INTERNATIONAL TECHNOLOGY CORPORATION

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Addendum 1 to the Site Decommissioning Plan for Molycorp, Inc. York, Pennsylvania Facility

Prepared for:

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1.0 Introduction

This Addendum 1 to the Molycorp, Inc. (Molycorp) York, Pennsylvania Site (York site) Decommissioning Plan (Decommissioning Plan) presents the methodologies proposed to survey, decontaminate, dismantle, free release and/or dispose the equipment, tanks, materials, and buildings at the York site.

The current Decommissioning Plan for the York site, August 1995 (Decommissioning Plan) does not address the buildings and equipment in sufficient detail to perform the required decommissioning activities. This Addendum 1 is intended to supplement the Decommissioning Plan which is being utilized for ongoing decommissioning activities. Although some of the work hereafter described has already been performed, the text is written in future tense.

The proposed sequence of events is to perform scoping and characterization surveys generally, determine the extent and quantify the amount of contamination in affected areas; decontaminate equipment and building structures to meet the free-release criteria; perform final status surveys to verify the free-release status of the equipment and buildings; and then demolish (if required) the free-released buildings and remove the building debris to an approved landfill. Items and structures which cannot be decontaminated to meet the free-release requirements will be dismantled and packaged as radioactive waste. Building demolition includes all building structures above grade. Subgrade demolition will be accomplished as part of the soil remediation phase of the York site decommissioning project addressed under the existing Decommissioning Plan.

2.0 Site Description

The Molycorp York site is located on the outskirts of the City of York at 350 North Sherman Street in Spring Garden Township, Pennsylvania. The site consists of approximately six acres of

real estate that are enclosed within a chain-link fence. There are 11 buildings on site which include office buildings, a laboratory building, a waste water treatment building, a storage building, a lunch and locker room building, a boiler building, and three process buildings. The majority of the site is paved and is served by one rail loading dock and two truck loading docks.

The York site formerly produced a broad line of inorganic rare earth chemicals for industrial purposes. Molycorp's rare earth processing plant utilized raw materials which had above-background concentrations of thorium and uranium. Concentrations of thorium were significant enough to require Molycorp to apply for and receive a Source Materials License (SMB-1408) (Docket 40-08794) from the Nuclear Regulatory Commission (NRC) in 1981.

2.1 Site Layout and Existing Radiological Conditions

The York site has 11 building areas which are divided into affected and unaffected survey areas based on their radiological status. Buildings or portions of buildings which are not suspected of being contaminated are considered "unaffected", as this term is used within the context of NUREG/CR-5849 "Manual for Conducting Radiological Surveys in Support of License Termination", draft report June 1992. Buildings which are known or suspected of being utilized to handle or process radioactive materials are considered to be "affected." Table 2.1 below sets forth a list of the York site buildings (by name and assigned number) and Molycorp's classification of each.

Table 2.1

Building Name	Building Number(s)	Radiological Status
Laboratory	9A	Affected
Tankroom	2	Affected
SX Building	3	Affected
REC Area	10, 10A, 10B, 11, 11A, 11B	Affected
Waste Water Treatment	14, 14A	Affected
Tank Room Admin. Area	2B	Unaffected
Administration Building	9	Unaffected
Moly Building	8, 8A	Unaffected
Mill Room	1	Unaffected
Locker/Lunch Room	4, 4A, 4B	Unaffected
Boiler House	7	Unaffected
Compressor Room	6A	Unaffected
Supply Room	6	Unaffected
Pipe Rack Room	13	Unaffected
Warehouse	15	Unaffected

Building locations on the York site are presented on Figure 1 (Attachment A).

2.2 Process History of the Buildings

To ensure proper characterization of the buildings, an attempt to determine the historical utilization of each building was made. The details for each building are provided in the following paragraphs for review:

- The Tankroom (Building 2), SX Building (Building 3), Moly Building (Building 8), and REC Area (Buildings 10 and 11) were known to contain process equipment and systems for rare earth processing operations.
- The Waste Water Treatment Building (Building 14) contained rolling filters and secondary process equipment which processed liquid effluents prior to discharge to the sedimentation pond.
- The Mill Room (Building 1) and Warehouse (Building 15) were utilized to receive and store process materials and equipment.
- The Locker/Lunch Room (Building 4), Compressor/Supply Room (Building 6), Boiler House (Building 7), Administration Building (Building 9), and Pipe Rack Room (Building 13) were utilized to perform process support functions and contained process support equipment.
- The Laboratory (Building 9) was used to analyze samples and support process development activities.

2.3 Potential Radiological Contaminants

Based on information of previous site operations, radiological sampling, and site characterization, the potential contaminants at the York site are as follows:

- Thorium-232 and daughters to Lead-208.
- Uranium-238 and daughters to Uranium-234.
- The radioactive decay series is not in equilibrium with the parent nuclide, Thorium-232, which is the predominant contaminant at the site.

2.4 Asbestos-Containing Materials

An asbestos survey was performed and identified the presence of asbestos-containing materials (ACM). Section 5.3 describes the asbestos survey and ACM found.

2.5 Potential Hazardous Contaminants

Due to the possibility of the presence of residual process chemicals, a hazardous materials survey will be performed during the scoping and characterization survey phases of the project. Section 5.4 describes the hazardous- and mixed-waste survey that will be performed.

3.0 Site Health And Safety Requirements

3.1 Industrial Health and Safety

A Site Health and Safety Plan (SHSP) will be written establishing the methods required to protect workers, the public, and the environment from the associated hazards resulting from the decontamination and decommissioning of the York site. The SHSP will include requirements and procedures required for employee protection for specific-site hazards and will be prepared and implemented in accordance with 29 Code of Federal Regulations (CFR) 1910.120(b)(4).

The SHSP will contain a Hazard Analysis (HA) that identifies the hazards of each task, the worker exposure potential to the hazards, and the control measures for preventing hazardous exposures. The HA will provide a method for identifying the specific requirements for personal protection equipment (PPE), monitoring, training, and medical surveillance which can be included in the SHSP.

The SHSP is a dynamic document that will be updated whenever a change in a work practice, piece of equipment, or exposure potential exists that may require the level of employee protection to be reduced or increased. The SHSP will be available on site and is required to be read by all personnel prior to working on site.

3.2 Radiological Protection Program

The Radiological Protection Program (RPP) outlines the radiological controls to be implemented during performance of decommissioning activities at the York site. The program is provided to assure compliance with federal, state, and local regulations, and to ensure maximum safety to

occupational workers and members of the general public, as well as protection of the environment. The RPP is supplemented by supporting radiological, health and safety, quality assurance, and administrative procedures. Also included in the RPP are descriptions and guidelines for controlling radiation exposure, performing surveys for radiation and radioactive materials, personnel monitoring requirements, radiation exposure limits, procedures and limits for controlling airborne radioactivity, surface contamination limits, controlling surface contamination, monitoring for surface contamination, PPE, decontamination methods and techniques, waste management, environmental management, and required reports and records.

4.0 Project Quality Assurance

The project quality assurance in the RPP will present the basic policies, assign responsibilities, and establish and document the procedural control of activities affecting quality to be performed by IT personnel and subcontractors. Since the ultimate objective of the project is to terminate an NRC license, it is mandatory that the data collected be reliable and accurate. To ensure that the radiological survey data is of the highest possible quality, routine and documented inspections will be performed by the project health physicist. Inspections will include and cover, at a minimum, the following activities:

- Instrumentation calibration and proper operation.
- Proper instrumentation utilization and documentation by health physics technicians.
- Daily source and background checks and surveys to ensure proper documentation and survey performance document.
- Verification that properly qualified and trained health physics technicians are performing the required surveys.
- Review of instrumentation that is out of calibration or fails to meet daily source and background checks to ensure removal from service and tagging as being "Out of Service."
- Verification that records and logs are properly maintained and stored to safeguard survey information.

Inspections by the project health physicist will be documented by area inspections, log entries, and review of survey data.

5.0 Initial Activities

5.1 Scoping Surveys

Scoping surveys, as defined by NUREG/CR-5849, are surveys generally limited to direct measurements (exposure rates and surface activity levels) and samples (smears, soil, water, and material with induced activity) obtained from site locations considered most likely to contain residual activity. Scoping surveys at the York site will be performed on buildings, equipment, and tanks prior to decontamination to identify and quantify the extent of contamination. These surveys will also be used to determine the radiological work permit (RWP) requirements, decontamination methods, and PPE requirements. Measurements and sampling in known areas of residual contamination need not be as comprehensive or be performed to the same sensitivity level as will be required for the characterization or final status survey, unless the information being assembled is included as a portion of the final status survey.

5.2 Characterization Surveys

Characterization surveys will be performed on building areas and equipment to determine and document the radiological conditions prior to performing decontamination. These surveys will be performed on equipment and building areas which are likely to exceed the guideline values of Table 1 of Regulatory Guide 1.86 "Termination of Operating Licenses for Nuclear Reactors." Characterization surveys will consist of direct measurements and smear samples obtained from building areas and equipment likely to contain residual radioactivity. Characterization surveys will be limited to buildings currently listed as affected in Table 2.1, and equipment known to be affected or discovered to be affected during the scoping surveys.

Characterization surveys will be performed by scanning tanks and equipment with appropriate detectors (microR meters, etc.) to identify gross levels of contamination. If those items do not exhibit elevated radiation levels additional surveys will be performed. In addition, floor/wall surfaces and other potentially-contaminated areas, such as elevated horizontal surfaces and ventilation duct work, will be scanned with one of the following types of meters: large area gas flow proportional counter; large area zinc sulfide/plastic scintillator for alpha and beta-gamma

radiation; or a Geiger Mueller detector. In addition to the direct scan performed above, smear samples will be obtained from building areas and equipment to quantify removable contamination. Those areas and items identified as contaminated above the guideline values of Table 1 of Regulatory Guide 1.86 will either be decontaminated to below guideline values or packaged for disposal as radioactive waste.

5.3 Asbestos Survey

A detailed asbestos survey of the York site has been performed and is available upon request. The results of the survey indicate that ACM exist at the site in the form of transite, floor tile and mastic, thermal pipe and tank insulation, gaskets, and roofing materials.

Results of the survey show ACM is present in affected areas such as the laboratory and waste water treatment building. The decontamination methodologies available in these areas are restricted to nondestructive types, such as light pressure washing, high-efficiency particulate air (HEPA) vacuuming, or hand wiping. ACM will be removed to facilitate decontamination.

5.4 Hazardous/Mixed Waste Assessment

During the scoping and characterization surveys, an assessment of each building will be performed to identify the presence of hazardous, characteristic, or mixed wastes. The survey will detail items requiring disposal, recycling and/or management as hazardous substances such as lead paint, mercury lights, switches or gauges, polychlorinated biphenyl ballasts or oils, halogen lights, nickel-cadmium batteries, solvents, or freon.

6.0 Decontamination Methodologies

The decommissioning objective includes the decontamination of equipment and building structures for unrestricted release, if possible. A description of the decontamination methodologies proposed for utilization on this project are presented below.

6.1 Equipment, Fixtures, and Tanks

Equipment and tanks located will be de-energized, locked, tagged out, isolated and drained, or depressurized as necessary. Equipment which cannot be economically decontaminated will be surveyed and all equipment with contamination above the limits or equipment which is suspected

to contain radioactive material will be treated as radioactive waste. The majority of equipment will be relocated from its respective building area and decontaminated for free release at the waste treatment building. Those items which are to large to be economically moved will be decontaminated in-place.

Scoping surveys will be conducted to identify areas of loose contamination which will be removed to prevent the possible spread of contamination during dismantling and relocation activities. Equipment will be disassembled and relocated from the process areas to the waste treatment building for additional decontamination. Prior to relocation, the exposed surfaces will either be decontaminated, containerized, or wrapped to prevent the spread of loose contamination during relocation activities. Open ends of pipes and other equipment openings will be sealed where practicable. Large tanks and pieces of equipment may require decontamination in-place rather than relocation to the waste treatment building. Figure 2 (Attachment A) presents a flow chart that describes the technical approach for equipment and fixture decontamination.

Following decontamination, the equipment and tanks will be surveyed for free release in accordance with Molycorp's approved release procedure *Molycorp, Inc. York, PA Surface Contamination Survey and Release for Equipment* 5-96 (Equipment Release Procedure). Items below the release limits will be staged in a clean lay-down area for unrestricted release. Items which are contaminated above the release criteria or have inaccessible surfaces which are potentially contaminated will be disassembled as necessary, cleaned, and resurveyed. It is anticipated that decontamination techniques will consist of simple wiping, hand scrubbing, high-efficiency particular air (HEPA) vacuuming, scrapping, pressure washing, and carbon dioxide (CO_2) blasting.

Utilization of a centralized decontamination area allows for control of the equipment being decontaminated, radioactive waste generation, and environmental effluents. The following decontamination methods will be available at the waste treatment building.

- ***General Wipe Down/Hand Scrubbing.*** This method will be utilized on equipment and tools which have limited amounts of contamination. The use of mild-cleaning surfactants may be incorporated to increase decontamination effectiveness. This method of decontamination is not practical for fixed contamination or large items which can be pressure washed much quicker.

- ***Pressure Washing.*** This technology utilizes water at pressures from 1,500 to 20,000 psi to wash the surface free of loosely adhered and in the case of higher pressures fixed contamination. Control of the effluents for this decontamination method is important to prevent the spread of contamination to surrounding areas. Nonhazardous detergents and soaps can be incorporated with pressure washing to improve the effectiveness of this decontamination method. Water will be controlled and collected from pressure washing activities and treated and released in accordance with Molycorp's NRC license and all local, state, and federal regulations.

- ***CO_2 Blasting.*** This method of decontamination is utilized when conventional methods such as pressure washing are not efficient. Dry ice (or CO_2) blasting is similar to other abrasive blasting techniques but provides a nonhazardous, nonconductive, and nonwaste generating mechanical cleaning action. CO_2 pellets sublime to gas leaving only the contaminants behind. CO_2 blasting will be performed inside temporary enclosures to prevent the spread of contamination.

6.2 Building Decontamination

Upon completion of process equipment removal from affected buildings, characterization surveys will be conducted on the building structures. Areas which are suspected of having contaminant permeation will be sampled to determine the depth and quantity of contamination. Sampling may include core boring, paint scraping, and drain line sludge sampling. The samples will be analyzed and the most economical and practical decontamination methodology selected, if feasible. Figure 3 (Attachment A) presents the technical approach to be followed for decontamination of building structures.

Those buildings which contain residual contamination will be decontaminated below guideline values utilizing the most economical and reliable method available. The goal is to free release all building structures above grade which will allow for building demolition (if required) to be performed on "clean" buildings. Several buildings have been identified as affected areas and will require some decontamination prior to performing the final status survey.

Areas which contain only loosely-adhered contamination will be either HEPA vacuumed, hand wiped, or pressure washed to remove contaminants. Areas which have imbedded or fixed contamination, which is not readily removed, will require more aggressive removal, such as CO_2 blasting. If the above methods are unsuccessful or unsuited for decontaminating the building structures, more aggressive methods such as scabbling, scarifying, abrasive blasting, and structure removal may be required. Decontamination of ground-level floors will only include the top

surface of the concrete slabs. Below-grade decontamination and excavation will be performed as part of the soil remediation phase of the overall decommissioning project.

Electrical outlets and power boxes will either be de-energized and removed from service prior to decontamination or covered and protected from water spray resulting from decontamination activities. Special attention will be required on above-grade horizontal surfaces, cracks and crevices, seams, and other areas where contamination could have accumulated over the processing life of the building(s). Localized ventilation with portable HEPA ventilation will be utilized to prevent the spread of contamination to surrounding areas and provide air flow away from workers during potential-airborne producing activities.

Decontamination of building exteriors will be performed utilizing the methods described herein; however, the use of engineering controls (i.e., HEPA ventilation, containment, affixative, etc.) will be necessary for contamination control when decontaminating exterior surfaces. Special attention will be required to ensure adverse weather conditions are not expected which would impede outside decontamination activities.

Spot surveys will be performed during decontamination to assess the effectiveness of the effort and to verify that the release limit guideline values are being achieved.

In addition to the decontamination methods described relative to equipment, the following additional techniques may be available or required for decontaminating building structures.

- ***HEPA Vacuuming.*** This method involves vacuuming contaminated dust and fines from surfaces which are contaminated. This technique is extremely successful if the contaminant is not fixed or tightly adhered to the surface being cleaned. Oily and sticky contaminants cannot be readily removed with HEPA vacuuming. The contaminant is vacuumed from the surface and deposited in the vacuum for packaging as radioactive waste. Air is exhausted through a 99.95 percent efficient filter for particle sizes of 0.3 micron or larger.

- ***Abrasive Blasting/Vacuum Blasting.*** This technology involves blasting the surface being decontaminated with an abrasive (aluminum oxide, steel shot, etc.) to remove the outer surface layer of the target material. The method is much more aggressive than CO_2 blasting and also generates radioactive waste from the addition of blast media and target material. Incorporation of a reclaimer can substantially reduce the volume of radioactive waste, as well as, reduce the amount of media

required. A vacuum head can be utilized with the abrasive blaster, which collects the blast media and removed surface as they are being blasted. This will reduce the opportunity for contamination to spread and additional clean-up required compared to conventional abrasive blasters.

- ***Surface Scaling and Scabbling.*** This is a destructive decontamination method that physically removes a layer of the surface being cleaned. This technique will be utilized to remove imbedded contamination on concrete surfaces if no other technique is successful and IT and Molycorp mutually agree to proceed. These techniques involve the use of needle scalers, scabblers, and scarifiers to remove concrete surfaces.

6.3 Raw Material (Product Recovery) Handling

When practical, raw materials and product materials will be recovered and packaged for shipment to a suitable facility. Recovery methods include HEPA vacuuming of product dust and fines; dismantlement of dewatering and sludge recovery equipment to allow recovery of product from equipment internals; and shoveling/scrapping of product from both vertical and horizontal surfaces. Product material will be packaged into containers and prepared for shipment to licensed-Molycorp site(s) or other appropriate facilities.

7.0 Final Status Survey

7.1 Final Status Survey Objectives

Upon completion of building decontamination activities, a final release survey will be performed on all buildings. The final release survey shall be performed in accordance with the requirements of NUREG/CR 5849 and will include unaffected as well as affected buildings and areas.

The purpose of the final status survey is to demonstrate that the radiological conditions of the above-grade building structures and removed processing equipment satisfy the unrestricted release guideline values (to be referred to as guideline values in this document) of Section 7.2 set forth below. The specific objectives of the release survey are to demonstrate the following:

Surface Activity. Is defined as radioactivity found on building or equipment surfaces and is expressed in units of activity per surface area (dpm/100 cm^2) and must meet the following:

- Average surface contamination levels (total activity) for each 1 square meter (m^2) grid and each survey unit are within the guideline values.

- Small areas of residual activity (hot spots) do not exceed three times the guideline value. The hot spot limit applies to areas up to 100 square centimeters (cm^2). The average activity within any 1 m^2 grid containing the hot spot must be within the guideline values.

- Removable activity does not exceed 20 percent of the average total surface activity guideline values.

Exposure Rates. Exposure rates in building locations that may be occupied meet the guideline value of Section 7.2 set forth below.

Coated Surfaces. Necessary efforts have been made to identify and remove contaminated paint or coated surfaces.

7.2 Unrestricted Release Criteria (Guideline Values)

On the basis of the combination of radiological contaminants (see Section 2.3) present at Molycorp's York site, the surface contamination guideline values from the Regulatory Guide 1.86 Table are:

Beta-gamma and alpha:

- 1,000 dpm/100 cm^2, total (fixed and removable), average over 1 m^2;
- 3,000 dpm/100 cm^2, maximum total over 100 cm^2; and
- 200 dpm/100 cm^2, removable contamination.

Exposure rates in occupiable locations are less than 10 μR/hr above background. Exposure levels are measured at one meter from floor/lower wall surfaces and are averaged over floor areas, not-to-exceed 10 m^2. The maximum exposure rate at one meter shall not exceed 20 μR/hr above background at any location.

7.3 Organization and Responsibility

The final status survey will be performed by a team of trained-qualified personnel. The team will operate under the supervision of a qualified health physicist who will have the authority to make appropriate changes to the final status survey plan and radiological survey procedures, as deemed

necessary, as the survey progresses. Since results of characterization surveys may be used to supplement the final status survey data, survey techniques and methods similar to those that will be utilized for the final status survey will be utilized.

7.4 Instrumentation

Instrumentation for performing the final status survey will be selected to provide a minimum detectable activity (MDA) low enough to determine the presence of contamination at approximately 25 percent of the guideline values. Sensitivities for scanning are calculated assuming a scanning speed of one-third the detector width per second (i.e., a three-second residence time passing over a small, discrete spot of alpha contamination).

Instrument efficiencies shall be determined using a laboratory standard traceable to the National Institute of Science and Technology (NIST). The combination of instrumentation and survey technique for scanning shall be chosen to provide a detection sensitivity that is less than the guideline value.

7.4.1 Instrument Operability

Source and background checks will be performed daily to ensure that instruments are operating properly.

7.5 Survey Protocol

7.5.1 Definitions

Affected Area. Areas that have potential-radioactive contamination at levels greater than 25 percent of the applicable radionuclide-specific guideline value based on past or preliminary radiological surveillance. Any area originally classified as unaffected where radionuclide contamination levels are in excess of 25 percent of the guideline value are identified.

Unaffected Area. All areas not classified as affected. These areas are not expected to contain residual radioactivity.

Survey Unit. A division of a survey area that is expected to have similar contamination and deposition patterns (i.e., floors and lower walls, upper walls, horizontal surfaces). The maximum

survey unit size is limited to approximately 100 m^2 for affected areas. No survey unit shall include both affected and unaffected areas.

7.5.2 General Survey Plan

Classification of areas with regard to contamination potential may change as the final status survey and associated sampling progresses. At a minimum, the floors and lower walls of affected buildings and the processing equipment in those buildings are assumed to be affected areas.

If necessary, the floor and lower wall areas shall be divided into different survey units to ensure that affected area survey units are less than 100 m^2. Otherwise, the floor and lower walls shall be treated as one affected area survey unit.

The floors and lower walls of affected areas shall receive 100 percent coverage during the final status survey. The survey measurements for surface activity will consist of a combination of surface scans, direct measurements, and measurements of removable activity for isotopes that are potentially present. Locations of areas of elevated activity will be identified and direct measurements will be performed to define their extent and activity levels. Residual activity, which exceeds the guideline value in any contiguous 1 m^2 area or survey unit shall be decontaminated until these conditions are satisfied. One total alpha and beta-gamma measurement will be made in each 2 m^2 square grid of affected areas. Biased (survey points selected due to the indication of elevated activity) measurements will be made at any elevated location identified during surface scans and suspect locations such as drains.

Building areas and large equipment suspected of having residual activity at greater than 25 percent of the guideline value, based on operating history and previous surveys, will be surveyed in the same manner as floors and lower walls. Upper walls, ceilings, and overhead surfaces are assumed to be unaffected areas; however, a minimum of three measurements for every 10 m^2 grid will be performed and 10 percent of each 10 m^2 grid will be scanned. Measurement locations for total and removable alpha and beta-gamma contamination will be chosen from accessible upper wall and ceiling areas in any area where radioactive material was likely to accumulate. If any measurement exceeds 25 percent of the applicable guideline value, the area will be evaluated for reclassification as affected.

To assure reasonable coverage of upper surfaces (> 2 meters high) above affected areas, an average of at least three measurement locations per 10 m^2 of upper wall and/or overhead surface area will be selected. At each location, a scan of the immediate area is performed to identify the presence of any elevated activity levels followed by the measurement.

All affected large equipment and tanks will be surveyed in accordance with the existing equipment release procedure.

7.5.3 Reference Grid System

A reference grid system shall be established for the following purposes:

- To facilitate systematic selection of measuring and sampling locations.
- To provide a mechanism for referencing a measurement or sample back to a specific location so that a survey point can be relocated.
- To provide a convenient means for determining average activity levels in one square meter.

Survey grids shall be approximately 1 square meter (3 feet x 3 feet) in affected areas. Each grid will be identified by a survey unit number followed by an alphanumeric identifier. Every 1 meter along the "x" axis will be identified alphabetically and every 1 meter along the "y" axis shall be identified numerically. Location codes for upper walls and ceilings or overhead surfaces will be referenced to the floor grids or to other prominent building features and may contain additional identifiers such as LW (lower wall or lower vertical), UP (upper wall or overhead), and C (ceiling).

Due to the various survey surface configurations, some grids may be smaller than 1 square meter or a shape other than square. Survey locations will be referenced to the grid system using a survey unit number and alphanumeric identifier; surveys of ungridded surfaces are referenced to the floor grid or to prominent building features and the survey unit number.

7.5.4 Surface Scans

Scanning (frisking in the count rate mode at one-third detector width per second) of surfaces to identify locations of residual surface activity will be performed according to the following schedule:

- Affected area - 100 percent of surfaces for alpha and beta-gamma.
- Unaffected area -10 percent of surfaces (alpha and beta-gamma).

Building interior surface scans will be conducted for alpha and beta-gamma radioactivity. Any elevated areas identified by alpha and beta-gamma scanning will be further investigated and possibly sampled for radiochemical analysis.

7.5.5 Direct Measurements

Direct (total) alpha and beta-gamma measurements shall be performed according to the following schedule:

- Affected areas - a minimum of one measurement per 2 m^2 grid.
- Unaffected areas - a minimum of 10 % of surface area.

7.5.6 Removable Contamination Measurements

One wipe (100 cm^2) for removable contamination shall be taken at each direct measurement location in an affected area and at each measurement location in unaffected areas. Wipes shall be analyzed for both alpha and beta-gamma activity.

7.5.7 Exposure Rate Measurements

Gamma exposure rate measurements shall be performed at a distance of 1 m from floor/lower wall surfaces. Measurements shall be uniformly spaced according to the following schedule:

- Gridded affected areas (floors and walls up to 2 m) - 1 measurement per 4 m^2.
- Unaffected areas - 1 measurement at each randomly selected location on floors/lower wall surfaces.

7.5.8 Special Measurements and Sampling

During the final status survey, a statistically-representative number of locations on painted or coated surfaces will be selected for removal of approximately 100 cm^2 of paint (or other surface coating) that may have been applied over contamination during past operations. At each location, a total alpha measurement will be performed before and after paint removal to determine whether contamination may have been painted over. Alpha and beta-gamma scans will be performed on the paint scrapings collected from each location. If elevations are detected or if the difference observed between "before" and "after" direct measurements suggests that contamination has been

painted over, selected paint samples may be composited and sent for isotopic thorium analysis or alpha analysis.

These samples will be obtained from floors and lower walls (affected areas) at locations where direct and removable contamination measurements do not indicate the presence of contamination. Paint samples may also be collected from surfaces where direct and removable activity measurements were made during the final survey, suggesting that contamination may have been painted over (i.e., areas exhibiting beta-gamma elevations with no corresponding direct alpha elevation).

7.5.9 Building Interiors

Building Numbers 2, 3, 9A, 10, 10A, 10B, 11, 11A, 11B, 14, and 14A have been classified as affected areas. Only the floors and lower walls (lower two meters) of these areas are considered to be affected at this time. Ceilings and upper walls are considered to be unaffected. The remaining buildings have been classified as unaffected (see Table 2.1). The building interior will be gridded and surveyed as described above.

7.5.10 Building Exteriors

Building exteriors are not suspected of being contaminated. The most likely area of any building exterior surface to exhibit elevated contamination levels would be in the vicinity of doors, walkways, ventilation exhaust, and other penetrations. Building exteriors will be surveyed for total and removable contamination around doorways, ventilation exhaust, and other penetrations. Any area which exhibits contamination in excess of 25 percent of the guideline value will be investigated and the exterior surface reclassified as necessary.

Areas around penetrations need not be gridded unless the location requires reclassification as an affected area or decontamination of the area is required.

7.6 Background Determinations

Background exposure rates will be determined for the York site by taking exposure rate measurements at locations near the site, preferably, from structures of similar construction. Results of background exposure rate measurements will be evaluated to assure that the averages determined are representative of the true average utilizing procedures described in NUREG/CR-5849.

7.7 Sample Analysis

Samples obtained during the final status survey will either be analyzed on site for gross alpha and beta-gamma activity or shipped to a qualified vendor for gamma spectrometry and/or thorium analysis. Only qualified laboratories with accepted quality assurance/quality control programs will perform analysis on samples from the York site.

7.8 Data Interpretation and Handling

7.8.1 Data Interpretation

Data conversions and evaluations will be performed following the guidance in NUREG/CR-5849. Measurement data will be converted to the appropriate units for comparison with the release criteria. Exposure rate values will be adjusted for contributions from natural background. Average values and minimum sample sizes for each survey unit will be determined. Average values for survey units will be compared with approved guideline values. Data for each survey unit will be tested against the 95 percent confidence level objective.

Additional remediation and/or further sampling and measurements will be performed where guideline values were not met or could not be demonstrated to the specified level of confidence.

7.8.2 Data Handling

Surface activity measurements for total and removable alpha or beta-gamma radioactivity shall be calculated as follows:

$$R_n(dpm/100\ cm^2) = [(R_g - R_b)/E](100/A) \qquad \text{Eq. 7-1}$$

where:

R_n = Net dpm/100 cm^2
R_g = Gross cpm
R_b = Background of instrument (and structural material background as required)(cpm)
E = Efficiency (4π cpm/dpm)
A = Active area of detector probe or wipe surface area (cm^2)

Laboratory sample results from any sampling will be presented with an estimated uncertainty at the 95 percent confidence level.

Average levels for a grid block or survey unit shall be calculated as follows:

$$\bar{X} = (1/n)\ \Sigma\ X_i \qquad \text{Eq. 7-2}$$

where:

$\bar{X}$ = Average grid block value of average survey unit value (dpm/100 cm^2)

In accordance with NUREG/CR-5849, no uncertainty calculation is necessary for 1 m^2 grid block average.

Surface activity and exposure rate guideline values for survey units are average values calculated according to the equations above. If the average values satisfy the guideline values and conditions, the results are further evaluated to determine whether the data for each survey unit (with the same contamination potential) provides a 95 percent confidence level that the true mean activity level meets the guideline value. The uncertainty due to counting error for each individual measurement (compared to the guideline value) is not taken into account.

The mean and sample standard deviation for each survey unit will be calculated. If there are areas of elevated activity in the survey unit or if the survey unit contains 1 m^2 grids, then the mean of 1 m^2 grid measurements will be used to calculate the mean for the survey unit using equation 7-2.

Calculation of the sample standard deviations shall be as follows:

$$S_x = \sqrt{\frac{\Sigma\ (\bar{X} - X_i)^2}{n-1}} \qquad \text{Eq. 7-3}$$

where:

S_x = Sample standard deviation
$\bar{X}$ = Survey unit average value (dpm/100 cm^2)

X_i = Average grid value (dpm/100 cm^2)

Calculation of the value of μ_a for each survey unit shall be as follows:

$$\mu_a = \overline{X} + t_{1-a,df}\, s_x/(n)^{1/2} \qquad \text{Eq. 7-4}$$

where:

μ_a = 95% confidence value for $\overline{X}$ (dpm/100 cm^2)
$\overline{X}$ = Calculated mean from equation 7-2
$t_{1-a,df}$ = t statistic for 95 percent confidence level with n-1 degrees of freedom
s_x = Sample standard deviation for equation 7-3
n = Number of individual data points used to determine s_x

The value of μ_a is compared to the applicable guideline value of Regulatory Guide 1.86 Table 1; if μ_a is less than the guideline value, the survey unit being tested meets the guideline value at a 95 percent confidence level. If unaffected area μ_a is greater than 25 percent of the guideline value then area classification must be reevaluated.

If μ_a is greater than the guideline value, either more cleanup is required or more measurements are needed to demonstrate compliance. The total number of data points (n_1) which would be required to demonstrate that the measurement value satisfies the guideline value at the desired level of confidence is given by:

$$n_1 = \left[\frac{s_x}{C_G - \overline{X}}\right]^2 \left[Z_{1-\alpha} + Z_{1-\beta}\right]^2 \qquad \text{Eq. 7-5}$$

where:

n_1 = Number of data points to demonstrate compliance
C_G = Guideline value
$\overline{X}$ = Mean calculated from equation 7-2
s_x = Sample standard deviation calculated from equation 7-3
$Z_{1-\alpha}$ *and* $Z_{1-\beta}$ = Standard normal variables: a is the false positive probability ($\mu_a < C_G$) if the true mean is equal to C_G, and b is the false negative probability ($\mu_a > C_G$) if the true mean is equal to C_G.

A false positive level of 5 percent and a false negative level of 10 percent will be used for this calculation in accordance with NUREG/CR 5849. The critical values are based upon infinite degrees of freedom in Table B-1 of NUREG/CR5849.

Critical Values
$Z_{1-\alpha} = 1.645$
$Z_{1-\beta} = 1.282$

7.9 Final Status Survey Report

A report describing the procedures and findings will be prepared and submitted to Molycorp. Report format and content will follow the recommendations contained in the NUREG/CR 5849.

7.10 Records

All records generated as a result of the final status survey shall be maintained in an auditable manner for the duration of the project and then retained in permanent project files in accordance with all applicable IT procedures.

8.0 Waste Management

This section provides an overview of the requirements, criteria, and methods to ensure proper collection, control, processing, classification, and transportation of radioactive, hazardous, mixed, residual, and solid waste that may be generated at the York site.

8.1 Radioactive Waste Management

Radioactive materials generated at the York site may consist of equipment, tools, process material, building debris, decontamination materials (i.e., rags, wipes, filters, etc.), decontamination waste (i.e., water, blast media, etc.), soils, residual process equipment waste (sludges), and used PPE.

Radioactive waste management involves proper identification, characterization, segregation, packaging, labeling and marking, manifesting, and transporting of the waste. ALARA (As Low As Reasonably Achievable) principles shall be incorporated into the radioactive waste management plans. A brief description of these management elements is described below:

- Identification of radioactive materials is accomplished by performing radiological sampling and surveys at the York site. The Decommissioning Plan requires that scoping, characterizing, and final status surveys, as well as sampling, be performed. This survey and sampling plan is expected to identify the presence all radioactive waste.

- Characterization of radioactive materials will be performed and the results compared to the concentration values of 10 CFR 61.

- Segregation of radioactive waste is performed to provide for decontamination or additional waste treatment of the materials being removed from the site.

- Packaging, labeling, and marking of radioactive waste is performed to meet the federal, state, and local regulations. Waste packaging is required to conform to minimum standards as described in 49 CFR.

- Manifesting radioactive waste is required to meet federal, state, and local regulations for transportation of radioactive waste. Information provided for a manifest must be accurate and reliable to insure compliance with these regulations.

- Transportation of radioactive waste is performed by licensed-hazardous waste transport companies with qualified operators and equipment. The regulations in 49 CFR regulate the transport of radioactive waste.

8.2 Hazardous Waste Management

Little, if any, hazardous waste has been identified at the York site. Hazardous material inventory surveys are included as part of this Decommissioning Plan and will be used to identify any hazardous or characteristic hazardous waste.

Hazardous waste management involves the same aspects as radioactive waste management. The materials must be identified, characterized, segregated, packaged, manifested, and transported to licensed-treatment or -disposal facilities. In addition, hazardous waste cannot be stored on site longer than 90 days unless the site is permitted to allow such storage. If hazardous waste is identified, waste minimization practices will be incorporated to limit the quantity of hazardous waste generated.

Prior to each shipment of hazardous waste, it must be properly packaged, labeled, and marked to meet all state and federal regulations. Each shipment must have a completed Uniform

Hazardous Waste Manifest, Hazardous Waste Disposal Analysis Record, and completed inspection logs.

8.3 Residual Waste Management

Residual waste management involves many of the same procedures required for hazardous waste management. The materials must be identified, characterized, and manifested for transportation to a licensed-treatment or -solid waste disposal facility. In addition, a Form U Notification form must be submitted to the Pennsylvania Department of Environmental Protection (PADEP) at least 15-working days prior to shipment of waste from the York site.

8.4 Mixed Waste Management

No mixed waste has been identified at the York site. A mixed-waste inventory survey is included as part of this Decommissioning Plan and will be performed during the scoping and characterizing surveys. If mixed waste is identified during these surveys, an analysis of the waste will be performed and potential treatment alternatives explored. Storage, treatment, and disposal of mixed waste is not considered to be part of the scope of decommissioning at this time.

8.5 Building Demolition Debris Management

With the exception of ACM and recyclable material noncontaminated building debris may be transported to a licensed-solid waste disposal facility.

8.5.1 ACM

ACM will be abated as outlined in Section 9.3 of this Decommissioning Plan Addendum and labeled and marked in accordance with federal and state regulations for disposal at a ACM-permitted and licensed solid waste disposal facility. a manifest will be completed for each load of ACM waste.

8.6 Transportation

All waste will be transported by companies licensed to transport the category of waste being moved. Transport equipment will be inspected to ensure that it is in satisfactory condition for transporting the waste. Drivers' credentials will be verified and vehicles properly placarded prior to release from the York site. Loads will be secured and blocked as necessary to prevent load shifting during transport. All shipments will be properly manifested, labeled, and

marked. Flatbeds and trailers utilized for radioactive waste transport will undergo both incoming and outgoing surveys to ensure compliance with the Department of Transportation regulations. Emergency instructions will be provided to drivers for radioactive and other hazardous shipments as required.

IT will ensure that all waste transported from the York site meets all required federal, state, and local regulations prior to departure from the site.

9.0 Demolition Methodologies

Prior to demolition of any building, a confirmatory survey shall have been performed by the NRC or their authorized subcontractor, and written confirmation release from the NRC that the structure is suitable for free release will be obtained.

9.1 Building Demolition/Dismantlement

In the event that a building structure cannot be decontaminated to meet the free-release requirements, it will be disassembled and packaged as radioactive waste. Disassembly of radioactive-contaminated structures will be performed by qualified radiation workers and under the supervision of the project manager and radiation safety officer. Dismantlement will be performed in a controlled manner such that the possibility for the spread of contamination is minimized. Dust control measures including mist or fog nozzles to spray water on surfaces which could produce dust and limiting dust producing work on windy days will be employed to prevent the spread of contamination. Debris from building disassembly will be segregated and packaged as radioactive waste.

9.2 Building Debris Disposal

As an alternative to packaging and disposing of building rubble as radioactive waste, building debris may be crushed into rubble and properly disposed. For purposes of this optional approach, rubble is defined as concrete, concrete blocks, building bricks, and building block materials used in the walls of buildings at the York site. A hydraulic ram attached to an excavator or a crusher will be utilized to rubblize these materials into aggregate which can be used as fill material. The hydraulic ram will be utilized if the disposal cell can accept aggregate up to 1 foot in its largest dimension. A crusher will be required if smaller aggregate

sizing is required. Building rubble from contaminated building dismantlement will be staged in a location near the crusher. The crusher is capable of crushing a maximum of 150 tons per hour. Rubble is loaded into the hopper where it is fed into the unit and crushed into aggregate-sized material. The rubble aggregate will be loaded into roll-off containers or directly into trucks for transport to an appropriate facility. Dust control during crushing activities will be maintained with water spray. During crushing operations if dust creates an opacity reading of 20 or higher at the crusher, water mist will be applied to the material before it enters the unit, as well as, at the crusher unit. If dust control cannot be maintained with the water mist, a ventilation hood can be placed over the crusher unit and the exhaust directed through a baghouse or cyclone unit.

Only trained operators will be authorized to operate or maintain the unit. Periodic inspections will be performed to ensure the equipment is operating properly and that all belts, pulleys, and other mechanically-hazardous features of the unit are suitably guarded.

9.3 Asbestos Abatement

Asbestos containing material (ACM) will be removed in areas where decontamination and decommissioning activities may encounter this material. ACM is divided into two categories, radioactive-contaminated and noncontaminated ("clean") asbestos. Asbestos abatement will be performed by individuals trained and licensed in the Commonwealth of Pennsylvania to perform this work and in accordance with approved-work procedures. Asbestos workers removing contaminated asbestos will be required to have radiation worker training.

The numerous types of ACM will be abated in accordance with the PADEP, the Pennsylvania Department of Labor and Industry (Bureau of Occupational & Industrial Safety), OSHA 29 CFR 1926.1101 Final Asbestos Rule 1995, and NESHAPS requirements. Prior to beginning any asbestos abatement, a 10-working day notification to the PADEP is required. All asbestos removed will be double bagged and labeled as containing ACM. In addition, radioactive-contaminated asbestos will be packaged for disposal as radioactive waste.

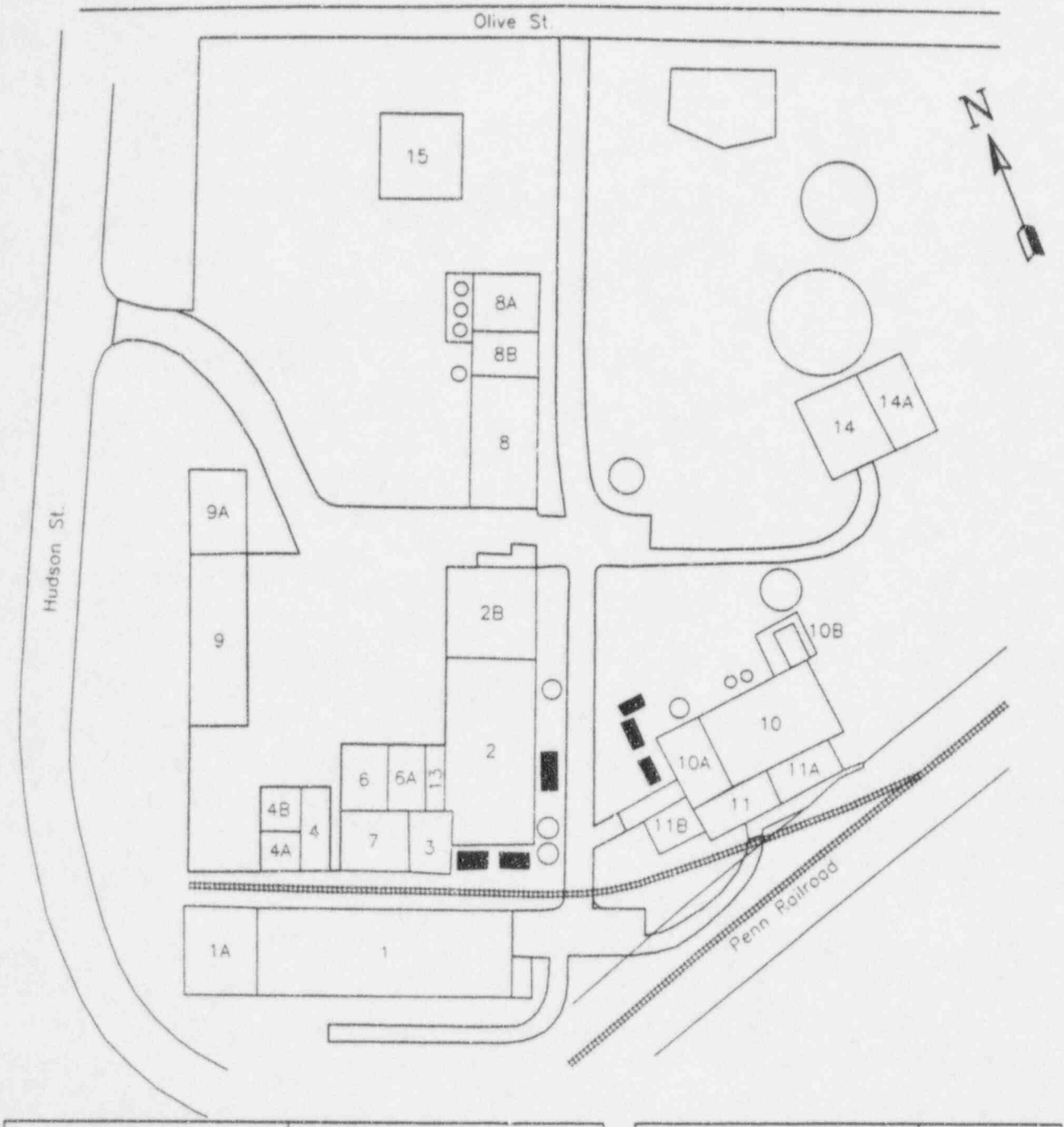
Attachment A

Figures

Figure 1 - York, Pennsylvania Site Building Layout

Figure 2 - Technical Approach for Processing Equipment, Tanks, etc.

Figure 3 - Technical Approach for Structures



BUILDING NAME	NUMBER
Laboratory	9A
Tankroom	2
99.9% Ce Room	3
REC Area	10, 10A, 10B, 11, 11A, 11B
Wastewater Treatment	14, 14A
Tank Room Admin Area	2B
Adminnistration Building	9
Moly Building	8, 8A

BUILDING NAME	NUMBER
Mill Room	1
Locker/Lunch Room	4, 4A, 4B
Boiler House	7
Compressor Room	6A
Supply Room	6
Pipe Rack Room	13
Warehouse	15

FIGURE 1
YORK, PENNSYLVANIA SITE BUILDING LAYOUT

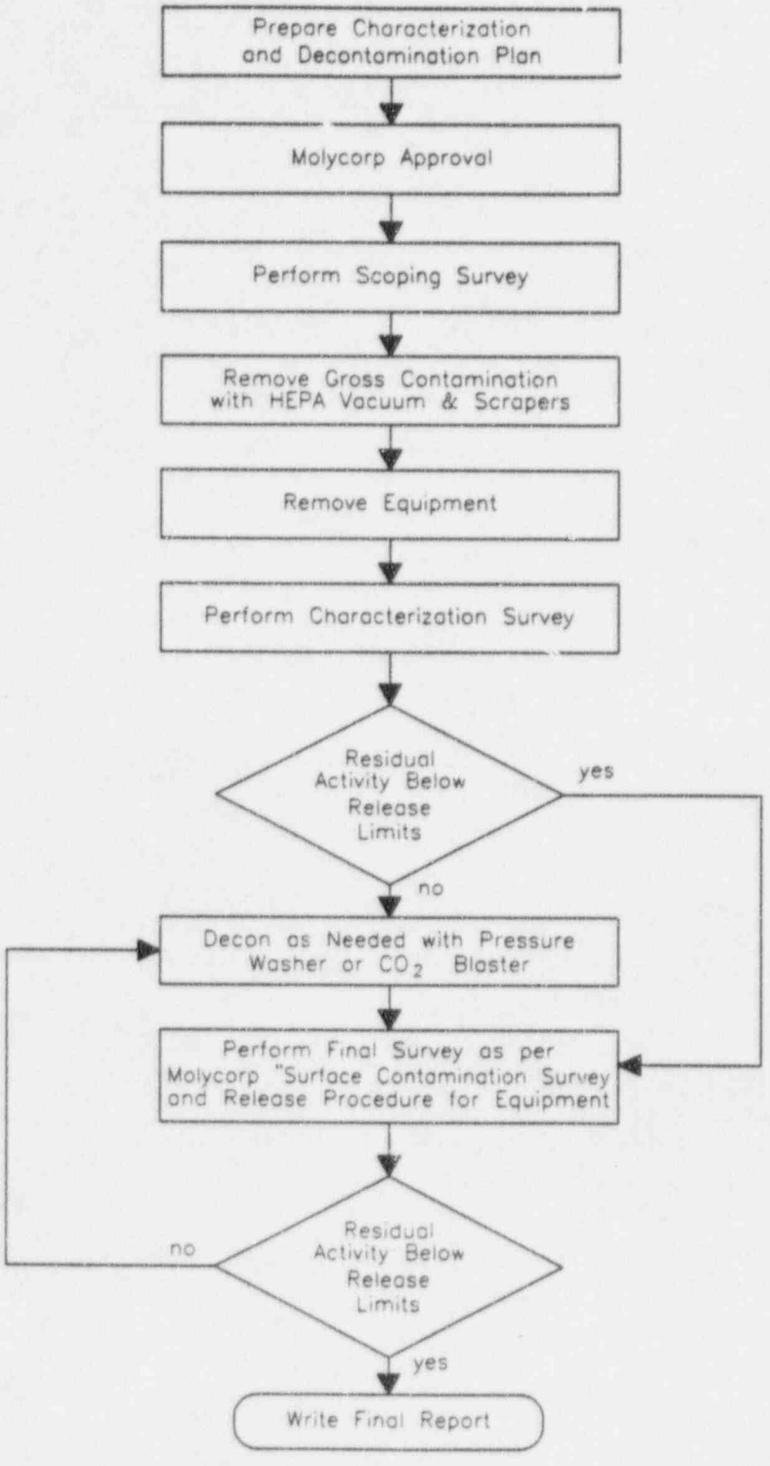


FIGURE 2
TECHNICAL APPROACH FOR PROCESSING
EQUIPMENT, TANKS, ETC.

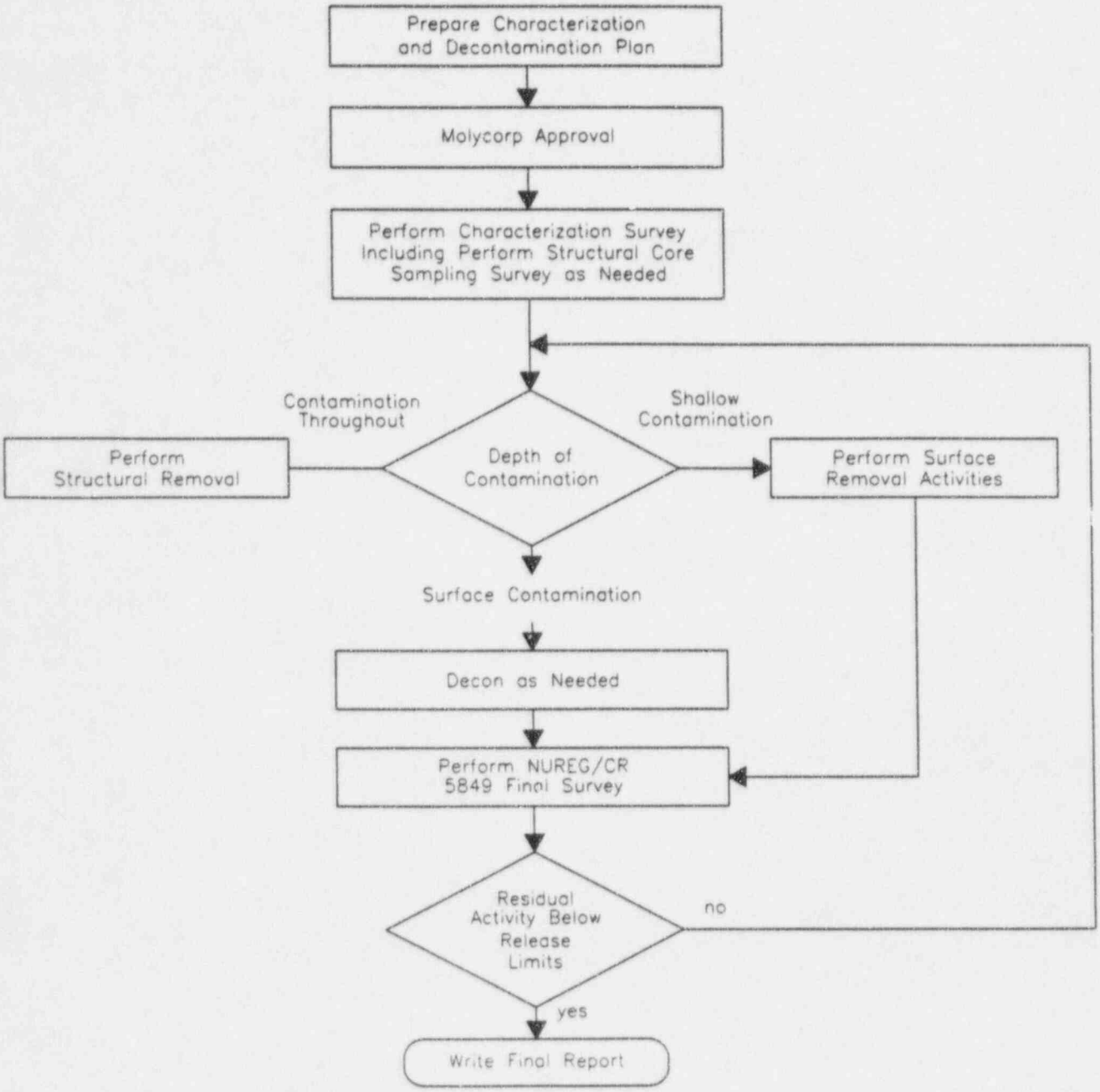


FIGURE 3
TECHNICAL APPROACH FOR STRUCTURES

Attachment B

Applicable and Appropriate Guidance Documents for Site Activities

Attachment B
Applicable and Appropriate Guidance Documents for Site Activities

1. NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination", Draft Report June 1992.

2. USNRC (NRC 1987), Office of Nuclear Material Safety and Safeguards (NMSS) "Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Materials."

3. Regulatory Guide 1.86, "Termination of Operating Licenses For Nuclear Reactors", June 1974.

4. Molycorp, Inc., "Decommissioning Plan for the York, PA Facility", August 1995.

5. IT Corporation HS700 "Radiation Protection Program"

6. IT Corporation RPP-001 "Internal Exposure Control"

7. IT Corporation RPP-002 "External Exposure Control"

8. IT Corporation RPP-003 "Contamination Control"

9. IT Corporation RPP-004 "Instrument and Surveillance"

10. IT Corporation RPP-005 "Radiological Areas and Posting"

11. IT Corporation RPP-006 "Sample Screening and Classification"

12. IT Corporation RPP-007 "Purchase, Receipt, and Identification of Radioactive Material"

13.	IT Corporation RPP-008	"Engineering Controls and Respiratory Protection"
14.	IT Corporation RPP-009	"Packaging and Transportation of Radioactive Materials"
15.	IT Corporation RPP-010	"Radiation Protection Records"
16.	IT Corporation RPP-011	"Control of Standard Operating Procedures for Radiation Protection"
17.	IT Corporation RPP-012	"Emergency Response Notifications"
18.	IT Corporation RPP-013	"Handling of Sealed Sources"
19.	IT Corporation RPP-015	"Control of Radiological Work"
20.	29 CFR 1910.120	"Hazardous Waste Operations and Emergency Response"
21.	29 CFR 1926	"Safety and Health Regulations for Construction"
22.	NIOSH Publication 85-115	"Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities"
23.	10 CFR 20	"Standards for Protection Against Radiation"