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Molycorp

January 7, 2002

Us Nuclear Regulatory Commission
Mr. Tom McLaughlin, Project Mgr.
Decommissioning Branch
Washington, D.C. 20555-0001

Subject: Molycorp, Washington SMB-1393 Building 39 and 42 final survey results

Dear Mr. McLaughlin,

Please find enclosed the final survey results for buildings 39 and 42 at Molycorp's Washington, PA facility. Molycorp plans to begin demolition work on these in late March.

If you have any questions concerning this report please call me at the above number.

Sincerely,

George W. Dawes

George W. Dawes
Facility Superintendent

Xc: file
D. Fauver, RSI (w/o attach)
R. Cherniske (w/o attach)
Bob Maiers, PA DEP (w/o attach)
Craig Gordon, NRC Region 1(w/attach)

Radiological
Final Status Survey Report
Building 39 and 42 (north end)

RSI

Molycorp, Inc.
Washington, PA

Performed By:
Radiological Services Inc.
For Molycorp, Inc.

1.0 BACKGROUND INFORMATION

1.1 Introduction

This Final Status Survey Report is submitted to provide a complete record of the radiological status of specific survey areas at the Molycorp, Inc. Washington, PA facility, relative to established guidelines for the license termination. Sufficient data and information is provided to enable an independent re-creation and evaluation at some future date of both the survey activities and the derived results. This Final Status Survey Report has been written in accordance with the guidance provided in NUREG/CR 5849, "Manual for Conducting Radiological Surveys in Support of License Termination".

In November and December 2001, Radiological Services, Inc. (RSI) performed a Final Status survey on a portion of the Molycorp Washington site. Specifically, surveys were performed on the interior and exterior surfaces of Building 39 and Building 42 (north-end).

1.2 Management Approach

The final status survey was conducted in accordance with NUREG/CR 5849, "Manual for Conducting Radiological Surveys in Support of License Termination", Decommissioning Plan for the Washington, PA Facility Part 1 Revision, June 1999. All personnel were trained in the use of RSI radiation protection and final status survey procedures used to support the project. In addition, personnel were trained in the use of specialized equipment such as survey instrumentation, etc. The Decommissioning Plan for the Washington, PA Facility, section 2.2, details the decommissioning organization and responsibilities.

2.0 SITE DESCRIPTION

Molycorp's Washington County facility is located in Southwestern Pennsylvania in Washington County, approximately 35 miles southwest of Pittsburgh. The plant site is located entirely in Canton Township on the outskirts of the City of Washington. The address of the facility is 300 Caldwell Avenue, Washington, Pennsylvania 15301. The Washington County facility covers an area totaling 55 acres. This property includes a 20-acre active facility area and an adjacent 35-acre parcel of undeveloped land.

2.1 Facility Description

Molycorp, Inc.'s Washington, Pennsylvania facility is situated on the outskirts of the City of Washington, PA at 300 Caldwell Avenue in Canton Township. The active site consists of approximately 20 acres that are fenced. The main process buildings are located on the north side of Caldwell Avenue, while employee vehicle parking, equipment and miscellaneous storage areas are located o the south side.
Molybdenum oxide manufacturing was begun in the 1920s, but processing of the material was idled in 991. The plant also produced ferro-columbium, as well as other ferroalloys, e.g., molybdenum.

2.2 Buildings

Building 39 and Building 42 (north-end) are the only two buildings within the scope of this Final Status Survey. All other buildings and structures will be surveyed at a later time.

2.2.1 Building 39, Maintenance Storage & Warehouse

Building 39 is a 103' long x 40' wide x ~20' high wood frame and wood truss structure with exterior corrugated metal wall and roof panels, and a concrete slab floor. The building runs from east to west and has a large sliding door at either end. Personnel doors are located on the east end of the north wall and the north end of the west wall.

2.2.2 Building 42 (north-end), Storage Warehouse

Building 42 (north-end) is a 121.5' long x 50' wide x ~30' high prefabricated metal structure with a structural steel frame, corrugated exterior metal wall and roof panels and a reinforced concrete floor.

3.0 OPERATING HISTORY

3.1 Licensing and Site Operations

Molycorp, Inc.'s Washington, Pennsylvania facility produced a ferrocolumbium alloy from Brazilian ore (pyroclore) between 1964 and 1970. While the use of pyroclore was commonplace by that time, the particular ore contained thorium, and slight traces of uranium, as an accessory metal. It should be noted that thorium contamination is the major isotope of concern. The thorium was in concentrations that required Molycorp to acquire a Source Materials License (December 19, 1963). The current Source Materials License is SMB-1393 (Docket 4008778). The license operation resulted in the production of thorium bearing slag, some of which was used as fill material over portions of the site.

Currently, much of the slag produced during this operation is relocated in a stabilized, soil-capped, pile on the south side of the southern portion of the site. There is also a smaller pile in the northern portion of the site. Ferro-columbium slag is also mixed with soils at various locations no the site.

The Decommissioning Plan for the Washington, PA Facility, RSI, June 1999, contains additional information on past license amendments and specifics on the operational history of the facility.

3.1.1 Operational Use of Building 39

Building was originally constructed in 1983. Since 1983, this building has been used as an equipment and parts storage area. This building is currently still being used in that capacity.

3.1.2 Operational Use of Building 42

Building was originally constructed in 1989. This building was used to store raw materials to support the Lanthanide metal and alloy production from 1981 to 1987. From 1993 to 1996, this building was leased out. Building 42 currently is used as a stores warehouse.

4.0 DECOMMISSIONING ACTIVITIES

A description of planned decommissioning activities required to complete the site decommissioning and release the site for unrestricted use, including decommissioning objectives, tasks and schedule, is given in the Decommissioning Plan for the Washington, PA Facility, RSI, June 1999. This section will summarize the activities performed to prepare Buildings 39 and 42 for Final Survey.

4.1 Re-Staging of Radioactive Material Packages

The initial task for the current phase of decommissioning was the removal of all packages and equipment from Buildings 39 and the northern end of 42. Although no radioactive materials were located in the two buildings, soil located around and adjacent to the buildings has been determined to have radioactive contamination.

The soil located in the grounds surrounding Building 39 is elevated with radioactive contamination. It was necessary to take shielded and unshielded measurements on the structure during final status surveys to obtain actual beta measurements without interference from the elevated gamma dose rates caused by the contaminated soils. The soil decontamination effort will be handled at a later time and discussed in a separate report.

5.0 FINAL STATUS SURVEY PROCEDURES

This section describes the methods used to demonstrate that radiation and radioactive contamination levels at specific portions of the Molcorp, Inc. Washington, PA facility have been reduced to levels below criteria established for unrestricted use. The basis for governing the conduct of the Final Status Survey was provided by procedure FSP-AP-001, Final Status Survey Design and Implementation. The methods described in that procedure were derived from regulatory guidance, specifically NUREG/CR 5849, Manual for Conducting Radiological Surveys in Support of License Termination, the Decommissioning Plan for the Washington, PA Facility (RSI, June 1999), and the Radiological Health and Safety Plan.

5.1 Initial Area Classifications

The initial classification for the survey areas within the scope of final status survey were based on site characterization data, history of radioactive materials involvement or potential for contamination of the survey area, recommendations by Molycorp, Inc. personnel knowledgeable of the facility conditions, and any applicable survey data such as routine surveillance or surveys conducted to support decommissioning activities. Survey areas were classified as follows:

- Unaffected Survey Areas: These areas have a low potential for radioactive contamination, based on knowledge of site history and previous survey information. Previous remediation precluded a survey area from initially being classified as unaffected.

- Affected Survey Areas: Affected areas are those areas that have potential radioactive contamination (based on site plant operating history) or known radioactive contamination (based on actual radiological surveys).

Buildings 39 and the north-end of Building 42 were classified as unaffected areas. Final status surveys were taken on the top surfaces of floors in Buildings 39 and the north-end of 42. However, due to the impact of contaminated soils on the undersides of concrete floors at the Molycorp, York, PA facility, radiological surveys will be required on the undersides of the building concrete floors prior to release.

5.2 Gridding

Gridding is not required in unaffected survey units and therefore, no gridding was necessary. However, some grid marks were used to bound the areas where scanning was performed up to 2 meters high on the walls.

5.3 Survey Location Designation

In a structural survey area, a survey location is usually represented by a single grid block or the area to be scanned surrounding a survey point. A survey location can contain one or more survey points. Survey locations were clearly identified to provide a method of referencing survey results to survey measurement locations. All data point measurement locations where the detectors were placed on the surface of the building were marked so to be able to perform confirmatory measurements, etc., as needed.

5.4 Final Status Survey Packages

A survey package is a collection of information in a standardized format for controlling and documenting field measurements taken for the Final Status Survey. A survey package was prepared for each survey unit independently and contains, as a minimum, the following:

- Form FSP-AP-001.4, Survey Area Breakdown
- Form FSP-AP-001.1, Radiological Survey Instructions
- Form FSP-AP-001.3, Survey Location Designation, Results and Comments
- Form FSP-AP-001.5, Final Status Survey Map

In addition, the survey packages contain the field data collection results, a copy of the final data converted to the reporting units required to demonstrate regulatory compliance, smear sample reports, a summary report for the survey unit, and any other pertinent data as determined by the project Radiological Engineer. All FSS survey packages prepared for a specific survey unit were reviewed for regulatory and procedural compliance and approved by the project Radiological Engineer prior to implementing the FSS for that specific area.

5.5 Measurement Frequencies

Measurement frequencies, or the physical spacing of samples and measurements, were selected to allow for a concentrated survey effort in those areas most likely to be

contaminated, taking into account the type and size of the survey unit. The *minimum* measurement frequency for each measurement type is described below.

5.5.1 Surface Scans

- Unaffected - β scan a minimum of 10% of the accessible surfaces. Alpha scans were also performed on interior and exterior wall surfaces. 2-square-meters were scanned at each TSC location.

5.5.2 Total Surface Contamination (fixed point) Measurements

- Unaffected - a minimum of 30 survey points or one survey point for each fifty square meters, whichever is greater

5.5.3 Removable Surface Contamination Samples

A smear sample for removable contamination was collected from each location where a TSC measurement was made. These samples were analyzed for alpha and beta-gamma contamination.

5.5.4 Exposure Rate Measurements

- Unaffected – a minimum of one exposure rate measurement for each fifty square meters

5.6 Instrumentation

Radiation detection and measurement instrumentation used for the final status survey was selected to provide both reliable operation and adequate sensitivity to demonstrate attainment of the release criteria. Both field survey instrumentation and analytical laboratory equipment were selected based on: (1) the necessary Minimum Detectable Concentrations (MDC), and (2) stability and reliability under environmental conditions. Instrumentation utilized to perform the final status survey is shown in Table 5-2.

Instruments and detectors used in the final status survey were calibrated by the manufacturer or by qualified vendors using NIST traceable sources. Instrumentation used in the final status survey was operated and maintained in accordance with approved procedures. Instruments used for fixed surface contamination measurements were pre-use response checked each day that they were used for data collection. The bench-top alpha and beta counting system was calibrated using sources traceable to NIST and source checked each day the instrument was used for sample counting.

Uncertainties and MDA values were calculated using equations 8-9 and 5-2 respectively of NUREG/CR 5849. Equation 8-9 was modified to correct units to disintegrations per minute. Uncertainty values were calculated using an average efficiency for the instruments used in the performance of the final status survey. Instrument MDAs were

calculated after calibration and/or field repairs. Count times were selected to ensure that the measurements would be sufficiently sensitive with respect to the release criteria.

Table 5-2, Final Status Survey Instrumentation

Instrument/ Detector Type	Description	Measurement Types(s)	Det. Eff.	MDA Dpm/100cm^2
Ludlum 2350-1 Data Logger/ 43-37-1	582 cm^2 gas flow proportional	Beta scan	29.42%	200-600
Ludlum 2360 Data Logger/ 43-89	100 cm^2 scintillation probe	Alpha/Beta scan Beta surface contamination Alpha surface contamination	β~13% α~17%	β-300-600 α-25-75 (achieved w/ 1 min. count)
Bicron Micro Rem	Tissue-equivalent organic scintillator	Exposure rates		
Ludlum 2929/ 43-10-1	Scintillator: Zn (Ag) adhered to plastic scintillation material	Alpha and beta activity on smear samples		

5.6.1 Instrument Use Technique

Techniques used in the performance of final status survey measurements were in accordance with section 9 of procedure FSP-AP-001, Final Status Survey Design and Implementation. Operation of the instrumentation used to perform the final status survey was done in accordance with procedures FSP-OP-003, Operation of the Bicron Micro Rem Meter and RPP-OP-105, Operation and calibration of the Ludlum 2929.

5.6.1.1 Surface Scans

Scan surveys were performed for alpha/beta activity in the Rate Meter mode at a rate of 1.5 to 2 inches per second, at a distance of approximately 0.25 inches from the surface. Visual and audible count rates were observed for an increase in activity. Verified areas of elevated activity were physically marked in the field and documented on the survey sheet. Scans were performed over 2-square meters around each TSC measurement location

5.6.1.2 Total Surface Contamination Surveys

Total surface contamination (TSC) measurements were performed for beta activity at a specific survey location after the scan for that survey location was completed. TSC measurements were obtained as prescribed in the survey instructions and at any areas of elevated activity identified during the scan survey. The measurements were obtained by placing the detector within one-quarter inch of the surface to be surveyed and counted in the Integrate mode for the specified time (normally one minute). All count rate values were recorded on the survey for each area.

5.6.1.3 Removable Surface Contamination Surveys

Removable surface contamination (smear) samples were obtained at each TSC measurement location and were taken over an area of 100 cm^2. All smears were analyzed for beta and alpha contamination.

5.6.1.4 Exposure Rate Surveys

Exposure rate measurements were taken by placing the detector at one meter from the surface of the location specified in the survey instructions and counted in the Rate Meter mode for the specified time (normally 15-30 seconds). All μR/hour values were recorded.

5.7 Background/Baseline Levels Identified

Material-Specific background levels were established for each type of instrument used for total surface contamination and exposure rate measurements. Background measurements were collected on surfaces of similar construction as the buildings at the site and having no possibility of being impacted by site operation. Measurements to establish background for a specific material were collected from multiple locations to provide an estimate of the variability or uncertainty. Background determination was performed using the same instruments that were used for FSS data collection. An average background value was determined for each material surveyed and this value was subtracted from each FSS measurement to determine a net count rate. Background determinations were required for concrete, and a class of materials designated as generic material. The required number of background measurements per material is as follows:

- Concrete - a minimum of 20 measurements
- Cinderblock - a minimum of 20 measurements
- Generic – a minimum of 10 measurements for each type of material surveyed (i.e., wood, insulation, corrugated steel, etc,)

5.7.1 Background in Buildings 39 and 42

The background response of the 100 cm^2 scintillation detectors used for surface activity measurements in Building 39 included a significant contribution from the gamma radiation "background" in the vicinity. The nominal exposure rate on the Washington site ranged from 5 to well over 30 microR/hour.

A method was devised to improve the accuracy of the detector background response for surface beta activity measurements. For a typical measurement at the Washington site, the major component of the detector background response was the contribution from gammas due to the soil concentrations adjacent to the building. A small contribution to the background response also came from the surface material beneath the detector sensitive area (the window). This component was mostly beta radiation with a minor gamma radiation contribution. A pair of measurements were taken at each survey location in Buildings 39 and 42 during the final status survey. The first measurement was

taken with an aluminum shield placed between the detector face and the surface of the material being measured. The shield was of sufficient thickness (3/16 inch) to completely attenuate the maximum beta energy of the thorium series beta emitters. The shielded measurement provided a good estimate of the background at the measurement location as it shielded the detector from emissions from surface contamination. Next, an unshielded measurement was obtained at the same location of the shielded measurement. The difference between the shielded and unshielded measurement, then was largely due to surface contamination from residual activity contamination and material background. Concrete and generic material surfaces were surveyed at off-site locations where background measurements were taken and found to have some contributing beta activity in the material make-up. These activities were subtracted from the measurements taken for each material type in buildings 39 and 42.

5.7.2 Background Anomalies in Buildings 39 and 42

While performing the final status survey on Buildings 39 and 42, numerous surface activity measurements exceeded the release criteria. This was due to unusually high background radiation in the area of the Buildings. The high background was caused by thorium in the surrounding soil.

5.7.2.1 Floor and Lower Walls

While performing the final status survey of the lower walls in Buildings 39 and 42, numerous total surface contamination measurements taken along the walls initially exceeded the release criteria. According to characterization data, the soil outside of Buildings 39 and 42 contain high concentrations of thorium. These measurements were taken on corrugated metal that is prevalent on the interior and exterior walls throughout Buildings 39 and 42. In each instance, a shielded and unshielded measurement was taken. In every instance, the data obtained from the resurvey was well below the release criteria.

5.7.2.2 Gamma scans of Building Roof-tops

Gamma measurement surveys taken on the roof were not performed due to the inability to safely access the roofs of the buildings.

5.8 Major Contaminants Identified

The major contaminants at the Molycorp, Inc. Washington, PA site are natural thorium and natural uranium.

5.9 Guideline Established

All final status survey measurements were compared to the values in FC 83-23, Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for Byproduct, Source, or Special Nuclear Material. The criteria for natural thorium are more conservative than natural uranium and were applied at the site. In addition, an exposure rate criterion of 5 uR/hr was applied.

The unrestricted use criteria for the buildings and structures are shown in Table 5-3 below.

Table 5-3
Guideline Values (values above background)

Measurement Type	Average	Maximum
Total Surface Contamination	1000 dpm/100 cm^2	3000 dpm/100 cm^2
Removable Surface Contamination		200 dpm/100 cm^2
Exposure Rate	5 μrem/hr	10 μrem/hr

5.9.1 Maximum Guideline Values

Individual measurement values were checked to determine if any were above the maximum guideline values in Table 5-3. The maximum guideline values were established for total surface contamination, removable surface contamination and exposure rate measurements.

The maximum guideline value for:

- A total surface contamination measurement is the maximum net dpm allowed in any 100 cm^2 area.
- A removable surface contamination measurement is the maximum net dpm allowed in any 100 cm^2 area,
- An exposure rate measurement is the maximum μR per hour above background allowed for any single measurement.

5.9.2 Average Guideline Values

FC83-23 allows for individual measurements to be screened against guideline values (sometimes referred to as the average guideline value). Areas of elevated activity between one and three times the guideline value could be tested to assure that the average surface activity level within a contiguous 1 m^2 area containing the elevated area is less than the guideline value. Since all final status survey data are below the average guideline values, this test was not performed.

6.0 SURVEY FINDINGS

This section provides the methods for evaluating all final radiological survey data. Detailed Data Reports for each survey unit is provided in Appendix A. Field data

collection forms and other information from the individual survey packages, as discussed in section 5.4 are provided in Appendix B.

The results for removable contamination indicate that the removable beta activity was always higher than the removable alpha activity. There was essentially no alpha contamination identified during the final status survey. Therefore, for demonstrating compliance with the unrestricted use criteria, Appendix A summarizes the results for removable beta contamination only. The removable alpha contamination counting results are provided in Appendix B.

6.1 Techniques for Reducing/Evaluating Data

All final status survey data was converted to the correct reporting units to demonstrate compliance with license termination requirements. The formulas used in the conversion process are provided in Appendix C.

There were a few exposure rate measurements that exceeded the maximum value of 10 μR/hr above background. These elevated results are believed to be attributable to contamination in the soil surrounding buildings 39 since there was essentially no surface contamination above background identified on the building surfaces. To confirm that the elevated exposure rates were due to soil contamination, a portion of wall was removed from building 39 and taken to a low background area for resurvey. The highest gamma dose rate location was MWB39-UG-15. The one-square meter of wall containing location code MWB30-UG-15 was removed from building 39. During final status surveys this location code had a gamma dose rate of 30 μR/hr. The wall section was resurveyed in a low background area with no findings above the background of 7 μR/hr. This survey verifies that the elevated exposure rates are due to the soils surrounding the building and not from the building materials or any activity located on the building itself.

The impact of having elevated gamma dose rates was evident in the surface mea surements as well. Although shielded and unshielded measurements were taken, the higher count rates caused by the gamma constituent in the soil created a larger degree of fluctuation between counts.

6.2 Comparison of Findings with Guideline Values and Conditions

The final status survey data was evaluated to ensure that the unrestricted use criteria were satisfied at the 95% confidence level in accordance with NUREG/CR 5849. The data are summarized in Appendix A. All survey results are well below the unrestricted use criteria and are essentially indistinguishable from background.

The average beta surface contamination levels in Buildings 39 and 42 were 16 dpm/100 cm^2 and 42 dpm/100 cm^2, respectively. The upper 95% confidence levels were 116 and 164 dpm/100 cm^2. These results are not likely to be statistical different from background levels. Removable contamination results were all less than MDA. The average exposure rates were 5.7 and -0.4 μR/hr for Buildings 39 and 42, respectively, with 95% upper confidence levels of 6.7 and 0.2 μR/hr.

7.0 SUMMARY

The final status surveys for Buildings 39 and 42 were performed in accordance with NUREG/CR 5849 and the Decommissioning Plan for the Washington, PA Facility. Results of the final status survey demonstrate that the residual contamination in all Building 39 and 42 survey units is below the unrestricted use criteria at the 95% confidence level and confirm that the buildings are suitable for unrestricted use.

REFERENCES

1) Draft NUREG/CR-5849, Manual for Conducting Radiological Surveys in Support of License Termination

2) Decommissioning Plan for the York, PA Facility, Revision 1, RSI, June 30, 1999

3) Policy and Guidance Directive FC83-23, Guidelines for Decontamination of Facilities and Equipment Prior to Release for Unrestricted Use or Termination of Licenses for By-Products, Sources or Special Nuclear Materials

4) Final Survey report for Decommissioning of the Molycorp, Inc. York, PA Facility, IT Corporation, May 1997

5) USNRC Materials License No. SMB-1408, Amendment 9

6) Molycorp, Inc., Radiological Health and Safety Plan

7) FSP-AP-001, Final status Survey Design and Implementation

8) FSP-OP-002, FSS Data Processing and Reporting

9) FSP-OP-003, Operation and Use of the Bicron Electra Plus

10) FSP-OP-005, Survey Area Turnover and Control

11) RPP-IP-001, Operation of the Bicron Micro Rem Meter

12) RPP-OP-105, Operation and calibration of the Ludlum 2929

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Radiological Services, Inc.

FINAL STATUS SURVEY GENERAL INSTRUCTIONS

Survey Area Name:	Building 42	Survey Area Category:	Structure
Survey Area Location:	Molycorp, Washington, PA	Survey Unit Classification:	Unaffected
Survey Unit Name:	Interior (MWB42-01)		

Survey Instructions

Measurement Type	Instrument & Detector	Count Time	Instructions/Remarks
Alpha/Beta Scan	Ludlum 2360/43-89 or Ludlum 2350/43-37-1	N/A	Perform a scan of 10% of the interior and exterior surfaces of the building floors and up to 2 meters on the walls. Alpha/beta scans to be performed on the walls. Beta scans are to be performed on floor surfaces. Scan a minimum of $4m^2$ around each TSC location designated on map MWB42-01-02. Scan survey will be performed at 1 inch per second. Note the location of any alarms on the survey map.
Alpha/Beta TSC	Ludlum 2360/43-89	1 minute	Collect alpha/beta TSC measurements at locations indicated on survey area map MWB42-01-02. Unshielded measurements will be collected for beta at each location.
RSC smears	Ludlum 2929	1 minute	Collect a smear at the location of each TSC measurement. Smears will be analyzed for both alpha and beta contamination.
Gamma ER	Micro Rem	N/A	Collect exposure rate measurements at each TSC measurement indicated on survey area map MWB42-01-02. ER measurements will be collected one meter from the surface.
All	Various	Various	Repeat a minimum of 5% of all measurement types collected. Record the number of the repeat measurements on the attached Survey Location Designator.

Prepared By: Craig E. Miller Date: 11/9/01

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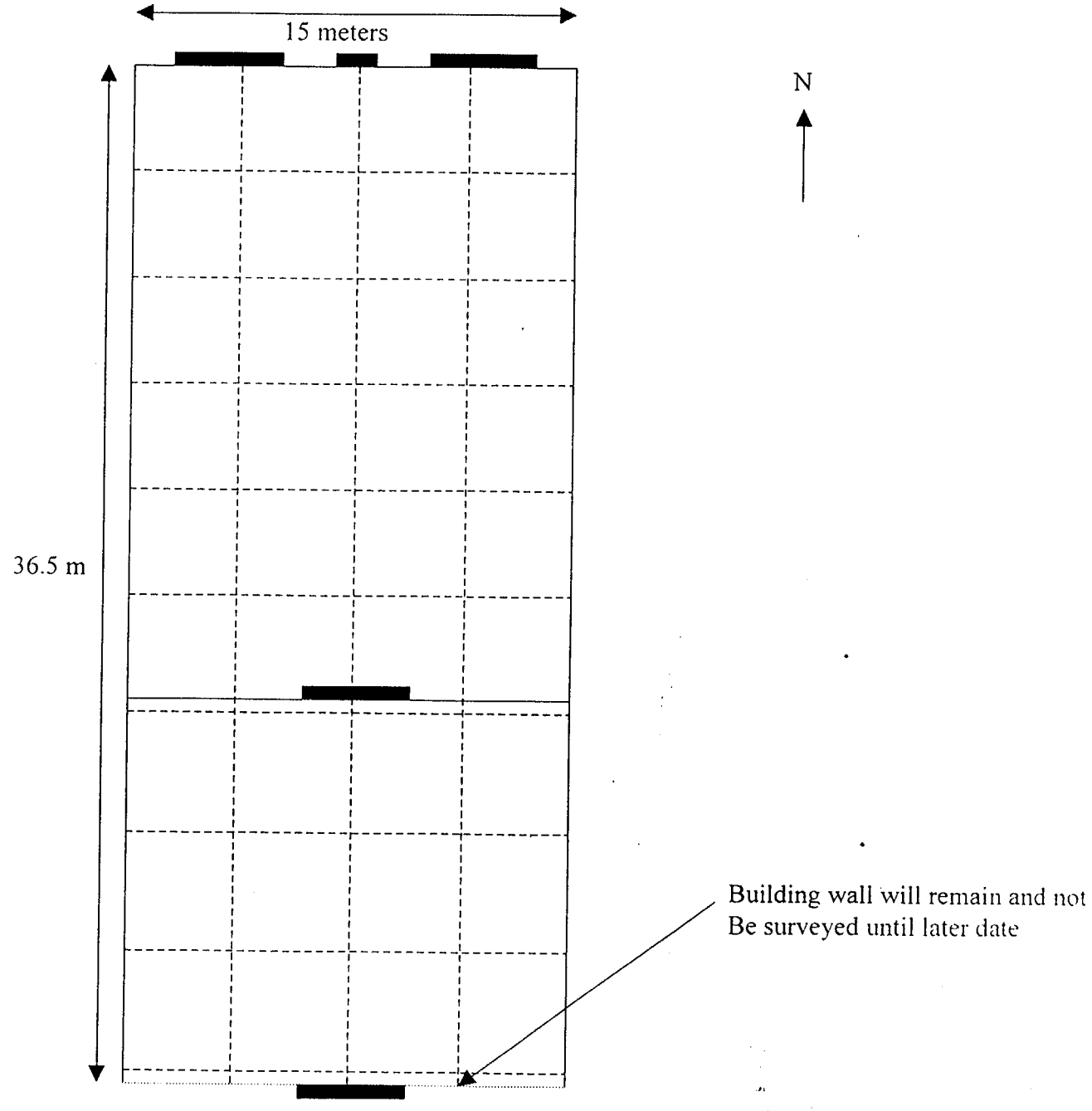
SURVEY AREA BREAKDOWN FORM

Survey Area Name	Building 42	Classification	Unaffected
Survey Area Location	Molycorp Washington, PA	Category	Structure

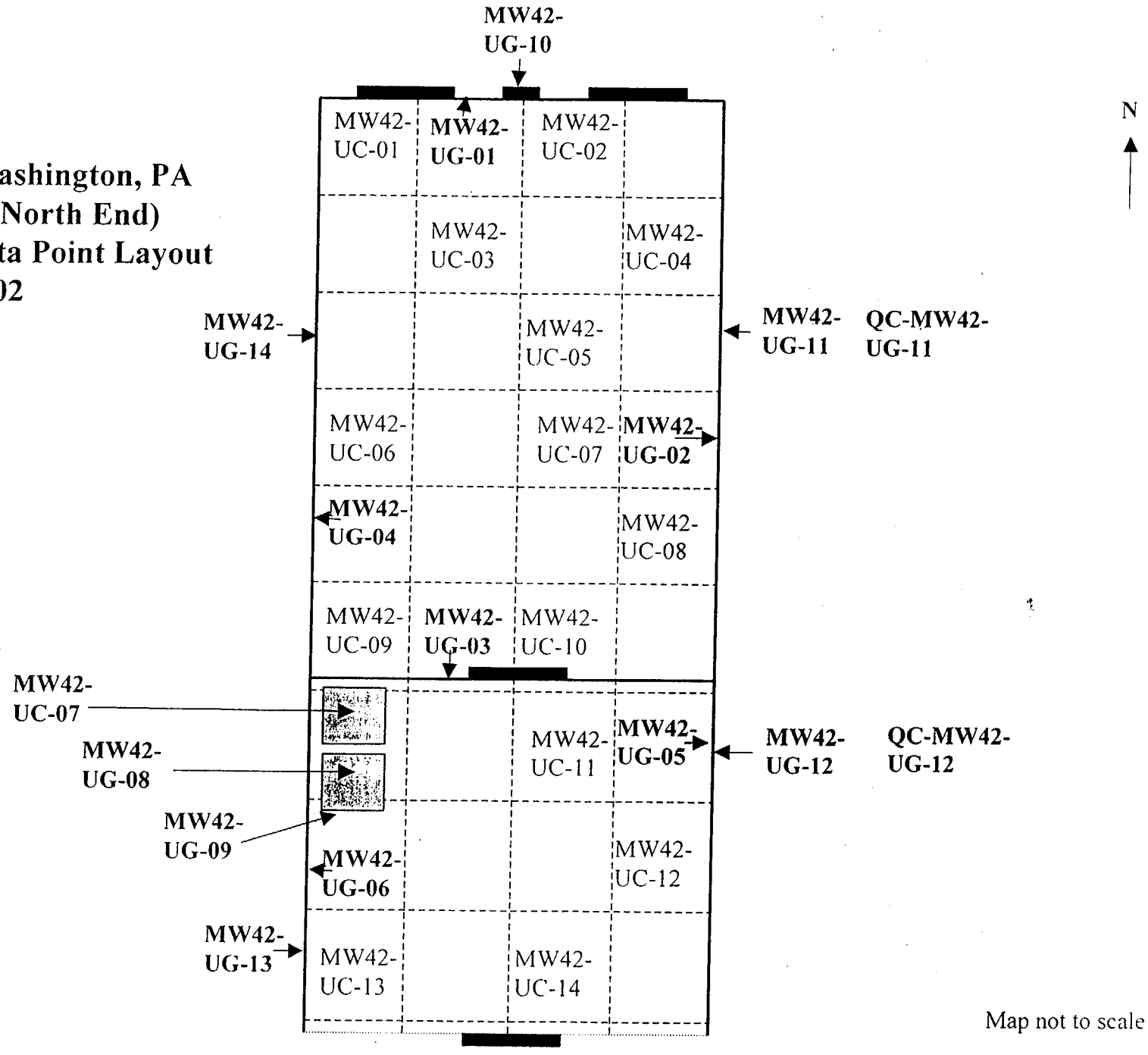
Survey Unit			Survey Material			Survey Locations			
Description	Classification	Area (m^2)	Description	Location Code	Survey Area (m^2)	TSC β	TSC α	ER	RSC
Interior	Unaffected	891.5 x 10% (90 m^2)	Concrete	MWB39-UC	(547.5) 55	14	14	14	14
			Generic	MWB39-UG	(344) 35	9	9	9	9
Exterior	Unaffected	176 x 10% (18 m^2)	Generic	MWB39-UG	(176) 18	5	5	5	5
QC Interior	Unaffected	108 x 5% (5.4 m^2)	Generic	MWB39-UC	8	2	2	2	2

Prepared By: Craig E. Miller Date: 11/9/01

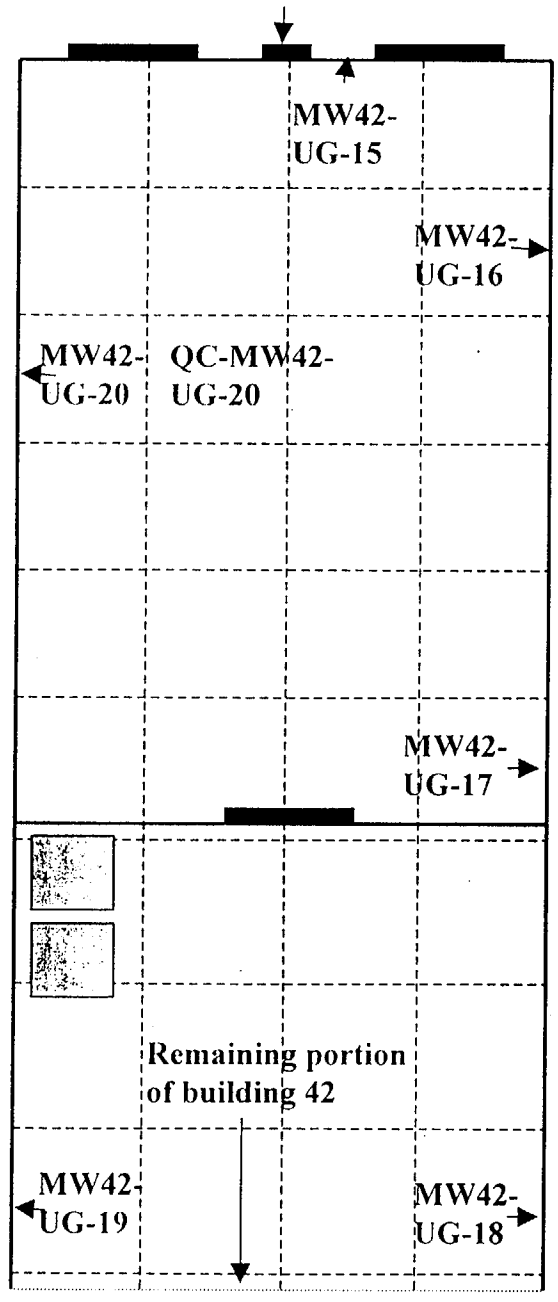
Washington, PA
Building 42
Overview



Molycorp Washington, PA
Building 42 (North End)
Grid and Data Point Layout
MWB42-01-02



Molycorp Washington, PA
Building 42 (North End)
Data Point Layout
MWB42-01-03



N

4x4 meters

Map not to scale

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SURVEY POINT DESIGNATOR

Survey Area Name: Building 42 (MWB42)
Survey Unit Name: MWB42-01 (Interior)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA		TSC MDA	
					α	β	α	β
Instrument Data	134735	6/9/02	149471	6/9/02	NA	137	NA	NA
	~~141303~~ 145478	11/2/02	~~151059~~ 156148	11/2/02	NA	NA	56	521
	A396E	4/2/02	NA	NA	NA	NA	NA	NA

	Print Name:	Sign Name:	Date:
Performed By:	Dave Riley	David J. Riley	11/9/01
	Howard Nordby	Howard Nordby	11/9/01

Location Number MWB42-	β Scan (cpm)	α Scan (cpm)	β TSC_{unsh} (cpm)	α (cpm)	ER (μR/hr)	Smears
UC-01	570	NA	354	2	7	Y
UC-02	550	NA	348	4	10	Y
UC-03	560	NA	361	6	10	Y
UC-04	520	NA	312	2	11	Y
UC-05	420	NA	282	5	9	Y
UC-06	650	NA	332	6	10	Y
UC-07	610	NA	335	2	10	Y
UC-08	620	NA	343	7	8	Y
UC-09	550	NA	327	7	9	Y
UC-10	520	NA	305	3	8	Y
UC-11	640	NA	303	3	9	Y
UC-12	530	NA	302	8	9	Y
UC-13	600	NA	273	7	7	Y
UC-14	630	NA	274	6	7	Y
NA	NA	NA	NA	NA	NA	NA
	↓	↓	↓	↓	↓	↓

Prepared by: **Craig E. Miller** Date: **11/9/01**

Reviewed by Craig E. Miller

RSI

Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 42 (MWB42)
Survey Unit Name: MWB42-01 (Interior)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA		TSC MDA	
					α	β	α	β
Instrument Data	~~141303~~ 145478	11/2/02	~~151059~~ 150748	11/2/02	146	1532	62	536
	A396E	4/2/02	NA	NA	NA	NA	NA	NA

	Print Name:	Sign Name:	Date:
Performed By:	Dave Riley	David J. Riley	11/12/01
	Howard Nordby	Howard Nordby	11/12/01

Location Number MWB42-	β Scan (cpm)	α Scan (cpm)	β TSC_{unsh} (cpm)	α (cpm)	ER (μR/hr)	Smears
UG-01	260	1	222	3	10	Y
UG-02	290	2	269	5	11	Y
UG-03	240	4	210	10	9	Y
UG-04	260	6	288	6	9	Y
UG-05	280	5	230	10	10	Y
UG-06	240	8	220	7	8	Y
UG-07	180	1	196	5	7	Y
UG-08	250	5	220	6	7	Y
UG-09	250	8	300	9	7	Y
NA	NA	NA	NA	NA	NA	NA

Prepared by: **Craig E. Miller** Date: **11/9/01**

Reviewed by: Craig E Miller

RSI

Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 42 (MWB42)
Survey Unit Name: MWB42-01 (Exterior)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA		TSC MDA	
					α	β	α	β
Instrument Data	~~141303~~ 141363 ~~145478~~	11/2/02	~~151059~~ 151054 ~~156195~~	11/2/02	146	1532	62	536
	A396E	4/2/02	NA	NA	NA	NA	NA	NA

	Print Name:	Sign Name:	Date:
Performed By:	Dave Riley	David J. Riley	11/12/01
	Howard Nordby	Howard Nordby	11/12/01

Location Number MWB42-	β Scan (cpm)	α Scan (cpm)	β TSC_{unsh} (cpm)	α (cpm)	ER (μR/hr)	Smears
UG-10	260	8	220	4	11	Y
UG-11	300	6	258	6	12	Y
UG-12	300	4	240	9	13	Y
UG-13	300	7	229	3	10	Y
UG-14	400	10	270	5	13	Y
(QC) UG-11	270	7	257	3	14	Y
(QC) UG-12	280	3	223	2	13	Y
NA	NA	NA	NA	NA	NA	NA

Prepared by: **Craig E. Miller** Date: **11/9/01**

Reviewed by: Craig E. Miller

DDO-138 Radiation Protection Survey Report

Site: Molycorp / ~~York~~ wash. PA

Section 1: Survey Information

Date:	Time:	Location:	Survey Issue Log Number:
11-15-01	1155	MWB42	01-308

RWP Number:	Purpose of Survey:	Page of
N/A	☐ RWP ☐ Routine Survey ☐ Unconditional Release ☒ Other:	Page 2 of 3

Survey Title

MWB42-

1. UC01
2. UC02
3. UC03
4. UC04
5. UC05
6. UC06
7. UC07
8. UC08
9. UC09
10. UC10
11. UC11
12. UC12
13. UC13
14. UC14

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1	<MDA	<MDA
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14	<MDA	<MDA
15		
16		
17		
18		
19		A
20	N	
21		
22		
23		
24		

	α	β
BKG	.2	60
LLD	4.5	29

Eff. = .344α .314β

Legend:

00 = mRem/h gamma | 00 C = mRem/h gamma contact | ① = Smear Location | ▽ = Air Sample Location | -X-X-X- = Rope, Boundary, or Barrier

00 β = mRem/h beta | 00 βC = mRem/h beta contact | --①-- = Large Area Wipe | ☐ = Bulk Material Sample

Section 2: Instruments Used

Instrument Name:	Model Number:	Serial/ID Number:	Calibration Due Date:	α / β MDA:
Ludlum	2929 / 43-10-1	167842 / 171328	11-24-01	13 / 91 DPM / 100cm²
N / A	N / A	N / A	N / A	N / A

Section 3: Review and Approval

Survey Performed By (Sign):	Area Posted and/or Barricaded:	Date and Time:
S Long	☐ Yes ☐ No ☒ Not Required	11-15-01 / 1215

Radiation Safety Officer (Print Name & Sign):	Date and Time:
S Long / S Long	11-15-01 / 1215

DDO-138 Radiation Protection Survey Report

Site: Molycorp / ~~York~~ Wash. PA

Section 1: Survey Information

Date:	Time:	Location:	Survey Issue Log Number:
11-15-01	1220	MWB42	01-308

RWP Number:	Purpose of Survey:	Page of
N/A	☐ RWP ☐ Routine Survey ☐ Unconditional Release ☒ Other:	Page 3 of 3

Survey Title

MWB42 –

① UG01
② UG02
③ UG03
④ UG04
⑤ UG05
⑥ UG06
⑦ UG07
⑧ UG08
⑨ UG09
⑩ UG10
⑪ UG11
⑫ UG12
⑬ UG13
⑭ UG14
⑮ QC-UG11
⑯ QC-UG12

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1	<MDA	<MDA
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15	↓	↓
16	<MDA	<MDA
17		
18		
19		A
20	N	
21		
22		
23		
24		

	α	β
BKG	.2	60
LLD	4.5	29

Eff. = .344α .314β

Legend:
00 = mRem/h gamma; 00 C = mRem/h gamma contact; ① = Smear Location; ∇ = Air Sample Location; -X-X-X- = Rope, Boundary, or Barrier
00 β = mRem/h beta; 00 βC = mRem/h beta contact; --①-- = Large Area Wipe; ☐ = Bulk Material Sample

Section 2: Instruments Used

Instrument Name:	Model Number:	Serial/ID Number:	Calibration Due Date:	α / β MDA:
Ludlum	2929 / 43-10-1	167842 / 171328	11-24-01	13 / 91 DPM/100cm²
N A	N A	N A	N A	N A

Section 3: Review and Approval

Survey Performed By (Sign):	Area Posted and/or Barricaded:	Date and Time:
SLong	☐ Yes ☐ No ☒ Not Required	11-15-01 / 1240
Radiation Safety Officer (Print Name & Sign): SLong / SLong		Date and Time: 11-15-01 / 1240

RSI

Radiological Services, Inc.

FINAL STATUS SURVEY GENERAL INSTRUCTIONS

Survey Area Name:	Building 42	Survey Area Category:	Structure
Survey Area Location:	Molycorp, Washington, PA	Survey Unit Classification:	Unaffected
Survey Unit Name:	Interior/Exterior (MWB42-01)		

Survey Instructions

Measurement Type	Instrument & Detector	Count Time	Instructions/Remarks
Alpha/Beta Scan	Ludlum 2360/43-89 or Ludlum 2350/43-37-1	N/A	Perform an alpha and beta scan around 2-square meter of each TSC location MWB42-UG15 through UG20.
Alpha/Beta TSC	Ludlum 2360/43-89	1 minute	Collect additional shielded and unshielded beta TSC data points MWB42-UG15 through UG20.
RSC smears	Ludlum 2929	1 minute	Collect a smear at each TSC location MWB42-UG15 through UG20.
Gamma ER	Micro Rem	N/A	Collect a gamma exposure rate measurement at each TSC location MWB42-UG15 through UG20 at one meter from the surface.
All	Various	Various	NA

Prepared By: _____ Date: 11/16/01

Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 42 (MWB42)
Survey Unit Name: MWB42-01 (Interior)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA α	Scan MDA β	TSC MDA α	TSC MDA β
Instrument Data	NA	NA	NA	NA	NA	NA	NA	NA
	141303	11/2/02	151069	11/2/02	130	1433	~~52~~ 44	~~425~~ 395 11-19-01
	A3965	4/2/02	NA	NA	NA	NA	NA	NA

	Print Name:	Sign Name:	Date:
Performed By:	Dennis Whitlock		11-19-01

Location Number	β Scan (cpm)	α Scan (cpm)	β TSC_{unsh} (cpm)	α (cpm)	ER (μR/hr)	Smears
UG-15	300	2	281	0	10	Y
UG-16	440	2	377	4	11	Y
UG-17	440	2	330	5	11	Y
UG-18	340	1	263	3	8	Y
UG-19	340	1	284	3	9	Y
UG-20	400	2	339	6	10	Y
QC-UG-20	400	2	326	5	10	Y

Prepared by: Craig Miller Date: 11/16/01

DDO-138 Radiation Protection Survey Report

Site: Molycorp / York, PA

Section 1: Survey Information

Date:	Time:	Location:	Survey Issue Log Number:
11-26-01	1400	Bldg. 42	01-315

RWP Number: N/A

Purpose of Survey: ☐ RWP ☐ Routine Survey ☐ Unconditional Release ☒ Other:

Page 2 of 2

Survey Title

MWB 42-

① UG-15
② UG-16
③ UG-17
④ UG-18
⑤ UG-19
⑥ UG-20
⑦ QC-UG-20

BKG α .04 EFF. α 0.362

BKG β 50.0 EFF. β 0.309

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1	< MDA	< MDA
2	< MDA	< MDA
3	< MDA	< MDA
4	< MDA	< MDA
5	< MDA	< MDA
6	< MDA	< MDA
7	< MDA	< MDA
8		
9		
10		
11		
12		
13		
14		A
15		
16	N	
17		
18		
19		
20		
21		
22		
23		
24		

Legend:
00 = mRem/h gamma; 00 C = mRem/h gamma contact; ① = Smear Location; ∇ = Air Sample Location; -X-X-X̄- = Rope, Boundary, or Barrier
00 β = mRem/h beta; 00 βC = mRem/h beta contact; --①-- = Large Area Wipe; ☐ = Bulk Material Sample

Section 2: Instruments Used

Instrument Name:	Model Number:	Serial/ID Number:	Calibration Due Date:	MDA:
Ludlum	2929	61549	8-20-02	α .14 β 86
Ludlum	43-10	024319	8-20-02	N/A

Section 3: Review and Approval

Survey Performed By (Sign): SLong

Area Posted and/or Barricaded: ☐ Yes ☐ No ☒ Not Required

Date and Time: 11-26-01 / 1420

Radiation Safety Officer (Print Name & Sign): SLong / SLong

Date and Time: 11-26-01 / 1420

RSI

Radiological Services, Inc.

FINAL STATUS SURVEY GENERAL INSTRUCTIONS

Survey Area Name:	Building 42	Survey Area Category:	Structure
Survey Area Location:	Molycorp, Washington, PA	Survey Unit Classification:	Unaffected
Survey Unit Name:	Interior (MWB42-01)		

Survey Instructions

Measurement Type	Instrument & Detector	Count Time	Instructions/Remarks
Alpha/Beta Scan	Ludlum 2360/43-89 or Ludlum 2350/43-37-1	N/A	NA
Alpha/Beta TSC	Ludlum 2360/43-89	1 minute	Collect shielded and unshielded beta TSC measurements at locations previously indicated on survey area map MWB42-01-02.
RSC smears	Ludlum 2929	1 minute	NA
Gamma ER	Micro Rem	N/A	NA
All	Various	Various	NA

Prepared By: _____ Date: 12/5/01

RSI
Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 42 (MWB42)
Survey Unit Name: MWB42-01 (Interior Shielded and Unshielded Floors)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA α	Scan MDA β	TSC MDA α	TSC MDA β
Instrument Data	141303	11/2/02	151059	11/2/02	NA	NA	N/A	475
	N/A							N/A
	N/A							N/A

	Print Name:	Sign Name:	Date:
Performed By:	Dennis Whitlock		12/5/01

Location Number MWB42-	β TSC_{unsh} (cpm)	β TSC_{sh} (cpm)	β TSC (ncpm)	β TSC (dpm)
UC-01	289	192	97	722
UC-02	318	230	88	655
UC-03	350	256	94	699
UC-04	322	224	98	729
UC-05	274	208	66	491
UC-06	326	241	85	632
UC-07	357	250	107	796
UC-08	362	232	130	967
UC-09	313	230	83	618
UC-10	307	220	87	647
UC-11	310	239	71	528
UC-12	300	220	80	595
UC-13	312	224	89	662
UC-14	290	223	67	499

Prepared by: _____ Date: 12-05-01

Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 42 (MWB42)
Survey Unit Name: MWB42-01 (Interior Shielded and Unshielded Walls)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA		TSC MDA	
					α	β	α	β
Instrument Data	141303	11/2/02	151059	11/2/02	NA	NA	N/A	425
	N/A							N/A
	N/A							N/A

	Print Name:	Sign Name:	Date:
Performed By:	Dennis Whitlock		12/5/01

Location Number MWB42-	β TSC_{unsh} (cpm)	β TSC_{sh} (cpm)	β TSC (ncpm)	β TSC (dpm)
UG-01	238	208	30	223
UG-02	247	225	22	164
UG-03	187	175	12	89
UG-04	204	212	-8	-60
UG-05	219	204	15	112
UG-06	193	175	18	134
UG-07	174	156	18	134
UG-08	210	195	15	112
UG-09	255	159	96	714
UG-15	198	207	-9	-67
UG-16	236	243	-7	-52
UG-17	251	246	5	37
UG-18	199	190	9	67
UG-19	207	215	-8	-60
UG-20	244	219	25	186
QC-UG-20	254	285	-31	-231

Prepared by: Craig E. Miller Date: 12-05-01

RSI
Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 42 (MWB42)
Survey Unit Name: MWB42-01 (Exterior Shielded and Unshielded Walls)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA α	Scan MDA β	TSC MDA α	TSC MDA β
Instrument Data	141303	11/2/02	151059	11/2/02	NA	NA	N/A	435
	N/A	←					→	N/A
	N/A	←					→	N/A

	Print Name:	Sign Name:	Date:
Performed By:	Dennis Whitlock		12/5/01

Location Number MWB42-	β TSC_{unsh} (cpm)	β TSC_{sh} (cpm)	β TSC (ncpm)	β TSC (dpm)
UG-10	222	224	-2	-15
UG-11	257	256	1	7
QC-UG-11	246	221	25	186
UG-12	239	230	9	67
QC-UG-12	226	249	-23	-171
UG-13	195	194	1	7
UG-14	249	219	30	223

Prepared by: Craig E Miller Date: 12-05-01

RSI

Radiological Services, Inc.

FINAL STATUS SURVEY GENERAL INSTRUCTIONS

Survey Area Name:	Building 39	Survey Area Category:	Structure
Survey Area Location:	Molycorp, Washington, PA	Survey Unit Classification:	Unaffected
Survey Unit Name:	Interior (MWB39-01)		

Survey Instructions

Measurement Type	Instrument & Detector	Count Time	Instructions/Remarks
Alpha/Beta Scan	Ludlum 2360/43-89 or Ludlum 2350/43-37-1	N/A	Perform a scan of 10% of the interior and exterior surfaces of the building floors and up to 2 meters on the walls. Alpha/beta scans to be performed on the walls. Beta scans are to be performed on floor surfaces. Scan a minimum of $4m^2$ around each TSC location designated on map MWB39-01-02. Scan survey will be performed at 1 inch per second. Note the location of any alarms on the survey map.
Alpha/Beta TSC	Ludlum 2360/43-89	1 minute	Collect alpha/beta TSC measurements at locations indicated on survey area map MWB39-01-02. Unshielded measurements will be collected for beta at each location.
RSC smears	Ludlum 2929	1 minute	Collect a smear at the location of each TSC measurement. Smears will be analyzed for both alpha and beta contamination.
Gamma ER	Micro Rem	N/A	Collect exposure rate measurements at each TSC measurement indicated on survey area map MWB39-01-02. ER measurements will be collected one meter from the surface.
All	Various	Various	Repeat a minimum of 5% of all measurement types collected. Record the number of the repeat measurements on the attached Survey Location Designator.

Prepared By: Craig E Miller Date: 11-7-01

RSI

Radiological Services, Inc.

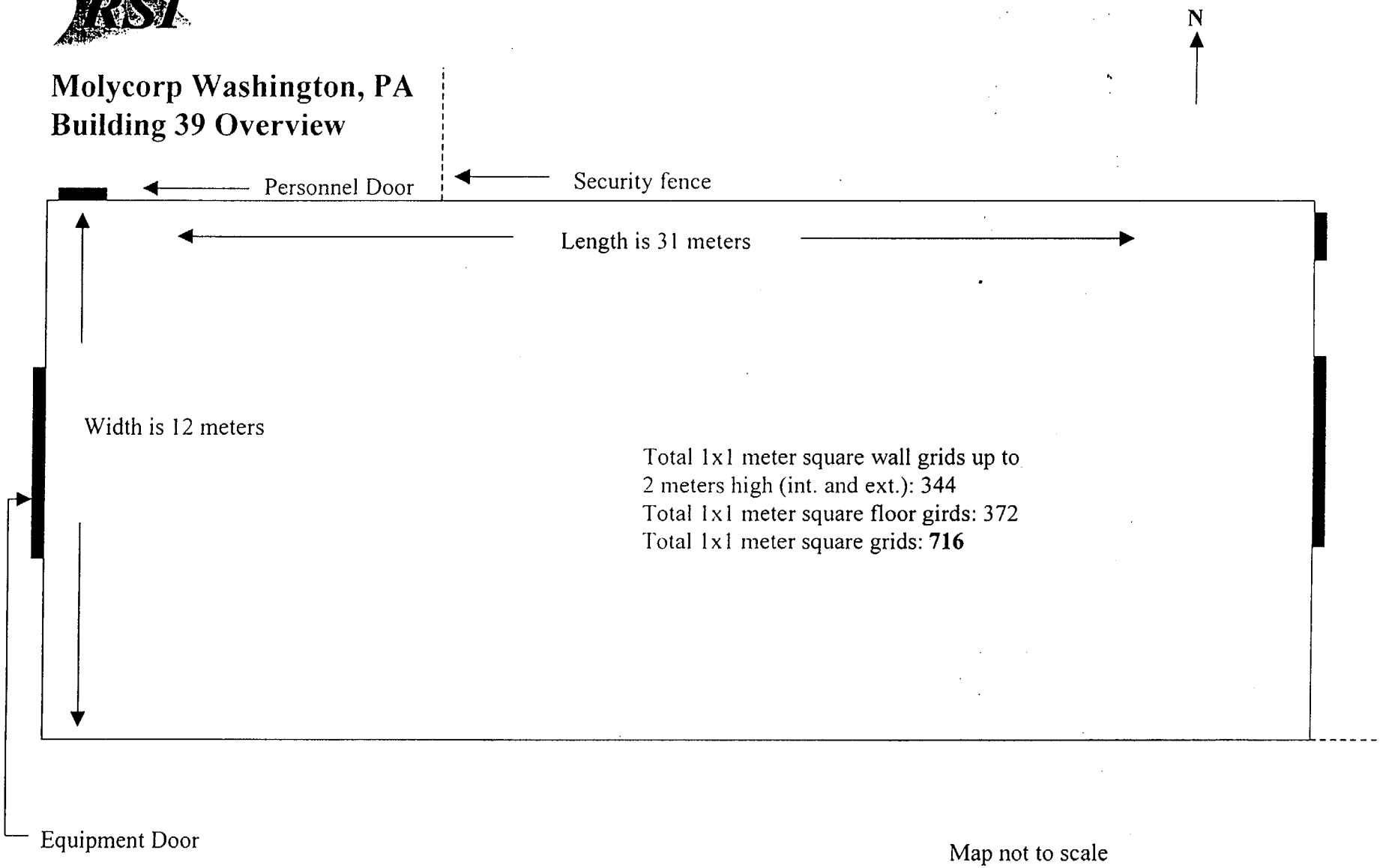
SURVEY AREA BREAKDOWN FORM

Survey Area Name	Building 39	Classification	Unaffected
Survey Area Location	Molycorp Washington, PA	Category	Structure

Survey Unit			Survey Material			Survey Locations			
Description	Classification	Area (m^2)	Description	Location Code	Survey Area (m^2)	TSC β	TSC α	ER	RSC
Interior	Unaffected	544 x 10% (55 m^2)	Concrete	MWB39BUC	38	10	10	10	10
			Generic	MWB39BUG	18	5	5	5	5
Exterior	Unaffected	172 x 10% (18 m^2)	Generic	MWB39AUG	18	5	5	5	5
QC Interior	Unaffected	73 x 5% (4 m^2)	Concrete	MWB39BUC	4	1	1	1	1

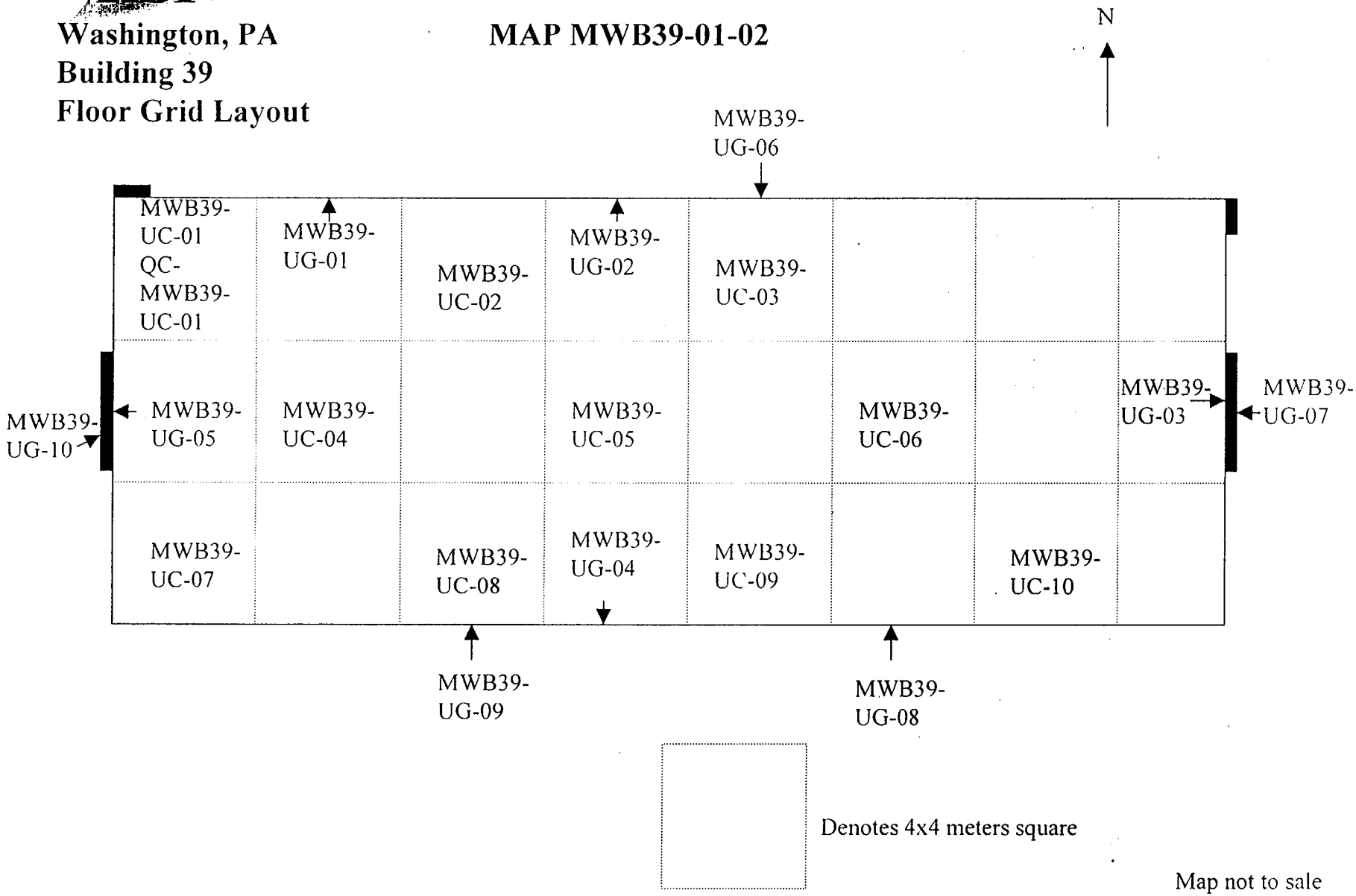
Prepared By: Craig E. Miller Date: 11/8/01

Molycorp Washington, PA
Building 39 Overview



Washington, PA
Building 39
Floor Grid Layout

MAP MWB39-01-02

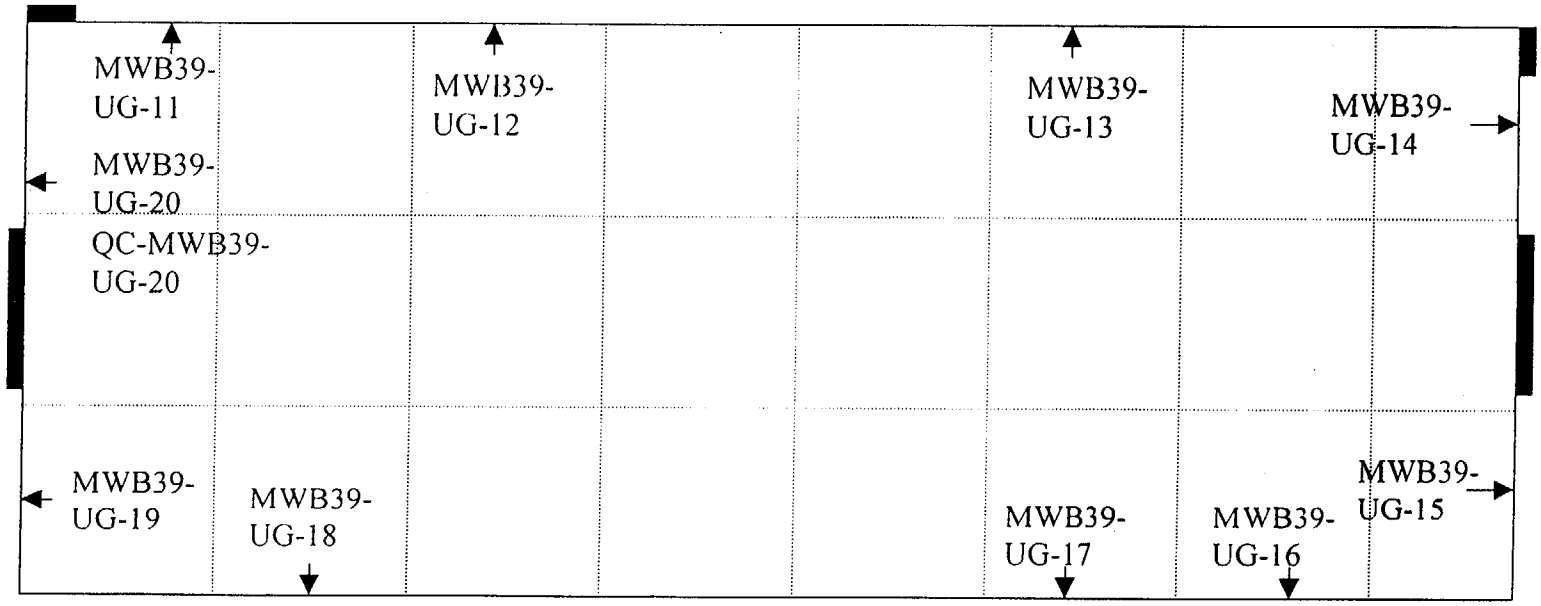


Map not to sale

Washington, PA
Building 39
Floor Grid Layout

MAP MWB39-01-03

N



Denotes 4x4 meters square

Map not to sale

RSI

Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 39 (MWB39)
Survey Unit Name: MWB39-01 (Interior)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA		TSC MDA	
					α	β	α	β
Instrument Data	134735	6/9/02	149471	6/9/02	NA	191	NA	NA
	141303	11/2/02	151059	11/2/02	126	1689	51	498
	A396E	4/2/02	NA	NA	NA	NA	NA	NA

	Print Name:	Sign Name:	Date:
Performed By:	Dave Riley	David J. Riley	11/8/01

Location Number	β Scan (cpm)	α Scan (cpm)	β TSC_{unsh} (cpm)	α (cpm)	ER (μR/hr)	Smears
UC-01	736	NA	360	4	13	Y
UC-02	789	NA	330	7	13	Y
UC-03	773	NA	304	8	12	Y
UC-04	847	NA	351	5	13	Y
UC-05	942	NA	315	6	13	Y
UC-06	896	NA	387	4	14	Y
UC-07	816	NA	330	7	14	Y
UC-08	835	NA	311	4	14	Y
UC-09	1250	NA	414	8	16	Y
UC-10	810	NA	335	4	15	Y
(QC)UC-01	750	NA	348	3	13	Y
NA	NA	NA	NA	NA	NA	NA
	↓	↓	↓	↓	↓	↓

Prepared by: _____ Date: 11/8/01

Reviewed By: _____

RSI

Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 39 (MWB39)
Survey Unit Name: MWB39-01 (Interior)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA		TSC MDA	
					α	β	α	β
Instrument Data	NA	NA	NA	NA	NA	NA	NA	NA
	145478	11/2/02	156748	11/2/02	103	1697	62	481
	A396E	4/2/02	NA	NA	NA	NA	NA	NA

	Print Name:	Sign Name:	Date:
Performed By:	Howard Nordby	Howard Nordby	11/8/01

Location Number	β Scan (cpm)	α Scan (cpm)	β TSC_{unsh} (cpm)	α (cpm)	ER (μR/hr)	Smears
UG-01	480	2	294	0	14	Y
UG-02	320	4	274	2	13	Y
UG-03	360	4	266	4	14	Y
UG-04	420	6	352	6	19	Y
UG-05	300	6	256	6	15	Y
NA	NA	NA	NA	NA	NA	NA

Prepared by: Eric E Miller Date: 11/8/01

Reviewed By: Eric E Miller

RSI

Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 39 (MWB39)
Survey Unit Name: MWB39-01 (Exterior)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA		TSC MDA	
					α	β	α	β
Instrument Data	145478	11/2/02	156748	11/2/02	72	1694	44.6	467
	A396E	4/2/02	NA	NA	NA	NA	NA	NA
	NA	NA	NA	NA	NA	NA	NA	NA

	Print Name:	Sign Name:	Date:
Performed By:	Howard Nordby	Howard Nordby	11/9/01

Location Number	β Scan (cpm)	α Scan (cpm)	β TSC_{unsh} (cpm)	α (cpm)	ER (μR/hr)	Smears
UG-06	600	2	540	6	14	Y
UG-07	400	1	330	0	17	Y
UG-08	420	0	384	4	24	Y
UG-09	420	1	379	2	20	Y
UG-10	460	2	298	5	15	Y
NA	NA	NA	NA	NA	NA	NA

Prepared by: **Craig Miller** Date: **11/9/01**

Reviewed By: Craig Miller

DDO-138 Radiation Protection Survey Report

Site: Molycorp / ~~York~~ Wash. 88, PA

Section 1: Survey Information

Date:	Time:	Location:	Survey Issue Log Number:
11-15-01	1140	MWB39	01-308

RWP Number:	Purpose of Survey:	Page of
N/A	☐ RWP ☐ Routine Survey ☐ Unconditional Release ☒ Other:	Page 1 of 3

Survey Title

MWB39 -
1. UC01
2. UC02
3. UC03
4. UC04
5. UC05
6. UC06
7. UC07
8. UC08
9. UC09
10. UC10
11. UG01
12. UG02
13. UG03
14. UG04
15. UG05
16. UG06
17. UG07
18. UG08
19. UG09
20. UG10
21. QC-UC01

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1	<MDA	<MDA
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20	↓	↓
21	<MDA	<MDA
22		A
23	N	
24		

	α	β
BKG	.2	60
LLD	4.5	29

Eff. = .344 α .314 β

Legend:
00 = mRem/h gamma; 00 C = mRem/h gamma contact; ① = Smear Location; ▽ = Air Sample Location; -X-X-X- = Rope, Boundary, or Barrier
00 β = mRem/h beta; 00 βC = mRem/h beta contact; --①-- = Large Area Wipe; ☐ = Bulk Material Sample

Section 2: Instruments Used

Instrument Name:	Model Number:	Serial/ID Number:	Calibration Due Date:	α / β MDA:
Ludlum	2929 / 43-10-1	167842 / 171328	11-24-01	13 / 91 dpm/100cm²
N / A	N / A	N / A	N / A	N / A

Section 3: Review and Approval

Survey Performed By (Sign):	Area Posted and/or Barricaded:	Date and Time:
S Long	☐ Yes ☐ No ☒ Not Required	11-15-01 / 1155
Radiation Safety Officer (Print Name & Sign): S Long / S Long		Date and Time: 11-15-01 / 1155

RSI

Radiological Services, Inc.

FINAL STATUS SURVEY GENERAL INSTRUCTIONS

Survey Area Name:	Building 39	Survey Area Category:	Structure
Survey Area Location:	Molycorp, Washington, PA	Survey Unit Classification:	Unaffected
Survey Unit Name:	Interior/Exterior (MWB39-01)		

Survey Instructions

Measurement Type	Instrument & Detector	Count Time	Instructions/Remarks
Alpha/Beta Scan	Ludlum 2360/43-89 or Ludlum 2350/43-37-1	N/A	Perform alpha/beta scans over 2-square meters around each additional TSC data point.
Alpha/Beta TSC	Ludlum 2360/43-89	1 minute	Collect a shielded and unshielded beta TSC measurements at each of the previously designated locations indicated on survey area map MWB39-01-02. Take additional data points from UG11 through UG20 and a QC at UG20.
RSC smears	Ludlum 2929	1 minute	Take a smear at each of the additional data point TSC locations UG11-UG20.
Gamma ER	Micro Rem	N/A	Perform a gamma exposure rate measurement one meter from the surface of each data point location UG11-UG20.
All	Various	Various	NA

Prepared By: Craig Miller Date: 11/15/01

Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 39 (MWB39)
Survey Unit Name: MWB39-01 (Interior)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA α	Scan MDA β	TSC MDA α	TSC MDA β
Instrument Data	NA	NA	NA	NA	NA	NA	NA	NA
	141303	11/2/02	151059	11/2/02	103	1596	45	472
	A396E	4/2/02	NA	NA	NA	NA	NA	NA

	Print Name:	Sign Name:	Date:
Performed By:	Dennis Whitlock		11-19-01

Location Number	β Scan (cpm)	α Scan (cpm)	β TSC_{unsh} (cpm)	α (cpm)	ER (μR/hr)	Smears
UG-11	380	2	330	7	16	Y
UG-12	360	0	304	7	14	Y
UG-13	380	1	300	3	14	Y
UG-14	280	0	245	3	15	Y
UG-15	600	2	452	10	30	Y
UG-16	440	4	371	19	17	Y
UG-17	440	4	350	7	18	Y
UG-18	400	1	346	8	17	Y
UG-19	500	2	392	5	16	Y
UG-20	400	1	262	6	15	Y
QC-UG-20	400	1	305	2	15	Y

Prepared by: Craig Miller Date: 11/16/01

DDO-138 Radiation Protection Survey Report

Site: Molycorp / York, PA

Section 1: Survey Information

Date:	Time:	Location:	Survey Issue Log Number:
11-26-01	1430	Bldg. 39	01-315

RWP Number: N/A

Purpose of Survey: ☐ RWP ☐ Routine Survey ☐ Unconditional Release ☒ Other:

Page 1 of 2

Survey Title

MWB39 –

1. UG-11
2. UG-12
3. UG-13
4. UG-14
5. UG-15
6. UG-16
7. UG-17
8. UG-18
9. UG-19
10. UG-20
11. QC-UG-20

BKG: α 0.4 BKG: β´ 50

EFF: α 0.362 EFF: β´ 0.309

Smear Number	Beta dpm/100cm²	Alpha dpm/100cm²
1	<MDA	<MDA
2	<MDA	<MDA
3	<MDA	<MDA
4	<MDA	<MDA
5	<MDA	<MDA
6	<MDA	<MDA
7	<MDA	<MDA
8	<MDA	<MDA
9	<MDA	<MDA
10	<MDA	<MDA
11	<MDA	<MDA.
12		
13		
14		
15		
16		A
17		
18		
19		
20		
21		
22		
23		
24		

Legend:

00 = mRem/h gamma | 00 C = mRem/h gamma contact | ① = Smear Location | ∇ = Air Sample Location | -X-X-X- = Rope, Boundary, or Barrier

00 β = mRem/h beta | 00 βC = mRem/h beta contact | --①-- = Large Area Wipe | ☐ = Bulk Material Sample

Section 2: Instruments Used

Instrument Name:	Model Number:	Serial/ID Number:	Calibration Due Date:	MDA:
Ludlum	2929	61549	8-20-02	α 14 / β´ 86
Ludlum	43-10	024319	8-20-02	N/A

Section 3: Review and Approval

Survey Performed By (Sign): S Long

Area Posted and/or Barricaded: ☐ Yes ☐ No ☒ Not Required

Date and Time: 11-26-01 / 1445

Radiation Safety Officer (Print Name & Sign): S Long / S Long

Date and Time: 11-26-01 / 1445

RSI

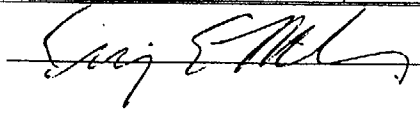
Radiological Services, Inc.

FINAL STATUS SURVEY GENERAL INSTRUCTIONS

Survey Area Name:	Building 39	Survey Area Category:	Structure
Survey Area Location:	Molycorp, Washington, PA	Survey Unit Classification:	Unaffected
Survey Unit Name:	Interior (MWB39-01)		

Survey Instructions

Measurement Type	Instrument & Detector	Count Time	Instructions/Remarks
Alpha/Beta Scan	Ludlum 2360/43-89 or Ludlum 2350/43-37-1	N/A	NA
Alpha/Beta TSC	Ludlum 2360/43-89	1 minute	Collect a shielded and unshielded beta TSC measurements at each of the previously designated locations indicated on survey area map MWB39-01-02.
RSC smears	Ludlum 2929-	1 minute	NA
Gamma ER	Micro Rem	N/A	NA
All	Various	Various	NA

Prepared By:  Date: 12-5-01

RSI
Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 39 (MWB39)
Survey Unit Name: MWB39-01 (Floor Shielded and Unshielded Walls)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA α	Scan MDA β	TSC MDA α	TSC MDA β
Instrument Data	141303	11/2/02	151069	11/2/02	NA	NA	N/A	528
	N/A							N/A
	N/A							N/A

	Print Name:	Sign Name:	Date:
Performed By:	Dennis Whitlock		12/5/01

Location Number MWB39-	β TSC_{unsh} (cpm)	β TSC_{sh} (cpm)	β TSC (ncpm)	β TSC (dpm)
UC-01	315	235	80	595
QC-UC-01	340	241	99	737
UC-02	336	247	89	662
UC-03	347	234	113	841
UC-04	348	298	50	372
UC-05	328	237	91	677
UC-06	348	262	86	640
UC-07	278	224	54	402
UC-08	317	229	88	655
UC-09	354	300	54	402
UC-10	341	260	81	603

Prepared by: _____ Date: 12-5-01

RSI
Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 39 (MWB39)
Survey Unit Name: MWB39-01 (Interior Shielded and Unshielded Walls)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA		TSC MDA	
					α	β	α	β
Instrument Data	141303	11/2/02	151059	11/2/02	NA	NA	N/A	466
	N/A							N/A
	N/A							N/A

	Print Name:	Sign Name:	Date:
Performed By:	Dennis Whitlock		12/5/01

Location Number MWB39-	β TSC_{unsh} (cpm)	β TSC_{sh} (cpm)	β TSC (ncpm)	β TSC (dpm)
UG-01	295	300	-5	-37
UG-02	298	271	27	201
UG-03	296	297	-1	-7
UG-04	412	387	25	186
UG-05	312	295	17	126
UG-11	295	289	6	45
UG-12	292	285	7	52
UG-13	294	307	-13	-97
UG-14	224	223	1	7
UG-15	463	440	23	171
UG-16	346	345	1	7
UG-17	320	319	1	7
UG-18	352	331	21	156
UG-19	362	358	4	30
UG-20	283	256	27	201
QC-UG-20	271	246	25	186

Prepared by: _____ Date: 12-5-01

RSI
Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 39 (MWB39)
Survey Unit Name: MWB39-01 (Exterior Shielded and Unshielded Walls)

	Instrument SN	CDD	Probe SN	CDD	Scan MDA		TSC MDA	
					α	β	α	β
Instrument Data	141303	11/2/02	151059	11/2/02	NA	NA	N/A	466
	N/A							N/A
	N/A							N/A

	Print Name:	Sign Name:	Date:
Performed By:	Dennis Whitlock		12/5/01

Location Number MWB39-	β TSC_{unsh} (cpm)	β TSC_{sh} (cpm)	β TSC (ncpm)	β TSC (dpm)
UG-06	295	263	32	238
UG-07	242	242	0	0
UG-08	345	335	10	74
UG-09	280	287	-7	-52
UG-10	238	218	20	149

Prepared by: Craig E. Miller Date: 12-05-01

RSI

Radiological Services, Inc.

FINAL STATUS SURVEY GENERAL INSTRUCTIONS

Survey Area Name:	Building 39	Survey Area Category:	Structure
Survey Area Location:	Molycorp, Washington, PA	Survey Unit Classification:	Unaffected
Survey Unit Name:	Interior (MWB39-01)		

Survey Instructions

Measurement Type	Instrument & Detector	Count Time	Instructions/Remarks
Alpha/Beta Scan	Ludlum 2360/43-89 or Ludlum 2350/43-37-1	N/A	NA
Alpha/Beta TSC	Ludlum 2360/43-89	1 minute	Collect shielded and unshielded beta TSC measurement on MWB39-UG-15 after that section of wall containing the data point location has been removed and taken to a low background area.
RSC smears	Ludlum 2929	1 minute	NA
Gamma ER	Micro Rem	N/A	Collect exposure rate measurements at MWB39-UG-15 once the wall section has been removed and taken to a low background area. ER measurement will be collected one meter from the surface.
All	Various	Various	NA

Prepared By: _____ Date: 12/15/01

Radiological Services, Inc.

SURVEY POINT DESIGNATOR

Survey Area Name: Building 39 (MWB39)
Survey Unit Name: MWB39-01 (Interior) Survey of removed section of wall

	Instrument SN	CDD	Probe SN	CDD	Scan MDA		TSC MDA	
					α	β	α	β
Instrument Data	NA	NA	NA	NA	NA	NA	NA	NA
	141303	11/2/02	151059	11/2/02	NA	NA	NA	440
	A396E	4/2/02	NA	NA	NA	NA	NA	NA

	Print Name:	Sign Name:	Date:
Performed By:	Dennis Whitlock	[signature]	12-19-01

Location Number	β Shielded (cpm)	β TSC_{unsh} (cpm)	β net (cpm)	β net (dpm)	ER (μR/hr)	Smears
UG-15	216	246	30	223	7	N

Prepared by: Craig Miller Date: 12/18/01