level" skills & knowledge, a needs analysis (which leads to Skill Units)**, a design & delivery method which is relevant to the workplace, and the assessment of trainees competence.	Mgt Procedure A4/T20 - Verification of Base Competence T50 - Competence Needs Analysis T60 - Skill Unit Production T100 - Workplace Competence Assessment

** Special Note:

The outcome of the Needs Analysis process is one or more Skill Unit Competence Standard. Draft Competence Standards can be found in Appendix F of the Training Plan. As Skill Unit Development Teams become established the Skill Unit manuals will contain the Competence Standards.

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter I

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
7	Training Requirements (Cont.)	c) Initial Training Safety training will be prioritized.	Training Plan, Appendix E - Gantt Chart, shows that safety related Skill Unit training package production and course delivery are high priority activities.
		d) Continuing Training** Training experiences are evaluated and improvement plans made & implemented. Refresher training on safety particularly is necessary. The evaluation and improvements apply to trainees and training alike.	Mgt. Procedure A4/T120- Competence Currency

**** Special Note:**
Refer to sub-item (5) of section 7d of this Order/chapter for a statement on the qualification of Trainers/Assessors due to prior involvement with knowledge tests.

7	Training Requirements (Cont.)	e) General Employee Training Requirements: Basis training for all, which is commensurate with duties of the individual.	Employees and long term contractors will be trained in Skill Units decided upon through the production of PCP's method - see Mgt. Procedure A4 / T70, section 3.1, 3.2 & 3.3. Visitors and short term contractors will receive an NCPP appreciation course (Skill Unit R24) - see Mgt. Procedure A4 / T70, section 3.4.

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter I

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
7	Training Requirements (Cont.)	f) Probabilistic Risk Assessment Training Requirements: Specialized skill required.	None until required by NCPP personnel, then as per DOE Order.
		g) Technician and Maintenance Personnel Training Requirements: Develop and / or improve technical skills. Safety-related systems have a special requirement**.	Will hire people according to their technical base competence, then train to fill the gap between that and the NCPP needs see:- Mgt. Procedure A4 /T20 - Verification of Base Competence T70 - Production of PCP's T90 - Control of Training Delivery T100 - Workplace Competence Assessment Skill Unit training will be pursued to qualify trainees.

**Special Note:
In the case of safety-related systems (ie: safety-related services / utilities) identified by the M&O Contractors; training on emergency response (Skill Unit R04) will specify these systems to trainees and that they are not to be interfered with.

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter I

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
7	Training Requirements (Cont.)	h) Technical Support Personnel Training Requirements: Develop appropriate technical skills.	As for item 7 (g) above.
		i) Management / Supervisory Training Requirements**: Training on Management and Supervision, as appropriate, is necessary.	NCPP personnel will be hired according to their management and/or supervisory base competence, then be developed to improve them on a personal basis. Mgt. Procedure A4 / T130 - Personal Development & PDPs

** Special Note:
Management & Supervisory skills need NOT be examined or maintained/improved for DOE purposes!

8	Operator & Supervisor Examination Requirements	Procedures covering development approval, controls and records aspects of assessment are necessary.	Mgt. Procedure A4 /T60 - Skill Unit Production T100 - Workplace Competence Assessment T40 - Competence Record Keeping

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter I

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
9	Operator & Supervisor Re-examination Requirements	Training and assessment shall be repeated periodically.	The biennial frequency of this requirement make it unnecessary, as Stage II of the NCPP is a 2 year program. However, a system of competence review, ie: Mgt. Proc. A4/T100 - Competence Currency, will be introduced, as well as evidence of skills being practised - through the NCPP Performance Monitoring System.
10	Requalification Requirements	Qualification must be repeated every two years.	
		a) Re-training before requalification may be necessary AND medical fitness.	As for item 9 above. Also see response to Chapter IV item 3.
		b) Requalification after extended absence is necessary.	Mgt. Procedure A4 /T70 - Production of PCP's.
11	Exceptions to Training Requirements	Persons who have sufficient skills without training are excepted from training if alternative evidence of competence is (a) gathered and (b) approved by managements.	Mgt. Procedure A4 /T10 - Verification of Base Competence T70 - Production of PCP's T40 - Competence Record Keeping

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter I

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
12	Extension Requirements		See response to item 9 above.
13	Alternatives to Educational Requirements (details in sub-items a, b, c & d to be referred to in detail if necessary).	Education to baccalaureate, associate degree and high school diploma levels can be substituted by other education and/or experience. Such alternative evidence of competence shall be evaluated case-by-case and approved by management.	Mgt. Procedure A4/T20 - Screening T10 - Verification of Base Competence T40 - Competence Record Keeping.
14	Alternatives to Experience Requirements (details in sub-items a & b to be referred to in detail if necessary).	Experience can be substituted by education. Such alternative evidence of competence should be evaluated case-by-case and approved by management.	Mgt. Procedure A4/T70 - Production of PCP's T90 - Control of Training Delivery T100 - Workplace Competence Assessment T40 - Competence Record Keeping.
15	Limitation for Over-time Worked		See the Staffing Plan.

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter I

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
16	Record Requirements	Evidence of competence and information relating to competence (eg: medical fitness examination results and alternatives to education / experience, see items 13 & 14 above) must be kept for operating organization personnel and be in an easily auditible format.	Mgt. Procedure A4 /T40 - Competence Record Keeping.

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter IV

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
1	Purpose	Information.	None.
2	Entry Level Requirements (see sub-items a, b, c, d, e & f for details if necessary)	Entry requirements for various types of employee are to be stated.	See Staffing Plan. Appendix C - Role Profiles. Mgt. Procedure A4/T10 - Verification of Base Competence T40 - Competence Record Keeping.
3	Medical Examination Requirements	Medical fitness criteria must be set for employees and a medical examination shall be carried out for:- * Prospective Employees * Employees on a 2 yearly basis** * Prior to employee returning to work after a serious illness / injury which kept him / her from performing their duties for more than one month.	See Staffing Plan, Appendix B - MSC Employee Handbook, and Appendix C - Role Profiles. Mgt. Procedure A4/T30 - Screening T10 - Verification of Base Competence T40 - Competence Record Keeping T70 - Production of PCP's.

** **Special Note:** The routine 2 yearly examination requirement is unnecessary, as Stage II of the NCPP is a 2 year program. However, MSC may, independently of this, initiate health checks on it's workers from time to time.

US DOE Order 5480.20
February 20th 1991 / June 19th 1991

Chapter IV

Item	Title	Interpretation	NCPP Response (with reference to the Training Plan Gantt Chart)
4	Staffing Requirements	Manning levels are determined by safety criteria. Information on manager and specialist staff, and how to contact them, shall be available in the facility.	See Staffing Plan.
5	Specific Training Requirements (see sub-items a) Operators, b) Fissionable Material Handlers & c) - Supervisors)	Training should be suitable for the job.	The details of item 5 are sometimes unsuitable for Stage II of the NCPP, because decontamination operations are not the focus of this item. However, the Training Plan sets out a program which is suitable for Stage II, including the appropriate safety, regulatory and technical skills.
6	Operator, Fissionable Materials Handler and Supervisor Proficiency Requirements	Skills must be assessed and documented.	With reference to the response to item 5 above; assessment and record keeping will be appropriate to Stage II activities of the NCPP. Mgt. Procedure A4/T100- Workplace Competence Assessment T40 - Competence Record Keeping.

Appendix L: Draft Regulatory Transition Schedule For Training Activities

SUMMARY

It is a declared aim of the NCPP to make the transition away from regulation by the DOE. The transition will be controlled, under the Quality Assurance Program. The NCPP requires the co-operation and participation of the DOE and the eventual regulators to achieve the aim in a reasonable time. The draft schedule overleaf is put forward as a part of the Regulatory Oversight Plan.

ADVANTAGES

The advantages of regulatory transition and this particular approach are:-

1. Some regulatory costs shifts from DOE to others.
2. A method of regulatory transition will be demonstrated; thus achieving declared aim.
3. The training principles of the DOE will continue to be upheld.
4. The alignment with industrial best practice for regulatory compliance, through a quality assurance program, will be achieved.
5. The non-DOE regulators will be involved early in Stage II and can be participate and contribute throughout the process.
6. The willingness of those involved to "make it happen" will enhance their credibility with NCPP observers.

Appendix L: Draft Regulatory Transition Schedule For Training Activities

	STEP	WHEN
1	Establish that DOE orders 5480.18A, if applicable, and 5480.20 can be assimilated into NCPP Management Procedures	End of Stage I Extension
2	Prepare Management Procedures as an integral part of the NCPP QA Program	Start of Stage II
3	Check that the NCPP Management Procedures are consistent with 10 CFR 830.330 and utilize industry's best practise for compliance with the CFR. Take advise from CDPHE (who are also "agents" for NRC and OSHA in Colorado) and EPA	Start of Stage II
4	Discussions with CDPHE on compliance with safety training regulations. Involve the safety skill unit development teams	Start 1 month into Stage II
5	Discussion with CDPHE on compliance with health training regulations. Involve the health skill unit development teams	Start 2 months into Stage II
6	Discussions with EPA on compliance with environmental training regulations. Involve the environmental skill unit development teams	Start 3 months into Stage, or as per the Regulatory Oversight Plan
7	Review progress and re-design process as appropriate	Start 4 months into Stage II

National Conversion Pilot Project
Stage I

Staffing Plan

Revision 2

30 September 1994

Submitted to:

U.S. Department of Energy - Rocky Flats Office
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Golden, Colorado 80402-0928

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804 Kerr Hollow Road
Oak Ridge, Tennessee 37830

Cooperative Assistance Agreement No:

DE-FC34-94RF00733

REVIEWED FOR
By H. M. Hoffman WNU
Date 12-6-94

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National Conversion Pilot Project
Stage I

Staffing Plan

Revision 2

26 September 1994

Prepared by:	Frank J. Yaklich, Jr., MSC Deputy PM	Date 9/30/94
Approved by:	M.L. Haupt, BNFL Inc. PM	Date 9/30/94
Approved by:	D.R. Floyd, MSC PM	Date 9/30/94
Approved by:	Elaine Nix, DOE-COR	Date 9/30/94

This Report was prepared by Manufacturing Sciences Corporation (MSC) under Cooperative Assistance Agreement No. DE-FC34-94RF00733 with the Department of Energy - Rocky Flats Office.

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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
0	6-14-94	All	All	First Approved Issue	
1	7-28-94	1&2	All	Change "Draft A" to Revision 1	
2	9-25-94	14-50	All	Revised Edition of MSC Handbook	
2	9-25-94	52-77	All	Revised Role Profiles	
2	9-25-94	79-80	All	Revised Laws and Regulations	
2	9-25-94	82-96	All	Hiring Plan Addition	
2	9-29-94	97-99	All	Personnel Requirements - Type and Quantity Addition	

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3.0 Objectives		3
4.0 Assumptions and Unknowns		4
5.0 Types and Quantities of Employees		5
6.0 The Principles of Employee Staffing Plan		6
Appendix A	Project Team Organization Chart	A - 1
Appendix B	MSC Employee Handbook	B - 1
Appendix C	MSC Role Profiles	C - 1
Appendix D	Staffing Plan Elements	D - 1
Appendix E	Laws and Regulations	E - 1
Appendix F	Hiring Plan	F - 1
Appendix G	Personnel Requirements - Type, Salary Grade and Quantity	G - 1

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1.0 Introduction

This Staffing Plan contains the deliverables for Work Task Assignment reference number WBS 135 (Staffing Plan) of the NCPP Stage I Work Plan - Revision 0, April 28, 1994. The specific deliverables are:

1.1 Create an Organizational Structure (Appendix A).

1.2 Define Human Resource Issues such as wages, benefits, etc. Covered in MSC Employee Handbook (Appendix B).

1.3 Determine Job Types, Quantities and Qualifications covered in Role Profiles and estimated (Appendix C).

1.4 Compile Staffing Plan Elements (Appendix D).

1.5 Identify Appropriate and Applicable Laws and Regulations and Delineate Human Resources Management Policies (Appendix E).

1.6 Discuss Hiring Strategy (e.g., How to attract RFETS Workers (Affirmative action for Rocky Flats Plant, AARFP)) (Appendix F).

2.0 Scope

The Staffing Plan encompasses all NCPP Stage II employees and subcontractors. It covers the qualifications, role profiles, hiring strategy, organization structure, human resources issues and the appropriate laws and regulations that govern such processes.

The Staffing Plan will be synchronized with the Facility Cleanup Plan and the Training Plan. The type and quantity of staff will be supplied by the Cleanup Plan. The Staffing Plan will identify qualified workers for the Training Plan. Also, the Staffing Plan will specify the competence requirements for employees which feed into the Training Plan.

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3.0 Objectives

3.1 To select employees that meet the standards required by the Training Plan to accomplish the goals of the NCPP.

3.2 To help implement the concepts of teamwork and competence.

3.3 To manage the activities and resources involved in the competence acquisition process at the beginning.

3.4 To assay the competence and skills of employees prior to hiring.

3.5 To assist in setting standards for employee competence.

3.6 To assist in identification of individual or team training needs.

3.7 To accomplish all objectives within the guidelines set out in the applicable federal and state laws that govern this type of endeavor.

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4.0 Assumptions and Unknowns

4.1 Staffing will commence during the fall and winter of 1994 and 1995 for Stage II.

4.2 Stage II staffing will continue at a rate determined by the Facility Cleanup Plan.

4.3 Stage II is initiated in the summer of 1994.

4.4 Sufficient human resources are available in the Denver area.

4.5 The number of workers required and the skills required are estimates at this time. The Staffing Plan will be refined as the project progresses.

4.6 All employees and subcontractors will work day shift only.

4.7 Sufficient base information will be available by the time hiring needs to start.

4.8 Some Declassification and Pilot Process/Product Verification will take place during Stage II.

5.0 Types and Quantities of Employees

5.1 There are three types of MSC NCPP employees:

5.2 Teamworkers

Teamworkers will be hourly-rated, hired employees from a skilled or non-skilled background, with maintenance, production, fabrication, or other appropriate practical experience. Role profiles are given in Appendix C. They will be selected for an interview based on the outcome of vocational accreditation/experience verification and screening.

5.3 Managers, Technologist and Support Staff

Managers and Technologist will be salaried, appointed employees from a professional engineering/scientific/managerial or similar background. Support Staff will be hourly-rated, hired employees from a vocational background. Role profiles are give in Appendix C. They will be selected for an interview based on the outcome of the verification of academic certification/vocational accreditation and some screening.

5.4 Subcontractors

Subcontractors are the same as Managers and Technologists, except that they are the salaried, appointed employees of a company which is under contract to MSC (e.g., BNFL Inc.) to provide a specific expertise or deliverable.

5.5 Number of Employees

See the latest NCPP Stage II Project Team Organization Chart, Appendix A. This is subject to increase or decrease as Stage II progresses.

6.0 The Principles of Employee Staffing Plan

6.1 The competence requirement for the ten specific roles (Appendix D) will be set out in the appropriate role profile.

6.2 The employees will be required to have skills relating to teamwork concept, business, vocational and academic competence.

6.3 The interviews will be of a structured nature to insure fairness.

6.4 Qualification against the role profiles will be a combination of academic certification, vocational accreditation, screening check and additional skills acquired in the work place.

6.5 The NCPP Training Plan will be structured to fill any competency gap that exists between an individuals pre-recruitment qualifications and the role profile competence requirements.

6.6 A job is the combination of a role profile and output related personal or team goals, which are laid out periodically.

6.7 Additional Skilling principles are covered in Section 7 of the Training Plan. If an employee fails to reach the competence standard required for the role, then employment may be terminated.

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Appendix A

Project Team Organization Chart

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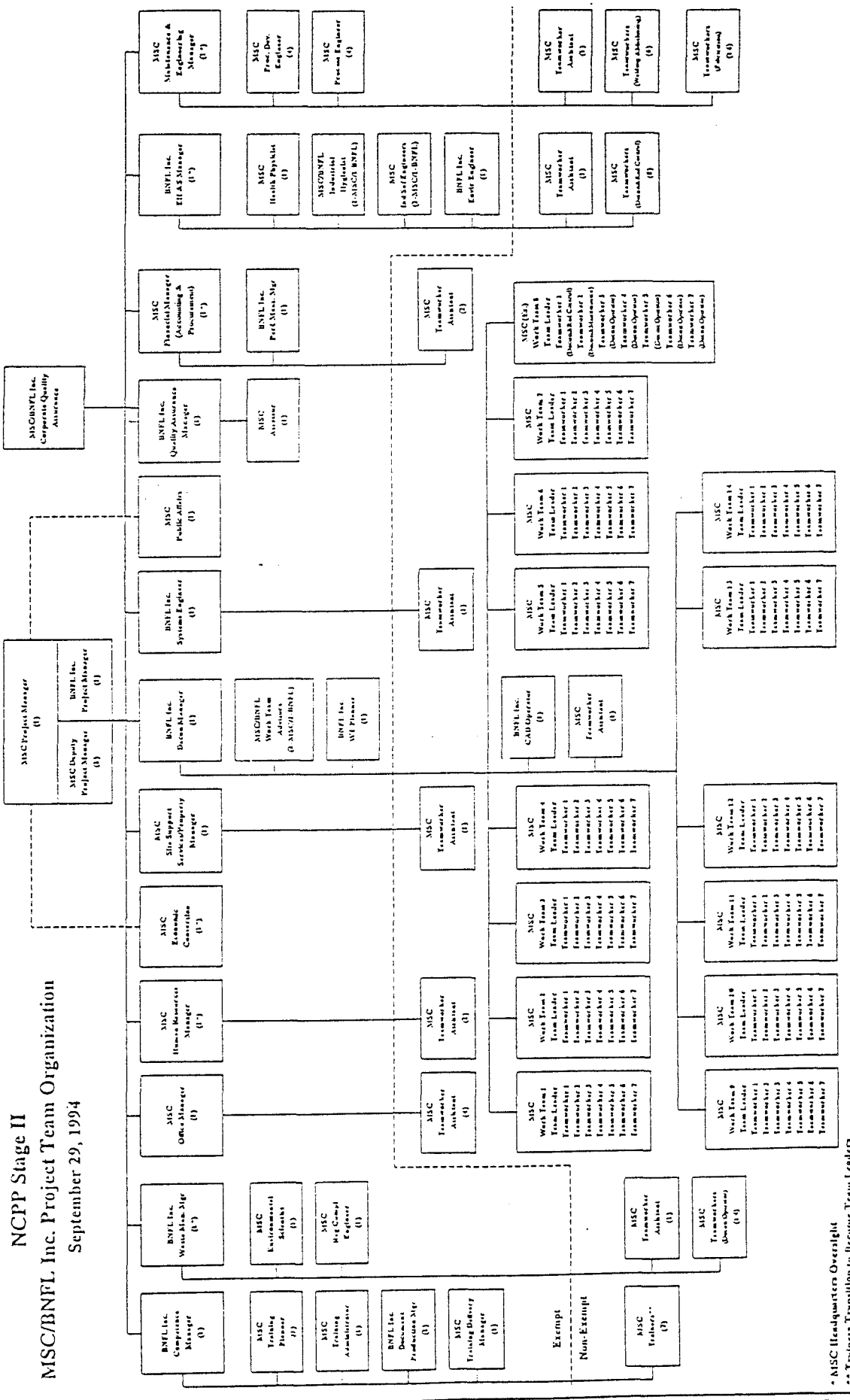
NCPP Stage II
MSC/BNFL Inc. Project Team Organization
September 29, 1994
MSC/BNFL Inc. Corporate Quality Assurance
MSC Project Manager (1)
BNFL Inc. Project Manager (1)
MSC Deputy Project Manager (1)
MSC Maintenance & Engineering Manager (1*)
MSC Proc. Dev. Engineer (1)
MSC Process Engineer (1)
MSC Transmember Assistant (1)
MSC Transmembers (Welding Abbotsburg) (1)
MSC Transmembers (Fabrication) (1-4)
BNFL Inc. EH&S Manager (1*)
MSC Health Physicist (1)
MSC/BNFL Industrial Hygienist (2-MSC/1-BNFL)
MSC Industrial Engineers (2-MSC/1-BNFL)
BNFL Inc. Event Engineer (1)
MSC Transmember Assistant (1)
MSC Transmembers (Decontaminated Control) (1)
MSC Financial Manager (Accounting & Procurement) (1*)
BNFL Inc. Perf Meas. Mgr (1)
MSC Transmember Assistant (2)
MSC (Ex-) Work Team 8 Team Leader Transmember 1 (Decontaminated Control) Transmember 2 (Decontaminated Maintenance) Transmember 3 (Decontaminated Operator) Transmember 4 (Decontaminated Operator) Transmember 5 (Decontaminated Operator) Transmember 6 (Decontaminated Operator) Transmember 7 (Decontaminated Operator)
BNFL Inc. Quality Assurance Manager (1)
MSC Auditor (1)
MSC Work Team 7 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
MSC Public Affairs (1)
MSC Work Team 4 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
MSC Work Team 14 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
BNFL Inc. Systems Engineer (1)
MSC Transmember Assistant (1)
MSC Work Team 5 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
MSC Work Team 13 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
BNFL Inc. Decon Manager (1)
MSC/BNFL Work Team Advisors (2-MSC/1-BNFL)
BNFL Inc. WI Planner (1)
BNFL Inc. CAD Operator (1)
MSC Transmember Assistant (1)
MSC Site Support Services/Property Manager (1)
MSC Transmember Assistant (1)
MSC Work Team 6 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
MSC Work Team 12 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
MSC Economic Controller (1*)
MSC Work Team 3 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
MSC Work Team 11 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
MSC Human Resources Manager (1*)
MSC Transmember Assistant (1)
MSC Work Team 2 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
MSC Work Team 10 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
MSC Office Manager (1)
MSC Transmember Assistant (1)
MSC Work Team 1 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
MSC Work Team 9 Team Leader Transmember 1 Transmember 2 Transmember 3 Transmember 4 Transmember 5 Transmember 6 Transmember 7
BNFL Inc. Waste Mgmt. Mgr (1*)
MSC Environmental Advisor (1)
MSC Reg Compl Engineer (1)
MSC Transmember Assistant (1)
MSC Transmembers (Decon Operators) (1-4)
BNFL Inc. Computerized Manager (1)
MSC Training Planner (1)
MSC Training Administrator (1)
BNFL Inc. Document Production Mgr (1)
MSC Training Delivery Manager (1)
Exempt
Non-Exempt
MSC Trainers** (2)
* MSC Headquarters Oversight
** Trainers Transition to Become Team Leaders

Appendix B

Manufacturing Sciences Corporation

Employee Handbook

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INTRODUCTION

Congratulations on your decision to join Manufacturing Sciences Corporation (MSC)! We are very glad to have you on our team. The greatest asset we have is our people and you as a dedicated member of our team can make a substantial impact on the growth, prosperity and success of our company.

Many factors define the success of a company such as satisfied customers, committed employees, community acceptance and delivery of needed products and services. One factor, however, stands out because without it a company cannot survive. That factor is profitability. The success of our company ultimately depends on profitability.

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About This Handbook

The MSC Employee Handbook contains an overview of company policies and benefit programs available to active, full-time, employees of MSC. The description of the benefits and policies contained in this handbook are set forth for the purpose of illustration only. In each case, the specific provisions are set forth in the full policy or full separate benefit plan which governs employee or dependent eligibility for benefits. To avoid any misunderstandings or to answer any questions, we have available, in the Human Resources Department, the specific provisions of the full plans and policies, which you may review.

The policies stated in this handbook are subject to change at the sole discretion of MSC. From time to time you may receive updated information concerning changes in policy.

This Handbook is not a contract, express or implied, guaranteeing employment for any specific duration. Although we hope that your employment relationship with us will be long-term, either you or the Company may terminate this relationship at any time, for any reason, with or without cause or notice.

MSC reserves the right to amend or terminate any of these programs or to require or increase employee premium contributions toward any benefits at its discretion.

Business Philosophy

As an employee of MSC we ask you to try to understand and support our business philosophy. You will come to learn our value system best by working with us, but a few of the more important elements are listed below:

Fairness

We place a great importance on the concept of fairness. We often judge actions the company is contemplating by first asking the question, "What is fair?" We want to pay you a fair wage. We want to charge our customers a fair price. We want to be treated fairly in return.

Customers

We keenly understand that we are in business solely to serve the needs of our customers. We want to distinguish ourselves from our competition by providing the kind of care and attention that will cause our customers to prefer to do business with us. We will strive to produce high quality products on time for a price that is both competitive and fair.

Community

We feel a special sense of responsibility to the community for providing the setting in which we can pursue our business objectives. We discharge that responsibility in part by operating our business in full compliance with all regulations designed to protect the environment and the people who live here. But we go a step further by actively seeking ways to help the community, such as trading with local merchants, hiring locally and encouraging community involvement by our employees.

Employees

We view employees as individuals. We believe that the human element is the key to getting the job done, and we strive to cultivate a work environment that is conducive to employee satisfaction.

Safety

We are totally committed to installing, operating, and maintaining our facilities so that they do not constitute a threat to you, your fellow workers or the community at large. We believe that the best safety program is one that places responsibility for safety on you as the principal beneficiary of safe work practices. Safe work practices are a condition of your employment at Manufacturing Sciences

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SAFETY AND HEALTH

MSC works very hard with you to provide a safe and healthful work setting. We carefully adhere to federal and state occupational health and safety laws and regulations and apply the best practicable operations, procedures, and technologies that lead to a safe and healthful workplace.

MSC's policy is to minimize the exposure of our employees, customers, visitors, and surrounding community to health or safety risks. For us to do this, you need to work hard to maintain safe and healthful working conditions and follow proper practices and procedures designed to prevent injuries and illnesses.

Your Responsibilities

All employees of MSC are responsible to do the following:

1. Exercise maximum care and good judgment at all times to prevent accidents and injuries;
2. Report all injuries to your supervisor and seek first aid for all injuries, no matter how small;
3. Report unsafe conditions, equipment, or practices to supervisors;
4. Use the safety equipment the Company provides.
5. Observe all safety rules and regulations.
6. Notify your supervisor, before you begin your workday, of any medication you are taking that may cause drowsiness or other side effects that could lead to injury to you and your co-workers.
7. Refrain from substance abuse.

Radiation Safety

All employees who work in a controlled area must undergo a comprehensive radiation safety training program under the direction of MSC's Radiation Safety Officer. Additional annual refresher training is also conducted. Employees will be required to demonstrate through written tests their comprehension of the material presented.

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EMPLOYMENT POLICIES

Equal Employment Opportunity

Manufacturing Sciences Corporation provides equal employment opportunities (EEO) to all employees and applicants for employment without regard to race, color, religion, sex, national origin, age, handicap, disability or status as a Vietnam-era or special disabled veteran in accordance with applicable federal laws. In addition, MSC complies with applicable state and local laws governing nondiscrimination in employment. This policy applies to all terms and conditions of employment, including, but not limited to, hiring, placement, promotion, termination, layoff, recall, transfer, leaves of absence, compensation, and training.

Medical Examinations

Upon becoming an MSC employee, you will be requested to undergo a medical exam including a alcohol and drug screening. This exam is performed by a Doctor chosen by the Company. Your employment with MSC is contingent upon successful completion of this exam and screening, and a determination by the Company and its doctor that you are able to perform the responsibilities of the job.

During your employment, you may also be requested to undergo medical exams and/or alcohol and drug screenings, at times chosen by the Company. In connection with these exams, you may be required to provide MSC with access to your medical records. In addition, the Company receives a medical report from its doctors about applicant's and employee's state of health. These Company-required medical exams and screenings are paid for by MSC.

Questions about medical examinations or alcohol and drug screening should be directed to your supervisor or the Human Resources Department

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Personnel Files

MSC maintains your personnel file. Your file contains information about all aspects of your employment, such as performance appraisals, beneficiary designation forms, corrective actions, training records and letters of commendation. You are welcome to review your personnel file at anytime. Contact the Human Resources Department to make an appointment.

It is important that your file is up-to date. Let your supervisor or the Human Resources Department know of any changes in personal information such as your name, telephone number, home address, marital status, number of dependents, beneficiary designation, scholastic achievements, or the individual to notify in case of an emergency.

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COMPENSATION POLICIES

Your Compensation

Manufacturing Sciences Corporation must recruit, reward and motivate high performance employees if we are to provide quality products to our customers and prosper as a company.

MSC knows that your compensation is an important issue to you that greatly effects your motivation, morale and performance. The goal of MSC's Compensation program is to pay you a fair and equitable salary that is competitive with the pay for similar positions in nearby private companies and within MSC.

Salary Reviews

MSC will review your salary at least annually and may make changes based on your performance and skills development. If a change is indicated, your salary will be adjusted fairly and equitably.

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Classification of Employment

In order to pay you correctly and to determine your level of benefits eligibility, employee classifications are as follows:

- **Full-Time Regular employees.**

Employees who work at least 30 hours per week on a regular basis. You may be "exempt" or "nonexempt" as defined below.

- **Part-Time Regular Employees.**

Employees who are hired by MSC to work less than 30 hours per week on a regular basis.

- **Temporary Employees.**

Employees who are hired by MSC to work full-time or part-time with the understanding that their employment will end at the completion of a specific assignment. (Note that a temporary employee may be offered, and may accept, a new temporary assignment with the Company and still retain temporary status.) Such employees may be "exempt" or "nonexempt" as defined below. (Note that employees hired from temporary employment agencies for specific assignments are employees of the respective agency and not of MSC.)

- **Nonexempt Employees.**

Employees who must be paid overtime for all hours worked in excess of forty hours in a workweek. This policy complies with requirements of federal wage and hour laws.

- **Exempt Employees.**

Employees who are not eligible for overtime pay in agreement with the federal wage and hour laws that apply, for work over forty hours in a workweek. Executives, professional and administrative employees are typically classified as exempt.

You will be informed of your employment classification during your orientation. If you change jobs at MSC, the Human Resources Department will let you know if your status changes.

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Recording Work Hours

It is our policy to obey the laws and requirements of our contracts that require us to keep records of the hours you work. MSC must maintain accurate records of these hours, and of the accrued leave time you have taken. For these reasons and to ensure you are paid properly, you must record your worktime and absences on MSC's official time cards.

Regarding your timecard;

1. Fill out your card every day in ink.
2. Check that the hours add up correctly.
3. Charge your time to the correct account number. (check with your supervisor if you are not positive).
4. Hand in your card to your supervisor for approval, daily.

Your supervisor approves the card and sends it to payroll for processing. Please make sure that the actual hours you work and the leave time you have taken are recorded correctly. It is **required** to only charge your time where it is worked. Falsification of a time card is a violation of company policy and is grounds for corrective action, including the possibility of discharge.

Pay Procedures

Non-exempt MSC employees are paid by check every Friday. Exempt MSC employees are paid by check twice a month. Paydays fall on the fifteenth and on the last day of each month. If a payday falls on an MSC-holiday or weekend, you will be paid on the day before the weekend or holiday.

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Overtime Pay

If you are a nonexempt employee, you will be paid for approved overtime work as follows:

You will be paid one and one-half times your current regular hourly rate for:

1. all hours worked over (8) hours per day.

2. all hours worked over (40) hours per week,

3. all hours worked on the first scheduled day off in a week.

Overtime at a minimum rate of "double time" will be paid for all work performed on the second scheduled day off in a week or on Company recognized holidays when it is directed by your supervisor.

Overtime pay for any hour excludes that hour from any other overtime payment on any other basis.

Call In Pay

Occasionally you may be asked to come in to work outside of your regular schedule and make an extra round trip to MSC. In these instances you will be guaranteed a minimum of 3 hours of regular pay or 2 hours of overtime pay.

Shift Differential

MSC pays a shift differential to those non-exempt employees who work outside the hours of 6:00 A.M. to 6:00 P.M. Those employees working full hours that fall between 6:00 P.M. and midnight will be compensated an additional $0.35 per hour worked. Employees working full hours that fall between midnight and 6:00 A.M. will be compensated an additional $0.55 per hour worked.

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EMPLOYEE BENEFITS

MSC has established a variety of employee benefit programs designed to help you and your eligible dependents meet the financial burdens that can result from illness, disability, and death, and to help you plan for retirement.

This section of the Handbook is meant to highlight some features of our benefit programs, which add up to a sizable part of your compensation from MSC. Our group health, life insurance, and retirement related programs are described more fully in summary plan description booklets (SPDs), which you are given when you become eligible to participate in these programs. Complete descriptions of our group health insurance programs are also in MSC's master insurance contracts with insurance carriers. These plans are kept in the Human Resources Department. Complete descriptions of our retirement-related programs are in the appropriate master plan documents, which are also kept in the Human Resources Department. If differences exist between the information in this Handbook, the SPDs, and the information contained in these master contracts or master plan documents, the master contract or the master plan documents will rule.

When benefits begin

You are generally eligible to apply for benefits after completing 30 days of continuous service if you are a active full-time regular employee.

When benefits end

Benefits end on the day your employment with MSC ends.

For more complete information regarding any of our benefit programs, please contact our Human Resources Department.

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Time off Benefits

Vacation

Full time employees begin to accrue vacation after 30 days employment.

Vacation Accrual Schedule

SERVICE	HOURS ACCRUED PER MONTH	DAYS PER YEAR
1 Month thru 5 Years	6.67 Hours	10 Days
5 Years thru 10 Years	10.00 Hours	15 Days
10 Years thru 20 Years	13.34 Hours	20 Days
After 20 Years	16.67 Hours	25 Days

Vacation Scheduling

Vacations may be taken in weekly, daily or half-day amounts (minimum of 4 hours) with prior supervisory approval. To insure approval a vacation request form should be filled out and given to your supervisor as early as possible. This will allow them to schedule around your absence. (Vacation request forms are available from the Human Resources Department)

Vacation Carryover

You can take vacation time throughout the year whenever you properly schedule it. However, you can only carry over a certain amount from year to year. The maximum amount of vacation you may carry over on January 1 depends on your length of service as of December 31.

Vacation Carryover Schedule

SERVICE	HOURS CARRIED OVER
1 Month thru 5 Years	80 Hours
5 Years thru 10 Years	120 Hours
10 Years thru 20 Years	160 Hours
After 20 Years	240 Hours

Note: If you have vacation time that is in an unusable amount (less than 4 hours) the amount less than 4 hours will also be carried over in addition to the amount you're allowed to carry over per the schedule.

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Pay in lieu of Vacation

You are encouraged to take your earned vacation. You will only be paid for unused vacation if you terminate. At that time, you will be paid only for your current balance of accrued unused vacation.

*H*olidays

MSC provides paid time off to all active full-time regular employees on nine holidays. The holidays the company recognizes are usually the following ones.

- **New Year's Day**
- **Good Friday**
- **Memorial Day**
- **Independence Day**
- **Labor Day**
- **Thanksgiving**
- **Day after Thanksgiving**
- **Christmas Eve**
- **Christmas**

MSC lets you know at the beginning of each calendar year the actual days we will observe these holidays.

*P*ersonal Day

In addition to Company-holidays, full-time regular employees are allowed eight hours off every year for personal business, religious observances, ethnic holidays, and other events important to you. You can take this 8 hours off in as small as 1/2 hour periods. You cannot carry this day over from year to year and you are not paid for it if you do not use it.

Unpaid Time Off

MSC understands that in certain emergency instances you may require time off without pay. We will consider these requests on a case by case basis.

Sick Pay

The Company provides paid time off to full-time regular employees for sickness or treatment of injuries.

Full-time regular non-exempt employees may receive up to 5 days (40 hours) of sick pay each calendar year. Paid sick days for new hires will be prorated based upon the time remaining in the calendar year from the date of hire.

In the event that you become ill, during your absence, you will be paid 80% of your current base rate for a period of up to 5 days. If you are fortunate enough to have sick days left at the end of the calendar year, MSC will compensate you for these days with a lump sum payment calculated at 50% of your base rate of pay as of December 31.

If you are absent more than 5 days

If you are absent for more than five consecutive workdays, you may be required to hand in a statement from your Medical Doctor before you will be permitted to return to work. In such cases, MSC also reserves the right to require you to undergo an examination by a Doctor chosen by the Company.

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Funeral Pay

If you are a full-time regular employee and a death occurs in your immediate family, you will be paid for time lost from your regular work schedule in agreement with the following guidelines.

You will be allowed three days off from work with pay if you lose your spouse, child, parents, siblings, grandparents, father-in-law or mother-in-law. Unpaid time off may be granted with your supervisors approval.

Jury and Witness Duty

Jury and Witness Duty Leave

To qualify for jury or witness duty leave, you must give your supervisor a copy of the summons to serve as soon as you receive it. Also, you need to give your supervisor proof of service when your jury or witness duty is over.

Jury Duty Pay

If you are a full-time regular employee and you are called to jury duty, MSC will make up the difference between jury pay and your regular hourly rate for the time you lose from work as a result of your jury service, for up to a maximum of fifteen working days per calendar year. You must make arrangements with your Supervisor in advance for the necessary time off. When you return to work, give the Human Resources Department a statement from the Court Clerk showing the dates of your jury duty and the amount of money you were paid.

Witness Duty

You will be allowed unpaid time off if you are summoned to appear in court as a witness.

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Medical Leaves of Absence

Requesting a medical leave

You may request a Medical leave of absence if you are a full-time regular or a part-time regular employee. If you expect to be absent for more than five consecutive work days because of an illness, injury, or disability (including pregnancy), you must submit a written request for a medical leave to your supervisor as soon as you learn that you will need a medical leave. If you can't work because of an emergency, you or someone in your family must let your supervisor know as soon as is practicable; follow this with a written leave request. (normally within three days). All medical leave requests must have medical certification from your Doctor letting us know why you need a medical leave and when you are expected to return to work. (MSC requires this certification from a Medical Doctor) The maximum time period that an employee may be on medical leave is twelve (12) months. Because of our size, MSC cannot hold a position open for more than the maximum period of leave. Therefore, an employee on a medical leave must return to work in accordance with this policy on or before twelve (12) months from the beginning of the leave, or employment will be terminated. If an individual is able to return to work after the twelve (12) month period has expired, MSC will give consideration for re-employment to any vacant position which the individual can perform.

During your medical leave

If your leave is approved you have to give MSC doctors statements at least every thirty days to update us on your condition. You may also have to provide MSC access to your medical records or undergo an exam at any time by a physician chosen by the Company at its discretion.

Vacation time continues to accrue only during the first thirty days of your medical leave. All Company group health benefits (e.g., Medical and Dental insurance) continue during your leave.

When your leave is over

Before you can come back to work from a medical leave, you have to give MSC a note from your doctor saying that you are able to return to work and can perform the essential functions of your job with or without reasonable accommodation. (Note: MSC will consider making reasonable accommodations to your disability in accordance with applicable laws where required.)

Unless applicable state or local law requires otherwise, getting your job back is not guaranteed to any employee returning from medical leave. The Human Resources Department will notify you before you start your leave if you have a right to return to the same or similar job. MSC tries to place employees returning from leave in their former jobs or a job that is close in status and pay, subject to budgetary restriction, MSC's need to fill vacancies, and the ability of MSC to find qualified temporary replacements.

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Personal Leaves of Absence

You may request unpaid personal leave of absence for up to thirty days if you are a full time or part time regular employee. As soon as you decide to ask for personal leave, hand in your request to your supervisor.

In cases of emergency, you or someone in your family must let your supervisor know as soon as it is practical. Follow this up with a written request, (usually within three days). In your request explain why you need personal leave and how long you expect to be gone from work.

Personal leave will be granted for justifiable reasons, at MSC's discretion, as long as the leave does not seriously hamper Company operations. Personal leaves are not granted until all accrued unused vacation is used.

MSC will try to place returning employees in their old jobs or in jobs of equivalent status and pay if possible.

Military Leaves of Absence

MSC supports the armed forces and the mission they have to protect the citizens and interests of the United States. If you are called to or volunteer for active military duty or Reserve or National Guard training, you will be granted an unpaid Military leave of absence so you can fulfill your military obligations.

To request Military leave

Submit a copy of your military orders to your supervisor. You will be granted time off and reinstated in accordance with the federal and state laws that apply.

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Health Benefits

*M*edical

Your health is important to us. MSC offers all full time regular employees medical insurance benefits that cover 80 percent of most hospital costs, doctor's fees, drugs and other medical bills. After completing 30 days of active service, you may apply, if you are eligible for one of two types of coverage. Individual coverage, which covers you only, or Family coverage, which covers you and your eligible dependents. You will be informed during your orientation of the current fees for the two options of coverage. Medical benefits begin the first of the month after completing 30 days of active service. Consult your Group Health Insurance Plan booklet for more information or contact the Human Resources Department.

*D*ental

Regular, professional dental care is essential to good health. Dental care can also prevent serious and costly problems later in life. For this reason, we encourage you and your family to see a dentist regularly. MSC's dental plan places special emphasis on preventive care, including checkups and teeth cleaning.

If you are a full time regular MSC employee, you are eligible to participate in MSC's dental plan after you have completed 30 days of active service. You may apply for one of two types of coverage. Individual coverage, which covers you only, or Family coverage, which covers you and your eligible dependents. During your orientation, you will be informed of the current fees for the two options of coverage. For more details about dental coverage, consult your Group Dental Insurance Plan booklet or contact the Human Resources Department.

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Disability Benefits

Short Term Disability

To make sure your income (or a portion of it) continues should you become ill or unable to work for a short period of time, MSC provides all full-time regular employees with short-term disability insurance benefits. If you are eligible, your coverage begins the first day following thirty (30) days of continuous service. (This program does not pay benefits if you become disabled by a pre-existing condition.)

A disability is either a work related or non-work related injury or illness diagnosed by a qualified Medical Doctor acceptable to the Company that prevents you from performing every key part of your job for a period of at least seven (7) calendar days. There is a one week waiting period before short-term disability benefits begin.

Short-term disability benefits are reduced by any workers compensation income benefits you receive.

The amount of your short-term disability coverage depends on how long you have been here. The longer you have worked here the greater your coverage. To find your exact coverage, check the table on the next page. If you have any questions, contact your Human Resources Department.

Short-Term Disability Schedule

LENGTH OF SERVICE	WEEKS OF ELIGIBILITY
Less than 6 months	1 week full salary
6 months but less than 1 year	1 week full salary. Balance up to 26 weeks at 70% of full salary.
1 year but less than 2 years	2 weeks full salary. Balance up to 26 weeks at 70% of full salary.
2 years but less than 5 years	5 weeks full salary. Balance up to 26 weeks at 70% of full salary.
5 years but less than 6 years	10 weeks full salary. Balance up to 26 weeks at 70% of full salary.
6 years but less than 10 years	12 weeks full salary. Balance up to 26 weeks at 70% of full salary.
10 years but less than 15 years	20 weeks full salary. Balance up to 26 weeks at 70% of full salary.
15 years or more	26 weeks at full salary.

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Long Term Disability

MSC provides all full-time regular employees with long-term disability (LTD) insurance benefits. Coverage for eligible employees begins after completing 30 days of continuous service.

Under this program, employees who are disabled for more than 180 days because of injury or sickness as defined in the plan, are eligible to receive a benefit equivalent up to 60% of their basic monthly earnings*, to a maximum benefit of $4,500 per month (less other income benefits.)

For further information and definitions regarding LTD coverage, consult your Summary Plan Description (SPD) booklet, or contact the Human Resources Department.

* Your basic monthly earnings amount for long term disability insurance calculations, is updated annually on March 31.

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Workers Compensation

To provide for payment of your medical expenses and for partial salary continuation in the event of a work-related accident or illness, you are covered by workers' compensation insurance. The amount and duration of benefits payable depend upon the nature of your injury or illness. In general, however, all medical expenses incurred in connection with an injury or illness are paid in full, and partial salary payments are provided beginning with the seventh consecutive day of your absence from work.

If you are injured or become ill on the job, you must immediately report the injury or illness to your supervisor, or the Human Resources Department. This ensures that the Company can help you get appropriate medical treatment. Your failure to follow this procedure may result in the appropriate worker's compensation report not being filed in accordance with the law, which may consequently jeopardize your right to benefits in connection with the injury or illness.

Questions regarding worker's compensation insurance should be directed to the Human Resources Department.

Retirement Benefits

401 K Plan

MSC began a retirement program through the establishment of a 401K plan to help provide you with retirement income. The 401K plan encourages eligible employees to save money on a pretax basis and to build a financial reserve for retirement.
You are encouraged to begin planning for retirement early in your career so that your investments can grow to help provide future financial security. You may participate in this plan as an active member on the earliest monthly date after you are eligible as defined in the plan.

Under the plan, eligible employees may choose to have the Company withhold between 1 percent and 20 percent of their gross compensation through payroll deductions (to a maximum of over $9000 per year adjusted for inflation) and contribute the amount to the plan as a savings contribution. MSC will contribute 50 cents for each dollar you contribute of the first 6% of your salary.

Example

Below is an example of the dollar amounts the employee and the company would contribute for different payroll deduction percentages for an employee who makes $400 a week.

Percentages		Actual Dollars		
Employee Contribution	Company Match	Employee	MSC	TOTAL
3%	1.5%	$12	$6	$18
6%	3%	$24	$12	$36
7%	3%	$28	$12	$40

To make changes

Employees may stop or change their contributions or adjust their investment mix by completing a 401K contribution form, available from our Human Resources Department. Withdrawals from the plan are permitted once an employee has reached age 59 1/2 or in the event of financial hardship as defined in the plan.

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What happens to my money?

The money contributed by employees and the matching amount contributed by MSC is held and invested according to the employees investment direction. Each employee personally directs their money into one or more of the accounts available through Principal Financial Group. The value of your account at retirement will depend on how long you have been a member of the plan, how much you have contributed, and your investment gains or losses.

Vesting

You are always 100% vested in your personal contributions to the 401K account. You own a percentage of your account from contributions that the company makes in the form of matching and discretionary contributions. (Discretionary contributions are optional contributions the company makes)

Generally, the schedule below determines your vesting percentage for company contributions:

YEARS OF VESTING SERVICE	VESTING PERCENTAGE
Less than 1	0 %
1	20 %
2	40 %
3	60 %
4	80 %
5 or more	100 %

Your vesting percentage will be 100% if you are working for us on or after the earliest of these dates:

- The date you reach age 60.
- The date you become totally disabled as defined in the plan.
- The date you die.

Once you are eligible to participate in the plan, you will receive an SPD (Summary Plan Description) booklet describing the plan in more detail. Questions regarding our 401K plan should be directed to the Human Resources Department.

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Survivor Benefits

Life Insurance

All full-time regular employees are provided life insurance coverage through MSC's life insurance program. You are covered, if you are eligible, after you complete 30 days of service. Under this program, you are covered by a life insurance benefit of twice your annual base salary*. The cost to provide this benefit is currently paid completely by the Company.

Accidental Death and Dismemberment Insurance

In addition to basic life insurance, you are also covered by accidental death and dismemberment insurance. Accidental death and dismemberment insurance pays a benefit if you die or are dismembered directly as a result of an accident. The amount the plan will pay depends on the severity of the injury. The maximum amount accidental death and dismemberment insurance will pay is twice your annual base salary*. The cost to provide this benefit is currently paid completely by the Company.

* Annual base salary for your life insurance amount is updated once a year on March 31.

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MISCELLANEOUS BENEFITS

Tuition Assistance

MSC sponsors an educational assistance program to help eligible employees develop their skills and abilities. Full-time regular employees are eligible to participate in this program.

Under our program, educational assistance is provided for courses offered by approved institutions of learning such as accredited colleges, universities, and trade schools. Courses must be, in MSC's opinion, directly or reasonably related to your present job or part of a degree program, or in line with a position that the Company believes you can reasonably achieve. Courses must not interfere with your job responsibilities and must be taken on your time.

Reimbursement covers actual costs of tuition, registration fees, and books, and is limited to a maximum of six credits per semester for approved courses, based on the schedule below:

GRADE RECEIVED	AMOUNT OF REIMBURSEMENT
A	100 %
B	100 %
C	100 %
P (pass/fail courses)	100 %
Lower than C	0 %

Employees eligible for reimbursement from any other source (e.g., a government-sponsored program or a scholarship) may seek help under our educational assistance program but are reimbursed only for the difference between the amount received from other funding sources and the actual course cost up to the maximum allowable.

To be eligible for reimbursement, you must;

1. Hand in a tuition reimbursement form to your supervisor before your course begins.
2. Receive the written approval of your supervisor and the Human Resources Department in advance.
3. Be actively employed by MSC when the course is finished.
4. Receive a qualifying grade.
5. Hand in an official transcript form from the school which shows the grade you received for the course.
6. Hand in a bursar's receipt or other official proof of payment.

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Tuition Advancement

MSC recognizes that incurring tuition costs may impose financial hardship on employees taking classes. In an effort to minimize the effect of tuition expenses on you, MSC will advance tuition reimbursement money to you before you complete your course. MSC will advance 75% of tuition costs to you at the start of the course with the remaining 25% reimbursed to you upon its successful completion. If you do not complete the course satisfactorily, or if you fail to provide us with an official transcript from the school showing the grade you received, you will have to repay to MSC the amount that was advanced to you.

Tuition reimbursement forms and tuition advancement forms are available in the Human Resources Department.

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EMPLOYEE CONDUCT

Work Schedules

Work Week

Presently, the regular work week for full-time regular employees is forty hours divided into five days Monday through Friday. Employees are regularly scheduled to work eight hours per day with an unpaid lunch period.

Daily and weekly work schedules may be changed from time to time at the discretion of MSC to meet the varying conditions of our business. Changes in work schedules will be announced as far in advance as practical.

Operations Department

Work Schedule:

Employees who work in the operations department are expected to be properly dressed in company coveralls and at their work station at the start of the scheduled work day. Your supervisor will inform you of the specific hours. You may be requested to work the day, evening, or midnight shift depending on the workload.

Breaks and Showers

Provided for in your workday are two twenty minute breaks, one in the morning and one in the afternoon. Twenty minutes are provided at the end of the day for a mandatory shower before you leave.

Half day schedule

Employees working half a day get one twenty minute break in the morning and must take a mandatory twenty minute shower at the end of the four hour shift.

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B reaks

Breaks are scheduled during the work day to provide rest for process area workers who must normally perform physically demanding tasks, and who are restricted from eating or drinking at their work stations. MSC has some guidelines it asks you to follow in regard to taking breaks:

1. Take your break at the scheduled time.
2. Use your judgment.

   If taking a break at the scheduled time means losing a disproportionate amount of time by interrupting your work, reschedule your break. Use **your** judgment to make the best use of your time.
3. Contact your supervisor if you are unable to take your break within a reasonable amount of time.

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Employee Relations

As an employee at MSC we will strive to treat you with respect and dignity. In turn, we ask that you treat all fellow employees with this same respect and dignity.

MSC expressly prohibits any form of employee harassment or discrimination based on race, color, religion, sex, national origin, age, personal characteristic, handicap, or disability, or status as a Vietnam-era or special disabled veteran. Interference with the ability of MSC's employees to perform their expected job duties is not tolerated.

MSC **prohibits** unwelcome sexual advances; requests for sexual favors; and all other verbal or physical conduct of a sexual or otherwise offensive nature.

Complaint Procedure

If you experience any job-related harassment based on your sex, race, national origin, disability, or another factor, or believe you have been treated in an unlawful, discriminatory manner, promptly report the incident to your supervisor, who will investigate the matter and take appropriate action, including reporting it to the Human Resources Manager. If you believe it would be inappropriate to discuss the matter with your supervisor, you may bypass your supervisor and report it directly to the head of your department or to the Human Resources Manager, who will undertake an investigation. Your complaint will be kept confidential to the maximum extent possible.

If the Company determines that an employee is guilty of harassing another employee, appropriate corrective action will be taken against the offending employee, up to and including termination of employment.

MSC will not condone any form of retaliation against any employee for filing a bona fide complaint under this policy or for helping in a complaint investigation.

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Guidelines for Appropriate Conduct

As an important member of the MSC team, you are expected to accept certain responsibilities, stick to accepted business principles in matters of personal conduct, and show a high degree of personal integrity at all times. This requires sincere respect for the rights and feelings of others. and demands that at work you conduct yourself so that you don't do anything that might be harmful to you, your co-workers, and/or MSC.

MSC encourages you to observe the highest standards of personal conduct at all times.

Types of behavior and conduct that MSC considers inappropriate includes, but is not limited to, the following:

1. Falsifying employment, timecard or other Company records
2. Violating MSC's nondiscrimination and/or sexual harassment policy
3. Soliciting or accepting gratuities from customers or clients
4. Excessive absenteeism or tardiness
5. Excessive, unnecessary, or unauthorized use of company supplies, particularly for personal purposes
6. Reporting to work intoxicated or under the influence of non prescribed drugs, and illegal manufacture, possession, use, sale, distribution or transportation of drugs
7. Bringing or using alcoholic beverages on MSC property or using alcoholic beverages while engaged in Company business off MSC's premises.
8. Engaging in horseplay or practical joking.
9. Fighting or using obscene, abusive, or threatening language or gestures
10. Theft of property from co-workers, customers, or MSC
11. Unauthorized possession of firearms on MSC premises or while on Company business
12. Disregarding safety or security regulations
13. Insubordination
14. Failing to maintain the confidentiality of Company, customer, or client information.

Should your performance, work habits, overall attitude, conduct, or demeanor become unsatisfactory in the judgment of MSC, based on violations either of the above or of any other MSC policies, rules, or regulations, you will be subject to corrective action, up to and including dismissal.

Progressive Discipline Procedure

Manufacturing Sciences Corporation will make every effort to solve problems which come up during your employment here. However, there are situations which require some type of formal corrective action. When this action is necessary, every effort will be made to work with the employee to correct the situation. A procedure has been set up for just that reason. Normally, this progressive procedure of positive corrective action will be taken, however some serious circumstances may warrant immediate termination of employment.

Steps in the progressive discipline procedure are as follows:

Discussion:

The supervisor will discuss the problem with the employee in question. This is an informal session designed to gather facts and solve problems.

Verbal Warning:

If the discussion fails to resolve the problem, a formal verbal warning will be issued by the supervisor. This discussion will be documented and placed in the employee's personnel file. It is designed for corrective action and problem solving. To prevent misunderstandings this session will also be attended by an additional management representative.

Written Notice:

This step will be necessary if the problem continues. The written notice will go into the employee's file and will outline the problem situation and list any prior action which has been taken. A satisfactory corrective action will be defined.

Dismissal:

If MSC and an employee are not able to reach a positive result through the progressive discipline procedure, termination of employment will result.

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Confidentiality of Information

It is the policy of MSC to ensure that the operations, activities, and business affairs of the Company and our clients are kept confidential to the greatest possible extent. If, during your employment, you acquire confidential or proprietary information about MSC and its clients, handle such information in strict confidence and do not discuss it with outsiders. You are also responsible for the internal security of such information.

You will be asked to sign a statement of confidentiality at the time of hire. Employees found to be violating this policy are subject to corrective action, up to and including dismissal.

Drug-Free Workplace

It is the policy of MSC to create a drug-free workplace in keeping with the spirit and intent of the Drug-Free Workplace Act of 1988. The use of controlled substances is inconsistent with the behavior expected of employees, subjects all employees and visitors to our facilities to unacceptable safety risks, and undermines the Company's ability to operate effectively and efficiently. In this connection, the unlawful manufacture, distribution, dispensation, possession, sale, or use of a controlled substance in the workplace or while engaged in Company business off MSC's premises is strictly prohibited. Such conduct is also prohibited during non working time to the extent that, in the opinion of MSC, it impairs an employee's job performance or threatens the reputation or integrity of the Company.

To educate employees on the dangers of drug abuse, the Company has established a drug-free awareness program. Periodically, employees will be required to attend training sessions at which the dangers of drug abuse, MSC's policy regarding drugs, and the availability of counseling will be discussed. Employees convicted of controlled substance- related violation in the workplace (including pleas of nolo contendere) must inform the Company within five days of such conviction or plea. Employees who violate any aspect of this policy may be subject to corrective action up to and including termination. At its discretion, the Company may require employees who violate this policy to successfully complete a drug assistance or rehabilitation program as a condition of continued employment.

Performance Reviews

The purpose of performance reviews is to provide the opportunity for frank and open communication between you and your supervisor about your job performance and relationship with your supervisor. We want you to do your job to the best of your abilities and to recognize you for good performance. Your supervisor may also have suggestions for you on how you can improve your performance. This is why your performance is evaluated by your supervisor on an ongoing basis. Regularly, this review will be a written evaluation.

What's reviewed?

All performance reviews are based on your overall performance in relation to your job responsibilities and also takes into account your conduct, skills development, safety awareness, demeanor, and record of attendance and tardiness.

In addition to regular performance reviews, special written performance reviews may be conducted by your supervisor at any time to let you know of the existence of performance or disciplinary problems.

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Absentism and Tardiness

MSC expects you to take responsibility for regular attendance and on-time arrival at work.
If you are unable to work because of illness or other emergencies, you personally, must notify your supervisor as soon as possible on each day of your absence unless you are granted an authorized leave for a specified time period. Failure to properly notify the Company results in an unexcused absence. Absenteeism or tardiness that is unexcused or excessive in the judgment of MSC is grounds for corrective action, up to and including dismissal.

601

Smoking

In order to maintain a safe and comfortable working environment and to ensure compliance with applicable laws, smoking in MSC offices and facilities, or on MSC grounds **is prohibited** except in designated outside areas. Because MSC may be subject to criminal and civil penalties for violations of applicable smoking laws, we must insist on you strictly following this policy. Employees smoking in any nonsmoking area may be subject to corrective action.

Phone Use

Telephones are provided for Company business. If it is absolutely necessary, you may make or receive a personal phone call. You should keep personal phone calls as brief as possible.

Many employees live in areas that are outside our local calling zone. Personal long distance phone calls may be made only after they are authorized by your supervisor in cases of emergency. e.g. notifying family of your late arrival due to unplanned overtime, etc.

Electronic Communication

All electronic and telephonic communication systems and all communications and information transmitted by, received from, or stored in these systems are the property of MSC and are to be used solely for job-related purposes. If you use these systems, you should have no expectation of privacy in connection with the use of this equipment or with the transmission, receipt, or storage of information in this equipment. To ensure that the use of electronic and telephonic communications systems and business equipment is consistent with MSC's legitimate business interests, authorized representatives of MSC may monitor the use of such equipment from time to time. The use of any software and business equipment, including, but not limited to, facsimiles, telecopiers, computers, and copy machines for private purposes is strictly prohibited.

Solicitation and Distribution

In order to provide a more orderly working environment for all employees, solicitation and/or distribution on Company property must be limited so normal business of MSC is not disrupted. No employee will be allowed to engage in solicitation for subscriptions, membership, or other outside activities of any kind for any purpose during his working time. Any employee who does so, and thereby interferes with his own work or the work of another employee, will be subject to corrective action, including dismissal.

Complaint Resolution Procedure

Misunderstandings or conflicts can happen in any company. To make sure you have effective working relations, it is important that such matters be corrected before serious problems develop. Most incidents resolve themselves naturally; however, should a situation continue that you believe is damaging to you or to MSC, please try to discuss the matter with your immediate supervisor, department head, or a member of the Human Resources Department.

603

Termination of Employment

All employment relationships with MSC are on an at-will basis on the parts of both company and employee. Although MSC hopes that our relationships with employees are long-term and mutually rewarding, the Company reserves the right to terminate the employment relationship at any time.

Employees who want to terminate their employment relationship with MSC are urged to let the Company know at least two weeks before their intended termination. This notice should preferably be given in writing to your supervisor and department head.

Employees who plan to retire are urged to provide MSC with a minimum of three months' notice. This will allow ample time for the processing of appropriate pension forms to make sure that any retirement benefits to which an employee may be entitled begin in a timely manner.

Exit interviews with the Human Resources Department are normally scheduled for outgoing employees after the supervisors receive notices of the resignation or intent to retire and for employees whose termination is initiated by MSC. The purposes of this interview are to review eligibility for benefit continuation and conversion, to ensure that all necessary forms are completed, to collect all Company property that may be in the employee's possession (e.g., Company credit cards and keys), and to provide employees with an opportunity to discuss their job-related experiences.

604

JOB TITLE: Senior Manager

Primary Responsibilities

- Perform task for which he/she is capable of and trained for.
- Work safely and comply with regulations.
- Actively seek and implement improvements.
- Act in a way which supports the team concept.
- Strive to achieve personal business related goals.
- Develop as an employee to the benefit of the company.
- Pass on skills and knowledge to others.
- Pursue goals of Personal Competence Plan.

Typical Work Content

- Supervise Middle Managers/NCPP.
- Long range planning.
- Short range planning.
- Working with MSC corporate headquarters in Oak Ridge, TN.
- Interface with DOE and M&O contractor.
- Community involvement as necessary.
- Project budget oversight.
- New product planning and oversight.
- Marketing strategy/NCPP.
- Team participation when necessary.
- Cost control oversight.
- Regulator interface/planning.
- Human resources/planning/oversight.
- Recognize and respond to warning signals.
- Contribute to the design and delivery of formal training.

Typical Work Conditions

Any office or facility environment.

605

JOB TITLE: Senior Manager (continued):

Competence Requirements

Base Competence/Outcome of Screening

- Baccalaureate certification in a science or engineering discipline.
- Professional management experience.
- Professional experience in metal fabrication.
- Thorough knowledge of DU, beryllium and radioactive scrap metal businesses.
- Knowledge of the regulations and working practices applicable to RFP.

Additional Skilling

- Teamwork concept.
- NCPP cultural awareness.
- Detailed knowledge of NCPP.
- Facility emergency arrangements.
- Radiological safety.
- Conventional safety.
- Regulations in the workplace.

This role profile is subject to amendment by MSC management at any time.

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JOB TITLE: Middle Manager

Primary Responsibilities

- Perform task for which he/she is capable of and trained for.
- Work safely and comply with regulations.
- Actively seek and implement improvements.
- Act in a way which supports the team concept.
- Strive to achieve personal business related goals.
- Develop as an employee to the benefit of the company.
- Pass on skills and knowledge to others.
- Pursue goals of Personal Competence Plan.

Typical Work Content

- Supervise Team Leaders.
- Daily task planning.
- Project planning.
- Daily emergency response.
- DOE and M&O contractor interface as necessary.
- Team participation.
- Cost control.
- Regulatory oversight and control.
- Human resources oversight/implementation.
- Short range NCPP planning.
- Industrial safety.
- Quality Assurance.
- Environmental Health & Safety.
- Production.
- Maintenance.
- Training.
- Waste Management.
- Decontamination.
- Accounting.
- Recognize and respond to warning signals.
- Contribute to the design and delivery of formal training and competence testing.

Typical Work Conditions

Any office or facility environment.

607

JOB TITLE: Middle Manager (continued):

Competence Requirements

Base Competence/Outcome of Screening

- Baccalaureate certification in appropriate discipline.
- Management experience.
- Knowledge of or professional experience in metal fabrication as applicable.
- Knowledge of DU, beryllium and radioactive scrap metal characteristics as applicable.
- Knowledge of the regulations and working practices applicable to RFP.

Additional Skilling

- Teamwork concept.
- NCPP cultural awareness.
- Detailed knowledge of NCPP.
- Radiological safety.
- Conventional safety.
- Facility emergency arrangements.
- Regulations in the workplace.
- Planning/project.

This role profile is subject to amendment by MSC management at any time.

608

JOB TITLE: Team Leader

Primary Responsibilities

- Perform task for which he/she is capable of and trained for.
- Work safely and comply with regulations.
- Actively seek and implement improvements.
- Act in a way which supports the team concept.
- Strive to achieve personal business related goals.
- Develop as an employee to the benefit of the company.
- Pass on skills and knowledge to others.
- Pursue goals of Personal Competence Plan.

Typical Work Content

- Supervise Teamworkers.
- Work as a team member.
- DOE and M&O contractor interface.
- Regulator interface.
- Task scheduling.
- Cost control.
- Teamworker scheduling.
- Decontamination tasks/as required.
- Manufacturing tasks/as required.
- Recognize and respond to warning signals.
- Contribute to the design and delivery of formal training and competence testing.

Typical Work Conditions

- Any office or facility environment.
- Working when wearing personal protective equipment such as anti-contamination clothing, respiratory protection and self-contained breathing apparatus.
- Working in confined spaces and on elevated surfaces.
- Respirator or full-face respirator: frequently
- Handle radioactive contaminated material: frequently
- SBGA: occasionally
- Solvents, chemicals and absorbents: frequently
- Lifting requirements:

Heavy (50-100+ lbs.):	rarely
Medium (25-50 lbs.):	occasionally
Light (0-25 lbs.):	frequently

609

JOB TITLE: Team Leader (continued)

Typical Work Conditions: (continued):

- Prolonged standing or walking.
- Recognize and respond to warning signals.
- Gloveboxes, ladders, scaffolds, etc.

Competence Requirements

Base Competence/Outcome of Screening

- Baccalaureate certification in a science or engineering discipline or in some cases an Associate Degree will suffice with proper experience.
- Experience in metal fabrication.
- Knowledge of DU, beryllium and radioactive scrap metal.
- Knowledge of the regulations and working practices applicable to RFP.
- Supervisory or similar experience.

Additional Skilling

- Teamwork concept.
- NCPP cultural awareness.
- Detailed knowledge of NCPP.
- Radiological safety.
- Conventional safety.
- Facility emergency arrangements.
- Regulations in the workplace.
- Various decontamination practices as required.
- Various manufacturing practices as required.
- Quality Program.
- Interviewing.

This role profile is subject to amendment by MSC management at any time.

610

JOB TITLE: Teamworker (Decontamination Operations)

Primary Responsibilities

- Perform task for which he/she is capable of and trained for.
- Work safely and comply with regulations.
- Actively seek and implement improvements.
- Act in a way which supports the team concept.
- Strive to achieve personal business related goals.
- Develop as an employee to the benefit of the company.
- Pass on skills and knowledge to others.
- Pursue goals of Personal Competence Plan.

Typical Work Content

- Decontamination of non-plutonium facilities using scrubbing, wiping, scraping, etc.
- Use of cleaning agents, e.g. solvents and acids.
- Maintenance of decontamination equipment.
- Operate super-heated high pressure water decontamination equipment.
- Operate pelletized and pressurized carbon dioxide decontamination equipment.
- Package used HEPA filters to comply with DOE, DOT, EPA, CDH and RCRA requirements.
- Maintain records necessary to meet all these requirements.
- Operate aqueous decontamination equipment.
- Neutralize hazardous waste.
- Package RCRA regulated wastes.
- Package TSCA regulated wastes.
- Handle radioactive material.
- Size reduce equipment and material.
- Remove package sewer and sump sludge.
- Size reduce HEPA filters.
- Perform RCRA, EPA, CDH, daily/weekly inspections.
- Mechanically strip paint and coatings.
- Compact/bale combustible waste.
- Load drums and boxes of waste into railcars and trucks in accordance with DOT regulations.
- Insure that all packaging complies with DOE, DOT, EPA, CDH and RCRA.
- Mark and label waste containers in accordance with specifications and procedures.
- Perform housekeeping duties in general work areas.
- Load drums and boxes of waste on the job site for processing.
- Cleaning of all air ducts.

611

JOB TITLE: Teamworker (Decontamination Operations) (Continued):

Typical Work Content (Continued):

- Mark and label waste containers in accordance with specifications and procedures.
- Use of air movers to control airflow.
- Dismantling of machinery.
- cutting metal components using saws, shears, oxy-acetylene torches, etc.
- Use of hoists, forklifts, etc.
- Identification of metals.
- Connect and disconnect metal pipework joints.
- Simple electrical maintenance.
- Disassemble equipment.
- Extensive drum handling.
- Housekeeping.

This job description covers the regular job functions and duties of the classification and is not to be taken as satisfying every chore which might have to be performed.

Typical Work Conditions

- Working when wearing personal protective equipment such as anti-contamination clothing, respiratory protection and self-contained breathing apparatus.
- Working in confined spaces and on elevated surfaces.
- Respirator or full-face respirator: frequently
- Handle radioactive contaminated material: frequently
- SBGA: occasionally
- Solvents, chemicals and absorbents: frequently
- Lifting requirements:

Heavy (50-100+ lbs.):	rarely
Medium (25-50 lbs.):	occasionally
Light (0-25 lbs.):	frequently

- Prolonged standing or walking.
- Recognize and respond to warning signals.

612

JOB TITLE: Teamworker (Decontamination Operations) (Continued):

Competence Requirements

Base Competence/Outcome of Screening

- Minimum high school graduate or equivalent.
- passes reading comprehension, math and mechanical reasoning tests.

Additional Skilling

- Business awareness.
- Teamwork concept.
- NCPP cultural awareness.
- Industrial Safety.
- Radiation Safety.
- Waste control.
- Quality Program.
- Decontamination techniques.
- Decontamination equipment.
- Dismantling/metal jointing.
- Flame cutting.
- Hand tools.
- Power tools.
- Metal identification.
- Department of Transportation (DOT) packaging and shipping requirements.
- Resource Conservation Recovery Act (RCRA) requirements to include Toxic Substance Control Act (TSCA).
- Beryllium operations.
- Supplied Breathing Air Garment (SBAG).
- Plasma arc cutting.
- Fork truck.
- Labeling/Marking.

This role profile is subject to amendment by MSC management at any time.

613

JOB TITLE: Teamworker (Decontamination & Radiological Control)

Primary Responsibilities

- Perform task for which he/she is capable of and trained for.
- Work safely and comply with regulations.
- Actively seek and implement improvements.
- Act in a way which supports the team concept.
- Strive to achieve personal business related goals.
- Develop as an employee to the benefit of the company.
- Pass on skills and knowledge to others.
- Pursue goals of Personal Competence Plan.

Typical Work Content

- Decontamination of non-plutonium facilities using scrubbing, wiping, scraping, etc.
- Use of cleaning agents, e.g. solvents and acids.
- Maintenance of decontamination equipment.
- Operate super-heated high pressure water decontamination equipment.
- Operate pelletized and pressurized carbon dioxide decontamination equipment.
- Package used HEPA filters to comply with DOE, DOT, EPA, CDH and RCRA requirements.
- Maintain records necessary to meet all these requirements.
- Operate aqueous decontamination equipment.
- Neutralize hazardous waste.
- Package RCRA regulated wastes.
- Package TSCA regulated wastes.
- Handle radioactive material.
- Size reduce equipment and material.
- Remove package sewer and sump sludge.
- Size reduce HEPA filters.
- Perform RCRA, EPA, CDH, daily/weekly inspections.
- Mechanically strip paint and coatings.
- Compact/bale combustible waste.
- Load drums and boxes of waste into railcars and trucks in accordance with DOT regulations.
- Insure that all packaging complies with DOE, DOT, EPA, CDH and RCRA.
- Mark and label waste containers in accordance with specifications and procedures.
- Perform housekeeping duties in general work areas.
- Load drums and boxes of waste on the job site for processing.
- Cleaning of all air ducts.

JOB TITLE: Teamworker (Decontamination & Radiological Control) (Continued):

Typical Work Content (Continued):

- Mark and label waste containers in accordance with specifications and procedures.
- Use of air movers to control airflow.
- Dismantling of machinery.
- cutting metal components using saws, shears, oxy-acetylene torches, etc.
- Use of hoists, forklifts, etc.
- Identification of metals.
- Connect and disconnect metal pipework joints.
- Simple electrical maintenance.
- Control and issuance of Radiation Work Permits (RWP's).
- Perform access control functions to RCAs.
- Make correct decisions on radiological safety in the field.
- Conduct and document radiological surveys for record.
- Perform simple calculations involving scientific notation and logarithms.
- Perform property release surveys.
- Collect environmental and job site samples.
- Maintain and or operate certain types of radiological equipment.
- Shall be responsible for monitoring the work areas to assure safe environmental conditions for the worker and to assure contamination is controlled within the exhaust filters of the buildings.
- This function also include control of radiation contamination. This might involve monitoring of items and people's clothing exiting the radiological controlled areas to insure no contamination occurs outside the controlled area.
- Check feed stock for the melting to characterize the level of radiation contamination before and after the recycle melt.
- Assess and define radiological safety risks.
- Prepare detailed reports.
- Housekeeping.
- Disassemble equipment.
- Maintain radiation exposure levels and personnel radiation doses As Low As Reasonable Achievable (ALARA).
- Identify conditions of job initiation, performance, evolution or testing that could result in the violation of radiological control standards or result in imminent danger or unacceptable risk. Notify teamleader and/or mitigate the effect of the radiological conditions.

JOB TITLE: Teamworker (Decontamination & Radiological Control) (Continued):

Typical Work Conditions

- Working when wearing personal protective equipment such as anti-contamination clothing, respiratory protection and self-contained breathing apparatus.
- Working in confined spaces and on elevated surfaces.
- Respirator or full-face respirator: frequently
- Handle radioactive contaminated material: frequently
- SBGA: occasionally
- Solvents, chemicals and absorbents: frequently
- Lifting requirements:

Heavy (50-100+ lbs.):	rarely
Medium (25-50 lbs.):	occasionally
Light (0-25 lbs.):	frequently

- Prolonged standing or walking.
- Recognize and respond to warning signals.
- Gloveboxes, ladders, scaffolds, etc.

616

JOB TITLE: Teamworker (Decontamination & Radiological Control) (Continued):

Competence Requirements

Base Competence/Outcome of Screening

- Minimum high school graduate or equivalent.
- passes reading comprehension, math and mechanical reasoning tests.
- Completion of one year of high school level algebra.
- Prior experience in radiation protection will be evaluated on a case by case basis for exemption from all or part of the education requirements.

These people will be responsible for environmental safety and be trained to meet Colorado Department of Health, NRC, Environmental Protection Agency (EPA) and Occupation Health & Safety Act (OSHA) requirements as related to their jobs.

Additional Skilling

- NCPP cultural awareness.
- Business awareness.
- Teamwork concept.
- Industrial Safety.
- Radiation Safety.
- Waste control.
- Decontamination techniques.
- Decontamination equipment.
- Dismantling/metal jointing.
- Flame cutting.
- Hand tools.
- Power tools.
- Metal identification.
- Department of Transportation (DOT) packaging and shipping requirements.
- Resource Conservation Recovery Act (RCRA) requirements to include Toxic Substance Control Act (TSCA).
- Beryllium operations.
- Supplied Breathing Air Garment (SBAG).
- Plasma arc cutting.
- Fork truck.
- Labeling/Marking.
- Quality Program.
- Training to become certified by MSC to meet regulatory requirements.

This role profile is subject to amendment by MSC management at any time.

617

JOB TITLE: Teamworker (Decontamination and Maintenance Operations)

Primary Responsibilities

- Perform task for which he/she is capable of and trained for.
- Work safely and comply with regulations.
- Actively seek and implement improvements.
- Act in a way which supports the team concept.
- Strive to achieve personal business related goals.
- Develop as an employee to the benefit of the company.
- Pass on skills and knowledge to others.
- Pursue goals of Personal Competence Plan.

Typical Work Content

- Decontamination of non-plutonium facilities using scrubbing, wiping, scraping, etc.
- Use of cleaning agents, e.g. solvents and acids.
- Maintenance of decontamination equipment.
- Operate super-heated high pressure water decontamination equipment.
- Operate pelletized and pressurized carbon dioxide decontamination equipment.
- Package used HEPA filters to comply with DOE, DOT, EPA, CDH and RCRA requirements.
- Maintain records necessary to meet all these requirements.
- Operate aqueous decontamination equipment.
- Neutralize hazardous waste.
- Package RCRA regulated wastes.
- Package TSCA regulated wastes.
- Handle radioactive material.
- Size reduce equipment and material.
- Remove package sewer and sump sludge.
- Size reduce HEPA filters.
- Perform RCRA, EPA, CDH, daily/weekly inspections.
- Mechanically strip paint and coatings.
- Compact/bale combustible waste.
- Load drums and boxes of waste into railcars and trucks in accordance with DOT regulations.
- Insure that all packaging complies with DOE, DOT, EPA, CDH and RCRA.
- Mark and label waste containers in accordance with specifications and procedures.
- Perform housekeeping duties in general work areas.
- Load drums and boxes of waste on the job site for processing.

JOB TITLE: Teamworker (Decontamination and Maintenance Operations) (Continued):

Typical Work Content (Continued):

- Cleaning of all air ducts.
- Mark and label waste containers in accordance with specifications and procedures.
- Use of air movers to control airflow.
- Dismantling of machinery.
- cutting metal components using saws, shears, oxy-acetylene torches, etc.
- Use of hoists, forklifts, etc.
- Identification of metals.
- Connect and disconnect metal pipework joints.
- Simple electrical maintenance.
- Install, troubleshoot, repair, maintain, replace, test various electrical, mechanical, structural, heating and ventilating and process waste systems throughout the plant.
- Preventative maintenance repair and installation of all types of electrical equipment in production areas.
- Re-brick furnaces.
- Set-up and operate equipment such as lathes, vertical and horizontal mills, drill and saws.
- Troubleshoot and repair hydraulic/pneumatic system.
- Fabricate, install, modify and repair supply lines, steam systems, reservoirs and fixtures for low and high pressure and hydraulic equipment as well as work on high vacuum pumping systems, components and special fittings.
- Work from blueprints, drawings, verbal instructions to determine materials, tolerances and specifications.
- Weld and solder various metals under atmospheric and inert vacuum chamber conditions.
- Operate fans, pumps, compressors, steam coils, traps and other equipment to maintain required vacuum, humidity and temperature and pressure control.
- Operate equipment to maintain air balance in dry room systems, life support systems, supply and exhaust systems.
- Lubricate various utilities equipment on a regularly scheduled basis.

JOB TITLE: Teamworker (Decontamination and Maintenance Operations) (Continued):

Typical Work Content (Continued):

- Make routine tours of the equipment in assigned area to read and record the various temperatures, pressures, vacuums and determine from the readings if equipment is functioning properly or if adjustments are needed and make adjustments.
- Spray paint vehicles, machinery, roofs, stacks, tanks, ceilings, parts, office furniture.
- High work using high pressure spray gun, crane, self-propelled manlift.
- Brush and roller paint surfaces.
- Remove and replace broken glass.
- Fiberglass tanks, pipes.
- Operate the waste sludge systems and various other systems.
- Perform various water analyses and tests of the activated sludge.
- Disassemble equipment.
- Extensive drum handling.
- Housekeeping.

This job description covers the regular job functions and duties of the classification and is not to be taken as satisfying every chore which might have to be performed.

Typical Work Conditions

- Working when wearing personal protective equipment such as anti-contamination clothing, respiratory protection and self-contained breathing apparatus.
- Working in confined spaces and on elevated surfaces.
- Respirator or full-face respirator: frequently
- Handle radioactive contaminated material: frequently
- SBGA: occasionally
- Solvents, chemicals and absorbents: frequently
- Lifting requirements:

Heavy (50-100+ lbs.):	rarely
Medium (25-50 lbs.):	occasionally
Light (0-25 lbs.):	frequently

- Prolonged standing and walking.
- Recognize and respond to warning signals.

620

JOB TITLE: Teamworker (Decontamination and Maintenance Operations) (Continued):

Competence Requirements

Base Competence/Outcome of Screening

- Minimum high school graduate or equivalent.
- passes reading comprehension, math and mechanical reasoning tests.

Additional Skilling

- Waste control.
- Decontamination techniques.
- Decontamination equipment.
- Dismantling/metal jointing.
- Flame cutting.
- Hand tools.
- Power tools.
- Metal identification.
- Department of Transportation (DOT) packaging and shipping requirements.
- Resource Conservation Recovery Act (RCRA) requirements to include Toxic Substance Control Act (TSCA).
- Beryllium operations.
- Industrial Safety.
- Radiation Safety.
- Supplied Breathing Air Garment (SBAG).
- Plasma arc cutting.
- Fork truck.
- Labeling/Marking.
- Business awareness.
- Teamwork concept.
- NCPP cultural awareness.
- Electrical as necessary.
- Mechanical as necessary.
- Welding as necessary.

This role profile is subject to amendment by MSC management at any time.

621

JOB TITLE: Teamworker (Fabrication)

Primary Responsibilities

- Perform task for which he/she is capable of and trained for.
- Work safely and comply with regulations.
- Actively seek and implement improvements.
- Act in a way which supports the team concept.
- Strive to achieve personal business related goals.
- Develop as an employee to the benefit of the company.
- Pass on skills and knowledge to others.
- Pursue goals of Personal Competence Plan.

Typical Work Content

- Segregate metals by alloy.
- create furnace charge.
- Cast ingots.
- Roll, anneal, press form, and extrude sheet.
- Extrusion spin.
- Assemble.
- Test and inspect product.
- Decontamination of non-plutonium facilities using scrubbing, wiping, scraping, etc.
- Various types of metal testing - physical, metallographic and ultrasonic.
- Extensive drum handling.
- Disassemble equipment.
- Operate forklift.
- Operate various kinds of metal fabricating and testing equipment.

Typical Work Conditions

- Working when wearing personal protective equipment such as anti-contamination clothing, respiratory protection and self-contained breathing apparatus.
- Working in confined spaces and on elevated surfaces.
- Respirator or full-face respirator: frequently
- Handle radioactive contaminated material: frequently
- SBGA: occasionally
- Solvents, chemicals and absorbents: frequently
- Lifting requirements:

Heavy (50-100+ lbs.):	rarely
Medium (25-50 lbs.):	occasionally
Light (0-25 lbs.):	frequently

622

JOB TITLE: Teamworker (Fabrication) (continued):

Typical Work Conditions (continued):

- Prolonged standing and walking.
- Recognize and respond to warning signals.

Competence Requirements

Base Competence/Outcome of Screening

- Minimum high school graduate or equivalent / successful completion of one year of chemistry or physics and two years of mathematics.
- passes reading comprehension and numerous tests to various fabrication functions.

Additional Skilling

- Teamwork concept.
- NCPP cultural awareness.
- Business awareness.
- Industrial Safety.
- Radiation Safety.
- Waste control.
- Decontamination techniques.
- Decontamination equipment.
- Dismantling/metal jointing.
- Flame cutting.
- Hand tools.
- Power tools.
- Metal identification.
- Department of Transportation (DOT) packaging and shipping requirements.
- Resource Conservation Recovery Act (RCRA) requirements to include Toxic Substance Control Act (TSCA).
- Beryllium operations.
- Supplied Breathing Air Garment (SBAG).
- Plasma arc cutting.
- Fork truck.
- Labeling/Marking.
- Fabrication equipment operation.
- Testing and inspection procedure.
- Quality Program.

JOB TITLE: Teamworker (Fabrication) (continued):

Additional Skilling: (continued):

- Teamwork concept.
- NCPP cultural awareness.
- Electrical as necessary.
- Mechanical as necessary.
- Welding as Necessary.

This role profile is subject to amendment by MSC management at any time.

624

JOB TITLE: Teamworker (Welding/Machining)

Primary Responsibilities

- Perform task for which he/she is capable of and trained for.
- Work safely and comply with regulations.
- Actively seek and implement improvements.
- Act in a way which supports the team concept.
- Strive to achieve personal business related goals.
- Develop as an employee to the benefit of the company.
- Pass on skills and knowledge to others.
- Pursue goals of Personal Competence Plan.

Typical Work Content

- Set up and operate various joining equipment
- Set up and operate various maching equipment
- Manual arc welding.
- Manual gas tungsten arc welding.
- Gas tungsten arc machine welding.
- Gas metal arc welding.
- Fabricates precision fixtures from blueprint.
- Machine and fixture setup and startup.
- Work from blueprints, sketches and verbal instructions.
- Operate various types of milling machines to mill various types of metals.
- Sharpen carbide tipped and high speed blades.
- Perform in-process inspection.
- Develop open set up computer program.
- Set up and operate single/multi-tool tape controlled lathes, mills (i.e., UMC's, 4 & 5 axis mills, Slant-Beds, T-Lathes).
- Set up and operate jig bore to drill, mill and bore parts without specialized fixturing.

Typical Work Conditions

- Working when wearing personal protective equipment such as anti-contamination clothing,
- Working in confined spaces and on elevated surfaces.
- Respirator or full-face respirator: frequently
- Handle radioactive contaminated material: frequently
- SBGA: occasionally
- Solvents, grease chemicals: frequently
- Prolonged standing:
- Recognize and respond to warning signals:

JOB TITLE: Teamworker (Welding/Machining) (continued):

Typical Work Conditions (continued)

- Lifting requirements:

Heavy (50-100+ lbs.):	rarely
Medium (25-50 lbs.):	occasionally
Light (0-25 lbs.):	frequently

Competence Requirements

Base Competence/Outcome of Screening

- Minimum high school graduate or equivalent.
- Passes reading comprehension, math and mechanical reasoning tests.
- Passes Production Welder Field Test. GTAW process in two positions on mild and stainless steels.
- Passes reading comprehension, math and mechanical reasoning tests.

Additional Skilling

- Teamwork concept.
- NCPP cultural awareness.
- Business awareness.
- Industrial Safety.
- Radiation Safety.
- Waste control.

This role profile is subject to amendment by MSC management at any time.

626

JOB TITLE: Technologist

Primary Responsibilities

- Perform task for which he/she is capable of and trained for.
- Work safely and comply with regulations.
- Actively seek and implement improvements.
- Act in a way which supports the team concept.
- Strive to achieve personal business related goals.
- Develop as an employee to the benefit of the company.
- Pass on skills and knowledge to others.
- Pursue goals of Personal Competence Plan.

Typical Work Content

- Engineering/scientific type work.
- Various managerial projects.
- Interface with DOE and M&O contractor.
- Interface with technologists at other DOE sites.
- Product development.
- Machine utilization/efficiency.
- Regulatory compliance.
- Systems engineering.
- Recognize and respond to warning signals.
- Planning.
- Document Control.

Typical Work Conditions

Any office or facility environment.

Competence Requirements

Base Competence/Outcome of Screening

- Baccalaureate certification in a science or engineering discipline.
- Professional experience in metal fabrication.
- Knowledge of DU, beryllium and radioactive scrap metal.
- Knowledge of the regulations and working practices applicable to RFP.

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JOB TITLE: Technologist (continued)

Competence Requirements (continued):

Additional Skilling

- Teamwork concept.
- NCPP cultural awareness.
- Detailed knowledge of NCPP.
- Beryllium Safety.
- Radiological safety.
- Conventional safety.
- Facility emergency arrangements.
- Regulations in the workplace.
- Special areas as needed.
- Planning.
- Document Control.

This role profile is subject to amendment by MSC management at any time.

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JOB TITLE: Team Assistant

Primary Responsibilities

- Perform task for which he/she is capable of and trained for.
- Work safely and comply with regulations.
- Actively seek and implement improvements.
- Act in a way which supports the team concept.
- Strive to achieve personal business related goals.
- Develop as an employee to the benefit of the company.
- Pass on skills and knowledge to others.
- Pursue goals of Personal Competence Plan.

Typical Work Content

- Assist Technologist.
- Assist Teamleaders.
- Assist Middle Managers.
- Assist Senior Managers.
- Assist Teammembers.

Typical Work Conditions

- Any office or facility environment.
- Working when wearing personal protective equipment such as anti-contamination clothing, respiratory protection and self contained breathing apparatus.
- Respirator or full face respirator.
- Handle radioactive contaminated material.
- Recognize and respond to warning signals.

Competence Requirements

Base Competence/Outcome of Screening

- Minimum high school graduate in addition to special training in a specialized field.
- Additional competence requirements specific to work content.
- Passes reading comprehension, math and mechanical reasoning tests.

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JOB TITLE: Team Assistant (continued):

Additional Skilling

- Teamwork concept.
- NCPP cultural awareness.
- Business awareness.
- Radiological safety.
- Industrial safety.
- Facility emergency arrangements.
- Regulations in the workplace.
- Quality Program.

This role profile is subject to amendment by MSC management at any time.

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Appendix D

Staffing Plan Elements

The Staffing Plan elements as addressed in this plan are:

1. Organization
   a. Role Profiles
   b. Quantity of Employee

2. Human Resources

3. Employment Policies

4. Compensation Policies

5. Employee Benefits

6. Other Benefits
   a. Health
   b. Disability
   c. Retirement
   d. Death

7. Employee Conduct

8. Hiring Strategy (Appendix F)
   a. Displaced Rocky Flats Workers
   b. Qualifications
   c. Internal Guidelines

9. Laws and Regulations
   a. Affirmative Action

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Appendix E

Laws and Regulations

MSC complies with a large number of federal and state laws and regulations. Listed below is a summary of ones that apply to employment practices of the NCPP.

Federal Laws and Regulations

1. Title VII of Civil Rights Act of 1964
2. Civil Rights Act of 1986
3. Civil Rights Act of 1991
4. Uniform Guidelines on Employee Selection Procedures (29 CFR Part 1607 (EEOC) 41 CFR 60-3.1 (OFCP)
5. Age Discrimination in Employment Act (ADEA) (29 USC 621, 634) Rehabilitation Act of 1973
6. Vietnam ERA Veteran's Readjustment Act of 1974 (VEVRAA)
7. Execute Order 11246 (30 Federal Regulation 12,320)
8. Section 3161 of The National Defense Authorization Act (Hiring Preference for Rocky Flats Workers)

State Laws

1. Colorado Civil Rights Act.
2. Colorado Revised Statutes as applicable
3. Colorado Wage Orders

Human Resources Management Policies

The Human Resources (Employment Policies) are delivered in the MSC's Employee Handbook Appendix B.

Hiring Strategy

The plan is to have three manager role profiles; Senior Manager, Middle Manager and Team Leader. There will be five Stage II team role profiles; Teamworker Decontamination Operations, Teamworker (Decontamination and Radiological Control), Teamworker (Decontamination and Maintenance Operations), Technologist, and Team Assistant. Some Stage III role profiles have been developed (and there will be more), for example; Teamworker (Welding and Machining) and Teamworker (Fabrication). The role profiles are included in Appendix C.

It is also the plan to hire displaced and at risk Rocky Flats workers based on MSC's employment policies outlined in the Employee Handbook (Appendix B). In addition, any screening and selection practices deemed necessary based on the NCPP will be implemented

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as they become apparent. These are likely to involve; competence history from previous employers (eg. EG&G), a medical examination, a structured interview, etc.

MSC has a list of all laid off workers and early retirees back to January 1992, which was agreed to be the cut-off date for inclusion as past Rocky Flats workers. This list will be compared to the applications that are on hand and people that have not applied will be contacted through EG&G and the Unions to see if there is any interest in working for MSC. Also, it is expected that EG&G will provide MSC with a list of at risk employees. As the list comes more into focus, these people will be contacted also.

Some small percentage of non Rocky Flats workers will be hired that will fall into the categories of consultants, subcontractor, and people with special talents that may not be available.

To date, MSC has attended a job fair to talk about NCPP and made numerous presentations in the community, at the Rocky Flats Plant and the Union Halls to enlighten and inform people about the NCPP. The response has been good but additional efforts will be made to notify people of the opportunities available due to the NCPP.

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Appendix F

Hiring Plan

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1.0 Introduction

This Hiring Plan contains deliverables for Work Task Assignment reference number WBS 135 (Staffing Plan) of the NCPP Stage I Extension Work Plan - Revision 0, April 28, 1994. The specific deliverables addressed in this plan are:

1.1 Identify, review, and accept or initiate modification of EG&G Staffing Plans and/or procedures for Stage II activities; or (b) initiate or continue development of Staffing Plans and/or procedures.

1.2 Define and initiate implementation of the Stage II Staffing Plan.

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2.0 Scope

The Hiring Plan encompasses all NCPP Stage II employees. It covers the hiring strategy, and procedures that govern the staffing process.

The Hiring Plan is a continuing development of and addition to the Staffing Plan. It will be synchronized with the Cleanup Plan, Staffing Plan and the Training Plan. The type and quantity of staff required will be supplied by the Cleanup Plan. The Staffing Plan will identify competence requirements of workers for the Training Plan. The Hiring Plan will delineate procedures that identify and select qualified employees required for the NCPP.

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3.0 Objectives

3.1 To identify procedures to recruit, screen interview and hire employees that possess the best qualifications fitting the requirements of the job and the standards required by the Staffing Plan and the Training Plan to accomplish the goals of the NCPP.

3.2 To Comply with regulatory requirements that relate to employee recruitment, selection and hiring.

3.3 To delineate procedures to impart preferential hiring treatment to Ex-Rocky Flats workers and DOE Employees at Rocky Flats and other DOE sites.

3.4 To continue development of the Staffing Plan or procedures.

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4.0 Assumptions and Unknowns

4.1 Staffing will commence during the fall and winter of 1994 and 1995 for Stage II.

4.2 Stage II staffing will continue at a rate determined by the Facility Cleanup Plan.

4.3 Stage II is initiated in the summer of 1994.

4.4 Sufficient human resources are available in the Denver area.

4.5 The number of workers required and the skills required are estimates at this time. The Staffing Plan will be refined as the project progresses.

4.6 All employees and subcontractors will work day shift only.

4.7 Sufficient base information will be available by the time hiring needs to start.

4.8 Some Declassification and Pilot Process/Product Verification will take place during Stage II.

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5.0 Definitions

5.1 Applicant - an individual who submits a official company application for employment, or who is interviewed by an authorized representative of MSC.

5.2 Critical skills - positions vital to carrying out the missions at Manufacturing Sciences Corporation, meeting contractual requirements, and maintaining compliance with federal and state regulations.

5.3 Designated Interviewers - individuals identified by MSC to participate in the interviewing and selection process for the position(s) to be filled.

5.4 Ex-Rocky Flats Workers - Individuals separated after January 1, 1992 in the following categories.

1. Displaced Workers (Involuntarily Separated)
2. Voluntarily Separated workers that were "at risk"
3. Voluntarily Separated workers that were not "at risk"
4. Retired Workers
5. Retired workers who received a voluntary separation payment

5.5 Hiring Manager - the individual responsible for selecting an individual to fill a employment opening.

5.6 Official applicant files - applicant information (resumes, applications, references, transcripts, etc. maintained by the personnel department.

5.7 Requisitioner - the hiring manager.

5.8 Requisition form - MSC Requisition for Personnel form used to initiate the staffing process.

5.9 Role profile - a summary of the position, including a summary of basic job duties, essential functions, and minimum requirements necessary to fill the position.

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6.0 Types and Quantities of Employees

6.1 There are three types of MSC NCPP employees:

6.2 Teamworkers

Teamworkers will be hourly-rated, hired employees from a skilled or non-skilled background, with maintenance, production, fabrication, or other appropriate practical experience. Role profiles are given in Appendix C of the Staffing Plan.

6.3 Managers, Technologist and Support Staff

Managers and Technologist will be salaried, appointed employees from a professional engineering/scientific/managerial or similar background. Support Staff will be hourly-rated, hired employees from a vocational background. Role profiles are give in Appendix C of the Staffing Plan.

6.4 Subcontractors

Subcontractors are the same as Managers and Technologists, except that they are the salaried, appointed employees of a company which is under contract to MSC (e.g., BNFL Inc.) to provide a specific expertise or deliverable.

6.5 Number of Employees

See the latest NCPP Stage II Project Team Organization Chart, Appendix A of the Staffing Plan. This is subject to increase or decrease as Stage II progresses.

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7.0 Recruitment

7.1 The recruitment plan for the NCPP will be prepared annually and is the responsibility of the Deputy Project Manager and the Human Resources Manager.

7.2 The recruitment plan will indicate when the recruitment process should begin for anticipated openings, where efforts should be focused, and what sources should be used. Recruitment efforts necessary to meet affirmative action goals and fill critical skill positions will be identified.

7.3 Sources of candidates will be identified and analyzed as part of the Recruitment Plan. For the NCPP the following sources may be utilized.

Direct communication with ex-Rocky Flats employees
Files
Internal Referrals
Advertising
Employment Agencies
Colorado State Unemployment Commission
College Recruiting
Trade Shows and Conventions

7.4 Existing qualified MSC employees will be considered to fill the position by promotion or transfer. Employees who have been hired, promoted or transferred or who have changed jobs for any reason, must wait a six-month period before applying for a different position.

7.5 The service of employment agencies, at commercial rates, may be used to help find candidates for difficult to fill positions. Only Human Resource Department personnel are permitted to interact with employment agency or recruiting firms regarding Human Resource needs.

7.6 Recruitment advertising will be handled by the Human Resources Department. All advertising will indicate that Manufacturing Sciences Corporation is an Equal Opportunity Employer.

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8.0 Requisition

8.1 When an employment vacancy is identified, the hiring manager will initiate a Requisition for Personnel. All requisitions will be approved by the Deputy Project Manager and then forwarded to the Human Resources Department. Each requisition for personnel is accompanied by a Role Profile Evaluation Matrix indicating essential job skills targeted by the hiring manager.

8.2 Staffing action will begin after the Human Resources Department receives a completed Requisition for Personnel. (A Requisition for Personnel form is attached).

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9.0 Screening

9.1 All applications and resumes received from any source will be forwarded to the Human Resources Department.

9.2 All applicant files will be retained by the Human Resources Department according to record retention guidelines.

9.3 MSC will obtain from the Department of Energy an official list of impacted ex-Rocky Flats workers that identifies the ex-workers as follows:

1. Displaced Workers (Involuntarily Separated)
2. Voluntarily Separated workers that were "at risk"
3. Voluntarily Separated workers that were not "at risk"
4. Retired Workers
5. Retired workers who received a voluntary separation payment

9.5 MSC will initially identify candidates by educational credentials and work experience.

Name:	Education	Relevant Experience

9.6 MSC will sequentially screen applicants and establish a list of candidates qualified for an initial interview in the order given below.

1. Displaced Rocky Flats Workers (Involuntarily Separated)
2. Voluntarily Separated Rocky Flats workers that were "at risk"
3. Voluntarily Separated Rocky Flats workers that were not "at risk"
4. Retired Rocky Flats Workers
5. Retired Rocky Flats workers who received a voluntary separation payment
6. Applicants for employment

9.7 After the initial screening candidates will be placed in a pool for consideration for the role profile their qualifications most closely match.

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10.0 Interviews

10.1 All employment interviews will comply with Equal Employment Opportunity and other legal requirements. All designated interviewers will be trained in acceptable interviewing techniques.

10.2 Invitations for interviews are to be made only by the Human Resources Department. Candidates may be interviewed one or more times.

10.3 Each interview will follow a standardized format: An overview of MSC and the NCPP. A discussion of the applicant's work experience. Standard questions relating to job requirements. A closing segment asking for questions and any additional information by the applicant and information about the next contact the applicant may expect.

10.4 Candidates may be requested to complete applicable employment tests during the interview visit.

10.5 Candidates will be requested to provide official transcripts and training records at the time of the second interview.

10.6 Candidates who are interviewed will be evaluated using a matrix format. An example of a Evaluation Matrix for the Teamworker Role Profile follows:

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Initial Screening/Interview Evaluation Matrix

Role Profile: Teamworker

Quality or Skill:	Evaluation Criteria								Skills Identification																				
	COMMUNICATION	TEAMWORK	INITIATIVE	MOTIVATION	STABILITY	EDUCATION	EXPERIENCE	JOB KNOWLEDGE	ELECTRICAL	PIPEFITTING	MILLWRIGHT	WELDING	LEADERSHIP	PACKAGING/TRANS	SIZE REDUCTION	DECONTAMINATION	AIR DUCT CLEANG	CHEMICALS	SMALL EQUIP MAINT	H PRESS H2O CLEANG	CO2 CLEANING	SUMP SEWER SLUDGE	RCRA CDH EPA INSPT	RAD SURVEYS	SAFETY EXPERIENCE	BERYLLIUM FAB	URANIUM FAB			
	Rate candidate on a scale of 1 - 10 for quality. 10 being strong.								Indicate with a X if candidate possesses skill.																				
Name:																													

11.0 Background Verification

11.1 Job qualifications and suitability of prospective employees may be established by MSC by personnel investigations. Such investigations will include as appropriate:

A credit check

Verification of high school diploma or a degree granted from an institution of higher learning.

Contacts with personal references

Contacts with previous employers

Local law enforcement checks when not prohibited by state or local law, statute, or regulation.

Testing

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12.0 Hiring

12.1 The hiring manager will make a concerted effort to meet identified affirmative action goals when filling job openings.

12.2 MSC will give preference in hiring NCPP employees in the following order.

1. Displaced Rocky Flats Workers (Involuntarily Separated)
2. Voluntarily Separated Rocky Flats workers that were "at risk"
3. Voluntarily Separated Rocky Flats workers that were not "at risk"
4. Retired Rocky Flats Workers
5. Retired Rocky Flats workers who received a voluntary separation payment
6. DOE Workers covered by Section 3161 of the National Defense Authorization Act
7. Applicants for employment

12.3 The Deputy Project Manager and the Human Resources Manager are responsible for reviewing role profiles and establishing pay rates for requisitioned job openings.

12.4 Offers of employment are only to be made by the Human Resources Department.

12.5 Physical Examinations will be scheduled by the Human Resources Department after the applicant has accepted an offer of employment. Human Resources will provide the examining physician with information on the physical requirements of the job.

12.6 For positions that require a security clearance before an employee is hired, the Human Resources Department will confirm that a security clearance has been granted before a report to work date is assigned.

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MANUFACTURING SCIENCES CORPORATION

REQUISITION FOR PERSONNEL

Requisition Number _____

Location _____

Department _____

Date _____

Role Profile: _____

Number Needed _____ Temporary _____ Permanent _____ Addition _____ Replacement _____

Included in Business Plan _____ Yes _____ No

Reason for Addition (if not in Plan) _____

_____

Hiring Range $ _____ To $ _____ Pay Grade _____ Requested Start Date _____

To Be Interviewed By _____

Requested by _____
Department Head

Approved By _____
Deputy Project Manager

If not in the Business Plan:

Approved By _____
President

Name of Employee _____

Starting Date _____

Attachment 1

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Appendix G

Projected Personnel Requirements
Type, Salary Grade and Quantity

Title	Projected Salary Grade	Company	Projected Start Date
Project Management			
MSC Project Manager	M-18	MSC	10/3/94
MSC Deputy Project Manager	M-17	MSC	10/3/94
BNFL Inc. Project Manager	M-16	BNFL	10/3/94
Training			
Competence Manager	M-16	BNFL	10/17/94
Training Planner	S-13	MSC	10/31/94
Training Administrator	S-14	MSC	10/31/94
Document Production Manager	S-13	BNFL	10/31/94
Training Delivery Manager	S-13	MSC	10/31/94
Trainer 1/Team Leader 1	F	MSC	10/31/94
Trainer 2/Team Leader 2	F	MSC	10/31/94
Trainer 3/Team Leader 3	F	MSC	10/31/94
Trainer 4/Team Leader 4	F	MSC	10/31/94
Trainer 5/Team Leader 5	F	MSC	10/31/94
Trainer 6/Team Leader 6	F	MSC	10/31/94
Trainer 7/Team Leader 7	F	MSC	10/31/94
Waste Management			
Waste Management Manager	S-14	BNFL	10/3/94
Environmental Scientist	S-13	MSC	10/31/94
Regulatory Compliance Support	S-14	MSC	10/17/94
Teamworker Assistant 1	C	MSC	12/5/94
Team Leader - Decontamination Operators 1	F	MSC	10/31/94
Teamworker (Decontamination Operator) 2	D	MSC	12/5/94
Teamworker (Decontamination Operator) 3	D	MSC	1/3/95
Teamworker (Decontamination Operator) 4	D	MSC	1/3/95
Teamworker (Decontamination Operator) 5	D	MSC	10/31/94
Teamworker (Decontamination Operator) 6	D	MSC	12/5/94
Teamworker (Decontamination Operator) 7	D	MSC	1/3/95
Teamworker (Decontamination Operator) 8	D	MSC	1/3/95
Team Leader - Decontamination Operators 9	F	MSC	10/31/94
Teamworker (Decontamination Operator) 10	D	MSC	12/5/94
Teamworker (Decontamination Operator) 11	D	MSC	12/5/94
Teamworker (Decontamination Operator) 12	D	MSC	1/3/95
Teamworker (Decontamination Operator) 13	D	MSC	1/3/95
Teamworker (Decontamination Operator) 14	D	MSC	1/3/95
Office Management			
Office Manager	S-13	MSC	10/31/94
Teamworker Assistant 2	C	MSC	1/3/95
Teamworker Assistant 3	C	MSC	1/3/95
Teamworker Assistant 4	C	MSC	1/3/95
Teamworker Assistant 5	C	MSC	1/3/95

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Title	Projected Salary Grade	Company	Projected Start Date
Human Resources			
Human Resources Manager	S-14	MSC	10/3/94
Teamworker Assistant 6	C	MSC	11/14/94
Teamworker Assistant 7	C	MSC	1/3/95
Economic Conversion			
Economic Conversion Manager	M-15	MSC	4/3/95
Site Support Services			
Site Support Services/Property Manager	M-15	MSC	12/5/94
Teamworker Assistant 8	C	MSC	1/3/95
Decontamination			
Decontamination Manager	M-15	BNFL	10/3/94
Work Team Advisor 1	S-13	BNFL	10/3/94
Work Team Advisor 2	S-14	BNFL	10/17/94
Work Team Advisor 3	S-13	MSC	10/31/94
Work Team Advisor 4	S-14	MSC	10/31/94
Work Team Planner	S-12	BNFL	10/3/94
CAD Operator	C	BNFL	10/17/94
Teamworker Asistant 9	C	MSC	1/3/95
Team Leader 8	F	MSC	1/3/95
Team Leader 9	F	MSC	1/3/95
Team Leader 10	F	MSC	1/3/95
Team Leader 11	F	MSC	1/3/95
Team Leader 12	F	MSC	1/3/95
Team Leader 13	F	MSC	1/3/95
Team Leader 14	F	MSC	1/3/95
98 Teamworkers (14 - Decontamination & Radiological Control) (14 - Decontamination & Maintenance) (70 - Decontamination Operator)	D	MSC	2/1/95-5/3/95
Systems Engineering			
Systems Engineer	S-14	BNFL	10/3/94
Teamworker Assistant 10	C	MSC	10/31/94
Public Affairs			
Public Affairs Manager	S-13	MSC	1/3/95
Quality Assurance			
Quality Assurance Manager	M-15	BNFL	10/3/94
Assessor	S-13	MSC	10/31/94
Finance			
Financial Manager (Accounting & Procurement)	M-17	MSC	11/14/94
Performance Measurement Manager	M-15	BNFL	10/3/94
Teamworker Assistant 11	C	MSC	1/3/95
Teamworker Assistant 12	C	MSC	1/3/95
EH&S			
EH&S Manager	S-13	BNFL	10/3/94
Health Physicist	S-13	MSC	10/31/94
Industrial Hygienist 1	S-13	BNFL	10/17/94
Industrial Hygienist 2	S-12	MSC	10/17/94
Industrial Hygienist 3	S-13	MSC	1/3/95

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Title	Projected Salary Grade	Company	Projected Start Date
Industrial Safety Engineer 1	S-13	BNFL	10/17/94
Industrial Safety Engineer 2	S-12	MSC	10/17/94
Industrial Safety Engineer 3	S-12	MSC	1/3/95
Environmental Engineer	S-12	BNFL	10/3/94
Teamworker Assistant 13	C	MSC	10/31/95
Team Leader - Decon & Rad Control 1	F	MSC	10/31/94
Teamworker (Decon & Radiological Control) 2	D	MSC	10/31/94
Teamworker (Decon & Radiological Control) 3	D	MSC	1/3/95
Teamworker (Decon & Radiological Control) 4	D	MSC	1/3/95
Teamworker (Decon & Radiological Control) 5	D	MSC	10/31/94
Teamworker (Decon & Radiological Control) 6	D	MSC	10/31/95
Teamworker (Decon & Radiological Control) 7	D	MSC	1/3/95
Teamworker (Decon & Radiological Control) 8	D	MSC	1/3/95
Maintenance & Engineering			
Maintenance & Engineering Manager	M-15	MSC	10/3/94
Process Development Engineer 1	S-13	MSC	10/17/94
Process Development Engineer 2	S-14	MSC	10/17/94
Process Development Engineer 3	S-13	MSC	11/17/94
Process Development Engineer 4	S-14	MSC	6/?/96
Process Engineer 1	S-13	MSC	10/17/94
Process Engineer 2	S-14	MSC	10/17/94
Process Engineer 3	S-13	MSC	6/?/96
Process Engineer 4	S-14	MSC	6/?/96
Teamworker Assistant 14	C	MSC	10/31/94
Team Leader - Welding & Machining 1	F	MSC	10/31/94
Teamworker (Welding & Machining) 2	D	MSC	10/31/94
Teamworker (Welding & Machining) 3	D	MSC	10/31/94
Teamworker (Welding & Machining) 4	D	MSC	6/?/96
Teamworker (Welding & Machining) 5	D	MSC	6/?/96
Teamworker (Welding & Machining) 6	D	MSC	6/?/96
Team Leader - Fabrication 1	F	MSC	10/31/94
Teamworker (Fabrication) 2	D	MSC	10/31/94
Teamworker (Fabrication) 3	D	MSC	10/31/94
Teamworker (Fabrication) 4	D	MSC	10/31/94
Teamworker (Fabrication) 5	D	MSC	10/31/94
Teamworker (Fabrication) 6	D	MSC	10/31/94
Teamworker (Fabrication) 7	D	MSC	10/31/94
Teamworker (Fabrication) 8	D	MSC	10/31/94
Teamworker (Fabrication) 9	D	MSC	1/?/95
Teamworker (Fabrication) 10	D	MSC	1/?/95
Teamworker (Fabrication) 11	D	MSC	1/?/95
Teamworker (Fabrication) 12	D	MSC	1/?/95
Teamworker (Fabrication) 13	D	MSC	6/?/96
Teamworker (Fabrication) 14	D	MSC	6/?/96
Teamworker (Fabrication) 15	D	MSC	6/?/96
Teamworker (Fabrication) 16	D	MSC	6/?/96

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National Conversion Pilot Project Stage I

Site Support Services Memorandum of Agreement

REVIEWED FOR CLASSIFICATION/UCNI
By
Date 12/06/94

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National Conversion Pilot Project
Stage I

Site Support Services
Memorandum of Agreement

Prepared by:	F. J. Yaklich, Manufacturing Sciences Corporation Deputy Project Manager	Date 6/28/94
Approved by:	M. N. Silverman, Manager DOE-RFFO	Date 7-1-94
Approved by:	A. H. Burlingame, President, EG&G, Rocky Flats, Inc.	Date 7/5/94
Approved by:	W. R. Gillison, General Manager, Wackenhut Services Inc., Rocky Flats	Date 7/5/94
Approved by:	D. R. Floyd, Manufacturing Sciences Corporation	Date 6/28/94

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Appendix A
Site Support Services
Areas of Agreement Summary Matrix

Areas of Responsibility	DOE	MSC	EG&G	WSI	Notes
Section A - Security					
A. Control of Classified Documents and Material		E,M			
B. Control of Sensitive and UCNI Documents		E,M			
C. Nuclear Material Control and Accountability		E,M			
D. Communications Security		E,M			
E. Computer Security		E,M			
F. Personnel Security					
1. Employee Badging		E, M		E, FD	
2. Visitor Control		E, M		E, FD	
3. Security Inquiries		E, M	E,FD	E, FD	
G. Access Control				E,FD	
H. Property Protection		E,M	E,FD		
I. Physical Security Systems			E,FD	E,FD	
J. Protective Force				E,FD	
K. Modifications to the Security Requirements			E,FD		
Section B - Utilities					
A. Basic Utility Service			E,FD		
B. Telecommunications		E,M	E,FC		
C. Centralized Computer Facility			FC		
Section C - Maintenance					
A. Corrective Maintenance		E,M	E,FD		
B. Preventative Maintenance and Surveillance			E,FD		
C. Maintenance Associated with Decontamination		E,M			
D. Maintenance Work Order Backlog			E,FD		

Section D - Fire Protection					
A. Fire Alarm Monitoring and Communications			E,FD		
B. Door Access			E,FD		
C. Emergency Services					
1. Fire Suppression			E,FD		
2. Emergency Medical Service			E,FD		
Areas of Responsibility	**DOE**	**MSC**	**EG&G**	**WSI**	**Notes**
3. Hazardous Materials Mitigation		E,M	E,FD		
4. Technical Rescue			E,FD		
D. Sprinkler Systems			E,FD		
E. Smoke Detection Systems			E,FD		
F. Manual Fire Phones/Pull Stations			E,FD		
Section E - Emergency Preparedness					
A. Facility Emergency Planning		E,M	E,FD		
B. Emergency Preparedness Training		E,M	E,FD		
C. Exercise Participation		E,M	E,FD		
D. Management Control		E,M	E,FD		
Section F - Procurement/Shipping of Materials					
A. Procurement of Materials and Supplies		E,M	E,FD		
B. On-Site Receipt and Material Control		E,M	E,FD		
C. Off-Site Transportation of Material		E,M			
Section G - Property Management					
A. Property Management and Control		E,M	E,FD		
B. Space Allocation		E,M			
C. Disposal of Excess Equipment			E,FD		
Section H - Waste Management					

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A. Disposal of Sanitary Waste		E,M	E,FD		
B. Operation of Active RCRA Units		E,M	E,FD,FC		
C. Removal of Excess Chemicals and Packaged Waste			E,FD		
D. Closure of Inactive Units		E	E,FD		
E. Control of PCB Transformer			E,FD		
F. Waste Operating Procedures		E,M			
G. Waste Generator Training		E,M			
H. Waste Characterization		E,M	E,FD		
I. Waste Packaging		E,M	E,FD		
J. Waste Assay			E,FD		
K. Waste Inspection			E,FD		
L. Waste Transportation		E,M	E,FD		
M. Waste Storage		E,M	E,FD		
N. Waste Disposal			E,FD		

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Areas of Responsibility	DOE	MSC	EG&G	WSI	Notes
Section I - Environmental Controls					
A. Chemical Tracking and Control		E,M	E,FD		
B. Response to Spills		E,M	E,FD		
Section J - Occurrence Reporting					
A. Implement Procedures and Reporting Process		E,M	E,FD		
B. Occurrence Categorization		E,M	E,FD		
C. Conduct of Critiques		E,M	E,FD		
D. Root Cause Analysis		E,M	E,FD		
E. Implement Lessons Learned Program		E,M	E,FD		
Section K - Health and Safety					
A. Respiratory Protection		E,M	E,FD		
B. Material Safety Data Sheets (MSDS)		E,M	E,FD		
C. Environmental Monitoring		E,M	E,FD		
D. Medical Treatment			E,FC		
Section L - Radiation Protection					
A. Radiological Health					
1. External Dosimetry			E,FC		
2. Internal Dosimetry			E,FC		
3. Dose Assessment Services			E,FC		
4. Portable Contamination Survey Instrumentation			E,FC		
B. Radiological Operations		E,M	E,FD,FC		
C. Radiological Engineering			E,FD		
Section M - Engineering					
A. Facility Modification Planning Approval		E,M			
B. M&O Contractor Review and Concurrence			E,FC		
C. As-Built Drawings Entered		E,M			

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Section N - Nuclear Safety					
A. Criticality Review		E,M	E,FD		
B. Nuclear Safety Review		E,M	E,FD		

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Areas of Responsibility	DOE	MSC	EG&G	WSI	Notes
Section O - DOE Oversight Management					
A. Contract Item Review	E,D				
B. Technical Item Review	E,D				
Section P - Miscellaneous Support Services					
A. Parking			E,FD		
B. Lock and Key Services			E,FD	E, FD	WSI provides key services only
C. Coordination of Tours		E,M	E,FD		
D. Laundry		E,M	E,FD		
E. Janitorial Services		E,M			
F. Cafeteria Services			E,FD		
G. Training		E,M	E,FC		

FD - Direct funding through EG&G or WSI work packages
M - Funding by MSC through NCPP
E - Execution
FC - Funding charged back to MSC by EG&G or WSI
D - Funding by DOE-RFFO

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1.0 Introduction

The Site Support Services Memorandum of Agreement (SSSMOA) contains the deliverable for Work Task Assignment number WBS 136 (Site Support Services Agreement) of the NCPP Stage I Work Plan - Revision 0, April 28, 1994. Each Section of the SSSMOA addresses funding sources, terms and conditions and mechanisms for payment, where appropriate.

2.0 Purpose

The Site Support Services Agreement establishes the provisions necessary to ensure the successful completion of Stage II of the National Conversion Pilot Project. Cooperative Agreement DE-FC34-94RF00733 was signed by Manufacturing Sciences Corporation (MSC) and Department of Energy, Rocky Flats Field Office (DOE-RFFO) on April 1, 1994. The Cooperative Agreement initiated the National Conversion Pilot Project (NCPP) at Rocky Flats Plant. The NCPP's main charter is to prepare all, or portions of, four former Non-Plutonium Production facilities (Buildings 865, 883, 444, and 447) at Rocky Flats for return to operations as scrap metal recycling facilities which will manufacture products for commercial use.

Stage I of the project involves planning while during Stage II the NCPP facilities will be cleaned out, maintained and prepared for recycling operations. The Site Support Services Agreement is only applicable to Stage II of the NCPP. The Site Support Services Agreement will define how DOE-RFFO, Wackenhut Services, Inc. (WSI), EG&G Rocky Flats, Inc. (EG&G) and Manufacturing Sciences Corporation will cooperate to ensure effective operation, maintenance, and servicing of the NCPP facilities during Stage II of the project.

It is essential to the successful execution of the NCPP that all parties to this agreement establish and maintain an effective working relationship throughout all levels of the respective organizations. In order to do this, it is necessary that each organization understand its respective roles and responsibilities. To implement these areas of responsibilities, this SSSMOA has been developed for those programs required to support the NCPP. The parties agree that nothing in this MOA modifies or affects each party's responsibilities and accountabilities as set forth in their respective contracts with DOE.

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The parties further agree that this MOA is not contractually binding. This agreement may be modified only by mutual written agreement of the parties.

3.0 Objectives

The objective of this agreement is to express and define the specific responsibilities of each of the parties in assuring the execution of the National Conversion Pilot Project and establish the guidelines through which this will be accomplished. The Site Support Services Memorandum of Agreement covers the Site Support Services that are deemed necessary at this time. Should the need for a service not covered in the original document, or a change to the terms expressed herein, become necessary in the future, it will be addressed through a signed modification to the original document. There are certain services which EG&G will not provide as referenced in Section P.

3.1 To address the Site Support Services necessary to carry out Stage II of the NCPP. Stage II involves the cleanup of Buildings 865, 883 and 444, and 447 during the next two years.

3.2 To develop a Memorandum of Agreement that is acceptable to all parties concerned in each service area.

3.3 To develop a structure that allows the supply of services to transition during Stage II from the M&O Contractor to other suppliers if it is shown by MSC to be in the best interest of objectives of the NCPP.

3.4 To develop a structure that allows for a smooth transition from DOE Orders and requirements to industry standard regulations where practical.

3.5 To address funding issues not covered in the M. N. Silverman letter (02569) to H. P. Mann (Appendix B) and the H. P. Mann letter (94-RF-05565) to M. N. Silverman (Appendix C).

4.0 Assumptions and Unknowns

4.1 Stage II of the Project will commence during the third quarter of calendar year 1994.

4.2 The Agreement will be written in such a manner as to allow services to be added, modified or deleted as circumstances and funding dictate, by mutual agreement of the parties.

4.3 MSC will have the option of using various M&O Contractor systems or using its own systems, whichever is in the best interest of the objectives of the NCPP and is in accordance with existing contracts.

5.0 Terms of Agreement

5.1 Areas of Responsibility

Consistent with clause C-1 of its prime contract with DOE, EG&G is responsible for the day-to-day operation of the Rocky Flats Plant.

Wackenhut Services, Inc. is responsible for providing, managing, supervising, and supporting a trained, equipped, motivated, and qualified Protective Force as well as performing RFP badging and visitor control functions. WSI responsibilities include, but are not limited to: the protection of SNM against theft and/or diversion; protecting vital facilities against sabotage; and control and protection of classified information and material. WSI is responsible for the management and development of RFP protection policies, requirements and programs in accordance with applicable DOE-HQ and DOE-RFFO orders and directives. WSI will work in coordination with EG&G and MSC in reducing security requirements in the NCPP facilities commensurate with the assets being protected and the acceptance of risk where documented.

DOE is responsible for programmatic, policy, and funding decisions; the establishment of goals and objectives; and the monitoring of performance of MSC, EG&G, and WSI.

Manufacturing Sciences Corporation responsibilities include, but are not limited to: cleanout of NCPP facilities; preparation of NCPP facilities for commercial activities; establishment of facility specific waste management

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infrastructure; development of regulatory framework for Stage III activities; and management of the project requirements.

5.2 Zones of Responsibility

MSC's zone of responsibility will include those portions of the NCPP facilities (buildings 865, 883, 444, and 447) and associated equipment therein which, through mutual determination of DOE, EG&G and MSC, are essential for the successful implementation of the NCPP. It is these portions and equipment that will be the primary responsibility of MSC to prepare for use in Stage III of the NCPP. MSC is responsible for implementing administrative controls and to train and qualify operators to maintain the safety envelope.

EG&G's zone of responsibility will be the outside of the NCPP facilities and support facilities. EG&G will be responsible for utilities and systems required to maintain the safety envelope of the NCPP facilities and support facilities, those facilities necessary for the provision of utilities to the NCPP facilities and support facilities, the roadways and parking areas, transmission lines and conduits, fire distribution system, inactive RCRA units or RCRA units to remain active that are not required to support NCPP activities, nuclear material, and the Building 883 classified communication junction box.

Additionally, EG&G's area of responsibility will include assuring that sitewide systems are maintained such that emergency response to fire, hazardous material or radiological incidents are managed successfully; ensuring that the engineered systems supporting facility safety envelope are maintained and making available administrative controls supporting the safety envelope; ensuring that services are provided to Manufacturing Sciences Corporation based on a plant priority system that accounts for the NCPP; removing and controlling all classified documents and material from the NCPP facilities; maintaining all basic building services (such as heat, lights, sanitary systems, etc.) to NCPP facilities as specified herein.

5.3 Agreement of Parties

All parties, EG&G, DOE-RFFO, MSC, & WSI, to this agreement are committed to the successful execution of the National Conversion Pilot Project. All parties to this agreement are committed to establishing and maintaining an effective working relationship throughout all levels of their respective

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organizations. The responsibilities for the conduct of the NCPP are established through this agreement which addresses sixteen programmatic and functional areas that are considered essential to the success of the NCPP.

5.4 Dispute Resolution

In the event that a dispute arises over the responsibility for the provision or funding of a service, the parties involved will enter dispute resolution. MSC, EG&G, and WSI will attempt to resolve the dispute among the cognizant EG&G Director, MSC Deputy Project Manager, WSI Deputy General Manager, and the DOE-RFFO Director of Communications and Economic Development. Should resolution be impossible, the matter will be brought to the attention of the EG&G President, the WSI General Manager, the MSC Project Manager, and the DOE-RFFO Manager.

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6.0 Areas of Agreement

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Section A
Safeguards and Security

I General

This Section outlines the responsibilities for the conduct of Safeguards and Security actions for Stage II of the National Conversion Pilot Project.

II. Areas of Responsibility

A Control of Classified Documents and Material

MSC will implement EG&G's classified document and material control system which is consistent with the requirements of DOE Orders 5632.03, 5632.05, 5635.1A, and 5639.03. There may be other orders that are applicable that are not listed here. This system will be documented and submitted to U. S. Department of Energy, Rocky Flats Field Office (DOE-RFFO) Security Division (SD) for approval prior to implementation.

B. Control of Sensitive and Unclassified Controlled Nuclear Information (UCNI) Documents

MSC will implement EG&G's system to control sensitive and UCNI documents. This system will be consistent with the requirements of DOE Orders listed in "A" above and the requirements of DOE Order 5635.04. EG&G and DOE will perform classification reviews.

C Nuclear Material Control and Accountability

EG&G and the DOE-RFFO will retain accountability and control requirements for all nuclear material that is in the possession of MSC. All material, including empty white drums and waste containers, will be processed, stored, inventoried, and controlled in accordance with the Rocky Flats Plant Nuclear Materials Safeguards Manual.

EG&G will establish a Material Balance Area (MBA) for the MSC operations. A separate MBA will be established for each building. EG&G's Nuclear Materials Safeguards (NMS) department will provide

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a nuclear material custodian to provide support for shipment and receipts of nuclear material.

An MBA specific Material Control and Accountability (MC&A) Plan and MC&A Procedure will be jointly developed for the MSC operations that will clearly delineate the responsibilities of the users of the nuclear material.

Inventory support required of MSC will be minimal and will be spelled out in the MC&A Plan and MC&A Procedures.

D. Communications Security

MSC will adopt, implement and comply with EG&G's communications security system. This system is consistent with the requirements of DOE Orders listed in "A" above as applicable and the requirements of DOE Order 5635.04. EG&G will conduct a vulnerability assessment to determine if there is a Technical Surveillance Counter Measures (TSCM) problem associated with the close proximity of MSC operations with uncleared personnel in the proximity of the EG&G classified operations. If it is determined that a unacceptable vulnerability exists, MSC and EG&G will prepare a plan for compensatory measures for DOE-RFFO approval.

E. Computer Security

MSC will comply with the requirements of and implement the provisions of, EG&G's classified and unclassified computer security program. This system is consistent with the requirements of DOE Orders listed in A above as applicable and the requirements of DOE Order 5635.04. The MSC Computer Security Plan will be coordinated with DOE-RFFO for site compatibility. The Computer Security Plan will be approved by DOE-RFFO. The computer systems will be accredited by DOE-RFFO.

MSC will also develop a program for reporting violations of computer use and computer security requirements, comparable to that in effect for other site contractors, and meets the requirements of applicable DOE directives.

EG&G will conduct a risk assessment within thirty (30) days of the

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beginning of Stage II to determine if there is a computer security problem associated with the close proximity of MSC operation with uncleared personnel in the proximity of the EG&G classified operations. If it is determined that an unacceptable vulnerability exists, MSC and EG&G will prepare a plan for compensatory measures for DOE-RFFO approval.

F. Personnel Security

1. Employee Badging

EG&G will process requests for badging of MSC employees in accordance with existing procedures and forward to WSI for badging. MSC will prepare badge requests (RF Form 47598. Rev. 6/93) and submit them to DOE-RFFO-SD for approval. Upon approval by DOE-RFFO-SD the forms will be forwarded to EG&G Personnel Security for processing. The forms will then be submitted to WSI for the badge preparation and issuing. EG&G and WSI will provide a priority to badging requests that are consistent with the priority assigned to WSI and EG&G personnel.

MSC will comply with all DOE-RFFO-SD requirements for the preparation of the badge request.

MSC will implement EG&G's procedure for the control of RFP badges. This procedure requires all MSC employees to use and display badges in a manner consistent with the RFP policies.

2. Visitor Control

This Section applies to all visitors to the RFP who are invited by MSC. Request for visitor approvals will be completed by MSC and submitted to DOE-RFFO-SD for approval of the visit. The same policy will be applied to both Foreign Nationals and U. S. Citizens. Upon approval of the visit request, DOE-RFFO-SD will forward the approved paperwork to EG&G for further processing of the visit in accordance with current EG&G Policy. The visits of Foreign National will be handled in the same manner. MSC will submit all visit requests for Foreign Nationals in a timely manner to allow for additional processing

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time. Upon completion, DOE-RFFO will forward the visitor request to EG&G Personnel Security Department for further processing. EG&G and WSI will provide a priority for processing visitor and Foreign National visitor requests that is consistent with the priority assigned to WSI and EG&G personnel.

EG&G and WSI will provide MSC with the necessary security support for MSC Foreign National visitors and workers. This support will include badging, security plan preparation, determining escort requirements, security administrative support, operations security, and security education and training.

3. Security Inquiries

MSC will conduct initial inquiries into matters relating to security. EG&G and WSI will assist MSC as appropriate. Any security inquiry conducted will be documented by MSC and processed in accordance with the DOE Orders.

G. Access Control

Site access and access to facilities, including NCPP facilities, will be controlled by WSI and in accordance with applicable procedures. MSC personnel will be subject to the same vehicle, package, and personal searches as other RFP personnel.

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H. Property Protection

MSC will implement EG&G's property protection system.

EG&G will carry all accountable, non-radioactive and non-nuclear material, property on the EG&G plant property management and control system. MSC will document all movement of accountable equipment in accordance with applicable Property Management directives. MSC employees will accept the same responsibility for the proper use, storage, inventory, and protection of accountable property as is expected of other plant employees. The accountable property under MSC's control will be subject to the same inventory and property control procedures as EG&G.

MSC will be responsible for ensuring proper management of classified material maintained within NCPP facilities.

I. Physical Security Systems

WSI will respond to all security alarms in NCPP buildings. MSC will be responsible for providing WSI emergency access to all areas that are under alarmed surveillance. MSC will be responsible for the education of their employees on the response to all security alarms.

MSC and WSI will support EG&G in the testing of all alarm systems. The EG&G Alarm Maintenance Shop will provide the maintenance of the security alarm systems for the NCPP buildings occupied by MSC.

J. Protective Force

WSI will be responsible for the response to all security alarms in the NCPP buildings occupied by MSC. WSI will provide key service to MSC employees consistent in priority with other Rocky Flats personnel and practice. WSI will provide required searches for MSC employees with the same frequency and selection criterion that are presently used for other RFP employees. WSI will enforce parking and traffic violations committed by MSC employees with the same degree of coverage as all other employees and visitors on the RFP site.

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K. Modifications to Security Requirements

For those security requirements which have significant programmatic impacts, MSC, WSI, and EG&G will coordinate efforts with the DOE-RFFO to reduce those requirements to a level commensurate with the assets and associated risks. All parties will work to maintain safeguards and security risks at a level acceptable to DOE-RFFO. When determined to be appropriate, EG&G will modify the 400 and 800 Areas security perimeter to allow uncleared MSC employees direct access to all NCPP facilities.

III. Funding of Activities

A. MSC Responsibilities

MSC will fund the implementation of a classified document and material control system and a system to control sensitive and UCNI documents. MSC will fund the implementation of a communications and computer security plan. MSC will fund the implementation of a property protection program.

B. EG&G and WSI Responsibilities

EG&G and WSI will fund routine Safeguards and Security activities through the respective budgetary processes. Changes to the security perimeter will be funded through downsizing activities. A special work package will be prepared for this activity. EG&G and WSI will provide guidance to MSC in implementation of necessary safeguards and security plans, or details of existing plans.

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Section B
Utilities

I General

This Section outlines the responsibilities for the provision of electricity, domestic sewage treatment, domestic water, natural gas, process steam, process waste lines to buildings 374 and 774, and other utilities for the NCPP facilities during Stage II of the NCPP.

II Areas of Responsibility

A. Basic Utility Service

EG&G will maintain responsibility for electricity, natural gas, domestic water, process steam, process waste lines to buildings 374 and 774, and domestic sewage treatment. These utilities will continue to be provided as basic services to the NCPP facilities.

B. Telecommunications

Responsibility for the telecommunications equipment used by MSC employees and in the area(s) of MSC will remain with EG&G, Rocky Flats. MSC will be accountable for any and all telecommunications equipment installed in those areas and used by MSC employees. Cost of all telecommunications services will be recovered from MSC through Telecommunications Direct Recovery. Installation of additional services will be provided by EG&G; however, the cost of these services will be recovered from MSC through Telecommunications Direct Recovery.

C Centralized Computer Facility

MSC will be granted access to any necessary automated systems and services provided by the Centralized Computing Facility necessary to meet the objectives of the NCPP. Requests for access will be submitted, in writing, and approved by the appropriate Rocky Flats Field Office Information Resources Management personnel, and will include Functional Requirements directly related to utilization of the automated systems being requested. EG&G will have responsibility for providing training of MSC personnel as appropriate; assure

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compliance with the appropriate computer security procedures; monitor access authorization as required, etc. MSC will be billed for utilization and training through EG&G's Direct Cost Recovery process.

III. Funding of Activities

Funding for basic utility services will be provided in the EG&G baseline operating budgets for the NCPP facilities. Funding for telecommunications and centralized computing facilities use will be through direct recovery from MSC.

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Section C
Maintenance

I. General

This Section outlines the responsibilities for the performance of maintenance activities in the NCPP facilities.

II. Areas of Responsibility

A. Corrective Maintenance

Corrective maintenance of facilities must be performed in order to maintain a safe environment. These services will be provided by EG&G during Stage II. Corrective maintenance work requests for the NCPP facilities will be incorporated into the plant wide priority system with tracking and execution performed by the Maintenance Action Center. Emergency conditions will be handled in accordance with the approved work control program established by EG&G.

B. Preventive Maintenance and Surveillance

Preventive maintenance of facilities must be performed to maintain a safe environment. These services, as described below, will be provided by EG&G during Stage II. These activities include, but are not limited to, fire protection and security systems and alarms, HVAC, Life Safety/Disaster Warning System (LSDW), electrical systems, and process waste systems. This responsibility is only applicable to equipment or systems presently installed in the facilities that have preventive maintenance work orders or scheduled surveillance requirements.

C Maintenance Associated With Decontamination

Maintenance associated with decontamination of the NCPP facilities will be the responsibility of MSC. These activities include, but are not necessarily limited to, Lock out/Tag out of electrical equipment, hoisting/rigging and lifting or moving of equipment, disassembly of machinery and equipment for decontamination purposes, stripping of paint or the application of paint for decontamination purposes, the application and removal of decontaminates, and the setup, operation,

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removal of decontamination equipment.

D. Maintenance Work Order Backlog

Corrective and preventive maintenance will be provided by EG&G during Stage II. MSC is responsible for reviewing the maintenance backlog and identifying to EG&G those work orders which must be completed to support Stage II and those work orders which would have to be completed to support Stage III. Some activities to support Stage II may have to be executed over multiple years.

MSC and EG&G are responsible for reviewing the work orders, estimating the cost of implementation, prioritizing activities, and requesting funding from DOE.

III. Funding of Activities

A. EG&G Responsibilities

EG&G Operations will include corrective and preventive maintenance in building baseline work packages. This activity includes the planning, scheduling and support personnel required to execute the specific type of maintenance.

EG&G will estimate the cost of reducing the backlog maintenance work orders. Funding to reduce the backlog will be requested in the FY95 budget call under a separate work package to support NCPP activities.

B. MSC Responsibilities

MSC will fund maintenance activities associated with the decontamination and clean up of areas in the NCPP facilities under MSC's responsibility. MSC will fund corrective maintenance associated with or caused by facility decontamination or cleanup. MSC will request additional funding from DOE-RFFO for corrective maintenance over and above that identified by priority within the Maintenance Action Center to support NCPP.

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C DOE Responsibilities

DOE will make final determination regarding the portion of the maintenance backlog that must be worked to support Stage II activities and prepare the facilities for Stage III based upon input and recommendation from MSC and EG&G. DOE will work with MSC and EG&G to prepare cost estimates and prioritize, schedule and implement the work orders. DOE will provide funding to a work package for general maintenance support to the NCPP.

Section D
Fire Protection

I. General

This Section outlines the responsibilities in the area of fire protection in the NCPP facilities.

II. Areas of Responsibility

Responsibilities for fire protection are delineated as follows:

A. Fire Alarm Monitoring and Communications (dispatching and emergency notifications)

All dispatching and fire alarm monitoring for NCPP facilities is the responsibility of the Rocky Flats Fire Department. This includes monitoring for actual fire and supervisory alarms and coordinating all radio communications for facility alarm systems. The Rocky Flats Communications Center will make notifications of system outages and will send a firefighter to immediately investigate fire and supervisory alarms.

MSC will take the appropriate actions to ensure the facility is adequately protected and compensatory actions in place after notification of the Fire Department Communications Center. MSC will provide a current list of those persons to be notified in the event of failures. Persons should be on-call 7 days a week, 24 hours per day. MSC will ensure that any new fire alarm systems are connected to the Fire Department Communications Center and notify that department prior to any scheduled maintenance or testing. All telephones will be connected to the Fire Department Communications Center utilizing the 2911 system for notification of any fire, medical, and hazardous materials emergencies.

B. Door Access

MSC will provide a means of accessing the facilities immediately in the case of an emergency. The Fire Department will have access to a Knox Box for each door or a master key. WSI is responsible for key service in the NCPP facilities.

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The Fire Department is responsible for maintaining accountability for all keys.

C. Emergency Services

Emergency services include: Fire Suppression, Emergency Medical Service, Hazardous Materials Mitigation and Technical Rescue.

The Rocky Flats Fire Department will respond to any and all fires within or around NCPP facilities. Each facility will be pre-planned annually and updated to reflect changing requirements. All fireground strategies and tactics will be the responsibility of the Rocky Flats Fire Department.

The Rocky Flats Fire Department will respond to any and all medical emergencies within or around NCPP facilities.

The Rocky Flats Fire Department will respond to any and all hazardous materials emergencies within or around NCPP facilities. MSC will be responsible for the clean up of incidental spills. The Rocky Flats Fire Department will not provide clean up that is not part of hazardous substance spill mitigation.

MSC will provide a 24 hour point of contact in the event of a facility emergency. MSC will report to the Command Post as necessary in response to an emergency. MSC will also provide technical support and data to update building specific pre-plans annually.

MSC will manage all waste generated as a result of spill cleanup in accordance with Rocky Flats Plant Hazardous Waste Requirements Manual. MSC will provide any and all information relative to the hazardous materials emergency upon request. MSC will be responsible for notifying the Rocky Flats Fire Department of the introduction of any new combustible materials into the NCPP facilities.

D. Sprinkler Systems

Fire sprinkler systems are under the jurisdiction of the EG&G Facility Operations Manager. Sprinklers will be maintained by EG&G. Alarms

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will be tested by EG&G. Testing surveillance is performed by the Rocky Flats Fire Department with assistance from MSC. The Rocky Flats Fire Department also performs inspections required by the facility Safety Analysis Report.

E. Smoke Detection Systems

Smoke detection systems will be tested and maintained by EG&G.

F. Manual Fire Phones/Pull Stations

These systems will be tested and maintained by EG&G.

III. Funding of Activities

A. MSC Responsibilities

Fund personnel to assist Fire Department as required in the areas identified above.

B. EG&G Responsibilities

EG&G will have contingency budget for anticipated supplies or damages occurring in the course of a Fire Department response to a hazardous material spill. EG&G will provide baseline funding for Fire Protection, Emergency Medical response, and fire equipment testing/maintenance in the NCPP facilities.

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Section E
Emergency Preparedness

I. General

This Section outlines the responsibilities in the area of Emergency Preparedness.

II. Areas of Responsibility

A. Facility Emergency Planning

EG&G Emergency Preparedness will:

1. Provide emergency program direction through the RF Site Emergency Plan and Implementing Procedures

2. Provide guidance on the facility emergency planning requirements through the EP Procedure 1-A41-5500-14.01, Building Emergency Program.

3. Assist the Building Emergency Preparedness Administrator (BEPA) with the preparation of a building-specific emergency plan and implementing procedures.

4. Coordinate with the BEPA on performing a building-specific hazards assessment to be used as the planning basis for the building emergency plan.

5. Assist the BEPA in the designation and assignment of specialized team members to support building emergency response.

6. Designate areas for evacuation and accountability for building residents.

7. Provide coordination and serve as the central point of contact for all responsibilities pertaining to emergency planning and response.

8. Provide an analysis of building hazard impacts on the

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Emergency Planning Zone (EPZ).

MSC will:

1. Follow the program requirements in the Site Emergency Plan and Implementing Procedures.

2. Accomplish building emergency program tasking in EP Procedure 1-A41-5500-14.01, Building Emergency Program.

3. Assign an MSC Building Emergency Preparedness Assistant (BEPA) to support building emergency program development and administration.

4. Through the BEPA, provide assistance in the development of hazards assessment for the building. Provide EG&G EP with a list of potential hazards within the building and associated to building operations prior to conduct of this assessment and the EPZ analysis.

5. Assign specialized team members for Building Emergency Support Team (BEST) and Bomb Search Team (BST), and appoint representatives to support the building Emergency Response Organization (ERO) according to the Site Emergency Plan,

6. Assist in the designation of evacuation and accountability areas for the building.

7. Develop the building-specific emergency preparedness program responsibilities, including emergency equipment to support response.

B. Emergency Preparedness Training

EG&G Emergency Preparedness will:

1. Provide assistance in scheduling formal EP training through Performance Based Training (PBT).

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2. Assist in the conduct of the emergency preparedness portion of building indoctrination training and emergency plan related training.

3. Maintain a copy of training records for building emergency preparedness indoctrination and ERO training.

4. Assist in scheduling Incident Command (IC) Training for building ERO personnel.

MSC will:

1. Ensure building personnel attend formal EP training and building indoctrination.

2. Provide annual refresher training for building personnel on (IC) emergency response actions.

3. Maintain building EP training documentation.

4. Coordinate with EG&G EP on annual EP training needs.

5. Request assistance from EG&G EP as necessary to support building specific training drills/tabletops/proficiency training.

6. BEPA, BST, BEST and ERO assigned personnel will be retrained.

C Exercise Participation

EG&G Emergency Preparedness will:

1. Coordinate with building management on the scheduling and conduct of annual and semiannual building EP drills.

2. Provide review and approval of drill schedules and scenarios for building EP drills.

3. Provide training to the BEPA and building management on the preparation and conduct of drills.

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4. Include building personnel in the site-wide drill/exercise program.

MSC will:

1. Develop drill packages based on EG&G EP direction for building EP drills.

2. Conduct, evaluate, and critique building drills.

3. Provide copies of drill reports and corrective actions to EG&G EP and DOE.

4. Ensure building personnel participate fully in building and site-wide drills and exercises.

5. Process any requests for exemption from building and site-wide drills and exercises through EG&G and DOE.

6. Provide representation to the plant ERO and Emergency Operations Center (EOC) upon request during drills/exercises and actual events.

D. Management Control

EG&G has overall EP program implementation responsibility. MSC emergency planning and operations will support the site-wide and building-specific EP Planning responsibilities. MSC will support the plant Emergency Response Organization as requested, to include direct support to the Incident Command Organization, Emergency Management Organization, and specialized emergency response team tasking.

III. Funding of Activities

A. EG&G Responsibilities

EG&G Emergency Preparedness will include site-wide program maintenance and operations in site support work packages.

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EG&G Emergency Preparedness will provide personnel assistance (man-hours) to support the MSC building-level program. Cost for this service will be included in the EG&G building baseline budget.

For FY95 building support requirements, this equates to 560 hours, including 366 hours for building emergency plan/procedure development; 144 hours for building drill design, conduct, and evaluation; 40 hours for drill surveillance and audit; and 10 hours for BEPA drill process orientation.

EG&G will include the hazards assessment of MSC building hazards as part of the hours in building emergency plan/procedure development.

B. MSC Responsibilities

MSC will fund the hours necessary to support an MSC Building Emergency Preparedness Assistant (BEPA). BEPA hours include training and operational support of the building program, and, any additional hours necessary for administration of the building program and equipment maintenance/requisition.

MSC will fund the hours needed for all building residents to complete building emergency indoctrination training (both initial and recurring), and the training necessary for assigned BST, BEST and ERO members.

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Section F
Procurement and Shipping

I. General

This Section outlines the responsibilities for procurement of materials, supplies, and services.

II. Areas of Responsibility

A. Procurement of Materials and Supplies

All materials and supplies, except data processing equipment and software obtained by MSC, must be procured through the EG&G Procurement Department. The procurement of materials and supplies will be in accordance with the "Acquisition Guideline for Requisitioning Commodities and Services". All equipment purchases in excess of $500 must be approved in writing by the DOE Contracting Officer or designee prior to submission of the requirement to EG&G Procurement.

B. On-Site Receipt and Material Control

All materials and supplies requisitioned by MSC will be delivered to EG&G Receiving. EG&G Warehouse Receiving is responsible for entering applicable equipment and materials into the DOE Property Control System EG&G Warehouse Receiving will assign an MSC property control number to all applicable equipment and materials.

EG&G Traffic is responsible for transporting the equipment and materials from EG&G Receiving to the NCPP facilities. MSC will manage all DOE controlled equipment in accordance with the EG&G Property Management Manual, 1-90000-PMM. MSC will designate Property Custodians who will perform the responsibilities outlined in the Property Management Manual. Property provided to MSC by DOE which is not controlled through the EG&G Property Management Manual will be managed in accordance with 10 CFR 600.117.

C Off-Site Transportation of Material

MSC will coordinate with the EG&G Traffic Department for the

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shipment of any materials off of the Rocky Flats Plant. MSC will meet the requirements of 1-94700-Traffic-120, Off-Site Transportation Manual.

III. Funding of Procurement and Shipping

A. MSC Responsibilities

MSC will absorb all of the costs of procuring supplies and materials on a charge back basis. This charge back is approximately 10% for purchases up to and including $25,000 and 3% for purchases over $25,000. MSC will arrange and pay for off-site transportation of material from the warehouse. MSC will be responsible for procuring for its use all data processing equipment and software as well as all other services except as otherwise provided herein.

B. EG&G Responsibilities

EG&G will cover the cost of transporting materials and supplies between the warehouse and NCPP facilities.

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Section G
Management of Property

I. General

This Section establishes the responsibilities for the management and control of existing and purchased equipment.

II. Areas of Responsibility

A. Property Accountability and Control

EG&G Property Management is responsible for the control of property at the Rocky Flats Plant. EG&G Property Management will assign a Responsibility Code to MSC. All equipment listed in Section F of the Cooperative Agreement will be transferred to this Responsibility Code. MSC will assign an individual to the position of Property Custodian. This person will implement the requirements of the EG&G Property Management Manual.

Any equipment fabricated on-site by MSC or its subcontractors in support of NCPP activities will be identified to EG&G. EG&G will then determine whether the item is accountable as an individual property record unit. If so, the item will be added to MSC's accountability list and Property Management will issue a property bar code to be placed on the item. Equipment brought in from other DOE or government sites to be utilized in the NCPP will be treated as a new purchase from a Property Management standpoint; property on loan in support of the NCPP will be identified as such.

Once property is assigned to MSC's responsibility code, changes in location, transfers to other custodians, changes in custodians, and property inventory will be handled in accordance with EG&G Rocky Flats Policy 3-26 and EG&G's Property Management Manual.

B. Space Allocation

For those facilities and areas that are within MSC's Area of Responsibility, as identified in Section F of the Cooperative Agreement, MSC, in coordination with DOE, will determine how that space is to be utilized.

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For all facilities and areas outside of MSC's Area of Responsibility, space will be allocated by EG&G Facility Planning.

C Disposal of Excess Equipment

In the event that any equipment assigned to MSC becomes inoperable, obsolete, or is in excess of current needs, the property will be dispositioned by MSC in accordance with EG&G Rocky Flats Policy 3-17 and the EG&G Property Management Manual.

Property which is unaccounted for must be reported to DOE and EG&G. MSC will conduct initial inquiries into the event and submit a report to DOE and EG&G. Items which cannot be located will be dispositioned in accordance with EG&G Rocky Flats Policy 3-17 and the EG&G Property Management Manual.

III. Funding of Activities

A. MSC Responsibilities

MSC will cover costs associated with property management for property and facilities under MSC accountability.

B. EG&G Responsibilities

EG&G will fund all activities related to the transfer of property and facilities to be used by MSC during Stage II. EG&G will also fund activities associated with the disposition of excess property.

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Section H
Waste Management

I. General

This Section outlines the responsibilities concerning the handling, packaging, transportation, storage, and disposal of waste generated during normal operations, clean-up activities, excess chemicals and packaged waste removal and as a result of abnormal events in and adjacent to buildings 865, 883, 444, and 447.

II. Areas of Responsibility

A. Disposal of Sanitary Waste

Manufacturing Sciences Corporation is responsible for segregating sanitary waste from other waste types and placing this waste in a proper receptacle. Sanitary waste must be controlled in accordance with the guidance provided in 1-20000-SAN-001. The following items cannot be disposed of in the RFP sanitary landfill and must be segregated from sanitary waste:

1. Radioactively contaminated materials
2. RCRA and CHWA-regulated wastes
3. PCB-contaminated waste
4. Friable asbestos
5. Materials on the hazardous substance list (40CFR302 Table 302.4)
6. Batteries from pagers, calculators, or watches
7. Photographic solutions
8. Containers with free liquids
9. Metal chips, turnings, ingots, plates, sheets, furniture, equipment, construction materials, drums, etc. unless they are rejected for recycle by Property Utilization & Disposal (PUD)
10. Untreated medical wastes
11. Aerosol cans unless prepared in accordance with Health and Safety Practices Manual, Section 11.02
12. Florescent light bulbs, crushed or otherwise
13. Pressurized vessels or cylinders
14. Containers displaying a) National Fire Prevention Agency

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(NFPA) labels with a rating of two or higher, b) onsite Hazardous Material label, c)PCB label, d) asbestos label e) radioactive material label, or f) DOT label for hazard classes 1-9.

15. Materials generated and/or recovered from the remediation of spills or releases of hazardous materials

All recyclable paper will be placed in approved recycle boxes. When full, the recycle boxes will be taped and transported to the loading dock for pickup by EG&G Trucking. All cardboard will be placed in dumpsters specifically marked for the disposal of cardboard.

Other materials that should be recycled include aluminum cans, printer cartridges, scrap metal, and office equipment. The disposition of all recyclable material should be in conformance with Rocky Flats Recycling Procedure 1-827-REC-011. All materials will be segregated and placed in a proper recycling collection receptacle. Questions regarding what material can be recycled should be resolved by contacting EG&G Waste Minimization.

Any non-radioactive material generated in a Radioactive Materials Management Area (RMMA) must be evaluated by EG&G Radiological Engineering. Any non-routine waste generated within a non-RMMA must also be evaluated by EG&G Radiological Engineering. Any waste that is destined for off-site disposal must be accompanied by a Property/Waste Release Evaluation (PRE). Any non-routine waste to be disposed of in the sanitary landfill requires a PRE. MSC will be responsible for arranging transportation of any wastes with EG&G Trucking.

All sanitary waste to be disposed of in the RFP sanitary landfill will be transferred by MSC from their area of operations to the sanitary waste dumpsters located outside of the facilities or to the loading dock. MSC will be responsible for ensuring the dumpsters are protected from adverse conditions, for reporting any deficiencies to the EG&G Facility Operations Manager and for ensuring the area surrounding the dumpster is maintained. EG&G Facility Operations will ensure that the dumpsters are maintained in an operable condition and that any deficiencies are corrected in a timely manner.

EG&G Trucking will be responsible for transporting the sanitary

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waste from the dumpsters and the loading dock to the sanitary landfill. EG&G personnel will examine all waste when it arrives at the landfill. Should any forbidden items be identified which can be traced to MSC operations, EG&G will notify DOE of the infraction and DOE will determine MSC's responsibility for taking any remedial actions necessary.

B. Operation of Active RCRA Units

During Stage I of the National Conversion Pilot Project, RCRA Units in MSC's area of responsibility will be classified as those that will remain active during the course of Stage II and those that can undergo the RCRA closure process. Units to remain active will be jointly agreed upon by MSC, EG&G, and DOE. The units to be the responsibility of MSC will be identified in an attachment to this MOA. For those units that are to remain active during Stage II, MSC will accept responsibility for the operation and maintenance of those RCRA Units. EG&G will retain responsibility for operation and maintenance of RCRA units outside of MSC's area of responsibility through which process waste may be transferred to a waste treatment or storage facility under EG&G's control.

Operation and maintenance of active RCRA units will be in accordance with the requirements of EG&G Rocky Flats Hazardous Waste Requirement Manual (HWRM), 1-10000-HWR. MSC will not undertake to close an active RCRA unit without notification of RCRA Regulatory Programs in accordance with the requirements of Procedure 1-A09-HWRM-15, Closure of Active RCRA Units and Deletion of 90 Day Accumulation Units.

MSC is responsible for proper response and reporting of any leaks or spills from an active RCRA unit under the cognizance of MSC. Release response and reporting will be in accordance with the requirements of Procedure 1-C49-HWRM-04, Release Response and Reporting.

MSC is responsible for conducting inspections in accordance with the Rocky Flats Hazardous Waste Requirements Manual (HWRM). Inspection records are required to be maintained for a minimum 3 year period. These records will be maintained in each facility under MSC's control. Deficiencies will be reported, and corrective actions taken, in accordance with applicable procedures in the HWRM.

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taken, in accordance with applicable procedures in the HWRM.

MSC will be responsible for assigning personnel as Systems Users for the Waste and Environmental Management System. These personnel will receive training in the use of WEMS and receive access authorization. Training and access authorization will be provided by EG&G. MSC will be responsible for entering data into WEMS that is applicable to the operation and maintenance of active RCRA units.

MSC will ensure that all new hires, all supervisors, and all waste custodians meet the training requirements in 1-10000-HWR-02, RCRA Training Requirements Procedure.

C. Removal of Existing Chemicals and Packaged Waste

A large inventory of chemicals and significant quantities of packaged wastes currently exist in each of the NCPP buildings. EG&G is responsible for removing all excess chemicals and currently packaged waste from the NCPP buildings prior to hands-on work being initiated by MSC in each of the buildings. It is estimated at this time that hands-on work will begin in the first NCPP building (Building 865) the first week of January 1995.

D. Closure of Inactive Units

During Stage I, EG&G, MSC and DOE will jointly identify those RCRA units that are not needed to support MSC operations during Stage II of the NCPP. These units will be closed by EG&G. EG&G will be responsible for:

1. Notification to Colorado Department of Health of intent to close an active unit.

2. Developing a RCRA Closure Plan.

3. Implementing the RCRA Closure Plan.

4. Managing the waste generated from closure activities.

5. Obtaining a Certificate of Closure from an independent registered professional engineer.

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6. Identifying any post-closure care.

7. Post-closure care.

E. Control Of Polychlorinated Biphenyl Contaminated Transformer

Building 865 contains one transformer which still contains Polychlorinated Biphenyls (PCB). EG&G will continue responsibility for meeting the requirements of the Toxic Substances Control Act (TSCA) Management Plan pertaining to in-service PCB transformers. PCBs at any concentration may be used in transformers for the remainder of their useful life subject to the following conditions with which EG&G will assure compliance:

1. Combustible materials must not be stored within a PCB transformer enclosure; within 5 meters of a PCB transformer enclosure; or within 5 meters of an unenclosed PCB transformer.

2. A written, controlled procedure will be used to perform the visual inspections. This procedure must have the concurrence of EG&G Waste Regulatory Programs.

3. Visual inspections of a PCB transformer will be conducted quarterly with at least 30-days between inspections. Reduced visual inspection frequencies can be applied if the criteria of Section 4.3.2 of 1-10000-EWQA Section 1.5, TSCA Management Plan are met. Visual inspection requirements for leaking PCB transformers of Section 4.3.2 must also be met.

F. Waste Operating Procedures

MSC will adopt EG&G waste procedures applicable to waste generation, handling, characterization, segregating, packaging, inspection, transportation, and storage. This will ensure that wastes generated by MSC during cleanout activities are handled, characterized, segregated, packaged in a manner that makes them acceptable for storage in a RFP waste storage facility or disposal at an approved off-site disposal facility.

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The EG&G Waste Operating, Waste Requirement, and Waste Management Procedures to be adopted include, but not limited to:

1. 1-10000-HWR, Hazardous Waste Requirements Manual
2. WO-1101, Solid Radioactive Waste Packaging Outside the PA
3. WO-1102, Waste/Residue Traveler Instructions
4. 1-10000-WRM-WO-4034, Radioactive Waste Packaging Requirements
5. 1-C88-WP1027-NONRAD, Non-Radioactive Waste Packaging Requirements
6. 1-20000-WPC-001, Waste Process Control
7. Labeling and Marking Procedures for Radioactive Material Containers
8. Low Level Waste Management Plan
9. On-Site Transportation Manual
10. Waste Programs, Training and Qualification Program Plan for Solid Radioactive Waste Generator
11. TSCA Management Plan
12. 1-10000-MWM, Medical/Infectious Waste Management Plan

The complete set of applicable manuals and procedures will be jointly determined by MSC, EG&G and DOE and will be identified in MSC's Waste Management Plan to be produced during Stage II.

G. Waste Generator Training

All MSC or subcontractor personnel who will generate or handle waste and personnel who will supervise these operations must meet the requirements of the EG&G Waste Generator Training and Qualification Program.

EG&G will make available all applicable Waste Generator Training

H. Waste Characterization

Prior to generating any wastes, MSC will properly identify and characterize the waste streams using any one or a combination of the following methods:

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1. Radiological Evaluations or Surveys;

2. Waste Stream and Residue Identification and Characterization (WSRIC) Building Books;

3. Non-routine Waste Origination Logs (for waste streams not identified in WSRIC Building Book);

EG&G will provide WSRIC Building Books, previous radiological surveys, support from EG&G Waste Program Organizations to advise in the identification and characterization of waste streams.

I. Waste Packaging

MSC will meet the waste packaging requirements of 1-10000-WRM-WO-4034, Radioactive Waste Packaging Requirements and 1-C88-WP1027-NONRAD, Non-Radioactive Waste Packaging Requirements. Per the requirements of WO-4034 an EG&G Waste Inspector will be present when Low Level or Low Level Mixed waste is placed into a waste drum or box. All waste packaging must comply with EG&G Rocky Flats Waste Requirement Procedures, the EG&G Hazardous Waste Requirements Manual, the EG&G Low Level Waste Management Plan, and the EG&G Transportation Manual.

MSC is responsible for coordinating with 400 and 800 Area Environmental Program Managers (EPM), EG&G Waste Programs and EG&G Traffic to establish the proper packaging for each identified waste stream.

If a waste container is rejected after transportation to a storage facility, the waste container will be returned to MSC who will be responsible for correcting the deficiency.

J. Waste Assay

Waste containing or potentially containing accountable nuclear material must be assayed to determine the quantity of nuclear material. MSC will refer to 1-10000-WRM-WO-4034 or contact Nuclear Materials Safeguards, as appropriate, to establish waste assaying requirements. MSC is responsible for preparing the waste

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containers for transportation to the waste assay station.

EG&G is responsible for performing the waste assay.

K. Waste Inspection

In addition to the Waste Inspection responsibilities identified in paragraph G above, EG&G Waste Inspection will perform a "dock inspection" of all waste containers prior to shipping. EG&G Waste Inspection will assess container integrity, drum or box contents, conformance, and container documentation, labeling, and marking.

L. Waste Transportation

MSC is responsible for surveying all waste containers for surface contamination prior to transportation to the facility loading dock. Prior to transportation of the waste containers from the facility loading dock EG&G Radiological Operations will be contacted to perform a release survey. The limits specified in the On-Site Transportation Manual will be met prior to the transportation of waste containers. MSC is responsible for coordinating shipment of wastes with EG&G Traffic prior to shipment.

EG&G Traffic is responsible for providing the equipment and personnel to transport the waste from the NCPP facility loading dock to the recipient waste storage facility.

M. Waste Storage

MSC must obtain EG&G Waste Program and Waste Operations approval prior to transporting any waste to an EG&G waste storage facility. MSC must identify the waste streams resulting from cleanup activities and the volumes and obtain EG&G Waste Programs concurrence that suitable waste storage capacity exists to accept the waste or that off-site disposal is available for the waste.

N. Waste Disposal

For wastes which are set for off-site disposal, EG&G will provide off-site transportation of waste packages to an appropriate waste disposal site. EG&G will be funded by DOE to support the disposal

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fees or costs for the generated waste during Stage II.

III. Funding of Activities

A. MSC Responsibilities

MSC will fund all activities associated with the generation, identification (except laboratory analysis, radiological surveys, etc.), handling and packaging of wastes.

B. EG&G Responsibilities

EG&G will include sanitary waste receptacle maintenance and upkeep in building baseline work packages. EG&G will include the anticipated cost of waste inspection, laboratory analysis, radiological surveys, waste transportation, waste storage, off-site waste transportation and disposal, removal of excess chemicals and packaged waste, and general waste program support in organizational work packages based on projected estimates of the waste streams and volumes of waste generation to be provided by MSC.

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Section I
Environmental Controls

I. General

This Section outlines the responsibilities in the area of Environmental Controls.

II. Areas of Responsibility

A. Chemical Tracking and Control

The EG&G Chemical Tracking and Control Program was established to comply with the Emergency Planning and Community Right-to-Know Act (EPCRA), Section 312. MSC will participate in the EG&G Chemical Tracking and Control System. The EG&G Chemical Tracking Program is described in 1-B44-HSP-9.12, Chemical Tracking in the EG&G Health and Safety Practices Manual. MSC will also consult with EG&G's Chemical Tracking and Control System Division to establish the proper interfaces.

MSC will maintain the Material Safety Data Sheets (MSDS) for chemicals residing in areas under their control.

B. Response To Spills

MSC and its subcontractors are responsible for appropriate response to, and reporting of, all spills, and releases of hazardous chemicals, non-hazardous substances (e.g. water) containing hazardous constituents, hazardous substances, hazardous materials, hazardous wastes, and oil (petroleum products as defined under 40 CFR 110) resulting from their actions, or failure to act, in areas where MSC, or its subcontractors, are performing work or from equipment under their control.

MSC's spill response will be in accordance with 1-C49-HWRM-04, Release Response and Reporting of the EG&G Hazardous Waste Requirements Manual. MSC will identify potential release scenarios in their areas of responsibility. These scenarios should be periodically evaluated for changing conditions during Stage II. EG&G will maintain spill response cabinets in areas where the potential for

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a release exists. The equipment and supplies in the cabinets will be maintained commensurate with the potential release scenarios.

MSC will report all spills requiring Emergency Response, per 1-C49-HWRM-04, to the EG&G Shift Superintendent. MSC will implement EG&G spill clean-up procedures and ensure that MSC employees have adequate training in the use of spill response procedures, equipment, and supplies.

If the conditions are met for the implementation of the RCRA Contingency Plan, MSC will draft the RCRA Contingency Implementation Report, resolve comments, and obtain approvals from CDH and EPA Region VIII through DOE. Questions concerning implementation of the RCRA Contingency Plan will be brought to the attention of EG&G Waste Regulatory Programs.

MSC will prepare any and all documentation required following a release which requires notification of an off-site regulatory agency.

III. Funding of Activities

A. MSC Responsibility

MSC will fund all reporting and investigation activities associated with spills that require the RCRA Contingency Plan to be implemented and/or notification of an offsite regulatory agency.

B. EG&G Responsibilities

EG&G will maintain spill response cabinets with appropriate equipment and supplies. EG&G will fund cleanup activities in the event of a spill (Reference Section D). EG&G will fund Waste Regulatory Program, Clean Air and Surface Water Division support of the NCPP through those organizations work packages. NEPA support will be funded through an NCPP general support work package.

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Section J
Occurrence Reporting

I. General

This Section outlines the responsibilities to comply with DOE Order 5000.3B or subsequent versions, Occurrence Reporting and Processing of Operations Information. This Section defines the roles and responsibilities with regard to the associated plant wide implementing procedures for Occurrence Reporting and establishes the requirement for distribution of incident/accident reports.

II. Areas of Responsibility

A. Joint Responsibilities

Both EG&G and MSC jointly agree to fully participate and cooperate in a consistent and diligent manner to attain and maintain timeliness and completeness in the execution of all identification, categorization, notification, investigation, analysis, correction, reporting and distribution requirements.

Both parties jointly agree that when involvement, corrective actions, and follow-up responsibilities overlap, each will support the other in carrying out the responsibilities of DOE Order 5000.3B or its successors.

B. MSC Responsibilities

MSC will implement the EG&G Occurrence Reporting process in accordance with the following EG&G procedures:

1. 1-10000-ADM-16.01, Occurrence Reporting Process
2. 1-38300-ADM-16.02, Occurrence Categorization
3. 1-10000-ADM-16.06, Conduct of Critiques
4. 1-10000-ADM-16.03, Root Cause Analysis
5. 1-10000-ADM-16.05, Implementation of Lessons Learned Program

C. EG&G Responsibilities

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EG&G Rocky Flats, Inc. agrees to provide MSC personnel the services of the Shift Superintendent Office, the Occurrence Notification Center (ONC) and the Performance Assurance Event Assessment and Management Systems groups as outlined in the above procedures. EG&G will continue to execute the responsibilities of the Operations Manager for all occurrences in which EG&G Rocky Flats has sole or principal involvement. The determination of principal involvement will be based upon the following criteria:

1. The nature of the issues surrounding the occurrence.
2. The extent and level of personnel participation in the occurrence (including precursor and immediate response actions).
3. The expertise and authority/responsibility required to dispatch the occurrence.
4. The equipment/operation impacted by the occurrence, and the location of the occurrence.

MSC will appoint a person to act in the role of Operations Manager as defined in 1-10000-ADM-1601, Occurrence Reporting.

III. Funding of Activities

A. MSC Responsibilities

MSC will fund all activities involving occurrences which are solely the responsibility of MSC or its subcontractors. For occurrences which are joint responsibility, each party will fund participation of their respective organizations.

B. EG&G Responsibility

EG&G will fund the Occurrence Notification Center, Performance Assurance Event Assessment organization, and any other necessary participation of EG&G personnel.

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Section K
Health and Safety

I. General

This Section outlines responsibilities in the area of health and safety program support.

II. Areas of Responsibility

The responsibilities for specific programmatic areas are as follows:

A. Respiratory Protection

MSC will implement EG&G's respiratory protection program formalized and documented in compliance with 29 CFR 1910.134 and 29 CFR 1910.120. EG&G will provide respirator fit tests, maintenance of all respirator fit test records, provision of respiratory protection devices, and cleaning and maintenance of all respiratory protection devices.

B. Material Safety Data Sheets (MSDS)

EG&G will provide maintenance of the master file for MSDSs, and access will be granted to MSC. MSC will maintain and update a chemical inventory in accordance with EG&G health and safety requirements and provide said inventory to EG&G initially, and as it is updated. MSC will provide MSDS to EG&G Industrial Hygiene for all regulated materials purchased by MSC prior to their introduction on Plantsite.

C Environmental Monitoring

MSC will be responsible for direct monitoring of exposures (i.e. chemical exposures, and physical or biological hazards) to its personnel and monitoring operations conducted under their jurisdiction, and EG&G will retain responsibility for monitoring of its personnel performing building support services-type activities as appropriate.

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D. Medical Treatment

EG&G Occupational Health is a designated provider of medical services for MSC. All examinations and medical certifications are completed in accordance with DOE Order 5480.8A. The following will provide additional necessary guidance for medical treatment:

1. MSC Human Resources will provide, on a monthly basis, to EG&G Occupational Health a list of all current MSC employees including detailees. This list will include social security numbers and be sorted by birth month;

2. EG&G Occupational Health will, in accordance with DOE Order 5480.8A, administer the annual and pre-placement medical examinations for MSC personnel;

3. MSC, in close coordination with EG&G Occupational Health, will schedule all pre-planned examinations, evaluations, and certifications;

4. In addition to scheduled examinations, EG&G Occupational Health designated physicians will provide emergency treatment, fitness for duty evaluations as required, authorize restricted duty, and make initial referral to offsite physicians for work-related injuries. EG&G Occupational Health will also provide assistance with all Workers' Compensation reports and claims. Follow-up reporting of benefits will be handled by MSC;

5. EG&G Occupational Health designated physicians will provide MSC with medical restrictions, extensions, and recommendations for waivers and appeals;

6. EG&G Health and Safety Records maintains all medical records on MSC employees, both active and inactive. Monthly employee updates will be provided by MSC.

7. MSC will reimburse EG&G Occupational Health for all occupational health services on an actual cost basis.

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III. Funding of Activities

A. MSC Responsibilities

MSC will maintain the MSDS in the NCPP facilities.

B. EG&G Responsibilities

EG&G will fund respirator fit tests, maintenance of test records, the provision of respirators, and the cleaning and maintenance of respirators. EG&G will continue to control the master MSDS file. EG&G will continue to monitor EG&G personnel who are providing services to MSC. EG&G will also provide medical treatment and health examinations.

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Section L
Radiation Protection

I. General:

This Section outlines the responsibilities in the area of Radiation Protection Program support for the conduct of radiological operations.

II. Areas of Responsibility:

The following areas of responsibility are addressed:

A. Radiological Health:

1. EG&G will provide external dosimetry services including whole body TLDs and special and extremity dosimetry as requested. EG&G and MSC will negotiate dosimetry exchange frequencies.

2. EG&G will provide internal dosimetry services including routine and special bioassay urinalysis, lung counts, and wound counts.

3. EG&G will provide dose assessment services, dosimetry analysis, and exposure reports in a mutually agreeable format and frequency. In addition, EG&G will maintain MSC personnel exposure records.

4. EG&G will provide portable contamination and radiation survey instrumentation. Instrumentation will be calibrated in accordance with approved EG&G procedures. Types and quantities of instruments needed will be mutually agreed upon.

B. Radiological Operations:

1. EG&G will provide continuing services to support the safety envelope. This will include: changing of fixed air heads - counting and reporting of air head results, performance of required radiation and contamination

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surveys at the EG&G specified frequency, and other specific building required surveillances.

2. EG&G will provide Radiological Control Technician (RCT) support to operations of step-off-pads in buildings. This service will include exit monitoring of personnel and equipment. RCT support will be in accordance with EG&G procedures and requirements.

3. MSC will provide RCT support for operations and evolutions being conducted by MSC personnel. As mutually agreed, EG&G RCTs will provide support to MSC in performance of characterization surveys.

4. MSC will ensure all material and equipment released for unconditional use is in accordance with criteria established in the Health and Safety Practices Manual.

C. Radiological Engineering:

1. Radiological Engineering will provide support to MSC consistent with the requirements necessary to maintain the Radiological Safety Envelope for each building.

III. Funding of Activities

A. MSC Responsibilities

MSC will fund activities associated with *its* work scope (step-off-pad services for MSC conducted operations and all support services above basic building baseline activities).

B. EG&G Responsibilities

Other services provided to MSC are considered to be landlord type support and will be forecasted and budgeted by EG&G. These costs will be identified in the EG&G accounting system by unique charge numbers for accounting and reporting of expenditures. These costs include the services and support described in this agreement for Radiological Health, Radiological Operations, and Radiological Engineering.

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Section M
Engineering

I. General

This Section outlines the responsibilities for Engineering.

II. Areas of Responsibility

Prior to implementing any modification to an NCPP facility, MSC must obtain written direction from DOE-RFFO. MSC may procure an Engineering contractor of its choice; however, EG&G Engineering will concur with all engineering designs prior to implementation.

All engineering performed by MSC or their subcontractors must conform with applicable Rocky Flats Plant standards and procedures. All engineering projects will conform with the Rocky Flats Configuration Change Control Program.

MSC will ensure that as-built drawings are entered into the Rocky Flats Engineering Drawing Control System.

III. Funding of Activities

A. MSC Responsibilities

Any engineering services procured by MSC to support NCPP activities will be funded by MSC. EG&G Engineering is a service organization which recovers its operating costs through direct recovery. MSC will include resources in any planned engineering activity for review and approval of Engineering Plans and the use of Engineering Technical Services.

B. EG&G Responsibilities

Given that EG&G Engineering operates as a service organization with direct recovery of costs, EG&G work packages must reflect the Engineering support required to assist in the development of Integrated Work Control Program work packages to perform corrective maintenance and to support activities to reduce the maintenance backlog in the NCPP facilities. These activities will be

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funded through the work package for general support of the NCPP.

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Section N
Nuclear Safety

I. General

This Section outlines the responsibilities in the area of Nuclear Safety. All of the NCPP facilities have a Preliminary Safety Analysis Report which defines the safety envelope of each facility. It is important that all activities conducted during Stage II of the NCPP be performed in a manner which is consistent with maintaining the facility safety envelope.

II. Areas of Responsibility

MSC has primary responsibility for the safe conduct of activities within the NCPP facilities. Prior to performing any decontamination activity which involve radiological material, MSC will consult with EG&G's Nuclear Safety Engineering organization.

EG&G Nuclear Safety Engineering is responsible for maintaining the facility Safety Analysis. EG&G Nuclear Safety is responsible for reviewing proposed facility changes and tests and experiments to be performed in the facilities. MSC will ensure these reviews are factored into any proposed facility modifications.

III. Funding of Activities

A. MSC Responsibility

- EG&G Nuclear Safety is a service organization which is directly funded by organizations that use those services. MSC will include Nuclear Safety review and concurrence into any planned facility modifications.

B EG&G Responsibilities

EG&G will ensure that Nuclear Safety is funded in a work package for General support to the NCPP for review and evaluation of IWCP work packages.

Responsibilities of the parties for compliance with nuclear safety

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requirements under Price Anderson Amendments Act, 1988, will be incorporated into this SSSMOA prior to commencement of any Price Anderson Amendments Act covered work.

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Section O
DOE Oversight Management

I. General

This Section outlines the responsibilities of DOE-RFFO for Oversight Management.

Oversight of the MSC Cooperative Agreement for Stage II of the NCPP will be conducted primarily through the Office of Communications and Economic Development (CED). Coordination of activities and requirements will be conducted by CED staff members with the advice, concurrence and direction of the Contracting Officer, the Office of Chief Counsel, and other cognizant technical staff as appropriate.

II. Areas of Responsibility

MSC will provide unrestricted access to NCPP facilities to DOE Environmental, Health and Safety inspectors and all other cognizant DOE personnel at all times.

DOE will provide oversight of contractual and technical requirements throughout Stage II. This will include budget, invoices, progress reports, and related activities.

DOE will provide office equipment and supplies for the NCPP facilities as outlined in the MSC Cooperative Agreement.

III. Funding of Activities

DOE-RFFO will fund all NCPP Oversight activities.

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Section P
Miscellaneous Support Services

I. General

This Section outlines the responsibilities for Miscellaneous Support Services.

II. Areas of Responsibility

A. Parking

Parking facilities are provided in the vicinity of the NCPP facilities. These parking facilities will be maintained by EG&G. No special parking privileges will be granted to MSC employees or its executives.

B. Lock and Key Services

Locksmith services, including lock and key control, will be the responsibility of EG&G who will provide the locking device and key (electronic or manual).

The installation, repair, and maintenance of all locking devices including magnetic locks and electric striker plates, activated by cipher device or panel switch, will be the responsibility of EG&G.

Only locks that conform to the Rocky Flats locking system will be installed. MSC agrees to report instances of non-conforming locks to EG&G.

MSC will report all defective locks/locking devices and doors to EG&G. In the case of defective fire or security doors, compensatory measures will be taken by MSC as specified by the EG&G Fire Department or WSI.

MSC will have access to all buildings and rooms where security checks and/or emergency response may be required. WSI provides continuous key service as necessary.

MSC will provide EG&G with a list of personnel authorized to initiate

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requests for locksmith services. EG&G Safeguards and Security will screen requests and determine correct specifications.

EG&G will be responsible for the issuance and accountability of cipher codes for cipher locking systems. EG&G will have responsibility for setting and controlling combinations for security containers and vaults.

Separate inventories will be maintained by EG&G and MSC for keys under their control. MSC will request installation of new locks through the EG&G Operations Manager.

C. Coordination Of Tours

MSC will coordinate all tours of the NCPP facilities by outside visitors through the EG&G and DOE-RFFO Communications Departments. MSC will provide all necessary paper work and information sufficiently ahead of the anticipated tour or visit to allow effective processing.

D. Laundry

Laundry services will be provided by EG&G Laundry. MSC will be responsible for handling and packaging the laundry for pick up in accordance with established EG&G Rocky Flats Plant procedures. EG&G Traffic will pickup and deliver the laundry to the NCPP facilities.

E. Janitorial Services

MSC will be responsible for the General housekeeping of the NCPP facilities. MSC will maintain or hire their own janitorial staff.

F. Cafeteria Services

MSC employees will have access to the Cafeterias at the Rocky Flats Plant site.

G. Training

All training provided to MSC by EG&G or WSI will be provided on a charge back basis. MSC will maintain training records for its own

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employees.

III. Funding of Activities

A. MSC Responsibilities

MSC will provide funding for janitorial services in their zones of responsibility. MSC will provide funding for training of its personnel.

B. EG&G Responsibilities

EG&G will provide materials for new lock services. EG&G will provide funding for cafeteria services and laundry services through common support funding. Current baseline funding for laundry services is inadequate to accommodate the anticipated increase in laundry as a result of Stage II activities. The operational baseline funding will have to be increased or funding will have to be made available through a general support work package. Coordination of tours will be provided through the Communications Department baseline funding.

EG&G will provide MSC with two controlled copies of all applicable plant manuals and procedures.

EG&G will not provide the following services:

1) Legal.
2) Personnel, Human Resource, and Labor Relations.
3) Media Relation and Employee Communications except as otherwise directed by DOE-RFFO.
4) Internal Audit.
5) Finance and Accounting, except as otherwise directed by DOE-RFFO.
6) Other services not specifically identified in this MOA.

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Appendix B
M. N.. Silverman Letter (02569) to H. P.. Mann

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United States Government | Department of Energy
Rocky Flats Office

memorandum

DATE: APR 18 1994

REPLY TO ATTN OF: CED:JM:02569

SUBJECT: General Funding Plan for National Conversion Pilot Project Buildings

TO: Harry P. Mann
General Manager
EG&G Rocky Flats, Inc.

The purpose of this memorandum is to advise EG&G of expected support for the National Conversion Pilot Project (NCPP). This is in response to concerns raised by several of your staff.

1. The EG&G Associate General Manager for Administration and Planning should review the proper charging method for staff participation in the NCPP planning activities.

2. EG&G should assume, for the purposes of budget development, the same level of support for building 444, 447, 865 and 883 in the foreseeable future as provided in FY94.

3. EG&G should work closely with Manufacturing Sciences Corporation (MSC) to ascertain estimates of wastes generated during the cleanup stage of the NCPP, and identify associated treatment, storage and disposal costs. These estimates should be included in the appropriate FY95 - FY96 EG&G work packages.

4. EG&G should also work closely with Rocky Flats Office and MSC personnel in the NCPP Site Support Subcommittee, chaired by Mr. Tony Tome, of your staff, to develop site support service agreements, clearly delineating responsibilities and costs.

5. EG&G should estimate additional site costs associated with the NCPP that cannot/should not be logically and easily charged back to MSC during Stage II (perhaps including utilities, badging, training, etc.), and identify potential sources within the current EG&G budget to cover those costs. Please examine the feasibility of using 3161 funding for that purpose.

for Mark N. Silverman
Manager

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Appendix C
H. P.. Mann letter (94-RF-05565) to M. N.. Silverman

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EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC.
ROCKY FLATS PLANT, P.O. BOX 464, GOLDEN, COLORADO 80402-0464 • (303) 966-7000

'94 MAY 19 PM 1 37

May 18, 1994

94-RF-05565

Mark N. Silverman
Manager
DOE, RFFO

NATIONAL CONVERSION PILOT PROJECT BUILDINGS - HPM-444-94

Ref: M. N. Silverman ltr (02569) to H. P. Mann, General Funding Plan for National Conversion Pilot Project Buildings, April 18, 1994

This is in response to your letter of April 18, 1994, regarding the National Conversion Pilot Project (NCPP). Additional issues which remain for EG&G Rocky Flats, Inc. regarding the points outlined are as follows:

1. "Proper charging method for staff participation": In order to comply with the Management Control System policies, all EG&G Rocky Flats staff time will be charged to a work package for the support of the project. It is understood that funding will be made available to the site in the amount required to provide the anticipated support. If additional funding is not available, EG&G will re-prioritize the FY95 work scope during the Budget Call Process.

2. "Assume...same level of support for Buildings 444, 447, 865 and 883": In preparing the various budget requests to headquarters, these buildings were assumed to be funded by Stockpile Support at a minimal ("shut-down") level. No other funding for support of these buildings was requested. EG&G understands that $20M has been ear-marked for the NCPP. If none of those funds are available to EG&G, it will be necessary to revise FY95 funding request to include all building costs.

3. Once the Waste Management Plan for NCPP is finalized, EG&G Rocky Flats will address the implications to the various work packages (and headquarters programs/funding sources) which will be affected. It is important to note that no significant impact was planned in the Activity Data Sheets (ADSs) submitted for Fiscal Year (FY) 1995 and 1996.

4. EG&G Rocky Flats continues to work with the NCPP Site Support Subcommittee and is heavily involved in the preparation of the Memorandum of Understanding (MOU) and various plans. Additional support will likely be required.

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5. "Identify potential sources within the current EG&G Rocky Flats budget to cover costs...not logically or easily charged back to MSC during Stage II": After the MOU is finalized, EG&G Rocky Flats can determine which costs will be borne by EG&G Rocky Flats. In the instance of basic plant-wide services (landfill, etc.), no funding implications are expected. Methods for charging certain building specific supports such as utilities, maintenance, etc. are yet to be determined and may have budget implications. However, as to building support and waste treatment, storage and disposal, significant impacts may require a re-prioritization of work scope planned for FY95 and FY96 due to funding limitations.

In general, EG&G Rocky Flats has submitted budget requests based upon assumptions regarding building use and plant population, which may no longer be valid. As soon as detailed information is available and the implications of the NCPP can be assessed, EG&G Rocky Flats will advise your office and make specific recommendations as to the implementation of the Pilot Program.

for
H. P. Mann
General Manager
EG&G Rocky Flats, Inc.

GLS:bdm

Orig. and 1 cc - M. N. Silverman

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RCRA Units to be Closed - NCPP

Building 865

1.	Satellite Accumulation Area # 865-1866	Room 145
2.	90-Day Accumulation Area # 865-960	Room 172
3.	90-Day Accumulation Area # 865-2137	Room 145
3.	Interim Status Sump # 40.47	Room 151

Building 883

1.	Satellite Accumulation Area # 883-2004	Room 105
2.	Interim Status Tank T-1 # 40.27	Room 139
	Interim Status Tank T-2 # 40.28	Room 139

Building 444/447

1. 90-Day Accumulation Areas (Excess Chemicals)

444-2080	Room 201
444-2100	Room 116
444-2140	Room 204
444-2141	Room 137
444-2142	Room 203
444-2143	Room 245

2.	Interim Status Acid Tank # 40.02	Room 9A
	Interim Status Acid Tank # 40.03	Room 9A
	Interim Status Cyanide Tank # 40.06	Room 9A
	Interim Status Cyanide Tank # 40.07	Room 9A
3.	Interim Status Unit # 30	Room 501

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National Conversion Pilot Project
Stage I

Preliminary Cost/Benefit Analysis Report

Revision 3
10 October 1994

Prepared to:

US Department of Energy - Rocky Flats Office
P.O. Box 928
Golden, Colorado 80402-0928

Prepared by:

Manufacturing Sciences Corporation
804 Kerr Hollow Road
Oak Ridge, Tennessee 37830

Cooperative Assistance Agreement No:

DE-FC34-94RF00733

REVIEWED FOR CLASSIFICATION/UCNI
By
Date 12/06/94

National Conversion Pilot Project
Stage I

Preliminary Cost/Benefit Analysis Report

Revision 3
10 October 1994

Prepared by:	D. R. Floyd, MSC, Vice President	11/22/94 Date
Approved by:	M.L. Haupt, BNFL Inc. PM	11-22-94 Date
Approved by:	D.R. Floyd, MSC PM	11/22/94 Date
Approved by:	E. Nix, DOE-COR	11/22/94 Date

This report was prepared by Manufacturing Sciences Corporation (MSC) under Cooperative Assistance Agreement No. DE-FC34-94RF00733 with the U.S. Department of Energy - Rocky Flats Office.

This report is intended for DOE-RFFO's use. Such use, duplication, and disclosure of this report is to be in accordance with Contract No. DE-FC34-94RF00733.

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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
0	June 6, 94	All	All	First Approved Issue	
1	June 27, 94	All	All	Comprehensive Revision	
2	July 27, 94	10	4.2.1 4.2.2	Data Correction	
2	July 27, 94	11	4.2.3	Additions	
2	July 27, 94	15	4.3.3	Data Corrections	
2	July 27, 94	29, 30, 31, 32, & 37		Add Tables B3, B4, B5, B6, & D3	
2	July 27, 94	34, 35, & 36		Replace Tables	
3	Oct. 10, 94	All	All	General revisions to incorporate comments	DR 7 11/22/94

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1.0 Executive Summary

The mission of the National Conversion Pilot Project (NCPP) is ***"to explore and demonstrate, at the Rocky Flats site, the feasibility of economic conversion at Department of Energy facilities."*** The NCPP was authorized by Secretary of Energy, Hazel O'Leary to proceed in three distinct stages with a review and decision required at the end of each stage before proceeding to the next. The NCPP is being conducted through a Cooperative Assistance Agreement (CAA) between the Department of Energy (DOE) and Manufacturing Sciences Corporation (MSC).

Stage I of the NCPP primarily involves planning and analysis for subsequent stages. It lasts 90 days and will cost the DOE $1 million (MM). Stage II would involve cleanup of four buildings and preparation for metal recycling activities, which would be done in Stage III. In the MSC proposal advancing the NCPP concept, Stage II was estimated to require two years and $40 million to complete and Stage III was expected to last three years and require gradually decreasing DOE funding as recycling revenues increased.

The DOE intends that the actual duration and cost of Stages II and III be determined before proceeding with either stage. The purpose of this preliminary cost/benefit analysis report is to provide those involved with the decision of whether to proceed into Stage II of the NCPP with information to aid in that judgment.

The approach followed in this report is to analyze the costs and benefits for each stage independently, since each must "stand alone" in the sense that the project could be terminated after any of them. The preliminary nature of and limited funding for the report precludes an in depth analysis or a full review of all possible options. The report examines the financial cost to the DOE of each stage and contrasts these with anticipated benefits, both quantifiable and intangible.

The NCPP cost/benefit potential is analyzed for three possible options:

1. Terminate now
2. Terminate after Stage II
3. Proceed through Stage III and a five-year lease period

A summary of the quantifiable forecast is as follows:

	DOE Cost, $ million	Peak Benefit, $ million	Benefit/Cost Ratio
Option 1	0	0	---
Option 2	42	96	2.3
Option 3	42	523	12.5

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The DOE has determined that the recycling activity in Stage III will be openly competed. The Stage III figures presented above are based on markets and other assumptions identified by MSC and may vary if another contractor is selected.

Some of the key benefits identified in the report include:

Stage I Benefits

1. A sound basis for determination of whether the project should proceed before committing to the much more costly second stage.

2. An understanding of the issues that concern Rocky Flats Stakeholders and whether these can be resolved.

3. An estimate of the cost of decontamination, declassification, and process verification necessary to prepare the four buildings for commercial operations.

4. An understanding of how the cleanup activities can be permitted under an Interim Measure/ Interim Remedial Action (IM/IRA) mechanism, bringing together Comprehensive Environment Response Compensation, and Liabilities Act (CERCLA) and The National Environmental Policy Act (NEPA) considerations.

Stage II Benefits

1. Four buildings, totaling 200,000 sq. ft. in area will be cleaned, decontaminated and made ready for future recycling activities by removing 2320 cubic yards of radioactive waste. About 2/3 of this waste is classed as low-level and the balance is low level mixed. New manufacturing space containing similar environmental controls would cost over $20 MM to establish.

2. Equipment in the four buildings will be cleaned to a level suitable for conducting recycling operations, repaired if necessary to meet environmental and safety requirements, and made ready for future recycling activities. If this equipment were installed new today, its book value would be $72 MM.

3. Employment of up to 207 displaced Rocky Flats Environmental Technology Site (RFETS) workers and retraining them for cleanup duties.

4. Local economic benefits, including purchase of supplies and services from local sources in an amount estimated at $10 MM during Stage II, and $15 MM annually for as long as the project continues.

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Stage III Benefits

1. Employment of nearly 500 displaced RFETS workers

2. Conserving resources by safely using environmentally-conscious manufacturing methods in facilities at RFETS to recycle DOE scrap metals into needed products.

3. Potential for continuing annual benefits to the local economy from a business with annual sales of nearly $50 MM. These benefits include primary wages of the workforce estimated at $17.5 MM, a multiplier effect estimated at 2.5 times the primary wages, or $ 44 MM, and payment of state and local taxes estimated at $2 MM.

4. Potential for annual lease and scrap metal payments of $7.5 MM in future lease periods

5. If a five year lease period follows the end of Stage III and achieves the forecast sales goals, the $42 MM DOE investment required in Stage II to make this happen will generate an overall economic return of $523 MM, yielding a benefit/cost ratio of 12.5 to 1.

The bases for the estimates of both costs and benefits are detailed in the report and its appendices. Because the appendices contain business sensitive information of MSC, their distribution is restricted to persons involved in making the Stage II decision and who have executed a non-disclosure agreement with MSC. The main body of the report is available for general review and contains summary information from the appendices.

The final recommendation of the report is that the potential benefits outweigh the estimated costs sufficiently to justify a decision to proceed into Stage II.

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2.0 Introduction

The mission of the NCPP is ***"to explore and demonstrate", at the Rocky Flats Site, the feasibility of economic conversion at Department of Energy facilities***. An important part of accomplishing that mission is to demonstrate whether the benefits that can be expected from the NCPP will justify its cost.

This is a *preliminary* report. It is generally recognized that insufficient information is available at this initial stage of the project to prove conclusively that the benefits will outweigh the costs. However it is important to gain a sense that sufficient potential for a favorable cost/benefit ratio exists to merit proceeding with Stage II of the NCPP. This preliminary report was therefore made a deliverable of the CAA between the DOE and MSC (1). A companion report to this, the Preliminary Market Analysis Report, provides more detailed descriptions of the markets on which this preliminary cost/benefit analysis is based (2).

The manner in which the NCPP is expected to explore and demonstrate feasibility of conversion is to see if four buildings previously used at the RFETS to make metal components for nuclear weapons can be converted to enable production of metal products for commercial and government use. The concept is to recycle scrap metal arising from the decommissioning of several DOE sites around the country. Because much of the DOE metal is radioactively contaminated, it appears reasonable to use a site such as Rocky Flats, where similarly radioactive metals were previously processed, to conduct the recycling. The environmental control infrastructure is already in place at RFETS and use of these facilities would eliminate the need to expose new facilities to radioactive contamination. Also the workforce previously skilled at working with such metals would be re-employed in a manufacturing industry rather than one less demanding of their know-how.

It is recognized that many issues need to be addressed to learn whether such an economic conversion is feasible. Examples of such issues are:

1. Can a factory previously used to produce small batch quantities of high precision components be converted for higher volume output?

2. Can the culture of a government-owned, contractor-operated plant be changed to accommodate an industrial profit-oriented culture?

3. Can a private firm be licensed and regulated on a DOE site?

4. Can suitable leasing arrangements be made, including accommodating the parties liability issues given that RFETS and many other DOE locales are Superfund sites.

5. Will the local community support continuation of operations at RFETS using materials similar to those processed previously?

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2.1 NCPP Organization

In order to address these and a host of other issues and questions, the architects of the NCPP created the unique organizational structure depicted in Figure 1.

2.1.1 Steering Committee

Central to this organization is a steering committee comprised of a single representative from those organizations most critically impacted by, or who have critical influence over, the outcomes of the project. These are:

- The Colorado Governors Office, represented by the Defense Conversion Director from the Colorado Office of Business Development
- The Colorado Department of Health and Environment (CDPHE)
- The Department of Energy (DOE)
- The Environmental Protection Agency (EPA)
- EG&G, the Management and Operating Contractor at Rocky Flats
- MSC, the NCPP Contractor
- The Rocky Flats Local Impacts Initiative (RFLII), an organization representing 18 local stakeholder groups.

2.1.2 Contractor and Subcommittees

The steering committee provides guidance and oversight to the NCPP contractor, whereas the DOE, through a CAA, provides project direction and most of the funding. Much of the work needed by the steering committee is provided by the six subcommittees listed in Figure 1. A steering committee member is designated as liaison to each subcommittee. Make-up of the subcommittees is drawn from the seven organizations represented on the steering committee plus other affected organizations including:

- United Steelworkers of America, Local 8031, the main plant union
- The International Guards Union of America, Local 1
- The Colorado Building Trades Council
- Wackenhut Security Incorporated (WSI), the plant security contractor

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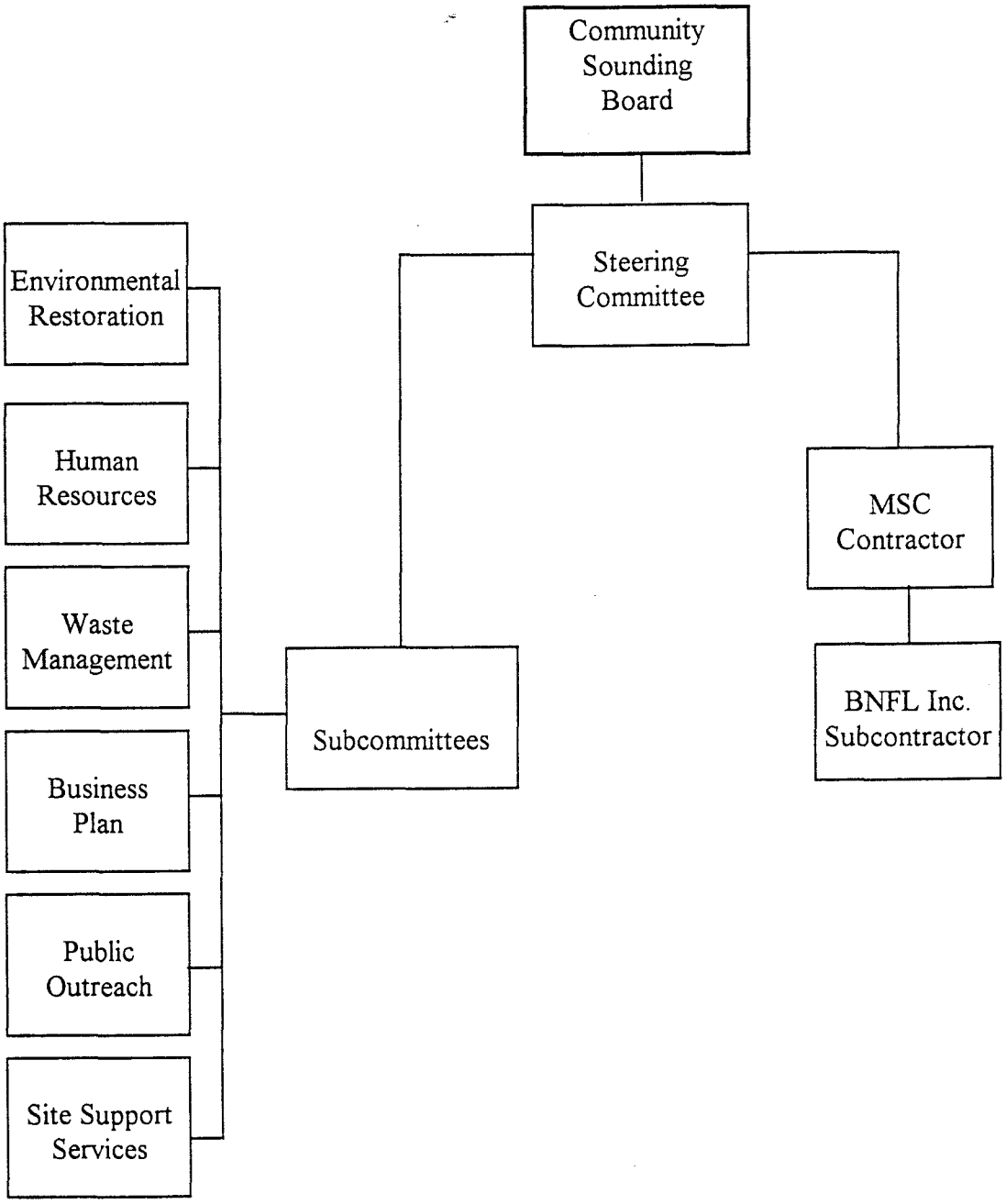
Figure 1

NCPP Stage I

Organizational Structure



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2.1.3 Sounding Board

The NCPP organizational structure also includes a sounding board comprised of individual representatives of organizations not serving on the steering committee but who have an important interest in the project. This entity listens to proposed responses to issues and provides the steering committee with an initial sense of public reaction to these responses. Sounding board members are also important sources of new issues that need addressing.

2.2 NCPP Stages

Initiation of the project was approved by Secretary of Energy, Hazel O'Leary (3) and jointly announced by Colorado's Governor, Roy Romer and officials of the EPA, CDPHE and DOE (4). The project is to proceed in three stages, with additional approval required between each stage.

2.2.1 Stage I, Planning/Characterization

The first stage, involving characterization of the condition of the four buildings to be used for the NCPP and planning for subsequent stages, began on April 1, 1994 with a defined period of 90 days to accomplish the prescribed work.

2.2.2 Stage II, Cleanup

If approved, the second stage will involve cleanup of these four buildings in preparation for Stage III, the recycling stage. Stage II involves two aspects in addition to cleanup: 1) declassification of existing hardware in preparation for recycling it, and 2) a limited amount of process verification to demonstrate suitability of the equipment within the buildings for producing products that can be made with recycled metals in Stage III. Stage II is expected to require about two years to complete.

2.2.3 Stage III, Recycling

Although MSC is the NCPP contractor for Stage I and II, the Stage III contractor will be selected through a competitive process. MSC will be eligible to compete for this contract. The contractual instrument for Stages I and II does not allow the contractor a fee and, in fact, requires cost sharing by the contractor. Although the terms and conditions for Stage III have not yet been specified, it is expected that it will involve 1) a leasing arrangement, 2) payment to the DOE for scrap metals utilized, and 3) and the opportunity for the contractor to generate profit from manufacturing products for both government and commercial use.

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3.0 Approach

Fundamental to the preparation of data for this Preliminary Cost/Benefit Analysis is the assumption of a manufacturing scenario. This scenario, presented in Appendix A, defines:

1) A typical set of products that could be manufactured at Rocky Flats,
2) Processes that would be used to make these products, and
3) How the equipment within the four buildings slated for use by the NCPP will be used to do this work.

Since this scenario contains information specific to MSC's interest in Stage III recycling, Appendix A will not be included in the public distribution of this report. It will be provided to the DOE and to others tasked with reviewing the merits of this report under non-disclosure restrictions. Summary information from the appendix is included in the main body of the report.

The approach taken in this report is to examine solely the cost/benefit issues of the NCPP itself. It would be possible to examine the more global benefits of recycling DOE metals in general, but that topic is covered generically in the NCPP Preliminary Market Analysis Report (2). Since each stage must stand alone and the project could be terminated before proceeding to the next, the cost and benefit of each stage will be examined independently. The *cost* of each stage is fairly quantifiable. It will be defined as the amount of money the DOE will be expected to provide to accomplish the activity defined for that stage. The *benefits* will include both intangible as well as quantifiable results. For example, an intangible benefit of Stage I has been to develop a closer working harmony between the DOE, EPA, and the CDPHE. A quantifiable benefit of Stage III will be to compensate the DOE for value received by the use of equipment or scrap metal. In general, the closer the project gets to Stage III, the more quantifiable the benefits will be.

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4.0 Cost/Benefit Data

4.1 Stage I, the Planning/Characterization Stage

4.1.1 Stage I Costs

The direct cost of Stage I to the DOE is $988,000. This sum is required to reimburse the NCPP contractor MSC, for allowed costs incurred in support of Stage I activities as defined in the NCPP Stage I Work Plan (4). In addition, MSC contributed $89,236 to Stage I activities.

There are additional costs associated with Stage I that have not been quantified but are nonetheless real. These are mostly costs for time spent by a wide variety of persons preparing for and executing Stage I activities. Examples include the members of the steering committee, the sounding board and the six subcommittees. It is estimated that this contribution totaled about 10,000 person-hours. If one assumed wages and other direct costs averaged $50 per hour per person, the value of the contribution would be $500,000. Thus, the total cost of Stage I is approximately $1.6 MM

4.1.2 Stage I Benefits

The benefits anticipated or realized for Stage I include:

- A determination of whether the project should proceed into the much more costly second stage.
- An understanding of the issues that concern Rocky Flats Stakeholders and whether these can be resolved
- Experience that can be and has been shared with the rest of the DOE regarding how a process such as this can be organized and conducted
- An assessment of the degree and nature of contamination present in the four buildings of interest
- An estimate of the cost of decontamination, declassification and process verification necessary to prepare the four buildings for commercial operations
- A plan whereby the Stage II activities described in the preceding can be completed
- Goodwill among existing and displaced RFETS employees that the DOE is sincerely seeking ways for them to be re-employed in careers that utilize the expertise they gained while supporting the U.S. Defense mission at Rocky Flats
- Goodwill among the local stakeholders that the DOE is sincerely interested in mitigating the economic decline necessitated by defense cutbacks and the eventual plant closure.
- Improved cooperation among state and federal agencies concerned with RFETS issues

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- A direct cost sharing of $89,236 by MSC, and an estimated indirect cost sharing by MSC of an additional $125,000 to develop and communicate the NCPP concept
-
- An analysis of potential markets for recycling DOE scrap metals, regardless of whether such recycling is ever done at RFETS
- An understanding of how the cleanup activities at a DOE site, which is on the National Priority Superfund Site, can be permitted under an IM/IRA mechanism, bringing together CERCLA and NEPA considerations to create a modified IM/IRA approach.

It is apparent that most of these benefits are not quantifiable. It is therefore not possible to state that the benefits exceeded the costs. However in the event that the NCPP is terminated after Stage I, the listed benefits are evidence that not only was a great deal learned and accomplished during Stage I, but also that the government received good value from the approximately $1.6 MM expenditure, if only by avoiding a much greater expenditure that, in the event of project termination, would not have been warranted.

4.2 Stage II, the Cleanup Stage

4.2.1 Stage II Assumptions

1. Once approved, Stage II will be carried to completion.
2. The Stage II Work Scope, as presented in the (CAA), will be completed as defined, on time and within budget.
3. Benefits for services provided, whether by the NCPP or the Management and Operations (M&O) contractor, are at least equal in value to the cost of those services, and may be more if value was added.

4.2.2 Stage II Costs

The total estimated costs to the DOE for Stage II is $ 42.2 MM. Of this sum, $38.2 MM covers all the reimbursable activities of MSC, its principal subcontractor BNFL Inc., and other sub-contractors as required. The remaining $4 MM covers the estimated costs of the M&O contractor which are in addition to the costs for M&O activities needed to support the safety envelop of the four NCPP buildings, because these costs would be incurred regardless of the presence of NCPP activities in these buildings. The basis for the MSC costs is presented in Appendix B and detailed in Table B.1.

The M&O estimate was provided by EG&G Rocky Flats, Inc. (EG&G/RF). In the event that the NCPP is terminated after Stage I, the M&O contractor must still expend $22 MM to maintain the four NCPP buildings in safe standby condition during the two years that Stage II would require. If Stage II proceeds, the M&O contractor will require an estimated $4 MM, for a total of $26 MM.

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4.2.3 Stage II Benefits

1. Four buildings, totaling 200,000 sq. ft in area, will be cleaned, decontaminated and made ready for future recycling activities. New manufacturing space containing similar environmental controls would cost over $20 MM to establish, based on the $100 per square foot cost MSC experienced building a similar facility in Oak Ridge, Tennessee.

2. Equipment in the four buildings will be cleaned, repaired if necessary to meet environmental and safety requirements, and made ready for future recycling activities. The original book value of this equipment is $21,419,381 MM. The current, depreciated book value of this equipment is $8,830,800. It is estimated that if all of this equipment were installed new today, its book value would be $72 MM.

3. An estimated 207 displaced RFETS workers will be hired by MSC and employed for two years doing cleanup, declassification, process verification and related support activities. The total NCPP payroll, including these employees, 20 subcontractor employees and three MSC managers, is estimated at $16 MM or about 42% of the total project cost.

4. Approximately 272,000 pounds of security-classified steel, beryllium, uranium and aluminum parts will be declassified. The value of this metal, if resold as scrap, is estimated to be $3,555,000. It will have more value when processed into intermediate and final product form during Stage III, if it is approved. That higher value will be taken as a benefit of Stage III.

5. Prototypical manufacturing processes for stainless steel (S/S) containers for use in storing plutonium metal, for disposing of waste, and for beryllium alloy products will be demonstrated to enable appropriate assessment of the facility manufacturing capability. A cost reimbursement of $741,000 is expected to result from sale of demonstration hardware.

6. An IM/IRA mechanism for administering cleanup of portions of a DOE Superfund Site will be demonstrated.

7. Open communication with local stakeholders will be enhanced by "before and after" tours of cleaned facilities and by showing examples of products that could be made in Stage III. Regular Public Information Meetings and formal public hearings at the beginning and near the end of Stage II will also support this benefit.

8. Sharing of results of Stage I and II of the NCPP will be done by visits to other DOE sites, visits by representatives of other DOE sites and through participation in national meetings on related topics. NCPP participation in two national DOE committees concerned with 1) waste container standardization and 2) scrap metal inventories will also support this national public outreach benefit.

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9. The net market value of DOE equipment suitable for resale, after decontamination costs have been recovered, is $2.3 MM.
10. Local economic benefits will include purchase of supplies and services from local sources in an amount estimated at $10 MM. At least 40% of this amount will be with small businesses and at least 20% with small women-owned and/or minority businesses.

11. The potential for establishing a long term manufacturing operation at RFETS will have been determined. This potential benefit includes, at peak production, estimated annual benefits of:

    - 500 jobs
    - $20 million payroll
    - $15 million procurement of supplies and services from local vendors
    - $3 million in local taxes
    - Return of $7.5 million to the DOE through lease fees and scrap metal purchases
    - Elimination of $8 million in costs to maintain the four NCPP buildings in standby, because the Stage III contractor will assume these costs under leasing arrangements.

4.2.4 Stage II Cost/Benefit Analysis

Two options are available to the DOE at this point. One is to terminate NCPP now. If this option is selected, the DOE cost will remain at $22 MM to cover the required maintenance of the buildings. EG&G estimates that this cost will be reduced somewhat during the first two years, but will stabilize at about $9 MM per year for the indefinite future. Thus, the cost to the DOE in five years will be $50 MM and in ten years will be $96 MM.

The benefit the DOE will receive for these costs equals the costs, and the net DOE benefit, defined as the difference between DOE benefits and DOE costs, is zero for all times over the next ten years. The local economic benefit is due to the impact of the wages of the workers. The University of Colorado published in 1989 a study of the impact of RFETS wages on the local economy. This study found that a beneficial multiplier effect of 2.76 times the wages is experienced by the local economy. To be conservative, throughout this study a multiplier of 2.5 times the anticipated payroll is used. The negative impact of the loss of wages due to cancellation of the NCPP for the two year period of Stage II is therefore 2.5 times the anticipated payroll of $16 MM, or about $40 MM. The positive impact of the $22 MM, M&O expenditure, of which 75% is wages according to EG&G, is about $42 MM. Thus the net impact is a positive $2 MM.

In five years, however, the impact is negative as can be seen in Table B.3, which compares the economic impact of the two options: termination or proceeding with Stage II. The data in this table is based on the assumption that the estimated wages due to the NCPP will total $47 MM during the three years of Stage III and $100 MM during the five year lease period after Stage III. The bases for these assumptions is found in subsequent sections of this report. In Table B.3, it can be seen that the net impact of terminating the NCPP now

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(Option 1), is a negative benefit (i.e. a cost) of $66 MM in five years and $228 MM in ten years.

Option 1 presented in Table B.3 focuses on the local economic impact if Stage II proceeds, but is terminated before the NCPP proceeds into Stage III. The net local economic impact is positive in two years when the work is being done, but decreases in five years due to the loss of the Stage III potential, and becomes negative in ten years when compared to proceeding with the NCPP. It can be seen in Table B.3 that, for all time periods, proceeding with Stage II has a more positive local economic impact than terminating the NCPP now. The magnitude of this impact is the difference between Option II and Option I for each time period. In two years this difference is $87 MM, in five years it is $83 MM and in ten years it is $65 MM. Thus, the net local economic benefit from continuing with Stage II of the NCPP is in the range of 1.5 and two times the cost of the NCPP, depending on the time period examined.

If the option to proceed with Stage II is selected, tangible, value-added benefits totaling nearly $7 MM will result, as follows:

- Declassification will produce $3.6 million in scrap metal suitable for resale
- Decontamination will produce clean equipment suitable for resale with an appraised market value of $2.3 million after allowing for $8 MM in cleanup costs.
- Sale of prototype hardware produced during verification operations conducted during Stage II will generate revenue of $7 MM.

The costs and benefits described above are summarized in Table B.4. The NCPP costs (line 1) and the M&O costs (line 2) are combined as the total DOE costs (line 3). The benefits due to the services provided by the NCPP activities are combined in line 4 with the benefits of the M&O activities performed in the NCPP buildings. These benefits are defined as being equal to the costs. Note that in ten years the cumulative M&O costs presented in line 2 of Table B.4 for Option 2 are $8 MM lower ($88 MM) than those for Option 1 ($96 MM). This is due to the reduction in the cost of maintaining the four NCPP buildings that results from the cleanup improvements.

It can be seen in line 5 of Table B.4 that the net benefit to the DOE is zero for the termination option and $7 MM for proceeding with Stage II only. This reflects the value-added contribution from the Stage II NCPP effort. The $8 MM savings in maintenance costs is "hidden" in the net DOE benefit figures because the net benefit reduces at the same rate as the net cost due to the definition that the benefit equals the cost of these services. Although hidden, this is a real savings that will be realized annually until the final disposition of these four NCPP buildings.

The summary results from Table B.3 are presented in line 6 of Table B.4. The net DOE benefit is combined with the local economic benefit to obtain the net overall benefit presented in line 7 of Table B.4. At each of the three periods examined the net benefit of proceeding with Stage II (Option 2) is positive compared to termination of NCPP now (Option 1). The

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amount of this difference, ranges from $94 MM (two years) to $72 MM, which is from 2.2 to 1.7 times the investment DOE is now being asked to make in Stage II of the NCPP.

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4.3 Stage III, the Recycling Stage

4.3.1 Stage III Unknowns

Substantial uncertainty exists regarding Stage III. Most fundamentally, it is not known whether there will even be a Stage III. Even if there is, the contractor who would carry out Stage III recycling activities is not known. Therefore, the specific markets that the contractor would develop at RFETS are uncertain. Also, the precise leasing arrangements, reimbursement amounts for scrap metal value and costs to DOE during the transition are not presently known.

In order to prepare an estimate, MSC and the Stage I and II contractor, must make certain assumptions, which are listed below and disclose information it sees about viable markets and reasonable business arrangements, which are described in the appendices. In order that full evaluation of the report can be made, details of this information that are considered proprietary will be shared, but only under agreement of non-disclosure.

4.3.2 Stage III Assumptions

1. Stage III will begin immediately after Stage II is completed and will terminate three years thereafter. Continuation of manufacturing beyond Stage III will be determined through the NEPA review process and the Long Range Site Reuse Planning Process.

2. Regardless of which firm is selected as Stage III contractor, the same workers who participated in Stage II activities will remain to conduct initial Stage III operations and be compensated at their Stage II prevailing wages, which are based on surveys of comparable positions in similar industries and the need to be competitive as a commercial enterprise. Additional workers will be hired as business conditions require. This plan shows additional hiring will be needed about halfway through Stage III, reaching a peak workforce of 462 persons by the end of Stage III.

3. Process verification and limited pre-production activities necessary to develop and demonstrate potential recycle markets will be performed during Stage II.

4. The production performance that is forecast in Table A.1 will be realized. The actual product type and mix may vary, but the results achieved will be as indicated.

5. No facility upgrades to improve productivity will occur in Stage II, but environmental control and waste processing upgrades will be done in Stage II.

6. The Stage III contractor will fund facility upgrades if necessary to achieve the production performance forecast in Table A.1.

7. Scrap metal will be imported to RFETS as required to meet the requirements forecast in Table A.2. An estimate of the nature, quantity and timing of this scrap import requirement is presented in Tables A.3 to A.5.

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8. The DOE will allow a realistic credit for recycling scrap metal of $1.09 per pound, as described in Appendix C, and the prices listed in Table C.1 for Stage III products will be achieved.

9. In order to utilize RFETS scrap metal to contain RFETS waste, The Department of Energy/Rocky Flats Field Office (DOE/RFFO) will agree to purchase mild steel boxes and stainless steel plutonium waste containers in the quantity described in Table A.1, for the price described in Table C.1 and on the schedule presented in Table C.2.

10. The proposed leasing arrangements and scrap metal reimbursement amounts proposed in Appendix D and summarized in Table D.1 are agreed.

4.3.3 Stage III, Costs

Presented in Table D.2 is a summary of the "Sales and Costs" for all three stages of the NCPP. It is not possible to ramp up instantly to a profitable mode because the decision whether to proceed with Stage III recycling activities will not be made until late in Stage II, and customers for recycle products will not have been arranged. Starting a new operation such as this will pose significant financial risk for the Stage III contractor. It is assumed that the DOE will mitigate this risk to the Stage III contractor by making an investment of the amount needed to cover initial losses in anticipation of recovering the entire investment from lease and scrap metal payments. This investment approach will be a subject of negotiation with the Stage III contractor, so the data presented here should only be considered an example.

This scenario is depicted in Table D.2. It can be seen that in the first quarter the loss is projected to be $4,042,000. This loss includes $509,000 of lease and scrap metal payments to the DOE. It is assumed that the DOE will provide the Stage III contractor $4,402,000 in this quarter but will receive a return of $509,000, making the "net" investment at this point $3,533,000. It can be seen by studying Table D-2 that the investment required of DOE decreases continuously from $3.5 MM in the first quarter of Stage III to no subsidy after the fifth quarter. Also, the cumulative subsidy will reach a maximum of $10.3 MM after the fifth quarter. At this point the value of the quarterly scrap metal and lease payments exceeds the investment, so no further cash outlay is required by DOE after FY 97. Each quarter thereafter, the DOE receives a return on the investment. This income stream is sufficient that by the end of the 11th quarter of Stage III the entire $11.1 MM investment will have been returned. By the end of Stage III, the DOE will have realized a net return of $1.5 MM.

Thus, in this scenario, there will be no net cost to the DOE for Stage III. In fact, the DOE will realize a net gain equal to about 15% of the proposed $10.3 MM investment. The DOE will be positioned to achieve significant annual income from the investment during any subsequent leasing periods and will also realize significant maintenance cost avoidance. Based on these estimates, the annualized profit margin for the Stage III contractor will reach about 9% of sales by the final quarter of Stage III.

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4.3.4 Stage III, Benefits

The benefits derived during Stage III are a direct result of the sales forecast in Table D.1. The scrap metal payments to the DOE are based on the amount of such metals used to make the products and the negotiated value of the scrap metal as described in Appendix D. It is assumed that the Stage III contractor will agree to a lease payment equal to 10% of sales of products. During the majority of Stage III, these scrap metal and lease payments will be used to repay the DOE for its investment required during the first year of Stage III, as shown in Table D.2.

The same format for presenting the cost/benefit analysis for Stage II in section 4.2.4 is used to describe Option 3 in Tables B.5 and B.6. Option 3 assumes NCPP proceeds as forecast and continues into a successful five year leasing period. Table B.5 presents data regarding local economic impacts and includes the data presented in Table B.3 for ease of comparison. The data for two years is the same for Options II and III, reflecting Stage II results. In five years there are significant differences. The M&O benefits after Stage III are only $64 MM compared to $95 MM for Option 2 because the Stage III contractor will assume all costs associated with maintenance of the four NCPP buildings that the M&O contractor would have incurred if Stage III had not proceeded. The NCPP benefits in Option 3 are strongly positive instead of negative as in Option 2, the effect of wages of the NCPP workforce. The net local impact of the lower M&O wages and higher NCPP wages in Stage III is strongly positive. This same trend occurs even more strongly for the ten year comparison.

In Table B.6 the various options can also be compared. For Option 3, the NCPP costs to the DOE in line 1 do not increase with time, indicating that there are no additional DOE costs in Stage III. In line 2, the M&O costs to the DOE in the five year period increase $8 MM for Option 3 compared to Option 2. This represents transition costs while the Stage III contractor is taking over the maintenance costs and preparing to run the buildings. These costs do not increase during the next five years because the Stage III contractor is incurring them as part of the manufacturing costs. These costs are totaled in line 3 and show the same trend for the same reasons.

The net DOE benefit in line 4 is less for Option 3 after five years than for Option 2 mostly because of the reduced M&O maintenance costs, which is in reality a cost savings to the DOE. After ten years the effect of leasing and scrap metal payments is greater than the reduction in M&O costs, so that Option 3 benefits are clearly greater than Option 2. The net DOE benefit after ten years is forecast to be $124 MM. The total DOE cost giving rise to this benefit is $42 MM. Thus, the DOE benefit/cost ratio is about 3 to 1. In line 5 the net DOE benefits are presented. These are the real, value-added benefits and Option 3 can clearly be seen to be better than Option 2.

The local economic benefit results from Table B.5 are included in line 6 of Table B.6. These are added in line 7 to the net DOE benefit to obtain the net overall benefit of the NCPP. It

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can be seen that this benefit may reach $523 MM in ten years. Considering the net cost to the DOE to achieve this benefit is $42 MM, this represents a benefit/cost ratio of 12.5 to 1.

5.0 Discussion

In an effort to determine the reasonableness of Stage II cleanup costs, MSC obtained with the help of DOE, information about similar cleanup activities at other DOE sites. At the Fernald Site, the information concerned the Decontamination and Decommissioning (D&D) of Bldg. 5, which is uranium contaminated (9). This is a five story building, with total area of the five floors being about 35,000 sq. ft. The cost breakdown provided suggests that, for those activities in common with NCPP planned activities, the costs are comparable. It appears that the overhead rates of Fernald Environmental Restoration Management Company (FERMCO), the site cleanup contractor, are higher than what is forecast for the NCPP.

At Battelle Columbus Laboratories (BCL), a decontamination for alternate use activity similar to what is planned for the NCPP is underway (10). In this case the NCPP costs are significantly lower on a per square foot basis than those experienced at BCL.

The substance of this Stage III Cost/Benefit analysis can be found by a careful review of the information provided in the accompanying tables. Those tables that relate to Appendix A define the assumptions about product types and quantities that will be manufactured in Stage III. These data are then used to determine the amount of metal that would be needed to produce the products during Stage III and are compared to feed material available at the RFETS to determine what must be imported.

The tables for Appendix B define the costs for the manufacturing operation based on the product requirements and the staff needed to meet these requirements. In truth, the operation is over-staffed initially to carry the workforce that was used in cleanup into the manufacturing stage. The rationale is that the productivity of the workforce will be low initially and the extra people will be needed to maintain delivery schedules. Also, there will be a significant manufacturing training need during this period.

The prices for products to be manufactured at the RFETS and sold during Stage III are estimated in the "C" Tables. In general the price basis is determined from known data about what is charged for these products presently. Included in the price for Radioactively-Contaminated Scrap Metal (RSM) products is a credit of $1.05 per pound for disposal cost avoidance. This rate is at the low end of the range of prices charged commercially for such disposal services. Since the DOE will be the source of the RSM, these figures assume that the DOE will agree to this rate of credit. Legislation mandating such level of credit has been drafted for the current session of Congress.

There are a host of intangible benefits that can result from pursuing the NCPP. The impact of the respective options on these benefits is presented in Table D-3. At a glance it can be seen that many negative benefits that would be obtained if the NCPP is terminated would be converted to positives if Option 2 were pursued. Furthermore, if Stage III occurs subsequent

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to Stage II (Option 3), all the intangible factors would be viewed as positive, save one. It is hoped that with improved information that will be available as a result of Stage II, even those not in favor of continuing work at RFETS will come to realize that the project should proceed because the risk to the public and the workforce is well-understood and is negligible.

6.0 Recommendations

1. Since it is apparent that the potential benefits of the NCPP significantly outweigh the expected costs, the project should be allowed to proceed to Stage II.

2. A more comprehensive Cost/Benefit Analysis should be prepared prior to a Stage III Manufacturing Decision, based on improved information that will become available during the course of Stage II.

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7.0 References

1. Cooperative Assistance Agreement, DE-FC34-94RF00733, April 1, 1994

2. Preliminary Market Analysis Report, deliverable under Cooperative Assistance Agreement, DE-FC34-94RF00733, April 1, 1994

3. Memo on the National Conversion Pilot Project, signed by DOE Secretary Hazel R. O'Leary Dec. 15, 1993

4. Joint NCPP Announcement, Colorado Governor Roy Romer, Dec. 21, 1993

5. NCPP Stage I Work Plan, Cooperative Assistance Agreement, DE-FC34-94RF00733.

6. GAO, 1992, "NUCLEAR MATERIALS, Removing Plutonium Residues from Rocky Flats will be Difficult and Cost", General Accounting Office Report GAO/RCED-92-219, September 1992, 28p.

7. Winston, P. L., WINCO, Minutes of Meeting, "Standardization of Waste Storage and Disposal Containers", Salt Lake City Utah, March 24-25, 1994

8. Lettter, James E. King, FERMCO, to Kevin Keenan, DOE/ RFFO, June 8, 1994

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8.0 Glossary of Acronyms

Be	Beryllium
BCL	Battelle Columbus Laboratories
BWI	Brush Wellman Incorporated
CAA	Cooperative Assistant Agreement
CDPHE	The Colorado Department of Health and Environment
CERCLA	Comprehensive Environment Response Compensation, and Liabilities Act
CO_2	Carbon Dioxide
D&D	Decontamination and Decommissioning
DOE/RFFO	The Department of Energy/Rock Flats Field Office
DU	Depleted Uranium
EG&G/RF	EG&G Rocky Flats, Inc.
EPA	The Environmental Protection Agency
FERMCO	Fernald Environmental Restoration Management Company
FFLII	Rocky Flats Local Impact Initiative
GAO	General Accounting Office
HLW	High Level Waste
IM/IRA	Interim Measures/Interim Remedial Action
LANL	Los Alamos National Laboratory
LLW	Low Level Waste
MM	Million (a thousand thousand)
M&O	Management and Operations
MPC	Multipurpose Canister
M/S	Mild Steel
MSC	Manufacturing Sciences Corporation
NCPP	National Conversion Pilot Project
NEPA	National Environmental Policy Act
RFLII	Rocky Flats Local Impacts Initiative
RFETS	Rocky Flats Environmental Technology Site
RSM	Radioactively-Contaminated Scrap Metal
S/S	Stainless Steel
TQM	Total Quality Management
VAC	Vacuum Arc Furnace
VAM	Vacuum Arc Melting
VAR	Vacuum Arc Remelting
VIM	Vacuum Induction Melt
WSI	Wackenhut Services Incorporated

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*** Note: All Financial Information is Presented in 1994 Dollars.**

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Table A.1 Product Types and Quantities to be Produced

Table A.1
Manufacturing Sciences Corporation Projection of the Quantity of Product
to Be Produced at Rocky Flats during the National Conversion Pilot Project

Market	Product	SI	Stage II								Stage III											
		FY 94		FY 95				FY 96				FY 97				FY 98				FY 99		
		III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
RSM	Pu Waste Containers			V	V	200	400	600	800	1000	3000	3000	3000	3000	1000	1000	1000	1000	1000	1000	1000	1000
	Pu Metal Containers					V	V			1000	1500	2500	2500	2500	2500	2500	2500	1500	1000	500		
	LLW- M/S							V	V		100	300	700	700	700	300	350	400	400	400	400	400
	LLW- S/S							V	V			50	100	150	200	250	300	350	400	450	500	550
	S/S Drums, 30 Gal.					V	V						200	400	600	800	1000	1200	1400	1600	1800	2000
	HLW Containers									V					50	100	150	200	300	400	500	500
DU	Proprietary*								V	V		1000	3000	5000	10000	15000	20000	40000	60000	80000	100000	120000
	MPC Shields												V	V		20	50	100	150	200	200	200
	Spent Fuel Casks																V	V			1	2
Be	Extruded Product			V			5	10	20	50	100	150	200	200	250	300	300	350	350	350	350	350
	Rolled Sheet				V	V			100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400
	Foil				V	V	V								1	2	4	10	20	30	40	50
	Investment Casting										V	V					20	50	100	200	300	400
		SI	Stage II								Stage III											

V = Verification of Process

Table A.2 Weight of Product Produced Per Quarter

Table A.2
Manufacturing Sciences Corporation Projection of the Weight of Product, in Tons,
to Be Produced at Rocky Flats during the National Conversion Pilot Project

Market	Product	Size, in.	Weight lbs	Stage II							Stage III											
		SI																				
				FY 94	FY 95				FY 96			FY 97				FY 98				FY 99		
				III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
SM																								
	Pu Waste Containers	5-Dia x 8 x 0.050	5.6	V	V	1	1	2	2	3	8	8	8	8	3	3	3	3	3	3	3	3	3	3
	Pu Metal Containers	12-Dia x 12 x 0.050	14.2			V	V			7	11	18	18	18	18	18	18	11	7	4	0	0
	LLW- M/S	36 x 53 x 90 x 0.160	1000					V	V		50	150	350	350	350	150	175	200	200	200	200	200
	LLW- S/S	36 x 53 x 90	1000					V	V			25	50	75	100	125	150	175	200	225	250	275
	S/S Drums, 30 Gal.	18-Dia x 28 x 0.160	54			V	V						5	11	16	22	27	32	38	43	49	54
	HLW Containers	18-Dia x 54 x 0.160	106							V					3	5	8	11	16	21	27	27
		Total Weight, tons				1	1	2	2	10	69	201	432	462	489	322	381	431	464	496	528	558
DU																						
	Proprietary	Proprietary	0.35						V	V		0.2	1	1	2	3	4	7	11	14	18	21
	MPC Shields	48-Dia. x 2	2500										V	V		25	63	125	188	250	250	250
	Spent Fuel Casks	24-Dia x 168 x 2	20000														V	V			10	20
		Total Weight, tons										0.2	1	1	2	28	66	132	198	264	278	291
Be																						
	Extruded Product	10 x 96 x 0.283	36	V			0.1	0.2	0.4	0.9	1.8	2.7	3.6	3.6	4.5	5.4	5.4	6.3	6.3	6.3	6.3	6.3
	Rolled Sheet	18 x 28 x 0.100	3		V	V			0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.7	1.8	2.0	2.1
	Foil	10 x 5400 x 0.005	36		V	V	V								0.0	0.0	0.1	0.2	0.4	0.5	0.7	0.9
	Investment Casting		10								V	V					0.1	0.3	0.5	1.0	1.5	2.0
		Total Weight, tons					0.1	0.2	1	1	2	3	4	5	6	7	7	8	9	10	10	11
		SI		Stage II							Stage III											

V = Verification of Process

Table A.3 Weight and Source of Steel Required Per Quarter

Table A.3
Manufacturing Sciences Corporation Projection of the Weight of RSM, in Tons
Requied at Rocky Flats during the National Conversion Pilot Project
and the Source of the Raw Material.

	SI	Stage II								Stage III										
	FY 94	FY 95				FY 96				FY 97				FY 98				FY 99		
Market	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
SM																					
Stainless Steel																					
Demand by Quarter					1	1	2	2	10	19	51	82	112	139	172	206	231	264	296	328	358
Cumulative Demand					1	2	3	4	12	29	70	133	194	251	312	378	437	495	559	624	686
Supply at RF by Quarter		25	10	5	10	15	20	10	0	0	9	5	10	15	20	20	20	20	20	20	20
Cumulative RF Supply		25	35	39	48	62	79	80	60	9	-67	-67	-169	-294	-446	-632	-843	-1087	-1362	-1670	-2009
Import Req'd by Quarter												67	169	294	446	632	843	1087	1362	1670	2009
Cumulative Import Req'd												67	236	530	976	1608	2451	3537	4900	6570	8578
Truckloads per Quarter												3	8	15	22	32	42	54	68	84	100
Mild Steel																					
Demand by Quarter										50	150	350	350	350	150	175	200	200	200	200	200
Cumulative Demand										50	200	550	900	1250	1400	1575	1775	1975	2175	2375	2575
Supply at RF by Quarter		50	25	50	100	100	40	50	20	10	20	20	20	20	20	20	20	20	20	20	20
Cumulative RF Supply		50	75	125	225	325	365	415	385	245	-85	-85	-415	-745	-875	-1030	-1210	-1390	-1570	-1750	-1730
Import Req'd by Quarter												85	415	745	875	1030	1210	1390	1570	1750	1730
Cumulative Import Req'd												85	500	1160	1620	1905	2240	2600	2960	3320	3480
Truckloads per Quarter												4	21	37	44	52	61	70	79	88	87
	SI	Stage II								Stage III											

Table A.4 Weight and Source of Depleted Uranium (DU) and Be Required Per Quarter

Table A.4
Manufacturing Sciences Corporation Projection of the Weight of DU and Be, in Tons
Requied at Rocky Flats during the National Conversion Pilot Project
and the Source of the Raw Material.

Market	SI	Stage II							Stage III												
	FY 94	FY 95				FY 96				FY 97				FY 98				FY 99			
	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
Depleted Uranium																					
Demand by Quarter											0.2	0.5	0.9	2	28	66	132	198	264	278	291
Cumulative Demand											0.2	0.7	1.6	3	31	97	229	427	691	968	1259
Supply at RF by Quarter		100	10	9						119	118.83	118.3	117.43	115.68	88	22	-110	-308	-572	-849	-1140
Cumulative RF Supply		100	110	119	119	119	119	119	119								110	308	572	849	1140
Import Req'd by Quarter																	110	418	990	1839	2980
Cumulative Import Req'd																	5	15	29	42	57
Truckloads per Quarter																					
Beryllium																					
Demand by Quarter					0.1	0.2	0.5	1	2	3	4	5	6	7	7	8	9	10	10	11	
Cumulative Demand					0.1	0.3	0.8	2	4	8	12	16	22	29	36	44	53	62	73	84	
Supply at RF by Quarter		20	30	40	30				116	112	108	104	98	91	84	76	67	58	47	36	
Cumulative RF Supply		20	50	90	120	119	118														
Import Req'd by Quarter																					
Cumulative Import Req'd																					
Truckloads per Quarter																					
	SI	Stage II							Stage III												

Table A.5 Summary of Scrap Metal Import Requirements

Table A.5
Manufacturing Sciences Corporation Summary Projection of the Weight of Raw Material, in Tons,
That Could be Imported to Rocky Flats during the National Conversion Pilot Project,
and the Number of Truckloads* Required to Meet This Need.

		SI	Stage II									Stage III											
			FY 94	FY 95				FY 96				FY 97				FY 98				FY 99			
		III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	
Market																							
RSM	Import Req'd by Quarter											152	584	1039	1321	1662	2053	2477	2932	3420	3739		
DU	Import Req'd by Quarter															0	110	308	572	849	1140		
Beryllium	Import Req'd by Quarter																		0	0	0		
RSM	Truckloads Req'd by Quarter											8	29	52	66	83	103	124	147	171	187		
DU	Truckloads Req'd by Quarter																		29	42	57		
Beryllium	Truckloads Req'd by Quarter																		0	0	0		
Total Shipments by Quarter												8	29	52	66	83	103	124	175	213	244		
Total Shipments by Week												1	2	4	5	6	8	10	13	16	19		
Total Shipments by Day												0	0	1	1	1	2	2	3	3	4		
		SI	Stage II									Stage III											

* A truckload is assumed to be 20 tons.

Table B.1 Summary of Costs for Stage II

Major Elements of Work Planned for Stage II of the NCPP and Approximate Costs for Each Element

WBS		Task	Estimated Cost (in thousands)
2.1	**Building 865**		**$9,595**
	2.1.1	Hazards Assessment	
	2.1.1.1	Pre-cleanup Survey	$230
	2.1.1.2	Post Cleanup Survey	$497
	2.1.2	Facility Cleanup	$7,981
	2.1.3	Operational Assessment	
	2.1.3.1	Declassification	$0
	2.1.3.2	Process Verification	$284
	2.1.3.3	Additional Equipment Assessment	$603
2.2	**Building 883**		**$8,921**
	2.2.1	Hazards Assessment	
	2.2.1.1	Pre-cleanup Survey	$142
	2.2.1.2	Post Cleanup Survey	$497
	2.2.2	Facility Cleanup	$6,562
	2.2.3	Operational Assessment	
	2.2.3.1	Declassification	$585
	2.2.3.2	Process Verification	$284
	2.2.3.3	Additional Equipment Assessment	$851
2.3	**Building 444/7**		**$10,837**
	2.3.1	Hazards Assessment	
	2.3.1.1	Pre-Cleanup Survey	$142
	2.3.1.2	Post Cleanup Survey	$496
	2.3.2	Facility Cleanup	$8,336
	2.3.3	Operational Assessment	
	2.3.3.1	Declassification	$763
	2.3.3.2	Process Verification	$337
	2.3.3.3	Additional Equipment Assessment	$763
2.4	**Operations Support**		**$8,847**
	2.4.1	Project Administration	
	2.4.1.1	Project Management	$824
	2.4.1.2	Office Management	$140
	2.4.1.3	Human Resources	$176
	2.4.1.4	Economic Conversion	$212
	2.4.1.5	Public Outreach	$140
	2.4.1.6	Finance	$419
	2.4.1.7	Contract Administration/Procurement	$351
	2.4.1.8	Project Controls	$351
	2.4.2	Project Technical Support	
	2.4.2.1	Quality Assurance Program	$351
	2.4.2.2	Systems Engineering Program	$212
	2.4.2.3	Engineering & Maintenance Program	$1,020
	2.4.2.4	Environment, Health & Safety Program	$865
	2.4.2.5	Waste Management Program	$528
	2.4.2.6	Training Program	$1,924
	2.4.2.7	Decontamination	$983
	2.4.3	Site Support Services	$351
	NCPP Stage II Total		**$38,200**

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Table B.2 Summary of Costs by Quarter for Stage I, II, and III

Table B.2
Manufacturing Sciences Corporation Projection of the Costs ,
in Thousands of $,
for Stages I, II and III of the NCPP.

	SI	Stage II								Stage III											
	FY 94		FY 95				FY 96				FY 97				FY 98				FY 99		
	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
No. of Employees	12	30	80	120	160	205	205	205	205	205	205	205	205	205	205	205	248	305	363	417	462
Total Average Wage	107	375	900	1200	1560	1948	1948	1948	1948	1948	1948	1948	1948	1948	1948	1948	2356	2898	3449	3962	4389
Goods and Services	47	94	225	300	390	487	487	487	487	487	487	487	487	487	487	487	589	724	862	990	1097
Overhead/Subcontracts	834	1760	1963	2250	2700	3684	3675	3642	3570	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
Scrap Metal Payments																					
Stainless Steel					0	0	1	1	3	6	17	28	38	47	59	70	79	90	101	111	122
Mild Steel										5	15	35	35	35	15	18	20	20	20	20	20
Depleted Uranium											0	1	2	4	55	132	264	396	528	555	582
Beryllium						9	18	51	120	225	330	435	450	557	664	692	823	881	964	1047	1130
Total Scrap Payments						9	19	52	123	236	363	499	525	643	792	912	1186	1387	1613	1733	1854
Lease Payments										70	129	223	318	377	451	465	621	762	908	1042	1154
Total Costs	988	2229	3088	3750	4650	6128	6128	6128	6128	4741	4926	5156	5277	5454	5678	5811	6752	7771	8832	9727	10494
	SI	Stage II								Stage III											

DOE Budget, qtr.	2229	3088	3750	4650	6128	6128	6128	6128
DOE Budget, cum	2229	5317	9067	13717	19845	25973	32101	38229
Costs w/o Overhead	469	1125	1500	1950	2443.8	2452.9	2486.1	2557.7

Table B.3 Local Economic Benefits (cost) for Two NCPP Options

Local Economic Benefits (cost) for Two NCPP Options						
	Option 1: Terminate Now			Option 2: Terminate After Stage II		
	Time Period - Years			Time Period - Years		
	2	5	10	2	5	10
Local Economic Benefit From M&O	42	92	180	49	95	165
Local Economic Benefit From NCPP	(40)	(158)	(408)	40	(78)	(328)
Sum of Local Economic Benefit	2	(66)	(228)	89	17	(163)

The Economic Benefit for the M&O is calculated by multiplying the cumulative M&O costs by 75%, the amount of the cost due to wages. This wage figure is then multiplied by 2.5, the multiplying factor for local economic benefit.

The Economic Benefit for continuing the NCPP relates to the estimated wages of $16 million for the first two years, $47 million for the next three years, and $100 million for the next five years. Multiplying these wage sums by 2.5 provides the local economic benefit. The number is positive if the NCPP continues and the wages are paid, the number is negative if the NCPP stops and the wages are lost.

Table B.4 Benfit (cost) Data for Two NCPP Options Over Three Time Periods

Benfit (cost) Data for Two NCPP Options Over Three Time Periods							
		Option 1: Terminate Now			Option 2: Terminate After Stage II		
		Time Period - Years			Time Period - Years		
		2	5*	10*	2	5*	10*
Financial[1]	DOE Cost:						
Line 1	NCPP	0	0	0	(38)	(38)	(38)
Line 2	M&O	(22)	(50)	(96)	(26)	(50)	(88)
Line 3	Total DOE Cost	(22)	(50)	(96)	(64)	(88)	(126)
Line 4	DOE Benefit	22	50	96	71	95	133
Line 5	Net DOE Benefit	0	0	0	7	7	7
Line 6	Local Economic Benefit	2	(66)	(228)	89	17	(163)
Line 7	Net Benefit	2	(66)	(228)	96	24	(156)
Human	Re-Employment	0	0	0	207	0	0

* Costs are cumulative of preceding years

[1] Costs are indicated in parenthesis ($) for clarity

Table B.5 Local Economic Benefits (costs) for Three NCPP Options

Local Economic Benefits (costs) for Three NCPP Options									
	Option 1: Terminate Now			Option 2: Terminate After Stage II			Option 3: Complete W/5 Year Lease		
	Time Period - Years			Time Period - Years			Time Period - Years		
	2	5	10	2	5	10	2	5	10
Local Economic Benefit From M&O	42	92	180	49	95	165	49	64	64
Local Economic Benefit From NCPP	(40)	(158)	(408)	40	(78)	(328)	40	157	407
Sum of Local Economic Benefit	2	(66)	(228)	89	17	(163)	89	221	471

The Economic Benefit for the M&O is calculated by multiplying the cumulative M&O costs by 75%, the amount of the cost due to wages. This wage figure is then multiplied by 2.5, the multiplying factor for local economic benefit.

The Economic Benefit for continuing the NCPP relates to the estimated wages of $16 million for the first two years, $47 Million for the next three years, and $100 million for the next five years. Multiplying these wage sums by 2.5 provides the local economic benefit. The number is positive if the NCPP continues and the wages are paid, the number is negative if the NCPP stops and the wages are lost.

Table B.6 Benefit (cost) Data for Three NCPP Options Over Three Time Periods

Benefit (cost) Data for Three NCPP Options Over Three Time Periods										
Tangibles										
		Option 1: Terminate Now			Option 2: Terminate After Stage II			Option 3: Complete W/5 Year Lease		
		Time Period - Years			Time Period - Years			Time Period - Years		
		2	5*	10*	2	5*	10*	2	5*	10*
Financial[1]	DOE Cost:									
Line 1	NCPP	0	0	0	(38)	(38)	(38)	(38)	(38)	(38)
Line 2	M&O	(22)	(50)	(96)	(26)	(50)	(88)	(26)	(34)	(34)
Line 3	Total DOE Cost	(22)	(50)	(96)	(64)	(88)	(126)	(64)	(72)	(72)
Line 4	DOE Benefit	22	50	96	71	95	133	71	87	124
Line 5	Net DOE Benefit	0	0	0	7	7	7	7	15	52
Line 6	Local Economic Benefit	2	(66)	(228)	89	17	(163)	89	221	471
Line 7	Net Benefit	2	(66)	(228)	96	24	(156)	96	236	523
Human	Re-Employment	0	0	0	207	0	0	207	462	462

* Costs are cumulative of preceding years

[1] Costs are indicated in parenthesis ($) for clarity

Table C.1 Prices of Products to be Produced

Table C.1

Listing of product types expected to be manufactured at Rocky Flats by MSC during the National Conversion Pilot Project. The list also includes anticipated prices for these products during quantity production.

Market	Product	Size, in.	Weight lbs	DIsposal Credit	Price for Product using new metal	Basis	Sales Price
RSM							
	Pu Waste Containers	5-Dia x 8 x 0.050	5.6	$6	$45	RF experience	$51
	Pu Metal Containers	12-Dia x 12 x 0.050	14.2	$15	$150	DoD Contract	$165
	LLW- M/S	36 x 53 x 90 x 0.160	1000	$1,090	$625	MSC Quote	$1,715
	LLW- S/S	36 x 53 x 90	1000	$1,090	$1,400	MSC Quote	$2,490
	S/S Drums, 30 Gal.	18-Dia x 28 x 0.160	54	$59	$360	MSC Quote	$419
	HLW Containers	18-Dia x 54 x 0.160	106	$116	$2,000	DOE Purchases	$2,116
DU		Size, in.	Weight lbs	Price per pound		Basis	Sales Price
	Proprietary	Proprietary	0.35	$26		Customer Survey	$9
	MPC Shields	48-Dia. x 2	2500	$5		MSC Experience	$12,500
	Spent Fuel Casks	24-Dia x 168 x 2	20000	$25		MSC Experience	$500,000
Be		Size, in.	Weight lbs	Price per pound		Basis	Sales Price
	Extruded Product	10 x 96 x 0.283	36	$100		Market Knowedge	$3,600
	Rolled Sheet	18 x 28 x 0.100	3	$125		Market Knowedge	$375
	Foil	10 x 5400 x 0.005	36	$500		Market Knowedge	$18,000
	Investment Casting	Miscellaneous	10	$100		Estimate	$1,000

Table C.2 Profit /Loss Projections by Quarter

Table C.2
Manufacturing Sciences Corporation Projection of the Sales of Product, in Thousands of $,
to Be Produced at Rocky Flats during the National Conversion Pilot Project

Market / Product	SI	Stage II									Stage III										
		FY 94	FY 95				FY 96				FY 97				FY 98				FY 99		
		III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
RSM			Assumed																			
		Size,	Sales																			
		in.	Price																			
Pu Waste Containers	5-Dia x 8 x 0.050		$51	5	10		10	20	31	41	51	153	153	153	153	51	51	51	51	51	51	51
Pu Metal Containers	12-Dia x 12 x 0.050		$165			2	8			0	165	248	413	413	413	413	413	413	248	165	83	0
LLW- M/S	36 x 53 x 90 x 0.160		$1,715					10	20		0	172	515	1201	1201	1201	515	600	686	686	686	686
LLW- S/S	36 x 53 x 90		$2,490					15	25			0	125	249	374	498	623	747	872	996	1121	1245
S/S Drums, 30 Gal.	18-Dia x 28 x 0.160		$419			5	5						84	168	251	335	419	503	587	670	754	838
HLW Containers	18-Dia x 54 x 0.160		$2,116							V					106	212	317	423	635	846	1058	1058
	Total Sales, $MM			5	10	7	23	45	76	41	216	572	1288	2183	2497	2709	2337	2737	3077	3415	3752	3878
DU																						
Proprietary	Proprietary		$9						5	5		9	27	45	90	135	180	360	540	720	900	1080
MPC Shields	48-Dia. x 4		$12,500										10	10		250	625	1250	1875	2500	2500	2500
Spent Fuel Casks	24-Dia x 168 x 2		$500,000														V	V			500	1000
	Total Sales, $MM								5	5		9	37	55	90	385	805	1610	2415	3220	3900	4580
Be																						
Extruded Product	10 x 96 x 0.283		$3,600	10			18	36	72	180	360	540	720	720	900	1080	1080	1260	1260	1260	1260	1260
Rolled Sheet	18 x 28 x 0.100		$375		15	20			38	75	113	150	188	225	263	300	338	375	413	450	488	525
Foil	10 x 5400 x 0.005		$18,000		20	30	10								18	36	72	180	360	540	720	900
Investment Casting	Complex - 10 lb		$1,000								10	20					20	50	100	200	300	400
	Total Sales, $MM			10	35	50	28	36	110	255	483	710	908	945	1181	1416	1510	1865	2133	2450	2768	3085
Total Projected Sales in Thousands of $:		by Quarter		15	45	57	51	81	190	301	699	1291	2233	3183	3767	4510	4651	6212	7625	9085	10420	11543
		Annual					168				1271				10474				22998			38672
	SI	Stage II									Stage III											

Table D.1 Summary of Benefits by Quarter for Stage II and III

Table D.1

Manufacturing Sciences Corporation Projection of the Sales and scrap Metal and Leasing Proceeds That the DOE Will Derive from Those Sales, in Thousands of $, for Stages II and III of the NCP

	SI	Stage II								Stage III											
	FY 94			FY 95				FY 96				FY 97				FY 98				FY 99	
	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
Total Projected Sales:	0	0	15	45	57	51	81	190	301	699	1291	2233	3183	3767	4510	4651	6212	7625	9085	10420	11543
Scrap Metal Value					0	9	19	52	123	236	363	499	525	643	792	912	1186	1387	1613	1733	1854
Lease Payments		0	2	5	6	5	8	19	30	70	129	223	318	377	451	465	621	762	908	1042	1154
Total by Quarter	0	0	2	5	6	15	27	71	153	306	492	722	843	1019	1243	1377	1807	2149	2521	2775	3008
Total by previous 4 Qtrs.	0			6	12	26	52	118	265	557	1022	1674	2363	3076	3828	4483	5446	6576	7854	9252	10454
Total by Stage	0								277												18263
	SI	Stage II								Stage III											

Table D.2 Summary of Sales, Costs, Profits and Losses

Table D.2
Manufacturing Sciences Corporation Projection of the Sales ,
Costs, DOE Contribution and Profit and Loss (P/L), in Thousands of $,
for Stages I, II and III of the NCPP.

	Stage II									Stage III											
	FY 94	FY 95				FY 96				FY 97				FY 98				FY 99		
	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III
Total Sales: by Quarter		15	45	57	51	81	190	301	699	1291	2233	3183	3767	4510	4651	6212	7625	9085	10420	11543
Total Sales by previous 4 Quarters					168	235	380	624	1271	2480	4523	7405	10474	13692	16111	19140	22998	27573	33341	38672
Total Sales by Stage								741												65217
Total Costs by Qtr	988	2229	3088	3750	4650	5881	5881	5881	5881	4741	4926	5156	5277	5454	5678	5811	6752	7771	8832	9727	10494
Total Costs, prev 4 Qs				10055	13717	17369	20162	22293	23524	22384	21429	20704	20101	20814	21566	22220	23695	26012	29166	33082	36824
Total Costs by Stage	988								38229												80620
STAGE III: Operating Profit/Loss									Qtly	-4042	-3635	-2924	-2095	-1687	-1168	-1160	-540	-146	253	692	1049
									Cum.	-4042	-3635	-6559	-8654	-10340	-11508	-12668	-13208	-13354	-13101	-12409	-11360
Less DOE Investment									Qtly	4042	3635	2924	2095	1687	1168	1160	540	146			
									Cum.	4042	3635	6559	8654	10340	11508	12668	13208	13354	13354	13354	13354
Net Profit/Loss									Qtly	0	0	0	0	0	0	0	0	0	253	692	1049
									Cum.	0	0	0	0	0	0	0	0	0	253	946	1994
DOE Lease/Scrap Payments										509	931	722	843	1019	1243	1377	1807	2149	2521	2775	3008
Net DOE Investment									Qtly	3533	2704	2202	1252	667	-75	-217	-1267	-2003	-2521	-2775	-3008
Net DOE Investment									Cum.	3533	6237	8438	9690	10357	10282	10065	8798	6795	4274	1498	-1510

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Table D.3 Summary Value Comparison of Three Possible NCPP Options

Summary Value Comparison of Three Possible NCPP Options							
Intangibles[2]							
		Option 1: Terminate Now		Option 2: Terminate After Stage II		Option 3: Complete W/5 Year Lease	
Reactions	Employees	-	Loss of hope for meaningful employment	+	207 trained, experienced in cleanup, available	+	Stable manufacturing jobs created
	Local Community	-	Most strongly disappointed	+	All pleased to see cleanup progress	+	All pleased to see cleanup progress
						-	Some disappointed about production
		-	Further erodes DOE credibility	-	Most disappointed to loose economic potential	+	Pleased for economic payoff, clean industry
	Regulators	-	Further erodes DOE credibility	+	Pleased IM/IRA cleanup model demonstrated	+	Non-DOE regulation
	State Government	-	Further erodes DOE credibility	+/-	Cleanup positive, economic loss negative	+	Pleased to have demonstrated IM/IRA cleanup model
	Congress	-	Congressional recycle directive not met	+	Satisfied that feasibility was tried, information shared	+	Pleased that feasibility demonstrated and recycling succeeding economically
Environmental Risk		-	Likelihood of incident/exposure increases	+	Likelihood of incident/exposure lower, stabilized	+	Controls and permits assure minimal risk
Resource Mgmt.		-	$92 MM in assets wasted	-	$92 MM in assets wasted	+	$92 MM in assets utilized
		-	Continued security	+	Reduced security	+	Reduced security
		-	Waste volume increase	-	Waste volume increase	+	Waste volume decreased by equipment/metal recycling
		-	Waste mortgage increased	+	Waste mortgage reduced, some	+	Waste mortgage reduced, some
Economic Conversion		-	Progress reversed, lessons not learned	+	Cleanup technologies demonstrated	+	Cleanup technologies demonstrated
		-	Reduces alternatives for scrap management	+	Worker retraining process tested, available	+	Worker retraining process tested, available
		-	Set back to recycling	-	Set back to recycling	+	Complies with Section 3780
		-	Reduced utilization of surplus facilities	+	Progress made, lessons learned	+	Progress made, lessons learned

[2] (+) indicates positive attribute, (-) indicates negative attribute

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National Conversion Pilot Project
Stage I

Preliminary Market Analysis Report

Revision 1
24 June 1994

Submitted to:

U.S. Department of Energy - Rocky Flats Office
P.O. Box 928
Golden, Colorado 80402-0928

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Cooperative Assistance Agreement No:

DE-FC34-94RF00733

REVIEWED FOR CLASSIFICATION/UCNI
By
12/01/94

1787

National Conversion Pilot Project
Stage I

Preliminary Market Analysis Report

Revision 1
24 June 1994

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1.0 Executive Summary

The purpose of this preliminary Market Analysis Report is to examine the market for recycling DOE metals to see if sufficient market potential exists that private industry would seek to use DOE facilities and displaced DOE defense workers to exploit these markets, Three DOE scrap metals are examined, radioactively-contaminated scrap metals (RSM), which consists mostly of steel and stainless steel, depleted uranium (DU) and beryllium (Be). For each of these metals the report examines:

- availability of raw material to support recycling activities,
- products that could be made by recycling,
- issues that impact on recycling,
- economic factors that could influence marketabliity of the products
- sales potential over the next 5 years as well as in the out years when decommissioning activity will be even greater.

The market segments for RSM include:

- processing to achieve free-release as scrap metal or recycling into restricted-reuse markets, and
- manufacture of containers for radioactive wastes

The market segments for DU include:
- radiation shields
- counterweights
- proprietary commercial applications

The beryllium market examined is a new family of beryllium-aluminum alloys.

Among the major findings of the report are these:

1. The total (present and future) DOE-wide inventory of RSM is estimated to be between 1 and 2 million tons.
2. Most of this RSM is a mix of undefined metals (44%), next most is steel (36%), followed by nickel (12%) and copper (3%).
3. Most of the DOE RSM, is located at the Nevada test site (40%). followed by Oak Ridge (30%) and Paducah (10%).
4. The total steel RSM arising from decommissioning Rocky Flats is estimated at 29,000 tons.
5. RSM arising from nuclear power plant operations and decommissioning may actually exceed DOE RSM generation.
6. Low level radioactive waste volume disposed in the US in 1992 was 1.7 million cubic feet, requiring about 16,500 waste containers.

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7. The total DOE radioactive waste volume is currently estimated at 27.5 million cubic feet.
8. The total RSM container market is estimated at $1.2 billion, requiring 701,000 containers of a variety of types.
9. If the RF RSM manufacturing capability were operated at its peak capacity, it would consume 6000 tons of steel RSM annually. If the RF RSM steel inventory were to be available for recycling at a uniform rate over 20 years, it would provide only 1450 tons annually and therefore utilize only about 25 % of the productive recycle capacity. Importation of the balance would be needed to operate the facility at its productive capacity.

The 5-year forecast of the DOE scrap metal recycling business is summarized in Table 1.1 below:

Table 1.1
Five Year Forecast for Total RSM, Depleted Uranium and Beryllium Sales Combined

	Total Sales, $ Million				
	1995	1996	1997	1998	1999
Radioactive Scrap Metal (RSM)	$87	$114	$125	$204	$280
Depleted Uranium	$46	$32	$21	$17	$27
Beryllium	$25	$27	$29	$31	$36
Total	$157	$174	$175	$252	$343

The portion of the total market that is forecast for the NCPP is presented on Table 1.2 below:

Table 1.2
Five Year Forecast for NCPP RSM, Depleted Uranium and Beryllium Sales Combined

	Total Sales, $ Million				
	1995	1996	1997	1998	1999
Radioactive Scrap Metal (RSM)	$0	$3	$14	$18	$17
Depleted Uranium	$0	$0	$1	$8	$18
Beryllium	$0	$2	$4	$8	$12
Total	$0	$5	$19	$34	$47

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Forecast NCPP sales compare to the available market as shown in Table 1.3 below:

Table 1.3 Comparison of NCPP Forecast Sales to the Total Available Market.

	Forecast Annual Sales		
	Total Market in 1999	NCPP Share in 1999	NCPP Share as % of Total
Radioactive Scrap Metal (RSM)	$280	$16	6%
Depleted Uranium	$27	$18	68%
Beryllium	$36	$12	34%
Total	$343	$46	13%

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2.0 Introduction

The Mission of the National Conversion Pilot Project (NCPP) is "to explore and demonstrate, at the Rocky Flats Site, the feasibility of economic conversion at DOE sites." Central to this theme of economic conversion is the existence of markets for the products that might be produced using equipment and facilities at Department of Energy (DOE) sites. The purpose of this preliminary report is to analyze these markets to determine if sufficient potential business exists to justify economic conversion and therefore to warrant proceeding to the next Stage of this feasibility project. As the report is preliminary, it is not expected to prove conclusively that the sales potential from these markets will be realized. Rather, the intent is to show that, if the facilities can be operated productively and economically, such potential can be realized.

The focus of this report is on markets that require products that can be produced with facilities that exist at Rocky Flats. These are conventional sheet metal manufacturing facilities that have special environmental controls which allow processing of:
-- radioactive metals, such as depleted uranium;
-- metals that are contaminated with radioactive species; and
-- metals requiring special environmental controls to process, such as beryllium.
These facilities are representative of capabilities found at other DOE sites, although few sites have such a comprehensive metal recycling capability as Does Rocky Flats.

The markets that will be assessed in this report are those that can make use of the sizable DOE inventory of scrap metal that now exists or will be generated in the course of decontamination and decommissioning (D&D) of several sites. Three categories of scrap metal will be evaluated in this report: beryllium (Be), depleted uranium (DU) and radioactively-contaminated scrap metal (RSM). Most RSM is mild steel (M/S) or stainless steel (S/S), but nickel, copper, aluminum and other non-ferrous metals can also be RSM. These scrap metals are the focus of this report and this project. The DOE sites are the ideal locations to recycle them without contaminating new facilities and because the infrastructure to handle them already exists. Recycling these scrap metals is also consistent with the vision of the DOE (DOE, 1994).

For each of these types of scrap metal, RSM, Be, and DU, the following approach will be followed to evaluate their market potential:

1. Raw Material Availability This will include an assessment of how much exists, its type, form, composition, timing of availability , location, etc. It also includes a discussion of availability of supplemental sources when needed to support its use.

2. Market Segments This will involve a description of general market areas that could employ DOE scrap metals. It will include a discussion of Products that are likely to be needed within this segment..

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3. Issues These are the non-economic factors that must be understood or resolved to enable recycling to be effective.

4. Economics This is a preliminary analysis of the economic factors that will determine the viability of recycling.

5. Sales Forecast This will include both a breakdown by product type of the total potential market and the market forecast for the next five years.

A section of this report will be devoted to the economics of decontaminating still-useful DOE equipment for use elsewhere. This will focus on known equipment at Rocky Flats, but will have implications for all sites.

Finally, the report will summarize the market potential for recycling these materials. This will include both the national potential and the portion that could be expected at Rocky Flats.

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3.0 Radioactively-Contaminated Scrap Metal

The DOE has finished a draft dated January 13, 1994 of a Strategic Plan for Recycle and Reuse of the Department's facilities and equipment (DOE, 1994). The Plan states that the recycle and reuse of RSM (radioactive scrap metal) appears to be more feasible than the recycle of other non metallic materials such as concrete and transite.
In the Vision Statement it states that...."It is the vision of EM-40 to have implemented an EM-wide recycle and reuse program for all recoverable contaminated materials by the end of Calendar Year 1995". The timely accomplishment of three strategic objectives will form the basis for the success of the vision:

1) *Reuse of contaminated surplus facilities, rather than dismantlement. Alternate uses of contaminated surplus facilities will be evaluated on a cost and benefit basis verses the dismantling and recycling of the materials of construction.*

2) *Development of risk based standards for the unrestricted release of mildly radioactive materials. If such a standard can be developed with the Environmental Protection Agency and the Nuclear Regulatory Commission then most of Does radioactive scrap metal could be recycled to the scrap metal industry or waste processors.*

3) *Develop a methodology for realistically evaluating life cycle costs and benefits of three possible options:*

    1. *Disposition of contaminated materials in DOE controlled shallow land burial grounds, i.e. Nevada Test Site.*

    2. *Processing, by either DOE or its contractors, contaminated materials to enable their restricted release and reuse by the DOE.*

    3. *Processing contaminated materials to enable their unrestricted release to the open market for use in commercial products.*

The next course of action, for DOE to approve the Strategic Plan, is imminent. Then a detailed Action Plan will be drafted within 120 days for review and approval. This Action Plan will address each of the strategies and goals and propose specific actions, milestones, and time lines for accomplishing the stated objectives. Development of the Action Plan will include significant input from the public and the companies in the metal processing industry.

3.1 Raw Material Availability

3.1.1 DOE RSM Inventory

In July 16, 1993 a report titled "US. Department of Energy's Weapons Complex scrap Metal Inventory" was submitted for printing (Duda, 1993). It is a report that was assembled under a DOE, Morgantown, contract by Quadrex and SRS Technologies. The inventory is based solely on data and other information from publicly available documents and not an actual physical inventory of all the DOE installations, therefore the quantities of

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metal in the report are considered conservative. The report states that the true tonnage of metal may be three to four times the quantity totals arrived at through public information.

The Report includes information gathered from phone or personal contact with key personnel at every weapons complex operating site and controlling Department of Energy Field Office. Documents were collected that had information on either the current inventory of scrap, the annual generation of scrap, and the future plans for decontamination and decommissioning at the site. One key source of information that could be accessed by MSC is the Remedial Action Program Information Center at Oak Ridge. The Report lists some 152 documents that were useful in assembling all the data.

The total volume of scrap identified in the Report is 991,000 tons, including 396,300 tons currently in stockpiles and an additional 594,800 tons from the decontamination and decommissioning of the various facilities. The Report also states that currently about 15,000 tons of scrap are generated annually from current operations and some D&D activity. The Report states that this number will grow to about 90,000 tons per year once large scale D&D work has commenced.

A summary of data from the major DOE sites follows:

TOTAL DOE-WIDE RSM INVENTORY

By Metal Type

METAL TYPE	QUANTITY (TONS)	PERCENT-TOTAL
Aluminum	16,250	4.10%
Brass	10	<.01%
Copper	11,215	2.83%
Lead	747	0.19%
Monel	1,745	0.44%
Nickel	47,524	11.99%
Steel	143,221	36.14%
Mixed	175,594	44.31%
TOTAL	**396,306**	**100.00%**

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By Site

SITE	QUANTITY	PERCENT-TOTAL
Fernald	8,099	2.04%
Hanford	416	0.10%
INEL	9,515	2.40%
NTS	157,319	39.69%
Oak Ridge Lab	25,002	6.31%
K-25	116,429	29.38%
Y-12	5,000	1.26%
Paducah	40,265	10.16%
Portsmouth	34,191	8.63%
Rocky Flats	70	0.02%
TOTAL	**396,306**	**100.00%**

TOTAL FOR D&D OF GASEOUS DIFFUSION PLANTS

METAL TYPE	QUANTITY (TONS)	PERCENT-TOTAL
Aluminum	22,200	3.73%
Copper	44,300	7.45%
Monel	4,400	0.74%
Nickel	57,700	9.70%
Steel	269,100	45.24%
Mixed	197,100	33.14%
TOTAL	**594,800**	**100.00%**

The quantities in this Report conflict with the more common figure of 1.5 million tons, quoted by Pat Whitfield in an October 91 draft report (Whitfield, 1991) which was sent to all the major DOE facilities with a request to submit comments on the data within 30 days. This Report was to be used as the basis for a position paper to the EM-1 Assistant Secretary, in late 1991 or early 1992 .

The information in this document does not fully justify the 1.5 million ton figure and there does not appear to be any other document since then that modifies the amount up until the '93 Scrap Metal Inventory Report. It has been reported that Whitfield is presently using the even higher figure of 1.8 million tons but the basis of this number is also unsubstantiated. Owen Robertson, who works for Pat Whitfield, is the current individual responsible for monitoring the RSM Program for the DOE. Don Clark (Clark, 1994) an assistant of Owen at Westinghouse Hanford, has said that the DOE believes that there is currently about 1-2 million tons of metal in stockpile. Also, Dorinda Funk of WINCO is currently performing a study of all of the DOE sites for inventory of Scrap Metal. Her initial analysis is that sites

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are not accumulating scrap metal but are burying it or disposing of it as fast as possible. She is reportedly concerned that if a directive is not received to accumulate scrap metal for recycle, the remaining inventory may not support an RSM business (Funk, 1994)
The 1.5 million tons that Whitfield claimed was within the DOE inventory is not broken down by type. If one uses the 'Quadrex ' Report, which gives a breakdown for 991,000 tons, it is possible to extrapolate the following breakdown:

TOTAL DOE RSM BY TYPE

METAL TYPE	QUANTITY (TONS)	PERCENT-TOTAL
Aluminum	57,900	3.86%
Brass	15	<.01%
Copper	84,000	5.60%
Lead	1,050	.07%
Monel	9,300	.62%
Nickel	159,300	10.62%
Steel	624,150	41.61%
Mixed	564,285	37.62%
TOTAL	**1,500,000**	**100.00%**

The significant quantity of 'mixed' RSM at DOE sites is due to the existence of old, large piles of metal. There are no public records on what is in those piles. If one assumes that the mixed pile holds on the average the same distribution of metals that exist in the defined areas, then one can total the amount of steel within the DOE based on the 1.5 million tons. That figure would be 41.61% of the mixed pile plus 624,150 tons of steel in the identified pile for a total of 858,949 tons of steel. This total is 57.26% of the total 1.5 million tons.

3.1.2 Nuclear Power Plant RSM

Currently operating Nuclear Power Plants in their normal course of operations generate only small amounts of metal waste. However, on approximately 18 month cycles the plant will have a major shutdown for maintenance. It is during these major shutdowns that significant amounts of metal waste are generated and must be disposed of in a proper manner. Shutdowns create waste metal from changing out heat exchangers, valves, motors, piping systems, and spent fuel racks. These metals are predominately carbon steel but include a fair amount of stainless steel. Minor quantities of aluminum, copper, and brass are also removed and disposed of as waste.

Nuclear Power Plants (NPP) operators have waste disposal volume limits imposed by their disposal sites and they also don't want to incur the expense and liability of burial. Thus, they use waste processors who, by recycling the metal scrap, significantly reduce the amount of NPP metal waste that must be buried, freeing this portion of the NPP operator's

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allotment so it can be used for non-recyclable waste. The technologies currently being used consist of smelting, chemical treatment, grit blasting, ultrasonic bombardment, ice blasting or just solvent wiping. The radioactivity is primarily on the surface so only that portion is removed, concentrated and buried. The remaining bulk of the metal is surveyed and given restricted or un-restricted release.

3.1.3 Nuclear Power Plant Decommissioning

Nuclear Power Plants are licensed by the NRC with a typical 40 year operating license. Based on the decommissioning plans on file with the NRC a typical plant will shut down at the end of its operating license and put its spent fuel in storage for ten years. At the end of those ten years the plant will be totally decommissioned and dismantled.

In a Department of Energy Draft report titled "Radioactive Scrap Metal Market Study-Use of RSM by the Electric Utility Industry for Spent Fuel Storage" (Atteridge, 1993) the total volume of stainless steel that will be available from the decommissioning of Nuclear Power Plants is estimated. The report totals the amount of stainless steel from the different types of reactors and when this material will be dismantled. It also states that the amount of contaminated carbon steel is likelyto be 5 to 10 times the quantity of stainless steel from nuclear power plant facilities. The total amount of steel available is as follows:

REACTOR TYPE	STAINLESS STEEL	CARBON STEEL
BWR	431 tons	4310 tons
PWR W/CE	956 tons	7170 tons
PWR B&W	1358 tons	6790 tons

REACTOR TYPE	NO. OF PLANTS	TOTAL METAL
BWR (GE)	39	184,899 TONS
BWR (AC)	1	4,741 TONS
PWR-W	55	446,930 TONS
PWR-CE	16	130,016 TONS
PWR-B&W	11	89,628 TONS
TOTALS	**122**	**856,214 TONS**
SCALING FACTOR	**X .89**	**X .89**
NET TOTAL		**761,854 TONS**

Note: To accommodate some obvious differences in the anticipated quantities of metal due to rating, physical size of plant, etc. a scaling factor was applied which averages about .89 over all the plants.

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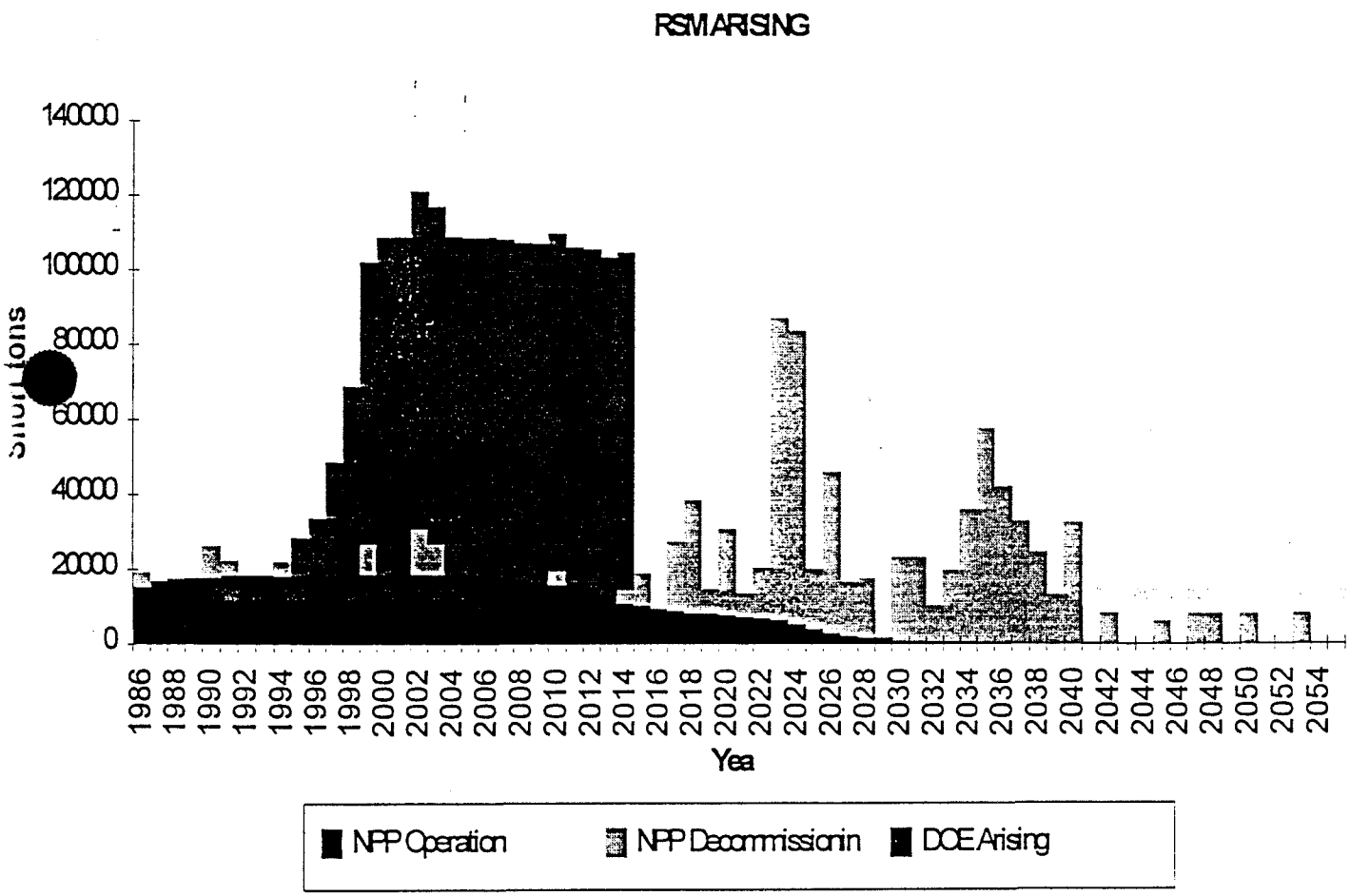
The nuclear power plants have already begun to be decommissioned. There are three plants in moth balls-Humboldt, Perry 2, and Peach Bottom 1. Shippingport was decommissioned five years ago. Trojan , Yankee Rowe and Shoreham are starting the decommissioning process (Gody, 1994). The metal from decommissioning is an existing market that will peak at year 2023 at about 85,000 tons and then start dropping off significantly by the year 2045. The total market will run from today till 2053 with an average annual volume of 12,697 tons/yr. or a market value (at $1.65/lb.) of $41,901,966.

A summation of RSM arisings expected from the three sources discussed above, DOE, Nuclear Power Plant Operations and Nuclear Power Plant D&D, is presented in the following chart.



3.1.4 Rocky Flats' Inventory of Scrap Metal

The DOE- wide inventory of scrap metal (Duda, 1993) suggests that only 70 tons of scrap metal exists at Rocky Flats. It is presumed that this very small number was obtained from manifests of waste packaged and ready for disposal. This is not the primary source of scrap

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metal that the NCPP will rely on. The NCPP plans to use metal arising from the decommissioning of Rocky Flats, beginning initially with the four buildings allotted for cleanup and reuse under the project and later extending to the site-wide cleanup activities. The initial estimate of steel RSM arising from the four NCPP buildings is 1,124 tons (Roberts, 1994). The initial estimate of steel arising from all buildings at RF is 29,000 tons (Shain, 1994). Thus the four-building NCPP cleanup involves about 4% of the steel RSM at RF.

The capacity for processing steel RSM at RF is about 6,000 tons per year (Edstrom, 1994). Thus, if all of the steel at RF were available when needed, it would be consumed in five years. It is more likely to be meted out over a twenty year period, in which case it will represent about 25% of the annual requirement. This means about 75%, or 4,500 tons per year, would need to be imported to RF to sustain a recycling operation that would enable consumption of the Rocky Flats RSM as it is generated.

3.2 Market Segments

The ultimate disposition of RSM will follow one of three pathways. One path involves decontamination and free release as scrap metal suitable for reprocessing without restriction. The second path will be into applications where the recycling and reuse will be subject to restrictions. A prime example would be the reuse of steel in containers that will be used to hold radioactive waste. The final path will be to dispose of the RSM because neither of the other two paths is economically viable. . Allocation of the DOE RSM inventory between these pathways will be driven by economic considerations, including the cost of disposal. The percentage allocation between the paths is a key issue that will be discussed in a later section. The focus of this section of the report is the second, or restricted-reuse, path.

3.2.1. Waste Containers

3.2.1.1. Low Level Waste (LLW) Containers

Low level waste is radioactive waste whose level of radioactivity measures less than 10 nanocuries per gram of waste. Such material can be disposed in licensed repositories such as engineered landfills. LLW from commercial operations is currently disposed in repositories operated by private concerns at Barnwell, South Carolina and Richland, Washington. The burial price for such repositories ranges from about $100 per cubic foot (about $800 per 55-gallon drum) to over $400 per cubic foot, depending upon whether the originator of the waste operates in the region where the waste site is located. LLW from DOE operations waste is buried at federal sites, such as the Nevada Test (NTS). The DOE assigns a cost of about $5 per cubic foot for waste buried at the NTS, but this figure is believed to exclude some costs of disposal. An EPA study, funded by DOE, is underway to obtain a more realistic cost (Burns, 1994).

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There are a wide variety of containers used for LLW. The DOE maintains a system for verifying suitability of containers of varying design for transportation and storage (Cruse, 1992). The DOE has just begun a task force for examine the possibility of standardizing among a few LLW containers (Winston, 1994).

The number of LLW containers that the DOE will need has been estimated as high as 500,000 (Arrowsmith, 1993). The actual quantity will not be known with any certainty until the efforts at standardization proceed and the amount of waste is better defined. However some confidence that the number is large can be gained by projecting commercial LLW burial experience over anticipated DOE waste quantities.

As can be seen by the following table, the amount of waste disposed of over the last four years reached a peak in 1992 and has now seen a significant drop-off in 1993.(Fuchs, 1994).

Low Level Waste Buried in the US, cubic feet

Source of Waste:	1990	1991	1992
Academic	48555	48,048	44,322
Government	72,354	103,700	158,186
Industry	356,344	551,080	908,379
Medical	22,792	28,622	26,251
Utility	642,999	637,672	606,076
Total	1,143,044	1,369,122	1,743,214

The waste from industry includes waste from the current LLW Processors like SEG, and Quadrex. The waste from utilities includes waste that went to processors but retained the waste generator identity. However the waste from waste processors is also predominately utility waste that because it has been processed has now become the processors waste and not the originators waste. The waste listed as medical and academic is generally not processed. It might have been repackaged but it generally represents many small generators who hire waste brokers to pick up, transport and package their waste to a burial site. The government category includes waste from non DOD, and DOE facilities. It includes waste from Veterans Hospitals and research facilities. The numbers are significant and yet it would be difficult to cost effectively process this material and probably Doesn't include significant amounts of actual metal anyway. The DOE has the Nevada Test Site available for burial at a very low rate of $5.00/cu. ft.

An estimate of the number of waste containers that would be needed to dispose of the volume of low level waste listed in the above table can be made by analyzing a typical low level waste disposal scenario such as practiced by MSC in its Oak Ridge operations. A typical procedure used at MSC is to place LLW within steel boxes having a volume of 37-

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cubic foot. These boxes are then compacted to about 25% of their original size. Six such boxes are then placed in a 105 cubic foot waste container which is sent to the repository for burial (3). Thus a 105 cubic foot wste container is used to contain 6 x 37 = 222 cubic feet of uncompacted LLW. These waste containers occupy 105 cubic feet in the repository. If the burial fee of the repository is $100 per cubic foot, the cost for disposing of 222 cubic feet of uncompacted waste is $10,500, or about $47 per cubic foot of uncompacted waste. In this example, the 37 cubic foot boxes weigh 220 lb and the 105 cubic foot container weighs 660 lb. The total amount of steel in these containers is therefore: 6 x 220 + 660 = 1980 lb, or about a ton. Thus, 222 cubic feet of uncompacted waste contains one ton of steel for burial, or about 1980/ 222 = 8.9 lb of steel per cubic foot of uncompacted waste.

If one assumes that the 1.73 million cubic feet of compacted waste disposed in 1992 was packaged in 105 cubic foot containers, then it is possible to estimate the toal mumber of containers that would have been required to dispose of it. This number is 1.73 million cubic feet disposed divided by 105 cubic feet per container, or about 16,500 containers. The amount of steel in these containers, assuming internal steel pre-compaction as described in the MSC practice, would have been about 16,500 tons. If the cost of the container were $0.75 per pound, the market for LLW containers in 1992 would have been about $25 million. Independent estimates have placed this market at about $30 million (Liby, 1994), so this analysis appears valid.

In its annual budget request to Congress, the DOE estimates that its current LLW disposal liabliity is 150,000 cubic meters, which equates to about 5.3 million cubic feet (DOE,1994). The report also indicates that the amount of Low Level Mixed Waste (LLMW) is 169,000 cubic meters (6 million cubic feet). If this total of 11.3 million cubic feet of LLW and LLMW were disposed in the manner described above, it would require 11.3 / 1.73 X 16,550 = 108,000 waste containers. If the cost of the DOE containers were comparable to that experienced by industry, it would represent a market of 11.3/1.73 X 30 = $196 million.

3.2.1.2 Transuranic Waste (TRU) Containers

TRU waste is waste that contains more than 100 nanocuries per gram of alpha emitting transuranium radio nuclides with half lives greater than 20 years. Currently this material is stockpiled at over 65,000 cubic meters. Containers will be needed for this material. Much of this waste is present at Rocky Flats. It has been estimated that 6 to 7 thousand 30-gal stainless steel drums will be needed to contain RF TRU waste plus an additional 1250 to 2500 55-gal. S/S overpacks for these drums (Bechtold, 1993). For market evaluation purposes a median number of 8400 containers will be assumed. It will also be assumed that these will be stainless steel containers valued at $500 each, for a total market of $ 4.2 million.

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3.2.1.3. High Level Waste (HLW) Containers

Significant high level waste containment is and will be needed at nuclear facilities and DOE facilities. At four DOE sites, Hanford, Savannah River, INEL and West Valley they need storage for 381,000 cubic meters of High Level Waste (HLW) (DOE, 1991). The DOE in 1991 forecast a need for 7680 containers over 17 years. The first 500 of these containers cost DOE $7000 each, or a total of $3.5 million. At that rate the forecast of 7680 containers would cost $54 million.

The most recent estimate of the DOE HLW disposal volume is 396,000 cubic meters, which is about 14 million cubic feet (DOE,1994). Certain forms of high level radioactive waste will be fixed in a vitrous or glass media by mixing it with molten glass and pouring it into stainless steel canisters. These canisters will require high integrity and good corrosion resistance. Other HLW will be disposed by mixing in grout and disposing in stainless steel boxes at Hanford. Current estimates are that 100,000 such boxes will be needed (Mizia, 1994). If these boxes cost $2000 apiece, this is a $200 million market.

3.2.1.4 Plutonium Oxide/Metal Waste Containers

Los Alamos National Laboratory (LANL) recently began designing an interim, reusable stainless steel waste container to allow repackaging of waste containing plutonium (Horrell, 1994). The concept is to create a container that works like a mason jar used in preserving fruit. The lid can be removed and later resealed. About 1000 containers will be needed initially. It is expected that Rocky Flats (RF) need large numbers of similar containers once plutonium cleanup begins, so the LANL containers are seen as a prototype for a much larger need at RF. The cleanup at Rocky Flats will involve placement in plutonium containing compounds, such as, oxides, salts, etc. In retrievable storage containers, probably made from stainless steel. The most current estimate for number of drums that will be needed to dispose of this waste ranges from a low of 13,000 to a high of 64,000, depending on which of four disposal options under consideration is selected (Kerridge, 1994). For market evaluation purposes, a median number of 38,500 will be used, and an estimated average price of $500 per drum. This total market is thus $19.2 million.

3.2.2 Plutonium Pit Containers

3.2.2.1 Pantex.

The DOE as part of its current effort aimed at dismantling its nuclear weapons stock pile, estimates that it will need over 20,000 stainless steel containers to hold plutonium "Pit" components (Zarrella, 1994). This container, and its thirty gallon drum "overpack" is currently being designed and tested by Sandia, Albuquerque. Assuming the price of these containers is $1200, this market is valued at $24 million.

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3.2.2.2 Rocky Flats

It is expected that any pits remaining at Rocky Flats will also be stored in containers of the type used for Pantex pits. It is assumed that 5000 containers might be needed for this purpose and, at the same price as for the Pantex containers, this is a $6 million market.

3.2.2.3 Russia

The Defense Nuclear Agency recently issued a purchase order for 32,968 stainless steel containers to be used to store plutonium parts resulting from dismantling of their nuclear weapons (Irby, 1993). The price for these containers was $39,994,295. This is tangible evidence that such container markets exist. this project did not make use of RSM, but the US containers may.

3.2.3 Spent Nuclear Fuel Containers

In 1998, the DOE, by law, must assume control of high level nuclear waste at the nuclear power plants around the country. Since progress on siting a permanent repository for such waste is behind schedule, the current expectation is that the DOE will cooperate with the nuclear industry in establishing a universal containment system (UCS) that will allow temporary storage of spent nuclear fuel at the utility sites prior to delivery to the permanent repository. The use of RSM may play an important role in the UCS, both in the multi-purpose canister (MPC) for containing the waste and in the overpack for the MPC. The MPC design has recently been placed for bid and prototypes should be built in the next two years (TRW, 1994). There is strong interest in the use of RSM to fabricate the containers and their internal steel racks (Hollaway, 1994). This paper indicates the potential for using 205,000 tons of S/S RSM, which is a significant (10%) percentage of the DOE inventory, and 18,000 tons of Depleted Uranium in MPCs. The projected cost for the MPCs is between $300,000 and $400,000 and some 10,000 may be needed (Nichols, 1994). Thus, this is a potential market of $3 to $4 billion. However it is assumed that the primary RSM metal fabrication component of this market will only be 20 % of the total, which is $60,000 to $80,000 each or a median total market potential of $700 million.

3.2.4 Uranium Hexaflouride containers

The DOE has stored a by-product of the nuclear isotope enrichment program, depleted uranium (DU), hexaflouride, in large metal cylinders for over forty years. There are currently 45,000 such cylinders containing about 400,000 metric tons of DU located at Portsmouth, OH, Oak Ridge, TN and Paducah, KY. About 2000 new cylinders are added annually (Lemons, 1990). The estimated proce of these cylinders is $4000 each, or a total annual market of $8 million.As soon as these containers are filled, the metal becomes radioactively contaminated scrap. Eventually when the DU is processed or disposed, the 45,000 bottles must be treated as RSM. The current total is about 20,000 tons of RSM. These storage vessels are currently kept outdoors. The opportunity for RSM ranges from

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using the old vessels as feed to producing new bottles from RSM, to retrofitting all of the bottles with a new corrosion-resistant alloy more suitable for outdoor storage.

3.2.5 Construction Metals

It is possible that RSM could be used during the construction of various DOE sites that will become contaminated in their use. An example would be reinforcement bar for concrete structures in new waste treatment facilities. One must be certain that the concrete will be otherwise contaminated for such applications lest intimate contact with RSM rebar would create a large amount of contaminated waste. It is also expected that RSM can be used in storage racks and as fillers within waste containers (Nichols, 1994). This market is too ill-defined at this point to warrant a sales estimate,

3.2.6 High Energy Physics Applications

Often large amounts of metal are used in conjunction with particle accelerators and subatomic particle detectors. Since these metals are subject to becoming RSM by activation from the energetic particles, the use of RSM initially can make good sense. An example is shield blocks positioned near high energy particle accelerators to absorb stray radiation, which has reportedly been a market, although sales figures are not known and the blocks may actually be provided at no cost in exchange for storing the RSM and avoiding disposal cost. Another example of a high energy physics application is the use of copper in instrumented detectors.

3.3 ISSUES

3.3.1 Recycle Policy

A core issue that will have a major impact on the success of RSM recycle is the establishment within the DOE of a policy advocating restricted reuse of RSM. Such a policy would mandate that, for applications where the metals employed will become radioactively contaminated in their use (e.g. containers for radioactive waste), RSM will be used whenever:
a) it is available and
b) it is economically feasible, taking into account burial cost avoidance for the RSM.
Such a policy will help establish a market for RSM products within the DOE and this market will enable growth of additional markets, such as RSM for commercial radioactive waste containment.

3.3.2 DOE Waste Disposal Costs

DOE presently associates an unrealistically low $5 per cubic foot cost with disposal of LLW. Commercial rates are twenty to one hundred times this amount. If DOE maintains

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such an artificially low waste disposal cost, the destiny of all RSM will be disposal at a DOE site, with the possible exception of nickel which may have sufficiently high intrinsic value to economically justify its decontamination costs without credit for burial avoidance.

3.3.3 Contamination Levels

The amount of contamination present in RSM is expected to be sufficiently low as to not degrade the metallurgical quality of the products. However there are perception issues regarding the presence of contamination that must be dealt with properly in order for RSM recycle to proceed effectively. The International Atomic Energy Agency (IAEA) has done a good job of addressing these issues (IAEA, 1992). They have determined for recycled RSM steel and aluminum the level of exposure that personnel doing the recycling as well as the public using the recycled products will experience. This provides a good methodology for similar analyses for the US RSM recycling industry to follow.

3.3.4 Legislative/Regulatory Aspects of RSM Recycle

3.3.4.1 Environmental/Health Physics

The Energy, Environment, and Resources Center at the University of Tennessee in 1992 was directed by the DOE to research the establishment of effective environmental standards for radioactive scrap metal (RSM). They published a draft report in May of 1993 (Katz, 1993).

There currently are no nationally applicable standards to facilitate treatment and recycle of RSM. Any existing standards do not seem to be adequate guidance in the treatment of RSM. The International Atomic Energy Agency has developed Basic Safety Standards (BSS) for specific isotopes of radioactivity. These standards follow ALARA (as low as reasonable achievable) concepts, which were advocated by the International Commission of Radiological Protection (ICRP). The current dose is 5 rem per annum. In the IAEA publication cited above, "The Application of Exemption Principles to the Recycle and Reuse of Materials from Nuclear Facilities" these principles are applied to determine safe levels for the recycle and reuse of steel, aluminum and concrete. They include volumetric and surface contamination levels and are based on an individual dosage of 1 mrem per year. A number of countries have already adopted the IAEA Principles for the unrestricted release of radioactively contaminated materials.

The Environmental Protection Agency has developed standards for safe levels of radioactivity, as they apply to drinking water and air quality. There are also some recent guidelines pertaining to the treatment of soils and debris which might have a bearing on RSM. In 1994 the EPA intends to propose uniform clean-up standards for contaminated federal facilities. The NRC proposes to release a draft Environmental Impact Statement in April 1994 that is expected to facilitate the development of contaminated materials clean-

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up standards. Meanwhile the commercial sector is governed primarily by the NRC Reg Guide 1.86.

The NRC proposes that individuals in the critical group be limited to less than 10 mrem per year for each exempted practice. This is based on the calculation that a continuous dose of 10 mrem per year over a lifetime would increase an individual's lifetime risk to cancer by 0.25% or to 4 chances in 10,000. In 1986, the proposed standard, Below Regulatory Concern (BRC), caused so much turmoil that the standard was never enacted. The EPA strongly told the NRC that the EPA and not the NRC has the primary responsibility for regulating offsite levels of radiation. The NRC should only concern itself with regulating NRC licensed facilities.

The Energy Act of 1992 stimulated the NRC to initiate the Enhanced Proposed Rule (EPR) effort to establish clean up standards for decommissioning of facilities. This effort could have guidelines for RSM. The NRC has additional guidelines for exposures to releases from nuclear power plants. These should be examined. For now the NRC Regulatory Guide 1.86 is the guiding document for commercial facilities and their handling of RSM. This guide was developed in 1974. Recent commercial recycle operations have been asked in their license applications to do a pathway analysis to determine the degree of public risk from recycled material based on their level of radioactivity and their use and application in the public domain.

The DOD uses a standard for radioactive exposures of 100 mrem effective dose per year. The DOE's surface contamination guidelines are contained in Order 5400.5 which in part is based on NRC Reg Guide 1.86. Some DOE Management and Operations (M&O) contractor have a perception of risk and liability for environmental contamination, and have therefore been reluctant to allow surface-contaminated metals to be free released, even though DOE Order 5400.5 contains guidelines that presumably permit such a release. The NCPP provides an important opportunity to show how a company, operating a private, licensed business on a DOE site, can actually accomplish movement of RSM into the market place and assume the liabilities attendant thereto.

At present, a commercial facility planning to recycle RSM must calculate an allowable dose for each isotope present. Different radionuclides exhibit different activities and thus the standards will depend on the radionuclides present. Without additional standards, a treatment method based on Reg. Guide 1.86 for surface contamination is appropriate. The following table summarizes the current status:

MATERIAL	SURFACE CONTAMINATION	VOLUMETRIC CONTAMINATION	POPULATION EXPOSURES
NICKEL, COPPER	NRC Reg. Guide 1.86 & DOE Order 5400.5	No Standards Available	No Standards Available
STEEL AND ALUMINUM	NRC Reg. Guide 1.86 & DOE Order 5400.5	NO US. Standards, IAEA Principles	No Standards Available

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3.3.3.2 Ownership/Liabilities

An important issue during Stage III of the NCPP will be enabling the Stage III contractor to operate as a private entity with respect to ownership and liability of RSM and any waste derived therefrom. The standard practice is that the waste generator retains ownership of its waste. The Stage III contractor will be the generator and owner of waste that is created from the cleaning of metals. Metals that are cleaned and pass survey for unrestricted use are no longer waste and do not require ownership identification. When the Stage III contractor releases metal in accordance with its license and NRC Regulation Guide 1.86 it releases that metal for unrestricted use. All recipients of the Stage III contractor metal and metal products will be informed as to the characteristics of the metal they receive for recycle or reuse. Once a shipment is accepted, the recipient has the liability associated with that metal. The license and contracts with customers will include a clause that will allow the Stage III contractor to return at any time metal from a customer if the Stage III contractor believes that the handling and processing of that metal would in any way jeopardize the operation as permitted under the license.

3.4 Economics

The products that can be made from RSM can also be made from virgin, or non-recycled metals as well. The economic engine that will drive whether RSM recycle will be viable is burial cost avoidance and allocation of a portion of this cost avoidance to the recycler in order to cover higher costs due to handling RSM. These higher costs include environmental controls, licensing, specialized training of employees, waste disposal and lack of economics of scale.

The following analysis demonstrates how economic factors will drive recycle decisions (Liby, 1994):

	Cost of Commercial Sheet Metal	Cost to Produce RSM Sheet Metal	Cost of Disposal	Benefit of Recycle
Carbon Steel	0.23	1.80	1.50	-0.07
Stainless Steel	1.32	2.20	1.50	0.62
Stainless Steel (Ni Feed)	1.32	2.32	1.50	0.50
Nickel Alloy	5.17	2.60	1.50	4.07

It can be seen that the higher the commercial value of a scrap metal, the more likely one can realize a cost advantage by recycling. For this reason stainless steel is a much more likely target for recycle opportunities than plain carbon steel.

3.5 Sales Forecasts

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3.5.1 RSM Container Fabrication

The information on RSM container market potential presented in section 3.2 is summarized in Table 3.1 below:

Table 3.1
Forecast of Total RSM Container Market

	Thousands of containers required						Market Potential, $ millions					
Container Purpose:	20-Year total	1995	1996	1997	1998	1999	20-Year total	1995	1996	1997	1998	1999
LLW - Non DOE	330	17	17	17	17	17	248	12	12	12	12	12
LLW - DOE	108	8	10	12	14	16	108	8	10	12	14	16
Transuranic Waste	8		1	2	2	1	4	0	1	1	1	1
High Level Waste	108	2	5	10	10	10	254	5	12	24	24	24
Pu Oxide/Metal Waste	39	1	3	10	10	10	19	1	2	5	5	5
Plutonium Pits	58	10	20	10	10	8	70	12	24	12	12	10
Spent Nuclear Fuel	10				1	2	700	0	0	0	70	140
Uranium Hexaflouride	40	2	2	2	2	2	100	5	5	5	5	5
Total	701	40	58	63	66	66	1503	43	65	71	143	212

The portion of that total market that is assumed for the NCPP is presented in Table 3.2 below:

Table 3.2
Forecast of NCPP RSM Container Market

	Thousands of containers required						Market Potential, $ millions					
Container Purpose:	5-Year total	1995	1996	1997	1998	1999	5-Year total	1995	1996	1997	1998	1999
LLW - Non DOE	0			0	0	0	0	0	0	0	0	0
LLW - DOE	8			3	3	3	8	0	0	3	3	3
Transuranic Waste	5			2	2	1	3	0	0	1	1	1
High Level Waste	2			0	1	1	5	0	0	0	2	3
Pu Oxide/Metal Waste	18		3	10	8	1	9	0	1	5	4	0
Plutonium Pits	11			1	4	5	13	0	0	1	5	7
Spent Nuclear Fuel	0				0	0	0	0	0	0	0	0
Uranium Hexaflouride	0			0	0	0	0	0	0	0	0	0
Total	45	0	3	16	17	11	38	0	1	10	15	13

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3.5.2 RSM Processing.

This service includes receiving RSM at a treatment center, sorting it, decontaminating and free-releasing the scrap metal, allocating that portion that can be economically recycled into restricted reuse applications because it cannot be decontaminated to free-release levels, and disposing of the balance.

The DOE market is based on the assumption that the various sites are discharging waste at a current rate of 15,000 tons of total metal per year. This equilibrates to 8,590 tons of steel (57.3% of total metals.) initially and 51,537 tons per year at the peak of decommissioning activity. The market is projected to have a thirty year life, ending in the year 2024. The reuse of existing facilities rather than dismantling them will delay the accessibility of some portion of these metals for recycle. In addition one must keep in mind that a significant amount of materials might prove too costly to process versus the straight burial option. Some metals are mixed, some are difficult to remove and most of them come under possible regulation by the toxicity characteristics they possess, i.e. lead.

There is a strong existing commercial market involving the waste arising from Nuclear Power Plants in their day to day operational waste complimented by the metal waste generated during their scheduled plant shutdowns (currently on an eighteen month cycle). The average market size for the Nuclear Power Plants is $48,123,445 per year which, based on $1.65/lb.. equals 29,165,724 lb. per year or 14,583 tons per year. This market will continue to increase slightly up until the year 2001 when the rate of plants being decommissioning exceeds the number of new plants coming on line. The market will continue to decrease from 2001 until it reaches zero in 2043 (Stark, 1994).

The Nuclear Plant decommissioning is a significant long term market that is just beginning. Current levels are about 323 tons per year of stainless steel and about ten times that, or 3230 tons per year, for carbon steel. This market will stay strong with major activity starting in 2017 at 18,300 tons and continuing strong until 2040 when it drops below 32,504 tons. The market is essentially exhausted by the year 2053. The major event that could significantly change these numbers would be if the NRC would start granting Nuclear Power Plants an extension of their operating license beyond the current 40 year limit, or if they delayed the decommissioning beyond current schedules.

In summary if the total RSM services for the three markets are as follows:

MARKET SEGMENT	PRESENT TONS/YR.	MAX. TONS/YR.
DOE RSM	8,590	51,537/2017
Power Plant Waste	14,583	19040/2001
Power Plant D&D	3,553	80,452/2023
TOTALS	**26,726**	

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Based on the trend data, the nuclear plant waste volume would be 18,700 tons in 1997, the nuclear plant decommissioning market would be stagnant that year with no plants being decommissioned, and the DOE market would have grown to an annual volume of 23,493 tons. Thus the total market in 1997 would be 42,193 tons. This total exceeeds the current estimated RSM waste processing capacity in the US of 41,000 tons per year.

The RSM reprocessing services market is summarized in Table 3.3 below:

Table 3.3
Forecast of Total RSM Reprocessing Services Market

	Millions of Tons of RSM to Reprocess						Market Potential, $ millions					
RSM Source	20-Year total	1995	1996	1997	1998	1999	20-Year total	1995	1996	1997	1998	1999
DOE D&D	150	9	10	12	15	18	248	14	17	20	24	29
NPP Operations	292	15	15	15	15	15	481	24	24	24	24	24
NPP D&D	200	4	5	6	7	9	330	6	8	10	12	14
Total	642	27	30	33	37	41	1059	44	49	54	61	68

The portion of the RSM services market tha is expected to be done under the NCPP will be confined to the arisings fromthe D&D of the Rocky Flats site. These are summarized in Table 3.4 below:

Table 3.4
Forecast of NCPP RSM Reprocessing Services Market

	Tons of RSM to Reprocess						Market Potential, $ millions					
RSM Source	20-Year total	1995	1996	1997	1998	1999	20-Year total	1995	1996	1997	1998	1999
DOE D&D	29		1	2	2	2	48	0	2	3	3	3
NPP Operations												
NPP D&D												
Total	29	0	1	2	2	2	48	0	2	3	3	3

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3.5.3 Summary of RSM Sales Potential

The summary of the data presented in sections 3.5.1 and 3.5.2 for the **Total** RSM container manufacturing market and the **Total** RSM reprocessing services market, respectively, is presented in Table 3.5 below:

Table 3.5
Summary of Total RSM Container and Reprocessing Services Market

Activity	Quantity of RSM						Market Potential, $ millions					
	20-Year total	1995	1996	1997	1998	1999	20-Year total	1995	1996	1997	1998	1999
Reprocessing*	642	27	30	33	37	41	1059	44	49	54	61	68
Container Mfg.**	701	40	58	63	66	66	1503	43	65	71	143	212
Total							2562	87	114	125	204	280

* Millions of Tons
** Thousands

The summary of the data presented in sections 3.5.1 and 3.5.2 for the **NCPP** RSM container manufacturing market and the **NCPP** RSM reprocessing services market, respectively, is presented in Table 3.66 below:

Table 3.6
Summary of NCPP RSM Container and Reprocessing Services Market

Activity	Quantity of RSM						Market Potential, $ millions					
	20-Year total	1995	1996	1997	1998	1999	20-Year total	1995	1996	1997	1998	1999
Reprocessing*	29	0	1	2	2	2	48	0	2	3	3	3
Container Mfg.**	45	0	3	16	17	11	38	0	1	10	15	13
Total							86	0	3	14	18	17

* Millions of Tons
** Thousands

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4.0 Depleted Uranium

Depleted uranium is a by-product of the process of producing enriched uranium needed for making nuclear fuel. In nature, uranium ore contains only 0.711 % of the isotope U-235, which is the isotope needed in nuclear fuel. Most of the other 99% of the uranium in the ore is the isotope U-238 which, although also radioactive, does not possess the characteristics necessary to be a nuclear fuel. In the US almost all uranium isotope enrichment has been done by a process known as gaseous enrichment, in which uranium hexafluoride (UF_6) gas is passed through a series of membranes that selectively separate the desired U-235 from the unwanted U-238. This unwanted material has been "depleted" of its U-235 content and thus has the name "depleted" uranium (DU). When collected at the end of this process, the DU is still in the chemical form UF_6 and is pumped, as a gas, into a large storage cylinder about the size of a gasoline tanker. The gas is allowed to condense to a liquid and eventually freeze to a solid within the container. If it is ever needed again, the UF_6 must be reheated to convert it back to a gaseous state and pumped from the cylinder.

4.1 Raw Material Availability

The DOE has an abundant amount of depleted UF_6 resulting from over 40 years of gaseous diffusion operations. This is stored in 45,000 cylinders, each containing about 10,000 lb of DU (Lemons, 1990). The current inventory is about 450,000 metric tons of contained uranium (Frank, 1993).

The current technology for converting UF_6 to metal is expensive and environmentally unfriendly. It involves reacting UF_6 gas with hydrogen gas in a chemical reactor, thereby reducing the UF_6 to uranium tetrafluoride (UF_4) which is a solid green-colored powder called "green-salt". The UF_4 powder is subsequently mixed together with magnesium metal flakes and heated in a reaction vessel until it reacts, producing DU metal and the waste by-product magnesium fluoride, MgF_2, which is slightly contaminated with uranium and therefore must be disposed as a low level waste. For every pound of DU metal produced, this process results in 1.6 lb of MgF_2 waste. The cost of metal produced in this manner is about $5 per lb.

Fortunately, a new technology is on the horizon that could dramatically decrease the cost of DU metal (Floyd, 1993). This technology, if successful, would enable the direct reduction of UF_6 to metal, by-passing the UF_4 stage. It would also eliminate the waste by-product MgF_2, replacing it with a marketable by-product hydrofluoric acid (HF). The cost of DU metal produced by this technology is estimated at $ 1 per lb. (Joyce, 1992).

In addition to DU in the form of UF_6, the DOE also has a substantial inventory of DU metal. The DOE Fernald site presently has about 6 million pounds of DU metal, although the site is making inquiries about disposing of this metal. the US Army has about 1 million lb. of DU metal stored at Fernald which is being readied for retrievable disposal at the

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NTS. The Army may also have even larger quantities of DU metal scrap that is classified and results from its DU armor production activities.

At Rocky Flats, the DOE has an estimated 200 tons of scrap DU available for recycling. Some of this metal is classified and needs to be melted or crushed to alter its classified shape before it can be made available for recycling.

4.2 Market Segments

The properties of DU that make it useful are its high density (19 g/cm^3), strength (tensile strength over 200,000 lb/in^2, making it as strong as high strength steel), and high atomic number, which helps make it opaque to radiation. These properties give rise to applications that can be categorized in market segments as follows:

Market Segment	Characteristic Exploited
Defense	High Strength and High Density
Counterweight	High Density
Shielding	High Atomic Number

These market segments are discussed below.

4.2.1 Defense Markets

4.2.1.1 Armor

The US Army has developed an armor, used in the M-1 Abrams Main Battle Tank, that includes depleted uranium armor. The fact of such use was classified during its development and was declassified in order to inform soldiers of the presence of this material in their environment. Details about the armor are not commonly available due to security considerations. It is not believed to be an important future market and there are no plans to produce armor at Rocky Flats in conjunction with the NCPP.

4.2.1.2 Anti-armor

Depleted uranium has proven to be very effective in penetrating armor. This has led to a significant market in the US which is described briefly below.

4.2.1.2.1 Kinetic Energy Penetrator Cores

DU is used as a high density, high strength core in small and large caliber ammunition produced for the US Army. This includes the main anti-tank round used in the main battle tank and the armor piercing 25 mm projectile used with the Bradley Fighting Vehicle. The US Navy uses a DU core in its anti-missile gattling gun, but new ammunition makes use of tungsten metal cores. There is a very mature US Industry capable of producing these

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components. The demand for such components is also very low and there is substantial under-utilized capacity, so it is unlikely that the DOE facilities will be used to produce products for this market.

4.2.1.2.2 Shaped-Charge Liners (SCL)

A principal anti-tank weapon used by the US military makes use of the shaped charge principle. A projectile is launched toward a target and, an instant before it arrives, an explosive charge within its warhead is detonated. This causes its typically cone-shaped metal liner to be accelerated toward the target while its former shape is altered by the action of the explosive into a pencil-shaped metal jet which strikes the target at a very high velocity, penetrating it. Although DU metal liners have proven to be especially effective for such penetration, The metal is still under development and has not yet been used for any production applications for a variety of reasons.

4.2.1.3 Earth Penetrator Weapon (EPW)

Recent interest has been expressed in the possibility of using DU in the body of a large EPW under development. In a war, EPWs would enable deep penetration into the earth to attack underground installations without having to resort to nuclear weapons. It is likely that this component would be cast and there is some possibility that DOE DU casting capabilities could be useful in producing such components.

4.2.2 Counterweight Markets

4.2.2.1 Aircraft

Counterweights are used in control surfaces to ease the force requirements of motors that move these surfaces. Often the space available for such weights is limited, forcing designers to look for high density metals such as DU. For example, one ton of DU is present as a counterweight in every Boeing 747. Several military aircraft also employ this metal in this way.

4.2.2.2 Naval Applications

DU has been considered as ballast for submarines. Lead is currently used. Had DU been used in one application, it would have freed-up space equal to a 10 ft cube. Such space is at a premium on submarines. It has also been calculated that if DU were used as ballast in surface ships, they would ride lower in the water and increase their stability.

4.2.2.3 Mineral Industry

DU has been used as a sinker bar to penetrate the high density liquids present in oil wells in order to aid in the placement of well-logging equipment. It is being considered as a collar

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for a hard-rock hammer and has been used as a collar in emplacing pipe in the oil industry. The oil industry often must deal with naturally occurring radioactive materials (NORM), so the radioactivity of DU is better understood within this industry than it is in some industries.

4.2.2.4 Nuclear Industry

DU is increasingly viewed as a desirable alternate to lead in applications where it will become contaminated, because contaminated lead is a mixed waste which gives rise to waste disposal problems. One such application is the use of DU as a counterweight in cranes, manipulators, etc. within radiation cells and nuclear power plants. DU is also being considered as an energy storage device in a back up power supply for the emergency cooling system in one of the new modular reactor designs.

4.2.3 Radiation Shielding Market

The high atomic number of DU means that it has a high atomic density. The effect of this is that the number of atoms that will appear in the path of a high energy particle attempting to pass through a given thickness of DU is greater than those present in a similar thickness of almost any other metal. The material DU most often competes with in radiation shielding applications is lead. Calculations performed by MSC show that for lead to achieve radiation absorption equal to DU the lead must be 83% thicker than the DU for radiation in the 1.5 million electron volt range. this means the lead will also be 10% heavier for equal levels of radiation protection. Thus, in this example, DU offers the twin advantage of lighter weight and requiring less space for the same radiation protection level compared to lead.

4.2.3.1 Shipping Casks

The legal weight truck shipping cask for spent nuclear fuel employs DU for its gamma-radiation shield. This cask, designed by General Atomics for the DOE Office of Civilian Radioactive Waste Management (OCRWM), by using DU instead of lead, released enough space in the GA design to allow a doubling of the spent fuel payload. This means that only half as many trips from nuclear power stations to the nuclear waste repository will be needed as otherwise would nave been required. This results both in significant cost savings and in a halving of the risk associated with such transport.

The DU in these casks must be precision machined to enable tight fit with the stainless steel containment barrier. The cross section of the shield is a round-cornered square and the full size shield will be about 24-in across, 14-ft. long, have 2-in. thick walls, and weigh 20,000 lb. Each cask shield will cost about $1,000,000 and about 50 will be needed, making this a $50 million market.

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4.2.3.2 Multi-Purpose Canister (MPC)

The US nuclear utility industry is concerned about the rising need for on site storage of spent nuclear fuel. As a result, working with OCRWM, they have conceived and placed for bid the multi-purpose canister (MPC), which will enable on-site storage until such time as the DOE is prepared to accept spent nuclear fuel for storage or disposal (TRW, 1994). The baseline design for the MPC requires the use of DU as an end cap radiation shield to protect welders from excessive radiation exposure while the MPC endcap is welded in place. These end caps are nominally 4-ft. diameter and 2-in. thick and specify DU to shorten the overall length and reduce the weight of the MPC. It is estimated that 10,000 MPCs will eventually be needed. The manufacturing process will be quite simple, involving casting of sections and machining of joints.

4.3 Economics

The key economic factor for wide scale use of DU metal products will be whether the abundant supply of DU in the form of uranium hexafluoride (UF_6) can be converted to metal economically and environmentally-responsible manner. There is a reasonable amount of metal scrap already available, but the largest markets will not materialize if the metal cannot be produced in a new manner. The DOE should be highly motivated to use the DU as metal, since it will be an enormous environmental liability if it must be disposed. One firm has proposed a cost of $5 billion to convert the 400,000 metric ton inventory of UF_6 into a benign form of uranium oxide (UO_2) that will be safe for disposal.

4.4 Issues

The principal issue surrounding the use of DU in many applications is concern over health effects. The DU processing industry has established a wealth of inforamtion about radiation contol practices and procedures in order to mitigate risks from working with DU. The principal risks have to do with inhalation or ingestion of DU. DU partivles that lodge in the lung can irradiate nearby tissue with alpha radiation and ingested DU acts like any other heavy metal that can have adverse effects on major organs such as the kidneys and liver. Because of its radioactivity, the presence of DU in the work environment is relatively easy to detect and protect against. The licensing procedures that permit DU operation require the DU operator to have a rigorous radiation monitoring, protection and health effects testing program in place to reduce the risk.

One popularized concern about DU is the "Gulf War Syndrome", which is an illness that several veterans experienced upon return from the battlefield. Because DU was used in armor/anti-armor applications in that war and no previous war, it was a suspected cause. Subsequent investigation has found no support for this suspicion. In fact, it now appears that the wide-scale use of unproven anti-chemical warfare drugs may be the cause of these symptoms (Chemical & Engineering News, 1994).

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4.5 Sales Forecasts

The Sales forecast for the depleted uranium market is presented in Table 4.1.

Table 4.1
Forecast for Depleted Uranium Metal Sales

	Total Sales, $ Million				
	1995	1996	1997	1998	1999
4.1 Defense					
4.1.1 Armor	$10	$5	$2	$1	
4.1.2 Anti-Armor	$30	$20	$10	$2	$3
4.2 Counterweights	$1	$1	$1	$1	$1
4.3 Radiation Shielding	$5	$6	$8	$12	$20
4.4 Proprietary				$1	$3
Total	$46	$32	$21	$17	$27

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5.0 Beryllium

5.1 Raw Material Availability

Most DOE scrap beryllium is stored at Rocky Flats. Approximately 100,000 lb is on site (Wilson, 1994). Much of it is classified and needs to be crushed or melted to destroy its shape and render it unclassified. This would be an activity of Stage III of he NCPP.. The price of scrap beryllium is high, and highly variable, depending on supply/demand considerations. It has sold for as much as $60 per pound and as little as $10 per lb.

The Brush Wellman Company, Inc. operates a mine in Utah from which beryllium ore is removed. The high cost of beryllium is related to the low beryllium content in the ore and the significant soil over burden that must be removed to get to the ore. Also the processes used to win the beryllium metal from the ore are lengthy and costly.

Kazakstan, a former Soviet republic, has recently emerged as a potential supplier of beryllium in western markets. This further complicates the price picture as the Kazakstani's are hurting for cash and offering metal at below traditional pure metal prices.

There is abundant beryllium available to meet currently-known markets. The existence of the large amount of beryllium scrap at Rocky Flats creates an opportunity to stimulate sales with lower cost products and retain those lower costs by improved productivity as demand increases.

5.2 Market Segments

The decline and/or elimination of production on several key programs, particularly the strategic weapons programs, has resulted in production levels of beryllium metal reducing to 1/3 those experienced in the mid-1980's.

The remaining beryllium business is mostly concentrated on Nuclear opportunities, Electro-Optical substrates and systems, and satellite structural components. In anticipation of the decline of the strategic weapons business, Brush Wellman recognized the need to develop lower cost materials and products. The critical issue is the cost/performance relationship. Producing a mix of products from pure beryllium metal to high strength alloys of aluminum and 40% (by weight) beryllium allows beryllium and its alloys the opportunity to meet cost/performance ratios in market segments previously unavailable to pure beryllium. AlBeMet™

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Beryllium and AlBeMet™ Market Potential

Aerospace/Defense

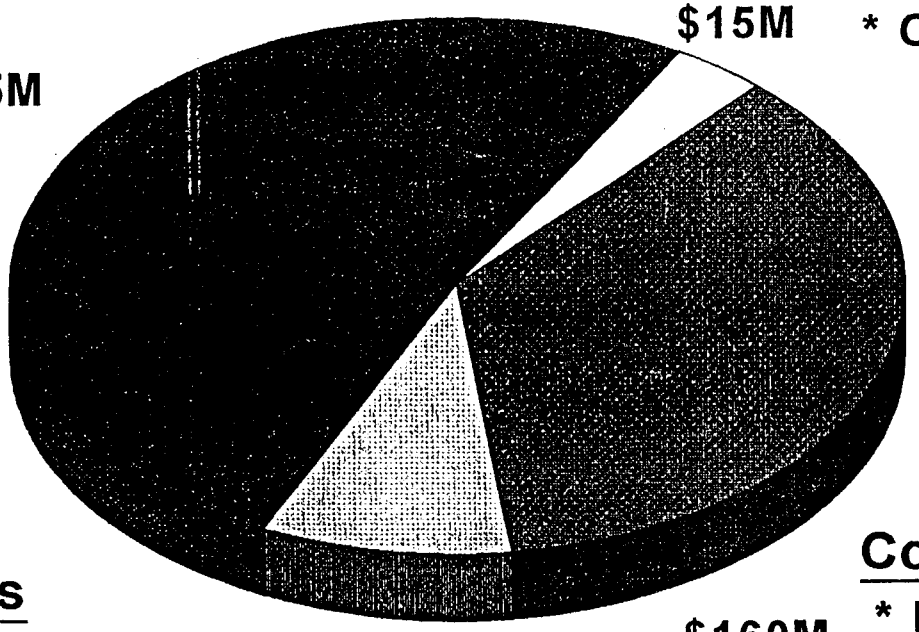
* Satellites
* Avionics
* Propulsion
* Missles
* Structural
* Electro-optical

$ 225M

Nuclear Markets

* Reflectors
* Fusion
* Other

$15M



$160M

$40M

Consumer Markets

* Bicycles
* High Tech Sports
* Golf

Commercial Markets

* Electronics
* Computers
* Enclosures
* Robotics
* Medical
* Automobile

The market potential is dependent upon AlBeMet™ giving a cost/performance value which will make it attractive to a much larger population of opportunities within various market segments. The following chart shows the annual market potential at maturity for all market segments. We estimate that markets will reach maturity starting in 5-15 years, depending on technology, market trends to high performance materials, and the timeliness of product development. (See Figure 5.1: Beryllium and AlBeMet™ Market Potential)

These markets will not mature simultaneously, however, it is possible that in 10 years annual levels of $300M+ per year can be achieved. This chart represents the value of materials and products delivered in either mill shapes, near net shapes, or finished components.

5.3 Issues

The key to market penetration is the cost/performance relationship. In order to attain the sales performance illustrated in the above section, certain critical processes and products must be developed. Table II shows a typical chart of evaluating the market potential of aircraft products based upon the value of the material as defined by weight. The aircraft market is a critical driver for future business. Only a net-shape technology, like investment casting, can hope to meet cost requirements as low as $300 to save a pound. The wrought AlBeMet™ market is reliant on a high strength, high performance, light weight materials required for structural applications. Lower percentage beryllium alloys like an AlBeMet™ 540, will have to be commercialized to meet these needs. (See Figure 5.2: AlBeMet™ Solutions to Aerospace Market's Demand For Weight Reduction)

Each application must be engineered to fully take advantage of the properties of AlBeMet™ or beryllium. This requires an extensive technical and marketing support activity combined with a framework for developing materials, products, and applications. This framework for product development, as illustrated in Table III, combines material alloys with existing and new process technology, engineered into products and applications. (See Figure 5.3: Framework for Product Development)

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AlBeMet™ Solutions to Aerospace Market's Demand for Weight Reduction

Aerospace Market Demand

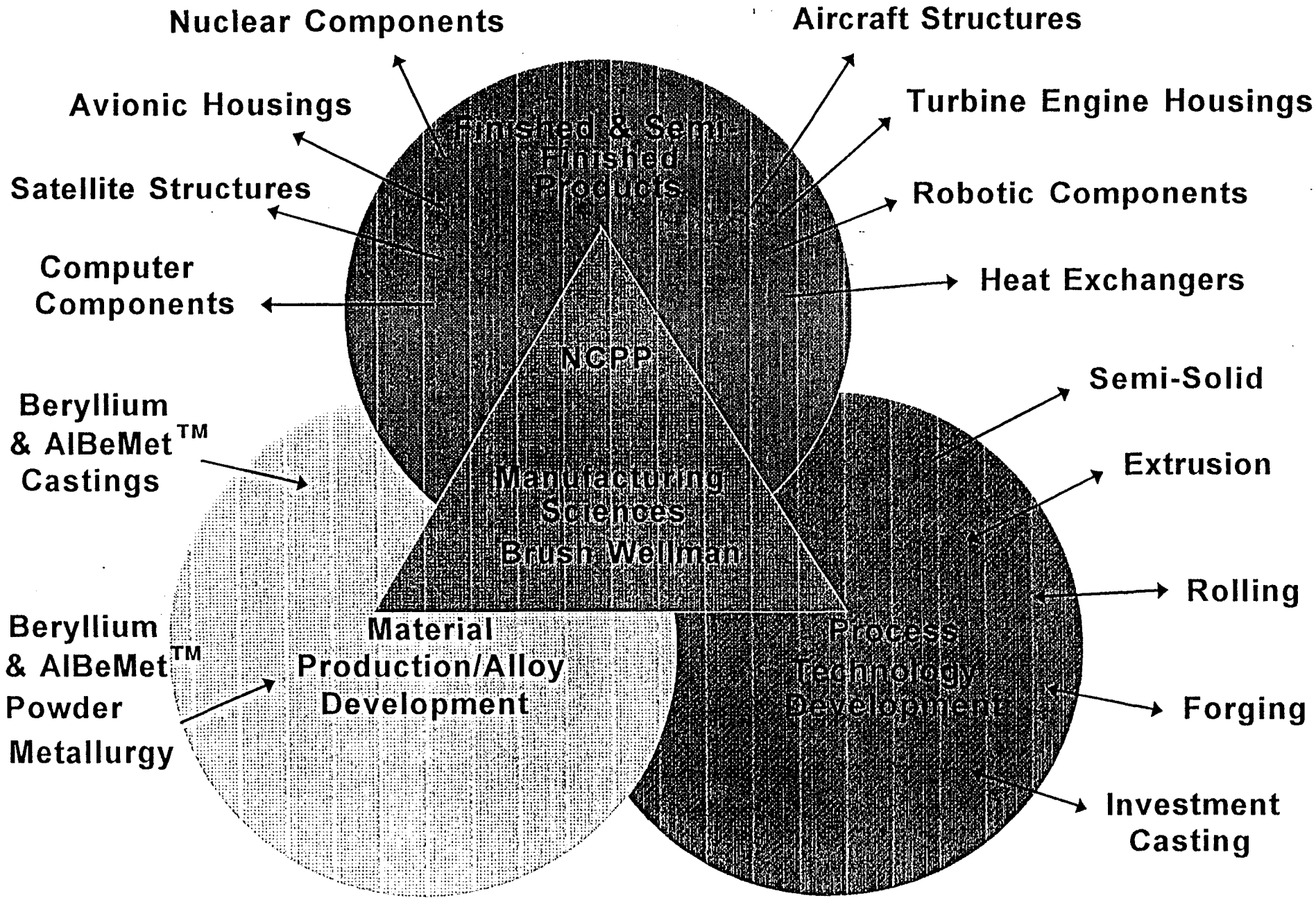
- Commercial Aircraft
- Military Aircraft
- Military Helicopters

$300/Lb — Cost ($) Willingness to Save 1 Lb wt. — $2,300/Lb

AlBeMet™ Solutions

- Net Shape Inv. Cast AlBeMet™ $100M/Yr
- Wrought AlBeMet™ $50M/Yr

Framework for Product Development



The market will be dependent on the following general technologies using both powder metallurgy input materials or cast input materials. Those technologies are:

1. Semi-Solid Processing

   This technology is only feasible with AlBeMet™ alloys with 50% or less beryllium content. The critical issue is to produce parts from slugs of input material with little or no machining.

2. Extrusion

   This technology is viable with all materials. The critical issue with this technology is to produce equivalent quality shapes as produced in aluminum with optimized AlBeMet™ alloys. Cost/performance considerations are related strongly to process yield and net shape extrusion capability.

3. Rolling

   This process technology can be broken down into two areas which are foil and sheet. (Foil <.020" thickness) The critical issue is cost and yield. All materials can be rolled, but we need to improve the cost/performance ratio greatly to make significant in-roads using rolled AlBeMet™ or beryllium.

4. Investment Casting

   This process has demonstrated the potential to produce complex components with little machining. The critical issue is duplicate the aluminum investment casting technology with a little, if any, deviation from aluminum costs other than the material difference and the fact that AlBeMet™ is vacuum cast.

   Figure 5.4 shows the estimated market opportunities dependent on successful accomplishment of technology and alloy development cost/performance targets shown on Figure 5.2. (See Figure 5.4: Market Potential by Process Technology)

The RF/NCPP using equipment available, could participate in the development of the following materials/processes:

1. Cast AlBeMet™ by Vacuum Arc Remelt (VAR)
2. Rolled AlBeMet™ foil and sheet
3. Rolled Beryllium foil and sheet
4. Extruded products
5. Forged products
6. Others TBD

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The critical issue is the ability to produce a high quality AlBeMet™ alloy using the VAR. It is possible that a high quality casting input into the extrusion or rolling technologies will improve the cost/performance ratio for AlBeMet™ by decreasing costs while maintaining the performance of powder derived materials.

5.5 Sales Forecast

The growth of sales into the targeted markets is dependent upon the ability of industry to develop low cost processing technology, characterize the product of that technology, and convince designers to use AlBeMet™ or beryllium as the product which best solves their problems. The current market is about $35M per year with most major defense programs that are seriously considering our materials not going into production until 1997 or later. This time frame is also consistent with most commercial products we are evaluating. We see only about 5-10% annual growth through 1997 with 15% per year growth beginning in the late 1990's and continuing through 2010. This is all dependent upon the successful implementation of product development and market penetration.

Table 5.
Sales Forecast - Total (Long Range)

1994	1997	2000	2005	2010
$35M	$44M	$67M	$135M	$275M

A forecast of the market for beryllium aluminum alloy sales over the next five years is presented in Table 5.2 below.

A five year forecast of beryllium-aluminum sales is presented in Table 5.2 below:

Table 5.2
Forecast for Beryllium-Aluminum Alloy Sales

	Total Sales, $ Million				
	1995	1996	1997	1998	1999
5.1 Extruded Product	$8	$8	$9	$10	$11
5.2 Rolled Sheet	$6	$6	$7	$7	$8
5.3 Foil	$3	$3	$3	$3	$4
5.4 Investment Casting	$9	$10	$10	$11	$13
Total	$25	$27	$29	$31	$36

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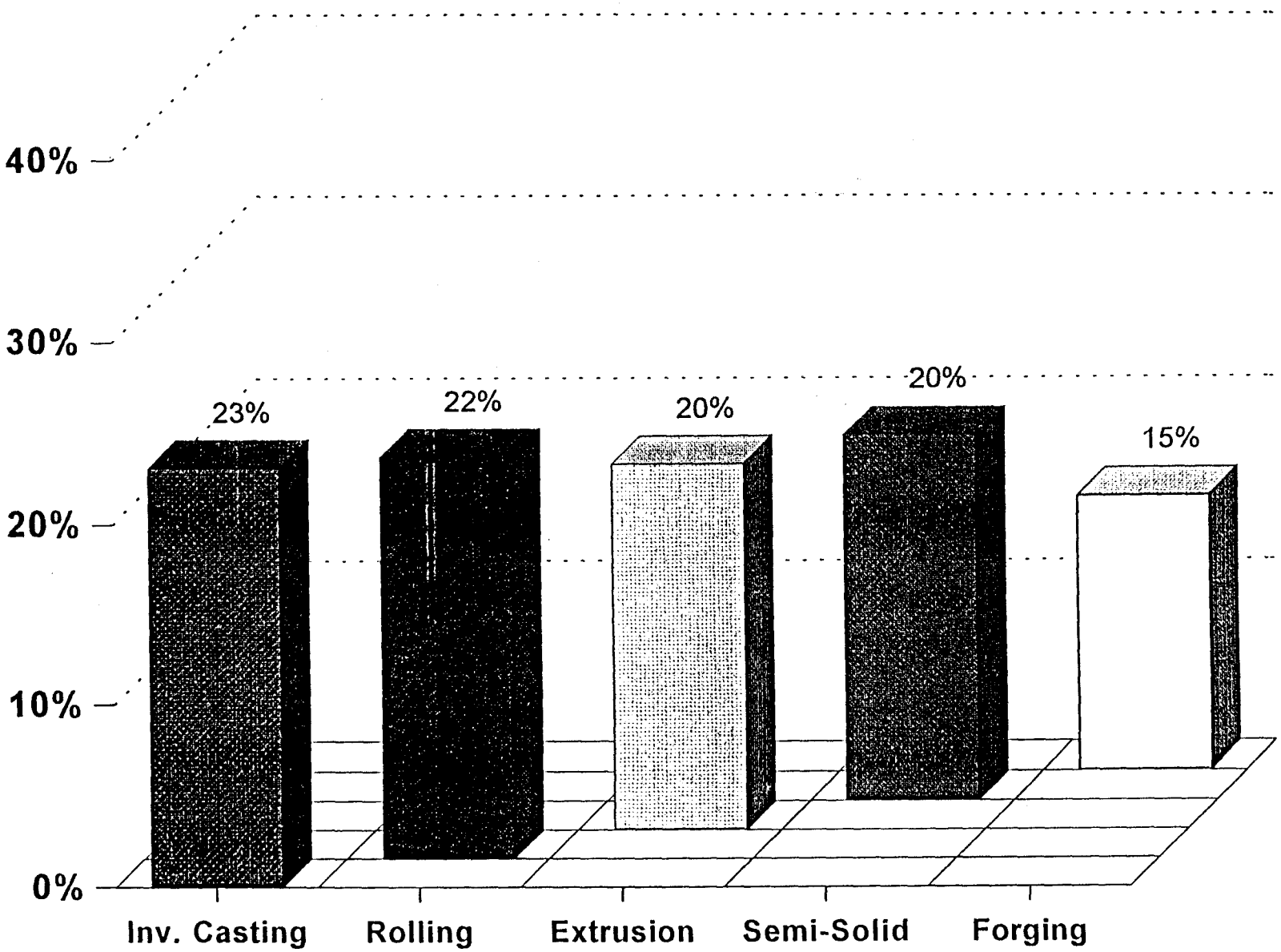
Market Potential by Process Technology



6.0 Equipment Resale

A potential business opportunity during Stage III is to decontaminate and resell equipment that has greater value than its decontamination cost. To test the value of this concept, MSC obtained the services of an equipment resale specialist to evaluate the market value of equipment in NCPP buildings not needed for the project. The results of this analysis are as follows:

No of Pieces of Equipment	Fair Market Value	Estimated Decon Cost	Net Equipment Value
170	$3.1 million	$0.8 million	$2.3 million

It can be seen that if the equipment is cleaned and decontaminated, it can be expected to generate a return to the NCPP of $2.3 million. If this model were extended site wide at Rocky Flats or DOE wide, the potential benefit to the DOE would be sizable. The work of decontamination and preparation for sale would also be good for displaced workers at the sites involved.

Central to this concept is the agreement by the DOE to release title for the equipment to a private firm licensed to receive, process and dispose of radioactive materials. For the NCPP this would presumably be the Stage III Contractor. This party would assume liability should problems arise for the recipient of the decontaminated and refurbished equipment due to residual contamination.

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7.0 Discussion

From the information presented above, there should be little doubt that an abundant amount of raw material exists to enable recycling of radioactively-contaminated scrap metal (RSM), depleted uranium (DU) and beryllium (Be). There is also good evidence presented that a market exists for products that can be made from RSM, DU and Be. The real question thus becomes, **Is recycling of these DOE scrap metals going to happen?** The purpose of this section of the report is to discuss what needs to transpire if these raw materials are to be converted into products and how the NCPP can help bring this about.

The key to this conversion is, or should be, free-market forces. Customers, including DOE users of RSM, DU and Be products, will ultimately buy the lowest-cost products that meet their performance specifications, all other things being equal. Recycling enjoys an aesthetic advantage over consuming new resources, but if the cost is appreciably higher, the product will not sell.

7.1 Factors Affecting the Recycle Market for DOE Scrap Metals.

What are the factors that affect the cost balance between new and recycled products? To list a few:

- Environmental Controls
- Wages and Productivity
- Facility Depreciation and Decommissioning
- Transportation
- Raw Materials
- Waste Disposal Cost Avoidance

The first four factors listed work to the advantage of using products made from new metals. the final two factors favor the use of recycled products. The key is whether the weight of the final two is sufficient to offset the first four. Further explanation of these factors may help. For ease of explanation, the following discussion will focus on RSM, but is equally true for DU and Be.

Environmental Controls

RSM require environmental controls that new or virgin metals do not. This includes ventilation systems to prevent radioactive materials from entering either the work area or the surrounding community, monitoring systems and procedures to assure this is true, and radiological health programs for the workforce. This obviously adds costs to products manufactured in a facility that operates with such controls compared to one that does not.

Wages and Productivity

Workers in radiological-controlled operations require specialized training to understand and perform the procedures for working with RSM. These procedures, and the impact they

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have on equipment operation, lead to higher wages and lower productivity compared to operations with new metals that do not require such training and controls.

Facility Depreciation and Decommissioning
All facilities have depreciation costs. However, facilities that process new metals can do so at higher productivity than can facilities that incorporate environmental controls. The consequence is that these costs for new metal products can be spread over a higher volume of products leading to a lower unit cost compared to RSM products. Also, RSM manufacture normally requires establishment of a decommissioning fund, and these costs must be allocated to the product.

Transportation
RSM requires a premium for transportation compared to virgin metals, and must often be transported over longer distances to the processing facilities, both factors adding cost to recycled products.

Raw Materials
RSM should normally be "free", except for transportation costs, owing to the desire of the owner of the RSM to be rid of it.

Waste Disposal Cost Avoidance
By recycling rather than disposing of the RSM, the RSM generator saves on disposal costs. This fact enables the RSM processor not only to acquire RSM but also to obtain a fee for "disposing" of the RSM for the generator. The amount of this fee will be just under the prevailing waste disposal fee, thus enabling the RSM generator to participate in the benefit of recycling. This factor is obviously the real key to bringing the cost of processing RSM into balance with the cost of processing new metals.

7.2 The Role of the NCPP in Responding to Recycling Cost Factors.

The National Conversion Pilot Project will help the DOE learn how and whether these costs can be brought into balance. The manner of doing this is discussed below for each of the above cost factors.

Environmental Controls
By using existing DOE facilities, many of the needed environmental controls are already in place. The radiological control infrastructure already exists. These costs need not be added costs, as they would be in a new purpose-built RSM recycling facility.

Wages and Productivity
Training costs can be reduced by using former site workers to do the recycling, many of whom have the radiological training and requisite skills. The wages paid for their previous work for DOE Defense Programs are generally not competitive with wages paid employees

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in industries producing products from virgin metals and will need to be reduced somewhat. The amount of reduction will be tempered by the need for their radiological control training and expertise. Productivity can be improved by making modifications to existing equipment and through the use of new equipment. Such upgrades should be made by companies wishing to make use of DOE facilities, not by the DOE.

Facility Depreciation and Decommissioning

Depreciation costs will be replaced by leasing costs in the NCPP scenario. It will be important that the negotiated leasing costs not exceed depreciation costs for new metal processing facilities. It will be equally important that these costs be non-zero, so that new metal manufacturers will not be disadvantaged through the "free" use of government facilities by their RSM competitors. The leasing costs should make allowance for the leasee to escrow funds for eventual decommissioning of the DOE facilities that have been used.

Transportation

The DOE RSM is located at many sites around the country. It will be helpful to process these metals into products at sites as close to the source of RSM as possible. To this end the NCPP will work with all DOE sites to identify RSM inventory, establish demand for RSM products, determine which RSM conversion activities can be done at each site, and assist in the establishment of regional reprocessing centers that optimize the use of assets at each site and region to manufacture their own needed products competitively with new metals.

Raw Materials

The DOE should not provide their raw materials "free" A price should be set based on the price these raw materials could command if released into the open market as scrap. This cost to the RSM manufacturer should be paid to the DOE when the product using the RSM is sold, and the cost should be shared with the local community, through the options provided by the Hall Amendment to the 94 Defense Authorization bill, in order that the local stakeholders can also share in the benefits of recycling RSM.

Waste Disposal Cost Avoidance

The DOE needs to allow a credit for the recycling of RSM both in DOE products and non-DOE products. A model for doing this exists within the commercial nuclear power industry. The cost of disposal of RSM from nuclear power plants in commercial repositories is currently about $1.50 per pound, and a cost increase just announced by the Barnwell site will increase this to about $2.00 per pound on July 1, 1994. Rather than dispose of it as low level waste (LLW), the nuclear power industry will gladly supply this RSM, even at this price, to companies capable of reprocessing this material into useful products. Their motivation is that they are allocated a fixed volume for their low level waste and they need this volume for non-recyclable LLW.

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This is an opportunity for the DOE to be proactive. It should provide a credit to encourage recycling of RSM, based on the free-market model of the nuclear power industry. This credit need not require that the DOE alter its current internal cost structure that leads to LLW burial costs well below comparable commercial costs. It should, however, give recognition to the twin benefits received be RSM recycling:

1) Reduced volume of LLW that needs disposing, freeing up space for non-recyclable waste and minimizing the ultimate volume of waste disposed, and

2) reduced disposal costs by the elimination of the need to handle and dispose of RSM as waste.

This credit should be provided the recycler when the RSM is delivered for recycling. The NCPP provides a mechanism to help establish and demonstrate this policy. This will be done by working with the DOE to learn the real cost to the DOE for RSM disposal rather than recycle, just as that cost is now known by the nuclear power industry. This cost savings will then form the basis for the cost credit the DOE can justify to stimulate RSM recycle.

7.3 Other Impacts of the NCPP on the Recycle Market

In addition to dealing with the cost factors involved with recycling, the NCPP will have an influence in several other key areas affecting the market for recycle of DOE scrap metals in DOE facilities using former DOE workers. These include:

- Recycle Technology
- Cleanup Technology
- Equipment Recycle
- Facility Recycle

Each of these is briefly discussed below.

7.3.1 Recycle Technology

The NCPP will allow the DOE to evaluate the use of many new technologies in the process of preparing for recycle. These include:

Vacuum Induction Melting (VIM) to effect waste minimization by the exclusion of oxygen from the melt atmosphere, which will in turn reduce the amount of radioactively-contaminated skull that is normally formed in the casting operation. VIM melting also enables easy and efficient filtration of all gases generated in melting RSM, DU and Be, resulting in improved environmental controls, for example, over air melting that is used elsewhere for steel melting.

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Seamless Container Fabrication to improve the corrosion resistance of waste containers by eliminating welds that are often the sites of leaks that lead to release of radioactive contents. The technology involves deep drawing and spinning operations previously employed to make nuclear weapons components and re-entry vehicles. Applications that will benefit from this technology include plutonium metal and oxide waste containers, plutonium pit containers, vitrified high level waste (HLW) containers and HLW-grout mixtures.

Vacuum Arc Melting to improve the metallurgical quality of beryllium-aluminum alloys and to create high-nickel master alloys. The technology involves the use of very expensive equipment that exists within the DOE and can create a cost advantage for RSM recycling. Applications include improved corrosion resistant alloys for waste forms requiring longer isolation from the environment and Be-Al alloys for electronic and aerospace applications.

7.3.2 Cleanup Technology

An important element of the NCPP is retraining former DOE workers in the technology of cleanup of manufacturing facilities. This should have good spin-off benefits for training workers for cleanup the balance of the Rocky Flats site and as a model for use at other DOE sites. It may also lead to opportunities for former DOE workers to participate in other cleanup opportunities within the environmental industry at large.

By working with the National Laboratories, the NCPP can be a test bed for testing new cleanup technologies. For example, the NCPP will use real-time beryllium monitoring instruments to alert against resuspension of beryllium contaminants. This technology was developed at Los Alamos National Laboratory (LANL). It may also have applicability to other forms of airborne contaminants. LANL has also spoken with NCPP representatives about the possibility of testing some water-soluble strippable resins that can be sprayed on contaminated surfaces, pealed off to remove contaminants and them dissolved to eliminate additional waste.

7.3.3 Equipment Recycle

As part of the NCPP, operable equipment not needed by the project may be decontaminated and resold. An equipment recycling specialist has provided an estimate of the market value for uncontaminated equipment of the type that must be removed from the NCPP buildings. If it is determined that such equipment can be cleaned to free release levels for less cost than its market value, it will be thus recycled rather than being scraped as feed metal for recycling. This experience can then be extended to other DOE sites and serve as a model and basis for possibly extensive cost savings for the DOE.

7.3.4 Facility Reuse.

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It is inescapable that the DOE, in decontaminating and decommissioning (D&D) its facilities, will have to process waste materials in order to dispose of them. This may require establishing new waste treatment facilities that will inevitably become contaminated. When such facilities are no longer needed, they too will have to be undergo D&D. To the extent existing, already-contaminated facilities can be used instead, new facilities will not be built and later cleaned, resulting in a net reduction in waste generated. This is a direct contribution to waste minimization through recycling of buildings. The NCPP can serve as a model to show how existing facilities at DOE sites can be used for cleanup.

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8.0 Recommendations

This is a preliminary market analysis. Its purpose is to demonstrate that there is ample business opportunity to justify further effort leading to recycling of RSM, DU and Be at Rocky Flats and other DOE sites. As the time and funding available to perform this study was limited, it should be viewed as a starting point for a more detailed and careful evaluation of the DOE RSM recycle business.

The information presented in this report shows that there is a large and growing business of recycling RSM. The DOE sites that are already equipped to handle radioactive materials should now be used to process these materials so that new, uncontaminated facilities need not be constructed and contaminated only to later be deactivated, adding to the environmental burden of decommissioning the former DOE defense sites. The former workers at these sites should be given first call on new positions to clean and reuse these facilities.

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9.0 Glossary of Acronyms

ALARA	As Low As Reasonably Achievable
Be	Beryllium
BWI	Brush Wellman Incorporated
CDH	The Colorado Department of Health
D&D	Decontamination and Decommisioning
DOE	The Department of Energy
DU	Depleted Uranium
EPA	The Environmental Protection Agency
HLW	High Level Waste
IAEA	International Atomic Energy Agency
INEL	Idaho National Engineering Laboratory
LANL	Los Alamos National Laboratory
LLW	Low Level Waste
MPC	Multi-Purpose Canister
MSC	Manufacturing Sciences Corporation
M/S	Mild Steel
NCPP	National Conversion Pilot Project
NORM	Naturally-Ocurring Radioactive Material
NPP	Nuclear Power Plants
Pu	Plutonium
RFP	The Rocky Flats Plant
RF	Rocky Flats
RSM	Radioactively-Contaminated Scrap Metal
S/S	Stainless Steel
TRU	Transuranic Waste
UCS	Universal Containment System
US	United States
VAM	Vacuum Arc Melting
VIM	Vacuum Induction Melt
VAR	Vacuum Arc Remelting
WINCO	Westinghouse Idaho Nuclear Company, Inc
WSI	Wackenhut Security Incorporated

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D1 Introduction

A number of options for the cleanup of Building 444/7 were considered as part of the Facility Cleanup Plan. This was principally due, to the size of the building, the quantity of equipment in those buildings and the uncontaminated nature of a significant portion of that equipment.

Three options were examined concerning the cleanup of Building 444/7. In the options the amount of Building 444/7 considered for cleanup varied. As with Buildings 865 and 883, equipment considered in the options was categorized into the following groups for Stage III:

1) decontamination and removal for use by DOE elsewhere.
2) decontamination and maintenance for use in Stage III.
3) decontamination for use as feedstock.
4) decontamination for unrestricted off-site utilization.
5) preparation and storage as waste of any remaining items.

The accumulated data from Building 444/7 was reviewed and segregated to into the following categories; feedstock, primary waste, secondary waste, oil, cleanliness, refurbishing time, and decontamination time. Consideration was given to the potential use by other parties if complete specialized fabrication shops were left intact for future use.

D2 Brief Discussion of Options

D2.1 Option #1

Option #1 included all equipment and structures with the exception of the Beryllium Machine Shop (Room 107) and Beryllium Dust Collection (Room 106). This includes all areas in the basement, first floor, and the mezzanine or second floor. Additional renovation work to Building 444 is as listed below:

1) Build a wall from ceiling to floor, from the east wall to the west wall, between Vacuum Furnaces #4-5 in Room 201. Wall will have a double-wide, 10' door to accommodate equipment movement.
2) Remove four crane rails, in Room 101, extending from Room 107.
3) Remove all utilities (air, water, vacuum, 480 & 220 VAC power) between column S & Q, the total length of Room 101 and replace existing fluorescent lighting with high pressure sodium or equal. Repair of structure will be as required.
4) Remove Inspection Modules A-F, utility feeds, and repair building as required.
5) Remove the T101 structure that contains offices, Parts Cleaning, Volume Determination, High Pressure Test Cell, and the Steigerwald EB Welder. Repair of remaining structure will be as required.

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D2.2 Option #2

Option #2 is similar to Option #1 concerning the amount of equipment to be removed and the extent of building renovation. The exceptions are that the following areas will be left as they are for possible development by other parties for other means:

1) Non-Destructive Testing (NDT), Rooms 139-143.
2) Precision Shop (Tool Engineering), Rooms 148, 151, 180, & 181.
3) Tool Crib, Room 138.
4) Tool Heat Treat, Room 125.
5) Furnaces, Room 137.

D2.3 Option #3

Option #3 includes only the following areas: all of the basement, all of the mezzanine or second floor, and the first floor East of the Column-G line (from the building south wall north to corridor A), and everything East of Column-C (from corridor A to north wall) of building 444. This will encompass such major areas as the Tool Grind (Rooms 113, 117, & 118), Carbon Shop (Rooms 116 & 700), Coating Area (Room 109A), Vacuum Furnaces (Rooms 10, 109, & 201), and the old and new Plating Labs (Rooms 212 & 245).

Based upon the aforementioned criteria, it was decided that Option #2 would yield the highest return for all parties involved for the following reasons:

1) Potential exists for the Precision Shop, NDT, Tool Crib and Heat Treat to be operated as a separate identity based upon the type and condition of equipment.
2) The Precision Shop, NDT, Tool Crib and Heat Treat areas are considered as having low to zero radionuclide and beryllium contaminants.
3) The above areas would generate considerable amounts of primary and secondary waste and oil in comparison to the amount of feedstock available.

Full details of Option #2 are given in the main text of the Facility Cleanup Plan. Details of Options #1 and #3 are included here for completeness.

D3 Option #1

D3.1 Current Building Operations

Current building operations are as detailed in Section 8.1 of the Facility Cleanup Plan which discusses Option #2 in complete detail. The drawing on Page D-36 shows the current layout of Building 444/7 with the area covered under Option #1 left unhatched. Page D-38 represents the final projected layout for Building 444/7 under Option #1.

D3.2 Sequence and Duration of Operations

As with Buildings 865 and 883, the approach to the Stage II work in Building 444/7 will follow a 10 step procedure. Based upon the scope of Option #1 as described above, the following estimates of time taken to achieve each step were calculated:

Step 1: Removal of Loose Waste/Unwanted Equipment

Building 444/7 contains a significant quantity of loose waste and unwanted equipment. It is understood that all waste will have been removed from the building before the start of Step 1 operations in Stage II, however there will be items not considered as waste by the current operator but which will become waste in Stage II. Such items are cabinets, tool boxes, and miscellaneous tools. These items are not expected to be contaminated to any significant degree considering their previous use; however they will be all surveyed for radiological and toxicological contamination prior to removal. Any minor contamination will be removed at this stage. Items removed in Step 1 will be relocated for reuse elsewhere, stored in the building for recycling in Stage III or removed as waste. In Building 444/7 it is proposed that equipment to be retained for Stage III be stored in suitable storage areas in Building 444/7 in compliance with all applicable regulations. This could mean as a consequence, existing equipment in identified rooms may need to be relocated at an early part of Step 1.

Based upon a Work Team (WT) size of seven Decontamination Workers and a Team Leader as discussed in section 4, it is estimated that Step 1 will take approximately 35.4 WT weeks to complete. Table D1 lists the major rooms and the quantity of miscellaneous material and equipment which are not required for Stage III operations.

Step 2: Cleaning of High Contamination Areas

The Characterization Work Plan has reviewed the radiological and toxicological survey data for Building 444/7 which is considered to be largely complete and representative of contamination levels within Building 444/7. Existing data show that known high contamination areas in Building 444/7 are minimal and are listed in Section 3.8 of the plan. Based upon the estimated time taken to clean these areas out and dispose of any waste generated (primary or secondary) and with an allowance for cleaning other areas not currently characterized but which could be in excess of acceptable limits, a total of 2 WT weeks should be allowed for Step 2.

Step 3: Assembly of a Decontamination Facility

Equipment destined not to remain in Building 444/7 (i.e., for reuse, recycle or as waste) will be subjected to decontamination as determined by acceptable criteria as listed in the Characterization Work Plan. While some equipment with significant contamination will have been partially decontaminated during dismantling or cutting, it will be necessary to further decontaminate equipment prior to leaving Building 444/7. It is proposed that this final decontamination will take place in a previously constructed modular facility in Building 444/7 located in Room 101. It is assumed that at least one of these modules will remain available for use as a decontamination facility. It is planned that the facility will contain CO_2 blasting equipment and electropolishing or ultrasonic cleaning equipment as well as space for

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conventional hands-on decontamination work. The facility will be equipped with HEPA filtration, lighting and a shower entry/exit area. The duration to clear the area of miscellaneous material followed by installation of new equipment, and modification, assembly and testing of the existing room for use is estimated to take 2 WT weeks. It is proposed that, after all Stage II operations in Building 444/7 are complete, all decontamination facilities constructed for Stage II will be left in an operational condition for the Stage III operator.

Step 4: Removal and Decontamination of Low Contamination Items of Equipment.

Table D2 lists the major items of equipment considered as low or zero contamination which are not required for Stage III operations. The table also gives an estimate of how long each item will take to disconnect from service lines or other equipment, to remove peripheral equipment and to dismantle or cut up. An allowance is also included for final decontamination in the decontamination facility prior to removal of the equipment from the building or storage as feedstock for Stage III inside the building. The table shows that 862/5 = 172.4 WT weeks (173) are required for the dismantling with a further 356/5 = 71.2 WT weeks (71) required for decontaminating and packaging of the waste.

Step 5: Removal and Decontamination of High Contaminated Items of Equipment.

Step 5 operations are summarized in Table D3 . This table lists these items known to contain or suspected of containing radiological or toxicological contamination at a level which requires use of a containment for dismantling operations. This step, therefore, allows time for the construction of a containment, its preparation and final decontamination and disassembly as well as the dismantling time. The containment used will be modular in form constructed from fiberglass reinforced plastic panels which can be decontaminated after the work is complete. Alternately, PVC sheeting (or similar) can be used. While this is more suited for containing irregularly shaped equipment, its decontamination potential after the work is more limited. A total of 12.5/5 = 2.5 WT weeks are allowed for the dismantling and removal operations with a further 1/5 = 0.2 WT weeks (a total of 3) required for decontaminating and packaging of the waste.

Step 6: Decontamination, Dismantling and Removal of Services No Longer Required

Steps 4 and 5 involved the removal of unwanted equipment from Building 444/7. During those steps equipment was disconnected from services with the minimum of service line removed at that time. Step 6 involves removing those service lines back to a suitable point consistent with Stage III operations (i.e., the removal of all redundant lines minimizing scope for future contamination potential).

Lines to be removed include ventilation exhaust, process waste, steam, compressed air, and reagent feeds. It is estimated that this step will take up to 2 WT weeks of effort to complete.

Step 7: Repairs to Structure Following Removal of Equipment

With the removal of certain items of equipment, a number of pits or depressions on the site of that equipment will be revealed. Likewise, with the removal of service lines, holes in the building walls may be opened. These structural issues will be resolved in Step 7. Depressions in the floor will be

decontaminated if necessary and filled with concrete or similar to the level of the surrounding area. Any holes in the building walls will be filled or covered with a suitable material. It is estimated that this Step will take 4 WT weeks of effort to complete.

Step 8: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as Low Contamination Risk

Step 8 involves dismantling, cleaning and maintaining (as necessary) equipment of a clean (i.e., uncontaminated) nature ready for use during Stage III operations. Table D4 lists the major items of equipment processed during this Step. The relative low contamination nature of this equipment (information based upon available survey data and operational history) indicates that containments should prove unnecessary for this Step and that dismantling will be undertaken with minimal protective clothing requirements. Should, however, contamination above levels requiring protective systems be detected, dismantling work will cease and the situation will be evaluated before continuing.

It is estimated that 195.25/5 = 39.05 WT weeks are required for the completion of this Step. Waste packaging may take up to; 39.5/5 = 7.9 WT weeks (a total of 47) to complete.

Step 9: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as High Contamination Risk

Step 9 concerns the decontamination, disassembly and maintenance of equipment which either has measurable contamination levels requiring containment and/or protective clothing or which may be contaminated to these levels on the basis of operational history. There are no items of equipment in Building 444/7 known to fall into this category. All equipment considered to have a higher potential for contamination is removed in Step 5 above. As a consequence, 0 WT weeks of effort are planned for this step.

Step 10: Final Decontamination of Complete Building to Operational levels

At the end of Step 9, all redundant equipment in Building 444/7 will have been removed with service lines cut back as appropriate. All equipment required for Stage III will have been cleaned and maintained. Step 10 is concerned with the final clean up of Building 444/7 to reduce any remaining contamination down to levels commensurate with continuing operations in the building. As Step 2 was concerned with the removal of high contamination areas and providing there has been no unexpected spread of contamination arising from Stage II operations, Step 10 should be of a short duration.

It is estimated that Step 10 in Building 444/7 will take up to 8 WT weeks of effort to complete.

A further 16 weeks of Work Team effort are planned to carry out building modifications required before the start of Stage III operations. These modifications for the chosen options are shown below:

Table D3.2-1 Building 444/7 Modifications Option #1

Work Description	Labor in Team Weeks	Primary Waste ft^3	Secondary Waste ft^3
Remove crane rails	0.6	100	25
Remove utilities Col.S-Q in Room 101	5	1900	50
Remove Inspection Modules A-F	7.8	5166	50
Remove T101 Structure	2.5	2880	50

D3.3 Maintenance Costs Associated with Building 444/7 Stage II Operations

The Operational Assessment of Building 444/7 (Reference 2) indicates that maintenance will be required for a number of pieces of equipment. The Operational Assessment lists those maintenance tasks which are judged as required prior to the commencement of Stage III operations. That Assessment describes those tasks as a) must be corrected, b) need fixing and c) correction can be delayed. For the purposes of this plan, it is assumed that tasks under a) and b) are carried out in Stage II. The table below lists the cost of maintenance items required for these tasks along with an estimate of the maintenance costs/times required for unspecified minor maintenance (gaskets, seals, hoses). The Operational Assessment does not include costs for minor maintenance since they are assumed to be low in relation to those identified costs. This document only includes maintenance costs associated with production equipment. It does not include costs for the maintenance of the building envelope. These are detailed in Reference 2.

Table D3.3-1 Maintenance costs associated with Option #1

Item number	Description	Material Cost
Building 444/7, 4.2.1	Rebrick each of the eight Vacuum Induction Melting Furnaces	$100,000

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Table D3.3-2 Summary Table for Stage II Operations, Building 444/7 Option #1

Step Number	WT weeks of effort
1	35
2	2
3	2
4	173 + 71
5	3
6	2
7	4
8	40 + 7
9	0
10	8
Building Mods.	16
Total	263

D4 Option #3

D4.1 Current Building Operations

Current building operations are as detailed in Section 8.1 of the Facility Cleanup Plan which discusses Option #2 in complete detail. The drawing on Page D-37 shows the current layout of Building 444/7 with the area covered under Option #3 left unhatched. A final projected layout for Option #3 is not given since the quantity of equipment removed is small and cannot be shown.

D4.2 Sequence and Duration of Operations

As with Buildings 865 and 883, the approach to the Stage II work in Building 444/7 will follow a 10 step procedure. Based upon the scope of Option #3 as described above, the following estimates of time taken to achieve each step were calculated:

Step 1: Removal of Loose Waste/Unwanted Equipment

The portion of Building 444/7 being considered under Option #3 contains a quantity of loose waste and unwanted equipment. It is understood that all waste will have been removed from the building before the start of Step 1 operations in Stage II, however there will be items not considered as waste by the current operator but which will become waste in Stage II. Such items are cabinets, tool boxes, and miscellaneous tools. These items are not expected to be contaminated to any significant degree considering their previous use; however they will be all surveyed for radiological and toxicological contamination prior to removal. Any minor contamination will be removed at this stage. Items removed in Step 1 will be relocated for reuse elsewhere, stored in the building for recycling in Stage III or removed as waste. In Building 444/7 it is proposed that equipment to be retained for Stage III be stored in suitable storage areas in Building 444/7 in compliance with all applicable regulations. This could

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mean as a consequence, existing equipment in identified rooms may need to be relocated at an early part of Step 1.

Based upon a Work Team (WT) size of seven Decontamination Workers and a Team Leader as discussed in Section 4 of the Facility Cleanup Plan, it is estimated that Step 1 will take approximately 24 WT weeks to complete. Table B5 lists the major rooms and the quantity of miscellaneous material and equipment which are not required for Stage III operations.

Step 2: Cleaning of High Contamination Areas

The Characterization Work Plan has reviewed the radiological and toxicological survey data for Building 444/7 which is considered to be largely complete and representative of contamination levels within Building 444/7. Existing data show that known high contamination areas in Building 444/7 are minimal and are listed in Section 3.8 of the Facility Cleanup Plan. Based upon the estimated time taken to clean these areas out and dispose of any waste generated (primary or secondary) and with an allowance for cleaning other areas not currently characterized but which could be in excess of acceptable limits, a total of 2 WT weeks should be allowed for Step 2.

Step 3: Assembly of a Decontamination Facility

Equipment destined not to remain in Building 444/7 (i.e., for reuse, recycle or as waste) will be subjected to decontamination as determined by acceptable criteria as listed in the Characterization Work Plan. While some equipment with significant contamination will have been partially decontaminated during dismantling or cutting, it will be necessary to further decontaminate equipment prior to leaving Building 444/7. It is proposed that this final decontamination will take place in a modular facility to be assembled in Room 117 (Tool Grind) and that the facility will contain CO_2 blasting equipment and electropolishing or ultrasonic cleaning equipment as well as space for conventional hands-on decontamination work. The facility will be equipped with HEPA filtration, lighting and a shower entry/exit area. Duration to clear the area of miscellaneous material before installation, modification, assemble and testing of the existing room for use is estimated to take 2 WT. It is proposed that, after all Stage II operations in Building 444/7 are complete, all decontamination facilities constructed for Stage II will be left in an operational condition for the Stage III operator.

Step 4: Removal and Decontamination of Low Contaminated Items of Equipment

Table D6 lists the major items of equipment considered as low or zero contamination which are not required for Stage III operations. The table also gives an estimate of how long each item will take to disconnect from service lines or other equipment, to remove peripheral equipment and to dismantle or cut up. An allowance is also included for final decontamination in the decontamination facility prior to removal of the equipment from the building or storage as feedstock for Stage III inside the building. The table shows that 315.5/5 = 63.1 WT weeks are required for the dismantling with a further 131/5 = 26.2 WT weeks (a total of 90) required for decontaminating and packaging of the waste.

Step 5: Removal and Decontamination of High Contaminated Items of Equipment.

Step 5 operations in Option #3 does not have any known material or equipment that is known to contain or suspected of containing radiological or toxicological contamination at a level which requires use of a containment for dismantling operations. Therefore 0 WT have been allocated for this step.

Step 6: Decontamination, Dismantling and Removal of Services No Longer Required

Steps 4 and 5 involved the removal of unwanted equipment from Building 444/7. During those steps equipment was disconnected from services with the minimum of service line removed at that time. Step 6 involves removing those service lines back to a suitable point consistent with Stage III operations (i.e., the removal of all redundant lines minimizing scope for future contamination potential).

Lines to be removed include ventilation exhaust, process waste, steam, compressed air, and reagent feeds. It is estimated that this step will take up to 2 WT weeks of effort to complete.

Step 7: Repairs to Structure Following Removal of Equipment

With the removal of certain items of equipment, a number of sumps, holes or depressions on the site of that equipment will be revealed. Likewise, with the removal of service lines, holes in the building walls may be opened. These structural issues will be resolved in Step 7. Depressions in the floor will be decontaminated if necessary and filled with concrete or similar to the level of the surrounding area. Holes in the building walls will be filled or covered with a suitable material. It is estimated that this Step will take 4 WT weeks of effort to complete.

Step 8: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as Low Contamination Risk

Step 8 involves dismantling, cleaning and maintaining (as necessary) equipment of a clean (i.e., uncontaminated) nature ready for use during Stage III operations. Table D7 lists the major items of equipment processed during this Step. The relative low contamination nature of this equipment (information based upon available survey data and operational history) indicates that containments should prove unnecessary for this Step and that dismantling will be undertaken with minimal protective clothing requirements. Should, however, contamination above levels requiring protective systems be detected, dismantling work will cease and the situation will be evaluated before continuing.

It is estimated that 195.25/5 = 39.05 WT weeks are required for the completion of this Step. Waste packaging may take up to; 39.5/5 = 7.9 WT weeks (a total of 47) to complete.

Step 9: Dismantling, Cleaning and Reassembly of Retained Equipment Considered as High Contamination Risk

Step 9 concerns the decontamination, disassembly and maintenance of equipment which either has measurable contamination levels requiring containment and/or protective clothing or which may be contaminated to these levels on the basis of operational history. There are no items of equipment in

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Building 444/7 falling into this category. All equipment considered to have a higher potential for contamination is removed in Step 5 above. As a consequence, a total of 0 WT weeks of effort are planned for this step.

Step 10: Final Decontamination of Complete Building to Operational Levels

At the end of Step 9, all redundant equipment in Building 444/7 will have been removed with service lines cut back as appropriate. All equipment required for Stage III will have been cleaned and maintained. Step 10 is concerned with the final clean up of Building 444/7 to reduce any remaining contamination down to levels commensurate with continuing operations in the building. As Step 2 was concerned with the removal of high contamination areas and providing there have been no unexpected spread of contamination arising from Stage II operations, Step 10 should be of a short duration.

It is estimated that Step 10 in Building 444/7 will take up to 2 WT weeks of effort to complete.

There are no building modifications associated with Option #3.

D4.3 Maintenance Costs Associated with Building 444/7 Stage II Operations

The Operational Assessment of Building 444/7 (Reference 2) indicates that maintenance will be required for a number of pieces of equipment. The Operational Assessment lists those maintenance tasks which are judged to be required prior to the commencement of Stage III operations. That Assessment describes those tasks as a) must be corrected, b) need fixing and c) correction can be delayed. For the purposes of this plan, it is assumed that tasks under a) and b) are carried out in Stage II. The table below lists the cost of maintenance items required for these tasks along with an estimate of the maintenance costs/times required for unspecified minor maintenance (gaskets, seals, hoses). The Operational Assessment does not include costs for minor maintenance since they are assumed to be low in relation to those identified costs. This document only includes maintenance costs associated with production equipment. It does not include costs for the maintenance of the building envelope. These are detailed in the Operational Assessment.

It is estimated that 145.75/5 = 29.15 WT weeks are required for the completion of this Step. Waste packaging may take up to 30.5/5 = 6.1 WT weeks (36.6) to complete.

Table D4.3-1 Maintenance costs associated with Option #1

Item number	Description	Material Cost
Building 444/7, 4.2.1	Rebrick each of the eight Vacuum Induction Melting Furnaces	$100,000

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Table D4.3-2 Summary table for Stage II operations, Building 444/7 Option #3

Step Number	WT weeks of effort
1	24
2	2
3	2
4	63 + 27
5	0
6	2
7	4
8	40 + 7
9	0
10	2
Building Mods.	0
Total	173

D5 Labor Requirements for Options #1 and #3

Based upon the durations specified for cleanup of Buildings 865 and 883 in the Facility Cleanup Plan and the durations for each option concerning Building 444/7 in this Appendix, an estimate of the labor requirements for Stage II has been made and is shown in Table D8.

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Tables D1 - D8

Table D1	Building 444/7 Room, Miscellaneous - Option #1
Table D2	Building 444/7 NCPP Clean Equipment for Removal - Option #1
Table D3	Building 444/7 NCPP Contaminated Equipment for Removal.- Option #1
Table D4	Building 444/7 NCPP Clean Equipment to Stay - Option #1
Table D5	Building 444/7 Rooms Miscellaneous - Option #3
Table D6	Building 444/7 NCPP Clean Equipment for Removal - Option #3
Table D7	Building 444/7 NCPP Clean Equipment to Stay - Option #3
Table D8	Stage II Weekly Labor Hours - Options #1 & #3

TABLE - D1

BUILDING 444/7 ROOMS & MISCELLANEOUS

OPTION #1

Room Function	Room Number	D&D Material Team Days	Total Material Cubic Feet	Primary Waste Cubic Feet	Secondary Waste Cubic Feet	Total Pounds	Oil Gallon
Util., Hse. vac., tanks, air comp.	1	2	1200	200	50	3000	0
Electrical shop	2	3	700	300	15	7000	0
Electronics shop	3	3	400	100	25	1500	0
Library	6	2	700	100	15	1000	0
Maintenance Machine shop	7	1	200	25	25	1200	0
Storage	8	2	1000	200	20	2000	0
Paint shop	9	1	200	50	15	1000	0
Storage	10	4	1800	300	50	15000	25
Sheet metal shop	11	2	500	200	20	3000	10
Production Machine Shop	101	6	2000	200	50	15000	25
Coaters & offices, 104 &a,b,c,d	104	4	800	200	25	1000	0
Second coatings shop	109	3	450	50	25	3500	0
Carbon Shop	116	4	500	200	40	3000	10
Tool Grind	117	3	450	50	30	3500	0
Tool Grind	118	3	450	50	30	3500	0
Heat Treat	125	3	300	20	30	500	0
Oven Area	137	2	1000	50	25	950	0
Tool Crib	138	5	1000	200	25	10000	0
Tool Engineering (Precision Shop)	148	2	600	20	30	500	0
Tool Engineering (Precision Shop)	151	2	250	20	25	300	0
Tool Engineering (Precision Shop)	180	2	300	20	30	500	0
Tool Engineering (Precision Shop)	181	3	300	20	30	500	0
Storage & HVAC above Prec.shop	182	3	300	150	30	2500	0
Furnace area & Storage for Plating Lab	201	4	1200	200	25	5000	0
D-38 storage and racks	202	5	1500	100	15	10000	0
Storage area	204	10	4800	1200	50	25000	0
Storage area & offices 205,6,7,8,9,10	205	2	500	200	25	1500	0
New plating lab	212	10	650	650	30	7500	0
Plating Lab	245	15	960	900	100	10000	0
Offices	101A,B &C	1	300	100	25	550	0
PMEL (Calibration Shop)	101K	1	300	100	25	550	0
Offices	10A	1	250	50	10	600	0
Offices	13 & 14	1	450	100	20	1500	0
NDT X-Ray Vault	139 & 143	1	300	20	10	1300	0
Offices	205A	1	300	50	25	1200	0
Misc. in Di/Wash room	212B	1	100	75	10	1200	0
Plating Lab office	245A	2	300	100	25	1000	0
Surface Finishing lab	245B	2	225	100	25	10000	5
Chemical Lab	245C	2	225	200	35	2000	0
Tool Crib	7B	4	2000	200	25	7000	25
Plating lab (Rm. 245) over flow tanks (	9A	3	3140	200	35	4000	0
Inspection Module	MOD A	2	600	200	20	10000	5
Inspection Module	MOD B	2	600	200	20	10000	0
Inspection Module	MOD C	2	600	200	20	10000	0
Inspection Module	MOD D	2	600	200	20	10000	0
Inspection Module	MOD E	2	600	200	20	10000	0
Inspection Module	MOD F	2	600	200	20	10000	0
High Pressure Test Cell (HPTC) pumps	T101	3	200	50	15	3500	30
High Pressure Test Cell & Console	T101A	4	2000	600	50	15000	25
Volume Determination	T102A & B	3	600	350	20	3500	20
Parts Storage	412	2	400	20	20	6000	0
Parts Storage	409	2	400	20	20	6000	0
EB Welder Stiegerwald	406	5	550	100	20	7500	25
Cleaning Area	406B	3	525	200	25	4500	0
New Chip Roaster	31A	5	2400	300	50	8000	25
Old Chip Roaster	32 & 502	5	2100	250	50	8500	25
Offices above HPTC	T101	2	600	200	30	4500	0
	Totals	177	46275	10560	1595	296850	255

Office equipment (desks & filing cabinets) in offices within the specified work area were calculated in total room material.

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Building 444/7, NCPP 'Clean' Equipment for Removal
Option #1

Table D2 1/6

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	RACINE HACK SAW	101/S-16		0.5	0.5	1	0.5	2.5	1	3.5	90	25	20	2000	10
2	KASCO HACK SAW	101/S-15		0.5	0.5	1	0.5	2.5	1	3.5	30	10	10	1000	10
3	DO-ALL BAND SAW	101/S-15		0.5	0.5	1	0.5	2.5	1	3.5	150	20	20	1500	0
4	LEBLOND 12X12 MARK II LATHE	101/S-15	00019618 00	0.5	2	4	1	7.5	3	10.5	830	100	25	30000	20
5	LEBLOND 12X12 MARK II LATHE	101/S-14	00019598 00	0.5	2	4	1	7.5	3	10.5	830	100	25	30000	20
6	T-BASE LATHE EX-CELLO	101/S-13	00036576 00	0.5	1	2	0.5	4	2	6	900	150	20	20000	15
7	T-BASE LATHE EX-CELLO	101/S-12	00019120 00	0.5	1	2	0.5	4	2	6	900	150	20	20000	15
8	T-BASE LATHE EX-CELLO	101/S-11	00019069 00	0.5	1	2	0.5	4	2	6	900	150	20	20000	15
9	T-BASE LATHE EX-CELLO	101/S-10	00019068 00	0.5	1	2	0.5	4	2	6	900	150	20	20000	15
10	T-BASE LATHE EX-CELLO	101/S-9	00034053 00	0.5	1	2	0.5	4	2	6	900	150	20	20000	15
11	T-BASE LATHE EX-CELLO	101/S-9	00034068 001	0.5	1	2	0.5	4	2	6	900	150	20	20000	15
12	PRATT-WHITNEY DRILL	101/Q-8	00018995 00	1	2	2	1	8	4	10	750	75	30	45000	20
13	BURN BOX	101/S-12	00019358 00	0.5	0.5	1	0.5	2.5	1	3.5	500	30	10	750	0
14	BURN BOX	101/Q-11		0.5	0.5	1	0.5	2.5	1	3.5	500	30	10	750	0
15	AMERICAN TURRET LATHE	101/Q-10	00013392 00	1	1	2	1	5	3	8	875	100	15	25000	15
16	AMERICAN TURRET LATHE	101/Q-11	00019621 00	1	1	2	1	5	3	8	875	100	15	25000	15
17	OPTICAL COMP. BAUSCH & LOMB	101/Q-12	00019187 00	0.5	0	1	1	2.5	1	3.5	300	200	20	2000	0
18	LEBLOND 16" HEAVY DUTY LATHE	101/Q-12	00019004 00	1	1	3	1	6	2	8	300	125	15	15000	10
19	MONARCH LATHE	101/Q-12	00019367 00	0.5	0.5	2	0.5	3.5	2	5.5	300	125	20	17000	10
20	MONARCH LATHE	101/Q-13	00019368 00	0.5	0.5	2	0.5	3.5	2	5.5	300	125	20	17000	10
21	WHITE-SUNSTRAND OMNIMIL	101/Q-9	00019533 00	1	2	5	2	10	4	14	2350	150	30	75000	50
22	MONARCH LATHE	101/R-16	00019369 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
23	MONARCH LATHE	101/R-16	00038542 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
24	MONARCH LATHE	101/R-18	00018992 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
25	MONARCH LATHE	101/R-17	00019001 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
26	MONARCH LATHE	101/R-17	00019370 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
27	MONARCH LATHE	101/R-18	00018993 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
28	MONARCH LATHE	101/R-19	00019371 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
29	HARDINGE LATHE	101/Q-18	00019370 00	0.5	0.5	2	0.5	3.5	2	5.5	100	25	10	4000	20
30	6-AXIS MILL EXCELLO WORK CENTER	101/Q-8	00019552 00	1	2	5	2	10	4	14	4600	150	35	50000	25
31	6-AXIS MILL EXCELLO WORK CENTER	101/N-8	00019719 00	1	2	5	2	10	4	14	4600	150	35	50000	25
32	MONARCH LATHE	101/R-16	00038654 00	1	1	2	0.5	4.5	2	6.5	300	25	10	5000	20
33	LEBLOND 12X12 MARK II LATHE	101/R-18	00019011 00	1	2	2	1	6	3	9	300	75	25	20000	20
34	SUMP CLEANER (TANK ON WHEELS)	101/R-16		0.5	1	1	0.5	3	2	5	100	25	10	2300	0
35	OIL SEPERATOR (TANK, NEW)	101/R-16		1	1	1	0.5	3.5	2	5.5	200	75	25	3500	40
36	HARDINGE LATHE	101/Q-18	00040405 00	1	1	2	1	5	2	7	100	40	10	5500	15
37	MERRICK WELDERS (2 EA)	104A	19729, 19734	1	1	1	1	4	1	5	300	200	10	1500	0
38	LEAK DETECTION SYSTEMS (2 EA)	104B	19789, 19506	1	1	1	1	4	1	5	300	150	10	2000	10
39	HOT HOLLOW COATER #6	104		1	1	2	1	5	2	7	360	300	10	2000	15
40	HOT HOLLOW COATER	104E WALL-N	00019868 00	2	2	2	1	7	2	9	360	300	10	2000	15
41	HOT HOLLOW COATER	104SOUTH	19840, 20204	2	2	2	1	7	2	9	360	300	10	2000	15
42	TITANIUM COATER	104	00026209 00	2	2	2	1	7	2	9	1100	500	10	2000	15
43	BAKEOUT OVEN SYSTEM (6)	104		1	2	2	1	6	2	8	750	700	10	3000	5
44	VACUUM BREW	104	00038654 00	1	1	2	1	5	2	7	550	200	10	3000	10
45	AVS FURNACE	109A/E-16	00019515 00	2	2	4	2	10	3	13	1440	500	25	30000	20
46	TOUCH BRAZE	109A/E-15	00019498 00	1	1	2	1	5	2	7	200	150	10	1500	10
47	CHROME COATER #1	109A/E-15	00029910 00	1	1	2	1	5	2	7	480	400	10	3000	10
48	INDUCTION BRAZER	109A/E-14	00035122 00	1	1	2	1	5	1	6	400	350	10	2500	10
49	ALUMINUM COATER	109A/E-14	00019497 00	1	1	1	1	4	1	5	380	300	10	2000	15
50	BENDIX CONTOUR PROJECTOR	109A/E-13	00034995 00	0.5	0	1	0.5	2	1	3	150	100	10	2500	0
51	ROOM, HOOD, WASH, & CHEM. (RCRA)	109B	CHEMICALS	1	2	2	1	6	3	9	300	300	50	1000	0
52	HARDINGE LATHE	101/Q-14		0.5	1	1	0.5	3	2	5	300	125	10	7000	15
53	HARDINGE LATHE	101/Q-15	00019662 00	0.5	1	1	0.5	3	2	5	300	125	10	7000	15
54	ANOCUT (ECM)	447/407		2	2	3	2	9	3	12	2250	2000	50	7000	0
55	CHARMILLES ELECT. DISC (EDM)	447/407		1	1	1	1	4	2	6	150	25	25	8000	0

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Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
56	BURST CHAMBER	447/408	00038862 00	0.5	1	2	1	4.5	2	8.5	150	25	15	15000	15
57	BURST CHAM PUMPS 2K, 30K)	447/408A		1	1	2	1	5	2	7	125	75	15	5000	15
58	STEIGERWALD EB WELDER	101H	00020234 00	2	2	5	2	11	3	14	3300	300	50	15000	200
59	RACINE SAW	101/R-18		0.5	1	1	0.5	3	1	4	75	25	10	3000	10
60	SIP MILL	101/N-8	00019369 00	1	1	1	0.5	3.5	1	4.5	70	25	10	5000	10
61	DEVLIEG LATHE	101/N-8		1	1	1	0.5	3.5	1	4.5	70	25	10	1500	10
62	INSPECTION TABLES (6 EA)	101/N-10		0	0	0	0.5	0.5	1	1.5	250	200	10	3000	0
63	MONARCH LATHE	101/N-12	00018372 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
64	MONARCH LATHE	101/N-12	00019373 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
65	MONARCH LATHE	101/N-12	00019769 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
66	MONARCH LATHE	101/N-12	00019374 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
68	MONARCH LATHE	101/N-14	00038539 00	0.5	0.5	1.5	0.5	3	1	4	150	25	15	4000	15
69	HARDINGE LATHE	101/N-14	00020059 00	0.5	0.5	2	0.5	3.5	1	4.5	75	20	10	3500	10
70	HARDINGE LATHE	101/N-14	00019238 00	0.5	0.5	2	0.5	3.5	1	4.5	75	20	10	3500	10
71	HARDINGE LATHE	101/N-14	00020058 00	0.5	0.5	2	0.5	3.5	1	4.5	75	20	10	3500	10
72	HARDINGE LATHE	101/N-14	00020060 00	0.5	0.5	2	0.5	3.5	1	4.5	75	20	10	3500	10
73	KINNEY VACUUM	101/N-15		1	2	2	0.5	5.5	2	7.5	720	100	10	5000	20
74	CARRIER AIR COND 4 EA (ESP MOD)	101		2	2	3	1	8	2	10	75	100	30	4000	FREON
75	BUILDING VACUUM SYSTEM (DK GREY)	BSMT.		1	2	10	2	15	3	18	1000	200	50	15000	0
76	AFS VACUUM FURNACE (SELL)	447/403	00020755 00	2	4	5	2	13	3	18	6500	100	100	50000	15
77	VACUUM INDUCTRIES	447/403		2	1	2	1	6	2	8	550	100	25	15000	10
78	VACUUM SPECIALTIES	447/403	00019171 00	2	1	2	1	6	2	8	1200	200	10	17500	10
79	GRIT BLASTER	447/404	00035102 00	1	1	2	1	5	2	7	275	75	10	4500	0
80	VACUUM SEPERATOR	447/404	00035101 00	1	1	2	1	5	1	6	250	25	25	3500	0
81	WESTINGHOUSE DEGREASER	447/404		1	1	1	0.5	3.5	1	4.5	75	25	10	500	0
82	RGA (RES GAS AN) CUSTOM ENG	447/404	00020420 00	0	0	1	0.5	1.5	1	2.5	100	100	10	1500	2
83	VACUUM MELT ARC FURNACE (VMAF)	447/405	00034019 00	2	2	5	2	11	3	14	3600	900	30	20000	80
84	CONTROL PANEL FOR VMAF	447/405A		0.5	0	1	0.5	2	1	3	60	50	10	700	0
85	2 TANKS FOR VMAF	447/405A		0	0	1	0.5	1.5	1	2.5	400	10	10	3000	0
86	POWER SUPPLY FOR VMAF	447/405A		1	0	1	0.5	2.5	1	3.5	160	160	20	5000	0
87	COMPRESSORS 2K,30,60K	T103		1	1	2	1	5	1	6	300	100	20	6000	20
88	TEST CELL	T101A		2	2	3	1	8	2	10	300	100	20	5000	5
89	BE ROOM	107 & 106				N/A	N/A	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
90	BAND SAW DOALL 2612-1	PS	00019126 00	0.5	0	0.5	0.5	1.5	1	2.5	150	20	20	1500	0
91	BAND SAW DOALL 2612-1	PS	00019403 00	0.5	0	0.5	0.5	1.5	1	2.5	150	20	20	1500	0
92	BORE JIG MORRE 3-B307	PS	00019053 00	0.5	0.5	1	0.5	2.5	1	3.5	130	20	10	5000	10
93	BORER JIG MOORE 3	PS	00013189 00	0.5	0.5	1	0.5	2.5	1	3.5	130	20	10	5000	10
94	BORER JIG MOORE 3 11X24 TABLE	PS	00019098 00	0.5	0.5	1	0.5	2.5	1	3.5	130	20	10	5000	10
95	BORER JIG MOORE 3 B-1643	PS	00019400 00	0.5	0.5	1	0.5	2.5	1	3.5	130	20	10	5000	10
96	BORING MILL PRECISION HORZ DEVILIEG	PS	00019159 00	0.5	0.5	1.5	0.5	3	1	4	160	20	10	7000	20
97	COMPARATOR MDL 600HP	PS	00040152 00	0.5	0	0.5	0.5	1.5	0.5	2	75	20	5	3000	0
98	WIRECUT EDM-26	PS	00020358 02	0.5	0.5	1	1	3	1	4	240	35	15	8000	30
99	WIRECUT ELOX V EDM	PS	00018972 00	0.5	1	1	0.5	3	1	4	200	75	20	5500	20
100	DISCHARGE MACHE ELECT CHARM LES D-4	PS	00019331 00	0.5	0.5	1	0.5	2.5	1	3.5	255	30	15	4000	35
101	DRILL PRESS 12 6 IN BEN 3, RAVEY	PS	00018945 00	0.5	0.5	0.5	0.5	2	0.5	2.5	40	5	50	500	0
102	DRILL PRESS ALZMETALL AB4 NST	PS	00019293 00	0.5	0.5	0.5	0.5	2	0.5	2.5	40	5	50	100	0
103	DRILL RADIAL 36 IN FOSDICK	PS	00018928 00	0.5	0	0.5	0.5	1.5	0.5	2	75	10	10	1000	0
104	GRINDER BELT 8 IN HMD VH600 W	PS	00019242 00	0.5	0	0.5	0.5	1.5	0.5	2	45	5	5	500	0
105	GRINDER CYLINDRICAL 24X36 LANDIS	PS	00019483 00	0.5	0.5	1	0.5	2.5	1	3.5	210	25	15	8000	40
106	GRINDER CYLINDRICAL UNIV. LANDIS 3RIL	PS	00019610 00	0.5	0.5	1	0.5	2.5	1	3.5	210	25	10	8000	10
107	GRINDER DRILL	PS	00042695 00	0.5	0	0.5	0.5	1.5	1	2.5	100	15	5	3000	5
108	GRINDER DRILL POINT THINNER OPTIMA	PS	00019325 00	0.5	0.5	0.5	0.5	2	1	3	170	15	10	4000	5
109	GRINDER HYD 12X24	PS	00019216 00	0.5	0.5	0.5	0.5	2	1	3	150	15	10	7000	25
110	GRINDER JIG MOORE CONSTANT PATH	PS	00019627 00	0.5	1	2	0.5	4	1.5	5.5	250	30	15	10000	20
111	GRINDER PRECISION JIG MOORE 4	PS	00019413 00	0.5	0.5	1.5	0.5	3	1	4	200	20	10	7500	10
112	GRINDER PRECISION TOOL ROOM B&S 8X1	PS	00020162 00	0.5	0.5	0.5	0.5	2	1	3	80	15	5	3000	50

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Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
113	GRINDER PRECISION TOOLROOM B&S 6X2	PS	00020183 00	0.5	0.5	0.5	0.5	2	1	3	80	15	5	3000	50
114	GRINDER PRECISION UNIV 10" KELLENBERGE	PS	00019890 00	0.5	0.5	1.5	0.5	3	1	4	210	30	10	9000	15
115	GRINDER SLOT MOORE 3650A	PS	00019358 00	0.5	0	0.5	0.5	1.5	0.5	2	100	25	10	8000	15
116	GRINDER SURFACE B&S 1024	PS	00019098 00	0.5	0	0.5	0.5	1.5	1	2.5	140	20	10	5000	25
117	GRINDER SURFACE G&L 380	PS	00019158 00	0.5	0	0.5	0.5	1.5	1	2.5	120	10	15	4000	15
118	GRINDER SURFACE PRECISION	PS	00019217 00	0.5	0.5	0.5	0.5	2	0.5	2.5	110	15	15	5500	10
119	GRINDER SURFACE PRECISION TAFT-PIER	PS	00019398 00	0.5	0	0.5	0.5	1.5	0.5	2	90	10	10	7500	5
120	GRINDER SURFACE ROTARY VER TP-6	PS	00010113 00	0.5	0	0.5	0.5	1.5	0.5	2	75	10	10	6500	5
121	GRINDER SURFACE ROTARY	PS	00088245 00	0.6	0.6	0.6		1.5	1	2.5	160	20	10	6000	60
122	GRINDER THREAD PRECISION ECXCELLO	PS	00019062 00	0.5	0.5	2	0.5	3.5	2	5.5	225	35	20	10000	50
123	GRINDER TOOL CUTTER MONOSET MT CINC	PS	00019418 00	0.5	0.5	0.5	0.5	2	1	3	50	10	10	2000	5
124	GRINDING MACHINE PRECISION UNIVERSAL	PS	00018766 00	0.5	0.5	1	0.5	2.5	1	3.5	200	15	10	5000	20
125	GRINDING MACHINEROTARY SURFACE M34	PS	00019981 00	0.5	0	0.5	0.5	1.5	0.5	2	110	15	10	8500	15
126	GRINDING MACHINE UNIVERSAL RED	PS	00019184 00	0.5	0	0.5	0.5	1.5	0.5	2	80	15	10	3000	5
127	GRINDING MACHINE UNIVERSAL B&S	PS	00019152 00	0.5	0	0.5	0.5	1.5	1.5	3	80	15	10	3000	5
128	HONING MACHINE SUNNEN MBB-1600	PS	00019238 00	0.5	0	0.5	0.5	1.5	2.5	4	75	15	10	2500	5
129	HYDROPTIC MACHINE B&S SIP	PS	00019061 00	0.5	0.5	1.5	0.5	3	1.5	4.5	435	35	10	10000	80
130	LATHE ENGINE 10" EE 60081	PS	00019305 00	0.5	0	0.5	0.5	1.5	1	2.5	160	25	10	6500	20
131	LATHE ENGINE 17X30 L&S	PS	00019079 00	0.5	0.5	1	0.5	2.5	1	3.5	160	30	10	7000	50
132	LATHE ENGINE MONARCH 26"	PS	00019029 00	0.5	0.5	1	0.5	2.5	1	3.5	160	30	10	7000	50
133	LATHE ENGINE POWERTURN 2518X48	PS	00019594 00	0.5	0	1	0.5	2	1	3	160	30	10	7000	50
134	LATHE HARDINGE HS12 833-C	PS	00019226 00	0.5	0	1	0.5	2	1	3	125	30	10	6500	20
135	LATHE HEAVY DUTY 20 SERIES 614	PS	00020634 00	0.5	0.5	1	0.5	2.5	1.5	4	160	25	10	7000	50
136	LATHE JLR PRECISION LEVIN 3C	PS	00019473 00	0.5	0	1	0.5	2	0.5	2.5	125	30	10	6500	25
137	LATHE MONARCH 2013TX30	PS	00019148 00	0.5	0.5	1	0.5	2.5	1.5	4	100	20	10	4000	20
138	LATHE PRECISION 10" MONARCH EE-GEE	PS	00019763 00	0.5	0	1	0.5	2	1	3	100	20	10	300	20
139	LATHE PRECISION 10" MONARCH EE-GEE	PS	00019764 00	0.5	0	1	0.5	2	1	3	100	20	10	3000	20
140	LATHE PRECISION 10" MONARCH EE	PS	00019147 00	0.5	0	1	0.5	2	1	3	100	20	10	4000	20
141	LATHE PRECISION CLUCKING SHELDON CM	PS	00019173 00	0.5	0	1	0.5	2	1	3	130	15	10	7000	25
142	LATHE PRECISION TOOL 20" MONARCH	PS	00019894 00	0.5	0.5	1	0.5	2.5	1	3.5	100	15	10	4000	20
143	LATHE RT-ANGLE AUTO NC HEAD	PS	00019041 00	0.5	0.5	1	0.5	2.5	0.5	3	125	15	5	3500	10
144	LATHE T-BASE COMPUTERIZED	PS	00018836 00	0.5	0.5	1.5	0.5	3	1.5	4.5	390	150	20	14000	40
145	LATHE TOOL ROOM L&S	PS	00019163 00	0.5	0.5	1	0.5	2.5	1	3.5	160	35	10	7000	50
146	LATHE TOOLMAKER 10"	PS	00019209 00	0.5	0.5	1	0.5	2.5	1	3.5	100	15	10	3000	20
147	LATHE TOOLMAKER 10" HARDINGE HLV-H	PS	00019471 00	0.5	0	1	0.5	2	1	3	100	20	10	3000	20
148	LATHE TOOLROOM 10" MONARCH EE-GEE	PS	00019603 00	0.5	0	1	0.5	2	1	3	100	20	10	300	20
149	LATHE TOOLROOM 10" MONARCH EE-GEE	PS	00019604 00	0.5	0	1	0.5	2	1	3	100	20	10	300	20
150	LATHE TOOLROOM 20" MONARCH 614	PS	00019768 00	0.5	0.5	1.5	0.5	3	1.5	4.5	100	20	10	4000	20
151	LATHE TOOLROOM 20" MONARCH 616	PS	00019767 00	0.5	0.5	1.5	0.5	3	1.5	4.5	160	35	10	7000	20
152	MACHINE CINC ELECTRICAL DISCHARGE	PS	00018972 00	0.5	0.5	1	0.5	2.5	1.5	4	175	25	15	8500	60
153	MACHINE JIG VORING 802	PS	00019948 00	0.5	0.5	2	1	4	1	5	800	100	20	20000	50
154	MACHINE LAP MASTER ABRASIVE	PS	00020404 00	0.5	0.5	1	0.5	2.5	0.5	3	130	15	10	4500	30
155	MACHINE HONING VAPOR BLAST LIQUID 8	PS	00020148 00	0.5	0.5	1	0.5	2.5	1	3.5	155	25	10	11500	25
156	MILL MOORE	PS	00018413 00	0.5	0.5	1	0.5	2.5	1	3.5	180	25	10	8000	10
157	MILLING MACHINE CINC. DH 507-14	PS	00019201 00	0.5	0.5	0.5	0.5	2	1	3	150	25	10	2000	10
158	MILLING MACHINE HOR K&T 626TF	PS	00019102 00	0.5	[illegible]	1	0.5	2.5	1	3.5	150	30	10	8000	20
159	MILLING MACHINE 12X24 BRGT BR2J 12BR	PS	00019380 00	0.5		1	0.5	2	0.5	2.5	125	15	10	3000	5
160	MILLING MACHINE 3-AXIS CIN VCM-160	PS	00013386 00	0.5	0	1	0.5	2	2	4	800	75	20	20000	50
161	MILLING MACHINE BRGT VERT RAM II	PS	00019637 00	0.5	0	1	0.5	2	1	3	128	15	10	3000	5
162	MILLING MACHINE BRGT VERT RAM II	PS	00019638 00	0.5	0	1	0.5	2	1	3	128	15	10	3000	5
163	MILLING MACHINE BRIDGEPORT	PS	00020286 00	0.5	0	1	0.5	2	1	3	128	15	10	3000	5
164	MILLING MACHINE BRIDGEPORT	PS	00020287 00	0.5	0	1	0.5	2	1	3	128	15	10	3000	5
165	MILLING MACHINE HARDINGE	PS	00019031 00	0.5	0	1	0.5	2	0.5	2.5	135	15	10	5500	10
166	MILLING MACHINE HORIZ VERT AVERE VHF-3	PS	00019329 00	0.5	0	1	0.5	2	0.5	2.5	140	15	10	8500	15
167	MILLING MACHINE K-T B 76800	PS	00019025 00	0.5	0.5	1	0.5	2.5	1	3.5	135	25	10	5000	20
168	MILLING MACHINE KNEE 36" HORT. CINC.	PS	00019481 00	0.5	0.5	0.5	0.5	2	1	3	150	20	10	5500	5

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Building 444/7, NCPP 'Clean' Equipment for Removal
Option #1

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Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
169	MILLING MACHINE NEW GROTON 1-22	PS	00019275 00	0.5	0.5	1	0.5	2.5	1	3.5	165	20	10	8500	10
170	MILLING MACHINE RAM STYLE	PS	00020517 00	0.5	0.5	0.5	0.5	2	0.5	2.5	110	15	10	5000	5
171	MILLING MACHINE RAM STYLE	PS	00020518 00	0.5	0.5	0.5	0.5	2	0.5	2.5	110	15	10	5000	5
172	MILLING MACHINE VERT. K&T	PS	00019338 00	0.5	0	1	0.5	2	0.5	2.5	105	10	10	2200	5
173	MILLING MACHINE VERT. BRGT. BR2J	PS	00019089 00	0.5	0.5	1	0.5	2.5	1	3.5	200	25	10	7000	5
174	ANALIZER TOOL	TG	00020175 00	0	0	1	0.5	1.5	1	2.5	110	20	15	8500	0
175	CAROUSEL MOTORIZED VERTICAL	TG	00020167 00	0.5	0	0.5	0.5	1.5	0.5	2	175	20	10	4000	0
176	COMPARATOR OPTICAL J&L A-7237	TG	00019881 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2000	0
177	COMPARATOR OPTICAL J&L A-7237	TG	00019945 00	0	0	1	0.5	1.5	1	2.5	30	15	5	300	0
178	COMPARATOR OPTICAL J&L A-7237	TG	00019946 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2000	0
179	COMPARATOR OPTICAL 14"	TG	00020271 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
180	COMPARATOR OPTICAL 14"	TG	00020270 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
181	COMPARATOR OPTICAL 14" W/10X20 MAG	TG	00019514 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2500	0
182	COMPARATOR OPTICAL 14" XL 14S	TG	00019746 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
183	COMPARATOR OPTICAL 14" XL 14S	TG	00019747 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
184	COMPARATOR OPTICAL 20"	TG	00020265 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2500	0
185	COMPARATOR OPTICAL 30"	TG	00020268 00	0	0	1	0.5	1.5	1	2.5	250	150	10	2500	0
186	COMPARATOR OPTICAL KLOOR NIKON III	TG	00019097 00	0	0	1	0.5	1.5	1	2.5	250	150	10	2500	0
187	CUTTER MASTER HDT. W/AIR SPINDLE	TG	00020106 00	0.5	0	0.5	0.5	1.5	0.5	2	75	15	5	5000	0
188	GRINDER CARBIDE SAW SHARPENER ACME	TG	00019480 00	0	0	0.5	0.5	1	0.5	1.5	55	10	5	1500	0
189	GRINDER CBD TOOL 8" XL044	TG	00018961 00	0	0	0.5	0.5	1	0.5	1.5	50	15	10	700	30
190	GRINDER CBD TOOL 8" XL044	TG	00018963 00	0	0	0.5	0.5	1	0.5	1.5	50	15	10	700	30
191	GRINDER CUTTER CINC. MONOSET	TG	00018122 00	0	0	0.5	0.5	1	0.5	1.5	50	15	10	700	0
192	GRINDER CUTTER UNIVERSAL GORTON 376	TG	00019390 00	0	0	0.5	0	0.5	0.5	1	25	5	50	150	0
193	GRINDER DRILL BLACK DIAMOND BW-90	TG	00019726 00	0	0	0.5	0	0.5	0.5	1	25	5	50	150	0
194	GRINDER DRILL BLACK DIAMOND BW-70	TG	00019748 00	0	0	0.5	0	0.5	0.5	1	25	5	50	150	0
195	GRINDER DRILL SELECT-O-MATIC ALINA	TG	00020026 00	0	0	0.5	0	0.5	0.5	1	30	10	50	800	0
196	GRINDER DRILL SELECT-O POINT ALINA	TG	00019334 00	0	0	0.5	0	0.5	0.5	1	30	10	50	800	0
197	GRINDER END MILL HUFFMAN HS 87R	TG	00020166 00	1	2	3	2	8	2	10	1500	25	10	25000	250
198	GRINDER FORM RELIEF SHSLOWMATIC FR	TG	00019494 00	0	0	0.5	0	0.5	0.5	1	50	10	5	2000	0
199	GRINDER OPTICAL FROM 2-AXIS WASINO	TG	00019646 00	0.5	0	1	0	1.5	1	2.5	150	15	10	5400	50
200	GRINDER OPTICAL FROM 2-AXIS WASINO	TG	00019647 00	0.5	0	1	0	1.5	1	2.5	150	15	10	5400	50
201	GRINDER PRECISION UNIVERSAL 10"	TG	00020318 00	0.5	0	1	0	1.5	1	2.5	150	15	10	5400	50
202	GRINDER SURFACE MICROMASTER B&S	TG	00019606 00	0	0	0.5	0	0.5	0.5	1	35	10	5	3000	0
203	GRINDER SURFACE PRECISION GALLMEYER	TG	00019393 00	0	0	0.5	0	0.5	0.5	1	100	15	10	4000	50
204	GRINDER TOOL CUTTER	TG	00019320 00	0	0	0.5	0	0.5	0.5	1	40	10	5	700	700
205	GRINDER TOOL CUTTER CINC.	TG	00019165 00	0	0	0.5	0	0.5	0.5	1	40	10	5	700	700
206	GRINDER TOOL CUTTER CINC.	TG	00019608 00	0	0	0.5	0	0.5	0.5	1	40	10	5	700	700
207	GRINDER TOOL CUTTER CINC. MONOSET 31	TG	00019388 00	0	0	0.5	0	0.5	0.5	1	60	15	5	1200	0
208	GRINDER TOOL CUTTER COMPACT	TG	00020463 00	0	0	0.5	0	0.5	0.5	1	5	5	5	70	0
209	GRINDER TOOL CUTTER HARO 12	TG	00019337 00	0	0	0.5	0	0.5	0.5	1	40	10	5	600	0
210	GRINDER TOOL CUTTER CINC. MONOSET	TG	00019931 00	0	0	0.5	0	0.5	0.5	1	40	10	5	600	0
211	GRINDER TOOL CUTTER CINC. MONOSET	TG	00019932 00	0	0	0.5	0	0.5	0.5	1	40	10	5	600	0
212	GRINDER TOOL CUTTER CINC. MONOSET	TG	00019933 00	0	0	0.5	0	0.5	0.5	1	40	10	5	600	0
213	GRINDER TOOL CUTTER OLIVER	TG	00019142 00	0	0	0.5	0	0.5	0.5	1	55	15	5	700	0
214	GRINDER TOOL MICROPOINT DEVLIEG	TG	00019067 00	0	0	0.5	0	0.5	0.5	1	50	10	5	700	0
215	GRINDER TOOL MICROPOINT DEVLIEG	TG	00019340 00	0	0	0.5	0	0.5	0.5	1	50	10	5	700	0
216	GRINDER TOOL OPTICAL PROJECTION BAC	TG	00019408 00	0.5	0	0.5	0.5	1.5	0.5	2	150	15	10	5400	50
217	GRINDER TOOL PRECISION DEVLIEG	TG	00033988 00	0	0	0.5	0	0.5	0.5	1	50	10	5	700	0
218	GRINDERTR70	TG	00056488 00	0	0	0.5	0	0.5	0.5	1	5	5	5	40	0
219	GRINDER MACHINE DRILL CHRISTEN 05 8	TG	00019346 00	0	0	0.5	0	0.5	0.5	1	75	10	5	550	0
220	HEATER INDUCTRION BRAZING TOCCO	TG	00020052 00	0.5	0	0.5	0.5	1.5	0.5	2	50	40	10	600	0
221	LATHE TOOL ROOM HARDINGE HLV-H	TG	00019245 00	0	0	0.5	0	0.5	0.5	1	60	10	5	1700	5
222	MARKING MACHINE IND PMI GT SOLNOT	TG	00010347 00	0	0	0.5	0	0.5	0.5	1	25	10	5	450	0
223	MILLING MACHINE PLANERAM STYLE SAJO S	TG	00019488 00	0	0	0.5	0	0.5	0.5	1	10	5	5	200	0
224	MILLING MACHINE SWIVELHD TURRETTURRE	TG	00019394 00	0	0	0.5	0	0.5	0.5	1	60	10	5	1200	20

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Building 444/7, NCPP 'Clean' Equipment for Removal
Option #1

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
225	PHODE OPTICAL VIDEO WS/STANDARD LENS	TG	00076515 00	0	0	0.5	0	0.5	0.5	1	25	10	5	550	0
226	SHARPENER DRILL AUTO MOHAWK 49	TG	00019468 00	0	0	0.5	0	0.5	0.5	1	40	10	5	1500	30
227	SHARPENER EXACTAMATIC DRILL WHISLOW	TG	00019259 00	0	0	0.5	0	0.5	0.5	1	25	10	5	550	0
228	COMPARATOR OPTICAL J&L	CS	00019454 00	0	0	0.5	0	0.5	0.5	1	25	10	5	550	0
229	DRILL RADIAL 36" CARTLON	CS	00019009 00	0.5	1	1	0.5	3	1	4	140	30	10	4000	10
230	DRILL MACHINE TURRET 3 AXIS NC BRIGMASTER	CS	00019518 00	0.5	1	2	0.5	4	1	5	550	35	20	10000	10
231	LATHE ENGINE 20" MARTIN D3-80	CS	00019202 00	0.5	1	1	0.5	3	0.5	3.5	200	15	10	8000	10
232	LATHE ENGINE HORT. MOMOSET 16X64	CS	00031150 00	0.5	0	0.5	0.5	1.5	0.5	2	110	15	10	6000	10
233	LATHE HARDINGE SUPERSLANT TURRET 3 AXIS	CS	00020358 00	0.5	0	0.5	0.5	1.5	0.5	2	70	15	10	2000	5
234	LATHE REGAL LEBLOND MAKINO	CS	00020721 00	0.5	0.5	0.5	0.5	2	0.5	2.5	170	20	15	5000	5
235	LATHE TOOLROOM 8" HARDINGE HLV H S	CS	00019383 00	0.5	0	0.5	0	1	0.5	1.5	95	15	10	2500	0
236	LATHE TURRET 42" VERTICAL BUL	CS	00018929 00	0.5	0.5	2	1	4	2	8	200	35	10	8000	15
237	LATHE TURRET 8X36 6 HOR OIS	CS	00018944 00	0.5	1	1	0.5	3	1	4	300	20	10	8000	15
238	MILLING MACHINE BRGT BRJ 12BR	CS	00019304 00	0.5	0.5	1	0.5	2.5	1	3.5	128	10	10	4000	5
239	MILLING MACHINE BRGT 52 STD VERT RAM H	CS	00020357 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	20	10	1500	5
240	MILLING MACHINE CINC. 4	CS	00019038 00	0.5	0	0.5	0.5	1.5	0.5	2	120	10	5	5000	5
241	MILLING MACHINE HORT. K&T	CS	00019396 00	0.5	0.5	2	0.5	3.5	1	4.5	128	10	10	4000	5
242	MILLING MACHINE KNEE 34" HORT. SAJO	CS	00019639 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	20	10	3000	10
243	MILLING MACHINE KNEE 34" HORT. CINC.	CS	00038439 00	0.5	0.5	0.5	0.5	2	1	3	75	15	10	3000	5
244	MILLING MACHINE VERT CINC. 420-18	CS	00019279 00	0.5	0	0.5	0.5	1.5	0.5	2	120	15	10	5000	5
245	MILLING MACHINE VER DOALL 200V	CS	00020720 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	20	10	3000	5
246	TURNING CENTER LEBLOND CHUCKER 20	CS	00020242 00	0.5	0.5	2	1	4	2	8	350	50	20	15000	30
247	MILL, CINCINNATI	CS	00019366 00	0.5	0.5	0.5	0.5	2	0.5	2.5	120	20	10	5000	10
248	MILL, CINCINNATI	CS	00019364 00	0.5	0.5	0.5	0.5	2	2	4	120	20	10	5000	10
249	MILL GE	CS		0.5	0.5	0.5	0.5	2	0.5	2.5	145	20	10	3000	10
250	DOALL SAW	CS	00019024 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	10	5	1500	0
251	FURNACE/CONTROLLER	205	00020724 00	0.5	0.5	0.5	0.5	2	1	3	144	55	15	4500	0
252	TUMBLER	205	00020219 00	0	0	0.5	0	0.5	0.5	1	12	10	5	300	0
253	PRESS, FRAME, HYD. BLUE	205		0	0	0	0	0	0.5	0.5	80	5	5	850	2
254	GRIT-BLASTER WHITE	205	00020095 00	0	0	0.5	0.5	1	0.5	1.5	80	25	5	2500	0
255	SQUARE TANK ON WHEELS	205		0	0	0	0	0	0.5	0.5	50	5	0	300	0
256	WASH SYSTEM (NEW)	212B		0.5	0	1.5	0.5	2.5	0.5	3	500	250	10	2500	0
257	WATER FILTRATION SYSTEM	212B	00020213 00	0.5	0	0.5	0.5	1.5	0.5	2	85	85	10	2000	0
258	BRIDGEPORT MILL	7/C-7	NO CE#	0.5	0.5	2	0.5	3.5	1	4.5	128	10	10	4000	5
259	CINCINNATI MILL	7/C-7	00038529 00	0.5	0.5	2	0.5	3.5	1	4.5	128	10	10	4000	5
260	DOALL GRINDER	7/C-7	NO CE #	0.5	0.5	2	0.5	3.5	2	5.5	128	10	10	4000	5
261	MONARCH LATHE	7/C-8	00018937 00	0.5	1	2	1	4.5		4.5	200	20	10	4500	10
262	LATHE14", LODGE & SHIPLEY	7/C-8	00038440 00	0.5	1	1	1	3.5	1	4.5	200	20	10	4500	15
263	DOALL BAND SAW	7/D-8	00013920 00	0.5	0.5	0.5	0.5	2	1	3	200	15	10	1500	0
264	LATHE SMALL MONARCH	7/D-8	00018934 00	0.5	0.5	1	0.5	2.5	1	3.5	100	15	10	2500	10
265	DRILL PRESS TREE MODEL 2UVR	7/E-8	NO CE #	0.5	0.5	0.5	0.5	2	1	3	150	20	15	2500	0
266	SIBLEY DRILL PRESS	7/E-8	00019013 00	0.5	0.5	1	0.5	2.5	1	3.5	150	15	10	2500	10
267	DELTA ROCKWELL DRILL PRESS	7/E-8	NO CE #	0.5	0.5	0.5	0.5	2	1	3	75	20	10	1500	0
268	BRIDGEPORT MILL	7/E-8	00019257 00	0.5	0.5	1	0.5	2.5	1	3.5	100	15	10	2500	10
269	DRAKE PRESS (GREEN LARGE)	7/E-8	00020566 00	0.5	0.5	0.5	0.5	2	1	3	90	10	10	2000	5
270	DRAKE PRESS (GREY SMALL)	7/E-8		0.5	0.5	0.5	0.5	2	1	3	50	10	10	1000	2
271	DAYTON GRIT BLASTER	7/E-7	00020603 00	0.5	0.5	1	0.5	2.5	2	4.5	130	30	10	1500	0
272	ULTRASONIC CLEANER, WESTINGHOUSE	10/H-15	00035099 00	0.5	0.5	1	0.5	2.5	2	4.5	75	25	10	750	0
273	FILTER DRYING BOX	10/H-15	NO CE #	0.5	0	0.5	0.5	1.5	0.5	2	60	10	10	250	0
274	ELECTROFOGER & TANK & POWER SUPPLY	203	00019490 00	1	1	2	1	5	2	7	400	250	50	4500	0
275	B BOX WAHOOD (SS)	203	00019378 00	0.5	0	1	0.5	2	1	3	150	50	20	500	0
276	B BOX WAHOOD	203	NO CE #	0.5	0	1	0.5	2	1	3	300	50	15	500	0
277	B-BOX WAHOOD WHITE ON SS STAND	203	00020207 00	0.5	0	1	0.5	2	1	3	550	50	15	500	0
278	B-BOX WAHOOD	203	00034035 00	0.5	0	1	0.5	1	1	2	300	50	15	500	0
279	PEXTO SHEAR	11	NO CE #	0	0	0	0.5	0.5	0.5	1	40	5	5	300	0

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Building 444/7, NCPP 'Clean' Equipment for Removal
Option #1

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
280	ESSLEY DRILL PRESS	11	00018997 00	0.5	0	0.5	0.5	1.5	0.5	2	130	20	5	1750	0
281	TENINSMITH ROLL	11	00020564 00	0	0	0.5	0	0.5	0.5	1	130	10	5	2500	0
282	BUFFALO PUNCH	11	00013342 00	0.5	0	1	0.5	2	0.5	2.5	100	20	10	5500	10
283	ALANTIC SHEAR (DK GREEN)	11	00020429 00	0.5	0	0.5	0.5	1.5	0.5	2	300	15	10	8500	5
284	BREAK (DK BLUE)	11	NO CE #	0	0	0.5	0.5	1	0.5	1.5	100	10	10	4500	.
285	HACKSAW POWER	11	NO CE #	0.5	0.5	1	0.5	2.5	1	3.5	90	25	20	2000	10
286	WELDERS (2)	11	NO CE #	0	0	0	0.5	0.5	0.5	1	100	100	10	3000	0
287	FORKLIFT	10/F-12	00019091 00	0	0.5	0.5	0.5	1.5	0.5	2	60	40	10	4000	15
288	HEALD LATHE, BOREMATIC, AMERICAN	101E/N-8	19041, 19218	0.5	1	3	1	5.5	2	7.5	1800	300	25	100000	150
289	SPIN FRICTION WELDER (NEW)	204A		0.5	0	1	1	2.5	0.5	3	240	50	10	35000	20
290	OVEN	138	00020131 00	0.5	0.5	1	0.5	2.5	0.5	3	175	50	10	4000	0
291	OVEN	138	00020132 00	0.5	0.5	1	0.5	2.5	0.5	3	175	50	10	4000	0
292	OVEN	138	00020133 00	0.5	0.5	1	0.5	2.5	0.5	3	175	50	10	4000	0
293	OVEN	138	00020134 00	0.5	0.5	1	0.5	2.5	0.5	3	175	50	10	4000	0
294	OVEN	138	00020135 00	0.5	0.5	1	0.5	2.5	0.5	3	175	50	10	4000	0
295	ULTRASONIC TANKS (3)	138		0	0	1	0.5	1.5	0.5	2	60	25	10	1600	0
296	BLUE M OVEN	138	00020243 00	0.5	0	0.5	0	1	0.5	1.5	60	30	10	800	0
297	BLUE M OVEN	138	00020244 00	0.5	0	0.5	0	1	0.5	1.5	60	30	10	800	0
298	DEVILBISS ROBOT	138	00020072 00	0	0	0.5	0	0.5	0.5	1	100	50	10	700	0
299	POWDER MIXER	138	00020137 00	0.5	0	0.5	0.5	1.5	0.5	2	130	30	10	300	0
300	OVEN LINDBERG	137	00019425 00	0.5	0.5	2	1	4	2	6	3360	150	25	30000	500
301	OVEN LINDBERG	137	00019423 00	0.5	0.5	1.5	1	3.5	1	4.5	385	100	20	10000	250
302	OVEN LINDBERG	137	00019452 00	0.5	0.5	2	0.5	3.5	1.5	5	490	125	20	13000	0
303	FURNACE	137	00013201 00	0.5	0	1	0.5	2	0.5	2.5	100	20	10	7000	0
304	PROPVIDENCE	137		0	0	1	0.5	1.5	1.5	3	100	20	10	7000	0
305	OIL FURNACE	137	00019153 00	0.5	0	0.5	0.5	1.5	0.5	2	50	20	10	1200	150
306	NITROGEN FURNACE	137	00019447 00	0	0	1	0	1	0.5	1.5	50	20	15	1000	0
307	S&W FURNACE	137	00019430 00	0.5	0.5	1	0.5	2.5	0.5	3	285	50	15	7000	0
308	DELTA SONICS (2 UNITS)	137	00019847 00	0	0	0.5	0.5	1	0.5	1.5	100	30	10	800	0
309	FURNACE, LOW TEMP, WEBBER	137		0.5	0	1	0.5	2	0.5	2.5	160	30	10	1200	0
310	HONE	137	00020148 00	0.5	0.5	0.5	0.5	2	0.5	2.5	110	30	10	1000	10
311	ABAR VACUUM FURNACE	137	00019424 00	0.5	0.5	2	0.5	3.5	1.5	5	190	50	15	4000	0
312	VARIAN MeV UNIT	139		0.5	0.5	1	0.5	2.5	0.5	3	170	50	10	5500	0
313	PHILLIPS 320 KeV UNIT	143C		0.5	0.5	1	0.5	2.5	0.5	3	125	40	10	2000	40
314	PHILLIPS 160KeV UNIT	143D		0.5	0.5	1	0.5	2.5	0.5	3	65	25	10	1000	20
315	KODAK EXOMAT FILM DEVELOPER	143B		0.5	0	0.5	0.5	1.5	0.5	2	50	20	10	500	0
316	BRIDGE CRANE	139		0.5	0	2	0.5	3	0.5	3.5	150	25	15	3000	5
317	SMALL BRIDGE CRANE	143C		0.5	0	2	0.5	3	1.5	4.5	125	25	15	2000	5
			TOTAL	160.5	148	379.5	172	859	355	1214	93624	20260	4195	1922210	7088

Table D3 1/1

Building 444/7, NCPP Contaminated Equipment for Removal
Option #1

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Install Containment (Days)	Prepare and Test Containment (Days)	Dismantle Equipment (Days)	Initial Equipment Decontamination (Days)	Clean and Open Containment (Days)	Remove Containment (Days)	Move Equipment (Days)	Total (Days)	Final Decontaminate and Package Waste (Days)	Total (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	Lathe Monarch	101/N-13	00038538 00	0 5	0 5	2	3	1	1	2	2	0 5	12 5	1	13 5	182	25	20	5000	15
			Total	0 5	0 5	2	3	1	1	2	2	0 5	12 5	1	13 5	182	25	20	5000	15

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Table D4 1/3

Building 444/7, NCPP 'Clean' Equipment to Stay
Option #1

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Oil (Gallons)
1	MORI-YASNAC LATHE	101/Q-13		1	1	2	1	5	10	10	10
2	HOT HOLLOW COATER	104/E WALL-S		2	2	3	1	8	300	10	15
3	HOT HOLLOW COATER	104/E WALL-MID		2	2	3	1	8	300	10	15
4	HARDINGE LATHE	101/Q-14		1	1	2	1	5	125	20	15
5	KINNEY VACUUM	101/N-15		1	2	2	1	6	100	10	20
6	INSTRON TENSILE /COPM TESTER	447/420	00002457 00	1	1	1	1	4	75	10	10
7	ELECTRODE WELDER/WELDER	447/405B		1	1	2	1	5	150	25	0
8	FREON DISTILLER	447/405B		1	1	1	1	4	80	10	0
9	SCISSORS LIFT	101H	00020323 00	1	1	1	1	4	100	25	50
10	SCALE PLATFORM DIGITAL 3142	RM205	00018172 00	0	0.25	0.25	0.25	0.75	2	1	0
11	DISPLAY DIGITAL DUAL CONTACT	RM205	00018173 00	0	0.25	0.25	0.25	0.75	5	2	0
12	SYSTEM LASER MARKING	RM101	00018217 00	0	0.25	0.5	0.25	1	10	5	0
13	LATHE TURRET 42 IN VER BUL GRAPHITE MOLD	RM116	00018929 00	1	1	2	0.5	4.5	25	15	50
14	LATHE TURRET 0X36.5 HOR GIS	RM116	00018944 00	1	1	1	0.25	3.25	20	10	10
15	HOIST HYD FURNACE GLOBE	RM109	00018964 00	0.5	0.5	1	0.25	2.25	10	5	5
16	HOIST HYD FURNACE GLOBE	RM109	00018965 00	0.5	0.5	1	0.25	2.25	10	5	5
17	HOIST HYD FURNACE GLOBE	RM109	00018966 00	0.5	0.5	1	0.25	2.25	10	5	5
18	HOIST HYD FURNACE GLOBE	RM109	00018967 00	0.5	0.5	1	0.25	2.25	10	5	5
19	CHARGER BATT BERG-GIBSON M31518	RM179	00018974 00	0	0.25	0.5	0.25	1	5	5	0
20	TANK S/S 60X58 500 GAL	RM009	00018978 00	0	0.25	0	0.25	0.5	5	5	0
21	FURNACE INDUCTION HI VAC 66 IN	RM201	00018984 00	1	1	3	1	6	125	20	150
22	FURNACE INDUCTION HI VAC 66 IN	RM201	00018985 00	1	1	3	1	6	125	20	150
23	FURNACE INDUCTION HI VAC 66 IN	RM201	00018986 00	1	1	3	1	6	125	20	150
24	FURNACE INDUCTION HI VAC 66 IN	RM201	00018987 00	1	1	3	1	6	125	20	150
25	FURNACE INDUCTION HI VAC 66 IN	RM201	00018988 00	1	1	3	1	6	125	20	150
26	FURNACE INDUCTION HI VAC 66 IN	RM201	00018989 00	1	1	3	1	6	125	20	150
27	FURNACE INDUCTION HI VAC 66 IN	RM201	00018990 00	1	1	3	1	6	125	20	150
28	FURNACE INDUCTION HI VAC 66 IN	RM201	00018991 00	1	1	3	1	6	125	20	150
29	HOIST ELEC 2T MOORE	RM201	00019002 00	0	0.5	0.5	0.25	1.25	15	5	5
30	CRANE BRIDGE 4000# WHITING	RM101	00019016 00	0	0.5	0.5	0.25	1.25	15	5	5
31	CRANE BRIDGE 2000# WHITING	RM101	00019017 00	0	0.5	0.5	0.25	1.25	15	5	5
32	CRANE BRIDGE 2000# WHITING	RM101	00019018 00	0	0.5	0.5	0.25	1.25	15	5	5
33	HOIST ELEC 4000# ROBBINS F820	RM202	00019019 00	0	0.5	0.5	0.25	1.25	15	5	5
34	CRANE BRIDGE 2000 WHITING	RM101	00019103 00	0	0.5	0.5	0.25	1.25	15	5	5
35	DRYER AIR COMPRESSED	R001	00019350 00	0.5	0.5	0.5	0.25	1.75	15	5	5
36	SYSTEM VAC PUMPING HERAEUS 3500	RM109	00019352 00	0.5	0.5	1	0.25	2.25	15	5	15
37	SYSTEM VAC PUMPING HERAEUS 3500	RM109	00019353 00	0.5	0.5	1	0.25	2.25	15	5	15
38	COLLECTOR CHIP BE EXHAUST SYSTEM OUTSIDE	SSIDE	00019584 00	0	1	1	0.5	2.5	25	15	0
39	PUMP ROOTS LEYBOLD-HERAEUS RA300	RM109	00019626 00	0	0.5	0.5	0.25	1.25	15	10	20
40	LATHE CHUCKER HARDINGE CHNC-18 W	RM101	00019661 00	0.5	0.5	0.5	0.25	1.75	20	10	20
41	PROGRAMMER PROCESS L N 1300	2NDFL	00019699 00	0	0	0.25	0.25	0.5	5	5	0
42	RECORDER TEMP FOXBORO	RM201	00019709 00	0	0	0.25	0.25	0.5	5	5	0
43	RECORDER TEMP FOXBORO	RM201	00019710 00	0	0	0.25	0.25	0.5	5	5	0
44	RECORDER TEMP FOXBORO	RM201	00019711 00	0	0	0.25	0.25	0.5	5	5	0
45	RECORDER TEMP FOXBORO	RM201	00019712 00	0	0	0.25	0.25	0.5	5	5	0
46	MILLING MACH 5-AXIS CNC EX-CELL-	RM101	00019719 00	2	2	2	0.5	6.5	20	15	50
47	COULOMETER DIGITAL 379 25102	RM201	00019751 00					0			
48	CRANE BRIDGE W/500# HOIST DEMAG MB	RM245	00019848 00	0	0.5	0.5	0.25	1.25	20	10	10

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Building 444/7, NCPP 'Clean' Equipment to Stay
Option #1

Table D4 2/3

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Oil (Gallons)
49	PUMP ROOTS LB RA-3001S	RM204	00019856 00	0	0 5	0.5	0 25	1.25	15	10	20
50	PUMP ROOTS LB RA-3001S	RM109	00019857 00	0	0 5	0 5	0 25	1.25	15	10	20
51	LATHE 2-AXIS CNC MORI SEIKI SL-1	RM101	00019902 00	1	1	2	0 25	4 25	20	10	15
52	BLOWER LEYBOLD-HERAEUS RA3001S	109	00019947 00	0	0 5	0 5	0 25	1.25	15	10	20
53	BLOWER ROOTS	100	00020061 00	0	0 5	0 5	0 25	1.25	15	10	20
54	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020074 00	0 25	0 5	1	0 25	2	20	5	0
55	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020075 00	0 25	0 5	1	0 25	2	20	5	0
56	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020076 00	0 25	0 5	1	0 25	2	20	5	0
57	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020077 00	0 25	0 5	1	0 25	2	20	5	0
58	POWER SUPPLY INDUCTION COIL 2	RM109	00020078 00	0 25	0 5	1	0 25	2	20	5	0
59	POWER SUPPLY INDUCTION COIL 2	RM109	00020079 00	0 25	0 5	1	0 25	2	20	5	0
60	POWER SUPPLY INDUCTION COIL 2	RM109	00020080 00	0 25	0 5	1	0 25	2	20	5	0
61	POWER SUPPLY INDUCTION COIL 2	RM109	00020081 00	0 25	0 5	1	0 25	2	20	5	0
62	SUB-STATION INDOOR 1500KVA	RM015	00020083 00	0	0	0	0	0	0	0	0
63	SCAFFOLD ELECTRIC LIFT XL-19	107	00020125 00	0 5	0.5	0.5	0 25	1.75	15	5	10
64	CHUCKING MACHINE HARDINGE NUMERI HANSEN	RM101	00020186 00	0 5	0 5	1	0 25	2.25	15	5	20
65	SUB-STATION INDOOR 1500KVA	RM015	00020199 00	0	0	0	0	0	0	0	0
66	TONGS RANGE 20"-34" 3 TON	RM205	00020206 00	0	0 25	0 25	0 25	0 75	15	5	0
67	SCALE TOLEDO 2300	RM202	00020214 00	0	0 25	0 25	0 25	0.75	15	5	0
68	SYSTEM VACUUM PUMPING	RM204	00020218 00	0	0 5	0 5	0 25	1.25	15	10	20
69	FORKLIFT TRUCK SIT DOWN ELEC	RM205	00020228 00	0 5	0 5	0 5	0 25	1.75	20	15	20
70	PUMPING SYSTEM KINNEY LIQ RIMS V STECKLINE	101	00020231 00	0	0	0	0 25	0 25	20	10	0
71	AIR CONDITIONING UNIT SELF-CONT	BLCNY	00020232 00	0	0 25	0 25	0 25	0 75	10	5	0
72	AIR CONDITIONING UNIT SELF-CONT INS OFFICE	RM202	00020233 00	0	0 25	0 25	0 25	0 75	10	5	
73	COIL HEATING INDUCTION	RM204	00020269 00	0	0 25	0 25	0 25	0.75	20	5	0
74	GRIPPER INGOT	RM201	00020204 00	0	0 25	0 25	0 25	0 75	10	5	0
75	GRIPPER INGOT	RM204	00020297 00	0	0 25	0 25	0 25	0.75	10	5	0
76	FURNACE VACUUM BRAZING	R109A	00020522 00	1	1	2	0.5	4.5	25	10	0
77	ANALYZER BERYLLIUM (THE BEAST)	RM014	00020621 00	0	0	0 25	0 25	0.5	10	5	0
78	MACHINE MILLING DOALL 200V VERTI	RM118	00020720 00	1	1	2	0 5	4.5	25	10	25
79	HOIST ELEC 2T**T-180	RM205	00020742 00	0	0 5	0 5	0 25	1.25	15	10	5
80	CRUSHER/SHREDDER 1000 LB/HR ARBO	RM204	00020748 00	1	1	1	0 25	3.25	25	10	30
81	ANALYZER BERYLLIUM #440		00021002 00	0	0 25	0.5	0 25	1	5	5	0
82	UNIT NORSAIRE EVAPORATIVE COOLIN	ROOF	00023218 00	0 5	0.5	1	0 25	2.25	25	10	0
83	FAN EXHAUST VENTILATION	ROOF	00023228 00	1	1	1	0 25	3.25	25	15	20
84	LIFT SCISSOR MARK SN 1284-10658		00024273 00	0 5	0 5	1	0 25	2.25	25	10	20
85	XFORMER 1500 KVA 3PH 60HZ DR PLT PWR		00028114 00	0	0	0	0	0	0	0	0
86	XFORMER 1500 KVA 3PH 60HZ DR PLT PWR		00028115 00	0	0	0	0	0	0	0	0
87	XFORMER 1500 KVA 3PH 60HZ DR PLT PWR	R015	00028118 00	0	0	0	0	0	0	0	0
88	DEGREASER ULTRASONIC VAPOR CDG1K PIPE SHP	MAINT	00035099 00	0	0 25	0 5	0 25	1	20	5	0
89	PUMP VAC MICROVAC STOKES 412	RM015	00038149 00	0	0 5	0 5	0 25	1 25	15	10	20
90	TANK S/S 48X84 450GAL***	RM09A	00038461 00	0	0	0	0	0	0	0	0
91	TANK S/S 48X84 450GAL***	RM09A	00038462 00	0	0	0	0	0	0	0	0
92	TANK S/S 42X42 200GAL***	RM09A	00038464 00	0	0	0	0	0	0	0	0
93	DETECTOR LEAK (HE) VARIAN 938-88	RM08B	00039074 00	0 25	0 25	0 5	0 25	1 25	15	5	5
94	COLLECTOR TITANIUM DUST PTBL	2NDFL	00055132 00	0 5	0 5	0.5	0 25	1.75	20	10	0
95	XFORMER SIEMENS-ALLIS 1500 K PLT POWER	0	00085850 00	0	0	0	0	0	0	0	0
96	XFORMER SIEMENS-ALLIS 1500 K PLT POWER	0	00085860 00	0	0	0	0	0	0	0	0
97	FORKLIFT DATSUN ET-3000	RM410	00010888 00	0	0 25	0 25	0 25	0 75	20	10	20

Table D4 3/3

Building 444/7, NCPP 'Clean' Equipment to Stay
Option #1

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Oil (Gallons)
98	READOUT DUAL CHANNEL FOR 1120	RM420	00020457 00	0	0	0	0.25	0.25	5	5	0
99	HOIST ELEC IT HAHN	RM403	00020720 00	0.25	0.25	0.25	0.25	1	5	10	5
100	TESTER TENSION COMPRESSION INSTR	RM420	00020757 00	0	0.25	0.25	0.25	0.75	5	5	5
101	SHREDDER INDUSTRIAL AZ-15	RM31B	00020764 00	0	0	0	0.25	0.25	0	5	0
102	HOIST TROLLEY 500	RM406B	00020767 00	0	0.25	0.25	0.25	0.75	5	10	5
103	CRANE MONORAIL	RM502	00020769 00	0.25	0.25	0.25	0.25	1	10	10	0
104	HOUSING HEPA FILTER BAG IN-OUT	RM406A	00020778 00	0	0.5	0	0.25	0.75	20	15	0
105	SCALE M2300 TOLEDO 500KG 30X30"		00020779 00	0	0	0.25	0.25	0.5	5	10	0
106	CLEANER ULTRASONIC WESTINGHOUSE	RM403	00026785 00	0	0	0.25	0.25	0.5	10	10	0
107	XFORMER 1000 KVA 3PH 60HZ DR PLT PWR		00028117 00	0	0	0	0	0	0	0	0
108	FURNACE MELTING ARC ELEC VAC	RM405	00034019 00	2	3	8	1	12	25	25	300
109	CRUSHER DRUM 55AR W/ COMPACTION	RM501	00034609 00	0.5	0.25	0.25	0.25	1.25	20	15	5
110	DETECTOR LEAK (HE) VARIAN 936-68S	HALL	00039972 00	0	0	0.25	0.25	0.5	5	5	5
111	CONTROLLER IONZN GAUGE G-P	RM407	00040852 00	0	0	0	0.25	0.25	0	5	0
112	XFORMER SQR D 1500/2000 K PLT PWR	447-2	00085689 00	0	0	0	0	0	0	0	0
113	COMPUTER DIGITAL DECMATE	0408B	00099420 00	0	0	0.25	0	0.25	0	5	0
114	PRINTER INTEGRAL DATA PRISM 800	RM420	00099421 00	0	0	0.25	0	0.25	0	5	0
115	COMPUTER MONITOR HP	RM414	00099422 00	0	0	0.25	0	0.25	0	5	0
116	PRINTER HP	0	00099423 00	0	0	0.25	0	0.25	0	5	0
117	KEYBOARD IBM	0	00099424 00	0	0	0.25	0	0.25	0	5	0
			Total	40.25	57.25	97.75	39.5	234.75	3412	933	2215

Table D5

TABLE - D5
BUILDING 444/7 ROOMS & MISCELLANEOUS
OPTION #3

Room Function	Room Number	D&D Material Team days	Total Material Cubic Feet	Primary Waste Cubic Feet	Secondary Waste Cubic Feet	Total Pounds	Oil Gallons
Util., Hse. vac., tanks, air comp.	1	2	1200	200	50	3000	0
Electrical shop	2	3	700	300	15	7000	0
Electronics shop	3	3	400	100	25	1500	0
Library	6	2	700	100	15	1000	0
Maintenance Machine shop	7	1	200	25	25	1200	0
Storage	8	2	1000	200	20	2000	0
Paint shop	9	1	200	50	15	1000	0
Storage	10	4	1800	300	50	15000	25
Sheet metal shop	11	2	500	200	20	3000	10
Second coatings shop	109	3	450	50	25	3500	0
Carbon Shop	116	4	500	200	40	3000	10
Tool Grind	117	3	450	50	30	3500	0
Tool Grind	118	3	450	50	30	3500	0
Furnace area & Storage for Plating Lab	201	4	1200	200	25	5000	0
D-38 storage and racks	202	5	1500	100	15	10000	0
Storage area	204	10	4800	1200	50	25000	0
Storage area & offices 205,6,7,8,9,10	205	2	500	200	25	1500	0
New plating lab	212	10	650	650	30	7500	0
Plating Lab	245	15	960	900	100	10000	0
Offices	10A	1	250	50	10	600	0
Offices	13 & 14	1	450	100	20	1500	0
Offices	205A	1	300	50	25	1200	0
Misc. in DI/Wash room	212B	1	100	75	10	1200	0
Plating Lab office	245A	2	300	100	25	1000	0
Surface Finishing lab	245B	2	225	100	25	10000	5
Chemical Lab	245C	2	225	200	35	2000	0
Tool Crib	7B	4	2000	200	25	7000	25
Plating lab (Rm. 245) over flow tanks (4)	9A	3	3140	200	35	4000	0
Parts Storage	412	2	400	20	20	6000	0
Parts Storage	409	2	400	20	20	6000	0
EB Welder Stiegerwald	406	5	550	100	20	7500	25
Cleaning Area	406B	3	525	200	25	4500	0
New Chip Roaster	31A	5	2400	300	50	8000	25
Old Chip Roaster	32 & 52	5	2100	250	50	8500	25
	Totals	118	31525	7040	1000	176200	150

Office equipment (desks & filing cabinets) in offices within the specified work area were calculated in total room material.

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Table D6 1/3

Building 444/7, NCPP 'Clean' Equipment for Removal
Option #3

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
1	AVS FURNACE	109A/E-16	00019515 00	2	2	4	2	10	3	13	1440	500	25	30000	20
2	TOUCH BRAZE	109A/E-15	00019498 00	1	1	2	1	5	2	7	200	150	10	1500	10
3	CHROME COATER #1	109A/E-15	00029910 00	1	1	2	1	5	2	7	480	400	10	3000	10
4	INDUCTION BRAZER	109A/E-14	00035122 00	1	1	2	1	5	1	6	400	350	10	2500	10
5	ALUMINUM COATER	109A/E-14	00019497 00	1	1	1	1	4	1	5	360	300	10	2000	15
6	BENDIX CONTOUR PROJECTOR	109A/E-13	00034995 00	0.5	0	1	0.5	2	1	3	150	100	10	2500	0
7	ROOM, HOOD, WASH, & CHEM. (RCRA)	109B		1	2	2	1	6	3	9	300	300	50	1000	0
8	ANOCUT (ECM)	447/407		2	2	3	2	9	3	12	2250	2000	50	7000	0
9	CHAMILLES ELECT. DISC (EDM)	447/407		1	1	1	1	4	2	6	150	25	25	6000	0
10	BURST CHAMBER	447/408	00038862 00	0.5	1	2	1	4.5	2	6.5	150	25	15	15000	15
11	BURST CHAM. PUMPS (2K, 30K)	447/408A		1	1	2	1	5	2	7	125	75	15	5000	15
12	BUR DEAQ VACUUM SYSTEM (DK GREY)	BSMT.		1	2	10	2	15	3	18	1000	200	50	15000	0
13	AF 8 VACUUM FURNACE (BELL)	447/403	00020755 00	2	4	5	2	13	3	16	6500	100	100	50000	15
14	VACUUM INDUCTRUES	447/403		2	1	2	1	6	2	8	650	100	25	15000	10
15	VACUUM SPECIALTIES	447/403	00019171 00	2	1	2	1	6	2	8	1200	200	10	17500	10
16	GRIT BLASTER	447/404	00035102 00	1	1	2	1	5	2	7	275	75	10	4500	0
17	VACUUM SEPERATOR	447/404	00035101 00	1	1	2	1	5	1	6	250	25	25	3500	0
18	WESTINGHOUSE DEGREASER	447/404		1	1	1	0.5	3.5	1	4.5	75	25	10	500	0
19	HGA (RES. GAS AN) CUSTOM ENG	447/404	00020420 00	0	0	1	0.5	1.5	1	2.5	100	100	10	1500	2
20	VACUUM MELT ARC FURNACE (VMAF)	447/405	00034019 00	2	2	5	2	11	3	14	3600	1000	50	20000	60
21	CONTROL PANEL FOR VMAF	447/405A		0.5	0	1	0.5	2	1	3	60	50	10	700	0
22	2 TANKS FOR VMAF	447/405A		0	0	1	0.5	1.5	1	2.5	400	10	10	3000	0
23	POWER SUPPLY FOR VMAF	447/405A		1	0	1	0.5	2.5	1	3.5	160	160	20	5000	0
24	ANALIZER TOOL	TG	00020175 00	0	0	1	0.5	1.5	1	2.5	110	20	15	6500	0
25	CAROUSEL MOTORIZED VERTICAL	TG	00020187 00	0.5	0	0.5	0.5	1.5	0.5	2	175	20	10	4000	0
26	COMPARATOR OPTICAL J&L A-7237	TG	00019081 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2000	0
27	COMPARATOR OPTICAL J&L A-7237	TG	00019945 00	0	0	1	0.5	1.5	1	2.5	30	15	5	300	0
28	COMPARATOR OPTICAL J&L A-7237	TG	00019946 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2000	0
29	COMPARATOR OPTICAL 14"	TG	00020271 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
30	COMPARATOR OPTICAL 14"	TG	00020270 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
31	COMPARATOR OPTICAL 14" W/10X20 MAG	TG	00019514 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2500	0
32	COMPARATOR OPTICAL 14" XL 14B	TG	00019746 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
33	COMPARATOR OPTICAL 14" XL 14S	TG	00019747 00	0	0	1	0.5	1.5	1	2.5	80	50	10	800	0
34	COMPARATOR OPTICAL 20"	TG	00020265 00	0	0	1	0.5	1.5	1	2.5	200	150	10	2500	0
35	COMPARATOR OPTICAL 30"	TG	00020266 00	0	0	1	0.5	1.5	1	2.5	250	150	10	2500	0
36	COMPARATOR OPTICAL KLOOR NIKON III	TG	00019097 00	0	0	1	0.5	1.5	1	2.5	250	150	10	2500	0
37	CUTTER MASTER HOT. W/AIR SPINDLE	TG	00020106 00	0.5	0	0.5	0.5	1.5	0.5	2	75	15	5	5000	0
38	GRINDER CARBIDE SAW SHARPENER ACME	TG	00019480 00	0	0	0.5	0.5	1	0.5	1.5	55	10	5	1500	0
39	GRINDER CBO TOOL 6" XL044	TG	00018961 00	0	0	0.5	0.5	1	0.5	1.5	50	15	10	700	30
40	GRINDER CBO TOOL 6" XL044	TG	00018963 00	0	0	0.5	0.5	1	0.5	1.5	50	15	10	700	30
41	GRINDER CUTTER CNC, MONOSET	TG	00019122 00	0	0	0.5	0.5	1	0.5	1.5	50	15	10	700	0
42	GRINDER CUTTER UNIVERSAL GORTON 33	TG	00019300 00	0	0	0.5	0	0.5	0.5	1	25	5	50	150	0
43	GRINDER DRILL BLACK DIAMOND BW-90	TG	00019726 00	0	0	0.5	0	0.5	0.5	1	25	5	50	150	0
44	GRINDER DRILL BLACK DIAMOND BW-70	TG	00019748 00	0	0	0.5	0	0.5	0.5	1	25	5	50	150	0
45	GRINDER DRILL SELECT-O-MATIC ALMA	TG	00020026 00	0	0	0.5	0	0.5	0.5	1	30	10	50	800	0
46	GRINDER DRILL SELECT-O-POINT ALMA	TG	00019334 00	0	0	0.5	0	0.5	0.5	1	30	10	50	800	0
47	GRINDER END MILL HUFFMAN HS-87R	TG	00020166 00	1	2	3	2	8	2	10	1500	25	10	25000	250
48	GRINDER FORM RELIEF SINSLOWMATIC	TG	00019494 00	0	0	0.5	0	0.5	0.5	1	50	10	5	2000	0
49	GRINDER OPTICAL FROM 2-AXIS WASHNO	TG	00019648 00	0.5	0	1	0	1.5	1	2.5	150	15	10	5400	50
50	GRINDER OPTICAL FROM 2 AXIS WASHNO	TG	00019647 00	0.5	0	1	0	1.5	1	2.5	150	15	10	5400	50
51	GRINDER PRECISION UNIVERSAL 10"	TG	00020316 00	0.5	0	1	0	1.5	1	2.5	150	15	10	5400	50
52	GRINDER SURFACE MICROMASTER B&S	TG	00019606 00	0	0	0.5	0	0.5	0.5	1	35	10	5	3000	0
53	GRINDER SURFACE PREC. GALLMEYER	TG	00019393 00	0	0	0.5	0	0.5	0.5	1	100	15	10	4000	50
54	GRINDER TOOL CUTTER	TG	00019320 00	0	0	0.5	0	0.5	0.5	1	40	10	5	700	700
55	GRINDER TOOL CUTTER CNC	TG	00019165 00	0	0	0.5	0	0.5	0.5	1	40	10	5	700	700
56	GRINDER TOOL CUTTER CNC	TG	00019808 00	0	0	0.5	0	0.5	0.5	1	40	10	5	700	700
57	GRINDER TOOL CUTTER CNC MONOSET 31	TG	00019388 00	0	0	0.5	0	0.5	0.5	1	60	15	5	1200	0
58	GRINDER TOOL CUTTER COMPACT	TG	00020463 00	0	0	0.5	0	0.5	0.5	1	6	5	5	70	0
59	GRINDER TOOL CUTTER HAMO 12	TG	00019337 00	0	0	0.5	0	0.5	0.5	1	40	10	5	800	0
60	GRINDER TOOL CUTTER CNC MONOSET	TG	00019031 00	0	0	0.5	0	0.5	0.5	1	40	10	5	800	0

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Building 444/7, NCPP 'Clean' Equipment for Removal
Option #3

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
81	GRINDER TOOL CUTTER CINC. MONOSET	TG	00019032 00	0	0	0.5	0	0.5	0.5	1	40	10	5	800	0
82	GRINDER TOOL CUTTER CINC. MONOSET	TG	00019033 00	0	0	0.5	0	0.5	0.5	1	40	10	5	800	0
83	GRINDER TOOL CUTTER OLIVER	TG	00019142 00	0	0	0.5	0	0.5	0.5	1	55	15	5	700	0
84	GRINDER TOOL MICROPOINT DEVLIEG	TG	00019067 00	0	0	0.5	0	0.5	0.5	1	50	10	5	700	0
85	GRINDER TOOL MICROPOINT DEVLIEG	TG	00019340 00	0	0	0.5	0	0.5	0.5	1	50	10	5	700	0
86	GRINDER TOOL OPTICAL PROJECTION BAC	TG	00019408 00	0.5	0	0.5	0.5	1.5	0.5	2	150	15	10	5400	60
87	GRINDER TOOL PRECISION DEVLIEG	TG	00033988 00	0	0	0.5	0	0.5	0.5	1	50	10	5	700	0
88	GRINDER TR70	TG	00056486 00	0	0	0.5	0	0.5	0.5	1	5	5	5	40	0
89	GRINDER MACHINE DRILL CHRISTEN 06-6	TG	00019346 00	0	0	0.5	0	0.5	0.5	1	75	10	5	550	0
70	HEATER INDUCTRION BRAZING TOCCO	TG	00020052 00	0.5	0	0.5	0.5	1.5	0.5	2	50	40	10	800	0
71	LATHE TOOLROOM HARDINGE HLV-H	TG	00019245 00	0	0	0.5	0	0.5	0.5	1	80	10	5	1700	5
72	MARKNOT MACHINE HYD. PWR 0T 30 MOT	TG	00010347 00	0	0	0.5	0	0.5	0.5	1	25	10	5	450	0
73	MILLING MACHINE PLAN RAM STYLE SAJO 3	TG	00019486 00	0	0	0.5	0	0.5	0.5	1	10	5	5	200	0
74	MILLING MACHINE SWIVEL HD. TURRETT TREE	TG	00019384 00	0	0	0.5	0	0.5	0.5	1	60	10	5	1200	20
75	PROBE OPTICAL VIDEO W/STANDARD LENS	TG	00076515 00	0	0	0.5	0	0.5	0.5	1	25	10	5	550	0
76	SHARPENER DRILL AUTO MOHAWK 49	TG	00019468 00	0	0	0.5	0	0.5	0.5	1	40	10	5	1500	30
77	SHARPENER EXACTAMATIC DRILL W/SLOW	TG	00019259 00	0	0	0.5	0	0.5	0.5	1	25	10	5	550	0
78	COMPARATOR OPTICAL JIL	CS	00019454 00	0	0	0.5	0	0.5	0.5	1	25	10	5	550	0
79	DRILL RADIAL 34" CARTLON	CS	00019009 00	0.5	1	1	0.5	3	1	4	140	30	10	4000	10
80	DRILL MACHINE TURRET 2 AXIS NC BURGMASTER	CS	00019516 00	0.5	1	2	0.5	4	1	5	550	35	20	10000	10
81	LATHE ENGINE 20" MARTIN DS-60	CS	00019292 00	0.5	1	1	0.5	3	0.5	3.5	200	15	10	8000	10
82	LATHE ENGINE HORT. MONOSET 16X84	CS	00031150 00	0.5	0	0.5	0.5	1.5	0.5	2	110	15	10	6000	10
83	LATHE HARDINGE SUPERSLANT TURRET 3 AXIS	CS	00020358 00	0.5	0	0.5	0.5	1.5	0.5	2	70	15	10	2000	8
84	LATHE REGAL LEBLOND MAKINO	CS	00020721 00	0.5	0.5	0.5	0.5	2	0.5	2.5	170	20	15	5000	5
85	LATHE TOOLROOM 9" HARDINGE HLV-H S	CS	00019363 00	0.5	0	0.5	0	1	0.5	1.5	95	15	10	2500	0
86	LATHE TURRET 42" VERTICAL BUL	CS	00018929 00	0.5	0.5	2	1	4	2	8	200	35	10	8000	15
87	LATHE TURRET 9X36 8 HOR GIS	CS	00018944 00	0.5	1	1	0.5	3	1	4	300	20	10	8000	15
88	MILLING MACHINE BRGT BRJ 12BR	CS	00019304 00	0.5	0.5	1	0.5	2.5	1	3.5	128	10	10	4000	5
89	MILLING MACHINE BRGT 32 STD VERT RAM H	CS	00020357 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	20	10	1500	5
90	MILLING MACHINE CINC. 4	CS	00019036 00	0.5	0	0.5	0.5	1.5	0.5	2	120	10	5	5000	5
91	MILLING MACHINE HORT. K&T	CS	00019396 00	0.5	0.5	2	0.5	3.5	1	4.5	128	10	10	4000	5
92	MILLING MACHINE KNEE 34" HORT. SAJO	CS	00019039 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	20	10	3000	10
93	MILLING MACHINE KNEE 34" HORT. CINC.	CS	00038439 00	0.5	0.5	0.5	0.5	2	1	3	75	15	10	3000	5
94	MILLING MACHINE VERT CINC. 420-16	CS	00019278 00	0.5	0	0.5	0.5	1.5	0.5	2	120	15	10	6000	6
95	MILLING MACHINE VER DOALL 200V	CS	00020720 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	20	10	3000	5
96	TURNING CENTER LEBLOND CHUCKER 20	CS	00020242 00	0.5	0.5	2	1	4	2	6	350	50	20	15000	30
97	MILL, CINCINNATI	CS	00019368 00	0.5	0.5	0.5	0.5	2	0.5	2.5	120	20	10	5000	10
98	MILL, CINCINNATI	CS	00019384 00	0.5	0.5	0.5	0.5	2	2	4	120	20	10	5000	10
99	MILL GE	CS		0.5	0.5	0.5	0.5	2	0.5	2.5	145	20	10	3000	10
100	DOALL SAW	CS	00019024 00	0.5	0.5	0.5	0.5	2	0.5	2.5	75	10	5	1500	0
101	FURNACE/CONTROLLER	205	00020724 00	0.5	0.5	0.5	0.5	2	1	3	144	55	15	4500	0
102	TUMBLER	205	00020219 00	0	0	0.5	0	0.5	0.5	1	12	10	5	300	0
103	PRESS, FRAME, HYD. BLUE	205		0	0	0	0	0	0.5	0.5	80	5	6	650	2
104	GRIT-BLASTER WASTE	205	00020095 00	0	0	0.5	0.5	1	0.5	1.5	80	25	5	2500	0
105	SQUARE TANK ON WHEELS	205		0	0	0	0	0	0.5	0.5	50	5	0	300	0
106	WASH SYSTEM (NEW)	212B		0.5	0	1.5	0.5	2.5	0.5	3	500	250	10	2500	0
107	WATER FILTRATION SYSTEM	212B	00020213 00	0.5	0	0.5	0.5	1.5	0.5	2	85	85	10	2000	0
108	BRIDGEPORT MILL	7/C-7	NO CE#	0.5	0.5	2	0.5	3.5	1	4.5	128	10	10	4000	5
109	CINCINNATI MILL	7/C-7	00038529 00	0.5	0.5	2	0.5	3.5	1	4.5	128	10	10	4000	5
110	DOALL GRINDER	7/C-7	NO CE #	0.5	0.5	2	0.5	3.5	2	5.5	128	10	10	4000	5
111	MONARCH LATHE	7/C-8	00018937 00	0.5	1	2	1	4.5		4.5	200	20	10	4500	10
112	LATHE 14", LODGE & SHIPLEY	7/C-8	38440	0.5	1	1	1	3.5	1	4.5	200	20	10	4500	15
113	DOALL BAND SAW	7/D-8	00013020 00	0.5	0.5	0.5	0.5	2	1	3	200	15	10	1500	0
114	LATHE SMALL MONARCH	7/D-8	00018934 00	0.5	0.5	1	0.5	2.5	1	3.5	100	15	10	2500	10
115	DRILL PRESS TREE MODEL 2UVR	7/E-8	NO CE #	0.5	0.5	0.5	0.5	2	1	3	150	20	15	2500	0
116	SELEY DRILL PRESS	7/E-8	00019013 00	0.5	0.5	1	0.5	2.5	1	3.5	150	15	10	2500	10
117	DELTA ROCKWELL DRILL PRESS	7/E-8	NO CE #	0.5	0.5	0.5	0.5	2	1	3	75	20	10	1500	0
118	BRIDGEPORT MILL	7/E-8	00019297 00	0.5	0.5	1	0.5	2.5	1	3.5	100	15	10	2500	10
119	DRAKE PRESS (GREEN LARGE)	7/E-8	00020568 00	0.5	0.5	0.5	0.5	2	1	3	90	10	10	2000	5
120	DRAKE PRESS (GREY SMALL)	7/E-8		0.5	0.5	0.5	0.5	2	1	3	50	10	10	1000	2
121	DAYTON GRIT BLASTER	7/E-7	00020603 00	0.5	0.5	1	0.5	2.5	2	4.5	130	30	10	1500	0

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Building 444/7, NCPP 'Clean' Equipment for Removal
Option #3

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Disconnect Services (Days)	Remove Peripheral Equipment (Days)	Dismantle Equipment (Days)	Move Equipment (Days)	Total (Days)	Decontaminate and Package Waste (Days)	Total Work (Days)	Total Material (Cubic Feet)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Total Weight (Pounds)	Oil (Gallons)
122	ULTRASONIC CLEANER, WESTINGHOUSE	10/H-15	00035009 00	0.5	0.5	1	0.5	2.5	2	4.5	75	25	10	750	0
123	FILTER DRYING BOX	10/H-15	NO CE #	0.5	0	0.5	0.5	1.5	0.5	2	60	10	10	250	0
124	ELECTRO ETCHER & TANK & POWER SUPPLY	203	00019490 00	1	1	2	1	5	2	7	400	250	50	4500	0
125	B BOX WHOOD (SS)	203	00019378 00	0.5	0	1	0.5	2	1	3	150	50	20	500	0
126	B BOX WHOOD	203	NO CE #	0.5	0	1	0.5	2	1	3	300	50	15	500	0
127	B BOX WHOOD WHITE ON SS STAND	203	00020207 00	0.5	0	1	0.5	2	1	3	550	50	15	500	0
128	B BOX WHOOD	203	00034035 00	0.5	0	1	0.5	1	1	2	300	50	15	500	0
129	PEXTO SHEAR	11	NO CE #	0	0	0	0.5	0.5	0.5	1	40	5	5	300	0
130	ESSLEY DRILL PRESS	11	00018997 00	0.5	0	0.5	0.5	1.5	0.5	2	130	20	5	1750	0
131	TERMISMITH ROLL	11	00020564 00	0	0	0.5	0	0.5	0.5	1	130	10	5	2500	0
132	BUFFALO PUNCH	11	00013342 00	0.5	0	1	0.5	2	0.5	2.5	100	20	10	5500	10
133	ALANTIC SHEAR (DK GREEN)	11	00020429 00	0.5	0	0.5	0.5	1.5	0.5	2	300	15	10	6500	5
134	BREAK (DK BLUE)	11	NO CE #	0	0	0.5	0.5	1	0.5	1.5	100	10	10	4500	.
135	HACKSAW POWER	11	NO CE #	0.5	0.5	1	0.5	2.5	1	3.5	90	25	20	2000	10
136	WELDERS (2)	11	NO CE #	0	0	0	0.5	0.5	0.5	1	100	100	10	3000	0
137	FORKLIFT	10/F-12	00019091 00	0	0.5	0.5	0.5	1.5	0.5	2	60	40	10	4000	15
138	SPM FRICTION WELDER (NEW)	204A		0.5	0	1	1	2.5	0.5	3	240	50	10	35000	20
			TOTAL	56	40.5	143.5	67.5	315.5	131	446.5	35100	9790	1835	857310	3231

Equipment and material for the following production areas and rooms are not included in this data base.

The division of the building is as follows: basement - everything east of Column J; Main Floor - everything east of Column G (from south wall north to corridor A), and everything east of Column C (from corridor A to north wall) of Building 444.

The mezzanine or second floor will be everything east of Column J or the entire second floor.

Tool Heat Treat, Rm. 126

Furnace area and storage, Rms. 137

NDT, Rms. 138 & 143

Precision Shop or Tool Engineering, Rms. 151, 148, 180, 181

Tool Crib for all aforementioned shops, Rm. 138

Main Production Rm. 101, Inspection Modules A-F, and the T101 unit containing offices, HPTC, Volume Determination, and EB Steigerwald welder.

Be Machine Shop and dust collection systems, Rms. 106 & 107

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Building 444/7, NCPP 'Clean' Equipment to Stay
Option #3

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Oil (Gallons)
1	INSTRON TENSILE /COPM TESTER	447/420	00002457 00	1	1	1	1	4	75	10	10
2	ELECTRODE WELDER/WELDER	447/405B		1	1	2	1	5	150	25	0
3	FREON DISTILLER	447/405B		1	1	1	1	4	80	10	0
4	SCALE PLATFORM DIGITAL 3142	RM205	00018172 00	0	0 25	0 25	0 25	0.75	2	1	0
5	DISPLAY DIGITAL DUAL CONTACT	RM205	00018173 00	0	0 25	0 25	0 25	0.75	5	2	0
6	LATHE TURRET 42 IN VER BUL GRAPHITE MOLD	RM116	00018929 00	1	1	2	0 5	4 5	25	15	50
7	LATHE TURRET 9X36 5 HOR GIS	RM116	00018944 00	1	1	1	0 25	3 25	20	10	10
8	HOIST HYD FURNACE GLOBE	RM109	00018064 00	0 5	0 5	1	0 25	2 25	10	5	5
9	HOIST HYD FURNACE GLOBE	RM109	00018065 00	0 5	0 5	1	0 25	2 25	10	5	5
10	HOIST HYD FURNACE GLOBE	RM109	00018066 00	0 5	0 5	1	0 25	2 25	10	5	5
11	HOIST HYD FURNACE GLOBE	RM109	00018067 00	0.5	0 5	1	0 25	2.25	10	5	5
12	TANK S/S 60X58 500 GAL	RM009	00018078 00	0	0 25	0	0 25	0.5	5	5	0
13	FURNACE INDUCTION HI VAC 66 IN	RM201	00018084 00	1	1	3	1	6	125	20	150
14	FURNACE INDUCTION HI VAC 66 IN	RM201	00018085 00	1	1	3	1	6	125	20	150
15	FURNACE INDUCTION HI VAC 66 IN	RM201	00018086 00	1	1	3	1	6	125	20	150
16	FURNACE INDUCTION HI VAC 66 IN	RM201	00018087 00	1	1	3	1	6	125	20	150
17	FURNACE INDUCTION HI VAC 66 IN	RM201	00018088 00	1	1	3	1	6	125	20	150
18	FURNACE INDUCTION HI VAC 66 IN	RM201	00018089 00	1	1	3	1	6	125	20	150
19	FURNACE INDUCTION HI VAC 66 IN	RM201	00018090 00	1	1	3	1	6	125	20	150
20	FURNACE INDUCTION HI VAC 66 IN	RM201	00018091 00	1	1	3	1	6	125	20	150
21	HOIST ELEC 2T MOORE	RM201	00019002 00	0	0 5	0 5	0 25	1.25	15	5	5
22	HOIST ELEC 4000# ROBBINS F620	RM202	00019010 00	0	0 5	0 5	0 25	1.25	15	5	5
23	CRANE BRIDGE 2000 WHITING	RM101	00019103 00	0	0 5	0 5	0 25	1.25	15	5	5
24	DRYER AIR COMPRESSED	R001	00019350 00	0 5	0 5	0 5	0 25	1.75	15	5	6
25	SYSTEM VAC PUMPING HERAEUS 3500	RM109	00019352 00	0 5	0 5	1	0 25	2 25	15	5	15
26	SYSTEM VAC PUMPING HERAEUS 3500	RM109	00019353 00	0.5	0 5	1	0.25	2 25	15	5	15
27	COLLECTOR CHIP BE EXHAUST SYSTEM OUTSIDE	SSIDE	00019584 00	0	1	1	0 5	2 5	25	15	0
28	PUMP ROOTS LEYBOLD-HERAEUS RA300	RM109	00019626 00	0	0 5	0 5	0.25	1.25	15	10	20
29	PROGRAMMER PROCESS L N 1300	2NDFL	00019699 00	0	0	0 25	0 25	0.5	5	5	0
30	RECORDER TEMP FOXBORO	RM201	00019709 00	0	0	0 25	0 25	0 5	5	5	0
31	RECORDER TEMP FOXBORO	RM201	00019710 00	0	0	0 25	0 25	0 5	5	5	0
32	RECORDER TEMP FOXBORO	RM201	00019711 00	0	0	0 25	0 25	0 5	5	5	0
33	RECORDER TEMP FOXBORO	RM201	00019712 00	0	0	0 25	0 25	0 5	5	5	0
34	COULOMETER DIGITAL 379 25102	RM201	00019751 00					0			
35	CRANE BRIDGE W/500# HOIST DEMAG MB	RM245	00010848 00	0	0 5	0 5	0 25	1.25	20	10	10
36	PUMP ROOTS LB RA-3001S	RM204	00010856 00	0	0 5	0.5	0 25	1.25	15	10	20
37	PUMP ROOTS LB RA-3001S	RM109	00010857 00	0	0 5	0.5	0 25	1.25	15	10	20
38	BLOWER LEYBOLD-HERAEUS RA3001S	RM109	00019947 00	0	0 5	0 5	0 25	1.25	15	10	20
39	BLOWER ROOTS	RM109	00020081 00	0	0 5	0 5	0 25	1.25	15	10	20
40	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020074 00	0 25	0 5	1	0 25	2	20	5	0
41	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020075 00	0 25	0 5	1	0 25	2	20	5	0
42	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020076 00	0 25	0 5	1	0 25	2	20	5	0
43	POWER SUPPLY INDUCTION COIL 1 25	RM109	00020077 00	0 25	0 5	1	0 25	2	20	5	0
44	POWER SUPPLY INDUCTION COIL 2	RM109	00020078 00	0 25	0 5	1	0 25	2	20	5	0
45	POWER SUPPLY INDUCTION COIL 2	RM109	00020079 00	0 25	0 5	1	0 25	2	20	5	0
46	POWER SUPPLY INDUCTION COIL 2	RM109	00020080 00	0 25	0 5	1	0 25	2	20	5	0
47	POWER SUPPLY INDUCTION COIL 2	RM109	00020081 00	0 25	0 5	1	0 25	2	20	5	0
48	SUB-STATION INDOOR 1500KVA	RM015	00020083 00	0	0	0	0	0	0	0	0

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Table D7 2/3

Building 444/7, NCPP 'Clean' Equipment to Stay
Option #3

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Oil (Gallons)
49	SUB-STATION INDOOR 1500KVA	RM015	00020199 00	0	0	0	0	0	0	0	0
50	TONGS RANGE 20"-34" 3 TON	RM205	00020206 00	0	0.25	0.25	0.25	0.75	15	5	0
51	SCALE TOLEDO 2300	RM202	00020214 00	0	0.25	0.25	0.25	0.75	15	5	0
52	SYSTEM VACUUM PUMPING	RM204	00020218 00	0	0.5	0.5	0.25	1.25	15	10	20
53	FORKLIFT TRUCK S/T DOWN ELEC	RM205	00020228 00	0.5	0.5	0.5	0.25	1.75	20	15	20
54	AIR CONDITIONING UNIT SELF-CONT	BLCNY	00020232 00	0	0.25	0.25	0.25	0.75	10	5	0
55	AIR CONDITIONING UNIT SELF-CONT INS OFFICE	RM202	00020233 00	0	0.25	0.25	0.25	0.75	10	5	
56	COIL HEATING INDUCTION	RM204	00020289 00	0	0.25	0.25	0.25	0.75	20	5	0
57	GRIPPER INGOT	RM201	00020294 00	0	0.25	0.25	0.25	0.75	10	5	0
58	GRIPPER INGOT	RM204	00020297 00	0	0.25	0.25	0.25	0.75	10	5	0
59	FURNACE VACUUM BRAZING	R109A	00020522 00	1	1	2	0.5	4.5	25	10	0
60	ANALYZER BERYLLIUM (THE BEAST)	RM014	00020621 00	0	0	0.25	0.25	0.5	10	5	0
61	MACHINE MILLING DOALL 200V VERTI	RM116	00020720 00	1	1	2	0.5	4.5	25	10	25
62	HOIST ELEC 2T**T-180	RM205	00020742 00	0	0.5	0.5	0.25	1.25	15	10	5
63	CRUSHER/SHREDDER 1000 LB/HR ARBO	RM204	00020746 00	1	1	1	0.25	3.25	25	10	30
64	ANALYZER BERYLLIUM #440		00021002 00	0	0.25	0.5	0.25	1	5	5	0
65	UNIT NORSAIRE EVAPORATIVE COOLIN	ROOF	00023216 00	0.5	0.5	1	0.25	2.25	25	10	0
66	FAN EXHAUST VENTILATION	ROOF	00023228 00	1	1	1	0.25	3.25	25	15	20
67	LIFT SCISSOR MARK SN 1284-10656		00024273 00	0.5	0.5	1	0.25	2.25	25	10	20
68	XFORMER 1500 KVA 3PH 60HZ DR PLT PWR		00028114 00	0	0	0	0	0	0	0	0
69	XFORMER 1500 KVA 3PH 60HZ DR PLT PWR		00028115 00	0	0	0	0	0	0	0	0
70	XFORMER 1500 KVA 3PH 60HZ DR PLT PWR	R015	00028116 00	0	0	0	0	0	0	0	0
71	DEGREASER ULTRASONIC VAPOR CDG1K PIPE SHP	MAINT	00035099 00	0	0.25	0.5	0.25	1	20	5	0
72	PUMP VAC MICROVAC STOKES 412	RM015	00038149 00	0	0.5	0.5	0.25	1.25	15	10	20
73	TANK S/S 48X84 450GAL	RM09A	00038461 00	0	0	0	0	0	0	0	0
74	TANK S/S 48X84 450GAL	RM09A	00038462 00	0	0	0	0	0	0	0	0
75	TANK S/S 48X84 450GAL	RM09A	00038494 00	0	0	0	0	0	0	0	0
76	DETECTOR LEAK (HE) VARIAN 936-66	RM06B	00039974 00	0.25	0.25	0.5	0.25	1.25	15	5	5
77	COLLECTOR TITANIUM DUST PTBL	2NDFL	00055132 00	0.5	0.5	0.5	0.25	1.75	20	10	0
78	XFORMER SIEMENS-ALLIS 1500 K PLT POWER	0	00085859 00	0	0	0	0	0	0	0	0
79	XFORMER SIEMENS-ALLIS 1500 K PLT POWER	0	00085860 00	0	0	0	0	0	0	0	0
80	FORKLIFT DATSUN ET-3000	RM410	00019888 00	0	0.25	0.25	0.25	0.75	20	10	20
81	READOUT DUAL CHANNEL FOR 1120	RM420	00020457 00	0	0	0	0.25	0.25	5	5	0
82	HOIST ELEC IT HAHN	RM403	00020729 00	0.25	0.25	0.25	0.25	1	5	10	5
83	TESTER TENSION COMPRESSION INSTR	RM420	00020757 00	0	0.25	0.25	0.25	0.75	5	5	5
84	SHREDDER INDUSTRIAL AZ-15	RM31B	00020764 00	0	0	0	0.25	0.25	0	5	0
85	HOIST TROLLEY 500	RM406B	00020767 00	0	0.25	0.25	0.25	0.75	5	10	5
86	CRANE MONORAIL	RM502	00020769 00	0.25	0.25	0.25	0.25	1	10	10	0
87	HOUSING HEPA FILTER BAG IN-OUT	RM406A	00020778 00	0	0.5	0	0.25	0.75	20	15	0
88	SCALE M2300 TOLEDO 500KG 30X30"		00020779 00	0	0	0.25	0.25	0.5	5	10	0
89	CLEANER ULTRASONIC WESTINGHOUSE	RM403	00028785 00	0	0	0.25	0.25	0.5	10	10	0
90	XFORMER 1000 KVA 3PH 60HZ DR PLT PWR		00028117 00	0	0	0	0	0	0	0	0
91	FURNACE MELTING ARC ELEC VAC	RM405	00034019 00	2	3	6	1	12	25	25	300
92	CRUSHER DRUM 55AR W/ COMPACTION	RM501	00034809 00	0.5	0.25	0.25	0.25	1.25	20	15	5
93	DETECTOR LEAK (HE) VARIAN 936-66S	HALL	00039972 00	0	0	0.25	0.25	0.5	5	5	5
94	CONTROLLER IONZN GAUGE G-P	RM407	00040652 00	0	0	0	0.25	0.25	0	5	0
95	XFORMER SQR D 1500/2000 K PLT PWR	447-2	00085689 00	0	0	0	0	0	0	0	0
96	COMPUTER DIGITAL DECMATE	0408B	00009420 00	0	0	0.25	0	0.25	0	5	0
97	PRINTER INTEGRAL DATA PRISM 800	RM420	00009421 00	0	0	0.25	0	0.25	0	5	0

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Table D7 3/3

Building 444/7, NCPP 'Clean' Equipment to Stay
Option #3

Number	Item Description	Coordinates Room & Column	Capital Equipment Number	Dismantle (Days)	Decontaminate (Days)	Reassemble and Test (Days)	Waste Package (Days)	Total (Days)	Primary Waste (Cubic Feet)	Secondary Waste (Cubic Feet)	Oil (Gallons)
98	COMPUTER MONITOR HP	RM414	00009422 00	0	0	0.25	0	0.25	0	5	0
99	PRINTER HP	0	00009423 00	0	0	0.25	0	0.25	0	5	0
100	KEYBOARD IBM	0	00009424 00	0	0	0.25	0	0.25	0	5	0
			Total	27.75	41.75	78.25	30.5	178.25	2307	768	1060

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Table D8

Labor requirements for Stage II Cleanup Operations - Options #1 and #3

Week No.	865	883	444/7 Option #1	444/7 Option #3	Total Option #1	Total Option #3	Lab.Hrs. Option #1	Lab.Hrs. Option #3	Hires Option #1	Hires Option #3
1	1	0	0	0	1	1	280	280	7	7
2	1	0	0	0	1	1	280	280	7	7
3	2	0	0	0	2	2	560	560	14	14
4	2	0	0	0	2	2	560	560	14	14
5	3	1	0	0	4	4	1120	1120	28	28
6	3	1	0	0	4	4	1120	1120	28	28
7	4	2	0	0	6	6	1680	1680	42	42
8	4	2	0	0	6	6	1680	1680	42	42
9	5	3	0	0	8	8	2240	2240	56	56
10	5	3	0	0	8	8	2240	2240	56	56
11	5	3	1	1	9	9	2520	2520	63	63
12	5	4	1	1	10	10	2800	2800	70	70
13	5	4	2	2	11	11	3080	3080	77	77
14	5	4	2	2	11	11	3080	3080	77	77
15	5	4	3	3	12	12	3360	3360	84	84
16	5	4	3	3	12	12	3360	3360	84	84
17	5	4	3	3	12	12	3360	3360	84	84
18	5	4	4	3	13	12	3640	3360	91	84
19	5	4	4	3	13	12	3640	3360	91	84
20	5	4	5	3	14	12	3920	3360	98	84
21	5	4	5	3	14	12	3920	3360	98	84
22	5	4	6	3	15	12	4200	3360	105	84
23	5	4	6	3	15	12	4200	3360	105	84
24	5	4	7	3	16	12	4480	3360	112	84
25	5	4	7	3	16	12	4480	3360	112	84
26	5	4	7	3	16	12	4480	3360	112	84
27	5	4	7	3	16	12	4480	3360	112	84
28	5	4	7	3	16	12	4480	3360	112	84
29	5	4	7	3	16	12	4480	3360	112	84
30	5	4	7	3	16	12	4480	3360	112	84
31	5	4	7	3	16	12	4480	3360	112	84
32	5	4	7	3	16	12	4480	3360	112	84
33	5	4	7	3	16	12	4480	3360	112	84
34	5	4	7	3	16	12	4480	3360	112	84
35	5	4	7	3	16	12	4480	3360	112	84
36	5	4	7	3	16	12	4480	3360	112	84
37	5	4	7	3	16	12	4480	3360	112	84
38	5	4	7	3	16	12	4480	3360	112	84
39	5	4	7	3	16	12	4480	3360	112	84
40	5	4	7	3	16	12	4480	3360	112	84
41	5	4	7	3	16	12	4480	3360	112	84
42	5	4	7	3	16	12	4480	3360	112	84
43	5	4	7	3	16	12	4480	3360	112	84
44	5	4	7	3	16	12	4480	3360	112	84
45	5	4	7	3	16	12	4480	3360	112	84
46	5	4	7	3	16	12	4480	3360	112	84
47	5	4	7	3	16	12	4480	3360	112	84
48	5	4	7	3	16	12	4480	3360	112	84
49	5	4	7	3	16	12	4480	3360	112	84
50	5	4	7	3	16	12	4480	3360	112	84

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Table D8 (continued)

Week No.	865	883	444/7 Option #1	444/7 Option #3	Total Option #1	Total Option #3	Lab.Hrs. Option #1	Lab.Hrs. Option #3	Hires Option #1	Hires Option #3
51	5	4	7	3	16	12	4480	3360	112	84
52	5	4	7	3	16	12	4480	3360	112	84
53	5	4	7	3	16	12	4480	3360	112	84
54	5	4	7	3	16	12	4480	3360	112	84
55	5	4	7	3	16	12	4480	3360	112	84
56	5	4	7	3	16	12	4480	3360	112	84
57	5	4	7	3	16	12	4480	3360	112	84
58	5	4	7	3	16	12	4480	3360	112	84
59	5	4	7	3	16	12	4480	3360	112	84
60	5	4	7	3	16	12	4480	3360	112	84
61	5	4	7	3	16	12	4480	3360	112	84
62	5	4	7	3	16	12	4480	3360	112	84
63	5	4	7	3	16	12	4480	3360	112	84
64	5	4	7	3	16	12	4480	3360	112	84
65	5	4	7	3	16	12	4480	3360	112	84
66	5	4	7	3	16	12	4480	3360	112	84
67	4	4	7	3	15	11	4200	3080	105	77
68	2	4	7	3	13	9	3640	2520	91	63
69	2	4	7	3	13	9	3640	2520	91	63
70	2	4	7	3	13	9	3640	2520	91	63
71	2	4	7	3	13	9	3640	2520	91	63
72	2	4	7	3	13	9	3640	2520	91	63
73	1	3	6	3	10	7	2800	1960	70	49
74	0	2	4	1	6	3	1680	840	42	21
75	0	2	4	1	6	3	1680	840	42	21
76	0	1	3	0	4	1	1120	280	28	7
77	0	0	3	0	3	0	840	0	21	0
78	0	0	1	0	1	0	280	0	7	0
79	0	0	0	0	0	0	0	0	0	0
80	0	0	0	0	0	0	0	0	0	0
81	0	0	0	0	0	0	0	0	0	0
82	0	0	0	0	0	0	0	0	0	0
83	0	0	0	0	0	0	0	0	0	0
						Totals	280280	217560		
						Hrs				

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OPTIONS #1 AND #3 DRAWINGS

D - 36	Building 444/7 Current Layout Showing Extent of Option #1
D - 37	Building 444/7 Current Layout Showing Extent of Option #3
D - 38	Building 444/7 Showing Final Layout for Option #1

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National Conversion Pilot Project
Stage I

Permitting Report
Revision 1
1 July 1994

Submitted to:
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By [illegible] U/NU
Date 12-6-94

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National Conversion Pilot Project
Stage I

Permitting Report

Revision 1
1 July 1994

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Approved by	for M.L. Haupt, BNFL Inc. PM	Date 7-1-94
Approved by	D.R. Floyd, MSC PM	Date 7/1/94
Approved by	E. Nix, DOE-RFFO	Date 10-14-94

This Report was prepared by Manufacturing Sciences Corporation under Cooperative Assistance Agreement No. DE-FC34-94RF00733 with the Department of Energy - Rocky Flats Office.

This Report is intended for DOE-RFO's use. Such use, duplication and disclosure of this Report is to be in accordance with Contract No. DE-FC34-94RF00733.

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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
0	27 May 94	All	All	First Approved Issue	
1	1 July 94	All	All	Incorporates DOE Comments	DR Floyd

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3.2

1.0 Introduction

The purpose of this Permitting Report is to identify which licenses and permits may need to be applied for prior to the commencement of Stage III operations, their relative costs, and the estimated time to submit the licenses and permits for use within the National Conversion Pilot Project (NCPP) buildings.

2.0 Assumptions

To provide this Permitting Report, the following set of assumptions were followed:

- Stage III of the NCPP will include operations very similar to those currently proposed.
- The private contractor applies for permits independently of the other operators at the plant site.
- Fees associated with permitting will be paid as scheduled in this Plan for each applicable permit type.
- The Stage II contractor will be able to transfer permits to a private operator who would assume NCPP Stage III operations to recover costs.

An illustration of the permits which may be required for Stage III operations has been provided below:

Table 2.0-1. Permits for Stage III Private Operations

Permit Type*	Permitting Agency	Description of Coverage under Permit
Source Material Permit 10 CFR 40 (CCR 1007-1)	Colorado Department of Health (Colorado is an NRC Agreement State). NRC Region V would have additional jurisdiction where CDH does not.	Successful application and implementation of this permit would allow the private contractor to use source materials in manufacturing processes (depleted uranium billets, etc.).
Byproduct Material Permit 10 CFR 30 (CCR 1007-X).	Colorado Department of Health (Colorado is an NRC Agreement State). NRC Region V would have additional jurisdiction where CDH does not.	Successful application and implementation of this permit would allow the private contractor to use byproduct materials in manufacturing processes (as defined in 10 CFR 30).
RCRA Permit	Colorado Department of Health Hazardous Materials and Waste Management Division	Allows generation, treatment, storage and disposal of wastes during permitted operations period (RCRA regulated).
Operating Permits for Air Emissions.	Colorado Department of Health Air Pollution Control Division Colorado Department of Health Air Quality Control Commission.	Allows limited discharge of air emissions for operations which have been specifically identified during the permitted operations period.
NPDES (National Pollutant Discharge Elimination System) Permit	EPA Region VIII, Water Management Division. CDH Water Quality Control Division.	Allows limited discharge of liquid wastes under agreed upon permitting conditions during the permitted operations period.

*Permits required will vary, depending upon the Stage III contractor's requirements.

3.0 Permitting Strategy and Associated Fee Schedules

3.1 Source Materials License

A Source Materials License issued by the State of Colorado will allow the Stage III contractor to use, store, and possess a limited quantity of depleted uranium metal for manufacturing processes. This license is approved by the State of Colorado and paid for by the Stage III Contractor. In the State of Colorado, there are three main categories of Source Material Licenses. Each of these categories differs by the intended processing and/or use of the source material.

3.1.1 Description of the Licensing process

A Source Materials permit is applied for in the State of Colorado through the Colorado Department of Health Radiation Control Division. This application is obtained from the Radiation Control Division along with the currently promulgated rules and regulations pertaining to radiation control within the State of Colorado. The prospective licensee then fills out the permit with necessary documentary evidence of its intended operations during Stage III. At the completion of the permit preparation and application, which demonstrates the ability of the private contractor to perform the work which it is to be permitted for, the application for the permit is submitted to the Radiation Control Division. The Radiation Control Division then reviews it to ensure that it adequately describes a credible licensing condition which would not adversely impact the health and welfare of the private contractor's workers, the public, or the environment. This review can vary in length of time to effect a full review.

After the Radiation Control Division reviews the license application it may find the application to be complete and issue an operating license, or it may find the application incomplete, in which case, the Radiation Control Division would request additional information to complete the application and review process. At the end of the license review cycle, the Radiation Control Division would either grant the license, or reject the application.

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3.1.2 Fee Schedule - State of Colorado. Category 2.C License

Table 3.1-1. State of Colorado Fees (Category 2.C License)

Description	Cost (July 1, 1993)
Application - New License	$850.00
Amendment	$480.00
Inspection - Routine	$860.00
Inspection - Non-routine	$1600.00
Estimated Initial Costs: Total	$3790.00

3.2 Byproduct Materials License

A Byproduct Materials License issued by the State of Colorado will allow the Stage III contractor to use, store, and possess a limited quantity of by-product materials for manufacturing processes. This license is approved by the State of Colorado and paid for by the Stage III Contractor. In the State of Colorado, there are seventeen main categories of Byproduct Material Licenses. Each of these categories differs by the intended processing and/or use and distribution of the byproduct material. The type of byproduct materials license required by the Stage III contractor may vary. For the purposes of this report, the type of Byproduct Materials License considered would be a license of broad scope to handle the recyclable materials of Stage III.

3.2.1 Description of Licensing Process

The steps outlined in Section 2.1.1 above apply to the licensing of byproduct materials for use, transfer or storage.

3.2.2 Fee Schedule - State of Colorado. Category 3.B License.

Table 3.2-1. State of Colorado Fees (Category 3.B License)

Description	Cost (July 1, 1993)
Application - New License	$1400.00
Amendment	$590.00
Inspection - Routine	$1100.00
Inspection - Non-routine	$2100.00
Estimated Initial Costs :Total	5190.00

3.3 Resource Conservation and Recovery Act (RCRA) Permit

A Resource Conservation and Recovery Act Permit is only necessary under certain circumstances. A RCRA Permit may not be necessary at all for the conduct of the NCPP. There are three sets of requirements under RCRA:

- The first set are Generator requirements, which, if properly met, do not require a permit. This would be under the conditions that time limits for storage of waste are met, that record keeping and manifest requirements are met, and that treatment, storage and disposal of the wastes occurs offsite.

- The second set are Treatment, Storage and Disposal Facility requirements, which do require a permit as well as corrective action requirements.

- The third set of requirements are for onsite storage (beyond Generator limits) where treatment or disposal is contemplated, a RCRA permit is necessary.

This permit, should it be required incorporates performance standards and other standards set forth in the Code of Federal Regulations regarding the treatment, storage and disposal of hazardous waste types.

3.3.1 Description of Permitting Process

If the need for a RCRA permit has been determined, it is applied for in the State of Colorado through the Colorado Department of Health Hazardous Materials and Waste Management Division. This application is obtained from the Division. Currently, Part A and Part B permit applications are required to get a RCRA permit. Permit modifications are made where there is an existing permit.

The Part A Application would identify the NCPP facility TSD units, waste types and descriptions of capacities for these units. The permittee would provide this information regarding its Stage III operations.

The Part B Application contains detailed information and conditions, which, when approved become the Operating Permit.

Once applications are submitted, these permit conditions, the facility management and estimated waste quantities are reviewed by the Hazardous Materials and Waste Management Division. These Permit provisions, once approved, provide for the measurement of regulatory compliance regarding the treatment, storage and disposal of RCRA regulated waste forms against approved permit conditions. Non-RCRA regulated wastes are not addressed by this permit.

For Stage II Cleanup operations and Stage III recycling operations, hazardous waste determinations and evaluations must be made to determine Generator requirements. Based upon these determinations, decisions would be made regarding storage, treatment and disposal needs and requirements including permitting for Stage II cleanup and Stage III recycling operations. The Stage II Waste Management Plan addresses this issue for Stage II and for Stage III, if it is determined that operations do constitute RCRA TSD activities, a permit would be required and an application would be generated.

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3.3.2 Fee Schedule - State of Colorado

Table 3.3-1. RCRA Permit Fee Schedule

Fee Description	Renewal period	When Payment is due	Amount
Annual Commission Fee	Annually	October 15 each year	$400.00*
Application Review Fee (ceiling fee)	On-going for review	At the time of request or acceptance of an application	$85.00/hour
Modification Fee for existing RCRA Permit	On a per-modification basis.	At the time of submittal of a modification.	Varies by Classification ceiling review† fee
Waste Fee	Annually	October 15 each year	$4.40/ton if kept on site according to fee schedule

* Noncommercial waste treatment is defined here as treatment of waste generated on site. A $600.00 fee applies when waste is brought on-site for treatment.
† The additional fee is intended to offset CDH expense in processing the modification.

3.4 Operating Permits for Air Emissions

Operating Permits for air emissions allow for the emission of different pollutants within the State of Colorado. Operating Permits can have a number of different components involved in them. Among the most vital of those is the Air Permit Emission Notice (APEN), which is an inventory form which identifies emission information for air pollution sources in the State of Colorado. In the case of the NCPP each emission point will be identified. Each emission point to the atmosphere must have its own APEN according to state and federal air quality laws, unless it is covered by an exemption. The APEN specifies the location at which the proposed emissions will occur, and provides a description of the facilities which will be emitting, and their processes. Revised APENs are issued each time a proposed change of emission levels is to occur. These APENs are provided with additional information which the Air Pollution Control Division require for evaluation of an Operating Permit. Additional permitting may also be required based upon whether emission sources will need modification to address current regulation. These permits to be generated may be in the form of Construction Permits, Prevention of Significant Deterioration (PSD) Permits, and any others which the Air Pollution Control Division deems necessary based on the scope of the Stage III operations.

3.4.1 Description of Process

Colorado Department of Health Air Pollution Control Division allows limited discharge of air emissions for operations which will be specifically identified during the permitted operations period of Stage III. Classically, APENs are applied for and described by their source, however, provisions exist for submission of group APENs. For the purposes of the NCPP, the air emission sources for Stage III operations have to be specifically identified so that the Stage III NCPP processes can be separated from the rest of Rocky Flats Plant operations which may be occurring concurrently. After these sources are identified, their estimated operational emissions are quantified and submitted as APENs. Generating APENs are an important portion of the complete permit application process. This information, along with additional information regarding the relevant plans of the

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NCPP, specifications, air quality data, and other information which the Air Pollution Control Division deems necessary to evaluate the application. For the purposes of the NCPP, National Emissions Standards for Hazardous Air Pollutants (NESHAPs) standards will apply to the emissions which occur during Stage III work since the types of pollutants generated during Stage III are regulated by the State of Colorado. The application for air permits in the state are approved by the Air Quality Control Division after review has occurred. Additional estimated emissions data is produced as documentation for Source Material Licenses and Byproduct Material Licenses.

3.4.2 Fee Schedule - State of Colorado

An applicant required to file an APEN is required to pay a non-refundable fee of $60.00 (Fee schedule of 1991). In addition to this fee, the Colorado Air Act requires that fees are established based upon the complexity and type of pollutants of the emitting source, the size of the emitting source, and the time required for the Air Quality Control Division to review the permit. As of 1991, the average annual fee for each source was not to exceed $110 with the maximum fee not to exceed $160 for each source. Also, no one facility with 10 or more sources is charged more then $110 / source. The fee schedule for 1994 has yet to be obtained from the State of Colorado. Therefore, once the fee schedule is obtained, this report will be updated to reflect that information.

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3.5 National Pollutant Discharge Elimination System (NPDES Permit)

A National Pollutant Discharge Elimination System (NPDES) Permit is a permit which allows the discharge of a carefully measured and monitored quantity of pollutants into waters of the State of Colorado. A permit is required whenever any discharge from a point source is going to occur. The duration of an NPDES permit is 5 years.

3.5.1 Description of Process

Should MSC in Stage II or the private contractor in Stage III choose to treat its liquid wastes, EPA Region VIII Water Management Division and the Colorado Department of Health Water Quality Control Division allow limited discharges of liquid wastes under agreed permitting conditions during a permitted operations period. The NPDES Permit is only independently applied for should the private contractor decide to do its own treatment. It may also be possible that the private contractor be considered a co-permittee under an existing permit. Specific information regarding the mode of the permitting process has been requested from the State, and this explanation will be expanded upon its receipt.

This permit application must be filed not less than 180 days prior to the date proposed for commencing the discharge. These applications must include facility descriptions, the proposed discharges, and a map and site diagram for the facility and discharge locations. These applications may also have to include plans, specifications and water quality data as the Water Quality Control Division may warrant. After application, this permit would be reviewed by the Water Quality Control Division, and either granted or denied based upon the determination of whether the discharge would result in pollution of the receiving waters in excess of that permitted by an applicable water quality standard, unless the permit contained effluent limitations and a schedule for compliance specifying treatment requirements. After a permit is granted, the permittee and the Water Quality Control Division have specific responsibilities for ensuring compliance with the permit and reporting.

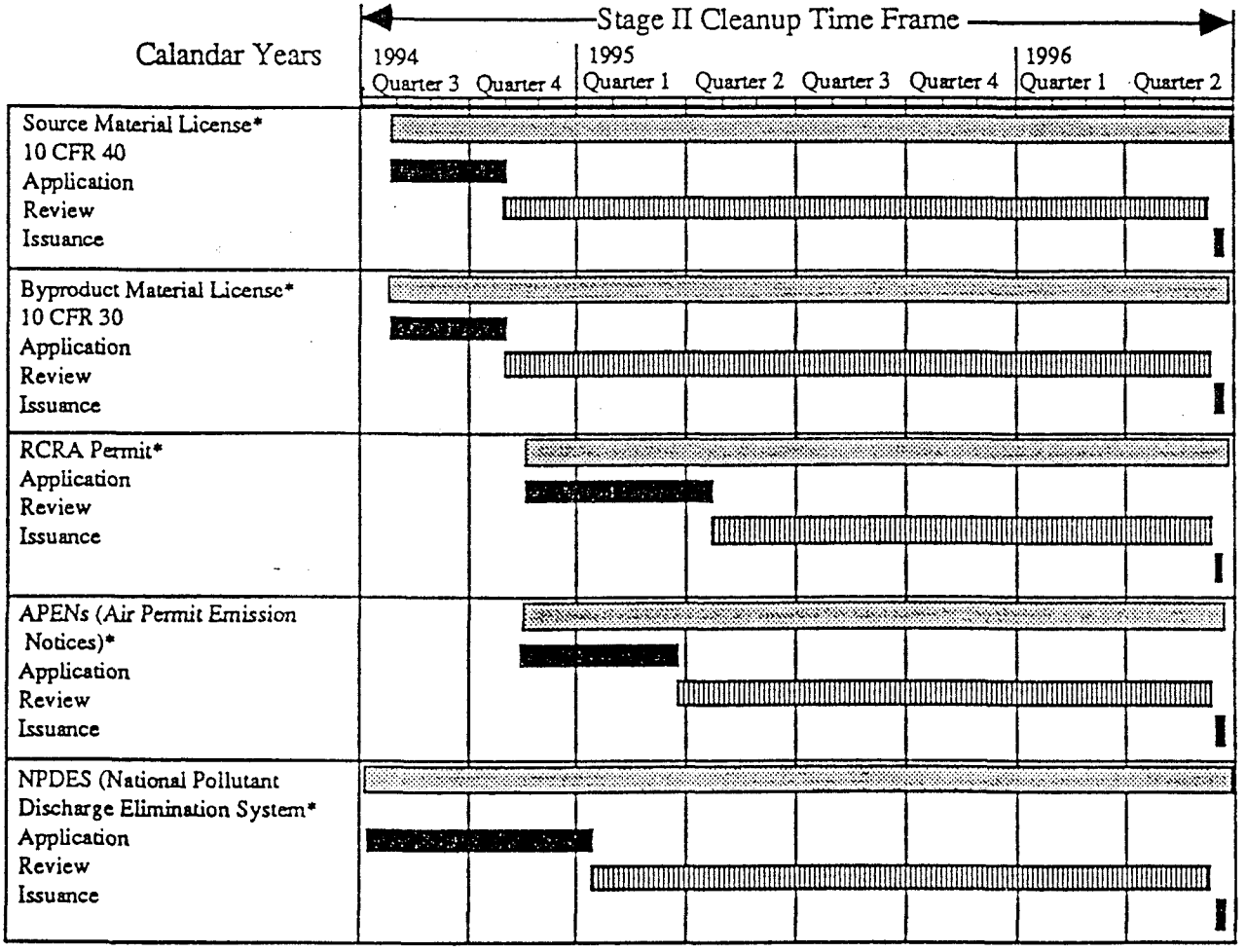
3.5.2 Fee Schedule - State of Colorado

Annual fees range from $84.00 - $11,605.00 depending upon the activity (Fee schedule of 1991). Specific Fee schedule information has been requested from the State of Colorado, but has not been received regarding this permit cost. When this information is obtained, this report will be revised to include it.

4.0 Permitting Schedule

A tentative permitting schedule has been developed to show the estimated amount of time required for each of the licensing and permitting activities which are considered. This schedule will in all likelihood be impacted by the extent of review times by the regulatory agencies, should they fully exercise their review extension options, as well as the ability of the private contractor to provide permit applications in a timely manner and answer/resolve questions/comments which are generated by the respective regulatory agencies.

Table 4.0-1. NCPP Stage II Permit Application Plan for MSC



* License and Permit Application times may vary in a way not described by this table.

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National Conversion Pilot Project
Stage I

Estimations of Stage II Waste in Support of the Rocky Flats Waste Management Plan

Revision 1
30 June 1994

Submitted to:

U.S. Department of Energy - Rocky Flats Office
P.O. Box 928
Golden, Colorado 80402-0928

Prepared by:

Manufacturing Sciences Corporation
804 Kerr Hollow Road
Oak Ridge, Tennessee 37830

Cooperative Assistance Agreement No:

DE-FC34-94RF00733

REVIEWED FOR CLASSIFICATION/UCNI
By B. M. Hoffman UCNI
Date 12-6-94

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National Conversion Pilot Project
Stage I

Estimations of Stage II Waste in Support of the Rocky Flats Waste Management Plan

Revision 1
30 June 1994

Prepared by:	G. G. Engelmann, BNFL Inc.	Date
Approved by:	M.L. Haupt, BNFL Inc. PM	6/30/94 Date
Approved by:	D.R. Floyd, MSC PM	6/30/94 Date
Approval by:	E. Nix, DOE-COR	7/29/94 Date

This Report was prepared by Manufacturing Sciences Corporation (MSC) under Cooperative Assistance Agreement No. DE-FC34-94RF00733 with the Depsrtment of Energy - Rocky Flats Office.

This Report is intended for DOE-RFO's use. Such use, duplication and disclosure of this Report is to be in accordance with Contract No. DE-FC34-94RF00733.

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Revision History

Rev	Date	Page	Para	Explanation	Approval Signature
1	30 June 94	11	Sec 5.2	Deleted first line in section 5.2	

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1.0 Introduction

The following waste estimations for the NCPP buildings (865, 883, and 444/447) are calculated based on data for Stage II cleanup in the Facility Cleanup Plan. Based on the technologies that are expected to be used for Stage II cleanup, the Primary and Secondary waste types and quantities have been estimated, and are presented in the tables that follow.

2.0 Purpose

The purpose of this report is to provide the best estimate possible at this time of the waste types and quantities expected to be generated during cleanup of buildings and equipment in Stage II of the NCPP. This data will be used to identify waste storage requirements and schedule disposal activities associated with Stage II. The data will also be used to support the preparation of the Rocky Flats Waste Management Plan.

3.0 Assumptions Necessary in Stage II

The following assumptions have been made in order to arrive at the estimations of waste to be generated during Stage II:

1. Stage II dismantling and decontamination will take place based on the requirements set by MSC estimations for Stage III metal recycling.
2. Low level waste is destined for disposal at the Nevada Test Site. Low level waste will be temporarily stored in the NCPP buildings. It is anticipated that additional storage space outside the four NCPP buildings may be needed during the first year of Stage II.
3. Presently there is no disposal site for low level mixed waste, but the possibility exists that in the near future mixed waste can be disposed of at Envirocare, Utah. Until then, the waste will be stored in accordance with the applicable regulations in the NCPP buildings.
4. The numbers are an estimation over a two year time frame and are subject to change.
5. Dismantling and decontamination efforts for building 444/447 are detailed in three versions. The selected option will be determined early in Stage II.

   Option # 1: Total Building

   Option # 2: Total Building minus Precision Shop, Heat Treat, NDT and Furnace Rooms

   Option # 3: Everything East of Column G
6. Size reduction of low level waste will take place during Stage II without additional permitting and licensing requirements. A Waste Analysis Plan will be required by CDH if low level mixed waste is crushed inside a tank or a container.
7. Secondary waste volume depends on the contamination level within the building and internal parts of equipment.
8. Excess chemicals and waste presently stored in the NCPP buildings are not included in the estimates.

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4.2 Building 883

Building 883	Waste Stream	Waste Type	Primary/Secondary (Volume %)	Estimated Volume ft^3
	Firebricks Graphite	LLW	Primary (25%)	3,545
	Stripout Waste	LLW	Primary (20%)	2,836
	Light Metal	LLW	Primary (35%)	4,963
	Combustible Waste	LLW	Secondary (80%)	1,272
	Other	LLW	Primary (4%)	567
	Waste Oil	LLW		307
	Circuit Boards/Scrap Metal	LLMW	Primary (25%)	1,418
	Combustible Waste	LLMW	Secondary (20%)	318
	Other	LLMW	Primary (6%)	851
Subtotal				16,077

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4.4 Building 444/447 (Option #2)

Building 444/447 Option 2	Waste Stream	Waste Type	Primary/Secondary (Volume %)	Estimated Volume ft^3
	Firebricks Graphite	LLW	Primary (30%)	12,231
	Stripout Waste	LLW	Primary (15%)	6,116
	Light Metal	LLW	Primary (20%)	8,155
	Combustible Waste	LLW	Secondary (70%)	3,821
	Other	LLW	Primary (4%)	1,632
	Waste Oil	LLW		931
	Circuit Boards/Scrap Metal	LLMW	Primary (25%)	10,193
	Combustible Waste	LLMW	Secondary (30%)	1,637
	Other	LLMW	Primary (6%)	2,446
Subtotal				47,162

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5.0 Conclusion

5.1 Baseline waste generation:

Total amount of waste estimated to be generated during Stage II without size/volume reduction:

Low level waste for all NCPP buildings:	40,230 (Option #3) - 57,533 (Option #1) ft^3
Low level mixed waste for all NCPP buildings:	9,332 (Option #3) - 21,262 (Option #1) ft^3

5.2 Size/volume reduction:

Total amount of waste estimated to be generated during Stage II with size/volume reduction:

Low level waste for all NCPP buildings:	11,766 (Option #3) - 13,014 (Option #1) ft^3
Low level mixed waste for all NCPP buildings:	2,972 (Option #3) - 4,295 (Option #1) ft^3

At this time there are a number of uncertainties associated with the waste volume. During Stage II, additional sampling will take place to more definitively determine the contamination. The waste types discussed in this report are not expected to change; however, as the Stage II work provides more definitive information on the levels of contamination in currently inaccessible areas, the quantities of waste may change from the numbers listed in this report. In the event that the quantities do change significantly, this report will be revised accordingly.

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National Conversion Pilot Project
Stage I

Stage II and Stage III NEPA Evaluations

Revision 2
28 July 1994

Submitted to:

U.S. Department of Energy - Rocky Flats Office
P.O. Box 928
Golden, Colorado 80402-0928

Prepared by:

Manufacturing Sciences Corporation
804 Kerr Hollow Road
Oak Ridge, Tennessee 37830

Cooperative Assistance Agreement No:

DE-FC34-94RF00733

REVIEWED FOR CLASSIFICATION/UCNI
By [illegible] U/NU
Date 12-6-94

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National Conversion Pilot Project
Stage I

Stage II and Stage III NEPA Evaluations

Revision 2
28 July 1994

Prepared by:	G. G. Engelmann, BNFL Inc.	7/28/94 Date
Approved by:	M.L. Haupt, BNFL Inc. PM	7/28/94 Date
Approved by:	D.R. Floyd, MSC PM	7/28/94 Date
Approval by:	E. Nix, DOE-COR	7/29/94 Date

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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
1	30 June 94	6	4	Signing of NEPA Policy	
1	30 June 94	7		Appendix A ADM for Stage III	
1	30 June 94	8		Appendix B Secretarial Policy on NEPA	
2	28 July 94	5 and 6		Revised NEPA requirements for Stage II	

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1.0 Introduction

The National Environmental Policy Act (NEPA) was established for Federal agencies to consider environmental consequences before the start of an action. MSC has proposed the implementation of the National Conversion Pilot Project (NCPP) which shall convert former defense production facilities to recycle DOE metals and reuse Federal facilities.

2.0 Purpose

The purpose of this NEPA evaluation report is to review and identify proposed NCPP Stage II and Stage III activities or decisions that may require NEPA actions.

3.0 Documents for the Stage II and Stage III NEPA Process

Described below are the two documents that are required to satisfy the proposed NCPP Stage II and the Stage III NEPA process.

3.1 Stage II Interim Measure/Interim Remedial Action (IM/IRA) - NEPA Values

The IM/IRA method under the Comprehensive Environmetal Response, Compensation, and Liability Act (CERCLA) involves proposing a plan for partially remediating a site or facility. A modified IM/IRA Proposed Plan for the NCPP addresses the identification of residual hazardous constituents in the NCPP buildings 865, 883, and 444/447, and presents remediation methodologies for bringing these facilities and related equipment to a standard of cleanliness that will allow the continued safe operations of the facilities.

Previously, every major DOE CERCLA action required an Environmental Assessment. An Action Description Memorandum (ADM) to initiate the NEPA process was submitted with that revision. On June 13,1994, the Secretary of Energy signed the policy concerning NEPA process improvements (Appendix A). The intent of the policy is to streamline the NEPA process consistent with the procedures of most other Federal agencies. Under the new policy, environmental objectives of NEPA will be incorporated as NEPA values in DOE CERCLA documents. For Stage II, the Proposed Action review and public involvement will be conducted solely under the CERCLA process. However, incorporated in this modified IM/IRA Proposed Plan will be applicable NEPA values, such as analyses of cumulative, air quality, transportation, and socioeconomic impacts and the no action alternative. Consequently, the ADM for Stage I is no longer required.

3.2 Stage III Action Description Memorandum (ADM)

The ADM is used as an aid for DOE to make a determination of the level of NEPA documentation required for a proposed action not exempted by DOE categorical exclusion (CX). The CX is a class of actions defined in DOE's NEPA regulations which do not individually or cumulatively have a significant effect on the environment. The NCPP is not

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expected to receive an exemption by CX, because the project is not a small-scope activity. In addition, the scope of the project does not meet the criteria defined by DOE's NEPA regulation. Based on the NEPA determination for Stage III of the NCPP, one of the following will apply for the proposed action:

1. Environmental Assessment (EA)

   The EA provides a multidisciplinary DOE review of the proposed action, describes the environmental impacts of the action, and identifies alternatives and mitigation measures of the action.

2. Environmental Impact Statement (EIS)

   The EIS is prepared in more detail than an EA and includes public participation. An EIS identifies alternatives to the proposed action, and provides a detailed assessment of the impact of each alternative on all aspects of the environment and human health.

The proposed ADM for Stage III is submitted with this document (Appendix B). The Stage III proposed action addresses the conduct of commercially permitted manufacturing on a DOE site and utilization of equipment and facilities otherwise left idle.

4.0 Conclusion

A NEPA evaluation for Stage II is no longer necessary since the DOE Secretarial Policy concerning NEPA process improvements was signed on June 13, 1994. This updated policy, indicates that DOE will rely on the CERCLA process for the review of actions to be taken under CERCLA. However, DOE will now require the incorporation of NEPA values in CERCLA actions.

The NEPA process for Stage III will be initially implemented with a submission of the attached ADM. The ADM will be used by DOE to make a determination of the NEPA documentation required for this proposed action.

The Stage III ADM will be the decision tool to determine the level of NEPA documentation required for Stage III. Concerning DOE's decision, additional documentation may be necessary, but the level of documentation cannot be identified at this time. It is thought currently, that an EA would fulfill NEPA compliance for Stage III. On the other hand, alternatives other than NEPA are being evaluated which include public and industrial involvement. A final decision regarding the level of NEPA documentation required for Stage III will be determined early in Stage II.

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Appendix A

SECRETARIAL POLICY

on the

National Environmental Policy Act

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To Mark / Jim	From John Morris
Co. BNEL	Co.
Dept.	Phone # 7198
Fax # 4587	Fax # 3679

National Environmental Policy Act

N
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SECRETARIAL POLICY on the NATIONAL ENVIRONMENTAL POLICY ACT

U.S. Department of Energy

June 1994

8/30/

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The Secretary of Energy
Washington, DC 20585

June 13, 1994

MEMORANDUM FOR SECRETARIAL OFFICERS AND HEADS OF FIELD ELEMENTS

FROM: HAZEL R. O'LEARY

SUBJECT: NATIONAL ENVIRONMENTAL POLICY ACT POLICY STATEMENT

Full compliance with the letter and spirit of the National Environmental Policy Act (NEPA), our national charter for protection of the environment, is an essential priority for the Department of Energy, consistent with our core values. We are fully committed to pursuing excellence in all areas of environment, safety, and health, including NEPA activities. The Department's openness initiative underscores the need for public access to information and involvement in our actions. The NEPA process is a valuable planning tool and an opportunity to improve the quality of the Department's decisions and build public trust.

An internal process improvement team and further analysis by the offices of the Assistant Secretary for Environment, Safety and Health and the General Counsel have shown that we must improve our NEPA process. We must approach NEPA as a team--ensuring quality and improving efficiency and thereby making NEPA work better and cost less. Accordingly, with the attached Policy Statement, I am directing a number of actions to streamline the NEPA process, minimize the cost and time for document preparation and review, emphasize teamwork, and make the process more useful to decision makers and the public. Importantly, the Policy Statement requires continuing evaluation of the outcomes of these reforms and allows for additional changes where necessary. I look forward to full participation within the Department, including our contractors, in implementing these important new policies.

ATTACHMENT

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SECRETARIAL POLICY STATEMENT

ON THE NATIONAL ENVIRONMENTAL POLICY ACT

The NEPA process is a valuable planning tool and provides an opportunity to improve the Department of Energy decisions and build public trust. Reviews of the Department's NEPA program have shown that the Department must change the way it conducts its business to avoid unnecessary delays and reap the full benefits of the NEPA process. The Department must conduct the process as a team effort to make NEPA work better and cost less. The following new policies will streamline the NEPA process, minimize the cost and time for document preparation and review, emphasize teamwork, and make the process more useful to decision makers and the public. Except where specifically indicated otherwise, these policies are immediately effective.

I. Delegations of Authority

A. To facilitate early integration of the NEPA process with project planning and decision making, reduce document review times, and foster ownership of NEPA documents, the Heads of Field Organizations listed in Attachment 1 will receive full authority for environmental assessments, findings of no significant impact, and associated floodplain and wetland action documentation requirements relating to their proposed actions. Under certain conditions, Heads of Field Organizations may redelegate these authorities to Heads of subsidiary Field Organizations. For actions not within the purview of a Field Organization, the Secretarial Officers listed in Attachment 1 will receive full authority for the preparation of such documents relating to their actions.

1. The Assistant Secretary for Environment, Safety and Health will grant this delegation upon receipt of a valid request. Heads of Field Organizations should redelegate such authorities to Heads of subsidiary Field Organizations upon receipt of a request. Requests for delegation should confirm that: (i) a NEPA Compliance Officer has been designated, (ii) internal scoping procedures and public participation and quality assurance plans have been prepared, and (iii), in the case of Field Organizations, adequate Department of Energy legal resources are available.

2. Secretarial Officers and Heads of Field Organizations should submit requests for delegation as soon as practicable; the Assistant Secretary for Environment, Safety and Health will delegate authorities within two weeks of receiving a valid request. Each Secretarial Officer and Head of a Field Organization listed in Attachment 1 is required to submit a valid request no later than December 15, 1994, so that the delegation process can be completed by December 31, 1994.

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B. To reduce document review times and foster ownership of NEPA documents, Secretarial Officers will approve implementation plans for environmental impact statements for their respective proposed actions, after soliciting comments from the Office of Environment, Safety and Health, in consultation with the Office of the General Counsel. Preparers are reminded that implementation plans are intended to be brief (normally about 20 pages) and to simply establish a road map for the environmental review to follow.

C. Each Secretarial Officer and Head of a Field Organization will submit an annual NEPA planning summary to the Assistant Secretary for Environment, Safety and Health by January 31 of each year and will make the summaries available to the public.

1. The annual NEPA planning summaries will describe briefly the status of ongoing NEPA compliance activities and any environmental assessments expected to be required in the next 12 months or environmental impact statements expected to be required in the next 24 months and, if available, the schedule for completion of each NEPA review identified (see Attachment 2).

2. Every three years starting with the first year, Field Organizations will include in the annual NEPA planning summary an evaluation of whether a site-wide environmental impact statement would facilitate future NEPA compliance efforts.

3. The Office of Environment, Safety and Health will review the summaries in consultation with the Office of General Counsel and comment as appropriate.

D. To maintain the quality of NEPA reviews, the Office of Environment, Safety and Health will provide additional guidance and training to Secretarial Offices and Field Organizations on matters such as the following:

1. Preparation of adequate statements of work to effectively direct the efforts of NEPA contractors;

2. Improving public participation in the NEPA process (to be provided with the assistance of the Public Affairs Office); and

3. Application of the Office of Environment, Safety and Health's "Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements."

E. The Assistant Secretary for Environment, Safety and Health is authorized to direct a Secretarial Officer or Head of a Field Organization to prepare an environmental assessment or environmental impact statement.

F. Where multiple Field Organizations or Program Offices would be involved in a proposed action for which an environmental assessment is to be prepared, all involved Offices should consult regarding the assignment of

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responsibility for preparing and approving the environmental assessment. The Assistant Secretary for Environment, Safety and Health will resolve NEPA issues where several Offices are unable to reach agreement.

II. Process Changes

A. The NEPA process should be a team effort. To establish team leadership and ownership of the NEPA process and thereby improve its management, the cognizant Secretarial Officer or Head of a Field Organization will designate a Department of Energy member of the team working on any project requiring NEPA review as the NEPA Document Manager, to manage the document preparation process and keep it on schedule. Among the responsibilities of the NEPA Document Manager are to:

1. Consider innovative measures to reduce NEPA process time;

2. Consider requesting variances from Department of Energy NEPA regulations (10 CFR Part 1021) as necessary to meet timing requirements or for other reasons that are permitted under section 1021.343 of the regulations; and

3. Elevate internal disputes for prompt decision.

The Project Manager or NEPA Compliance Officer may serve this function as appropriate; in any case, the NEPA Document Manager should work closely with these other individuals.

B. To expedite approval of innovative procedures, where appropriate, the Assistant Secretary for Environment, Safety and Health is delegated authority to grant variances from provisions of Department of Energy NEPA regulations, as provided in 10 CFR 1021.343.

C. The NEPA Document Manager will conduct an early internal scoping process for the environmental assessment or environmental impact statement being prepared. The scoping process should involve a team representing all necessary departmental elements. For an environmental impact statement, this internal scoping process should precede the public scoping process that begins with publication of a notice of intent.

1. The internal scoping process will include the adoption of a proposed schedule for the preparation of the NEPA document and a public participation plan tailored to the project in question.

2. For each environmental impact statement, the schedule established during the internal scoping process will, absent extraordinary circumstances, provide for completion of a final environmental impact statement within 15 months of the issuance of the Notice of Intent.

3. The NEPA Document Manager will maintain a tracking system to monitor compliance with the schedule. The annual NEPA planning summaries

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will identify NEPA reviews that are behind schedule and the reasons for any delays.

D. To eliminate multiple cycles of revisions, internal reviews of draft environmental assessments and environmental impact statements will be concurrent, rather than sequential.

1. As a general matter, documents will be revised only after all reviewing offices have submitted their comments and agreement has been reached as to what changes are necessary.

2. Absent extraordinary circumstances, any subsequent reviews that may occur will be limited to addressing any new material, confirming that previous comments have been adequately addressed, and obtaining management-level concurrence.

E. To facilitate meeting the environmental objectives of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and respond to concerns of regulators, consistent with the procedures of most other Federal agencies, the Department of Energy hereafter will rely on the CERCLA process for review of actions to be taken under CERCLA and will address NEPA values and public involvement procedures as provided below.

1. NEPA reviews will be undertaken for siting, construction, and operation of treatment, storage, and disposal facilities that, in addition to supporting CERCLA actions, also serve waste management or other purposes.

2. Department of Energy CERCLA documents will incorporate NEPA values, such as analysis of cumulative, off-site, ecological, and socioeconomic impacts, to the extent practicable.

3. The Department of Energy will take steps to ensure opportunities for early public involvement in the CERCLA process and will make CERCLA documents available to the public as early as possible.

4. Notwithstanding the above, the Department of Energy may choose, after consultation with stakeholders and as a matter of policy, to integrate the NEPA and CERCLA processes for specific proposed actions.

5. For proposed corrective actions under the Resource Conservation and Recovery Act at sites that are listed on the National Priorities List under CERCLA, project managers should consult with the Environmental Management NEPA Compliance Officer, who will involve the Offices of Environment, Safety and Health and General Counsel as necessary to make determinations about how to proceed under NEPA.

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III. NEPA Contract Reform

A. All future contracts for the preparation of environmental assessments and environmental impact statements will contain incentives to encourage superior performance in document quality and timeliness.

B. To improve the quality and timeliness of documents, all contractors preparing NEPA documents will be subject to performance appraisals.

1. Procurement solicitations will include an evaluation criterion for the bidder's past performance of comparable assignments. Measures will include any existing evaluations of NEPA support performance.

2. At the conclusion of the preparation of each environmental assessment and environmental impact statement, the NEPA Document Manager will evaluate the contractor's performance for timeliness, quality, cost-effectiveness, responsiveness, and application of the Office of Environment, Safety and Health's "Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements." The evaluations will be provided to the contractor with an opportunity for rebuttal and made available to Secretarial Offices and Field Organizations for consideration in assigning future work to a contractor.

3. Management and Operating Contractors and National Laboratories will be subject to the same NEPA evaluation process as other contractors.

C. Consistent with the contract reform effort that is underway Department-wide, a quality improvement team comprised of Headquarters and Field project, procurement, NEPA, and legal personnel will be formed to develop innovative contracting mechanisms and incentives suited particularly to NEPA document preparation contracts. The quality improvement team will develop recommendations on the most effective use of different contracting mechanisms, such as fixed price contracts, award fees, indefinite quantity/indefinite delivery contracts, and task order contracts. The team also will recommend specific methods of evaluating a potential contractor's past performance. Finally, the team should consider proposing Department of Energy organizations to participate in pilot projects to test contracting mechanisms and methods of evaluation and to monitor performance of the resulting contracts through appropriate metrics. The team will report its findings and recommendations no later than October 1, 1994.

IV. Additional Reforms for High Priority Projects

A. Department of Energy personnel rather than contractors will be used, to the maximum extent practicable, to prepare environmental assessments and environmental impact statements that have short preparation time requirements or present unusually controversial or sensitive issues.

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Where resource limitations do not permit Department of Energy personnel to carry out the entire task, contractors might be used for limited analytical or drafting assignments.

B. When necessary or helpful in meeting important departmental objectives, the NEPA Document Manager may form a special team, comprised of relevant Field Organization and Secretarial Office personnel and representatives from the Offices of Environment, Safety and Health and General Counsel, to carry out the NEPA process from start to finish. This will ensure that all relevant programmatic, policy, and legal considerations are taken into account from the beginning and that the only necessary review function is obtaining senior management approval.

C. The NEPA Document Manager is encouraged to consider whether a specific project offers opportunities for innovation in the NEPA process. For example:

1. Using a toll-free number for submission of comments in order to reduce the number of public scoping meetings.

2. Providing the NEPA document on-line as an option for interested parties to provide comments.

D. The cognizant Secretarial Officer and the Assistant Secretary for Environment, Safety and Health will consult to determine whether delegation of approval authority for a specific environmental impact statement to the Secretarial Officer or the Head of a Field Organization would be appropriate to expedite the review and approval process.

V. Enhanced Public Involvement

A. NEPA Document Managers will take appropriate action to encourage and facilitate public participation throughout the NEPA process, taking into account Office of Environment, Safety and Health guidance on improving public participation.

B. Whenever possible, the Department of Energy will provide enhanced opportunities for public involvement in the environmental assessment process, which ordinarily will include at a minimum:

1. Early public notice of the Department of Energy's intent to prepare an environmental assessment (concurrent with state/tribal notification); and

2. Opportunity for interested parties, on request, to review environmental assessments (concurrent with state/tribal review) prior to Department of Energy approval.

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VI. Continuing Improvement

A. One year from now a quality improvement team will be formed to measure the outcome of the NEPA initiatives put forth in this policy statement and to consider what additional reforms are necessary; this team will report its findings and recommendations within 90 days of its formation.

B. The Office of Environment, Safety and Health will solicit comments from the NEPA Document Manager, the NEPA Compliance Officer, and team members after completing each environmental impact statement and environmental assessment on lessons learned in the process and will circulate a quarterly summary to all NEPA Compliance Officers and NEPA Document Managers. The Office of Environment, Safety and Health also will revise its "Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements", as appropriate, to reflect the lessons learned and will improve Department-wide NEPA policy, directives, guidance, and training accordingly.

C. The Office of Environment, Safety and Health will provide NEPA training in order to develop a more knowledgeable and experienced group of Headquarters and Field personnel capable of carrying out NEPA compliance activities.

D. The Office of Environment, Safety and Health will consider establishing a NEPA certification program to formally recognize the expertise of personnel who have achieved a specified combination of training and practical experience.

E. The Office of Environment, Safety and Health and the Office of General Counsel will monitor the progress of and advise the Secretary on the Department's NEPA compliance program. Metrics will include the cost and time required for NEPA document preparation, the influence of NEPA review on decision making, the evaluations of contractor performance, Environmental Protection Agency ratings of Department of Energy environmental impact statements, public reactions, and litigation experience. Within two years, Secretarial Offices and Field Organizations, with assistance from the Offices of Environment, Safety and Health and General Counsel, will reduce the median process time for environmental impact statements (from notice of intent to final environmental impact statement) to 15 months with no decline in quality. Meeting this objective will, of course, require adjustments to the schedules for environmental impact statements now in preparation.

F. In carrying out and improving their NEPA compliance process, Heads of Departmental Elements should make effective use of NEPA Compliance Officers for advice, assistance, training, and coordination.

* * * * * *

This policy statement establishes internal management procedures and, as such, must be followed by Department of Energy personnel. It is not intended to create rights or obligations or any cause of action on the part of any other person.

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ATTACHMENT 1

SECRETARIAL OFFICERS *

Assistant Secretaries:
- Defense Programs
- Energy Efficiency and Renewable Energy
- Environmental Management
- Fossil Energy
- Field Management (Associate Deputy Secretary)

Directors:
- Civilian Radioactive Waste Management
- Energy Research
- Laboratory Management
- Nonproliferation and National Security
- Nuclear Energy

Administrators:
- Bonneville Power Administration
- Western Power Administration
- Alaska Power Administration
- Southeastern Power Administration
- Southwestern Power Administration

HEADS OF FIELD ORGANIZATIONS *

Operations Office Managers:
- Albuquerque, Chicago, Idaho, Nevada, Oakland, Oak Ridge, Richland, and Savannah River Operations Offices

Managers:
- Golden Field, Ohio Field, and Rocky Flats Offices

Directors:
- Morgantown Energy Technology Center
- Pittsburgh Energy Technology Center
- Bartlesville Project Office
- Metairie Site Office
- Naval Petroleum and Oil Shale Reserves (in Colorado, Utah, and Wyoming)
- Naval Petroleum Reserves in California
- Yucca Mountain Project Office

Project Manager of Strategic Petroleum Reserve Project Office

* For purposes of applying this policy: Secretarial Officers are heads of departmental elements that report to the Office of the Secretary. Heads of Field Organizations are heads of field departmental elements that report to a Secretarial Officer (or, in the case of Bartlesville Project Office, Metairie Site Office, Naval Petroleum and Oil Shale Reserves, Naval Petroleum Reserves, and the Strategic Petroleum Reserve Project Office, to a Deputy Assistant Secretary). The above list excludes Secretarial Officers and Heads of Field Organizations that generally do not sponsor proposed actions that are subject to NEPA review.

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ATTACHMENT 2

ILLUSTRATION OF CONTENT OF ANNUAL NEPA PLANNING SUMMARY FOR AN ENVIRONMENTAL IMPACT STATEMENT OR ENVIRONMENTAL ASSESSMENT

ENVIRONMENTAL IMPACT STATEMENTS:

Appleton Windplant and Wind Farms, Appleton County, Washington

Description: The proposed action would include placement and operation of an estimated 420 wind turbines, collection lines, transmission lines, access roads, turbines and transformer pads, and various other associated facilities. These wind energy projects are proposed for development in Stayman County (Central Washington).

Schedule:
NOI: April 1994
Public Scoping Meetings: May 1994
Implementation Plan: July 1994
Draft EIS: December 1994
Final EIS: June 1995
ROD: July 1995

ENVIRONMENTAL ASSESSMENTS:

Wastewater Flow Collection and Treatment System, Mississippi River Plant, Jackson, Mississippi

Description: To construct and operate a collection and treatment system for contaminated wastewaters and groundwaters at the Department of Energy-operated Mississippi River Plant. The system would consist of collection conduits, a flow splitter box, an equalization basin, sedimentation basins, sludge handling and storage facilities, and associated chemical storage and feed equipment.

Schedule: No schedule yet set. In preliminary stages of consideration.

Note: Schedule information should be provided to the extent available.

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Appendix B

Action Description Memorandum

NATIONAL CONVERSION PILOT PROJECT STAGE III

PROPOSED ACTION

The Proposed Action is to allow a commercial operator to conduct commercially permitted manufacturing operations on a Department of Energy site. Commercially permitted manufacturing operations will be performed within the boundaries of permits obtained from the CDH and EPA as they are appropriate.

NEED FOR THE ACTION

Buildings 865, 883, 444, and 447 have been identified as buildings on the site which do not have a continued production mission within Department of Energy site operations. Consequently, they have been approved for an economic conversion project which will utilize equipment and facilities which have been cleaned up to make commercial items while protecting workers, the public, and the environment. This project will also eventually employ a number of otherwise displaced Rocky Flats Plant workers. The allowance of commercial manufacturing operations in these buildings is intended to create economic opportunities and benefits not practically achievable by allowing these facilities to sit idle until their currently scheduled final action of decontamination and decommissioning. Additionally, the cost for disposing of waste generated during final decontamination and decommissioning will be saved. The cost of routine maintenance and surveillance for the facilities during Stage III operations are to be absorbed eventually by the commercial operator. These costs would otherwise be borne by the general public if the buildings were not reused.

LOCATION OF THE ACTION

The Rocky Flats Plant is located in northern Jefferson County, approximately 16 miles northwest of Denver, Colorado. The proposed action is located within buildings 865, 883, 444, and 447 along with associated structures providing utility support to the buildings. These buildings are located in the south and southeast areas of the plant.

POTENTIAL ENVIRONMENTAL ISSUES

Commercial operations within the National Conversion Pilot Project buildings would not impact the environment in any way not previously described for plant manufacturing operations. The operations which would occur would be performed with similar feed stocks to operations which occurred during the NCPP buildings historical DOE mission. The private operator would be responsible for waste it generated during its commercial operations. The waste responsibility will be defined in operational permits by the private contractor and the applicable agencies, namely CDH, DOE, and EPA.

National Conversion Pilot Project
Stage I

Regulatory Oversight Plan

Revision 0
17 June 1994

Submitted to:
U.S. Department of Energy - Rocky Flats Office
P.O. Box 928
Golden, Colorado 80402-0928

Prepared by:

Manufacturing Sciences Corporation
804 Kerr Hollow Road
Oak Ridge, Tennessee 37830

Cooperative Assistance Agreement No:

DE-FC34-94RF00733

REVIEWED FOR CLASSIFICATION/UCNI
By B. M. Hoffman UCNI
Date 12-6-94

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National Conversion Pilot Project
Stage I

Regulatory Oversight Plan

Revision 0
17 June 1994

Prepared by	M.S. Colalancia, BNFL Inc. EH&S	Date 6/17/94
Approved by	M.L. Haupt, BNFL Inc. PM	Date 6/17/94
Approved by	D.R. Floyd, MSC PM	Date 6/17/94
Approved by	~~M.E. Anderson~~, DOE-COR D. Elaine Nix	Date 8/8/94

This Report was prepared by Manufacturing Sciences Corporation under Cooperative Assistance Agreement No. DE-FC34-94RF00733 with the Department of Energy - Rocky Flats Office.

This Report is intended for DOE-RFO's use. Such use, duplication and disclosure of this Report is to be in accordance with Contract No. DE-FC34-94RF00733.

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Revision History

Rev.	Date	Page	Para	Explanation	Approval Signature
0	17 June 94	All	All	First Approved Issue	DR Lloyd 6/17/94

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1.0 Introduction

The National Conversion Pilot Project (NCPP) at Rocky Flats Plant involves personnel from the Colorado Department of Health (CDH), the Department of Energy, Rocky Flats Field Office (DOE-RFFO), the U.S. Environmental Protection Agency, Region VIII (U.S. EPA Region VIII), and Manufacturing Sciences Corporation (MSC), the prime contractor of the NCPP.

The purpose of the NCPP Regulatory Oversight Plan is to identify the regulatory authorities, the relative responsibilities of each regulatory participant, and the strategy used for establishing regulatory linkages, including required agreement documents. This plan will allow all appropriate regulatory participants to have the opportunity to review and evaluate ongoing cleanup activities during Stage II of the NCPP. Also, they can provide assistance for the conduct of this work through the processes of reviewing documentation and/or providing useful and reasonable recommendations. MSC will provide senior management oversight during all activities of this project. Specific activities of the Stage II effort will be evaluated on a case-by-case basis to ensure that work which may contradict compliance efforts are not allowed.

2.0 Assumption

A number of assumptions are necessary for the conduct of the work during Stage II of the NCPP . These assumptions, as they apply to the Regulatory Oversight Plan, are the following:

- The communication mechanism used during Stage II to resolve jurisdictional conflicts will be provided by the NCPP Steering Committee.
- Open communication will be encouraged during the entirety of the Stage II activity. Information will continue to be exchanged as it becomes available on a timely basis between those parties having regulatory responsibilities.
- CDH, EPA and DOE-RFFO will give priority to the conduct of Stage II activities when regulatory guidance is requested from these participants without undue delay.
- All regulatory oversight participants have been funded to support this activity.
- Regulatory oversight will be provided within the boundary of the National Conversion Pilot Project IM/IRA. Additional requirements which may develop, applicable to the conduct of the NCPP, will be discussed and agreed upon by each of the regulatory guidance participants and MSC prior to implementation within the NCPP.

These assumptions are key to the Regulatory Oversight Plan. Additional assumptions regarding the NCPP activities can be found in the IM/IRA Proposed Plan.

3.0 Stage II Regulatory Framework

The utilization of the Interim Measure/Interim Removal Action (IM/IRA) process for NCPP has been agreed by DOE-RFFO, the U.S. EPA, Region VIII and the CDH. These government agencies will be responsible for regulatory oversight for the NCPP Stage II cleanup activities.

3.1 The Colorado Department of Health (CDH)

The CDH is a stakeholder and has been involved in the NCPP through its inception and planning stage. It is the responsibility of the CDH to protect the environment and ensure the health and safety of workers and the public by collecting health and environmental data, developing plans to

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address health problems, managing and enforcing state and some federal regulatory programs, investigating complaints and responding to emergencies throughout the entire NCPP. The CDH will assist with RFP site investigation and develop recommendations where none are currently existent for protection of public health and the environment.

During the NCPP Stage II, the CDH will review and evaluate ongoing cleanup activities. Additionally, the CDH can provide additional assistance for the conduct of this work through the processes of reviewing documentation and/or providing recommendations. The CDH is a regulatory oversight team member and provides independent assurance of MSC cleanup performance. The CDH will provide independent assurance of MSC cleanup performance.

3.2 U. S. Department of Energy (DOE)

In accordance with requirements proposed in the pending FY 1994 National Defense Authorization Act, the DOE proposes to proceed with a pilot economic conversion program at the RFP to accelerate waste minimization through recycling, evaluate the feasibility of converting former non-nuclear production facilities on a Superfund site to alternate economic uses, and employ weapons complex surplus workers. DOE is also the owner of the RFP. During Stage II, DOE is responsible for conducting all scheduled Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) actions and will maintain its scheduled commitments under the existing provisions of the Interagency Agreement (IAG) and other regulatory requirements.

In addition, under CERCLA, DOE is responsible for the execution of the NCPP IM/IRA and the performance of the prime contractor MSC.

3.3 U.S. EPA, Region VIII, Region VIII

The US EPA Region VIII is a stakeholder and has been involved in the NCPP through its inception and planning stage. It is the responsibility of the EPA to protect the environment, and ensure the health and safety of workers and the public in addition to the plants and animals surrounding the Rocky Flats Plant. To meet this enormous responsibility, the EPA has been given by the Congress enforcement capability for violations of environmental laws and statutes. During the NCPP Stage II, the EPA will review and evaluate the ongoing cleanup activities. Additionally, the EPA can provide additional assistance for the conduct of this work through the processes of reviewing documentation and/or providing recommendations. The EPA is a regulatory oversight team member and provide independent assurance of MSC cleanup performance.

4.0 MSC Management Support

In Stage II, MSC will be performing the cleanup activities under the NCPP IM/IRA. Under the Cooperative Agreement, MSC is responsible for complying with all appropriate regulatory orders, laws and regulatory agreements, procedures, policies, etc. MSC is also responsible for the performance of its subcontractors.

During the initial phases of Stage II, MSC will be required to follow all appropriate regulations and DOE Orders. However, the use of these orders will be gradually reduced over the conduct of Stage II work in a manner acceptable to all regulators so that the acceptable requirements will be based on Colorado State statutes and regulations as well as federal statutes and regulations which apply to private commercial business entities.

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5.0 Applicable Laws and Regulations

All Stage II cleanup activities will be regulated under the NCPP IM/IRA under CERCLA, and are also subject to the terms of the Cooperative Agreement between MSC and DOE.

The cleanup activities will comply with the following codified regulations as a minimum :

- 10 CFR 20 Standards for Protection Against Radiation
- 29 CFR 1910 Occupational Safety and Health Standards
- 40 CFR 61 National Emission Standards for Hazardous Air Pollutants
- 40 CFR 110 Radioactive Waste Environmental
- 40 CFR 191 Hazardous Waste Environmental
- 40 CFR 260 Hazardous Waste Management System - General
- 40 CFR 761 Toxic Substances Control Act

Additionally, DOE Orders will apply to the initial conduct of Stage II activities with the understanding that they will be eventually phased out and replaced with codified regulatory guidance and direct oversight by the responsible regulatory agencies in the State of Colorado under the Colorado Code of Regulations.

6.0 Regulatory Interactions

6.1 CDH Responsibilities

In Stage II of the NCPP, CDH will play an active role in the regulatory oversight of the project. CDH responsibilities include providing assistance in formulating guidance for regulatory compliance in the unlikely circumstance that clear guidance does not exist. Another responsibility would include providing assistance formulating guidance for regulatory transition activities occurring during Stage II. CDH also has the role of an enforcement agency regarding the safe and healthful conduct of NCPP work activities.

6.2 DOE Responsibilities

In Stage II of the NCPP, DOE has regulatory responsibility for the conduct of MSC actions performed during execution of the IM/IRA. DOE will interact openly with CDH and U.S. EPA, Region VIII and MSC to resolve regulatory oversight issues which may be identified during Stage II. DOE will fulfill an active role during the regulatory transition period, to ensure that DOE Orders, which will be systematically converted to Stage III operations, have been appropriately addressed within the codified regulatory scheme applicable to private business sector.

6.3 U.S. EPA, Region VIII

In Stage II of the NCPP, U.S. EPA, Region VIII will play an active role in the regulatory oversight of the project. In this respect, U.S. EPA, Region VIII responsibilities include formulating guidance for regulatory compliance regarding environmentally related questions which may be generated during the conduct of Stage II activities. This will take place within the bounds of the IM/IRA in the unlikely circumstance that clear guidance does not exist. Another responsibility would include providing assistance formulating guidance for regulatory transition activities occurring during Stage II. U.S. EPA, Region VIII would also provide information for rules which may have an impact on the NCPP activities. U.S. EPA, Region VIII also has enforcement authority for actions which may negatively impact the environment, and consequently the health and safety of NCPP workers and the public.

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6.4 MSC Responsibilities

In Stage II of the NCPP, MSC is the prime contractor for the DOE. Therefore, MSC has regulatory responsibility for the conduct of its actions at the Rocky Flats Plant site, as has been described in the Cooperative Assistance Agreement. MSC will implement regulatory oversight recommendations which have been agreed upon by MSC and the other regulatory participants. MSC will actively pursue additional guidance that may be useful for the conduct of this work. MSC will fulfill an active role in demonstrating to DOE, CDH and EPA that the requirements of DOE Orders used early in Stage II have codified regulatory analogs used in the private business sector later in Stage II.

6.5 Specific Divisional and Management Elements

6.5.1 CDH Divisional Elements

Within each of the above described agencies, specific divisional and management elements will be involved during the Stage II activities. This involvement has been summarized in Table 6.5-1. In this table, specific divisional elements of CDH, namely Air Pollution Control Division, Radiation Control Division, and Hazardous Materials and Waste Management Division would be involved in various aspects of the following activities: training, regulatory compliance, environment, health and safety, engineering and maintenance, and decontamination. These activities have been defined by the Stage II Work Breakdown Structure (WBS).

6.5.2 DOE-RFFO Management Elements

In the DOE-RFFO, specific management elements would be involved with Stage II activities. This involvement has been summarized in Table 6.5-1. In the table, specific management elements involved include Environmental Restoration Management, Low Level Waste Management, and Occupational Safety and Health Management. These specific management elements would be involved in the various aspects of training, regulatory compliance, environment, health and safety, engineering and maintenance, and decontamination. These activities are further defined by the Stage II WBS.

6.5.3 U.S. EPA Region VIII Divisional Elements

U.S. EPA Region VIII divisional elements would be involved in the same aspects of Stage II work activities. These divisional elements are the Air Radiation and Toxics Division, Hazardous Waste Management Division, and the Water Management Division. The definition of work has been provided in the Stage II WBS.

6.5.4 MSC Management Elements

To aid in the regulatory oversight of the NCPP Stage II work, the specific management elements involved would be the management team consisting of the MSC and BNFL Inc. Project Managers, the MSC Deputy Project Manager, the Quality Assurance Manager, and the managers who would be providing the full scope of NCPP Stage II services identified in Table 6.5-1 by WBS description.

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Table 6.5-1. Proposed Responsibilities

Stage II WBS Number	1.2.1	1.2.2	1.2.3	1.2.4	1.2.5
WBS Description	Training	Regulatory Compliance	Environment Health and Safety	Engineering and Maintenance	Decontamination
Agency					
CDH					
Air Pollution Control Division	X	X	X	X	X
Radiation Control Division	X	X	X	X	X
Hazardous Materials and Waste Management Division	X	X	X	X	X
DOE-RFFO					
Environmental Restoration Management		X	X		X
Low Level Waste Management	X	X	X	X	X
Occupational Safety and Health Management	X	X	X		X
U.S. EPA Region VIII					
Air Radiation and Toxics Division		X	X	X	X
Hazardous Waste Management Division		X	X		X
Water Management Division		X	X	X	X

7.0 Dispute Resolution

Since there are four distinct entities involved in the regulatory oversight of the NCPP Stage II activities, there may be disputes if consensus cannot be reached regarding specific regulatory questions which could arise from this work. Therefore, a formal dispute resolution process will be followed. This 7 step process has been summarized below with a regulatory question being the starting point:

- A regulatory question regarding NCPP Stage II work cannot be resolved on the floor by the involved project work team.
- The regulatory question is raised to the divisional and management elements.
- The regulatory divisional and management elements resolve the question or refer it to the NCPP Steering Committee.
- The regulatory question is elevated to the NCPP Steering Committee.

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- The NCPP Steering Committee will devise a resolution based upon the written recommendation of technical subcommittees.
- If written recommendations require that the IM/IRA be changed, a formal revision process which takes accounting of regulatory impacts, cost and schedule impacts and working conditions impacts will be followed.
- Changes to the IM/IRA which may potentially affect the environment, or the health and safety of the workers or public will require review and approval by the regulating bodies.

8.0 Summary

The Rocky Flats Plant has been identified as a Superfund site with defined cleanup requirements. Proceeding with the NCPP on this site will allow DOE, EPA and CDH to identify and resolve the tough issues surrounding economic conversion, which are critical to the development of DOE Complex-wide conversion policy. DOE Orders were not written with economic conversion in mind; therefore, regulatory transition must occur to allow the intent of regulatory requirements to be met without compromising the communities' rights to meaningful and timely conversion as well as protection of the environment, and the health and safety of the workers and the public. In addition, the Regulatory Oversight Plan would continue to convene the NCPP Steering Committee to work on eliminating the barriers of conversion in real time with this pilot project.

During Stage II of the NCPP activities, MSC will continue to identify applicability and redundancy issues, and continue to discuss planned work, problems and the impact of applicable requirements with regulators prior to commencement of work. These interactions will help resolve institutional and industrial barriers, without violating the appropriate rules and regulations. Therefore, MSC can ensure a thorough, effective, and traceable compliance with applicable regulatory requirements.

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National Conversion Pilot Project
Stage I

Training Plan

Revision 2
30 September 1994

Submitted to:

U.S. Department of Energy - Rocky Flats
PO. Box 928
Golden, Colorado 80402-0928

Prepared by:

Manufacturing Sciences Corporation
804 Kerr Hollow Road
Oak Ridge, Tennessee 37830

REVIEWED FOR CLASSIFICATION/UCNI
By B. M. Hoffman UCNI
Date 12-6-94

Cooperative Assistance Agreement No:

DE-FC34-94RF00733

National Conversion Pilot Project
Stage I

Training Plan

Revision 2
30 September 1994

Prepared by:	K. D. Biddle, BNF plc. AST PM	Date:30 Sept 1994
Approved by	M. L. Haupt, BNFL Inc. PM	Date 10/12/94
Approved by:	D. R. Floyd, MSC PM	10/14/94 Date
Approved by:	~~M. E. Anderson,~~ E. Nix DOE-COR	10/9/94 Date

This Report was prepared by Manufacturing Resources Corporation (MSC) under Cooperative Agreement No. DE-34-94RF00733 with the Department of Energy - Rocky Flats.

This Report is intended for DOE-RFO's use. Such use, duplication and disclosure of this Report is to be in accordance with Contract No. DE-FC34-94RF00733.

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Revision History

Revision	Date	Page	Paragraph	Explanation	Approval Signature
0	16 June 94	All	All	First Approved Issue	
1	6 July 94	All	All	Typographical Corrections	
		6	3.6	Deleted	
		6 & 7	3.7 to 3.14	Re-numbered 3.6 to 3.15	
		14	2 & 6	Amended in Accordance With DOE Comment Resolution	
		App. B & F	Titles	Amended in Accordance With DOE Comment Resolution	
		App. B	Part 3	Item Added to Competence Required List	
		App. E	A10, A16 & A17	Corrected/ Refined	
2	30 Sept 94	5	1.2	Added to Explain Stage I Extension Deliverables	DR Floyd Inclusive
		9	4.4	Amended Due to Stage I Extension Deliverables	
		17	9.5	Added Due to Stage I Extension Deliverables	
		18	10.0	Amended Due to Stage I Extension Deliverables	
		19	12.1 & 2	Amended due to Stage I Extension Deliverables	
		19	12.3	Amended Due to Stage I Extension Deliverables	

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Revision History - Continued

Revision	Date	Page	Paragraph	Explanation	Approval Signature
2	30 Sept 94	App. E	All	Up-dated to Version 2	
		App. F	All	Amended Due to Stage I Extension Deliverables	
		App. H to K	All	New Appendices Added	

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Training Plan
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2.0 Scope

3.0 Definitions

4.0 Objectives

5.0 Assumptions And Uncertainties

6.0 Numbers and Types Of Employees

7.0 The Principles Of Employee Competence Qualification

8.0 Program Summary (Including Training Documentation Structure Under Activities 8 & 9)

9.0 Resources

10.0 Management Systems

11.0 Controls

12.0 Transition From DOE Orders To Commercial Regulations

13.0 Appendices

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1.0 Introduction

1.1 Revision 1 of this plan contained the deliverables for Work Task Assignment reference number WBS 134 (Training Plan) of the NCPP Stage I Work Plan - Revision 0, dated 28th April 1994. The specific deliverables from this Work Plan were:

1.1.1 "curricula demonstrating compliance with regulatory requirements"; these are given in Appendix F, Part 1 (Draft Skill Units Which Will Be Needed For Stage II).

1.1.2 "a training schedule showing identified training needs meeting the proposed hire schedule for all hired Stage II personnel"; this is contained within Appendix B, Parts 1 to 3 (Draft Competence/Role Matrices) and Appendix E (Program Gantt Charts 1 & 2).

1.1.3 "training plan elements to be used in the training schedule"; these are contained in the main text of this Plan and it`s appendices.

1.2 Revision 2 of the Training Plan has several additional deliverables for Work Task Assignment reference number WBS 134 (Training Plan) of the NCPP Stage I Extension Work Plan - Revision 0, dated September 14 1994. The specific deliverables from this second Work Plan are:

1.2.1 "A chart of DOE Order clauses and how NCPP deals with them"; this is given in Appendix K (Chart Indicating How NCPP Stage II Training Systems Relate To The Appropriate DOE Orders).

1.2.2 "A summary of findings and recommendations. Access to the evidence of base competence for ex-EG&G recruits"; this is given in Appendix I (Preliminary Assay Of Some "External" Training Resource Providers).

1.2.3 "Draft four procedures for use during recruitment and training activities in Stage II"; these are given in Appendix J (Draft Management Procedures on Screening, Verification of Base Competence, Competence Record Keeping and Production of Personal Competence Plans).

1.2.4 "Draft cultural action plan and competence standards for skill units R01, R02 & R03 defined"; this are given in Appendix H (NCPP Stage II Cultural Action Plan) and revisions to Appendix F (Draft Skill Units For NCPP Stage II - Part 1).

1.2.5 "Draft schedule of events and milestones"; this is given in Appendix L (Draft Regulatory Transition Schedule For Training Activities).

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2.0 Scope

The Training Plan encompasses all MSC NCPP Stage II employees and subcontractors. It covers preparations for training, verification of evidence of pre-recruitment competence, Additional Skilling & associated competence assessment, qualification and the pursuit of excellence.

The recruitment of employees will be in accordance with the Staffing Plan, after which the Training Plan takes over. The Training Plan is also synchronized with the Facility Clean Up Plan section of the NCPP IM/IRA and other pre-production activities.

The Training Plan also outlines some Stage III training related activities.

3.0 Definitions

3.1 Additional Skilling.

Additional Skilling is the way in which an employee's competence gap (i.e., the difference between the competence which an employee brings to a role and that required for the role) will be filled. It involves the acquisition of workplace competence in the form of skill and knowledge in a structured education and training program. Knowledge and skill is assessed and assessment provides evidence of competence which is auditable.

3.2 Continuous Improvement.

Continuous Improvement is the unceasing process of actively seeking and implementing change for the better. The principles of Total Quality Management and the techniques of quality engineering guide and enable the process.

3.3 Competence.

Competence is the knowledge and skills necessary for an employee to perform his/her role to the minimum standard.

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3.4 Culture.

Culture is the combination of attitudes, beliefs and values which shapes group behavior.

3.5 Currency.

Currency, in the context of skills, exists when competence is maintained to match role requirements. Currency is sustained by a comprehensive, pragmatic and employee participative system, which complements statutory training requirements. The system output is a peer review of competence and a training action plan.

3.6 Practitioner.

A practitioner is someone who's expertise is based in experience and working knowledge, rather than pure theory.

3.7 Program.

A program is a chart of events against a timescale with dependencies, responsibilities and resource loadings taken into account (e.g., a Gantt chart).

3.8 Pursuit Of Excellence.

Pursuit Of Excellence is the relentless pursuit of quality and value as perceived by the customer (whether internal or external).

3.9 Schedule.

A schedule is a list of events against a timescale.

3.10 Screening.

Screening is part of the employee selection process, see Sections 1.5 & 1.6 and Appendices E & F of the Staffing Plan.

3.11 Skill Unit.

A Skill Unit is an education/training package. It is delivered to trainees in the form of a structured course. It also has a structured manual, to ensure consistent delivery, see Section 8 (Activities 8 & 9: Production of Training Documentation) of this Plan.

3.12 Teamwork and Team Competence.

Teamwork is the efficient combination of human resources which gives a greater output than that expected from the sum of individual effort. It can take the form of blue-collar work teams, transient problem-solving management teams, etc. The concept is based on flexible-working and cooperation of all employees, in support of common goals.

The competence that employees have in a teamwork environment must be judged on the basis of team goals/needs, not personal aspirations.

3.13 Training (Competence).

The term "training" does not adequately convey that, for the NCPP, MSC's aim is to have auditable employee competence followed by the pursuit of excellence. The working definition of "training" in broad terms for the purposes of this document is that aim. Similarly, this Training Plan, should be regarded as a comprehensive competence plan for MSC employees.

4.0 Objectives

4.1 To give employees the competence necessary to comply with statutory regulations. To this end, training will be designed around regulatory requirements which apply to private businesses. Therefore a controlled transition away from the current regulatory requirements (DOE orders) will be an integral part of the plan.

4.2 To establish the NCPP/MSC mission & vision and cascade them to MSC NCPP employees and subcontractors.

4.3 To vigorously implement the concepts of teamwork and team competence.

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4.4 To utilize training as a "vehicle" for business-led cultural change in the workplace. To this end, managers will act as "cultural champions", driving the Cultural Action Plan contained in Appendix H.

4.5 To minimize the use of a classroom training environment and concentrate on competence acquisition and assessment in the workplace.

4.6 To practice Total Quality Management and continuous improvement as an integral part of how competence is managed within the NCPP.

4.7 To establish concise, user-friendly training related systems which are consistent with quality assurance standards and best business practice.

4.8 To project manage the activities and resources involved in the competence acquisition process, in a timely and cost effective way. To this end, training is considered to be a major sub-project of the NCPP and will demand the appropriate project management resources and techniques.

4.9 To assay the competence of employees prior to being trained.

4.10 To assist in the setting of standards for employee competence.

4.11 To assist in the identification of individual or team training needs where competence gaps exist.

4.12 To provide "fit-for-purpose" education and training. To this end, the utilization of NCPP MSC/BNFL Inc. personnel as trainers will be maximized.

4.13 To assess the competence of trained employees.

4.14 To record auditable evidence of employee competence.

4.15 To generate training documentation which is high quality, fit-for-purpose, user-friendly and based around existing regulatory, operational and business information.

5.0 Assumptions And Uncertainties

5.1 Stage II training will commence at some time during the winter of 1994/5 and will be paced by the Facility Clean Up Plan and the Declassification and Product Verification sections of the NCPP Operational Assessment.

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5.2 Stage II proposals, including this Plan, are accepted by the stakeholders during the summer of 1994.

5.3 The exact start date for training for decontamination work depends on the timely completion of prerequisite steps. These steps include the preparation of training documents & training zones within the targeted facilities, the recruitment & training of trainers, the establishment of relationships with non-MSC training providers, the recruitment of teamworkers & team leaders and the removal of some waste and restricted materials from the targeted buildings.

If any of these activities are late then training will be delayed.

5.4 Sufficient human resources, equipment & materials are available for training preparations, training delivery and competence assessment. Refer to Section 9.0 of this Plan.

If such resources are not available then the completion of training will be delayed with an associated cost consequence.

5.5 The timescales and resource levels indicated in the detailed program (see Section 8.0 and Appendix E) are estimated and not fixed. The program will be amended and refined many times. However, training "windows" of 2 or 3 weeks are provisionally included in the Facility Clean Up Plan between decontamination steps.

5.6 The Staffing Plan is workable and that sufficient workers of the right type will be recruited. Also, the number of employees who fail to qualify against the role profile competence requirements will be of the order of 1%.

5.7 All employees and subcontractors will work only day hours (i.e. first shift).

5.8 Sufficient base information (i.e., operating instructions/procedures, equipment manufacturer`s manuals, etc.) will be available by the time the preparation of training documents commences.

If it is not then the start of training delivery will be delayed.

5.9 No sickness or other unauthorized absence occurs for trainees or members of the management team.

Completion of training delivery will be delayed if this does occur.

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6.0 Numbers and Types Of Employees

Worker classification definitions are given on page 22 of Appendix B in the Staffing Plan. The latest NCPP Stage II MSC/BNFL Inc. Project Team organizational chart, see Appendix A of this Plan, shows the numbers and types of employees. There are three broad types of MSC NCPP employee:

6.1 Teamworkers

Teamworkers will be hourly-rated, hired employees from a skilled or non-skilled background, with maintenance, production, fabrication, or other appropriate practical experience. Role profiles are given in Appendix C of the Staffing Plan. They will be selected for recruitment based on the outcome of vocational accreditation/experience verification and screening.

There are several types of work teams, each with a different purpose and Teamworker mix:

Team Purpose	No. of Teams	Team Composition
Decontamination Operations	14	1 Working Team Leader 5 Teamworkers (Decontamination) 1 Teamworker (Decontamination & Radiological Control) 1 Teamworker (Decontamination & Maintenance)
Waste Control	1	6 Waste Minimization Teamworkers (Decontamination & Maintenance) 4 Waste Water Control Teamworkers (Decontamination & Maintenance)
Contamination Control	1	4 Contamination Control Teamworkers (Decontamination & Radiological Control) 4 Beryllium Monitoring Teamworkers (Decontamination & Radiological Control)
Declassification and Product Verification	1	6 Teamworkers (Welding & Machining) 4 Teamworkers (Decontamination & Maintenance) 8 Declassification Teamworkers (Fabrication) 4 Fabrication Teamworkers (Fabrication)

Appendix B, Parts 1 and 2 shows a notional competence/role matrix for Teamworkers.

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6.2 Managers, Technologists and Team Assistants

Managers and Technologists will be salaried, appointed employees from a professional engineering/scientific/managerial or similar background. Team Assistants will be hourly-rated, hired employees from a vocational background. Role profiles are given in Appendix C of the Staffing Plan. They will be selected for recruitment based on the outcome of the verification of academic certification/vocational accreditation and some screening.

Appendix B, Part 3 shows a notional competence/role matrix for this group of employees.

6.3 Subcontractors

Subcontractors are the same as Managers and Technologists, except that they are the salaried, appointed employees of a company which is under contract to MSC (e.g., BNFL Inc.) to provide a specific expertise or deliverable.

7.0 The Principles Of Employee Competence Qualification

The process described below is illustrated in Appendix C.

7.1 The competence requirement for a particular role will be set out in the appropriate role profile, according to the Staffing Plan. Competence requirements will not be confined to technical skills or knowledge, employees will also be required to have skills relating to business and the teamwork concept.

7.2 The academic & vocational competence which an employee acquired prior to recruitment will be verified and taken as the starting point for Additional Skilling.

7.3 Additional Skilling is the way in which the competence gap (i.e., the difference between the competence described in Sections 7.1 & 7.2) will be filled.

7.4 Qualification against the role profile competence requirements will be a combination of academic certification, vocational accreditation, some outcomes from screening and Additional Skilling assessment.

7.5 For a role with one incumbent, the Additional Skilling needs will be based on the individual.

7.6 For a Teamworker role, an individual's Additional Skilling needs will be decided upon on the basis of workplace competence required by the team as a whole and how he/she can most effectively contribute to that team.

HAT

7.7 Each employee will have a Personal Competence Plan (PCP), as illustrated in Appendix D, which will specify what Additional Skilling he/she will be required to undertake to reach qualification.

7.8 All Additional Skilling documentation will be "fit-for-purpose" and biased towards workplace requirements. To enable this, when necessary, structured training manuals will be prepared by small teams of practitioners.

7.9 All Additional Skilling will be "fit-for-purpose" and biased towards workplace requirements. To facilitate this, whenever possible, training will be delivered by practitioners in the workplace. However, when more appropriate, training will be delivered in an off-the-job environment.

7.10 Trainees will be arranged into appropriately sized groups for training delivery. Likewise for competence assessment.

7.11 If, after three attempts to pass a competence assessment following the appropriate training, an employee is unsuccessful, then his/her employment will be reviewed and may be terminated.

7.12 Competence currency and further employee development is an integral part of the plan.

8.0 Program Summary

The training sub-project program shown in Appendix E has several major activities, these are summarized below:

Activity 1: Definition (Training Plan)

The training sub-project must be clearly defined in a definition document, i.e. this Plan which has been written as part of the Stage I deliverables.

Activity 2: Management of Cultural Change

Clearly MSC management and the workforce at the RFP have a great potential to make the NCPP successful. To ensure that the culture in which the NCPP will thrive is established and sustained, a controlled program of cultural evolution is vital.
MSC managers/leaders will define the NCPP mission/vision and prepare to facilitate structured cultural education. The education will be part of a face-to-face, participative induction process for all employees.

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This will be the first step in the cultural development of the NCPP and will embody cultural facets such as quality, safety, dynamics of change, trust, open communication, competence and continuous improvement.
Separate education will follow on business awareness and the teamwork concept.

Activities 3 & 4: Assimilation Of USDOE Orders and Generation of Management Procedures

Some management systems will be assimilated from USDOE. However, regulatory control will be passing from USDOE to CDH, EPA and OSHA. Therefore, steps will be taken to set up fit-for-purpose systems which conform to the new requirements and remove the need for DOE Orders. Best business practice with regard to employee competence will be formalized by procedures.

Activity 5: Appointment Of The Competence Sub-Project Management Team.

Acquiring the human resources for the roles set out in Appendix F is a priority.

Activity 6: Competence Needs Analysis

The outcome of a preliminary needs analysis is included in Appendix E of this Plan. Some follow up tasks will be necessary.

Training topics will be structured into packages called Skill Units. Each Skill Unit can contain several related Competence Elements. The Units & Elements provide a structured syllabus.

Activity 7: Teamworker Selection/Production of Draft Teamworker PCP's

While the recruitment of all MSC NCPP employees is taken into account in the program, the pace of base competence verification and Additional Skilling is dictated by the rate of Teamworker selection.

The base competence of trainees will be defined in the Staffing Plan, therefore recruitment and process of competence qualification are linked.

All employees will have a Personal Competence Plan (PCP), which takes account of their base competence and the training they need to reach qualification for their role.

Activities 8 & 9 Production of Training Documentation

The approach to producing Skill Units will be to use small teams. The teams are typically made up of a technical expert (e.g.. someone who may eventually be a Trainer), a technical writer (if necessary) and a person with co-ordinating and quality assurance skills (to ensure that the Skill Unit is produced on time and to the right quality). However, the size and mix of the team can vary to suit the circumstances.

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Skill Units have 5 parts:

1 Competence Standard (CS); which the trainees must achieve. This is in the form of a table of Competence Elements each with performance criteria and under-pinning knowledge requirements.

2 Competence Assessments (CA); which is how trainee competence is proven. Assessments take the form of written knowledge tests, oral knowledge tests or observation of practical tasks. Assessments match each of the Competence Elements mentioned in 1 above.

3 Training Packages (TP); which includes Trainers Notes, Trainee Handouts, Key Points, Drawings, Diagrams, etc. (i.e. material which helps the trainee to understand, gives consistent delivery, but excludes Operating Procedures and any other detailed technical information which exists on a stand-alone basis). Again, Training Packages match the Competence Elements mentioned in 1 above.

4 Course Plan, which is an hour-by-hour and day-by-day program of how the training and assessment is paced.

5 Resource Schedule (RS); which lists tools, consumables, existing safety information, existing equipment manuals, existing Operating Procedures etc., which are necessary to actually deliver training. These Schedules are also matched with the Competence Elements mentioned in 1 above.

Activities 10, 11, & 12 Prepare Human Resources/Prepare Training Zones/Routine Management

See Section 9.0 of the Plan. The Competence Sub-Project Management Team will require some induction. Specific work for the team is detailed and routine work is outlined.

Trainers will bring some skills with them, but may need to be trained on instructional techniques, decontamination methods and training systems. A structured approach to training trainers is the way to ensure that the technical expertise a person may have is properly passed on to others in a reproducible way.

Training zones within the Facilities need to be established, pilot training events can then follow. Programming of the day-by-day training related tasks is necessary to achieve optimum co-ordination of trainees, trainers and resources. The programming assumptions used in earlier activities will now be replaced by estimates, and then by facts, in due course.

Activities 13 to 34 Training Delivery

There will be separate training delivery streams for Managers (see also Activity 1), Technologists, Team Leaders, Team Assistants , Decontamination Teams and the other Work Teams. Thus reflecting the different training needs of each group.

A series of training events which correspond to Skill Units will be programmed, each controlled by the appropriate trainer(s). Plans will continue to be refined as training delivery progresses.

Activity 35 Review Experience

One (or more) structured, major reviews of the competence sub-project should take place, for three reasons:

1 To ensure that improvements are identified for any future RFP decontamination program.

2 To ensure that MSC can use the data obtained for internal technical development during Stage II and prior to Stage III.

3 To ensure that MSC gain information which can be used as publicity and thereby attract more business.

Activities 36, 37 & 38 Stage III Preliminaries

Some tasks are outlined, but are beyond the current detailed planning horizon.

9.0 Resources

Refer to the resource summary at the end of the Gantt Chart in Appendix E for an indication of the volume of manpower required. Note that, irrespective of the figures in the Gantt Chart resource summary, the Employee Competence Sub-Project Management Team resources are full-time during timespans given in Activity 5.

9.1 Employee Competence Sub-Project Management Team

The roles and duties for this team are set out in Appendix G. Links will be maintained with the BNFL Fuel Division Additional Skills Training Group, who will be a source of expertise, base information and authoring effort.

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9.2 Skill Unit Development Teams

The NCPP management team (whether teachers, technologists, managers etc.) will be the source of expert knowledge and will contribute to skill unit development. They will be augmented by hired technical authors and typing effort.

9.3 Trainers

The whole NCPP management team has a wealth of expertise and will be the source of trainers in two ways:

1. Managers, Technologists and members of the Employee Competence Sub-Project Team will train other employees in specific commercial, safety or technical topics.

2. Before Team Leaders take up this role they will contribute to training design and workplace training delivery.

The commitment and availability of the NCPP workforce to training each other is vital to the success of the project and must be assumed.

Some sub-contracted training services will be used when it is cost effective.

9.4 Materials / Equipment / Training Zones

Each Skill Unit will have an associated series of non-manpower resource requirements. These will be identified during the training design steps and sized when the detailed programming is done. Factors affecting the scale of such resources are; the skills that recruits bring to the project, what is taught in the classroom environment & what is learned by hands-on experience, equipment availability & ease of access and nature of the training topic. It is not possible to make a reliable estimate of the scale of such resources at this time.

9.5 "External" Training Resource Providers

A preliminary assay of some providers is given in Appendix I.

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10.0 Management Systems

Management systems will be designed and formalized as procedures. They will be written by and used by the project team. The systems are given below. Some procedures have been drafted (indicated by ***bold , underlined italic text*** below) and can be found in Appendix J.

10.1 Management Systems For Employee Selection and Competence Qualification.

* ***Verification of Base Competence Prior Hiring.***

* ***Screening.***

* ***Competence Record Keeping.***

10.2 Management Systems For Additional Skilling.

* Competence Needs Analysis (as appropriate post-Stage I activities and incl. programming data).

* Skill Unit Production (incl. the make-up & duties of Unit Development Teams, Skill Unit manual structure, assay of existing training courses & operational information and document/software controls).

* ***Production of Personal Competence Plans.***

* Programming of Training and Related Events (incl. the use of base data from Needs Analyses).

*Control Of Training Delivery (incl. credentials & choice of training providers, preparation of training providers, preparation of training areas, piloting of training events, periodic quality verification of training providers & other training delivery resources and response to trainee feedback).

* Competence Assessment.

10.3 Management Systems For Currency and The Pursuit Of Excellence.

* Competence Currency.

* Performance Management (incl. performance appraisal).

* Production Of Personal Development Plans.

* Business Improvement Teams.

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11.0 Controls

The primary controls for the Stage II competence sub-project are the statutory regulations, management systems and program already mentioned in this Plan. In addition there are the overall controls of the NCPP and there may be secondary controls, such as; personal/team goals, published measures of performance against the program and TQM / Continuous Improvement.

12.0 Transition From DOE Orders To Commercial Regulations.

Training related DOE Orders 5480.18A and 5480.20 are cited in the Cooperative Agreement. The means of transition from these orders is out-lined below.

12.1 Transition From DOE Order 5480.18A

The purpose of this order is "to establish a performance-based training process....". Some of the NCPP workplace competence systems, as laid down in management procedures, will replace this order. The appropriate procedures will be prepared as a priority in Stage II. To assist in this process a "mapping" exercise has been carried out, showing how DOE Orders can be equated to NCPP management procedures, see Appendix K.

12.2 Transition From DOE Order 5480.20, Chapters I & IV

The purpose of this order is to "establish the selection , qualification, training and staffing requirements....". Most of the requirements are safety related. The NCPP Staffing Plan and the role profiles included in it are equivalent to some parts of Chapter I. The NCPP Training Plan and the safety related Skill Units mentioned in it are equivalent to the remaining parts of Chapter I and Chapter IV. So, early in Stage II, the priority will be to design and deliver training which demonstrates the equivalence. To assist in this process a "mapping" exercise has been carried out, showing how DOE Orders can be equated to NCPP management procedures, see Appendix K.

12.3 Transition To Commercial Regulations

Training will be designed and carried out in compliance with CDH, EPA, OSHA and NRC requirements. To assist the compliance process, the appropriate direct interface between NCPP management and the regulators will take place regarding employee competence. A suggested schedule for such interface is given in Appendix L.

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13.0 Appendices

A NCPP Stage II MSC/BNFL Inc. Project Team Organizational Chart. (MI000411.PM4)

B Draft Competence/Role Matrix For NCPP Stage II Project Team:
- Part 1; Decontamination Or Contamination/Waste Control Teamworkers.
- Part 2; Material Declassification And Product Verification Teamworkers.
- Part 3; MSC Managers, Technologists And Assistants Or Equivalent Subcontracted BNFL Inc. Personnel. (MI000421.PM4)

C The Process Of Employee Competence Qualification And Beyond. (MI000413.PM4)

D Illustration Of Personal Competence Plans. (MI000417.PM4)

E NCPP Stage II Competence Program Gantt Chart. (MI000414.PM4)

F Draft Skill Units For NCPP Stage II:
- Part 1; List Of Cultural, Regulatory And Decontamination Operation Units Which **Will** Be Needed And Associated Competence Element Listings.
- Part 2; List Of Maintenance Activity Units Which **May** Be Needed.
- Part 3; List Of Material Declassification And Product Verification Related Units Which Will Probably Be Needed.
- Part 4; List of Management Education Units Which Will Probably Be Needed. (MI000435.PM4)

G NCPP Stage II Employee Competence Sub-Project Team Structure. (MI000424.PM4)

H NCPP Stage II Cultural Action Plan. (MI000430.PM4)

I Preliminary Assay Of Some "External" Training Resource Providers. (MI000432.PM4)

J Some Draft Management Procedures. (MI000436.PM4//GP000243 to 246.PM4)

K Chart Indicating How NCPP Stage II Training Systems Relate To The Appropriate DOE Orders. (MI000433.PM4)

L Draft Regulatory Transition Schedule For Training Activities. (MI000431.PM4)

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Appendix B: Draft Competence/Role Matrix For MSC NCPP Stage II Project Team.

Part 1: Decontamination Or Contamination/Waste Control Teamworkers.

Detailed competence requirements will be set out in role profiles (see Staffing Plan) and personal competence plans (which will be developed from this matrix during Stage II).

Type Of Role / Type Of Competence Required	Teamworker (Decontamination)	Teamworker (Decontamination And Radiological Control)	Teamworker (*Decontamination* And Maintenance)
Vocational Accreditation	?	?	✓
Vocational Experience	✓	✓	✓
Medical Fitness	✓	✓	✓
NCPP Culture	✓	✓	✓
Business Awareness	✓	✓	✓
Teamwork Concept	✓	✓	✓
Workplace Regulations	✓	✓	✓
Radiological Safety	✓	✓	✓
Conventional Safety	✓	✓	✓
Beryllium Safety	✓	✓	✓
Metal Joints	✓	✓	✓
Dismantling Using Tools	✓	✓	✓
Forklifts And Hoists	✓	✓	✓
Hot Cutting	✓	✓	✓
Containments	✓	✓	✓
Waste Control and Handling	✓	✓	✓
Decontamination Operations	✓	✓	✓
Radiological Control	×	✓	×
Clerical Skills	?	✓	✓
Electrical Isolation	×	×	✓
Repair and Maintenance Of Electrical Systems	×	×	✓

For Key To Symbols See Page 5.

Appendix B: Draft Competence/Role Matrix For MSC NCPP Stage II Project Team.

Part 1: Continued.

Type Of Role / Type Of Competence Required	Teamworker (Decontamination)	Teamworker (Decontamination And Radiological Control)	Teamworker (Decontamination And Maintenance)
Electrical Installation	×	×	✓
Electrical Preventative Maintenance	×	×	✓
Brickwork / Glazing	×	×	✓
Machine Setting	×	×	✓
Machine Tool Maintenance	×	×	✓
Fault Diagnosis And Repair Of Hydraulic And Pneumatic Systems	×	×	✓
Fabrication And Repair of Steam Supply Lines	×	×	✓
Fabrication And Repair of Vacuum Lines	×	×	✓
Work From Blueprints	×	×	✓
Welding And Soldering	×	×	✓
Operate Powered Equipment	×	×	✓
Operate Ventilation Or Associated Systems	×	×	✓
Lubrication	×	×	✓
On-line Inspection And Adjustment Of Machinery	×	×	✓
Painting	×	×	✓
Fibreglass Repairs	×	×	✓
Operate Waste Sludge System	×	×	✓
Water And Sludge Analysis	×	×	✓

For Key To Symbols See Page 5.

Appendix B: Draft Competence/Role Matrix For MSC NCPP Stage II Project Team.

Part 2: Material Declassification And Product Verification Teamworkers.

Detailed competence requirements will be set out in role profiles (see Staffing Plan) and personal competence plans (which will be developed from this matrix during Stage II).

Type Of Role / Type Of Competence Required	Teamworker (Welding and Machining)	Teamworker (Fabrication)
Vocational Accreditation	✓	✓
Vocational Experience	✓	✓
Medical Fitness	✓	✓
NCPP Culture	✓	✓
Business Awareness	✓	✓
Teamwork Concept	✓	✓
Workplace Regulations	✓	✓
Radiological Safety	✓	✓
Conventional Safety	✓	✓
Beryllium Safety	✓	✓
Use Of Tools	✓	✓
Forklifts And Hoists	×	✓
Hot Cutting	×	×
Waste Control and Handling	✓	✓
Clerical Skills	?	?

For Key To Symbols See Page 5.

Appendix B: Draft Competence/Role Matrix For MSC NCPP Stage II Project Team.

Part 2: Continued.

Type Of Role / Type Of Competence Required	Teamworker (Welding and Machining)	Teamworker (Fabrication)
Brickwork	×	✓
Machine Setting	✓	×
Machine Tool Maintenance	✓	×
Manual Welding Set Up	✓	×
Manual Welding	✓	×
Milling	✓	×
Turning	✓	×
Metal Testing	×	✓
Beryllium Pre-casting and Casting Ops.	×	✓
Steel Casting	×	✓
Uranium And Aluminium Casting	×	✓
Metal Fabrication	×	✓
Waste Container Fabrication	×	✓
Product Inspection	✓	✓

For Key To Symbols See Page 5.

Appendix B: Draft Competence/Role Matrix For MSC NCPP Stage II Project Team.

Part 3: MSC Managers, Technologists And Assistants Or Equivalent Subcontracted BNFL Inc. Personnel.

Detailed competence requirements will be set out in role profiles (see Staffing Plan) and personal competence plans (which will be developed from this matrix during Stage II).

Type Of Role / Type Of Competence Required	Senior Manager	Middle Manager	Technologist	Team Leader	Team Assistant
Academic Certification	✓	✓	✓	?	?
Vocational Experience	✓✓	✓✓	✓✓	✓	?
Teamwork Concept	✓	✓	✓	✓	✓
Medical Fitness	✓	✓	✓	✓	✓
Business Awareness	✓✓	✓	✓	✓	✓
Emergency Response	✓	✓	✓	✓	✓
Preparation Of Managers As Trainers	✓	✓	×	✓	×
Clerical Skills	×	×	×	×	✓
Instructional Skills	×	×	✓	✓	?
Technical Appreciation	×	×	×	✓	×
Regulation Compliance And Quality Assurance	✓	✓	✓	✓	?
Regulations In The Workplace	✓	✓	✓	✓	✓
Radiology Safety	?	✓	✓	✓	?
Conventional Safety	✓	✓	✓	✓	✓

Key:

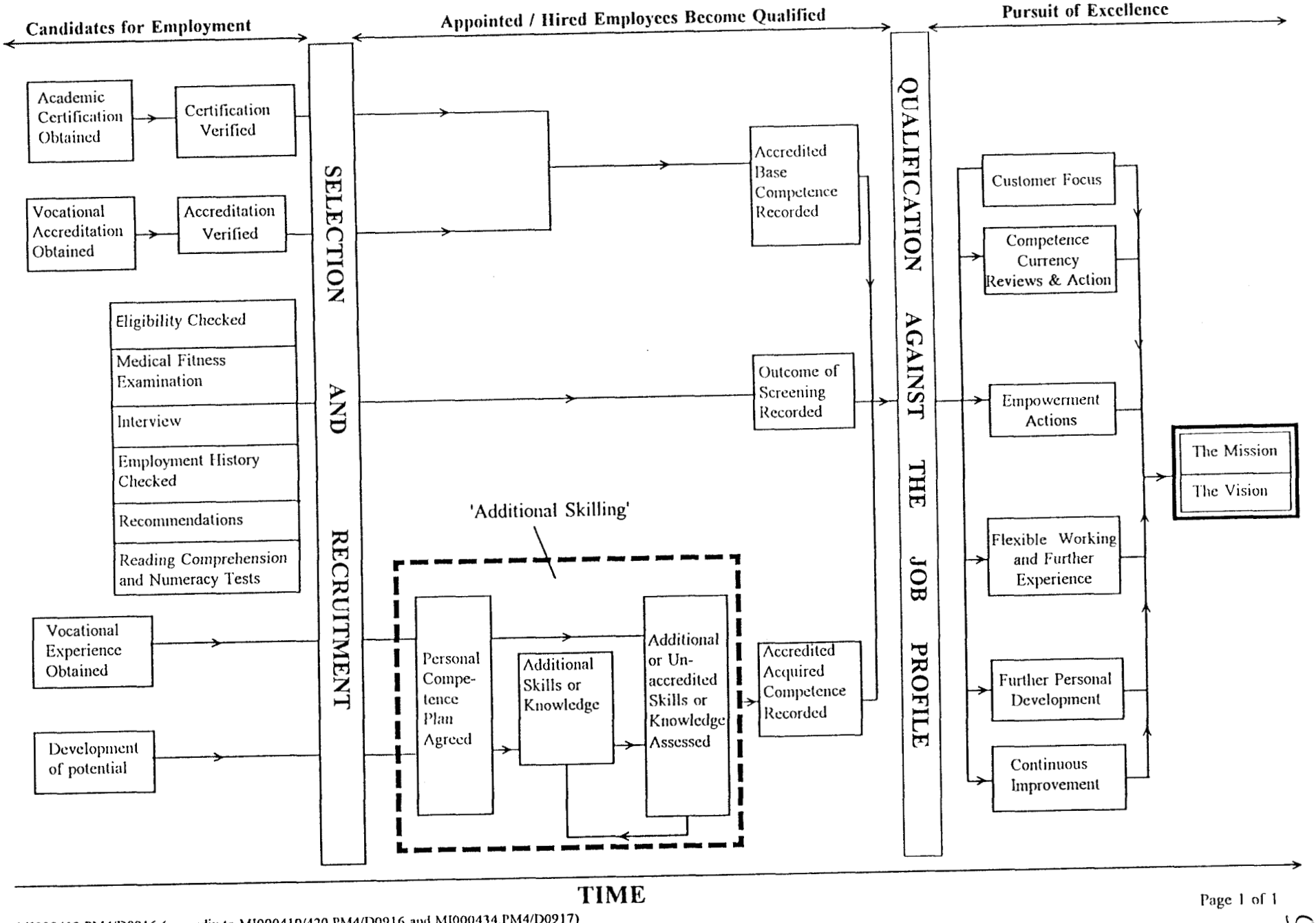
✓✓ = Exception due to unique competence acquired prior to appointment.

✓ = Competence required (can be through NCPP training or acquired prior to recruitment).

× = Competence not required

? = Competence required for some people, to some extent, or undetermined as yet

Appendix C: The Process of Employee Competence Qualifications and Beyond.



MI000413.PM4/D0916 (appendix to MI000410/420.PM4/D0916 and MI000434.PM4/D0917)

Appendix D: **Illustration Of Personal Competence Plans (Extracts From Some Draft Plans In Matrix Format).**

← Team Members →

Skills ↕

	Joe	Susan	Tom	etc.
Safety	✓	✓		
Fitting	×		–	
Casting		✓		
Rolling Mill		–		
Quality Assurance			✓	
Utilities	✓			
Safe Access	–			✓

Key :

✓	=	Skill required and has been acquired		=	Skill required but not yet acquired
×	=	Skill required but failed to be acquired	–	=	Skill not required

Appendix E: Gantt Chart

The Gantt Chart For NCPP Stage II

In Quarterly Format Is Attatched

(Cover page, 23 Gantt chart pages and resource summery page)

Project description

Report: Gantt Chart	Date: 3-10-94	Time: 14:18
Title: NCPP STAGE II TRAINING PLAN	Project ID: MSC-NCPP	Version: 2
Manager: D. FLOYD	Project filename: NCPPS2	Dept: INC-ASTG
Project start: 2-05-94	Project end:	Budget:

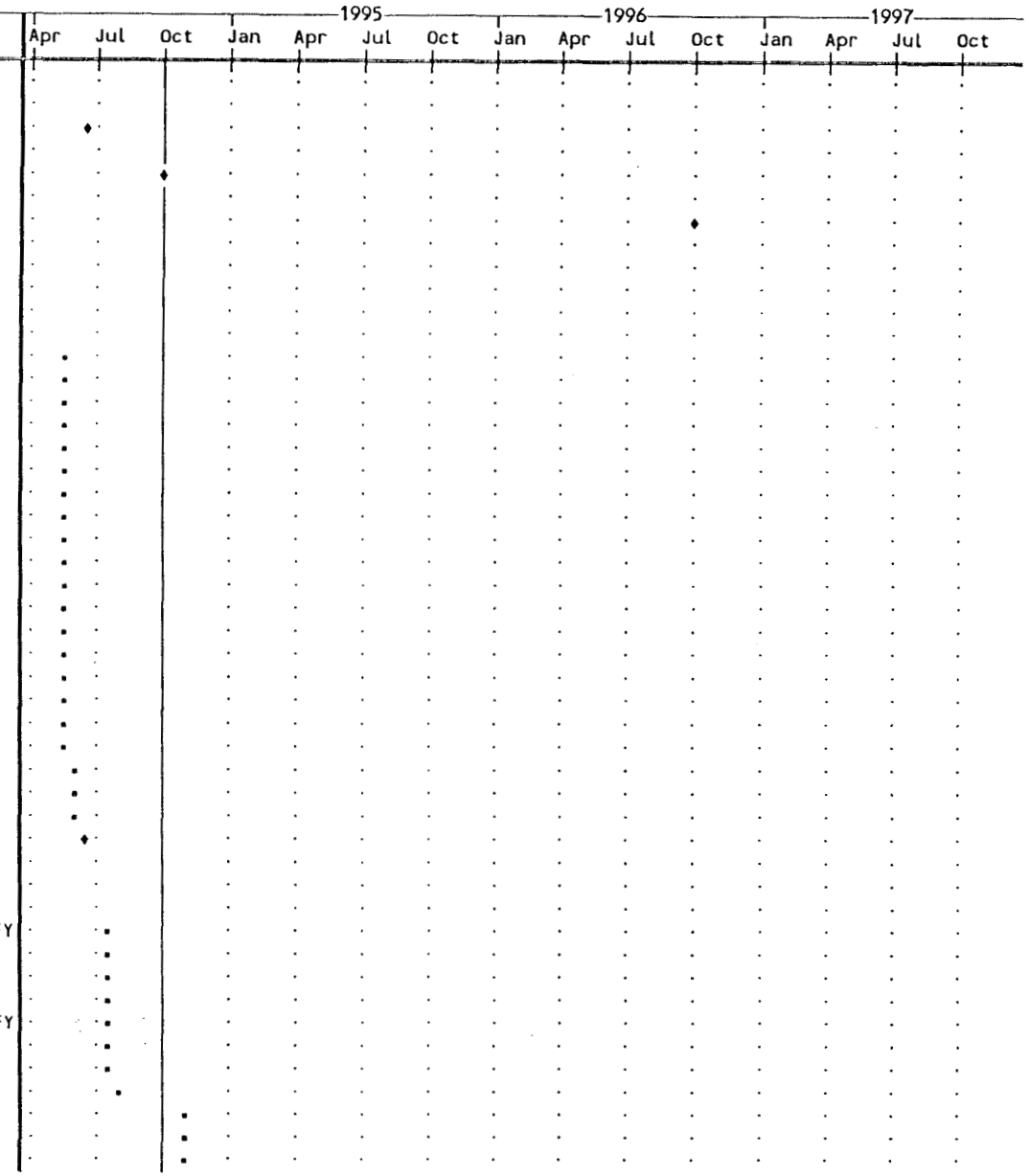
Description: MSC-NCPP STAGE II EMPLOYEE COMPETENCE PROGRAM

Legend

▪▪▪▪▪	Activity	♦	Milestone
C▪▪▪▪	Activity on critical path	L▪▪▪▪	Locked activity
═▪▪▪	Partially completed activity	═══	Completed activity
▲	Original start date	▼	Original end date
.....	Discontinuous activity	.....♦	Baselined milestone

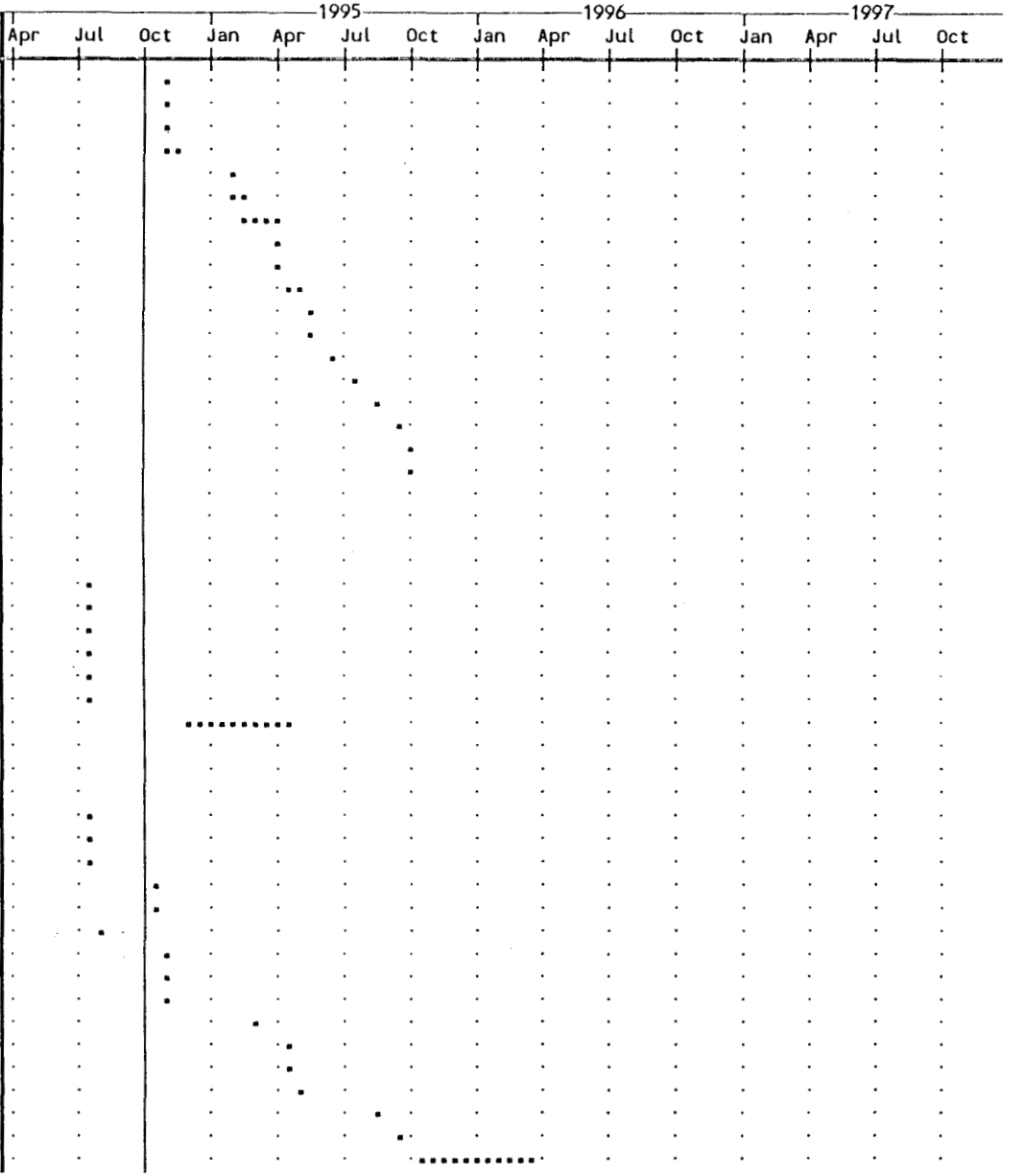
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
PROJECT MILESTONES		
M1 Stage I Complete/Clean Up Plan Written	♦	MM
M2 Stage II Notional Start	♦	MM
M3 Stage III Notional Start	♦	MM
TRAINING		
A1 DEFINITION (Training Plan)		
T1 Agree Training Milstones	0	MM
T2 Establish Demographics	1	MM
T3 Assimilate MSC Hierachy	0	KB
T4 Assimilate Work Cell Structure	1	FY
T5 Agree Sources Of Training Effort	0	MM
T6 Agree Role Of Trainers	0	MM
T7 Agree Availability Of Trainers	0	MM
T8 Reconcile Task Split Between Stage I & Stage II	0	KB
T10 Agree Function of Training Plan	1	MM
T11 Draft Scope Section of Plan	0	KB
T12 Draft Objectives Section of Plan	0	KB
T13 Draft Assumpts & Uncerts Sect of Plan	0	KB
T14 Draft Type/No Trainees Section of Plan	0	KB
T15 Draft Training Principles Sect of Plan	0	KB
T17 Draft Program Section of Plan	2	KB
T18 Draft Manpower/Facilities Section of Plan	1	KB
T20 Draft Controls Sect of Plan	1	KB
T22 Draft Systems Section of Plan	0	KB
T30 Obtain Comments on Plan	2	MM
T31 Rewrite Plan	6	KB AS
T32 Approve Plan	1	DF MH
M4 Training Plan Submitted To USDOE	♦	KB
A2 MANAGEMENT OF CULTURAL CHANGE		
T1 Consult MSC On Workshop Content	1	KB DF FY
T5 Make Arrangements For Workshop	1	AD
T10 Prep Mission Vision Workshop	5	KB A?
T15 Issue Workshop Session Notes	0	KB
T20 Run Mission Vision Workshop	2	KB DF FY
T21 Work Up Actions Into A Plan	1	A?
T22 Draft Cultural Change Plan	1	A?
T23 Issue Plan For Comment	0	A?
T24 Redraft Cultural Change Plan	1	A?
T25 Finalise & Issue Cultural Change Plan	1	A?
T30 Arrange Cultural Course Attendance	1	PR



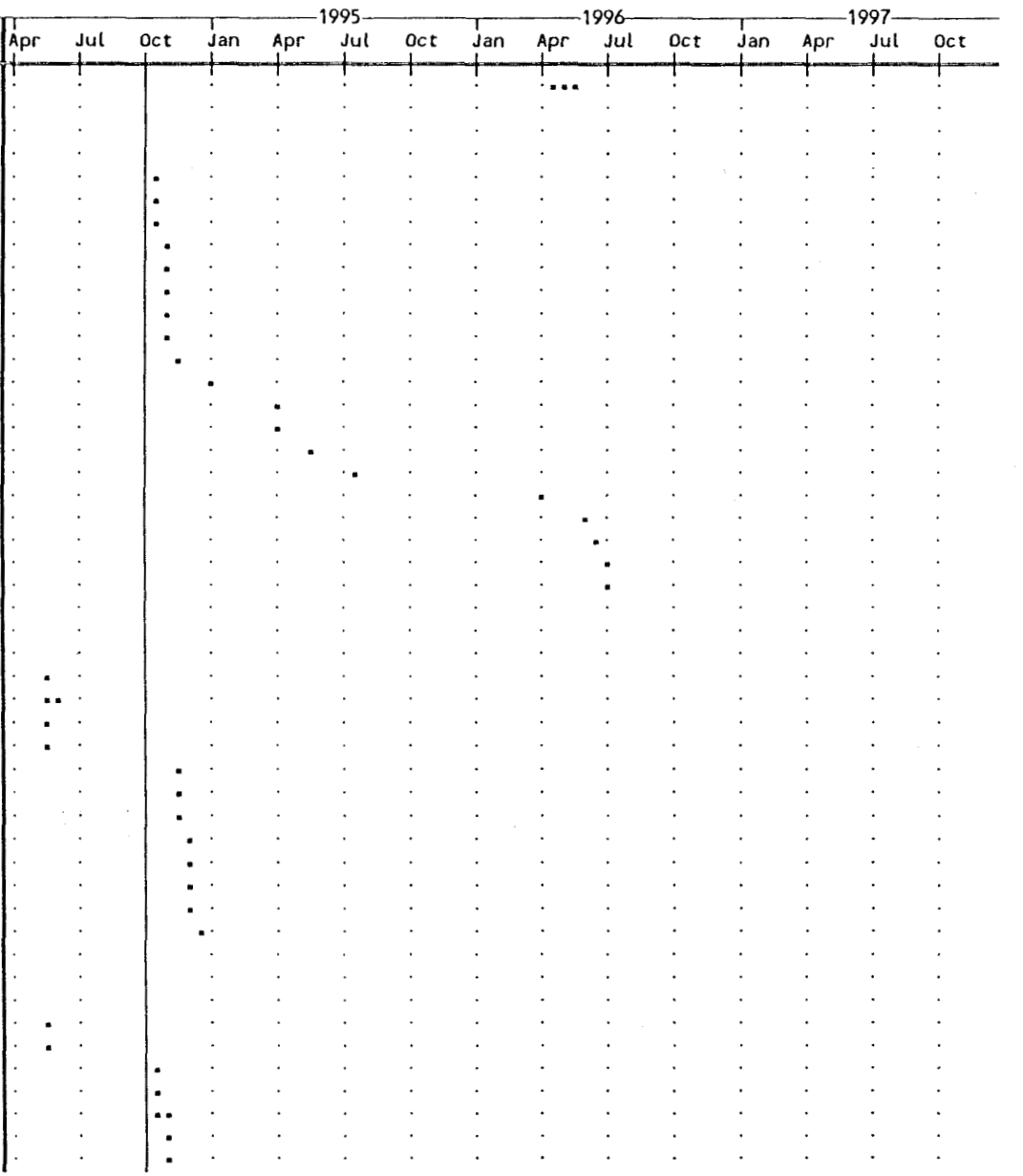
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T40 Prep DF & FY For R01 Course	3	KB DF FY
T45 Prep DF & FY For R02 Course	3	KB DF FY
T50 Prep DF & FY For R03 Course	3	KB DF FY
T60 Refine R01, R02 & R03 Culture Manuals	2	A?
T90 Review Cultural Change Presentations	2	KB DF FY
T91 Develop Cultural Action Plan 1	2	KB DF
T92 Implement Cultural Action Plan 1	24	FY DF
T95 Reprogram Management Of Cultural Change	2	PR
T100 Identify & Work Up Teambuilding Activities	5	KB
T101 Arrange Teambuilding Activity 1	2	AD
T102 Teambuilding Activity Briefing 1	1	MM
T103 Run Teambuilding Activity 1	3	MM
T104 Review Teambuilding Activity 1	1	KB MM
T110 Develop Cultural Action Plan 2	3	KB DF FY
T120 Arrange Teambuilding Activity 2	2	AD
T130 Teambuilding Activity Briefing 2	1	MM
T140 Run Teambuilding Activity 2	3	MM
T150 Review Teambuilding Activity 2	2	MM
A3 ASSIMILATION OF USDOE ORDERS 5480.18A & 5480.20		
T10 Identify Clauses In 5480.18A To Be Assimilated	1	KB MC
T11 Identify Priority Mgt Procedures	0	KB
T20 Revise Order Of A4 (Generate Mgt Proc`s)	0	KB PR
T30 Identify Clauses In 5480.20 To Be Assimilated	1	KB MC
T31 Identify Prioity Skill Units	1	KB
T32 Revise Order Of A8 (Gen. Prim. Skill Units)	1	KB PR
T40 Liaison With CDH & Other H&S Agencies On Competence	10	KB
A4 GENERATE MANAGEMENT SYSTEMS		
T20 Prep MP; Verif`n Of Base Competence Prior To Recruit`t	3	HR TD
T30 Prep MP; Screening	1	HR
T40 Prep MP; Competence Record-Keeping	1	TD
T50 Prep MP; Competence Needs Analysis	1	DP
T60 Prep MP; Skill Unit Production	3	DP
T70 Prep MP; Prod`n Of PCPs	2	TD
T80 Prep MP; Programming	1	PR
T90 Prep MP; Control Of Training Delivery	3	TD
T100 Prep MP; Competence Assessment	3	TD
T110 Prep MP; Performance Management	2	HR
T120 Prep MP; Competence Currency	1	DP
T130 Prep MP; Production Of PDPs	1	HR
T140 Prep MP; Business Improvement Teams	2	KB
T200 Debate 3rd Party Accreditations	1	MM
T210 Develop Accreditation Plan	5	MM
T220 Execute Accreditation Plan	0	MM



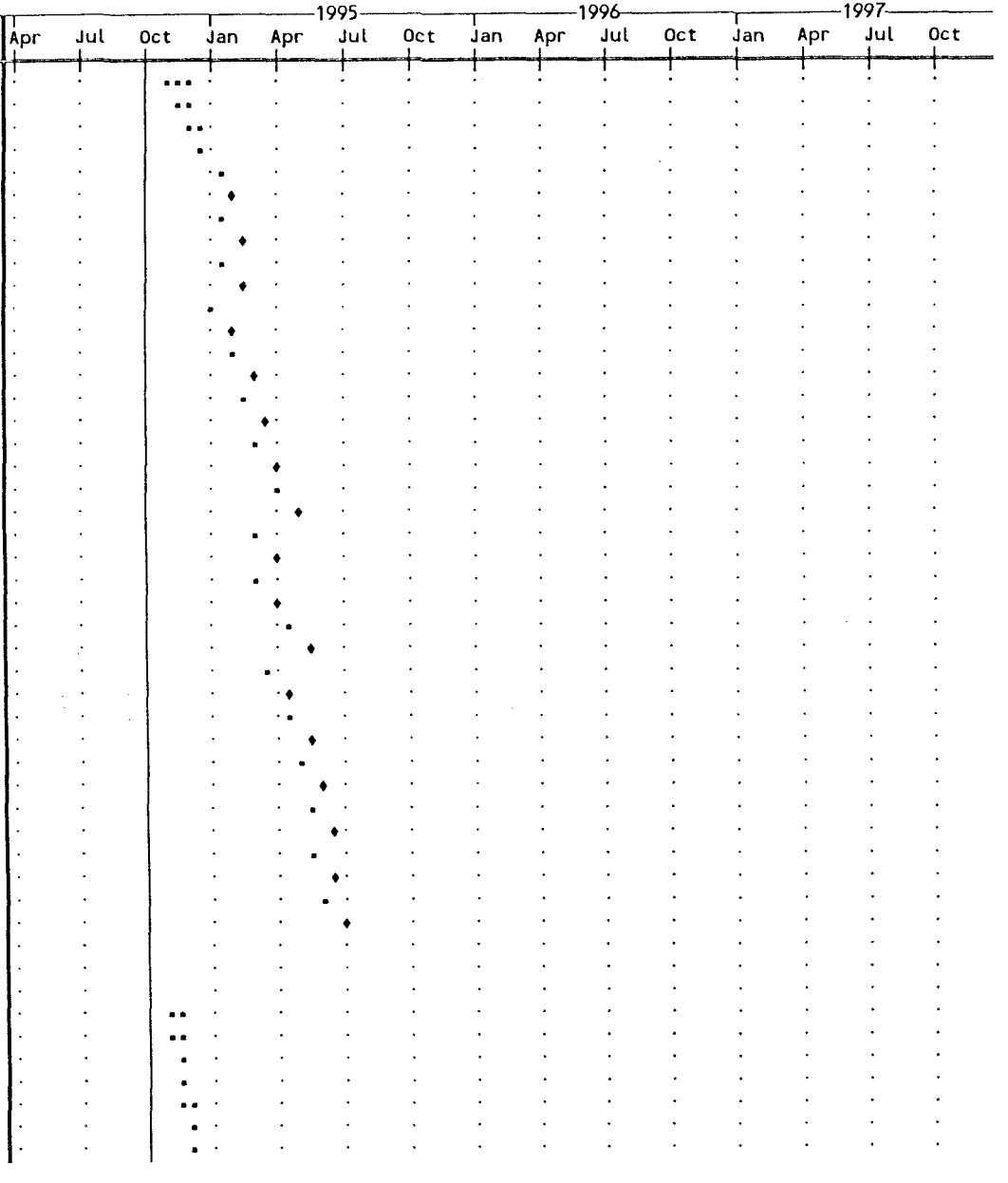
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T230 Seek 3rd Party Q.A. Acceditation	20	MM
A5 APPOINT COMPETENCE SUB-PROJECT TEAM		
T10 Appoint Competence Manager	0	FY MH
T20 Appoint Training Delivery Manager	0	FY MH KB
T21 Appoint Document Production Manager	0	MH KB
T22 Appoint Planner/Record-Keeper	3	FY KB
T23 Appoint Administrator	3	FY KB
T30 Identify UDT Memberships	1	DP
T35 Assay "External" Agency Trainers	3	TD
T40 Hire First Group Of Trainers (Team Leaders)	4	TD AR
T50 Hire Technical Author/Typists	2	DP
T60 Hire Second Group Of Trainers (Team Leaders)	4	TD AR
T70 Re-Deploy First Grp Of Trnrs to Team Leader Posts	0	TD AR
T80 Hire Third Group Of Trainers (Team Leaders)	4	TD AR
T90 Re-Deploy Second Grp Of Trnrs To Team Leader Posts	0	TD AR
T100 Re-Deploy Third Grp Of Trnrs To Team Leader Posts	0	TD AR
T110 Re-Deploy Document Production Manager	2	KB
T120 Re-Deploy Training Delivery Manager	2	KB
T130 Re-Deploy Planner/Record-Keeper	1	KB
T140 Re-Deploy Administrator	1	KB
T150 Re-Deploy Competence Manager	0	X
A6 COMPETENCE NEEDS ANALYSIS		
T10 Complete Preliminary Needs Analysis	8	KB MM
T20 Work up Data	10	KB AS
T30 Agree Competence Pre-requisites	5	FY KB
T40 Agree Training Exception Criteria	2	FY KB
T50 Draft Competence/Named Tmwkr Matrix [see A7/T80 etc]	4	TD CE AR
T55 Draft Mgr/Techt/TL/Asst PCPs	2	FY TD
T60 Prepare Supplementary Needs Analysis Workshop	1	DP
T70 Run Supplementary Needs Analysis Workshop	1	DP
T80 Draft Maintenance & Prod Verif'n Competence Stnds	2	DP
T90 Revise Competence/Named Tmwkr Matrix [see A6/T50]	2	DP CE AR
T95 Revise TL PCPs	2	FY AR MM
T100 Revise Mgr/Techt/Asst PCPs	4	FY MM
A7 TEAMWORKER SELECTION/DRAFT TEAMWORKER PCPs		
T10 Agree On Demographics	1	MM
T20 Design Selection Steps	2	MM
T30 Identify Selection Resourses	1	HR
T31 Train Selection Resources	3	HR
T32 Publicise Vacancies	10	HR
T33 Make Selection Arrangements	3	HR
T34 Schedule Details	1	HR



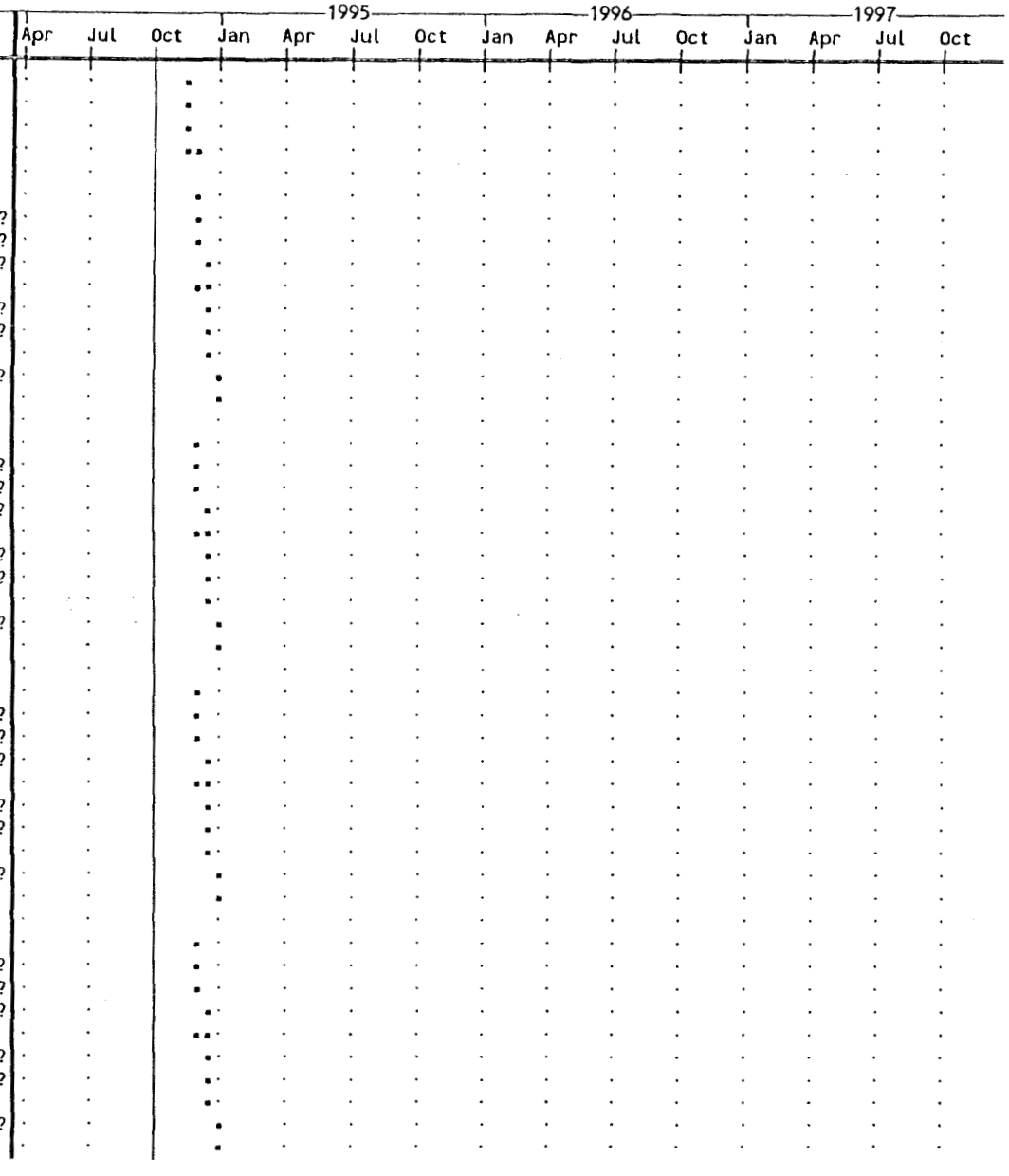
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T40 Conduct Verification Of Credentials/Accreditations	20	TD HR
T45 Conduct Screening	37	HR AR CE
T50 Agree On Recruits	8	MM
T55 Notify Recruits	5	HR
T60 Draft PCPs For Decon. Team #1	1	TD AR
M5 Decon Team #1 Start Training	♦	MM
T70 Draft PCPs For Contamination Control Team	1	TD MC
M6 Contamination Control Team Start Training	♦	
T80 Draft PCPs For Waste Control Team	1	TD GE
M7 Waste Control Team Start Training	♦	MM
T90 Draft PCPs For Declass'n/Prod Verif'n Team	1	TD CE
M8 Declassification & Product Verification Team Start Trng	♦	MM
T100 Draft PCPs For Decon. Team #2	1	TD AR
M9 Decon Team #2 Start Training	♦	MM
T110 Draft PCPs For Decon Team #3	1	TD AR
M10 Decon Team #3 Start Training	♦	MM
T120 Draft PCPs For Decon Team #4	1	TD AR
M11 Decon Team #4 Start Training	♦	MM
T130 Draft PCPs For Decon Team #5	1	TD AR
M12 Decon Team #5 Start Training	♦	MM
T140 Draft PCPs For Decon Team #6	1	TD AR
M13 Decon Team #6 Start Training	♦	MM
T150 Draft PCPs For Decon Team #7	1	TD AR
M14 Decon Team #7 Start Training	♦	MM
T160 Draft PCPs For Decon Team #8	1	TD AR
M15 Decon Team #8 Start Training	♦	MM
T170 Draft PCPs For Decon Team #9	1	TD AR
M16 Decon Team #9 Start Training	♦	MM
T180 Draft PCPs For Decon Team #10	1	TD AR
M17 Decon Team #10 Start Training	♦	MM
T190 Draft PCPs For Decon Team #11	1	TD AR
M18 Decon Team #11 Start Training	♦	MM
T200 Draft PCPs For Decon Team #12	1	TD AR
M19 Decon Team #12 Start Training	♦	MM
T210 Draft PCPs For Decon Team #13	1	TD AR
M20 Decon Team #13 Start Training	♦	MM
T220 Draft PCPs For Decon Team #14	1	TD AR
M21 Decon Team #14 Start Training	♦	MM
A8 PRODUCE PRIMARY STAGE II TRAINING DOCUMENTATION		
T10 Establish Document Controls [as in Mgt Proc]	7	DP AS
T15 Produce Trainer/Assessor Training Manual - Unit R80	10	AS
T20 Assay Existing MSC Courses	1	TD
T21 Initial Assay Of Existing EG&G/DOE Courses	3	TD
T22 Initial Assay Of Local Colleges/Agencies Courses	3	TD
T30 Initial Assay Of Existing RFP OSAs	3	TD
T35 Initial Assay Of Existing RFP Operating Procedures	3	TD



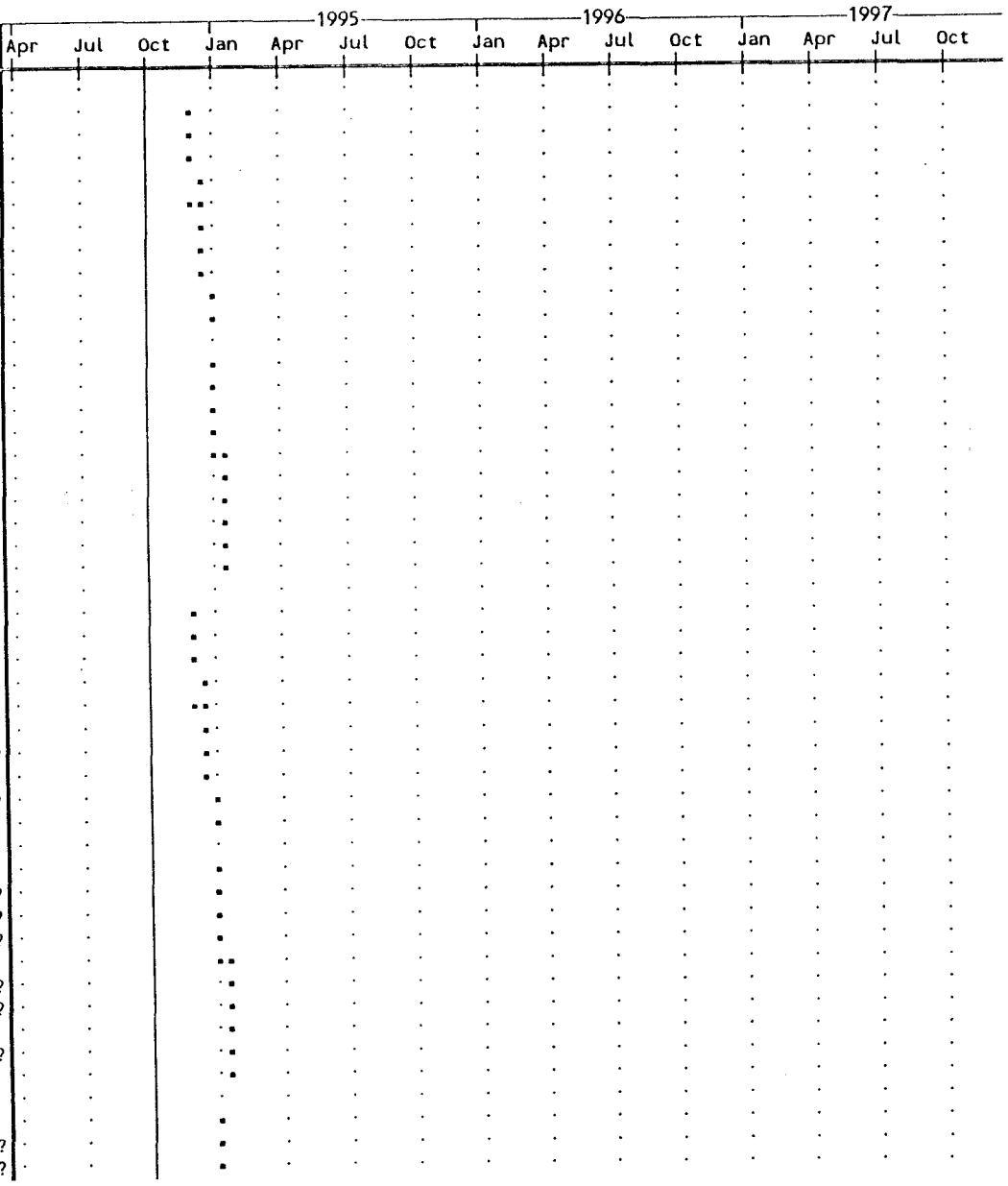
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T40 Amend Document Control Procedure	2	DP AS
T41 Issue Revised Document Control Procedure	1	DP
T50 Establish UDTC & UDT Members For Each Unit	2	DP
T55 Write UDT Program (Fully Expand A8/T60-T300)	10	PR
T60 Collect Base Information For Unit	2	T?
T61 Draft Unit R01 CS	4	DP T? A?
T62 Draft Unit R01 CA	6	DP T? A?
T63 Agree Draft CS/CA	2	DP T? A?
T64 Assay Existing Training Courses/Material	3	DP T?
T65 Draft Unit R01 TP	10	DP T? A?
T66 Agree Draft TP	2	DP T? A?
T67 Draft Unit R01 PLAN & RS	1	T? A?
T68 Finalise Unit	2	DP T? A?
T69 Assemble And Issue Unit	1	AD
T70 Collect Base Information For Unit	2	T?
T71 Draft Unit R02 CS	4	DP T? A?
T72 Draft Unit R02 CA	6	DP T? A?
T73 Agree Draft CS/CA	2	DP T? A?
T74 Assay Existing Training Courses/Material	3	DP T?
T75 Draft Unit R02 TP	10	DP T? A?
T76 Agree Draft TP	2	DP T? A?
T77 Draft Unit R02 PLAN & RS	1	T? A?
T78 Finalise Unit	2	DP T? A?
T79 Assemble And Issue Unit	1	AD
T80 Collect Base Information For Unit	2	T?
T81 Draft Unit R03 CS	4	DP T? A?
T82 Draft Unit R03 CA	6	DP T? A?
T83 Agree Draft CS/CA	2	DP T? A?
T84 Assay Existing Training Courses/Material	3	DP T?
T85 Draft Unit R01 TP	10	DP T? A?
T86 Agree Draft TP	2	DP T? A?
T87 Draft Unit R03 PLAN & RS	1	T? A?
T88 Finalise Unit	2	DP T? A?
T89 Assemble And Issue Unit	1	AD
T90 Collect Base Information For Unit	2	MC
T91 Draft Unit R04 CS	4	DP MC A?
T92 Draft Unit R04 CA	6	DP MC A?
T93 Agree Draft CS/CA	2	DP MC A?
T94 Assay Existing Training Courses/Material	3	DP MC
T95 Draft Unit R04 TP	10	DP MC A?
T96 Agree Draft TP	2	DP MC A?
T97 Draft Unit R04 PLAN & RS	1	MC A?
T98 Finalise Unit	2	DP MC A?
T99 Assemble And Issue Unit	1	AD



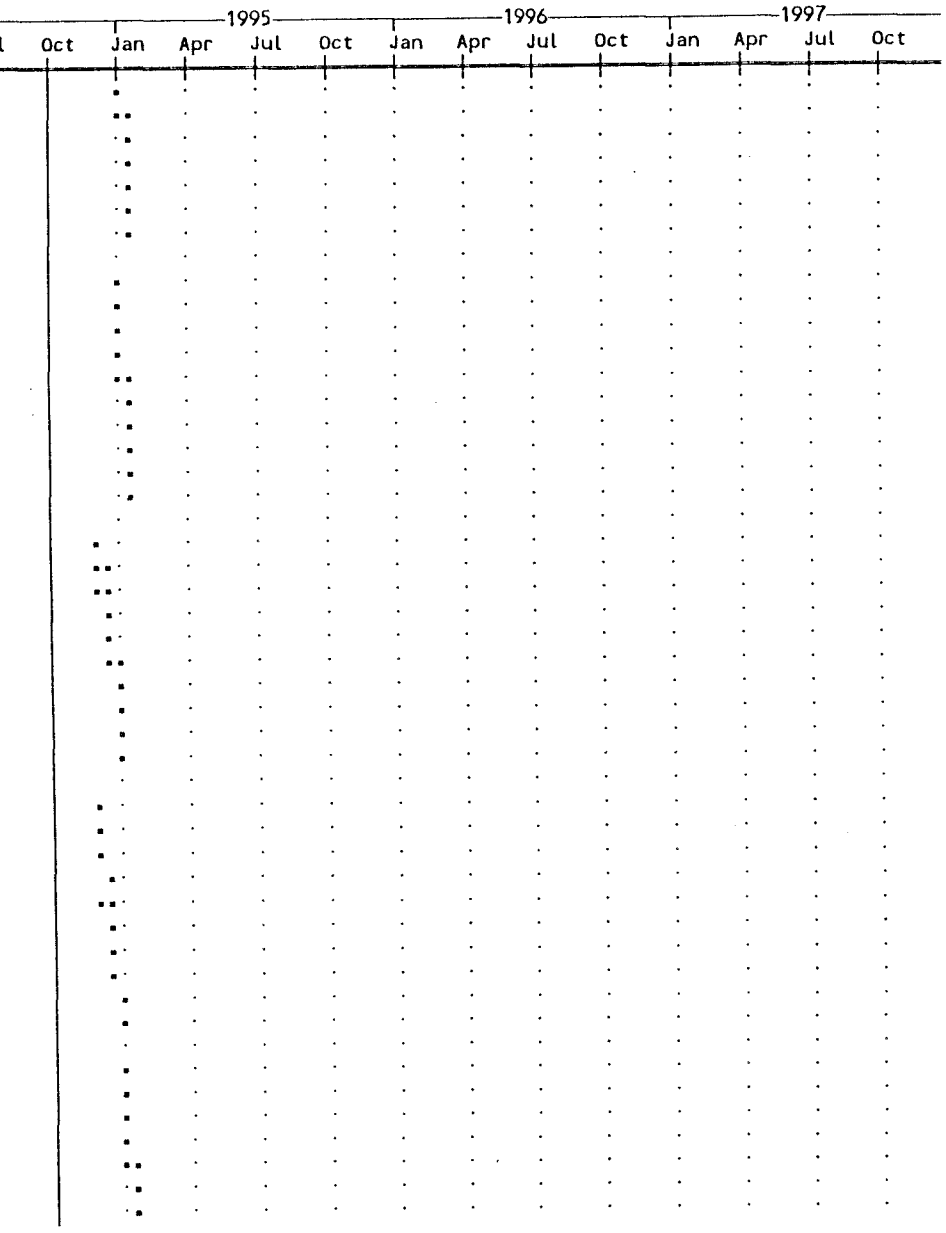
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T110 Collect Base Information For Unit	2	MC
T111 Draft Unit R05 CS	4	DP MC A?
T112 Draft Unit R05 CA	6	DP MC A?
T113 Agree Draft CS/CA	2	DP MC A?
T114 Assay Existing Training Courses/Material	3	DP MC
T115 Draft Unit R05 TP	10	DP MC A?
T116 Agree Draft TP	2	DP MC A?
T117 Draft Unit R05 PLAN & RS	1	MC A?
T118 Finalise Unit	2	DP MC A?
T119 Assemble And Issue Unit	1	AD
T120 Collect Base Information For Unit	2	MC
T121 Draft Unit R06 CS	4	DP MC A?
T122 Draft Unit R06 CA	6	DP MC A?
T123 Agree Draft CS/CA	2	DP MC A?
T124 Assay Existing Training Courses/Material	3	DP MC
T125 Draft Unit R06 TP	10	DP MC A?
T126 Agree Draft TP	2	DP MC A?
T127 Draft Unit R06 PLAN & RS	1	MC A?
T128 Finalise Unit	2	DP MC A?
T129 Assemble And Issue Unit	1	AD
T130 Collect Base Information For Unit	2	CE
T131 Draft Unit R07 CS	4	DP CE A?
T132 Draft Unit R07 CA	6	DP CE A?
T133 Agree Draft CS/CA	2	DP CE A?
T134 Assay Existing Training Courses/Material	3	DP CE
T135 Draft Unit R07 TP	10	DP CE A?
T136 Agree Draft TP	2	DP CE A?
T137 Draft Unit R071 PLAN & RS	1	CE A?
T138 Finalise Unit	2	DP CE A?
T139 Assemble And Issue Unit	1	AD
T140 Collect Base Information For Unit	2	T?
T141 Draft Unit R08 CS	4	DP T? A?
T142 Draft Unit R08 CA	6	DP T? A?
T143 Agree Draft CS/CA	2	DP T? A?
T144 Assay Existing Training Courses/Material	3	DP T?
T145 Draft Unit R08 TP	10	DP T? A?
T146 Agree Draft TP	2	DP T? A?
T147 Draft Unit R08 PLAN & RS	1	T? A?
T148 Finalise Unit	2	DP T? A?
T149 Assemble And Issue Unit	1	AD
T150 Collect Base Information For Unit	2	T?
T151 Draft Unit R09 CS	4	DP T? A?
T152 Draft Unit R09 CA	6	DP T? A?



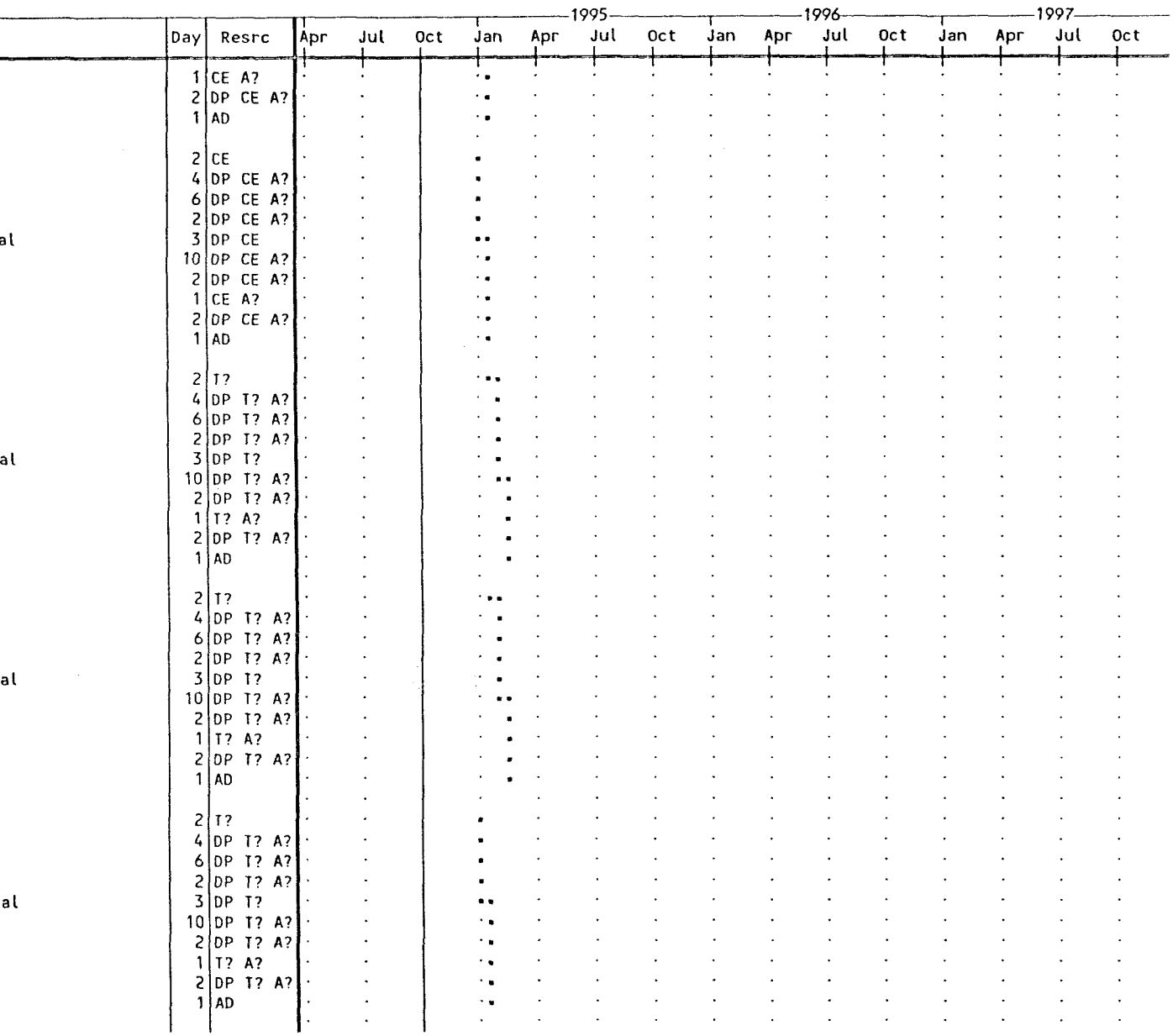
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T153 Agree Draft CS/CA	2	DP T? A?
T154 Assay Existing Training Courses/Material	3	DP T?
T155 Draft Unit R09 TP	10	DP T? A?
T156 Agree Draft TP	2	DP T? A?
T157 Draft Unit R09 PLAN & RS	1	T? A?
T158 Finalise Unit	2	DP T? A?
T159 Assemble And Issue Unit	1	AD
T160 Collect Base Information For Unit	2	MC
T161 Draft Unit R10 CS	4	DP MC A?
T162 Draft Unit R10 CA	6	DP MC A?
T163 Agree Draft CS/CA	2	DP MC A?
T164 Assay Existing Training Courses/Material	3	DP MC
T165 Draft Unit R10 TP	10	DP MC A?
T166 Agree Draft TP	2	DP MC A?
T167 Draft Unit R10 PLAN & RS	1	MC A?
T168 Finalise Unit	2	DP MC A?
T169 Assemble And Issue Unit	1	AD
T170 Collect Base Information For Unit	2	GE
T171 Draft Unit R11 CS	4	DP T? A?
T172 Draft Unit R11 CA	6	DP T? A?
T173 Agree Draft CS/CA	2	DP T? A?
T174 Assay Existing Training Courses/Material	3	DP T?
T175 Draft Unit R11 TP	10	DP T? A?
T176 Agree Draft TP	2	DP T? A?
T177 Draft Unit R11 PLAN & RS	1	T? A?
T178 Finalise Unit	2	DP T? A?
T179 Assemble And Issue Unit	1	AD
T180 Collect Base Information For Unit	2	CE
T181 Draft Unit R12 CS	4	DP CE A?
T182 Draft Unit R12 CA	6	DP CE A?
T183 Agree Draft CS/CA	2	DP CE A?
T184 Assay Existing Training Courses/Material	3	DP CE
T185 Draft Unit R12 TP	10	DP CE A?
T186 Agree Draft TP	2	DP CE A?
T187 Draft Unit R12 PLAN & RS	1	CE A?
T188 Finalise Unit	2	DP CE A?
T189 Assemble And Issue Unit	1	AD
T190 Collect Base Information For Unit	2	CE
T191 Draft Unit R13 CS	4	DP CE A?
T192 Draft Unit R13 CA	6	DP CE A?
T193 Agree Draft CS/CA	2	DP CE A?
T194 Assay Existing Training Courses/Material	3	DP CE
T195 Draft Unit R13 TP	10	DP CE A?
T196 Agree Draft TP	2	DP CE A?



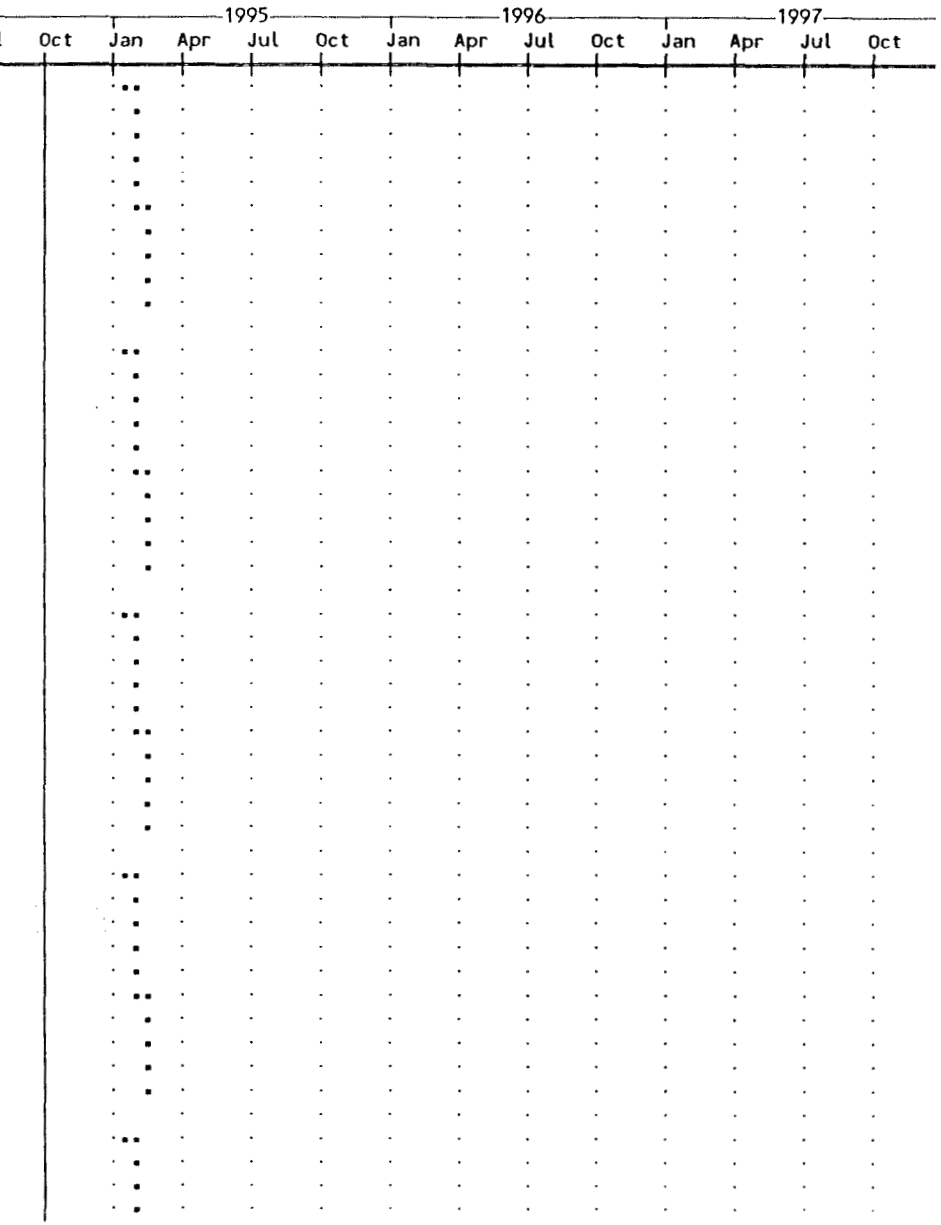
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T197 Draft Unit R13 PLAN & RS	1	CE A?
T198 Finalise Unit	2	DP CE A?
T199 Assemble And Issue Unit	1	AD
T200 Collect Base Information For Unit	2	CE
T201 Draft Unit R14 CS	4	DP CE A?
T202 Draft Unit R14 CA	6	DP CE A?
T203 Agree Draft CS/CA	2	DP CE A?
T204 Assay Existing Training Courses/Material	3	DP CE
T205 Draft Unit R14 TP	10	DP CE A?
T206 Agree Draft TP	2	DP CE A?
T207 Draft Unit R14 PLAN & RS	1	CE A?
T208 Finalise Unit	2	DP CE A?
T209 Assemble And Issue Unit	1	AD
T210 Collect Base Information For Unit	2	T?
T211 Draft Unit R15 CS	4	DP T? A?
T212 Draft Unit R15 CA	6	DP T? A?
T213 Agree Draft CS/CA	2	DP T? A?
T214 Assay Existing Training Courses/Material	3	DP T?
T215 Draft Unit R15 TP	10	DP T? A?
T216 Agree Draft TP	2	DP T? A?
T217 Draft Unit R15 PLAN & RS	1	T? A?
T218 Finalise Unit	2	DP T? A?
T219 Assemble And Issue Unit	1	AD
T220 Collect Base Information For Unit	2	T?
T221 Draft Unit R16 CS	4	DP T? A?
T222 Draft Unit R16 CA	6	DP T? A?
T223 Agree Draft CS/CA	2	DP T? A?
T224 Assay Existing Training Courses/Material	3	DP T?
T225 Draft Unit R16 TP	10	DP T? A?
T226 Agree Draft TP	2	DP T? A?
T227 Draft Unit R16 PLAN & RS	1	T? A?
T228 Finalise Unit	2	DP T? A?
T229 Assemble And Issue Unit	1	AD
T230 Collect Base Information For Unit	2	T?
T231 Draft Unit R17 CS	4	DP T? A?
T232 Draft Unit R17 CA	6	DP T? A?
T233 Agree Draft CS/CA	2	DP T? A?
T234 Assay Existing Training Courses/Material	3	DP T?
T235 Draft Unit R17 TP	10	DP T? A?
T236 Agree Draft TP	2	DP T? A?
T237 Draft Unit R17 PLAN & RS	1	T? A?
T238 Finalise Unit	2	DP T? A?
T239 Assemble And Issue Unit	1	AD



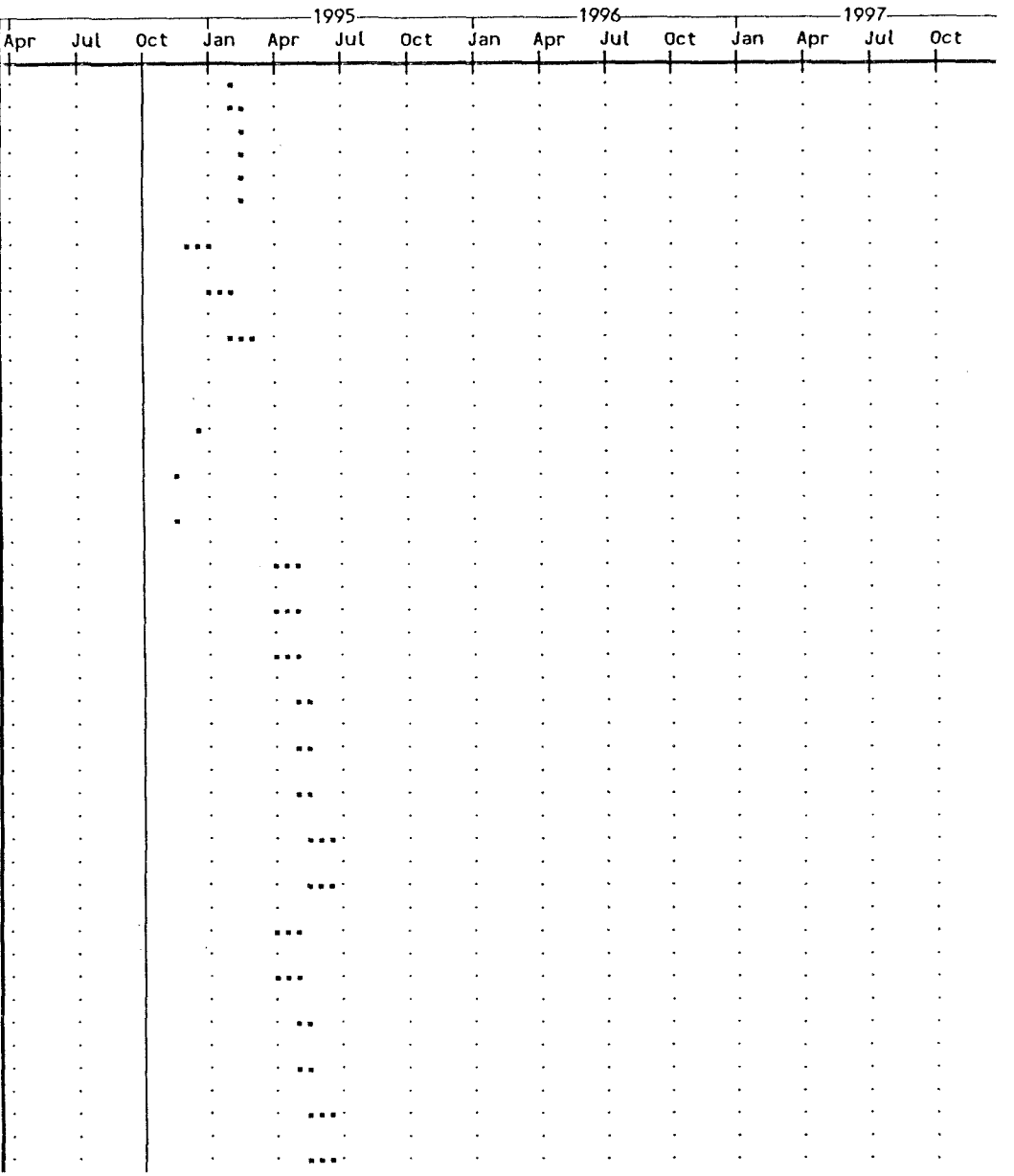
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T240 Collect Base Information For Unit	2	T?
T241 Draft Unit R18 CS	4	DP T? A?
T242 Draft Unit R18 CA	6	DP T? A?
T243 Agree Draft CS/CA	2	DP T? A?
T244 Assay Existing Training Courses/Material	3	DP T?
T245 Draft Unit R18 TP	10	DP T? A?
T246 Agree Draft TP	2	DP T? A?
T247 Draft Unit R18 PLAN & RS	1	T? A?
T248 Finalise Unit	2	DP T? A?
T249 Assemble And Issue Unit	1	AD
T250 Collect Base Information For Unit	2	T?
T251 Draft Unit R19 CS	4	DP T? A?
T252 Draft Unit R19 CA	6	DP T? A?
T253 Agree Draft CS/CA	2	DP T? A?
T254 Assay Existing Training Courses/Material	3	DP T?
T255 Draft Unit R19 TP	10	DP T? A?
T256 Agree Draft TP	2	DP T? A?
T257 Draft Unit R19 PLAN & RS	1	T? A?
T258 Finalise Unit	2	DP T? A?
T259 Assemble And Issue Unit	1	AD
T260 Collect Base Information For Unit	2	T?
T261 Draft Unit R20 CS	4	DP T? A?
T262 Draft Unit R20 CA	6	DP T? A?
T263 Agree Draft CS/CA	2	DP T? A?
T264 Assay Existing Training Courses/Material	3	DP T?
T265 Draft Unit R20 TP	10	DP T? A?
T266 Agree Draft TP	2	DP T? A?
T267 Draft Unit R20 PLAN & RS	1	T? A?
T268 Finalise Unit	2	DP T? A?
T269 Assemble And Issue Unit	1	AD
T270 Collect Base Information For Unit	2	CE
T271 Draft Unit R60 CS	4	DP CE A?
T272 Draft Unit R60 CA	6	DP CE A?
T273 Agree Draft CS/CA	2	DP OR A?
T274 Assay Existing Training Courses/Material	3	DP OR
T275 Draft Unit R60 TP	10	DP OR A?
T276 Agree Draft TP	2	DP OR A?
T277 Draft Unit R60 PLAN & RS	1	OR A?
T278 Finalise Unit	2	DP OR A?
T279 Assemble And Issue Unit	1	AD
T280 Collect Base Information For Unit	2	CE
T281 Draft Unit R61 CS	4	DP CE A?
T282 Draft Unit R61 CA	6	DP CE A?
T283 Agree Draft CS/CA	2	DP OR A?



NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T284 Assay Existing Training Courses/Material	3	DP OR
T285 Draft Unit R61 TP	10	DP OR A?
T286 Agree Draft TP	2	DP OR A?
T287 Draft Unit R61 PLAN & RS	1	OR A?
T288 Finalise Unit	2	DP OR A?
T289 Assemble And Issue Unit	1	AD
T300-1 Produce Maintenance Skills Unit R30-1	30	DP T? A?
T300-2 Produce Maintenance Skills Unit R30-2	30	DP T? A?
T300-3 Produce Maintenance Skills Unit R30-3	30	DP T? A?
A9 PRODUCE SECONDARY STAGE II TRAINING DOCUMENTATION		
T1 Revise UDT Program	2	PR
T5 Produce Unit R81	15	DP T? A?
T10 Produce Unit R82	15	DP T? A?
T15 Produce Unit R23	30	DP T? A?
T20 Produce Unit R62	30	DP T? A?
T30 Produce Unit R63	30	DP T? A?
T40 Produce Unit R64	30	DP T? A?
T50 Produce Unit R21	30	DP T? A?
T60 Produce Unit R22	30	DP T? A?
T70 Produce Unit R65	30	DP T? A?
T80 Produce Unit R66	30	DP T? A?
T30-4 Produce Maintenance Skills Unit R30-4	30	DP T? A?
T30-5 Produce Maintenance Skills Unit R30-5	30	DP T? A?
T30-6 Produce Maintenance Skills Unit R30-6	30	DP T? A?
T30-7 Produce Maintenance Skills Unit R30-7	30	DP T? A?
T30-8 Produce Maintenance Skills Unit R30-8	30	DP T? A?
T30-9 Produce Maintenance Skills Unit R30-9	30	DP T? A?



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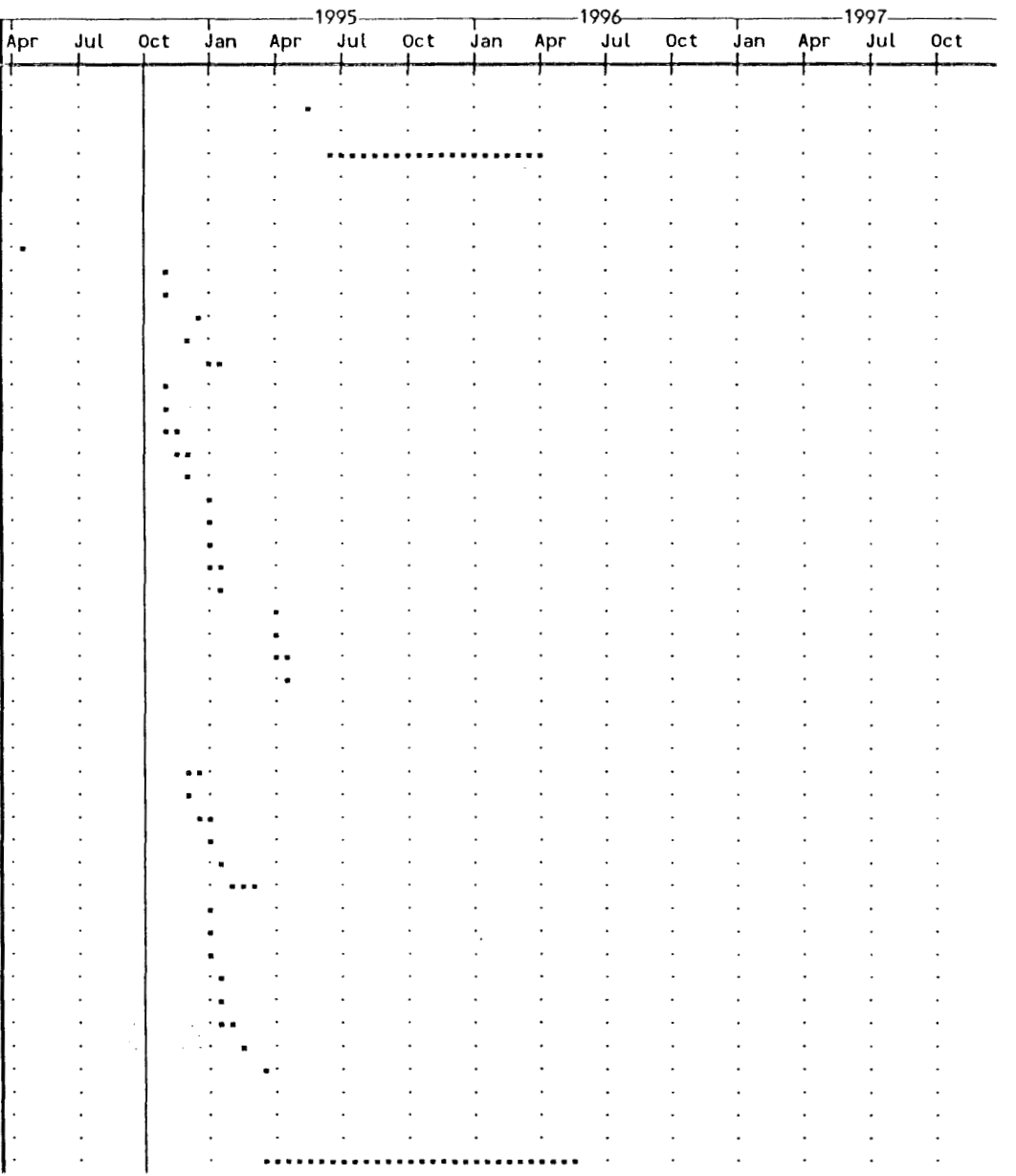
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T100 Rewrite UDT Program	10	PR
T110 Ongoing Unit Production (15)	310	DP T? A?
A10 PREPARE HUMAN RESOURCES FOR TRAINING		
T5 Arrange Trainer Training	4	DP AD
T10 Prepare Competence Team Induction	2	KB
T15 Run 1st Competence Team Induction	1	KB
T16 Run 2nd Competence Team Induction	1	KB
T17 Induct UDT Members	1	KB DP
T18 Liaison With Oak Ridge On R60 Series Unit Prep`n & Trng	8	DP TD CE
T20 Train 1st Intake "External" Trainers In NCPP Systems	2	TD
T30 Train 1st Intake MSC Trainers On Tng/Asmt Systems	3	TD
T40 Train 1st Intake MSC Trnrs On Instruct`l Techniques	5	TD ET
T50 Train 1st Intake MSC Trainers On Decontam Methods	21	AR MC GE
T60 Accredit 1st Intake Trained Trainers	2	DP ET
T70 Train 2nd Intake "External" Trainers In NCPP Systems	2	TD
T80 Train 2nd Intake MSC Trainers On Tng/Asmt Systems	3	TD
T90 Train 2nd Intake MSC Trnrs On Instruct`l Techniques	5	TD ET
T100 Train 2nd Intake MSC Trainers On Decontam Methods	21	AR MC GE
T110 Accredit 2nd Intake Trained Trainers	2	DP ET
T120 Train 3rd Intake MSC Trainers On Tng/Asmt Systems	3	TD
T130 Train 3rd Intake MSC Trnrs On Instruct`l Techniques	5	TD ET
T140 Train 3rd Intake MSC Trainers On Decontam Methods	21	AR MC GE
T150 Accredit 3rd Intake Trained Trainers	2	DP ET
A11 TRAINING DELIVERY PREPARATIONS		
T10 Draft Program for B865 Pilot Training	2	PR
T20 Prepare Training Zone In B865	3	T?
T30 Pilot Decontamination Training	3	T?
T40 Prepare Training Zones Other Buildings	5	T?
T50 Obtain Authority To Progress	1	DF
T60 Procure Training Materials	0	TD T?
T70 Re-write Stage II Training Delivery Program	3	PR
T80 Draft Personal Trng Prog Decon Teams #1, #2 & #3	3	PR
T90 Draft Personal Trng Prog D&PV, WC And CC Teams	2	PR
T100 Draft Pers`l Trng Prog Decon Teams 4, 5 & 6	2	PR
T110 Draft Pers`l Trng Prog Decon Teams 7, 8, 9 & 10	2	PR
T120 Draft Pers`l Trng Prog Decon Teams 11, 12, 13 & 14	2	PR
T160 Revise Pers Trg Prog For First 8 Teams	2	PR
T170 Revise Pers Trg Prog Last 7 Teams	2	PR
A12 ROUTINE MGT OF COMPETENCE PROGRAM		
T10 General/Ongoing Management	530	KB DP TD



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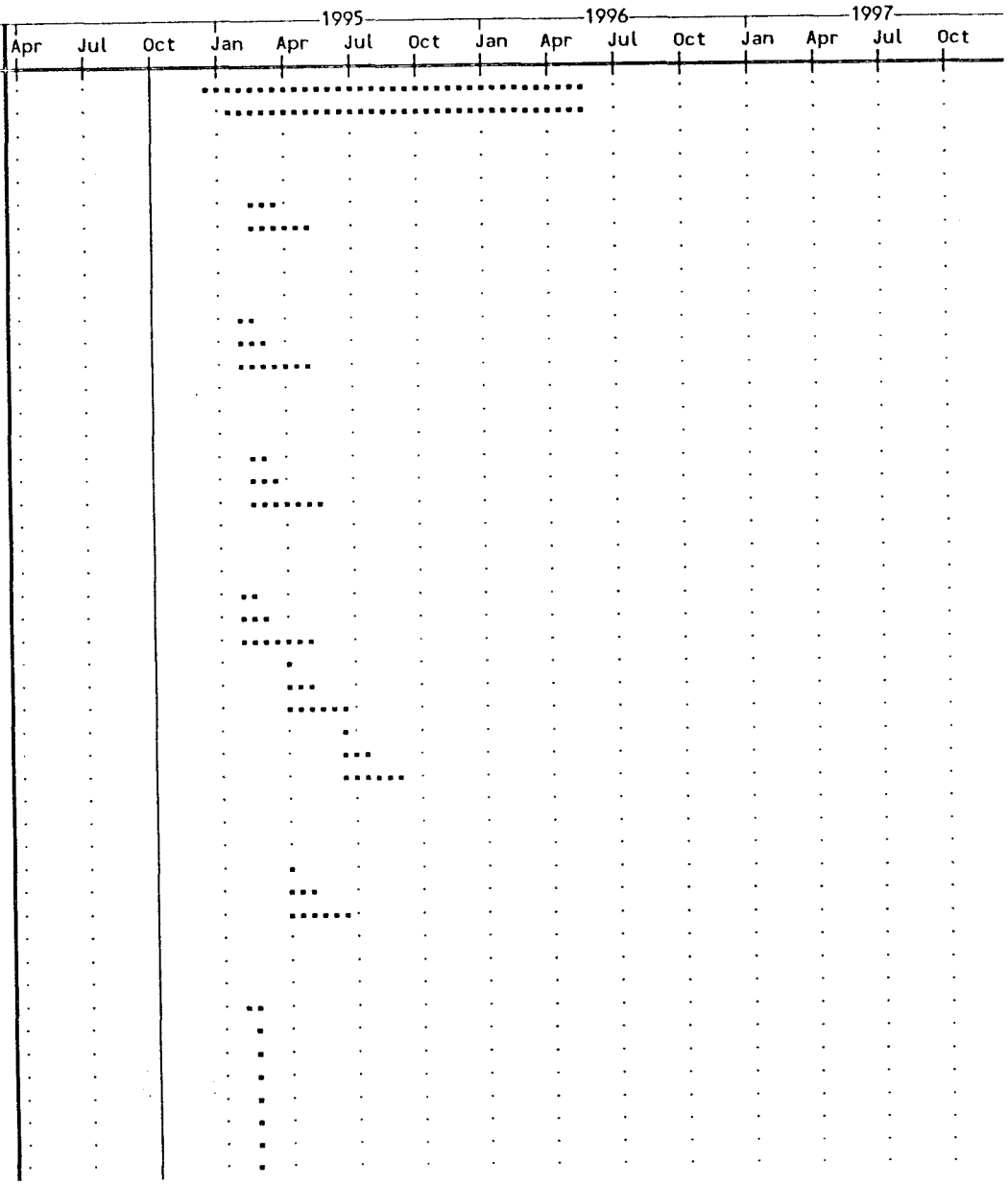
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T20 Administration	350	AD
T30 Planning	300	PR
A13 SENIOR MANAGER TRAINING		
T10 Safety Training (c/w T4 to T9 of A18 & 19)	0	X
T20 Tech`l Appr`n (c/w Series R10/20/30/60 Units For Tmwkrs)	0	X
A14 MANAGER TRAINING		
T10 Induction (c/w T1 to T3 of A18 to A21)	0	X
T20 Safety Training (c/w T4 to T9 of A18 to A22)	0	X
T30 Tech`l Appr`n (c/w Series R10/20/30/60 Units For Tmwkrs)	0	X
A15 TECHNOLOGIST TRAINING		
T10 Induction (c/w T1 to T3 of A21 to A24)	0	X
T20 Safety Training (c/w T4 to T9 of A21 to A24)	0	X
T30 Tech`l Appr`n (c/w Series R10/20/30/60 Units For Tmwkrs)	0	X
A16 TEAM LEADER TRAINING		
T10 1st Intake Induction (c/w T1 to T3 of A18 to A20)	0	X
T20 1st Intake Safety Trng (c/w T4 to T9 of A18 to A20)	0	X
T30 1st Intake Tech`l Appr`n (c/w R-Unit Trng For Tmwkrs)	0	X
T40 2nd Intake Induction (c/w T1 to T3 of A24 to A27)	0	X
T50 2nd Intake Safety Trng (c/w T4 to T9 of A24 to A27)	0	X
T60 2nd Intake Tech`l Appr`n (c/w R-Unit Trng For Tmwkrs)	0	X
T70 3rd Intake Induction (c/w T1 to T3 of A31 to A34)	0	X
T80 3rd Intake Safety Trng (c/w T4 to T9 of A31 to A34)	0	X
T90 3rd Intake Tech`l Appr`n (c/w R-Unit Trng For Tmwkrs)	0	X
A17 TEAM ASSISTANTS TRAINING		
T10 Induction (c/w T1 to T3 of A24 to A27)	0	X
T20 Safety Training (c/w T4 to T9 of A24 to A27)	0	X
T30 Tech`l Apprec`n (c/w R10 R20 R30 & R60 Units For Tmwkrs)	0	X
A18 DECON TEAM #1 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?



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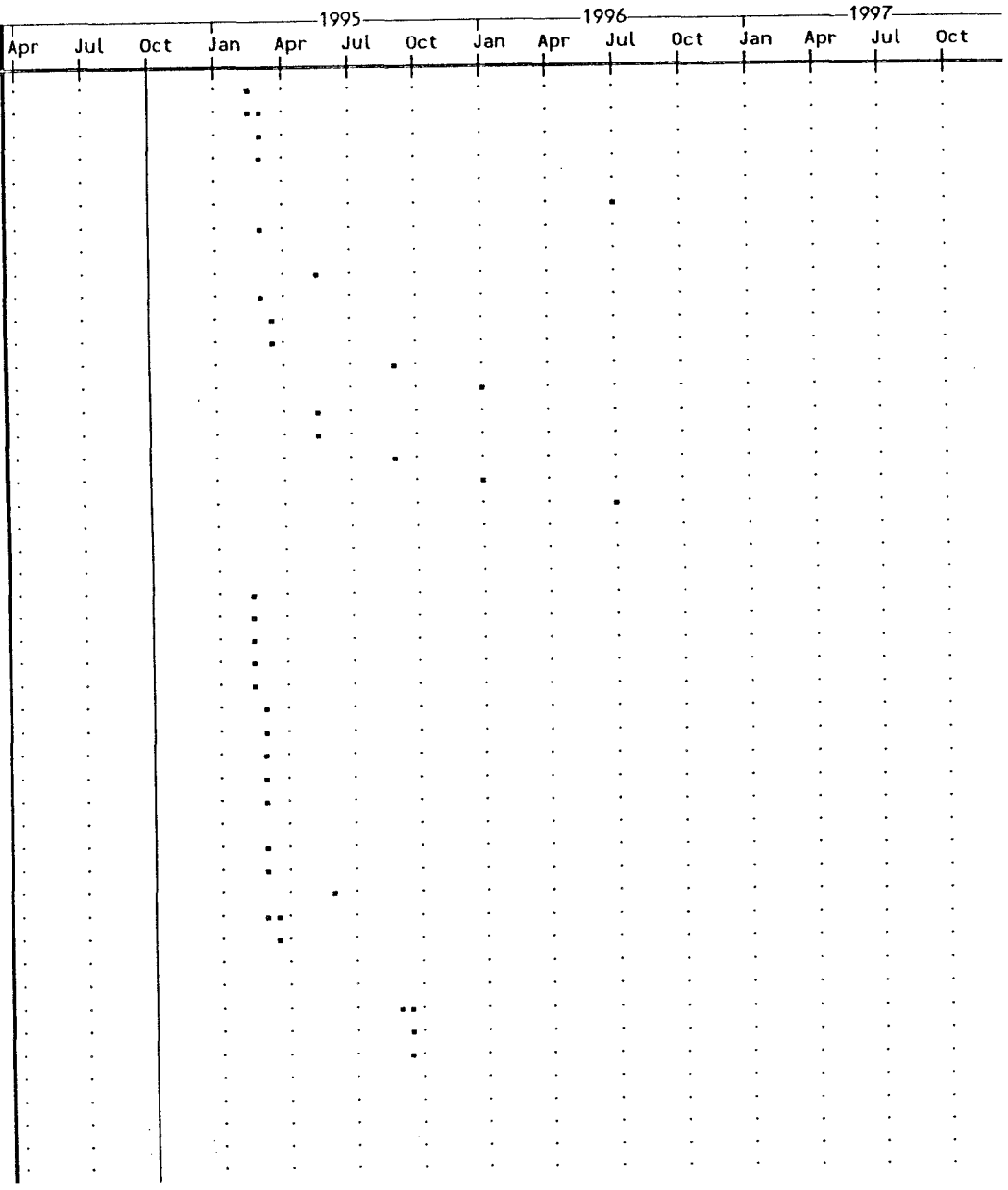
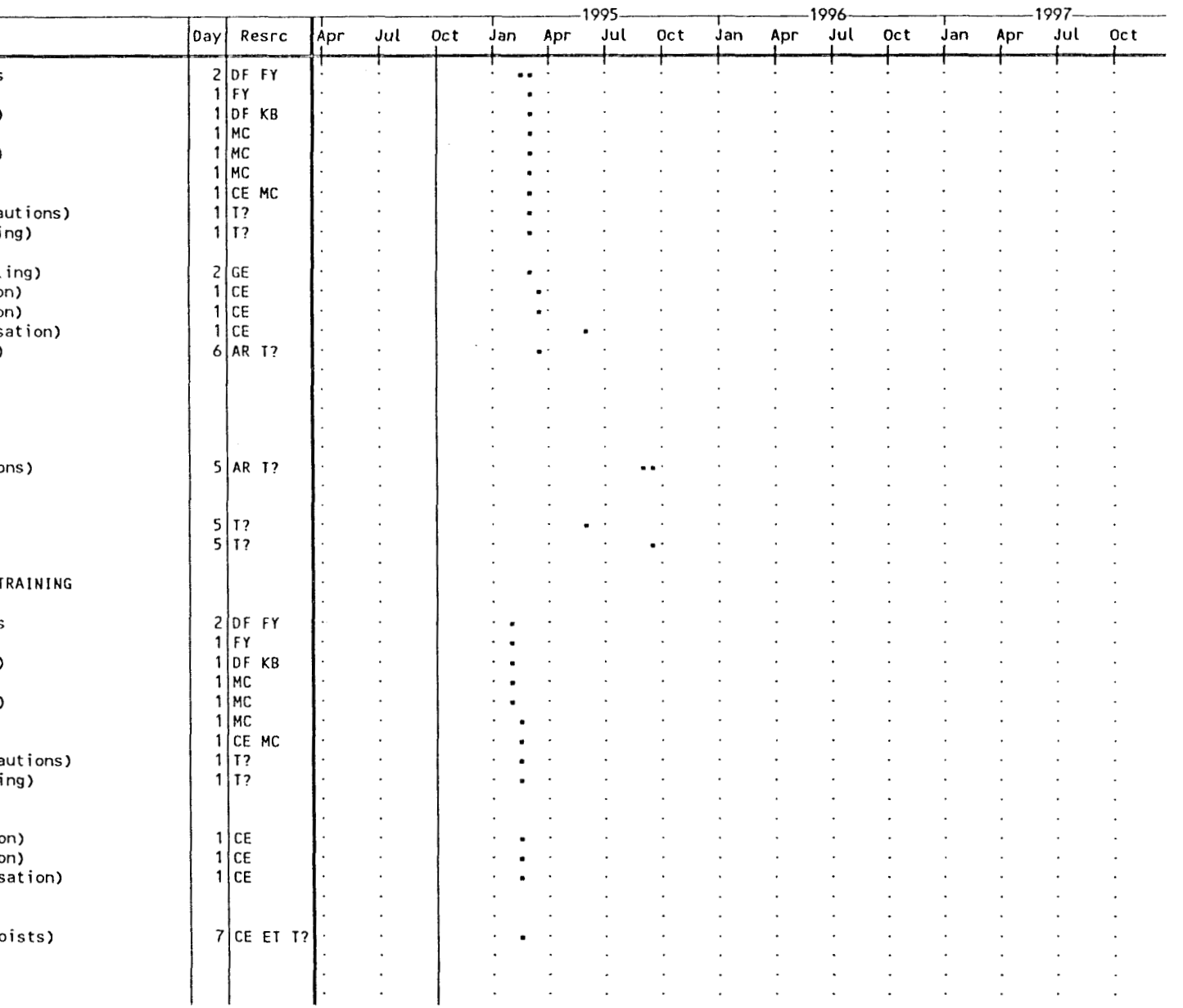
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T12 Run Unit R12 (Bldg 865 Familiarisation)	1	CE
T14 Run Unit R14 (Bldg 444/447 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T18 Run Unit R18 (Dismantling Using Tools)	2	AR T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T22 Run Unit R22 (Making And Dismantling Metal Jts)	1	T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
T30/B Building Maintenance Skills Training	2	T?
A19 CONTAM CONTROL TEAM TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T12 Run Unit R12 (Bldg 865 Familiarisation)	1	CE
T13 Run Unit R13 (Bldg 883 Familiarisation)	1	CE
T14 Run Unit R14 (Bldg 444/447 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T16 Run Unit R16 (Safe Means Of Access)	3	T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
A20 WASTE CONTROL TEAM TRAINING		



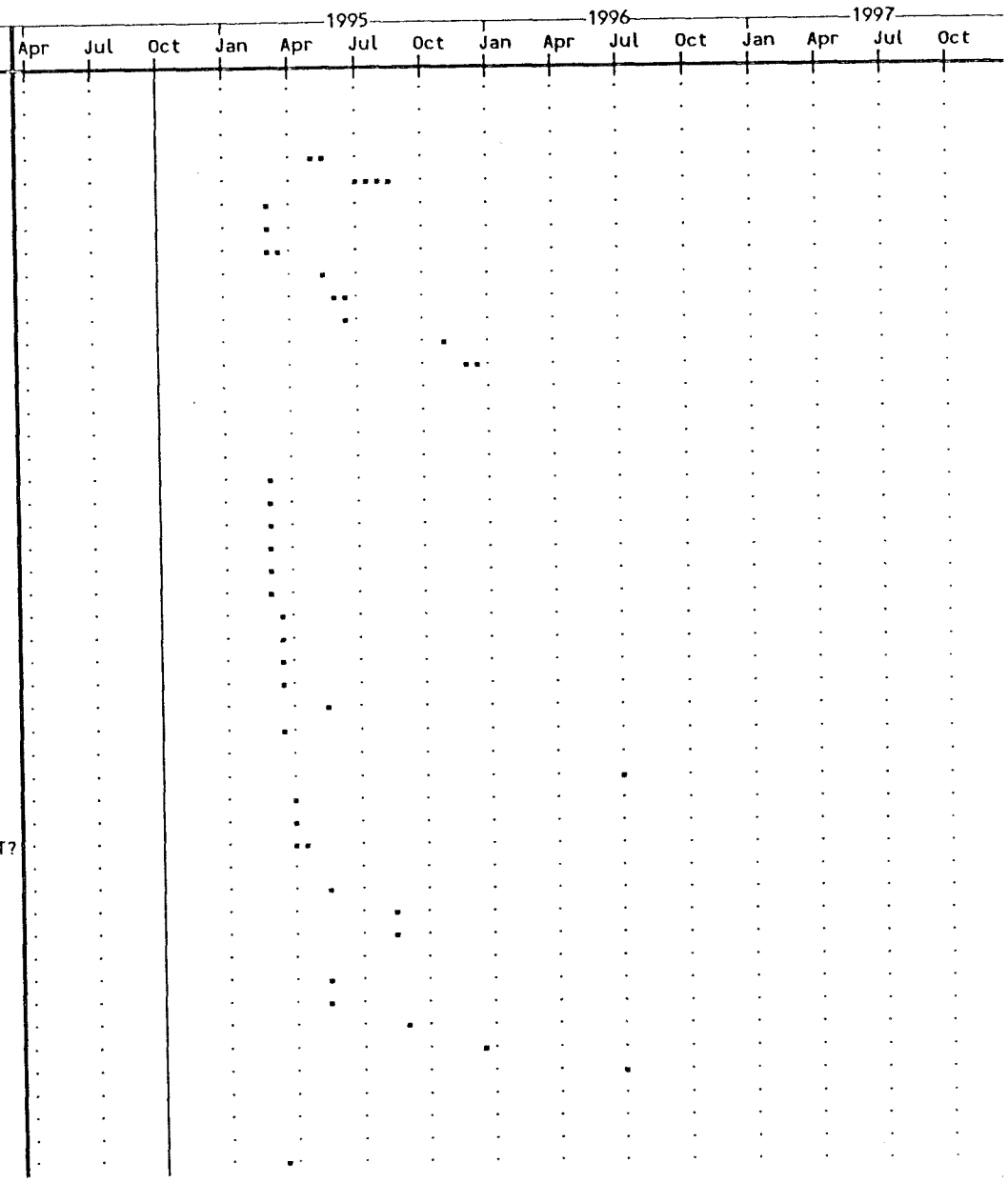
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T12 Run Unit R12 (Bldg 865 Familiarisation)	1	CE
T13 Run Unit R13 (Bldg 883 Familiarisation)	1	CE
T14 Run Unit R14 (Bldg 444/447 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
A21 DECLASSIF`N AND PRODUCT VERIF`N TEAM TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T12 Run Unit R12 (Bldg 865 Familiarisation)	1	CE
T13 Run Unit R13 (Bldg 883 Familiarisation)	1	CE
T14 Run Unit R14 (Bldg 444/447 Familiarisation)	1	CE
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?



NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T30/1 Maintenance Skills Training	10	T?
T30/2 Maintenance Skills Training	12	T?
T59 D&PV Team Transfer To Oak Ridge	3	AD TW
T60 Run Unit R60 (Beryllium Pre-casting Operations)	5	OR
T61 Run Unit R61 (Beryllium Casting)	5	OR
T62 Run Unit R62 (Steel Melting)	5	OR
T63 Run Unit R63 (Uranium Melting)	5	OR
T65 Run Unit R64 (Aluminum Melting)	3	OR
T65 Run Unit R65 (Hyrdrospin Operations)	5	CE
T66 Run Unit R66 (Test Waste Container Fabrication)	5	CE
A22 DECON TEAM #2 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T12 Run Unit R12 (Bldg 865 Familiarisation)	1	CE
T14 Run Unit R14 (Bldg 444/447 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T16 Run Unit R16 (Safe Means Of Access)	3	T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
T30/B Building Maintenance Skills Training	2	T?
A23 DECON TEAM #3 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY



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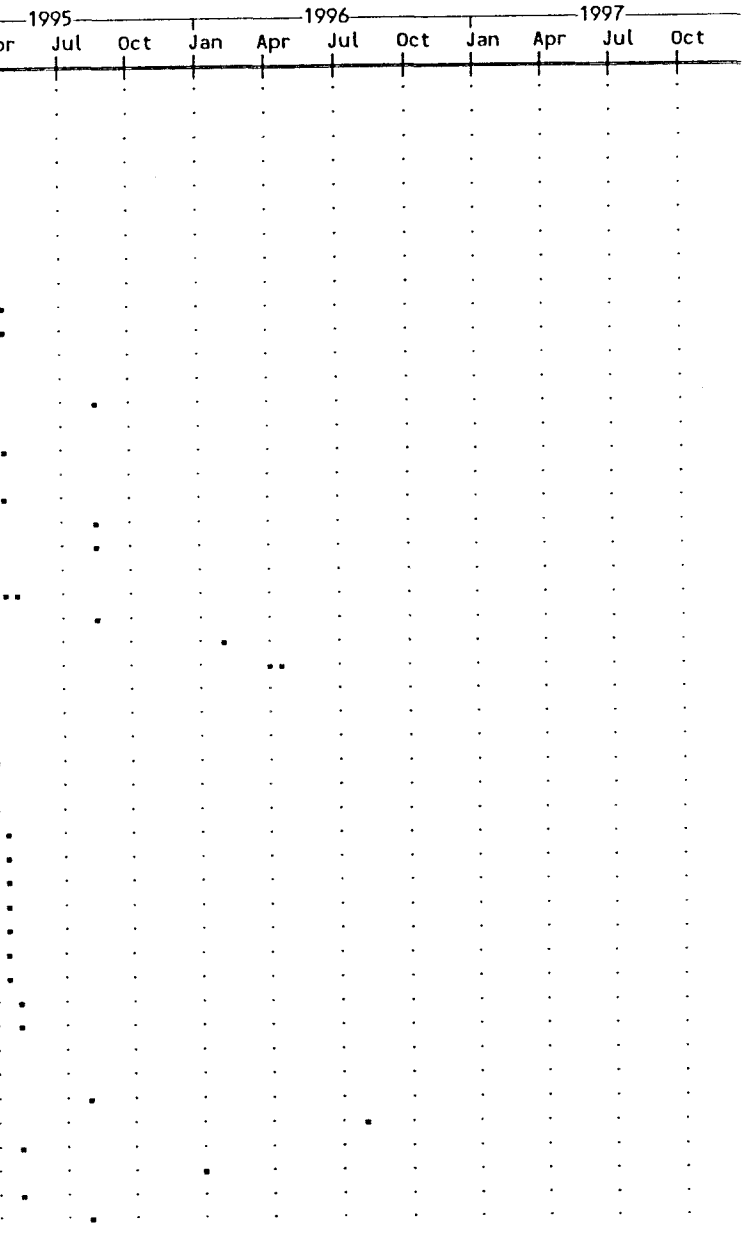
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T12 Run Unit R12 (Bldg 865 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
A24 DECON TEAM #4 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T12 Run Unit R12 (Bldg 865 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T16 Run Unit R16 (Safe Means Of Access)	3	T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T18 Run Unit R18 (Dismantling Using Tools)	2	AR T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?



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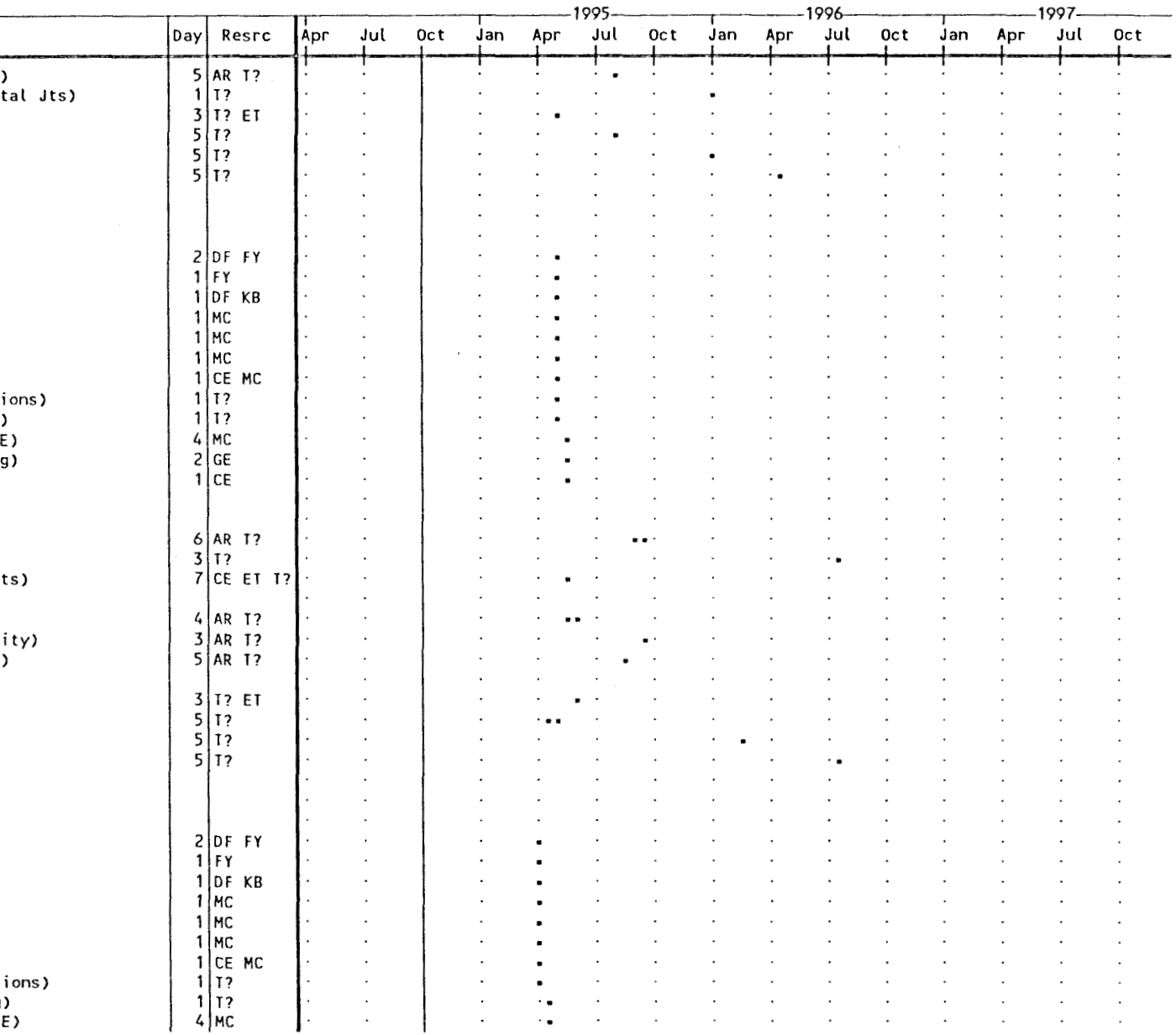
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T22 Run Unit R22 (Making And Dismantling Metal Jts)	1	T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
A25 DECON TEAM #5 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T12 Run Unit R12 (Bldg 865 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T16 Run Unit R16 (Safe Means Of Access)	3	T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
A26 DECON TEAM #6 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC



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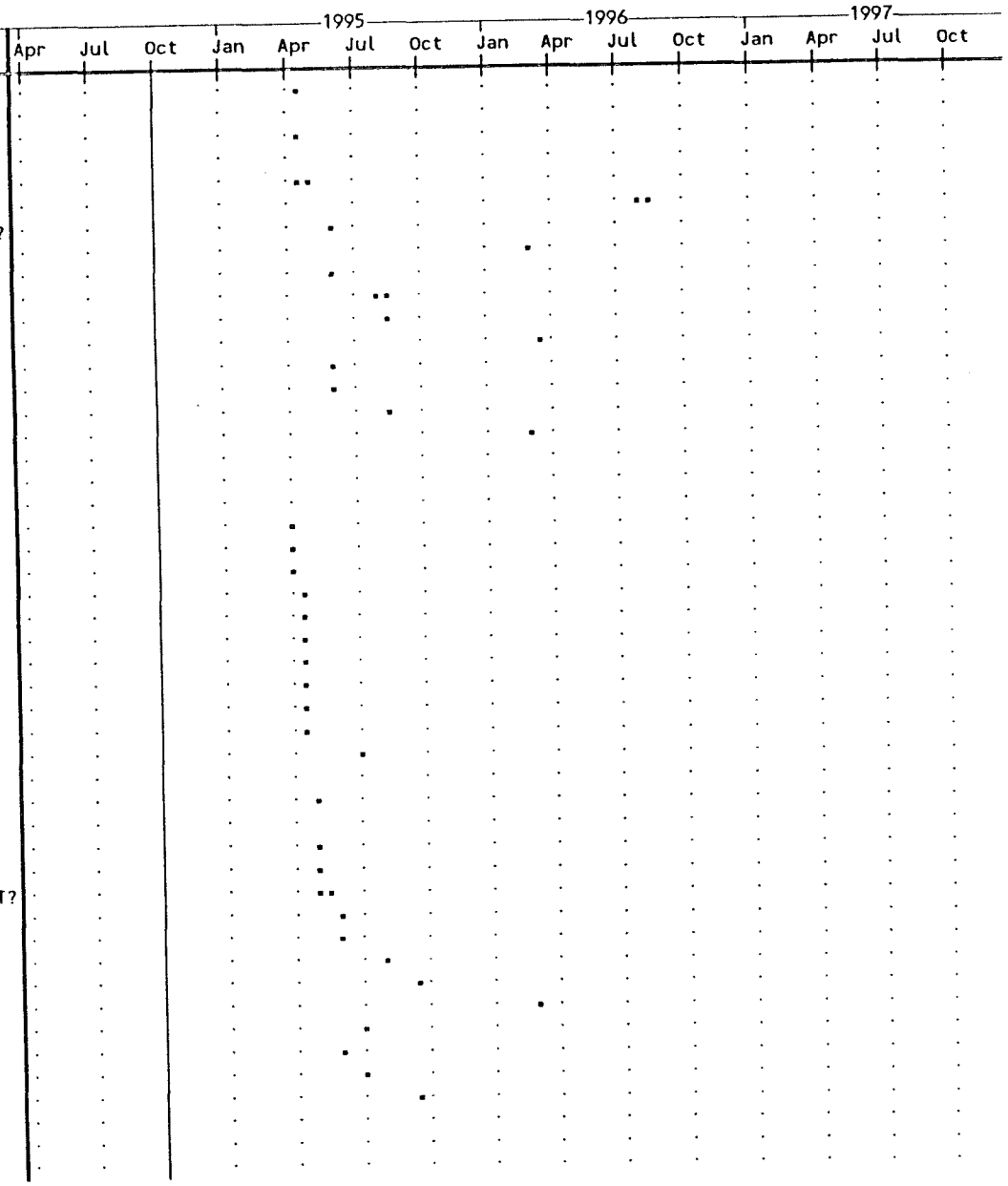
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T13 Run Unit R13 (Bldg 883 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T16 Run Unit R16 (Safe Means Of Access)	3	T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T18 Run Unit R18 (Dismantling Using Tools)	2	AR T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T22 Run Unit R22 (Making And Dismantling Metal Jts)	1	T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
A27 DECON TEAM #7 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T13 Run Unit R13 (Bldg 883 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T16 Run Unit R16 (Safe Means Of Access)	3	T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T18 Run Unit R18 (Dismantling Using Tools)	2	AR T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T22 Run Unit R22 (Making And Dismantling Metal Jts)	1	T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
A28 DECON TEAM #8 TRAINING		



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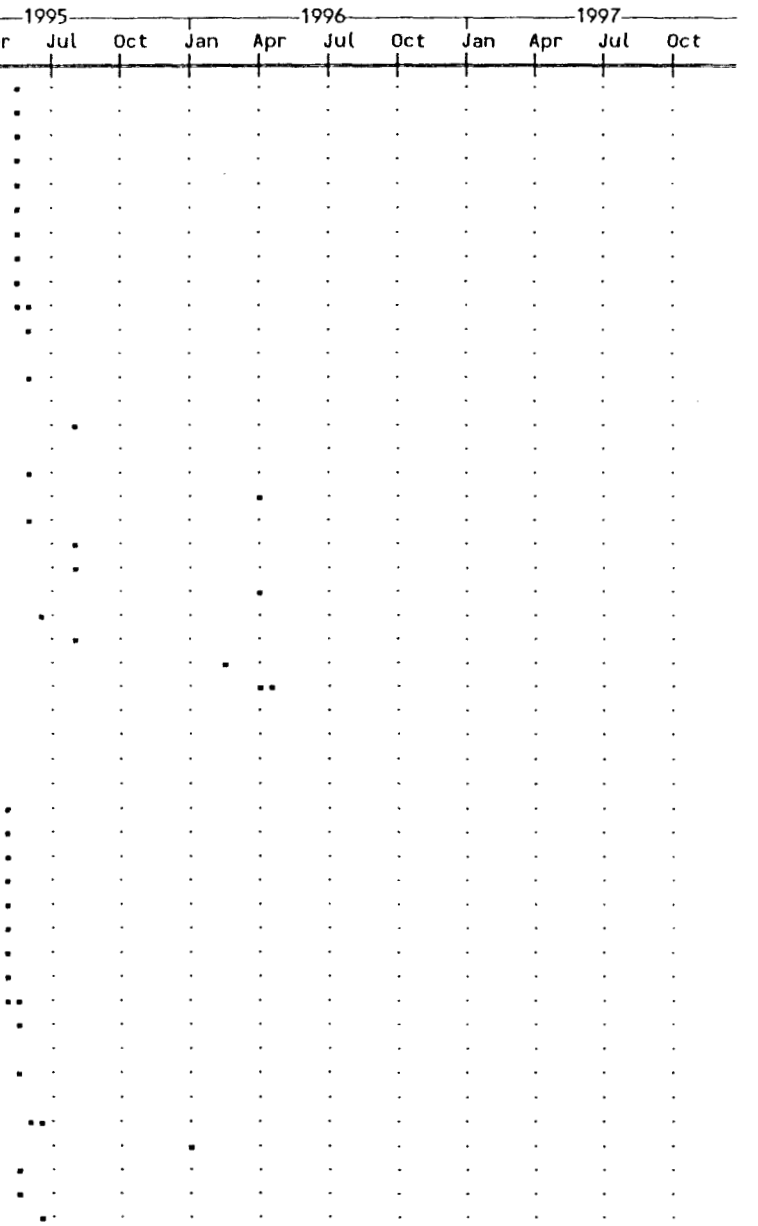
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T13 Run Unit R13 (Bldg 883 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T18 Run Unit R18 (Dismantling Using Tools)	2	AR T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T22 Run Unit R22 (Making And Dismantling Metal Jts)	1	T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
A29 DECON TEAM #9 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T13 Run Unit R13 (Bldg 883 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T16 Run Unit R16 (Safe Means Of Access)	3	T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T18 Run Unit R18 (Dismantling Using Tools)	2	AR T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?



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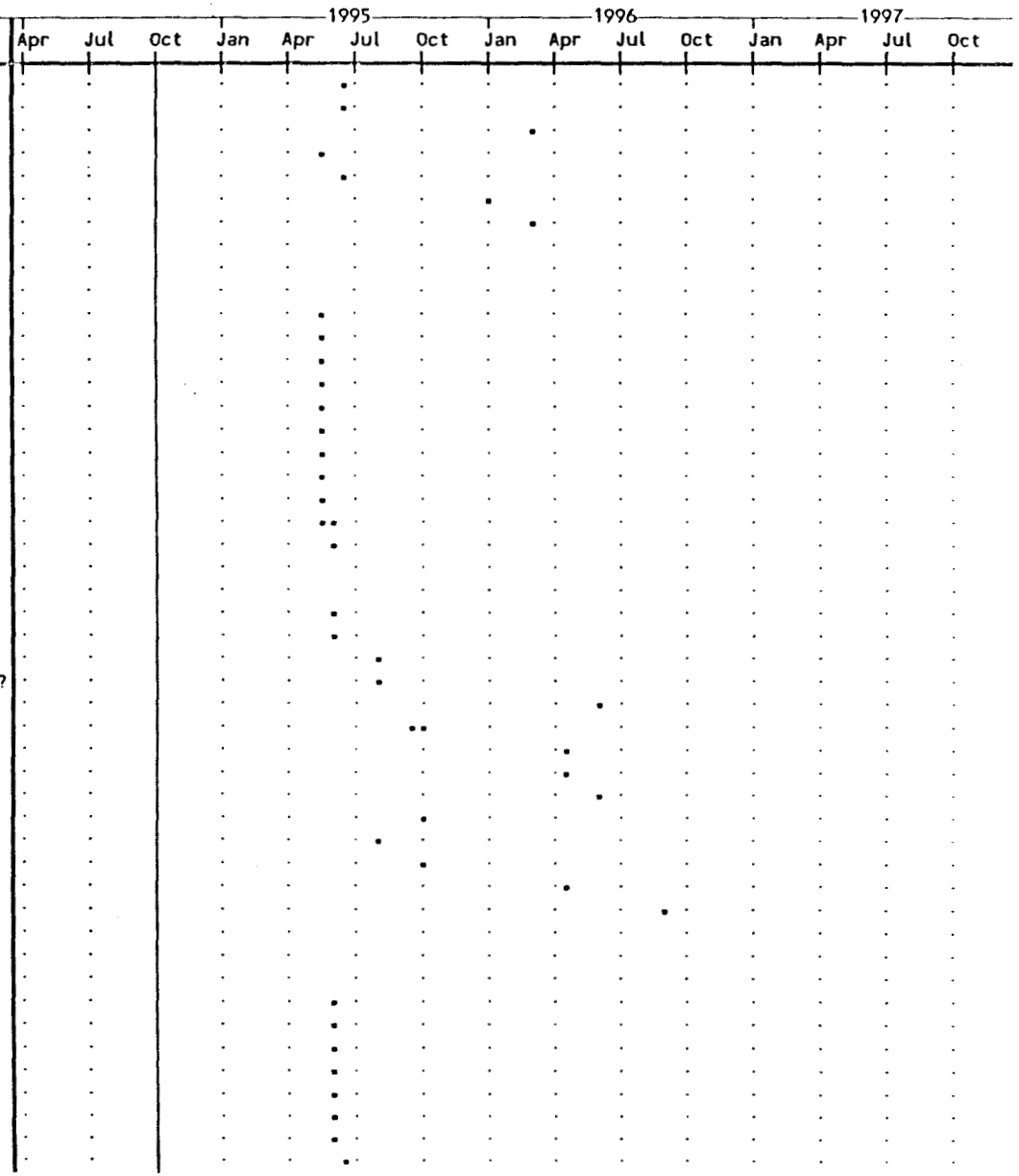
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T22 Run Unit R22 (Making And Dismantling Metal Jts)	1	T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
A30 DECON TEAM #10 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T14 Run Unit R14 (Bldg 444/447 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T16 Run Unit R16 (Safe Means Of Access)	3	T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T18 Run Unit R18 (Dismantling Using Tools)	2	AR T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T22 Run Unit R22 (Making And Dismantling Metal Jts)	1	T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
T30/B Building Maintenance Skills Training	2	T?
A31 DECON TEAM #11 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?



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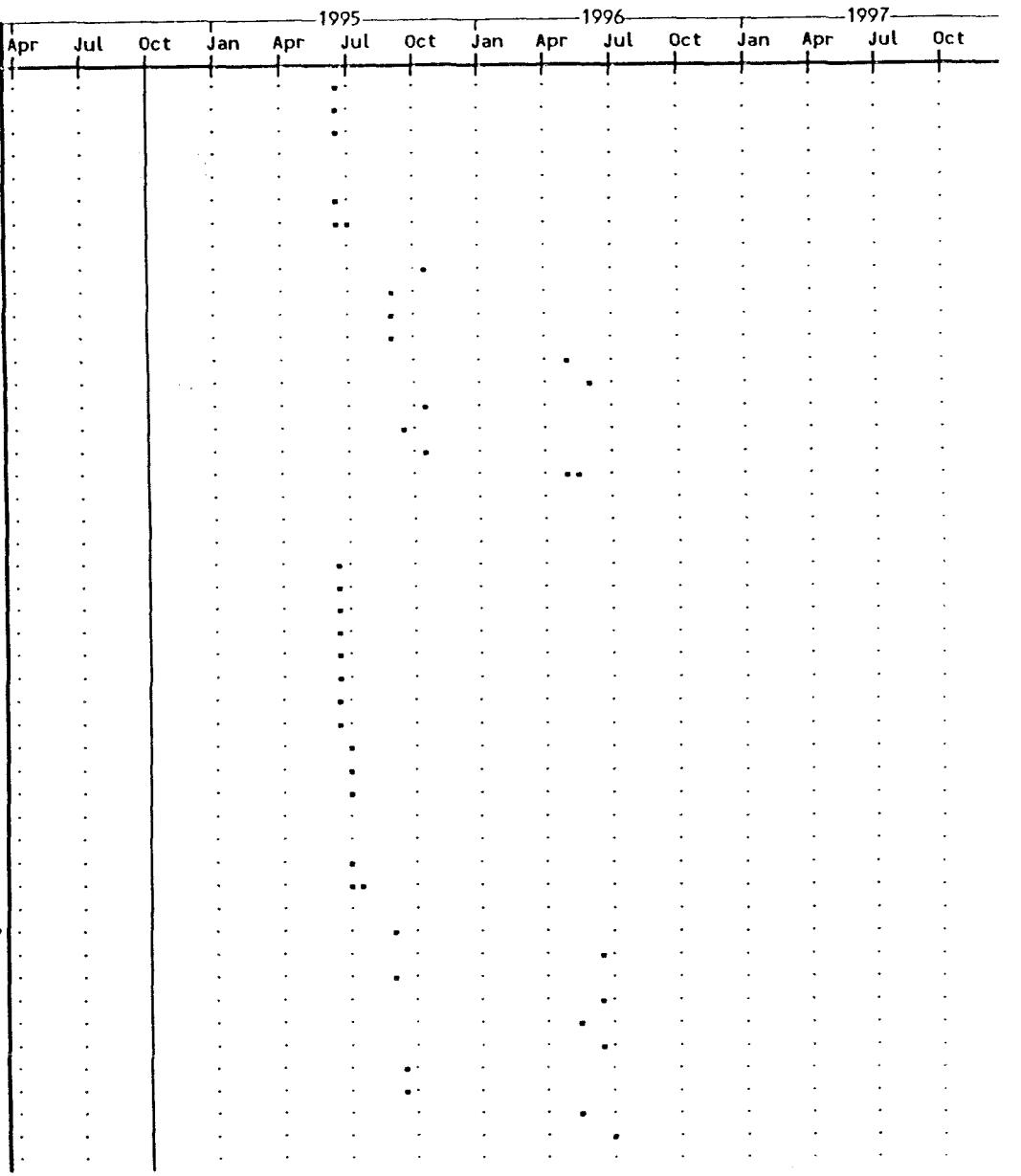
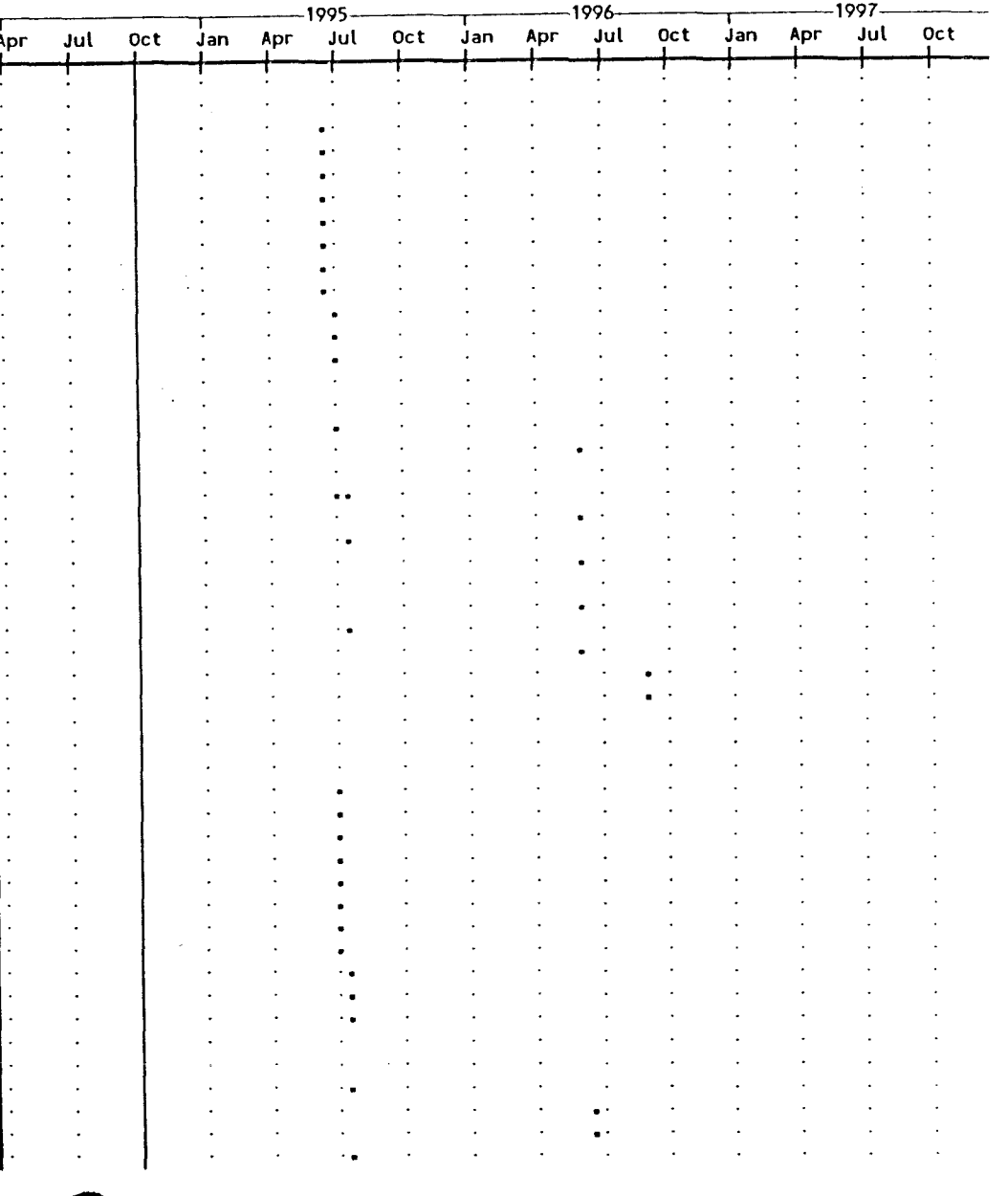
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T14 Run Unit R14 (Bldg 444/447 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T18 Run Unit R18 (Dismantling Using Tools)	2	AR T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T22 Run Unit R22 (Making And Dismantling Metal Jts)	1	T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?
A32 DECON TEAM #12 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T14 Run Unit R14 (Bldg 444/447 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T18 Run Unit R18 (Dismantling Using Tools)	2	AR T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T21 Run Unit R21 (Advanced Decon Operations)	5	AR T?
T22 Run Unit R22 (Making And Dismantling Metal Jts)	1	T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/3 Maintenance Skills Training	5	T?



NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
A33 DECON TEAM #13 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T14 Run Unit R14 (Bldg 444/447 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?
T18 Run Unit R18 (Dismantling Using Tools)	2	AR T?
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T20 Run Unit R20 (Oper`n Of The Decon Facility)	3	AR T?
T22 Run Unit R22 (Making And Dismantling Metal Jts)	1	T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/B Building Maintenance Skills Training	2	T?
A34 DECON TEAM #14 TRAINING		
T1 Run Unit R01 (NCPP Culture)/Agree PCPs	2	DF FY
T2 Run Unit R02 (MSC Business Awareness)	1	FY
T3 Run Unit R03 (The Teamworking Concept)	1	DF KB
T4 Run Unit R04 (Emergency Response)	1	MC
T5 Run Unit R05 (Reg`ns In The Workplace)	1	MC
T6 Run Unit R06 (Radiological Safety)	1	MC
T7 Run Unit R07 (Beryllium Safety)	1	CE MC
T8 Run Unit R08 (Conv`l Hazards And Precautions)	1	T?
T9 Run Unit R09 (Use Of Protective Clothing)	1	T?
T10 Run Unit R10 (Radiological Control T & E)	4	MC
T11 Run Unit R11 (Waste Control And Handling)	2	GE
T14 Run Unit R14 (Bldg 444/447 Familiarisation)	1	CE
T15 Run Unit R15 (Basic Decon Operations)	6	AR T?
T16 Run Unit R16 (Safe Means Of Access)	3	T?
T17 Run Unit R17 (Fork Lift Trucks And Hoists)	7	CE ET T?



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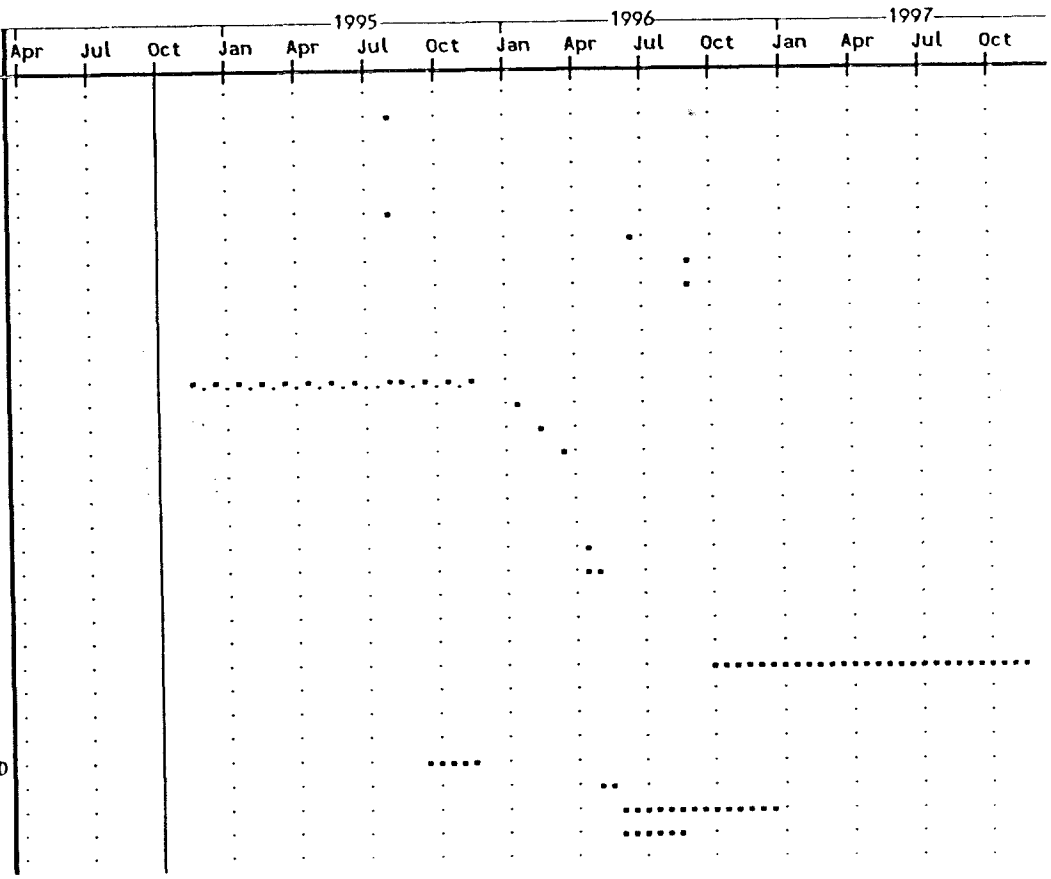
NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc
T19 Run Unit R19 (Temporary Containments)	4	AR T?
T23 Run Unit R23 (Hot Cutting)	3	T? ET
T30/1 Maintenance Skills Training	5	T?
T30/2 Maintenance Skills Training	5	T?
T30/B Building Maintenance Skills Training	2	T?
A35 REVIEW EXPERIENCE		
T1 Monthly Review Meetings	7	MM
T10 Gather Data For Summary Document	10	FY KB
T20 Draft Summary Document	10	KB FY
T30 Create Publicity	10	DF
A36 INITIAL STAGE III PLANNING		
T1 Generate Pre-training Activities List	8	MM TD
T2 Produce Documentation & Training Delivery Program	10	PR
A37 STAGE III TRAINING		
T1 Stage III Training	300	MM
A38 PURSUIT OF EXCELLENCE PROGRAM		
T1 Establish Currency Practices	40	MM TW TD
T2 Define Actions And Produc Program	20	MM
T3 Implementation Of Empowerment Action Plan	50	MM
T4 Customer Focus Education	10	MM



NCPP STAGE II TRAINING PLAN

NCPP STAGE II TRAINING PLAN	Day	Resrc	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct	Jan	Apr	Jul	Oct
							1995				1996				1997		
Resource summary																	
Utilization																	
UNASSIGNED		X															
Keith Biddle (CMT)	65.2	KB	17.2	5.5	13.7	19.9	59.6	44.2	39.0	49.0	30.9	0.5					
Dennis Floyd	65.2	DF	0.5	0.9	3.0	23.2	15.3	2.0		10.0							
Frank Yaklich	65.2	FY	4.5	0.9	7.4	21.2	15.3	2.0		10.0							
Administrator (CMT)	65.2	AD	2.0	1.0	11.0	88.0	60.9	60.5	58.5	58.5	39.6						
Planner/Record Keeper (CMT)	65.2	PR		1.1	16.0	66.6	70.5	53.7	52.0	52.0	45.2						
MSC/BNFL Management Team	65.2	MM	11.7		11.3	1.5	5.5	9.7	14.9		55.4	30.4	85.2	64.0	65.0	66.0	39.0
Marco Colalancia	65.2	MC		0.5	24.0	54.0	73.5	15.0									
MSC Human Resources Mangmt	65.2	HR		2.5	58.0	2.0	1.0										
Trng Delivery Mngr (CMT)	65.2	TD		4.5	48.0	28.5	59.4	43.1	47.8	39.0	29.4						
Docum't Prod'n Mngr (CMT)	65.2	DP	2.0		58.6	72.8	87.6	45.5	45.5	43.6	19.8						
Mark Haupt	65.2	MH			0.3												
Andrew Roberts	65.2	AR			25.6	28.7	46.2	49.1	0.3	1.0	16.1						
Carl Edstrom	65.2	CE			21.5	40.5	29.0	10.0	12.0			1.0					
ASTG Springfields (CMT)	65.2	AS	10.0		12.5												
Trnr(CMT)/Tech Advsr/Tm Ldr	65.2	T?			54.2	141.4	291.3	224.0	67.5	95.5	80.7	39.0					
Author/Typist (CMT)	65.2	A?		4.7	136.6	264.9	219.0	32.5	32.5	28.6	4.4						
Expert External Trnr (CMT)	65.2	ET			1.0	4.0	36.0	16.0	5.0								
Gislinde Engelmann	65.2	GE			6.0	8.5	22.0	8.0									
MSC Oak Ridge Tng/Ops Staff	65.2	OR				22.0	13.0										
Teamworkers	65.2	TW				2.0		2.4	17.6								
Total days			47.9	21.6	508.7	889.7	1105.1	617.7	392.6	387.2	321.5	70.9	85.2	64.0	65.0	66.0	39.0

Appendix F: Draft Skill Units For NCPP Stage II.

Part 1: Cultural, Regulatory And Decontamination Skill Units Which Will Be Needed

Skill Units are utilized to bridge the gap between an employees's competence and the competence requirements stated on his/her role profile, as laid out in his/her Personal Competence Plan.

Each Skill Unit will only be designed and delivered when a competence gap actually exists for an employee.

The Skill Units listed below will be required by many employees and cover cultural, **regulatory** and decontamination knowledge and skills. Details of the competence elements for each Skill Unit are attached.

Detailed Competence Element listings are attached.

R01	MSC/NCPP Culture
R02	MSC Business Awareness
R03	The Teamworking Concept
R04	Emergency Response
R05	Regulations In The Workplace
R06	Radiological Safety
R07	Beryllium Safety
R08	Conventional Hazards And Precautions
R09	Use Of Protective Clothing
R10	Radiological Control Techniques And Equipment
R11	Waste Control And Handling
R12	Building 865 Familiarization
R13	Building 883 Familiarization
R14	Building 444/447 Familiarization
R15	Basic Decontamination Operations
R16	Safe Means Of Access
R17	Fork Lift Trucks And Hoists
R18	Dismantling Using Hand Tools And Power Tools
R19	Temporary Containments
R20	Operation Of The Decontamination Facility
R21	Advanced Decontamination Operations
R22	Making And Dismantling Metal To Metal Joints
R23	Hot Cutting
R24	NCPP Appreciation For Visitors/Contractors

NCPP

ROCKY FLATS

SKILL UNIT MSC/NCPP Culture

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 History of MSC and Relationship with DOE and M&O Contractor	Participants able to list some of NCPP milestones from the past and some of the key features of the NCPP Co-operative Agreement.
2 Ethics and Values	Participants able to recognize the key features of MSC's business philosophy (pages 16 & 17 and 41 to 50 of the MSC Employee Handbook refers).
3 Staffing Policy and Employee Benefits	Participants able to recognize the key features of MSC NCPP staffing policy (main text of NCPP Staffing Plan refers) and employee benefit package (pages 19 to 40 of MSC Employee Handbook refers).
4 MSC/NCPP Mission	Participants can recognize the mission statement (the Stage II Cultural Action Plan refers).
5 MSC/NCPP Vision	Participants can recognize some features of the detailed vision (the Stage II Cultural Action Plan refers).
6 The Dynamics of Change	Participants can distinguish between the two types of change.
7 Learning to Learn	Participants can identify several learning blockages and their minimum personal responsibility when learning.
8 Safety and Quality Assurance Continued...	Participants can recognize their responsibilities to safety (page 18 of the MSC Employee Handbook refers) and can list the components of the Quality Assurance Program (the QA Program Plan refers).

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
9 Principles of Flexible Working and Continuous Improvement	Participants can list some key features of flexible working (primary responsibilities section of role profiles refers - see Staffing Plan, App. C). Also, can list some key features of the continuous improvement process.
10 The process of Employee Competence Qualification and Beyond	Participants recognize the main steps in the Competence Qualification process (Training Plan, App. C refers).

NCPP

ROCKY FLATS

SKILL UNIT MSC Business Awareness

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Operations At MSC Oak Ridge	Participants can list some of MSC activities at Oak Ridge.
2 Relationship With BNFL	Participants can state the relationship.
3 Business Case for Stage II of the NCPP	Participants can state the conditions for business success in Stage II (Sections 2.5 & 2.6 of the Stage I Final Technical Report refers).
4 Business Case for Stage III of the NCPP	Participants can state the conditions for business success in Stage III (Sections 2.5 & 2.6 of the Stage I Final Technical Report refers).
5 Stage III Products and Markets	Participants can list some products & markets.
6 Responding To The Customer	Participants can describe the internal & external customer / supplier chain.
7 Costs and Revenue	Participants can list some major costs and major sources of revenue.
8 The Influences On The Success of the NCPP	Participants can list some positive and some negative influences on success.
9 The Impact That Employees Can Have On the Success of the NCPP	Participants can state their personal responsibility / impact on success.

NCPP

ROCKY FLATS

SKILL UNIT The Teamworking Concept

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Flexible Working	Participants can recognize the components of a job and where flexibility is lodged.
2 Work Teams	Participants can recognize the features of a work team.
3 Quality Improvement Teams	Participants can recognize the features of a quality improvement team.
4 Benefits of Teamwork	Participants can list some benefits.
5 Team Structure	Participants can recognize the characteristics of a team.
6 The Principles of Team Competence	Participants can recognize the features of the team competence principle in a flexible working environment.
7 Competence/Role Matrix and Personal Competence Plans	Participants can recognize the components of the matrix and how individuals fit into it. Also, can recognize the PCP production steps.
8 Team Goals	Participants can recognize goals in a flexible working environment.
9 Team Management	Participants can recognize the components of the team management approach for the NCPP and how tasks are planned, allocated, and tracked.

NCPP

ROCKY FLATS

SKILL UNIT Emergency Response

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Building safety-related systems and NCPP non-interference policy	
2 Action In The Event Of A Fire	THESE COLUMNS
3 Action In The Event Of A Toxic Material Release	WILL BE
4 Action In The Event Of a Radioactive Substance Release	FILLED IN DURING
5 Life Saving Action	
6 Artificial Resuscitation/CPR	STAGE II
7 Action In The Event Of Trauma Shock	
8 Action To Stop Bleeding	
9 Action In The Event Of Electric Shock	
10 How To Summon Help / Interfaces With Emergency Services	
11 Control Of A Crowd	
12 Action In The Event Of An Incident In An Adjacent Building	

NCPP

ROCKY FLATS

SKILL UNIT Regulations In The Workplace

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Security at RFP	THESE COLUMNS WILL BE FILLED IN DURING STAGE II
2 Status of USDOE Orders	
3 EPA Regulations, including: NEPA, RCRA, CERCLA, CAA, CWA, FFCA, PADA.	
4 The Role of EPA Region VIII	
5 NRC Regulations And Licence Allowable Activities	
6 The Role of the CDH & Colorado State Laws	
7 State / Federal Regulation Interface	
8 OSHA Regulations, including Hazard Communications	

NCPP

ROCKY FLATS

SKILL UNIT Radiological Safety

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Types And Properties Of Radiation	THESE COLUMNS WILL BE FILLED IN DURING STAGE II
2 Sources Of Contamination	
3 Materials Previously Used In Bld 444/7 Bld 865 & Bld 883	
4 Radiological Sampling / Monitoring	
5 Personal Dose Information / Records and Dose Limits	
6 Improving / Minimizing Dose (including Counselling)	
7 Radiological Areas And Controls / Restrictions	
8 Changeroom Procedure	
9 Monitoring Of Skin And Clothing On Exit From Changeroom	
10 Action In The Event Of Ingestion Of Radioactive Substances Or Contamination Of The Skin	

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ROCKY FLATS

SKILL UNIT Beryllium Safety

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Beryllium Hazards 2 Beryllium Induced Diseases 3 Occupational Monitoring Of Beryllium 4 Precautions When Handling Beryllium 5 Action In The Event Of Ingestion Of Beryllium Or Contamination Of	THESE COLUMNS WILL BE FILLED IN DURING STAGE II

NCPP

ROCKY FLATS

SKILL UNIT Conventional Hazards and Precautions

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Manual Lifting	THESE COLUMNS
2 Fire	WILL BE
3 Corrosive Chemicals	FILLED IN DURING
4 Electricity	STAGE II
5 Stored Energy	
6 Heated Surfaces	
7 Noise	
8 Industrial Hygiene	
9 Recognizing Over-exposure To Hazards	
10 Housekeeping Policy	

NCPP

ROCKY FLATS

SKILL UNIT **Use of Protective Clothing**

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Factors Which Determine What Clothing Is Used	
2 Matching The Clothing To The Hazard	THESE COLUMNS
3 Donning Routine	
4 Monitoring Of Used Clothing	WILL BE
5 Doffing Routine	FILLED IN DURING
6 Correct Disposal Route For Used Clothing	STAGE II

4M3

NCPP

ROCKY FLATS

SKILL UNIT Radiological Control Techniques and Equipment

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Control And Issue Of Radiation Work Permits (RWP's)	THESE COLUMNS WILL BE FILLED IN DURING STAGE II
2 Performing Access Control Functions To RCA's	
3 Radiological Contamination And Radiation Standards	
4 Performing And Recording Radiological Surveys	
5 Performing Calculations	
6 Making Radiological Safety Decisions	
7 Property Release Surveys	

NCPP

ROCKY FLATS

SKILL UNIT Waste Control and Handling

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Chemical Composition And Physical Forms Of Waste	THESE COLUMNS WILL BE FILLED IN DURING STAGE II
2 Waste Classifications	
3 How Waste Is Generated	
4 Waste Related Hazards And Precautions	
5 Packaging Of Waste	
6 Storage Of Waste	
7 Destination Of Waste And Associated Documentation & Labelling	
8 Action In The Event Of A Waste Spillage	
9 Authorization To Be A RFP Waste Generator	

NCPP

ROCKY FLATS

SKILL UNIT Building 865 Familiarization

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Building Geography	THESE COLUMNS WILL BE FILLED IN DURING STAGE II
2 Location Of Building Specific Safety Equipment And How To Use It	
3 Building Utilities	
4 Main Hazards	
5 Major Equipment To Be Retained	
6 Major Equipment To Be Removed	
7 Outline Of Decontamination / Pre-Production Work	

NCPP

ROCKY FLATS

SKILL UNIT Building 883 Familiarization

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Building Geography	THESE COLUMNS
2 Location Of Building Specific Safety Equipment And How To Use It	WILL BE
3 Building Utilities	FILLED IN DURING
4 Main Hazards	STAGE II
5 Major Equipment To Be Retained	
6 Major Equipment To Be Removed	
7 Outline Of Decontamination / Pre-Production Work	

NCPP

ROCKY FLATS

SKILL UNIT Building 444/447 Familiarization

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Building Geography 2 Location Of Building Specific Safety Equipment And How To Use It 3 Building Utilities 4 Main Hazards 5 Major Equipment To Be Retained 6 Major Equipment To Be Removed 7 Outline Of Decontamination / Pre-Production Work	THESE COLUMNS WILL BE FILLED IN DURING STAGE II

NCPP

ROCKY FLATS

SKILL UNIT Basic Decontamination Operations (Components etc.)

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Wiping/Washing/ Scrubbing/Mopping/ Scraping/Sanding	THESE COLUMNS
2 Use of Detergent/Paint Stripper/Solvents/Acid	WILL BE
3 Dry Vacuum Cleaning	FILLED IN DURING
4 Carbon Dioxide Blasting	STAGE II
5 Grit Blasting	
6 Vibro-Finishing	
7 Ultrasonic Cleaning	
8 Electro-Chemical Cleaning	
9 Mechanical Washing/ Jetting	

NCPP

ROCKY FLATS

SKILL UNIT Safe Means Of Access

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Permit System 2 Confined Space Entry including: Isolation Methods, Venting/Purging Buddy System/Other Responsibilities, Breathing Air Sampling (including oxygen-in-air measurement) Ventilation 3 Use Of Ladders 4 Use Of 'Easy Erect' Scaffolding 5 Operation Of The 'Cherry Picker' 6 Operation Of The 'Lift-a-Loft'	THESE COLUMNS WILL BE FILLED IN DURING STAGE II

NCPP

ROCKY FLATS

SKILL UNIT Fork Lift Truck and Hoists

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Truck Driving Skill	THESE COLUMNS WILL BE FILLED IN DURING
2 Truck Specific Features And Controls	
3 Truck Battery Safety And Battery Changing	
4 Overhead Pendent Controlled Crane	
5 Overhead Radio Controlled Crane	
6 Overhead Travelling Carriage Crane	
7 Jib Crane	
8 Slings and Slinging	
9 Hydraulic Jacks	
10 Air-bag Equipment Movers	
11 Rachet-type Manual Lifters	
12 A-frame Gantries	

NCPP

ROCKY FLATS

SKILL UNIT Dismantling Using Hand Tools & Power Tools

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Saws	THESE COLUMNS
2 Crimp/Shear Tool	WILL BE
3 Portable Electric Drill	FILLED IN DURING
4 Screwdrivers	STAGE II
5 Cutting Wheels / Abrasive Discs	
6 Hydraulic Shear	
7 Levers / Small Jacks	
8 Hammers	
9 Electric Sander	
10 Dismantling Techniques Using Tools	

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ROCKY FLATS

SKILL UNIT Temporary Containments

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Preparation for Containment Construction (including Cleaning Area) 2 Construction Of Tent Containment 3 Preparation of Tent Containment For Use (Including Connection Of Utilities) 4 Spraying On Surface Coating 5 Use of Tent Containment 6 Decontamination of Tent Containment 7 Dismantling Of Tent Containment 8 Construction of RMC 9 Preparation of RMC For Use (Including Connection Of Utilities)	THESE COLUMNS WILL BE FILLED IN DURING STAGE II

SKILL UNIT Temporary Containments (continued)

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
10 Spraying On Surface Coating 11 Use of RMC 12 Decontamination of RMC 13 Dismantling of MDC	THESE COLUMNS WILL BE FILLED IN DURING STAGE II

NCPP

ROCKY FLATS

SKILL UNIT Operation Of The Decontamination Facility

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Entry/Egress Of Personnel 2 Entry/Egress Of Equipment 3 Spraying On Surface Coating 4 Maintaining Ventilation System	THESE COLUMNS WILL BE FILLED IN DURING STAGE II

NCPP

ROCKY FLATS

SKILL UNIT Advanced Decontamination Operations (Walls, Ceilings, etc.)

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Monitoring Aspects Of Advanced Decontamination Operations	THESE COLUMNS
2 Wet Vacuum Cleaning	WILL BE
3 High Pressure Water/ Steam Cleaning	FILLED IN DURING
4 Foam Decontaminants	STAGE II
5 Grinding/Scabbling	
6 Chemical Treatment/ Sweating	
7 Strippable Coatings And Tie-down Coatings	
8 Foam Filling	

Skill Unit No	Document/Disk No	R21DDR00.PM4/D3701
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NCPP

ROCKY FLATS

SKILL UNIT Making and Dismantling Metal to Metal Joints

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Identification Of Metals And Jointing Materials	
2 Connecting / Disconnecting Metal Flanged Joints	THESE COLUMNS
3 Connecting / Disconnecting Metal Compression Joints	WILL BE
4 Unbolting / Bolting Machine Panels	FILLED IN DURING
5 Unbolting/ Bolting Machine Anchorage Points	STAGE II

Skill Unit No Version No Variant Page 1 of 1	Document/Disk No Version Validity Start Date Production Date	R22DDR00.PM4/D3701
	IP Protection Statement	

NCPP

ROCKY FLATS

SKILL UNIT Hot Cutting

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Compressed Gas Safety	THESE COLUMNS WILL BE FILLED IN DURING STAGE II
2 Preparation Of Oxyacetylene Equipment	
3 Use Of Oxyacetylene Equipment	
4 Safe Storage of Oxyacetylene Equipment	
5 Safety Precautions With Plasma Arc Equipment	
6 Preparation Of Plasma Arc Equipment	
7 Use Of Plasma Arc Equipment	
8 Storage Of Plasma Arc Equipment	

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Variant	Production Date	
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NCPP

ROCKY FLATS

SKILL UNIT NCPP Appreciation For Visitors/Contractors

COMPETENCE STANDARD

COMPETENCE ELEMENT	COMPETENCE CRITERIA
1 Aims of the NCPP 2 NCPP Mission/Vision 3 Safety 4 Emergency Response 5 Security 6 Supervision	THESE COLUMNS WILL BE FILLED IN DURING STAGE II

Skill Unit No Version No Variant Page 1 of 1	Document/Disk No Version Validity Start Date Production Date	R24DDR00.PM4/D3701
	IP Protection Statement	

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Appendix F: Draft Skill Units For NCPP Stage II.

Part 2: Maintenance Activity Skill Units Which May Be Needed.

Skill Units are utilized to bridge the gap between an employees's competence and the competence requirements stated on his/her role profile, as laid out in his/her Personal Competence Plan.

Each Skill Unit will only be designed and delivered when a competence gap actually exists for an employee. This, of course, will only be resolved during the employee selection process.

The Skill Units listed below may be required by some employees and cover maintenance knowledge and skills.

R30 Electrical Isolation
Repair and Maintenance Of Electrical Systems
Electrical Installation
Electrical Preventative Maintenance
Brickwork / Glazing
Machine Setting
Machine Tool Maintenance
Fault Diagnosis And Repair Of Hydraulic And Pneumatic Systems
Fabrication And Repair of Steam Supply Lines
Fabrication And Repair of Vacuum Lines
Work From Blueprints
Welding
Soldering
Operation Of Fans And Compressors
Operation Of Pumps
Operation Of Steam Systems
Operation Of Air Handling Systems/Ventilation Equipment
Lubrication
On-line Inspection And Adjustment Of Machinery
Painting
Fiberglass Repairs
Operation Waste Sludge System
Water And Sludge Analysis

Appendix F: Draft Skill Units For NCPP Stage II.

Part 3: Material Declassification And Product Verification Related Skill Units Which Will Probably Be Needed.

Skill Units are utilized to bridge the gap between an employees's competence and the competence requirements stated on his/her role profile, as laid out in his/her Personal Competence Plan.

Each Skill Unit will only be designed and delivered when a competence gap actually exists for an employee.

The Skill Units listed below will probably be required by employees who carry out material declassification and product verification operations.

R60 Beryllium Pre-casting Operations
R61 Beryllium Casting
R62 Steel Melting
R63 Uranium Melting
R64 Aluminium Melting
R65 Hydrospin Operations
R66 Test Waste Container Fabrication
Fault Diagnosis And Repair Of Hydraulic And Pneumatic Systems
Furnace Brickwork Repairs
Machine Setting
Machine Tool Maintenance
Manual Welding Set Up
Manual Welding (MIG and TIG)
Milling
Turning
Metal Testing
Metal Sheet Fabrication
Product Inspection

Appendix F: Draft Skill Units For NCPP Stage II.

Part 4: Management Education Skill Units Which Will Probably Be Needed.

Skill Units are utilized to bridge the gap between an employees's competence and the competence requirements stated on his/her role profile, as laid out in his/her Personal Competence Plan.

Each Skill Unit will only be designed and delivered when a competence gap actually exists for an employee.

The Skill Units listed below will probably be required by managers or team leaders.

R80 Workplace Training and Competence Assessment Techniques
R81 Quality Assurance Program
R82 Management of Work

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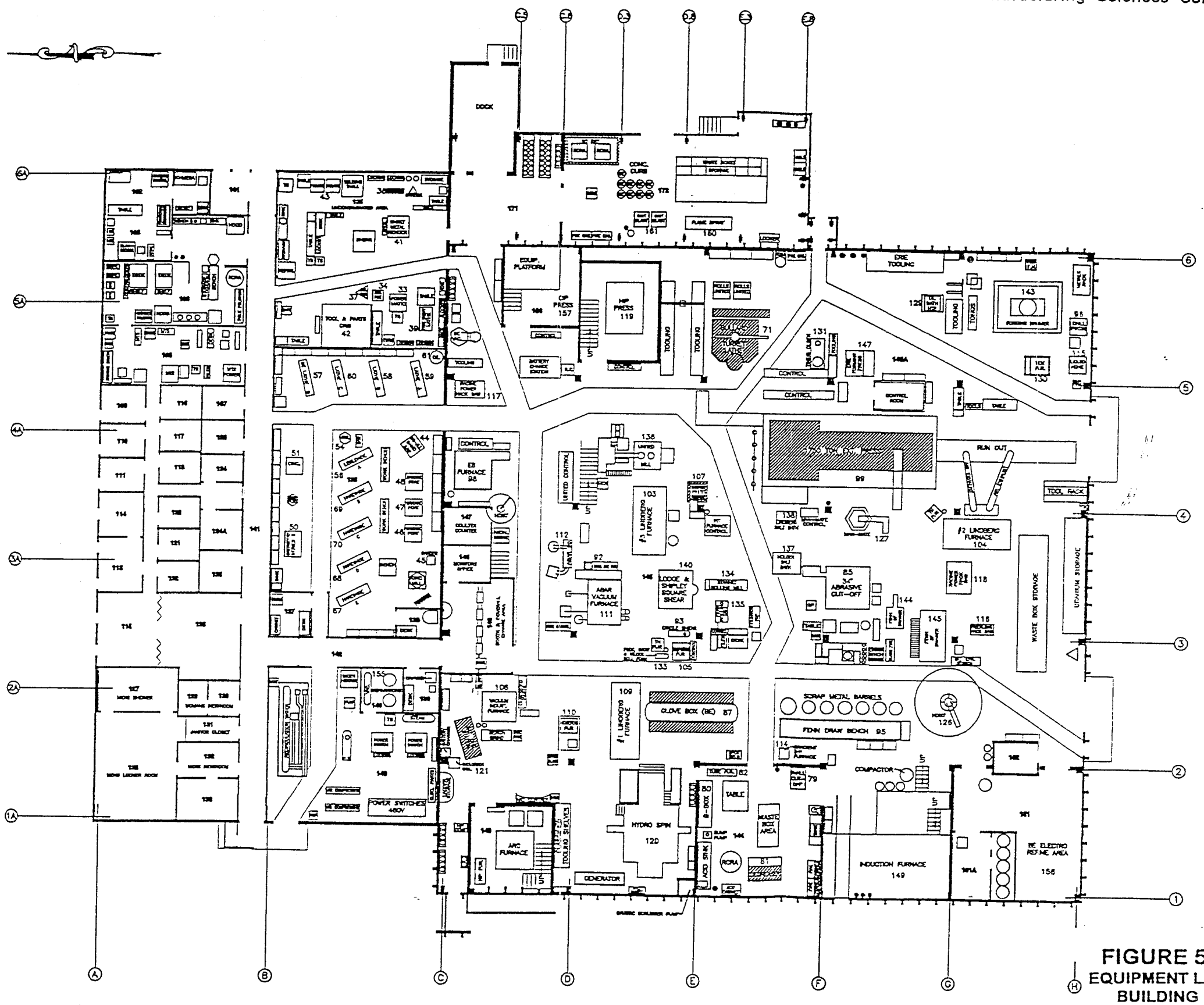

FIGURE 5.3-1
EQUIPMENT LAYOUT
BUILDING 865
SEPTEMBER 1994
PAGE 17

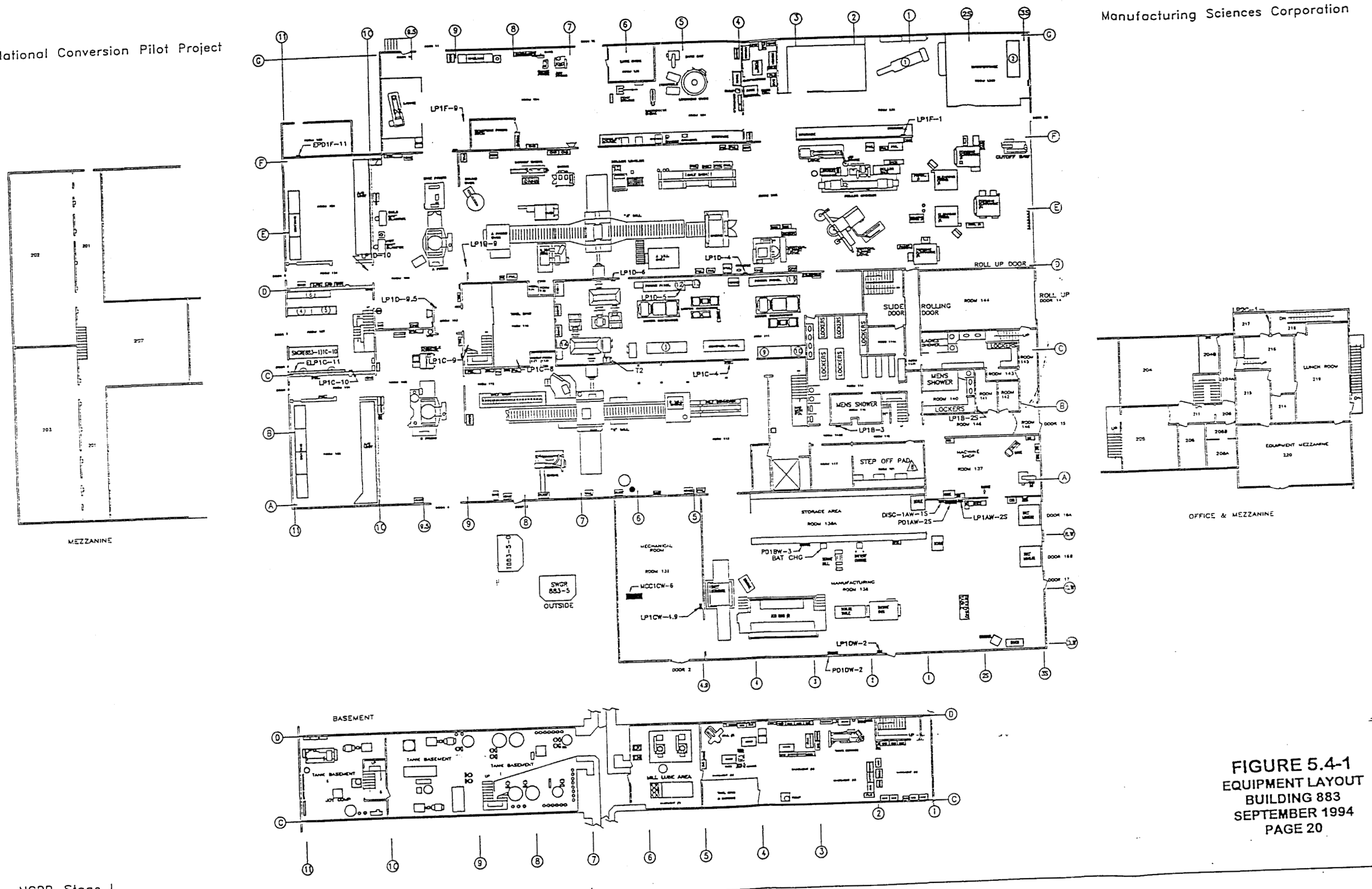

FIGURE 5.4-1
EQUIPMENT LAYOUT
BUILDING 883
SEPTEMBER 1994
PAGE 20

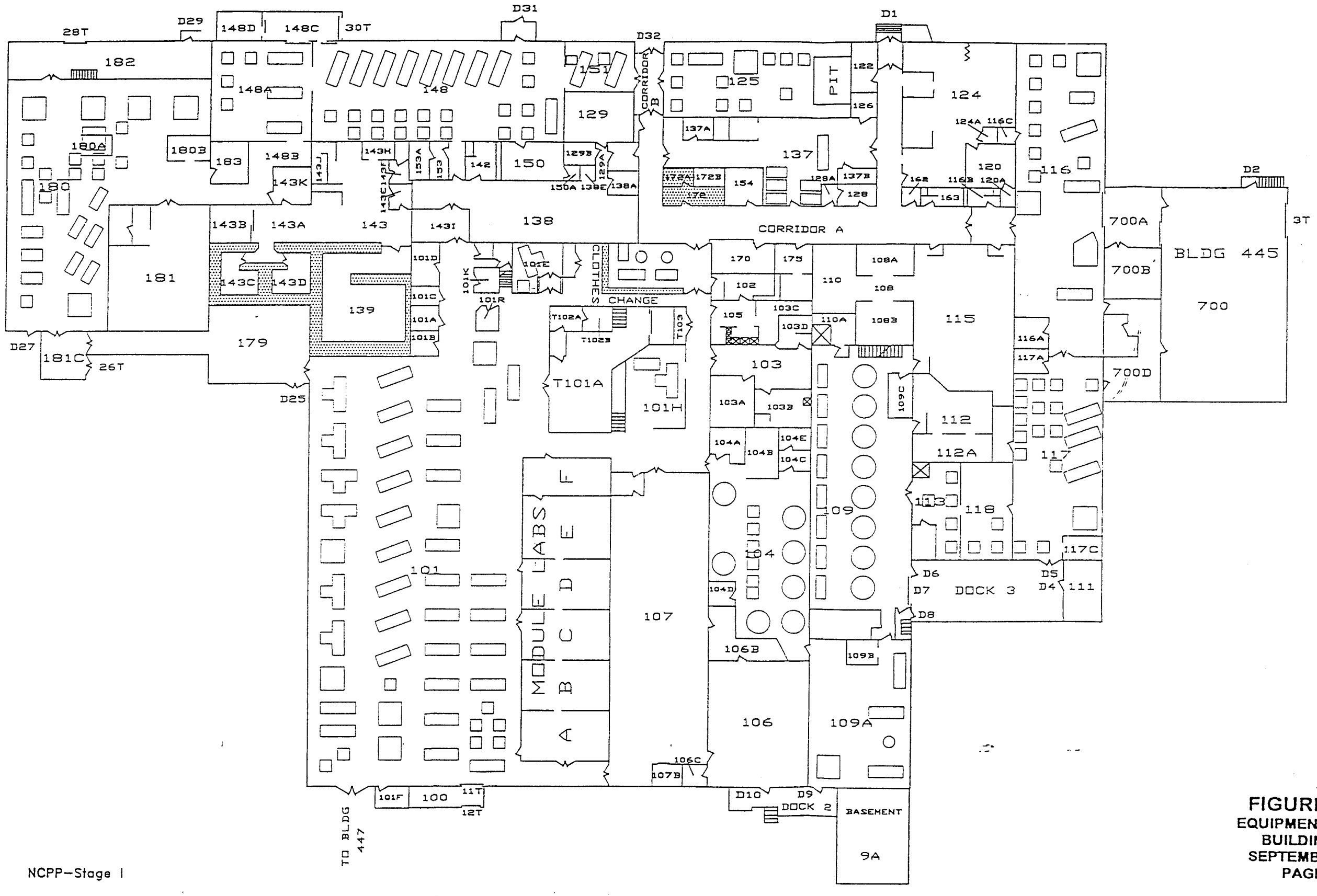

FIGURE 5.5-1
EQUIPMENT LAYOUT
BUILDING 444
SEPTEMBER 1994
PAGE 25

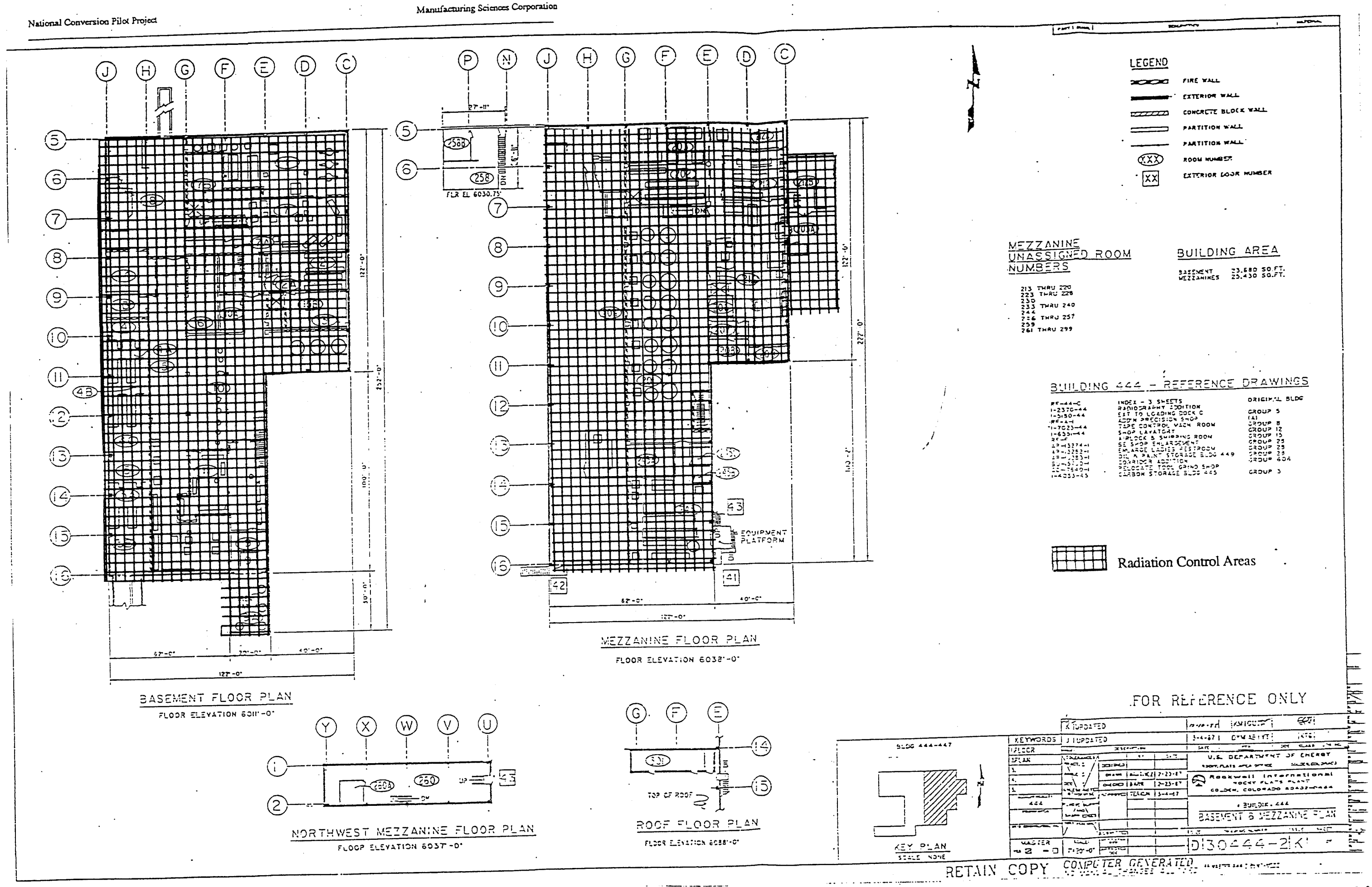

FIGURE 5.5-2 Building 444 Drawing Mezzanine & Basement Floor Plan Elevation

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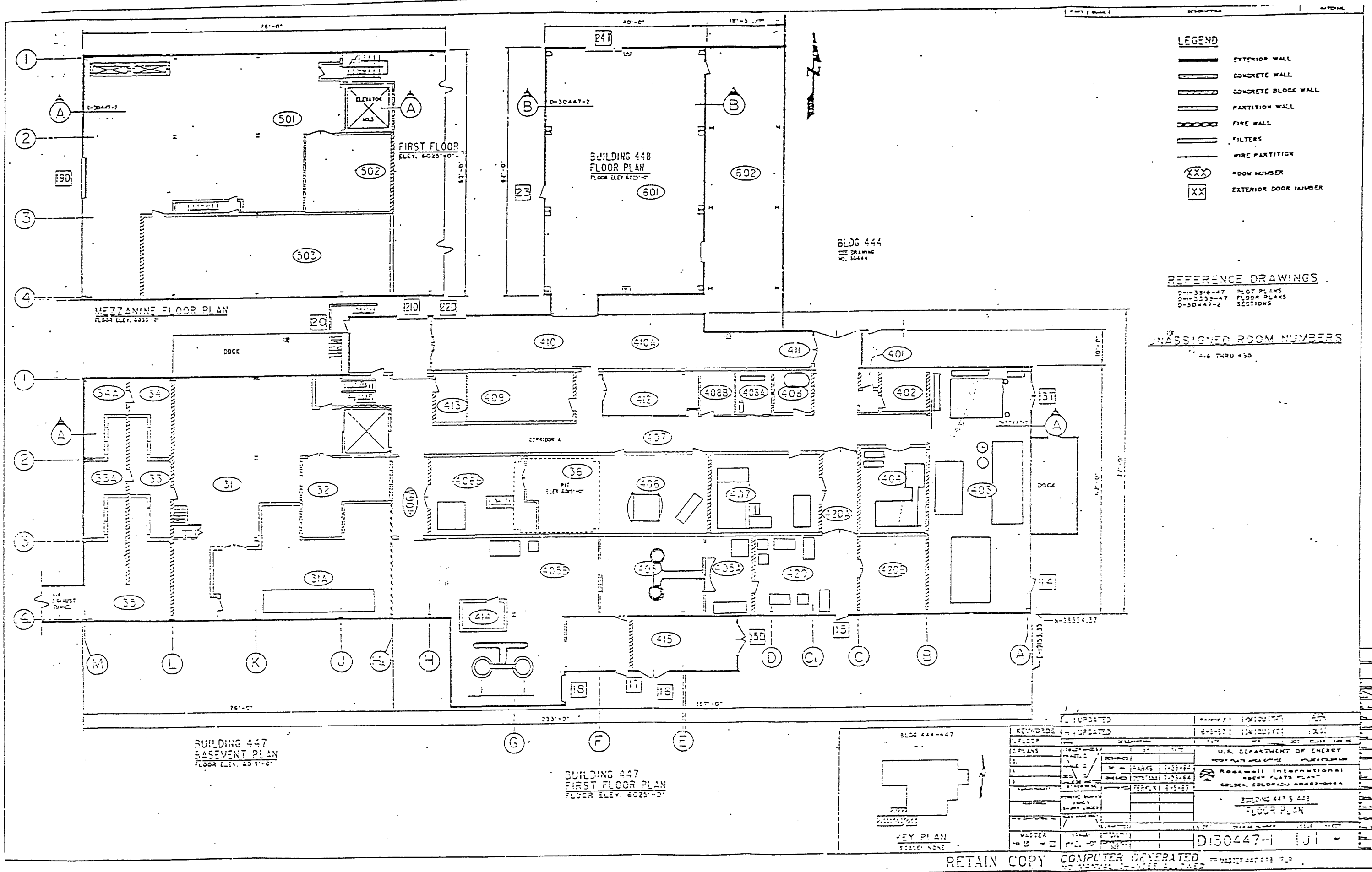

FIGURE 5.6-1 Equipment Layout-Building 447

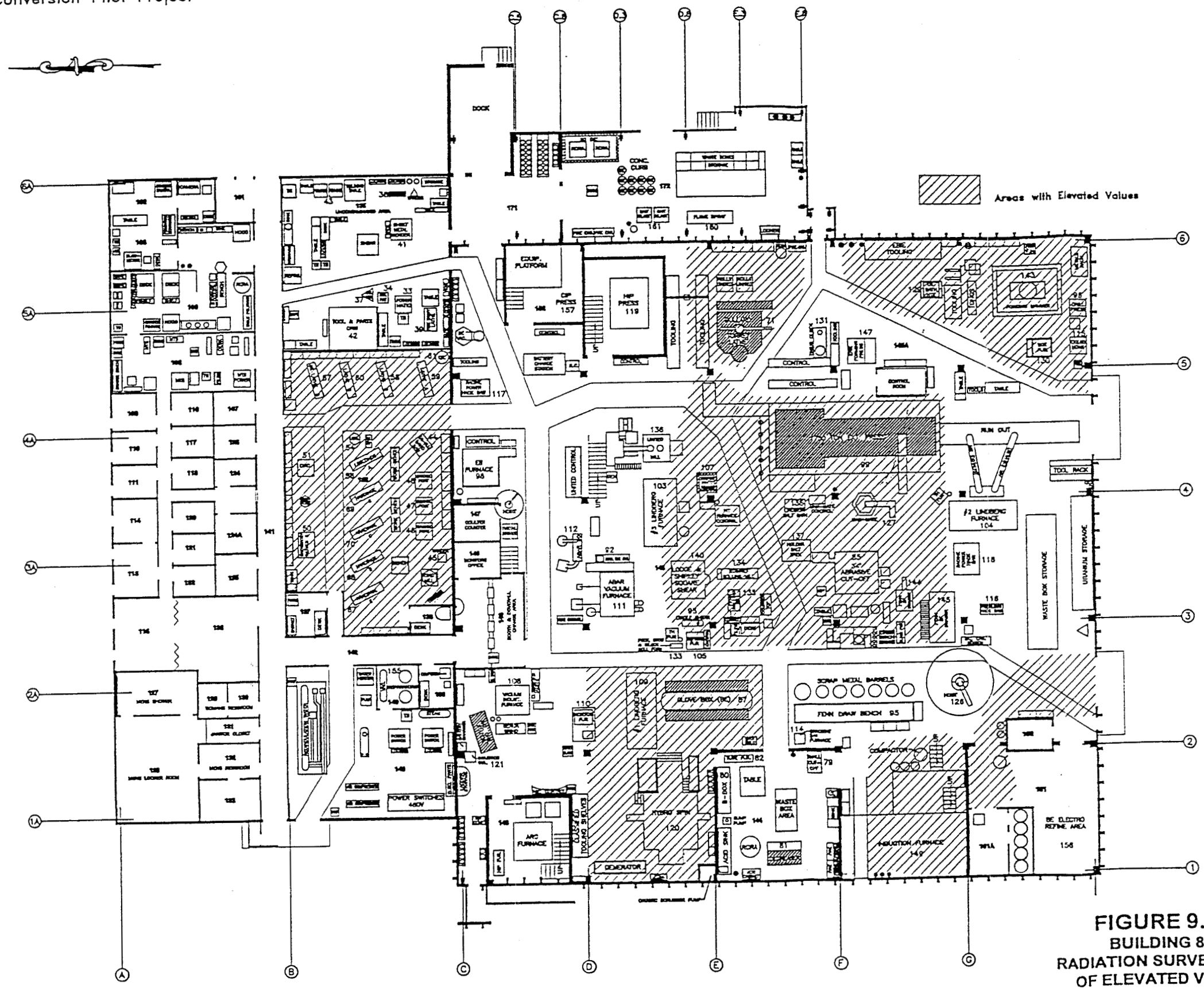

FIGURE 9.1-1
BUILDING 865
RADIATION SURVEY AREAS
OF ELEVATED VALUES
SEPTEMBER 1994
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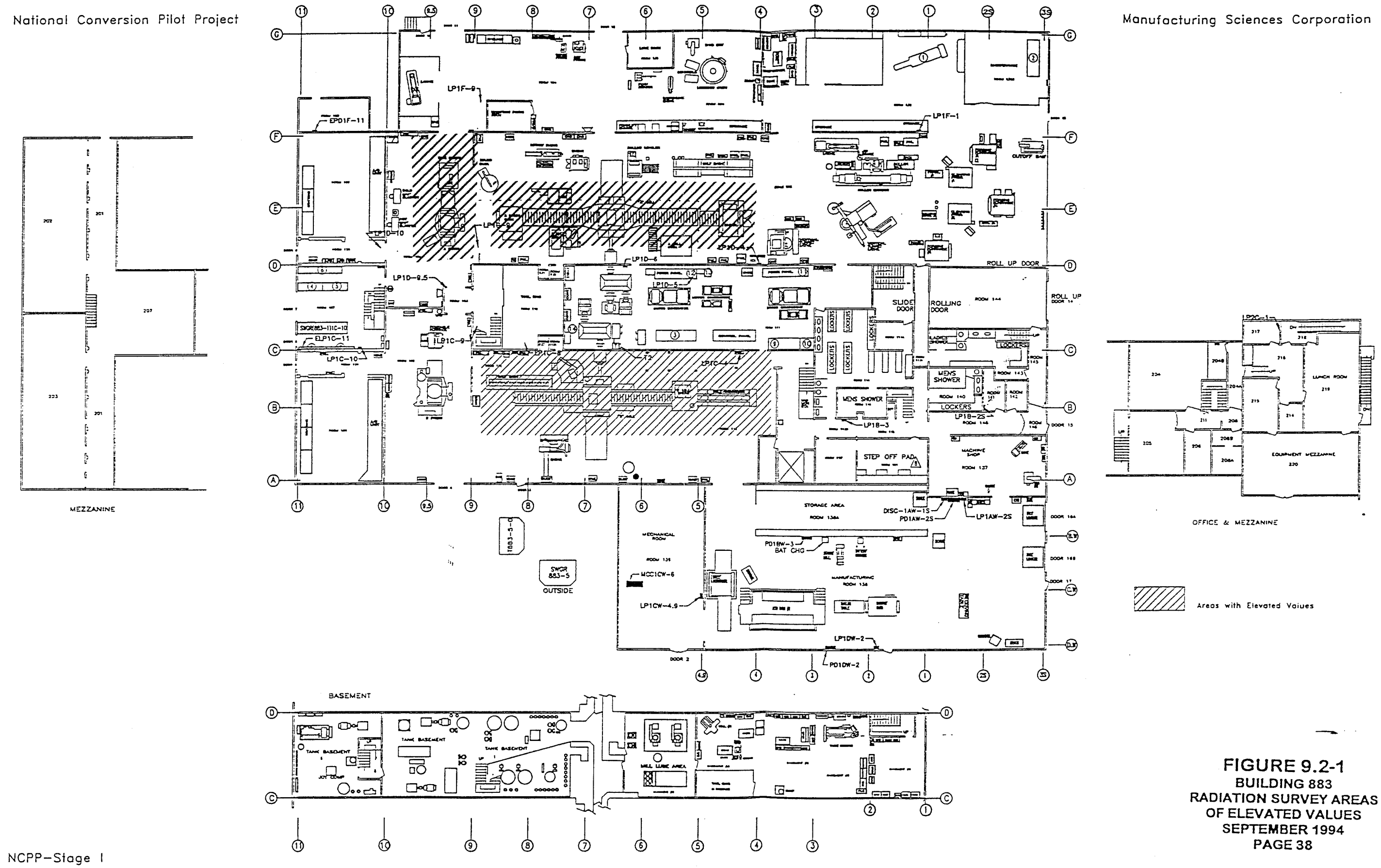

FIGURE 9.2-1
BUILDING 883
RADIATION SURVEY AREAS
OF ELEVATED VALUES
SEPTEMBER 1994
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National Conversion Pilot Project

Manufacturing Sciences Corporation

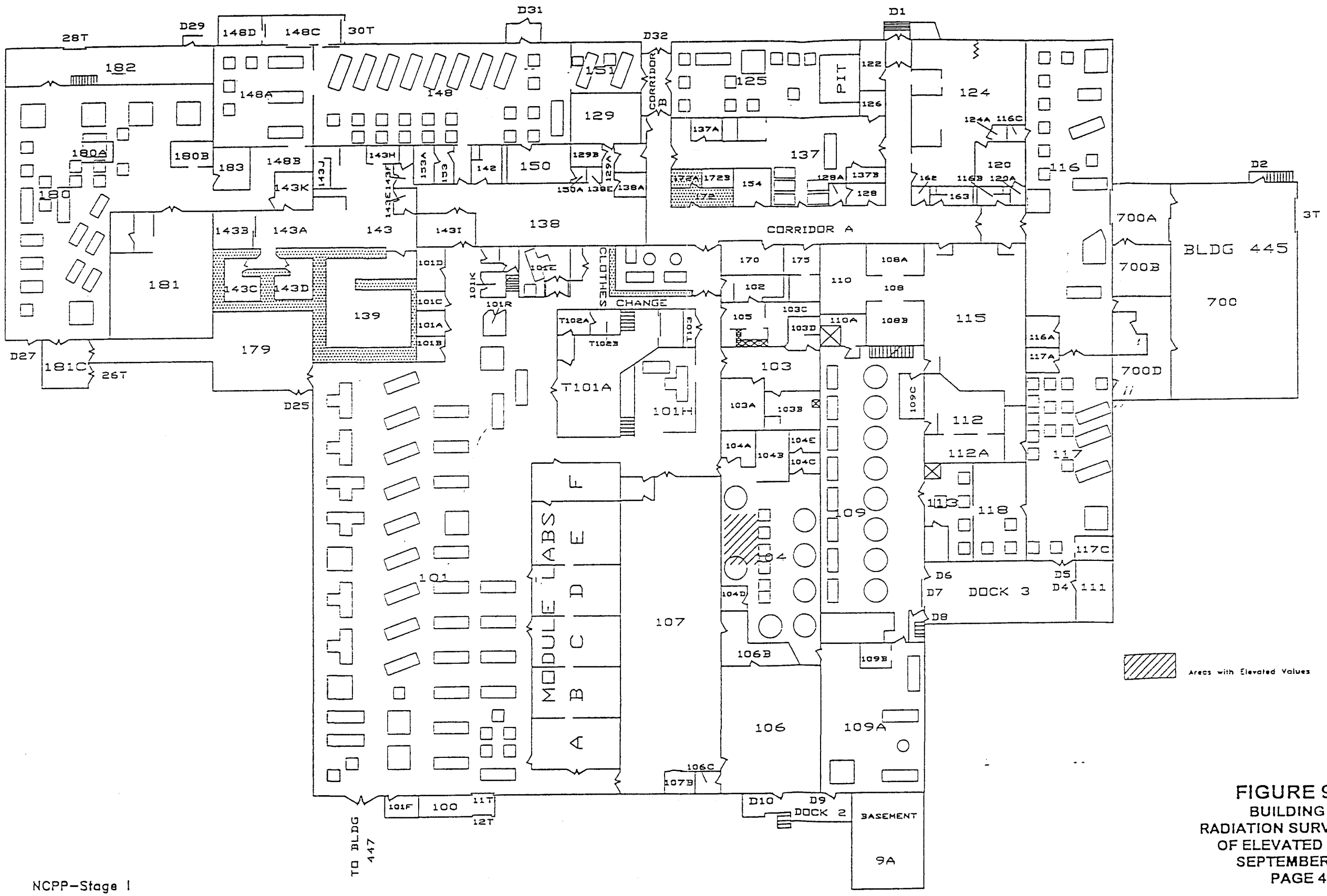

FIGURE 9.3-1
BUILDING 444
RADIATION SURVEY AREAS
OF ELEVATED VALUES
SEPTEMBER 1994
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NCPP–Stage I

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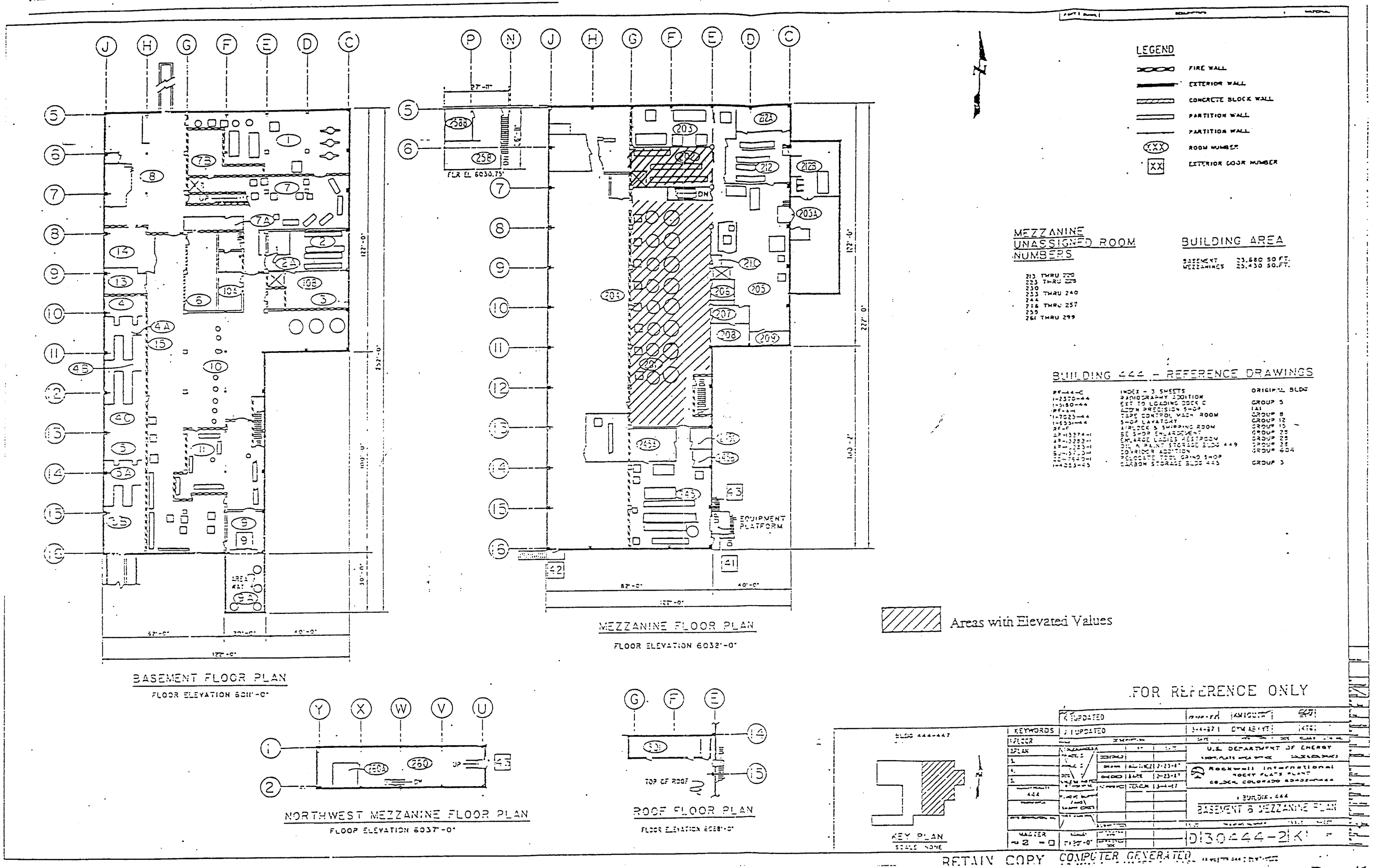

FIGURE 9.3-2 Building 444 Basement & Mezzanine, Radiation Survey Areas of Elevated Values

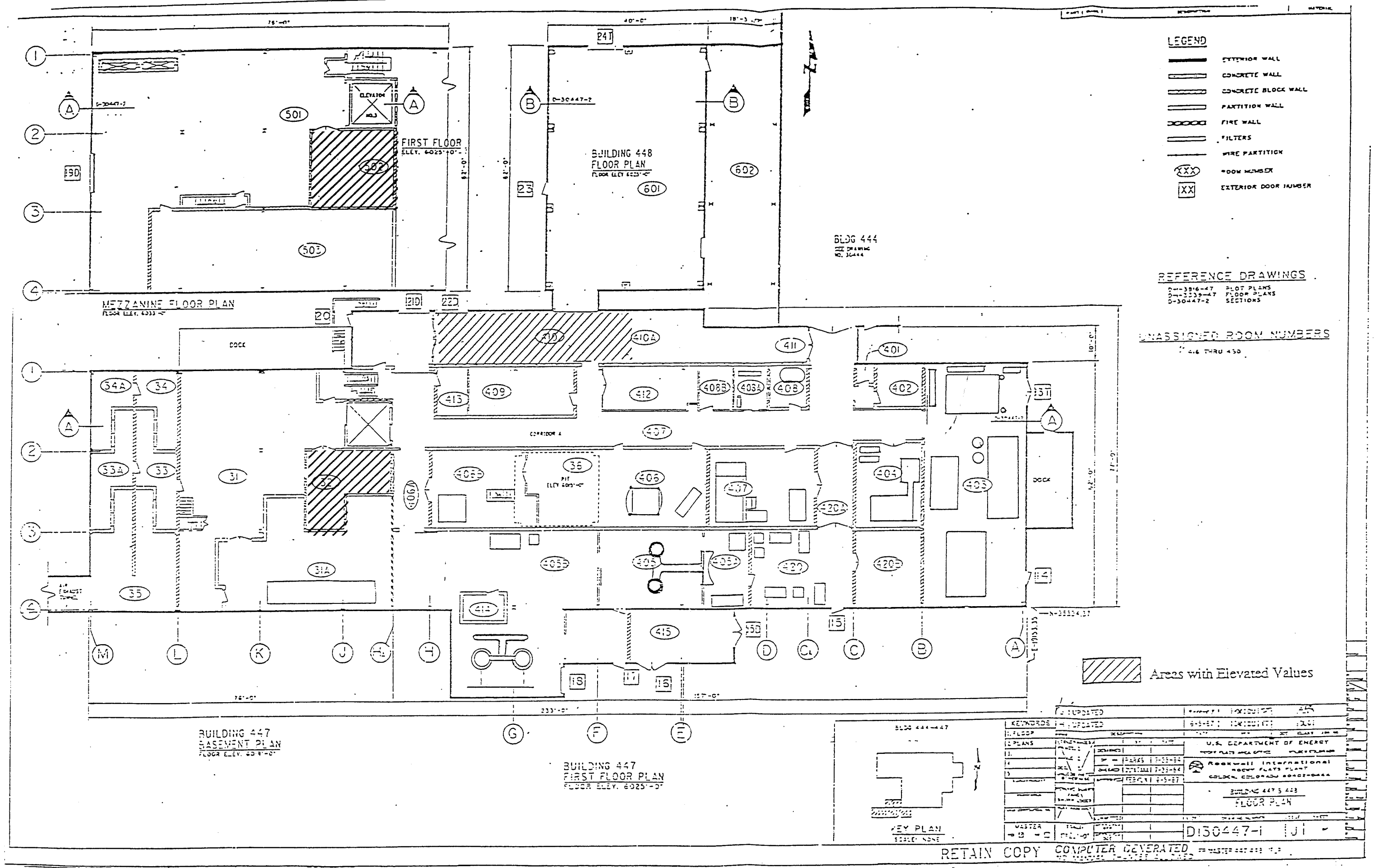

FIGURE 9.4-1 Building 447 Radiation Survey Areas of Elevated Values

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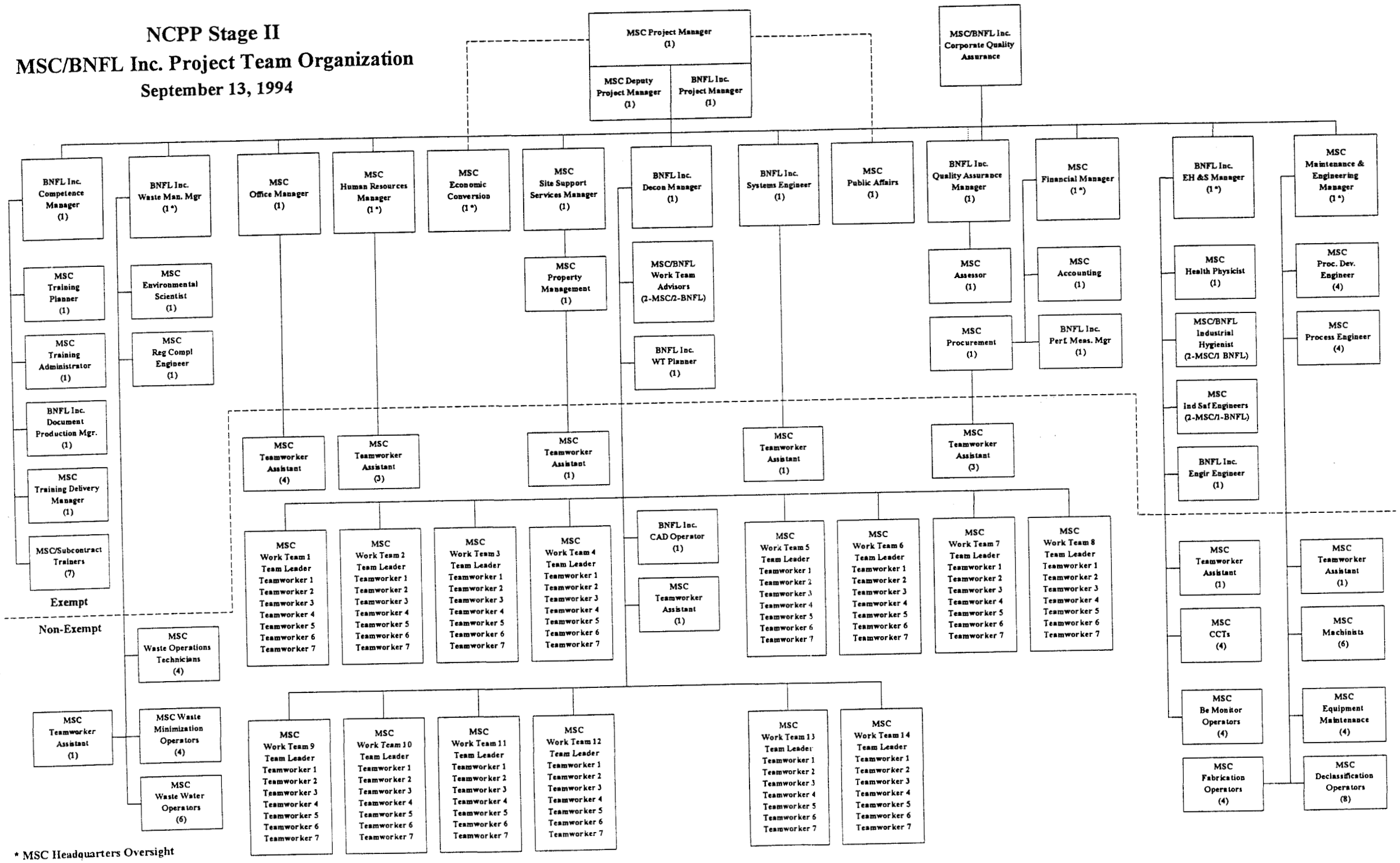
Appendix A:

NCPP Stage II
MSC/BNFL Inc. Project Team Organization
September 13, 1994



* MSC Headquarters Oversight