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LETTER OF TRANSMITTAL

DATE: April 25, 2002

TO: USNRC Region 1

ATTN: Ms. Marie Miller

FROM: Ravi Jarecha

RE: Work Plan for Decontamination and Disassembly of D111 and D102/112 Production Departments and Flex-Kleen Baghouse

PARS PROJECT NO: 610-01

Enclosed please find: X Report __ Letter __ Proposal __ Other

No. of Copies Enclosed: 1 Copy of the Work Plan for your review

This is being sent to you: X For approval __ For your use __ For Completion

Enclosed please find one (1) copy of the Work Plan for the Decontamination and Disassembly of D111 and D102/112 Production Departments and Flex-Kleen Baghouse for Shieldalloy Metallurgical Corporation in Newfield, NJ.

The following changes and/or additions have been made to the Work Plan per our telephone conference on April 23, 2002:

Page 1 of 14 Section 1.1: The second sentence of the second paragraph was clarified to read "Short-term risks to the general public and decontamination and disassembly workers will be minimized by the institution of engineering, administrative and procedural controls in accordance with the ALARA philosophy and all applicable OSHA regulations.

Page 2 of 14 Section 2.2 Lines 11 through 15: The volumetric release criteria published in the June 13, 2000 Federal Register has been included in the Work Plan. These are 1.1 pCi/g and 0.5 pCi/g for ^{232}Th and ^{238}U, respectively.

Page 2 of 14 Section 2.2 Lines 17 through 18: The final work-over survey details were changed to read, "For the walk-over survey after the removal of the buildings, a screening level of 10 microR per hour above background, at a distance of one (1) meter from the soil surface will be used."

Page 2 of 14 Section 2.2 Lines 22 through 28: In addition to material and soil/dust, concrete was added to the list of material that will be managed at the Storage Yard.

Page 3 of 14 Section 2.3.2 Line 24: The word "all" was inserted before slag.

Page 4 of 14 Sections 2.4.1: The second and third sentence was changed to "Since the measurements show a maximum exposure rate of 1500 microR/hour, the area does not require posting as a Radiation Area as defined by 10 CFR 20.1902 and it is unlikely that any person will receive more than 2 mrem in an hour. Nonetheless, every effort will be made to keep exposures as low as possible in accordance with the ALARA philosophy.

Page 5 of 14 Sections 2.4.2: The second and third sentence was changed to "Since the measurements show a maximum exposure rate of 900 microR/hour, the area does not require posting as a Radiation Area as defined by 10 CFR 20.1902 and it is unlikely that any person will receive more than 2 mrem in an hour. Nonetheless, every effort will be made to keep exposures as low as possible in accordance with the ALARA philosophy.

Page 5 of 14 Sections 2.4.3: The second and third sentence was changed to "Since the measurements show a maximum exposure rate of 40 microR/hour, the area does not require posting as a Radiation Area as defined by 10 CFR 20.1902 and it is unlikely that any person will receive more than 2 mrem in an hour. Nonetheless, every effort will be made to keep exposures as low as possible in accordance with the ALARA philosophy.

Page 4 of 15 Section 2.4.1 Lines 43 and 44: The following statement was added, "All concrete that exceeds the release criteria will be stored in the SMC Newfield Storage Yard."

Page 7 of 14 Section 3.4.3: Specifies that Internal Radiological Exposure shall be calculated by measuring the airborne radioactivity level pursuant to SMC Radiation Safety Procedure No. RSP-008 and RSP-018.

Page 10 of 14 Section 3.5.5 Line 28: In addition to slag and soil/dust, concrete was added to the list of material that will be managed at the Storage Yard.

Page 11 of 14 Section 3.6 Lines 5 through 8: For the Final Status Survey , the statement was changed from 15 microR per hour above background measured at two (2) centimeters from the ground surface to be consistent with NRC guidelines of 10 microR per hour above background measured at one (1) meter from the ground surface.

Table 1: The volumetric release criteria have been update to 1.1 pCi/g and 0.5 pCi/g for ^{232}Th and ^{238}U, respectively.

Table 4: Details of the instrument sensitivity information is as follows:
25 dpm (alpha)/100cm^2 for the Ludlum 43-1 Detector/2221 Meter in Scaler Mode
200 dpm (alpha)/ 100cm^2 for the Ludlum 43-1 Detector/2221 Meter in Ratemeter Mode

The planned approach for the Final Status Survey and the personnel monitoring procedure will be available for your review at the SMC Newfield Facility or otherwise at your request.

PARS and SMC are committed to work with you and the NRC to complete this project in a safe and timely manner. If you have any questions, please do not hesitate to contact me at (609) 890-7277 or Mr. David Smith, of SMC, at (856) 692-420 ext. 226.

Sincerely,

PARS Environmental, Inc.

Ravi Jarecha, CET
Director, Health & Safety Division

enc.

cc: Mr. David R. Smith - Shieldalloy Metallurgical Corporation (w/enclosure)

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Work Plan
for the
Decontamination and Disassembly
of
D111 and D102/112
Production Departments
and
Flex-Kleen Baghouse

Shieldalloy Metallurgical Corporation

Report No. 610-01

PARS
Environmental
Inc.

Work Plan

for the

Decontamination and Disassembly

of

D111 and D102/D112 Production Departments

and

Flex-Kleen Baghouse

Submitted to:

Shieldalloy Metallurgical Corporation
12 West Boulevard
Newfield, NJ 08344
(609) 692-4200

Prepared by:

PARS Environmental Inc.
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Robbinsville, NJ 08691
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Report No. 610-01
April 2002

TABLE OF CONTENTS

I. INTRODUCTION

Shieldalloy Metallurgical Corporation (SMC) operates a facility located in Newfield, NJ. This facility manufactures or has manufactured specialty steel and super alloy additives, primary aluminum master alloys, metal carbides, powdered metals, and optical surfacing products. Raw materials currently used at the facility include beneficiated ores which contain oxides of columbium (niobium), vanadium, aluminum metal, titanium metal, strontium metal, zirconium metal and fluoride (titanium and boron) salts. During the manufacturing process, the facility generates a variety of by-products that have commercial application.

Some of the materials received, used or stored by SMC contain radioactive material, which is classified as "source material" pursuant to Title 10 CFR Part 40. The U.S. Nuclear Regulatory Commission has authorized SMC to ship, receive, possess, use, and store source material pursuant to License No SMB-743. The primary forms of source material currently present at the site include ores used as feed to metallurgical operations, byproduct slag used as a slag fluidizer, and baghouse dust. A schematic map of the site, showing the major site features of this plant, is presented on Figure 1 – Site Map.

1.1 Purpose

The purpose of this plan is to detail the activities to be performed for the decontamination and disassembly of the D111 and D102/D112 Production Departments and the Flex-Kleen Baghouse. The overall goal of the decontamination and disassembly of the above-referenced buildings is to remove all radioactive materials such that residual levels permit the buildings to be released for unrestricted use. In this case the buildings are to be removed, since operations in these areas have ceased.

The removal of these buildings is expected to reduce the long-term risk to the general public since the site will be released for the unrestricted use pursuant to 10 CFR 40.42. Short-term risks to the general public and decontamination and disassembly workers will be minimized by the institution of engineering, administrative and procedural controls in accordance with the ALARA philosophy and all applicable OSHA regulations.

Along with this Decontamination and Disassembly Plan, the SMC Radiation Safety Procedures (RSPs) will be used to implement the onsite work, and will be supplemented by the PARS Project Health and Safety Plan, as required.

II. FACILITY INFORMATION

2.1 Contaminants of Concern

SMC is licensed to possess uranium and thorium in any form suitable for transport under Department of Transportation regulations. Previous studies of radionuclide content of the materials typically found at SMC are indicative of a natural distribution of the radioactive progeny of these series radionuclides. The contaminants of concern at SMC and during this project include ^{232}Th plus progeny in equilibrium and ^{238}U plus progeny in equilibrium.

2.2 Release Criteria

SMC Radiation Safety Procedure No. RSP-009, "Contamination Control" contains the surface release criteria for the SMC Newfield facility. These criteria are shown in Table 1. For volumetric release criteria, values published in the June 13, 2000 Federal Register shall be followed. These release criteria values are 1.1 pCi/g and 0.5 pCi/g for ^{232}Th and ^{238}U, respectively.

For the walk-over survey after the removal of the buildings, a screening level of 10 microR per hour above background, at a distance of one (1) meter from the soil surface will be used. At any location that exhibits an exposure rate in excess of this value will be subject to additional investigation and/or remediation.

Material, soil/dust and concrete that are below the stated release criteria will be classified as unrestricted. Material, soil/dust and concrete that exceed the stated release criteria will be decontaminated using HEPA-vacuuming and/or more aggressive means, such as chipping, scrapping, grinding or sand blasting, if necessary, to classify the material as unrestricted. In the event that the material, soil/dust and concrete cannot be effectively decontaminated to below release criteria or soil/dust exceeds the release criteria, the material, soil/dust and concrete will be properly managed according to SMC Procedures and USNRC Regulations.

2.3 Building/Production Department Descriptions

A brief description of the former operation at each of the buildings, included in this project, is provided in the following sections.

2.3.1 Production Department D102

Production Department D102 produced pure metals and alloys by reducing metal oxides with aluminum powder, known as the aluminothermic process. D102 and the production of chromium metal began very early in the history of the SMC plant. In addition to the aluminothermic process, D102 also housed the stockpile of CANAL© crushing/sizing/packaging operation. The building had been equipped with a furnace, crushing equipment, scales, bagging equipment, and other miscellaneous items. D102 is a “Restricted Area”, but is no longer stores licensable material, in the form of CANAL©.

The current building was constructed in 1958. The overall building is 54 feet wide and 300 feet long. The aluminothermic department utilized 73% of the building with the balance utilized for the crushing and packaging department, as described in Department D112.

2.3.2 Production Department D111

Production Department D111, or the ferrocolumbium production department, was the predominant location where source material ore was smelted into ferroalloy. It is equipped with an operator room, mechanical booms, heavy equipment handlers, storage containers, scales, a variety of melting pots, two furnaces, a dust collection system, and other miscellaneous items. D111 is a “Restricted Area”, but no licensable material, in the form of slag and pyrochlore, are present at this time.

The original building was purchased from the Federal Government and moved from Montana to Newfield, New Jersey in 1964. The original structure is 80 feet by 90 feet. An additional structure was added, also in 1964, that is 22 feet by 71 feet. In 1981, the D111 was expanded with the addition of another building, approximately 135 feet by 123 feet wide. The building is 70 feet tall at the peak. D111 is constructed of wood and metal.

It the past, ferrocolumbium slag may have been used on-site as fill material for certain construction projects within the SMC plant. Should fill slag be encountered, through survey results or from disassembly operations, all slag shall be extracted and transported to the Storage Yard. Fill slag may be encountered in D102 and D111.

2.3.3 Production Department D112

Production Department D112 crushes all lump alloy smelted or melted at the SMC plant. D112 is capable of taking pieces as large as twenty-four inches in diameter. The lump alloy was then crushed, sized, and packaged to a variety of forms. Allow could be sized from four inch to 8 mesh down through several different crushing systems. The sized alloy could be either delivered to another department for further processing or packaged in its final form for shipment to a customer.

D112 did not process source material, but is contained within the same structure as D102. D112 shares the 54 feet by 300 feet building with D102, and utilized approximately 27% of the building for its operations.

2.3.4 Flex-Kleen Baghouse

The Flex-Kleen Baghouse system was installed in 1987. It was designed to draw up to 200,000 cfm, and typically operated in concert with the former AAF Baghouse system. Pulsed air jets in the Flex-Kleen Baghouse removed the dust generated in the ferrocolumbium production department (D111). The dust was then conveyed via a series of screw conveyors through filter bags and collected into storage bins. When the storage bins were full, the dust was taken to the Storage Yard. The building is equipped with storage bins, filter bags, and other miscellaneous items. The Flex-Kleen Baghouse is a "Restricted Area", because of the baghouse dust, which is still present inside the system and associated ductwork.

2.4 Limited Historical Site Assessment

Information on historical and current radiological contamination levels, as part of SMC's Radiation Protection Program were reviewed to obtain a general characterization of the buildings targeted in this Plan. The available Quarterly Survey Reports from the 4th Quarter of 1997 through the 2nd Quarter of 2001 were reviewed in this section. The information that follows for each of the areas, with the exception of D112, is:

- **Ambient Gamma Exposure Rates**: measured in various areas of the facility, following a similar protocol as described in section 3.4 of this Plan.
- **Total Surface Contamination Levels**: measured on surfaces, including floors, desks, equipment, tables, and other accessible horizontal surfaces, following a similar protocol as described in section 3.4 of this Plan.

Summaries of the *maximum* Ambient Gamma Exposure Rates and Total Surface Contamination values measured during the respective calendar quarter are summarized in Table 2 and 3, respectively.

Additionally, Total Surface Contamination Levels that were *well above average* for each calendar quarter are plotted, in Figures 2, 3a, 3b, 3c and 4, to provide a visual geographic distribution of maximum contamination levels that are to be expected. These maximum values were compared to the site-specific release criteria to characterize the buildings.

No evidence or reports of catastrophic events such as spills or fires exist.

The information presented in this section of the Plan will be used to scope additional surveys and the decontamination effort prior to the disassembly of the buildings.

2.4.1 Production Department D102

Ambient Gamma Exposure Rates measured in D102 ranged from background to 1500 microR/hour. Since the measurements show a maximum exposure rate of 1500 microR/hour, the area does not require posting as a Radiation Area as defined by 10 CFR 20.1902 and it is unlikely that any person will receive more than 2 mrem in an hour. Nonetheless, every effort will be made to keep exposures as low as possible in accordance with the ALARA philosophy.

As Figure-2 shows, Total Surface Contamination values ranged from background to a maximum of 2000 dpm (alpha)/100cm^2. The highest values were primarily located on a concrete area outside of the bay door on the East side of the building. This is the only area in D102 that is expected to exceed the site-specific release criteria. All concrete that exceeds the release criteria will be stored in the SMC Newfield Storage Yard.

2.4.2 Production Department D111

Ambient Gamma Exposure Rates measured in D111 ranged from background to 900 microR/hour. Since the measurements show a maximum exposure rate of 900 microR/hour, the area does not require posting as a Radiation Area as defined by 10 CFR 20.1902 and it is unlikely that any person will receive more than 2 mrem in an hour. Nonetheless, every effort will be made to keep exposures as low as possible in accordance with the ALARA philosophy.

As Figures-3a, 3b, and 3c show, Total Surface Contamination values ranged from background to a maximum of 583 dpm (alpha)/100cm^2. The highest value approaches, but does not exceed the site-specific release criteria.

2.4.3 Flex-Kleen Baghouse

Ambient Gamma Exposure Rates measured in Flex-Kleen Baghouse area ranged from background to 40 microR/hour. Since the measurements show a maximum exposure rate of 40 microR/hour, the area does not require posting as a Radiation Area as defined by 10 CFR 20.1902 and it is unlikely that any person will receive more than 2 mrem in an hour. Nonetheless, every effort will be made to keep exposures as low as possible in accordance with the ALARA philosophy.

As Figure-4 shows, Total Surface Contamination values ranged from background to a maximum of 2444 dpm (alpha)/100cm^2. The primary source of radiological contamination is the remaining residual dust in the system. Many areas are expected to exceed the site-specific release criteria.

III. PROJECT METHODOLOGY

3.1 PROJECT ORGANIZATION

All field work will be managed by **Mr. Ravi Jarecha, CET** and **Mr. Robert Confer, CIH**. During the performance of the work described in this Plan, Mr. Jarecha will be the Field Supervisor. He will be the primary person responsible for designating the temporary restricted area in which work is to be performed, directing the work of other support staff, performing the survey activities, and preparing the Final Status Survey Report. Mr. Confer will be the Technical Field Supervisor. He will serve as the additional primary person responsible in the event that two PARS employees are required to be on-site and as support to all field operations.

Technical oversight for the entire project is the responsibility of **Dr. Edward A. Christman, CHP**. Dr. Christman has reviewed and approved this Plan, will assist in the review of the quality of the data collected and the preparation of the Final Status Survey Report, and provide an interface between SMC and project personnel.

Mr. Louis Apoldo, PE will provide be the senior advisor for the construction, disassembly, and decontamination phases of this Plan. **Dr. Harch S. Gill** will ensure that work has been followed in accordance to this Plan and USNRC guidelines.

A brief narrative of each member of the PARS Project Team is included in Appendix A of this Plan.

Also, on the Project Team is Summit Compliance, a contractor to SMC, who will provide personnel, materials and equipment necessary for the decontamination and disassembly of the buildings included in this Plan. Summit will also provide a field supervisor, **Mr. Robert Bennet**, to oversee the crew of decontamination and disassembly personnel.

3.2 PRE-WORK ACTIVITES/H&S PLAN

Prior to the start of work, personnel that will be involved with the project will attend an initial tailgate safety briefing, which will cover this Plan and its implementation. Participants in this project should have current 40 Hour OSHA HAZWOPER and Confined Space Entry training.

As part of the pre-work activities, work areas shall be established, which includes the posting of the areas as required, establishing the work boundary, and set up and placement of equipment to be used during this project. PARS field personnel will perform pre-work radiation and contamination surveys of the work areas and will generate a SMC Radiation Work Permit, as required, for the project based on the results of the survey. Additionally, the PARS Health and Safety Plan shall be reviewed and signed by all personnel involved in this project.

3.4 FIELD INSTRUMENTATION AND PROCEDURES

In order to ensure that Project Team personnel, SMC personnel, and the general public are not exposed to excess air contaminants, including radiological contaminants, the following are types of monitoring and screening that shall be conducted during this project. A list of field instrumentation to be used during this project is listed in Table 4.

3.4.1 Surface (Alpha) Contamination

A Ludlum Measurements, Inc. (Ludlum) Model 43-1 Scintillator (Alpha detector) will be used to measure Total and Removeable surface contamination.

- The instrument will be calibrated according to Manufacturer specifications.
- The instrument will be source checked with ^{230}Th.
- Background measurements will be obtained in areas free of source material.
- Total contamination shall be conducted by scanning impermeable* surfaces (such as concrete, metal and drywall) with the detector held 1/8 inch off the surface being monitored.
  **Alternative procedures, i.e. offsite laboratory analysis, are to be followed for porous surfaces, such as wood, soil, water, etc.*
- The detector will be moved at a rate of one to two inches per second over the surface of the area.
- The measured data shall be recorded on the "Contamination Survey Form"
- This measurement value is the total surface contamination.

When total surface contamination measurements exceed the site-specific release criteria, removable surface contamination (wipe tests) shall be conducted in the following manner:

- A Smear cloth shall be wiped in an "S" shape using moderate pressure.
- The area covered will be approximately $100cm^2$ ($16in^2$).
- The Ludlum Model 43-1 Scintillator shall be used to measure the activity on the smear cloth following the above-described procedure.
- The fixed contamination will be determined by subtracting the removable contamination value from the total surface contamination value.

3.4.2 Ambient Gamma Exposure

A Ludlum Model 19 MicroR Meter (Gamma Surveyor) will be used to measure Ambient Gamma Exposure.

- The instrument will be calibrated according to Manufacturer specifications.
- The instrument will be source checked with ^{238}U or ^{239}Th.
- Background measurements will be obtained in areas free of source material.
- Ambient Gamma Exposure shall be monitored by holding the instrument detector approximately three feet (waist level) from the walking surface.
- The measured data shall be recorded on the "Ambient Gamma Exposure Form"

3.4.3 External and Internal Radiological Exposure

External Radiological Exposure shall be monitored using thermoluminescent dosimeters (TLDs) on personnel and at the SMC fence boundary. TLDs will be deployed on a monthly basis and returned to the supplier for processing and reporting. Records of the deployment and collection shall be documented on the "Dosimeter Deployment Form." Internal Radiological Exposure shall be determined from the measurement of airborne radioactivity. Airborne radioactivity shall be measured by collecting a known volume of air (2 liters per minute for 480 minutes) onto a filter and analyzing the filter with the on-site field instrumentation and/or sending the filter to an offsite laboratory for alpha activity analysis. This air monitoring procedure shall be consistent with SMC Radiation Safety Procedures No. RSP-008 and RSP-018.

3.4.4 Ambient Air Monitoring Other Than Radiological

Personnel and ambient air monitoring shall be conducted for air contaminants, other than radiological in nature. A known volume of air shall be collected on a filter for analysis and sent to an offsite laboratory for analysis. Potential air contaminants include, but are not limited to, nuisance dust (total and respirable), metal dust, and asbestos fibers. When necessary, confined spaces shall be monitored for oxygen, combustibles, and toxic vapors/gases prior to entry and continuously during entry.

3.5 DECONTAMINATION AND DISASSEMBLY PROCEDURE

Prior to beginning any site work, a general site characterization will be performed by conducting additional contamination survey(s) of all material and building structures, which are safety accessible. The tasks that are to be performed under this Plan are described below:

3.5.1 Decontamination of D102/112

Building D112 and Building D102, as stated in section 2.3.1, is no longer used to store licensable material. The licensable material was removed from D102 during the second quarter of 1998. Due to the nature of operations in these departments, the contaminated areas are expected to be limited to unpaved and concrete areas that were in contact with slag material in the past.

The first step of the project is decontamination of all material and building structures, which are safety accessible, that exceed the site-specific release criteria. Areas with removable surface contamination will be marked with paint and decontaminated, utilizing HEPA-vacuuming techniques. The dust collected from the HEPA-vacuuming will be transported to the SMC Storage Yard. The marked areas will be re-surveyed after initial decontamination. If an area exceeds the site-specific release criteria after HEPA-vacuuming, the contamination will be considered fixed.

The material with fixed contamination will be marked with a second paint color and targeted for more aggressive decontamination, such as chipping, scrapping, grinding or sand blasting.

3.5.2 Decontamination of D111 and Flex-Kleen Baghouse

The Flex-Kleen Baghouse removed the dust generated in Building D111, the ferrocolumbium production department. The disassembly of the Flex-Kleen Baghouse and Building D111 will be conducted after Building D102/112 has been decontaminated and disassembled.

The first step is removal of the filter bags in the baghouse. The filter bags will be unhooked from their supports, lowered to the base of the baghouse and placed into a container and moved to the SMC Storage Yard. All surfaces of the baghouse will be decontaminated using HEPA-vacuuming techniques.

The baghouse will be surveyed after initial decontamination. If an area exceeds the site-specific release criteria after HEPA-vacuuming, the contamination will be considered fixed and the material will be marked for further decontamination. As the baghouse is disassembled, the baghouse structures will be transported to the inside of Building D111 for an additional survey to release the material or to designate the material for further decontamination, such as chipping, scrapping, grinding or sand blasting. The dust collected from the decontamination will be transported to the SMC Storage Yard.

All visible dust on horizontal surfaces and equipment within D111 will be HEPA-vacummed. Building D111 and the equipment inside will be surveyed after initial decontamination. If an area exceeds the site-specific release criteria after HEPA-vacuuming, the contamination will be considered fixed, and the material will be marked for further decontamination. The marked areas will be brought to the inside of D111 and designated for further decontamination, such as chipping, scraping, grinding or sand blasting. The dust collected from decontamination will be transported to the SMC Storage Yard.

3.5.3 Disassembly of D102/112

After decontamination has been conducted, the equipment inside of D102/112 will be disassembled. The equipment will be surveyed to ensure that it is below the release criteria. Equipment that is found to exceed the release criteria will be further decontaminated and re-surveyed.

Once all of the internal structures have been effectively decontaminated and removed, the disassembly of the building will be conducted using a trackhoe with a grapple attachment and other heavy equipment, as needed. All building material shall be surveyed to ensure that it is below the release criteria. Building structures that are found to exceed the release criteria will be further decontaminated and re-surveyed.

Large building structures that could not be decontaminated in place shall be moved to a decontamination area for HEPA-vacuuming and further disassembly. Each building structure shall be surveyed and released for unrestricted use or set aside for further decontamination and subsequent surveying.

All unpaved areas, within the footprint of the building, that do not meet the release criteria will be excavated to remove contaminated material. The soil and slag, if encountered, shall be transported to the SMC Storage Yard.

3.5.4 D111 and Flex-Kleen Baghouse

After decontamination has been conducted, the equipment inside of D111 will be disassembled. The equipment will be surveyed to ensure that it is below the release criteria. Equipment that is found to exceed the release criteria will be further decontaminated and re-surveyed.

The baghouse will be disassembled using a trackhoe with a grapple attachment, cutting torches, chains and heavy equipment, as needed. The baghouse building components shall be taken inside to D111 for surveying. Building structures that are found to exceed the release criteria will be further decontaminated and re-surveyed.

The disassembly of D111 will be conducted using a trackhoe with a grapple attachment and manual disassembly through the use of cutting torches and hand-held saws, as is appropriate and safe.

Large building structures that could not be decontaminated in place shall be moved to a decontamination area for HEPA-vacuuming and further disassembly. Each building structure shall be surveyed and released for unrestricted use or set aside for further decontamination and subsequent surveying.

3.5.5 General Decontamination and Disassembly Procedures

Areas and material that do not have surface contamination, or have been decontaminated to below the site-specific release criteria shall be disassembled and removed for unrestricted use. If contamination is suspected to have diffused into porous materials, such as wood, the material shall sampled and sent for off-site analysis.

Decontamination areas shall be constructed inside of Building D102/112 and/or D111 area, unless it is not feasible due to disassembly operations. If necessary, temporary restricted areas will be established outside of the buildings for the purpose of decontamination and staging. The areas will be surveyed prior to decontamination and/or staging in order to establish a baseline for each of these temporary restricted areas. The areas will be surveyed after decontamination and staging areas are no longer needed. The survey results will be compared to the baseline survey in order to determine if decontamination is necessary or the areas can be released for unrestricted. The internal decontamination area shall minimize dust release to outside areas.

All tools, equipment, and vehicles that enter the work areas shall be appropriately surveyed prior to leaving the work area to determine if decontamination is required.

All building structure material will be surveyed at the ground level when disassembled and before release. This will ensure that no material that exceeds the alpha and gamma site-specific release criteria will be taken off-site.

Materials released as unrestricted, will be stored in an area for ultimate disposal or recycling, depending on the nature of the material. Building materials contaminated above the site-specific release criteria shall be disposed of as low-level radioactive waste in accordance with USNRC regulations.

The only material that will be managed at the SMC facility will be fill slag, soil/dust and concrete that exceed the site-specific release criteria. These materials will be put in the Storage Yard. Additional material may be temporarily stored there during the course of the project.

During the disassembly, Transite Panels will be encountered on the roof and sides of Building D102/112 and D111. Summit Compliance has contracted a Licensed Asbestos Abatement Contractor. The EPA-notification, air monitoring, disposal and other aspects of applicable regulations will be coordinated through these two parties.

The former buildings, decontamination and staging areas shall be effectively surveyed pursuant to the MARSSIM guidelines for preparation of the Final Status Survey.

Instrumentation used during the project will be appropriate for the type of radiation expected, of sufficient sensitivity and accuracy to detect the radioactive materials found at the SMC facility, and of sufficient in quantity to support the activities. Calibration documentation and specification for each piece of equipment used will be included in the Final Status Survey Report.

3.6 FINAL STATUS SURVEY OF WORK AREAS

Gamma radiation surveys will be conducted in all areas where work with radioactive material was conducted, including the former buildings areas and the locations used for decontamination. The surveys will be conducted over 100% of the surface to be monitored, by walking over the areas moving a sodium iodide detector in a serpentine pattern with the detector one (1) meter from the ground. When elevated activity is detected in a particular location, an exposure rate shall be obtained in that area. Measured exposure rates will be compared with the 10 microR/hour above background release criteria. Any areas exhibiting residual radioactivity above the applicable criterion will be identified with paint and the SMC Radiation Safety Officer (RSO) will be notified. The RSO will make the final determination as to additional remediation in those areas.

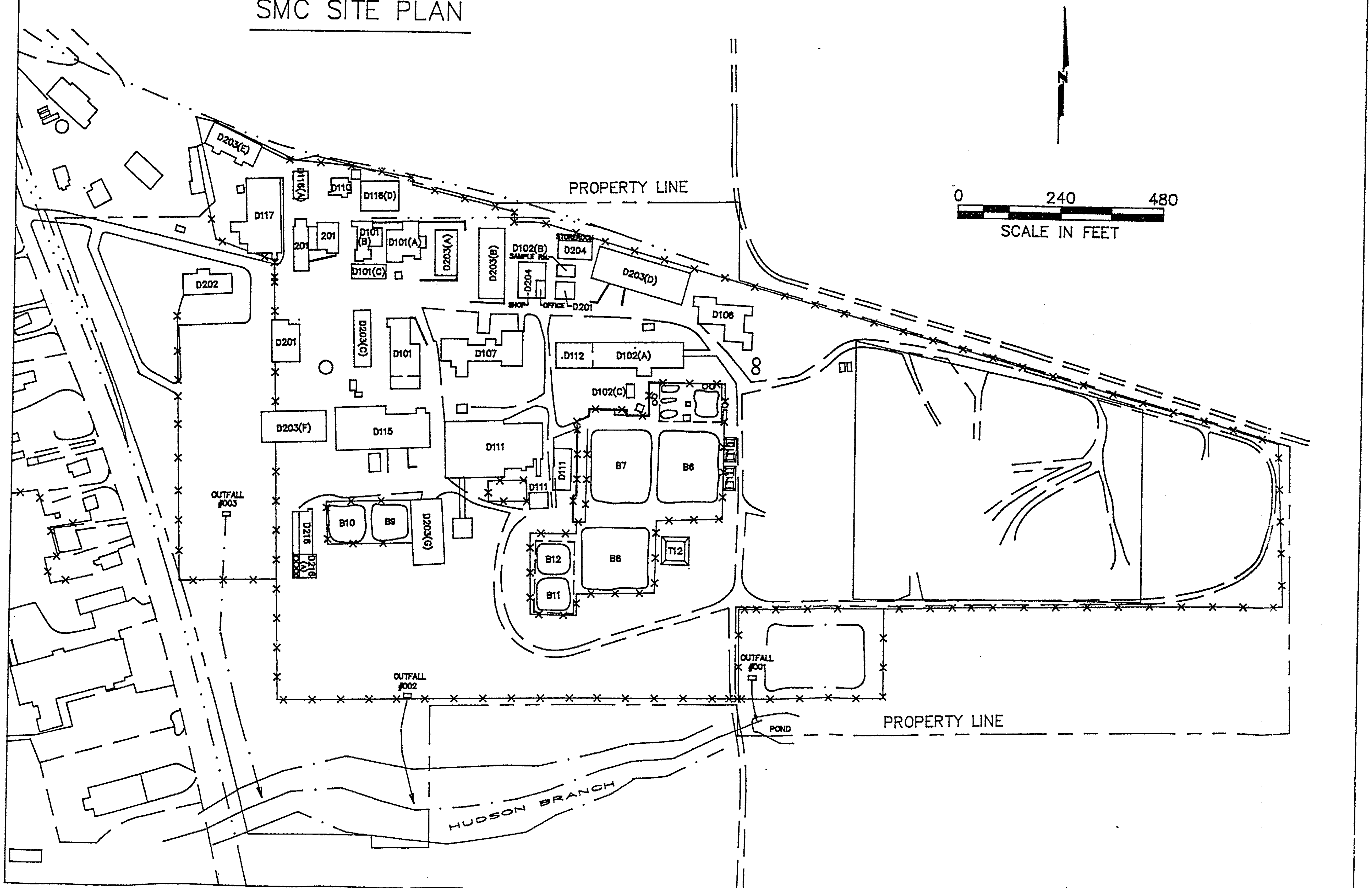
Soil samples will be obtained from the immediate proximity of all the work areas during this project. These will be forwarded to an offsite laboratory for radiological analysis by the methodology of gamma spectroscopy. The existing background soil sample data set for SMC, which should include samples from local uncontaminated areas, will be used for comparison.

3.7 HEALTH AND SAFETY PROCEDURES

Health and safety provisions have been established to permit the project to be conducted without adverse impacts on worker health and safety. In general, these follow the recommendations in applicable SMC Radiation Safety Procedures. The topics include work area entry, control of work, training, emergency procedures, ALARA, contamination control, protective clothing, personnel monitoring, non-radiological hazards, and lighting considerations. Confined space entries, working at elevated heights, and operation of heavy equipment will be briefly addressed in the PARS Health and Safety Plan, however the field supervisor for Summit Compliance shall be responsible for implementing their own safety procedures for such operations described.

FIGURES

SMC SITE PLAN



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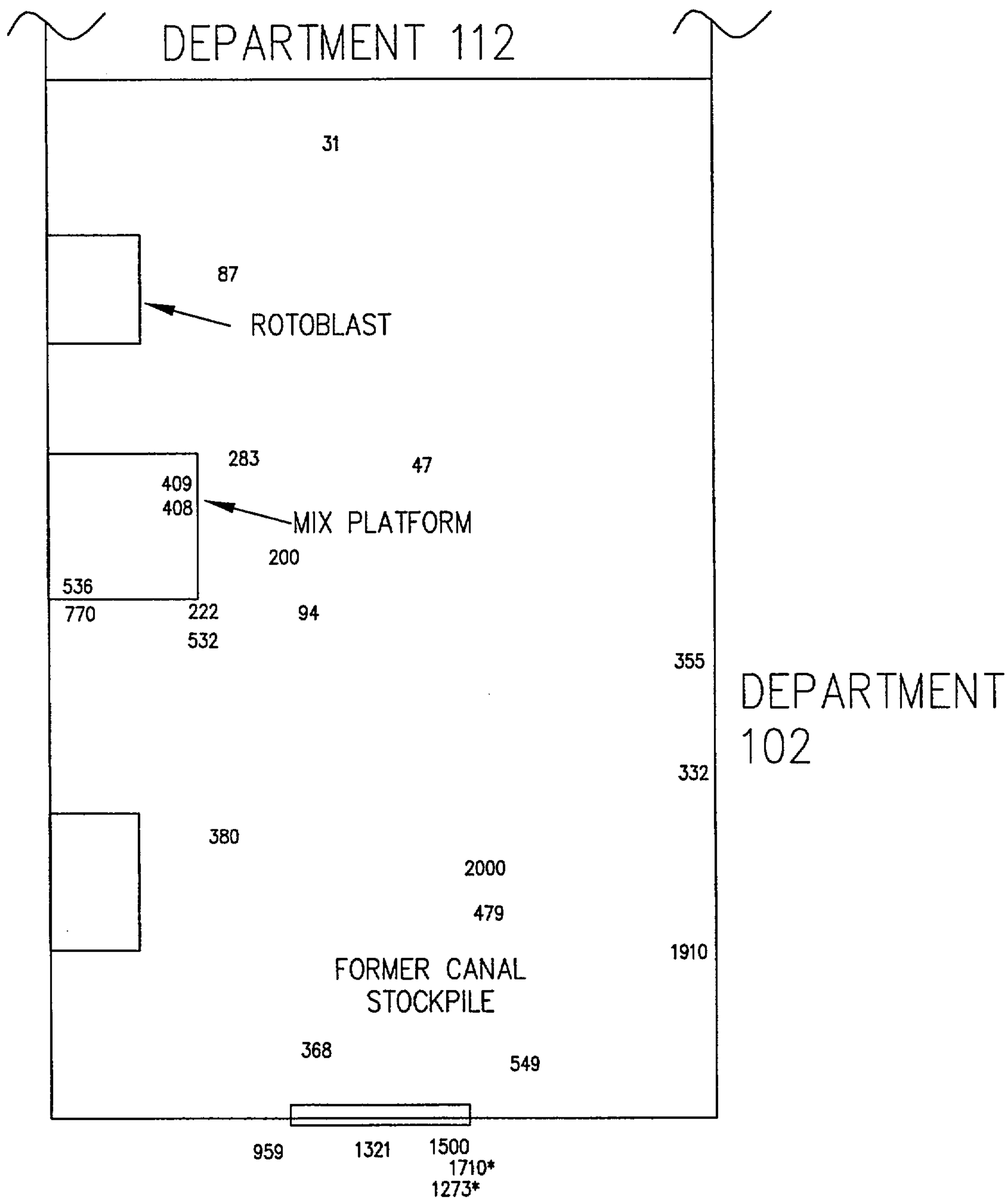


MEASUREMENTS DENOTE TOTAL ALPHA CONTAMINATION IN dpm/100 cm².

MEASUREMENTS WERE OBTAINED FROM QUARTERLY SURVEY REPORTS FROM 4th QUARTER 1997 THROUGH 2nd QUARTER 2001, CONDUCTED BY IEM.

* MAXIMUM MEASUREMENT(S) FROM 2nd QUARTER 2001 SURVEY REPORT.

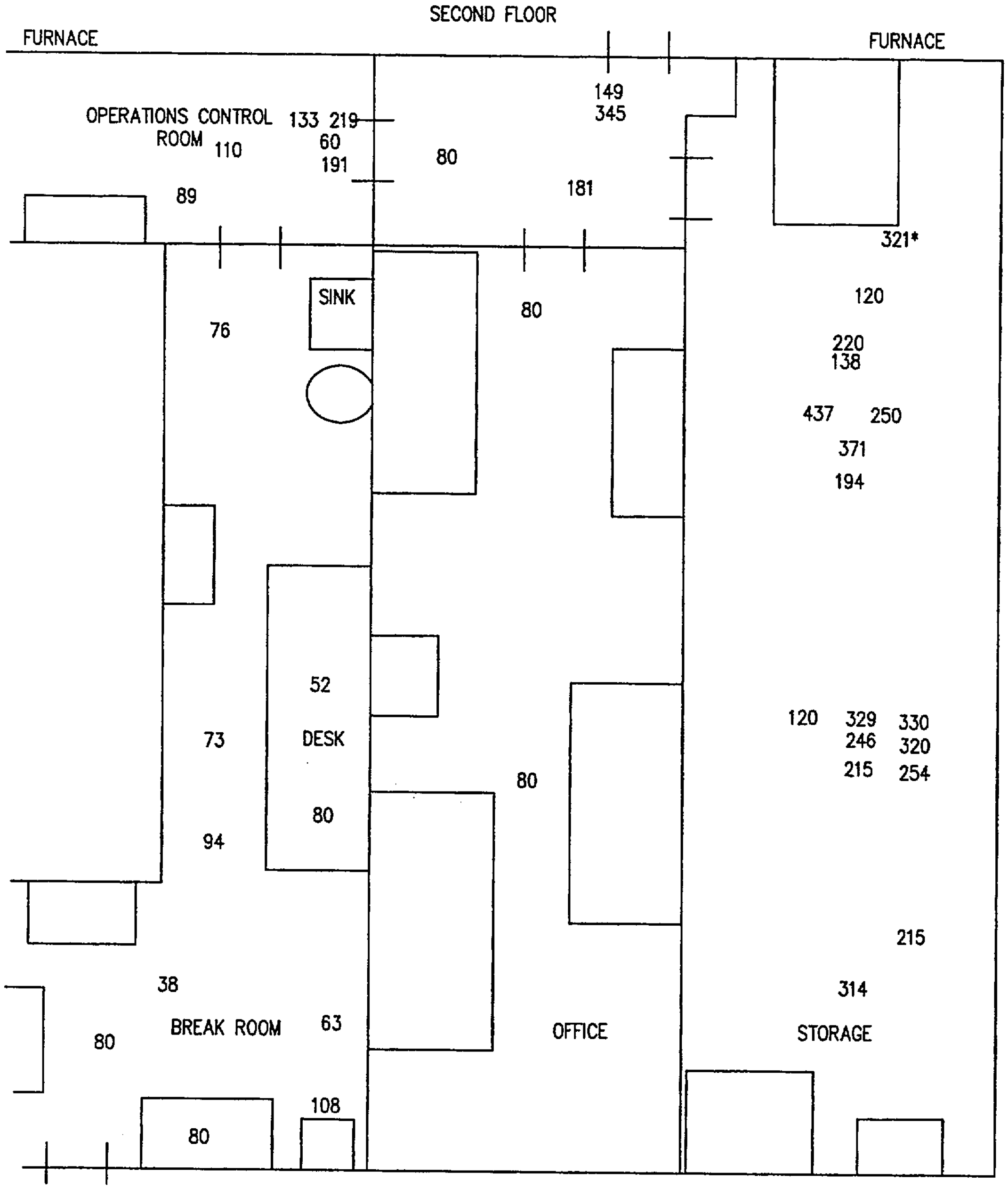
FIGURE 2

SHEILDALLOY METALLURGICAL CORPORATION

PARS ENVIRONMENTAL, INC.

ROBBINSVILLE, NEW JERSEY

DR. BY: PM	SCALE: NOT TO SCALE	JOB No.: 610-01
CK'D. BY: RJ	DATE: 4/2/02	FILE NO.: 610-01
REV. NO.	REV. DATE:	FIGURE NO.: 2



D111 – OFFICE AND BREAK ROOM

MEASUREMENTS DENOTE TOTAL ALPHA CONTAMINATION IN dpm/100 cm².

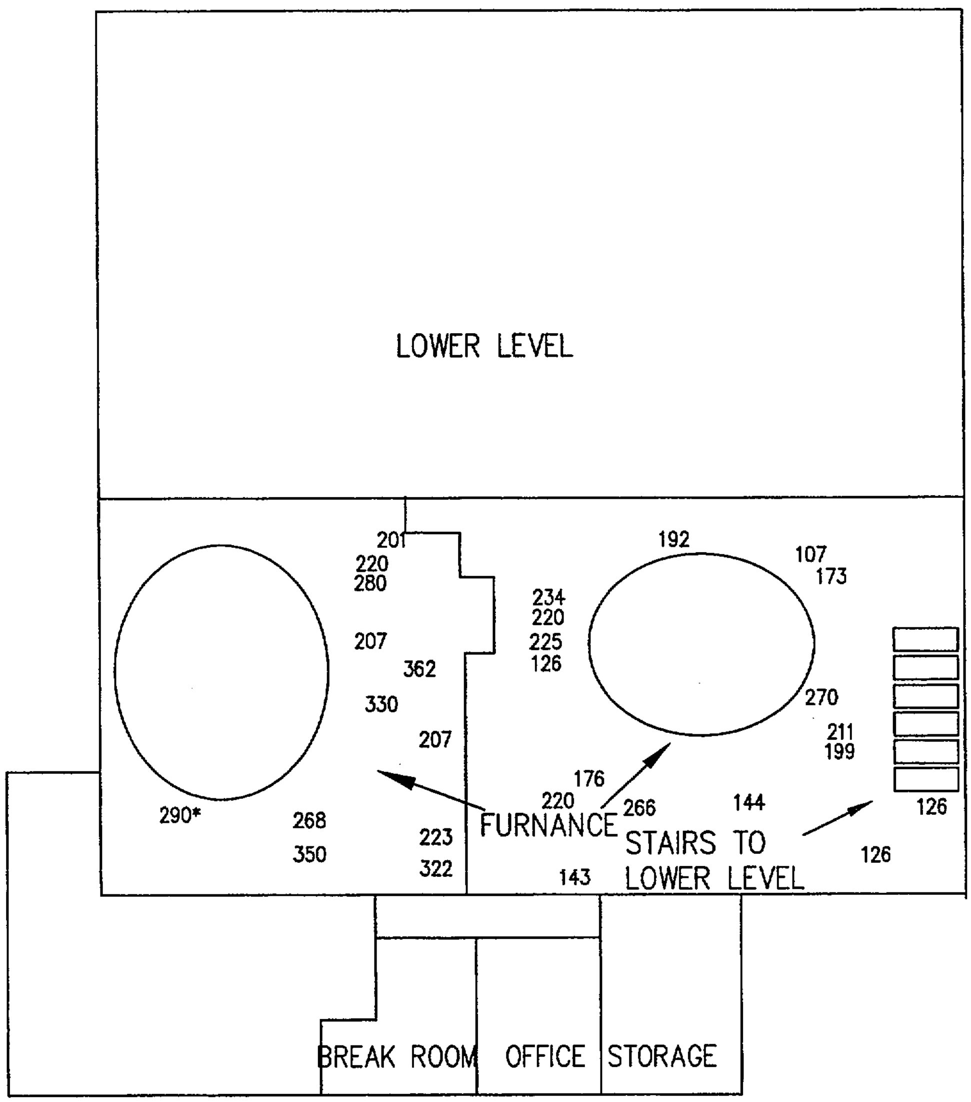
MEASUREMENTS WERE OBTAINED FROM QUARTERLY SURVEY REPORTS FROM 4th QUARTER 1997 THROUGH 2nd QUARTER 2001, CONDUCTED BY IEM.

* MAXIMUM MEASUREMENT(S) FROM 2nd QUARTER 2001 SURVEY REPORT.

FIGURE 3A
SHEILDALLOY METALLURGICAL CORPORATION

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: PM		SCALE:	NOT TO SCALE	JOB No.:	586-02
CK'D. BY: RJ		DATE:	4/2/02	FILE NO.:	586-02.dwg
REV. NO.		REV. DATE:		FIGURE NO.: 3A	



D111 – UPPER LEVEL

MEASUREMENTS DENOTE TOTAL ALPHA CONTAMINATION IN dpm/100 cm².

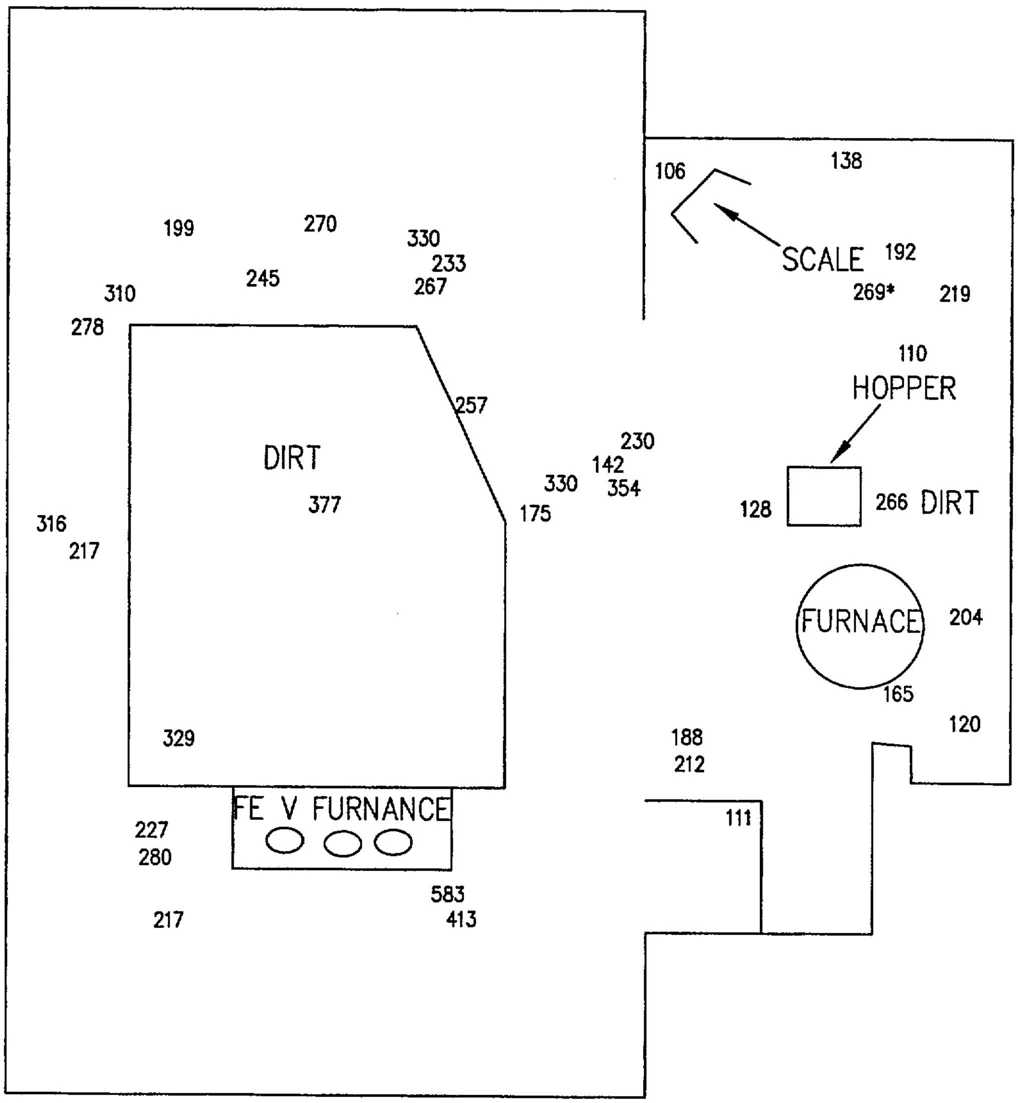
MEASUREMENTS WERE OBTAINED FROM QUARTERLY SURVEY REPORTS FROM 4th QUARTER 1997 THROUGH 2nd QUARTER 2001, CONDUCTED BY IEM.

* MAXIMUM MEASUREMENT(S) FROM 2nd QUARTER 2001 SURVEY REPORT.

FIGURE 3B
SHEILDALLOY METALLURGICAL CORPORATION

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

DR. BY: PM	SCALE: NOT TO SCALE	JOB No.: 610-01
CK'D. BY: RJ	DATE:	FILE NO.: 610-01
REV. NO.	REV. DATE:	FIGURE NO.: 3B



D111 – LOWER LEVEL

MEASUREMENTS DENOTE TOTAL ALPHA CONTAMINATION IN dpm/100 cm².

MEASUREMENTS WERE OBTAINED FROM QUARTERLY SURVEY REPORTS FROM 4th QUARTER 1997 THROUGH 2nd QUARTER 2001, CONDUCTED BY IEM.

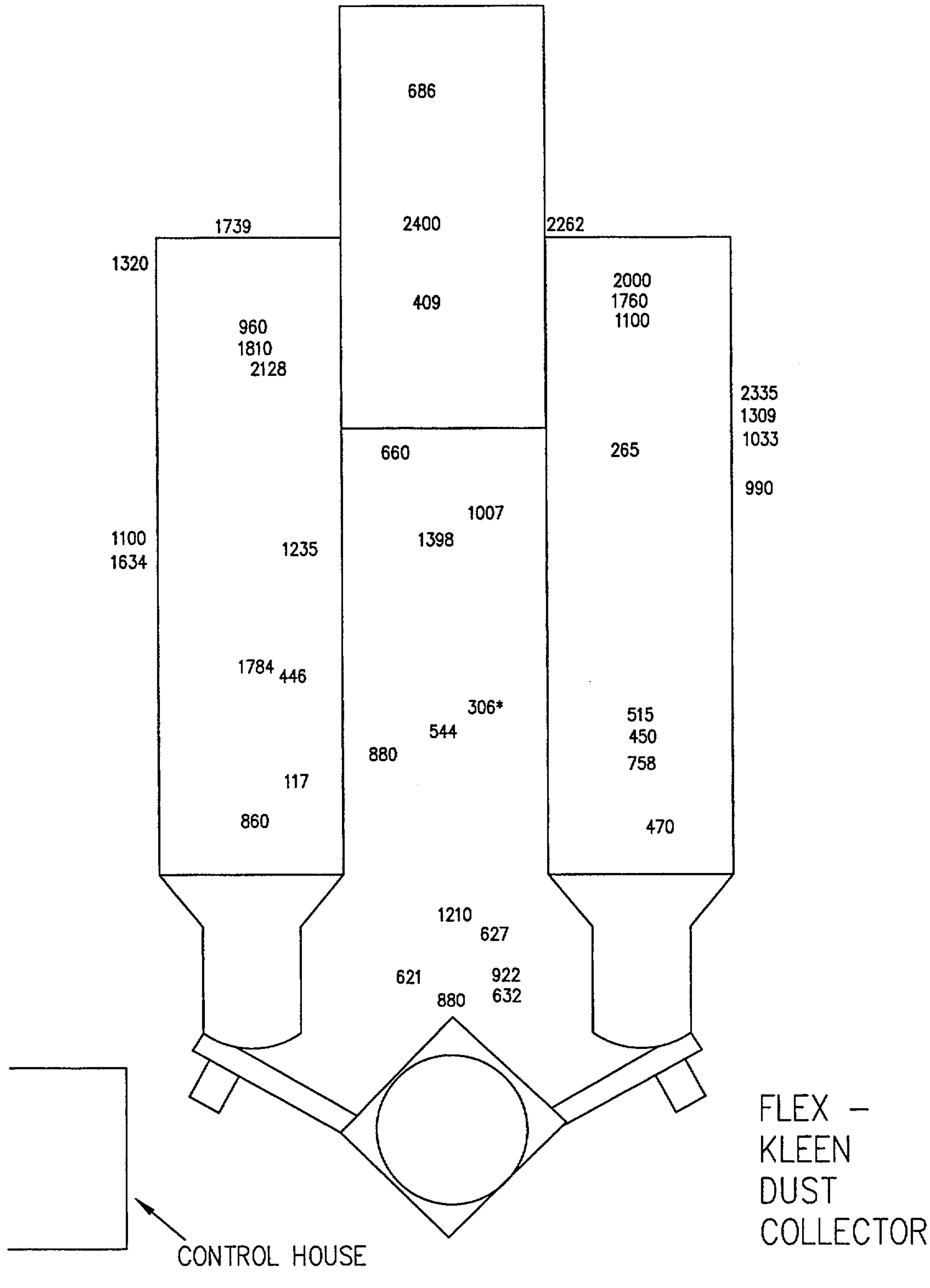
* MAXIMUM MEASUREMENT(S) FROM 2nd QUARTER 2001 SURVEY REPORT.

FIGURE 3C
SHEILDALLOY METALLURGICAL CORPORATION

PARS ENVIRONMENTAL, INC.
ROBBINSVILLE, NEW JERSEY

131139

DR. BY: PM	SCALE: NOT TO SCALE	JOB No.: 586-02
CK'D. BY: JK	DATE: 4/2/02	FILE NO.: 586-02.dwg
REV. NO.	REV. DATE:	FIGURE NO.:3C



MEASUREMENTS DENOTE TOTAL ALPHA CONTAMINATION IN dpm/100 cm^2.

MEASUREMENTS WERE OBTAINED FROM QUARTERLY SURVEY REPORTS FROM 4th QUARTER 1997 THROUGH 2nd QUARTER 2001, CONDUCTED BY IEM.

* MAXIMUM MEASUREMENT(S) FROM 2nd QUARTER 2001 SURVEY REPORT.

FIGURE 4

SHEILDALLOY METALLURGICAL CORPORATION

PARS ENVIRONMENTAL, INC.

ROBBINSVILLE, NEW JERSEY

DR. BY: PM	SCALE: NOT TO SCALE	JOB No.: 610-01
CK'D. BY: RJ	DATE: 4/2/02	FILE NO.: 610-01
REV. NO.	REV. DATE:	FIGURE NO.: 4

TABLES

Table 1 - Site-specific Release Criteria

TYPE	NUCLIDE[1]	REMOVABLE[2,4]	TOTAL[2,3] (FIXED PLUS REMOVABLE)	CONCENTRATION[6,7]
Surface	U-nat, U-235, U-238 and associated decay products	1,000 dpm • /100 cm² above background	5,000 dpm • /100 cm² above background	--
Surface	Th-nat, Th-232, Sr-90, Ra-223, Ra-224, U-232, I-126, I-131, I-133	200 dpm/100 cm² above background	1,000 dpm • /100 cm² above background	--
Surface	Mixture of U-nat and Th-nat	--	600 dpm • /100 cm² by *direct frisk* above background[5]	--
Soil Volume	U-238 and U-234 with progeny in equilibrium	--	--	8.5 pCi/g each above background, averaged over the volume of interest
Soil Volume	Th-232 and Th-228 with progeny in equilibrium	--	--	1.1 pCi/g each above background averaged over the volume of interest
Soil Volume	Mixture of U-nat and Th-nat	--	--	10 microR per hour above background

[1] Where surface contamination by both • and • gamma-emitting radionuclides exists, the limits established for • and • gamma-emitting radionuclides should apply independently.

[2] As used in this table, dpm (disintegrations per minute) means the rate of emission by radioactive material as determined by correcting the counts per minute observed by an appropriate detector for background, efficiency, and geometric factors associated with the instrumentation.

[3] The levels may be averaged over 1 m², provided the maximum surface activity in any area of 100 cm² is less than three times the guide values. For purposes of averaging, any square meter of surface shall be considered to be above the activity guide G if: (1) from measurements of a representative number (n) of sections it is determined that $1/n \cdot \sum_n S_i \cdot G$, where S_i is the dis/min-100 cm² determined from measurement of section i; or (2) it is determined that the sum of the activity of all isolated spots or particles in any 100 cm² area exceeds 3G.

[4] The amount of removable radioactive material per 100 cm² of surface area should be determined by wiping that area with dry filter or soft absorbent paper, applying moderate pressure, and assessing the amount of radioactive material on the wipe with an appropriate instrument of known efficiency. (Note - The use of dry material may not be appropriate for tritium.) When removable contamination on objects of surface area less than 100 cm² is determined, the activity per unit area should be based on the actual area and the entire surface should be wiped. Except for transuranics and Ra-226, Ra-228, Ac-227, Th-228, Th-230, and Pa-231 • emitters, it is not necessary to use wiping techniques to measure removable contamination levels if direct scan surveys indicate that the total residual surface contamination levels are within the limits for removable contamination.

[5] Assumes removable activity is the limiting value.

[6] Taken from (reference) BTP.

[7] Concentrations may be averaged over the soil volume of interest as described in (reference) FSTP.

[8] Assumes 2.5 pCi/g each of Th-232, Th-228, U-238, and U-234 (plus progeny in equilibrium) evenly distributed throughout the soil volume to a depth of 15 cm, with measurements made at a height of less than three (3) cm above the soil surface. Taken from (reference) IEM.

Table 2 - Historical Site Assessment Data
Maximum Gamma Survey Readings (microR/hour)

Building/Location	4th 1997	1st 1998	2nd 1998	3rd 1998	4th 1998	1st 1999	2nd 1999	3rd 1999	4th 1999	1st 2000	4th 2000	1st 2001	2nd 2001
D102	950	500	900	1400	50	1500	1000	70	80	50	40	110	80
D111													
Office and Break Room	10	12	12	11	12	20	15	11	13	11	12	12	15
Storage Area	8	15	11	12	15	13	12	7	8	7	19	16	12
Upper Level	105	600	75	192	80	150	140	90	80	80	170	130	110
Lower Level	900	600	500	475	280	500	480	900	325	300	700	80	180
Flex-Kleen Baghouse	18	15	N/S	15	40	23	10	12	13	15	21	40	20

Table 3 - Historical Site Assessment Data

Maximum Surface Contamination (disintegrations per minute α / 100 square centimeters)

Building/Location	4th 1997	1st 1998	2nd 1998	3rd 1998	4th 1998	1st 1999	2nd 1999	3rd 1999	4th 1999	1st 2000	4th 2000	1st 2001	2nd 2001
D102	151	549	2000	1500	770	536	222	466	413	1910	1982	1273	1710
D111													
Office and Break Room	225	181	140	89	110	Background	Background	345	133	149	177	60	Background
Storage Area	371	339	320	215	330	326	159	329	194	437	Not Sampled	120	321
Upper Level	277	362	350	268	330	273	223	270	199	266	190	126	290
Lower Level	377	257	310	278	330	252	329	583	413	354	186	142	269
Flex-Kleen Baghouse	2335	2444	2400	1058	1320	1334	1214	880	627	1235	399	306	632

TABLE 4 – Field Instrumentation

INSTRUMENT MODEL	DETECTOR	USE	DETECTION EFFICIENCY	DETECTION SENSITIVITY
Ludlum Model 2221 Scaler/Ratemeter	Ludlum Model 43-1 Scintillator	Contamination surveys (alpha) of surfaces and smears	Alpha 60% ^{239}PU	25 dpm(alpha)/100cm^2 (scaler) 200 dpm(alpha)/ 100cm^2 (ratemeter)
Ludlum Model 19 MicroR Meter	1in^2 sodium iodide (NaI)T1 scintillator	Walkover gamma survey	To Be Determined	175 cpm/micror/hr (*137Cs gamma*)
Gil Air 5	--	Low flow air sampling pump	--	--
Gilibrator	--	Flow calibration for Gil Air 5 (<5 lpm)	--	--
High Flow Sampling Pumps	--	High flow air sampling pumps (>5 lpm)	--	--
TLD Dosimeters (supplied by ICN)	--	External radiation dose	--	--

APPENDICES

Appendix A: PARS Project Team Description

APPENDIX A

Ravi Jarecha, C.E.T.(Project Director)

Ravi Jarecha, CET is the Director of Health & Safety Division at PARS Environmental, Inc. and is responsible for all day-to-day project activities, including the supervision of PARS field project personnel, for all Health & Safety projects. He is also responsible for coordinating all project activities, and he involves PARS senior level technical staff when appropriate and required to meet project objectives.

Mr. Jarecha is a graduate of Rutgers University where he majored in Environmental & Occupational Health. He is a Certified Environmental Trainer with over eight years of Health & Safety experience in diverse projects in the environmental field. During his career Mr. Jarecha as had a variety of roles on many environmental projects. His recent experience includes:

- Project Director and Supervising Health & Safety Officer during the environmental investigation conducted at a hazardous waste site that was contaminated with radioactive waste and volatile organic compounds in groundwater, where he also developed and implemented the Health and Safety Plan.

- Project Director of a personal air monitoring project for exposure to site contaminants at a hazardous waste site. The monitoring data was then compared to the OSHA Permissible Exposure Limit to determine if personnel wore adequate personal protective equipment.

- Project Director for air sampling at several asbestos abatement sites during removal and decontamination of asbestos containing building material.

Edward A. Christman, Ph.D., C.H.P. (Health Physics Planning)

Dr. Edward Christman has over 30 years experience in the field of Environmental Health and Safety, with specialized interest in Radiation Protection. He has served as the Assistant Clinical Professor at the Mailman School of Public Health in Columbia University, New York, and has taught a graduate level course in Health Physics offered jointly with the Department of Applied Physics and Applied Mathematics. He has also been an Associate Graduate Faculty Member at the Department of Environmental Sciences in Rutgers University.

Dr. Christman has been certified by the American Board of Health Physics in comprehensive Health Physics since 1983. He graduated with a Masters and a Doctorate in Radiation Science from Rutgers University in 1974 and 1977, respectively. His current specialized areas of expertise include Occupational Health and Safety, Radiation Protection, Radiation Physics and Chemistry, and Medical Physics.

From 1991 to 1999, he served as the Director of the Environmental Health and Safety Office at the Health Sciences Campus at Columbia University, where he initiated the program in the Health Sciences Division, and was responsible for all Environmental and Occupational Health and Safety Programs for the campus. Previously he had served as Associate Director for Program Development in the Department of Radiation and Environmental Health and Safety in Rutgers University, where he initiated and coordinated all Health and Safety programs at the university.

From 1977 to 1989, he was the Supervising Radiologist at the Department of Radiation and Environmental Health and Safety in Rutgers University, where his responsibilities included the supervision of the Radiation Safety Program for the University and Medical School. This included more than 300 radioisotope users, many analytic X-ray units, and other machine sources including a 20 MeV Tandem Van de Graff accelerator.

Dr. Christman has extensive experience in providing Radiation Protection to industry and is active in many professional activities. He is the founding member of the Executive Board at the U.S. EPA Eastern Region Radon Training Center at Rutgers University. He is also a Member of the New Jersey Department of Environmental Protection's (NJDEP) Radium/Radon Advisory Board, as well as being a member of several Health Physics honor societies and related professional organizations.

Robert Confer, C.I.H. (Health Physics Monitoring)

Mr. Robert Confer, CIH has 42 years of experience in the field of Industrial Hygiene, including more than 25 years with Exxon Corporation. While with Exxon Mr. Confer served as a Senior Industrial Hygiene Associate, providing services in the following areas:

- Provided technical support in Environmental and Industrial Hygiene to over 27 foreign and domestic facilities.
- Managed a multi-plant industrial hygiene program at refineries and petrochemicals plants.
- Conducted detailed research on sampling and analytical instrumentation and methods for air sampling for application throughout foreign and domestic facilities.

Mr. Confer has also worked with Westinghouse Electric Company and the Pennsylvania Department of Health. During that time he worked on a variety of industrial hygiene projects, including:

- Developing appropriate health and safety practices for work with enriched uranium fuel.

- Ensuring effective contamination control of radioactive material.
- Evaluating employee exposure to airborne contaminants.
- Designing and evaluating ventilation systems to minimize employee exposure.
- Evaluating personnel exposure to ionizing radiation.

Harch S. Gill, Ph.D. (Remedial Planning)

Dr. Harch Gill is the General Manager of PARS Environmental, Inc. and in that capacity he will be responsible for ensuring that all necessary resources are provided to the project in a timely manner.

Dr. Gill graduated from Cornell University in 1971 with a major in Civil Engineering and a minor in Environmental Engineering. He has worked with the Nuclear Regulatory Commission on several nuclear related projects since 1971. He has been the principal investigator and project manager for Preliminary Safety Analysis Reports (PSAR) and Environmental Reports (ER) for over twenty nuclear plants, primarily in the eastern United States. Clients that he has worked with include:

- Public Service Electric and Gas Company at the Salem and Hope Creek Nuclear Power Generating Stations
- Potomac Electric and Power Company at the Douglas Nuclear Power Generating Station
- Virginia Electric Power Company at the North Anna Nuclear Power Generating Station
- Niagara Mohawk Power company at the Nine-Mile Point Nuclear Power Generating Station
- Baltimore Gas and Electric Company at the Calvert Cliffs Nuclear Power Generating Station

He was the project manager for studies related to the disposal of low-level radioactive wastes for the "Southern Compact", a group of electric utility companies in the South-Eastern United States.

Dr. Gill has participated in the decommissioning of three facilities that were licensed with the United States Nuclear Regulatory Commission (USNRC) as Permanent Restricted Areas. In July 2000, Dr. Gill was part of the team that decommissioned several buildings at the Former Sylvania Products Incorporated facility in Hicksville, New York. The project was done for GTE Operations Support Incorporated (GTEOSI) in cooperation with New York State Department of Environmental Protection (NYSDEC) and USNRC. The decommissioning scope of work involved the excavation and disposal of over 2000 tons of soils at the site contaminated with low levels of Uranium, Thorium and trichloroethene. All work was performed in full compliance with NRC's Radiation Safety Procedures. The project involved the performance and documentation of a final status survey in accordance with NUREG-1575, "Multi-Agency Radiation Survey and Site Investigation Manual" (MARSSIM).

Louis J. Apoldo, P.E. (Remedial Engineering/Heavy Construction)

Mr. Apoldo is a PARS Senior Engineer with more than 35 years of consulting engineering experience in the planning and direction of a wide variety of remedial engineering projects involving the application of geotechnical engineering and heavy construction principles. He has a Masters degree in Civil Engineering, is a registered Professional Engineer, and has gained diverse professional experience in leadership roles at several large consulting engineering organizations. During his career, Mr. Apoldo has had key participation in several projects involving radiological and nuclear-related issues, such as:

- Engineering Manager of the Feasibility Analysis, Disposal Method Selection, and Preliminary Design activities for the permanent closure of the NYSERDA low-level radwaste burial trenches at West Valley, NY. This project involved the development of candidate concept designs to contain low-level radwastes that had been historically deposited in uncontrolled burial trenches, and the logical selection of a conceptual engineered structure that could cost-effectively and safely contain these buried radwastes for at least 300 years.

- Project Director for the investigation and remediation of the Sumitomo Machinery Company site in Teterboro, NJ, which contained mixed (chlorinated solvents and radionuclides) waste soil and groundwater contamination issues. To limit the remedial costs for addressing the excavated mixed waste soils, a temporary waste separation process was established onsite which employed a transportable thermal desorption unit to remove the volatile solvent contamination from the mixed waste soils. The remaining radiologically contaminated soils were then surveyed onsite, so that the soils containing significant radionuclide contamination could be containerized and shipped to a commercial low level radwaste disposal facility, while the remaining soils were disposed locally as daily cover at a municipal landfill.

- Engineering Manager of the Siting and Waste Containment Concept Design Studies for the New York State Low Level Radioactive Waste Commission. The engineering tasks included developing the rationale and engineering requirements for developing several concept designs to safely contain the low level radwastes generated in NY for up to 1000 years, and to elicit public comments about these candidate containment concepts.

APPENDIX A

- Senior Consultant for Underground Engineering serving the US Department of Energy during the Environmental Studies for the Permanent National High Level Radwaste Repository planned for the Yucca Mountain site in Nevada. Mr. Apoldo participated in the planning of a pilot bore into the proposed repository area and in the planning of various geotechnical and geologic tests to be conducted in the host formation.

- Senior Technical Reviewer for geotechnical and foundation studies conducted for the design and construction of several nuclear power plants, including Salem Generating Station, Atlantic Generating Station, and Hope Creek Generating Station for Public Service Electric & Gas in NJ. Mr. Apoldo also monitored the quality of the Class I structural fill to support the cooling water intake structures at the Prairie Island Generating Station in Red Wing, MN, and performed the initial geotechnical site investigations for candidate sites in MD for Baltimore Gas & Electric and in Moscow, OH for Cincinnati Gas & Electric.