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BUILDING TOXIC METAL CHARACTERIZATION AND DECONTAMINATION REPORT

Area 6, Building 914

August 2011

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TABLE OF CONTENTS

LIST OF ACRONYMS iv
INTRODUCTION 1
METHODS: AIR SAMPLING 2
METHODS: NNSS BUILDING 914 SWIPE SAMPLING PLAN 3
Hotspot Sampling 3
Primary Sampling Objective 4
Selected Sampling Approach 4
Number of Total Samples: Calculation Equation and Inputs 5
Assumptions that Underlie the VSP Locating a Hotspot Design Method 6
Sensitivity Analysis 6
Recommended Data Analysis Activities 7
RESULTS: AIR SAMPLING 20
RESULTS: SWIPE SAMPLING 22
CONFIRMATORY SAMPLING 37
DISCUSSION AND CONCLUSION 40
REFERENCES 42
APPENDIX A: BUILDING 914 PHOTOGRAPHS 43
APPENDIX B: CONFIRMATORY SAMPLING PLAN 46
Random Sampling Locations for Comparing a Mean with a Fixed Threshold (Parametric) ... 47
Primary Sampling Objective 50
Selected Sampling Approach 50
Number of Total Samples: Calculation Equation and Inputs 50
Statistical Assumptions 52
Sensitivity Analysis 52
Further Recommended Data Analysis Activities 53

LIST OF ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
AL	Action Level
Be	Beryllium
Cd	Cadmium
Cr	Chromium
DOE	Department of Energy
EPA	Environmental Protection Agency
HEPA	high-efficiency particulate air
IH	Industrial Hygiene
Mn	Manganese
NNSS	Nevada National Security Site
NSTec	National Security Technologies, LLC
O&I	Operations & Infrastructure
Pb	Lead
PEL	Permissible Exposure Limit
PPE	personal protective equipment
TLV	Threshold Limit Value
VSP	Visual Statistical Program

INTRODUCTION

The purpose of this report is to outline the toxic metal characterization and decontamination efforts in Area 6, Building 914. This includes the initial building inspection, the hotspot sampling, results/findings, building cleanup, and the verification sampling.

Building 914 is a steel light frame building that was constructed in 1992. It is about 16,454 square feet, and five employees are assigned to this building. According to the building's floor plan blueprints, it could be inferred that this building was once a Wiremen/Lineman shop.

In 2002-2004, the National Nuclear Security Administration Nevada Site Office embarked on a broad characterization of beryllium (Be) surface concentrations throughout the North Las Vegas Facility, the Nevada National Security Site (NNSS), and ancillary facilities like the Special Technologies Laboratory, Remote Sensing Laboratory, etc. Building 914 was part of this characterization. The results of the 2002 study illustrated that the metal housekeeping limits were within acceptable limits and from a Be standpoint, the building was determined to be fit for occupancy.

On March 2, 2011, based on a request from Building 914 users, National Security Technologies, LLC (NSTec) Industrial Hygiene (IH) collected bulk samples from the southwest corner of Building 914 at heights above 6 feet where black dust had been noticed on this particular wall. Prior to commencing sampling, IH was also informed that in the past the southwest corner of the building had been used as a welding station. This fact had not been confirmed; however, it had to be taken into consideration as a possibility. With this information, IH decided to conduct surface swipe sampling of the area and analyze the samples for toxic metals, namely Be, cadmium (Cd), chromium (Cr), lead (Pb), and manganese (Mn). The sample results indicated values two to four times above the housekeeping threshold for Be, Cd, Cr, Pb, and Mn. Although the swipe sampling data obtained were high for the toxic metals, the IH Manager explained to the necessary personnel that there is an extremely low probability that any employee was exposed to airborne toxic metals above the Permissible Exposure Limit (PEL). Subsequently, the following actions were instituted with immediate effect:

- The facility was closed and posted;
- The necessary personnel were notified; and
- Controls were instituted for ingress and egress of the building.

These sample results provided a basis for further investigation on issues such as the extent of contamination.

On March 17, 2011, IH performed an extensive sampling event involving the entire warehouse in accordance with NSTec Organization Procedure OP-P250.004, Sampling Procedures. Analysis of the results from this exercise illustrated that toxic metal contamination was ubiquitous throughout the warehouse section of this building but did not extend into the office, restroom, and break room areas. In response to this data, the following was performed with immediate effect to prevent further concerns:

- Prior to the start of building cleanup, all items leaving the warehouse were required to be wet-wiped and/or cleaned with a high-efficiency particulate air (HEPA) vacuum.
- Warehouse operators were required to don personal protective equipment (PPE) prior to entering the warehouse. The PPE consisted of half-face air-purifying respirators with P-100 filtration, nitrile gloves, and Tyvek protective coveralls and booties. The operators also were required to complete Toxic Metals Awareness training for Be, Cd, Cr, and Pb.
- All disposable PPE was placed into a plastic bag (double bagged) and labeled.
- Users were instructed to contact IH prior to the first entry so that personal and area air monitoring could be scheduled and performed.

On March 22, 2011, a planning meeting was held with Environment, Safety, Health & Quality management; Operations & Infrastructure (O&I) management; Facility Management; Occupational Medicine; O&I Operations; and IH. After a brief discussion concerning the salient facts of the surface sample results, it was agreed that the facility and its contents required cleaning. The facility would then be re-sampled to verify cleanliness and suitability for re-occupancy. It was further agreed upon to perform the following.

- Brief the affected employees on the sampling results and actions to be taken.
- Offer voluntary medical surveillance for all current employees and any employees who formerly occupied this facility.
- Contact key customers of this facility to alert them to plan at least three weeks ahead for retrieval of critical items.
- Prepare a scope of work for cleaning the facility with its contents in situ.

On April 18, 2011, warehouse cleanup activities began. During the cleanup operation, the areas to be cleaned were divided into 5 sections, designated as P1 through P5. As the cleaning progressed, IH was concurrently sampling the finished areas to verify the cleanliness of the building. The sampling was conducted in accordance with OP-P250.004 to determine if surface Be, Cd, Cr, and Pb levels were below the NSTec surface metal criteria of 0.2, 10, 50, and 50 micrograms per 100 square centimeters (µg/100 cm^2) of the respective toxic metals per NSTec CD-P280.017, Occupational Exposure Prevention and Control of Carcinogens and Reproductive Hazards. Regarding Mn, IH determined using process knowledge that surface contamination should be kept below 1,000 µg/100 cm^2.

On July 5, 2011, upon receipt of the results from the last cleaned section, the cleanup operations were concluded. The building was statistically determined to be clean; thus, it could be reoccupied and the warehouse operations could resume immediately.

METHODS: AIR SAMPLING

Personal breathing zone and area air samples were collected during this building characterization and cleanup effort. The major objective of the air sampling was to determine if airborne levels of the subject metals were below the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs) and the Department of Energy (DOE) Action Levels (ALs).

METHODS: NNSS BUILDING 914 SWIPE SAMPLING PLAN

The swipe sampling was conducted to determine if surface Be, Cd, Cr, and Pb levels were below the NSTec surface metal criteria of 0.2, 10, 50, and 50 µg/100 cm^2 of the respective toxic metals per NSTec CD-P280.017, Occupational Exposure Prevention and Control of Carcinogens and Reproductive Hazards. Regarding Mn, IH has determined using process knowledge that surface contamination should be kept below 1,000 µg/100 cm^2.

Hotspot Sampling

For the purposes of this report, a "hotspot" is defined as an area with elevated toxic metal values in the building of concern (see Table 2 below for the hotspot shape and size). A hotspot swipe sampling approach was used for the characterization of the wall and floor surfaces of Building 914. However, the hotspot sampling plan did not account for the racks and shelves located throughout the warehouse. Therefore, IH determined that if a floor hotspot sample point was below a rack, each shelf on that particular rack was to be sampled. The sampling plan design utilized the Visual Statistical Program (VSP) software to detect areas of potential elevated values with a 95/95 percent confidence level.

This section summarizes the sampling design used and associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. The sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (e.g., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

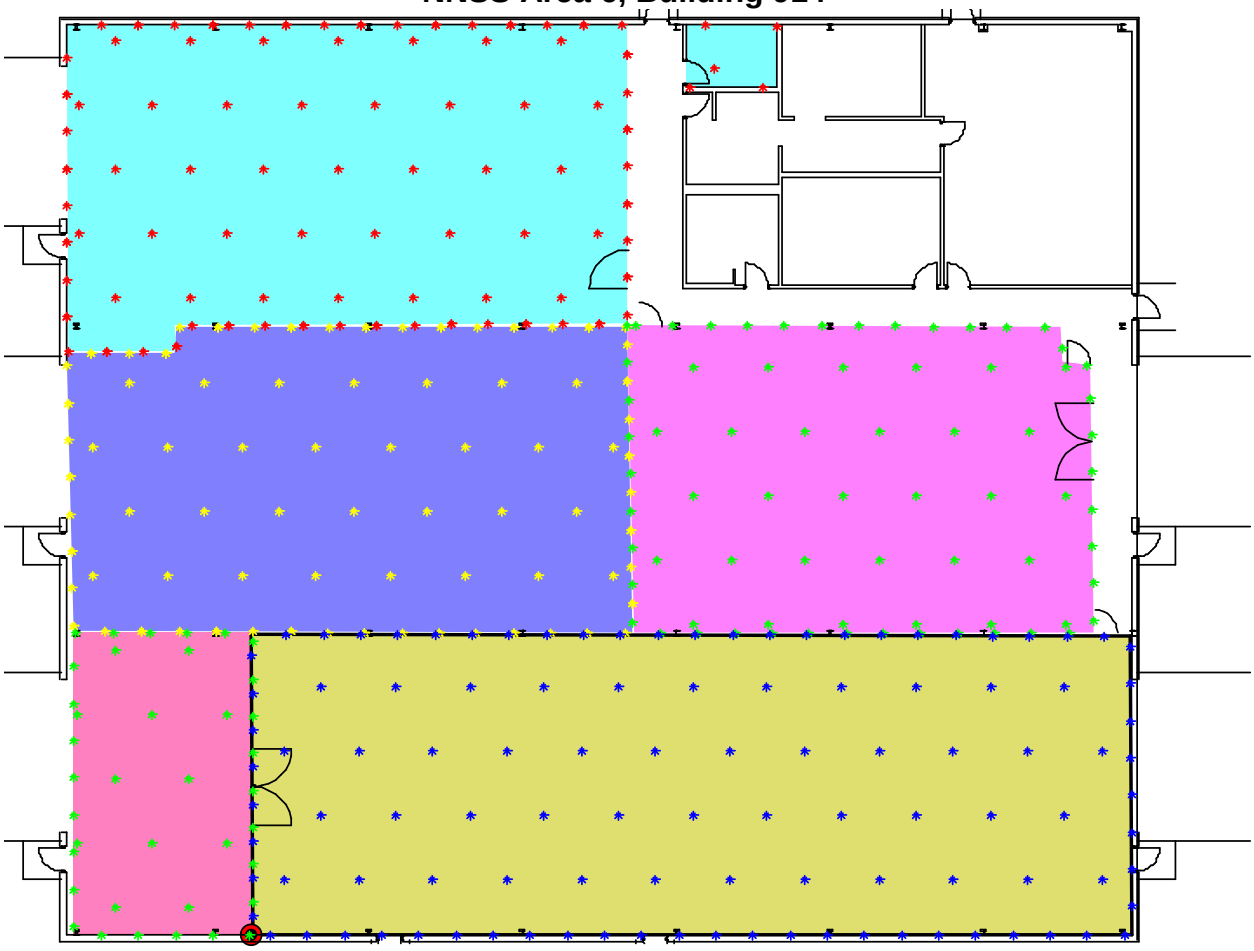
Table 1 below summarizes the sampling design developed. A figure illustrating sampling locations in the field is also provided below.

Table 1

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Detect the presence of a hotspot that has a specified size and shape
Type of Sampling Design	Hotspot
Sample Placement (Location) in the Field	Systematic (Hotspot) with a random start location
Formula for calculating number of sampling locations	Algorithm developed by Singer and Wickman (1969)
Calculated total number of samples	256
Type of samples	Point Samples
Number of samples on map [a]	256 (+ Shelving samples)
Number of selected sample areas [b]	6
Specified sampling area [c]	40,011.95 ft^2
Grid pattern	Triangular
Size of grid/Area of grid [d]	9.66024 feet / 80.8177 ft^2

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas (chain link fencing locations were removed).
[b] The number of selected sample areas (P1-P5) is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected (P1 will not be sampled for hot spots as it contains the highest concentrations).
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.
[d] Size of grid / Area of grid gives the linear and square dimensions of the grid spacing used to systematically place samples.

NNSS Area 6, Building 914



Primary Sampling Objective
The primary purpose of sampling at this site was to detect "hotspots" (local areas of elevated concentration) of a given size and shape with a specified probability, 95 /95 percent confidence level.

Selected Sampling Approach
This sampling approach requires systematic grid sampling with a random start. If a systematic grid is not used, the probability of detecting a hotspot of a given size and shape will be different than desired or calculated.

Number of Total Samples: Calculation Equation and Inputs

The algorithm used to calculate the probability of a hit (which makes possible the calculation of the hotspot size or the number of samples) was developed by Singer and Wickman (1969) and Singer (1972) with refinements by Davidson (1995). Gilbert (1987) also discussed hotspot sampling designs. Inputs to the algorithm include the size, shape, and orientation of a hotspot of interest, an acceptable probability of finding a hotspot, the desired type of sampling grid, and the sampling budget. For this design, the grid size was calculated based on the given hotspot size and other parameters.

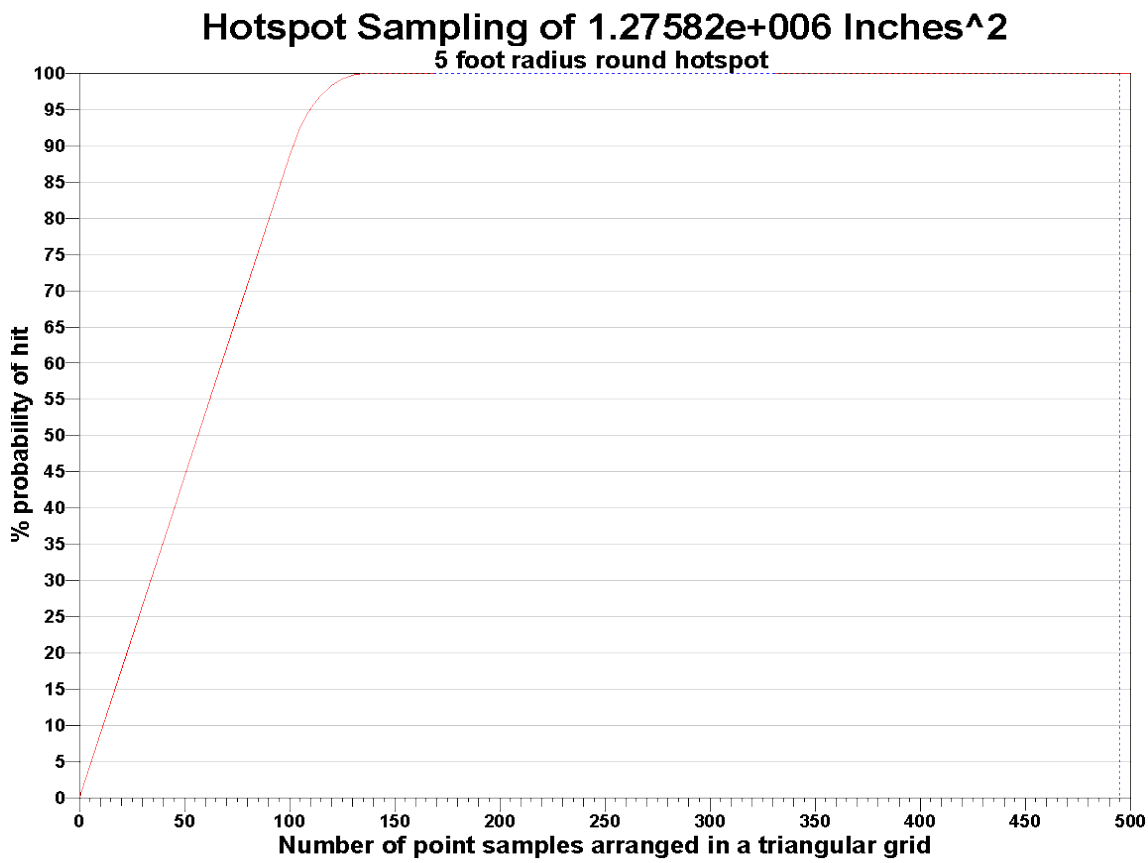
The inputs to the algorithm that result in the grid size are shown in Table 2 below.

Table 2

Parameter	**Description**	**Value**
Inputs		
1-☐(probability of hit)	Probability of detection	95%
Grid Type	Grid pattern (Square, Triangular or Rectangular)	Triangular
Sample Type	Point samples or square cells	Points
Hotspot Shape	Hotspot height to width ratio	1
Hotspot Size	Length of hotspot semi-major axis	5 feet
Hotspot Area [a]	Area of hotspot (Length^2 * Shape * ☐)	78.5398 ft^2
Angle	Angle of orientation between hotspot and grid	Random
Sampling Area	Total area to sample	40011.945 ft^2
Outputs		
Grid Size	Spacing between samples	9.66024 feet
Grid Area	Area represented by one grid	80.8177 ft^2
Samples [b]	Optimum number of samples	496 less 240 on fencing

[a] Length of semi-major axis is used by Singer-Wickman algorithm. Hotspot area is provided for informational purposes.
[b] The optimum number of samples is calculated by dividing the sampling area by the grid area.

The following graph shows the relationship between the number of samples and the probability of finding the hotspot. The dashed blue line shows the actual number of samples for this design (which may differ from the optimum number of samples because of edge effects).



Assumptions that Underlie the VSP Locating a Hotspot Design Method

1. The shape of the hotspot of concern is circular or elliptical.
2. The level of contamination that defines a hotspot is well defined.
3. The location of the hotspot is unknown, and if a hotspot is present, all locations within the sampling area are equally likely to contain the hotspot.
4. Samples are taken on a square, rectangular, or triangular grid pattern.
5. Each sample is collected, handled, measured, or inspected using approved methods that yield unbiased and sufficiently precise measurements.
6. A very small proportion of the surface being studied will be sampled (the sample is much smaller than the hotspot of interest).
7. Sample locations are independent of the measurement process.
8. The systematic grid is placed at a randomly determined starting place to cover the surface area of interest.
9. There are no classification errors (if a hotspot is sampled, it is not mistakenly overlooked or an area is not mistakenly identified as a hotspot).

Sensitivity Analysis

The sensitivity of the calculation of number of samples was explored by varying the probability of hit (percent), hotspot shape (height to width ratio) and hotspot size (length of semi-major axis). Table 3 below shows the results of this analysis.

Table 3

Number of Samples				
		Size=2.5	**Size=5**	**Size=7.5**
1-□=90	**Shp=0.8**	2394	599	266
	Shp=0.9	2073	519	231
	Shp=1	1835	459	204
1-□=95	**Shp=0.8**	2625	657	292
	Shp=0.9	2254	564	251
	Shp=1	1981	496	221
1-□=100	**Shp=0.8**	3188	797	355
	Shp=0.9	2754	689	306
	Shp=1	2456	614	273

1-□ = Probability of Hit (%)
Shp = Hotspot Shape (Height to Width Ratio)
Size = Hotspot Size (Length of Semi-major Axis)

Recommended Data Analysis Activities

Post data collection activities generally follow those outlined in the Environmental Protection Agency (EPA) Guidance for Data Quality Assessment (EPA, 2006). The data analysts will become familiar with the context of the problem and goals for data collection and assessment. The data will be verified and validated before being subjected to statistical or other analyses. Graphical and analytical tools will be used to verify to the extent possible the assumptions of any statistical analyses that are performed as well as to achieve a general understanding of the data. The data will be assessed to determine whether they are adequate in both quality and quantity to support the primary objective of sampling.

A map of the actual sample locations will be generated so that the sampling plan and the field implementation may be compared. Deviations from planned sample locations due to topographic, vegetative, or other features will be noted. Their impacts will be qualitatively assessed. If a hotspot is discovered, additional sampling may be performed to determine its size and shape, in which case the initial assumptions of the sampling design may then be assessed and/or reconsidered.

The sample locations generated from the hotspot sampling plan were as follows.

sample points of building 914.xlsx

Area: P4 - Room 109 West											
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX, ft	LY, ft	LZ, ft	Location
107.1943	520.4365	0	**P4-1**		Hotspot		Floor	8.11	3.34	0.00	P4
223.1171	520.4365	0	**P4-2**		Hotspot		Floor	17.77	3.34	0.00	P4
339.04	520.4365	0	**P4-3**		Hotspot		Floor	27.43	3.34	0.00	P4
454.9629	520.4365	0	**P4-4**		Hotspot		Floor	37.09	3.34	0.00	P4
570.8857	520.4365	0	**P4-5**		Hotspot		Floor	46.75	3.34	0.00	P4
686.8086	520.4365	0	**P4-6**		Hotspot		Floor	56.41	3.34	0.00	P4
802.7315	520.4365	0	**P4-7**		Hotspot		Floor	66.07	3.34	0.00	P4
49.2328	620.8286	0	**P4-8**		Hotspot		Floor	3.28	11.70	0.00	P4
165.1557	620.8286	0	**P4-9**		Hotspot		Floor	12.94	11.70	0.00	P4
281.0786	620.8286	0	**P4-10**		Hotspot		Floor	22.60	11.70	0.00	P4
397.0014	620.8286	0	**P4-11**		Hotspot		Floor	32.26	11.70	0.00	P4
512.9243	620.8286	0	**P4-12**		Hotspot		Floor	41.92	11.70	0.00	P4
628.8472	620.8286	0	**P4-13**		Hotspot		Floor	51.58	11.70	0.00	P4
744.77	620.8286	0	**P4-14**		Hotspot		Floor	61.24	11.70	0.00	P4
860.6929	620.8286	0	**P4-15**		Hotspot		Floor	70.91	11.70	0.00	P4
107.1943	721.2208	0	**P4-16**		Hotspot		Floor	8.11	20.07	0.00	P4
223.1171	721.2208	0	**P4-17**		Hotspot		Floor	17.77	20.07	0.00	P4
339.04	721.2208	0	**P4-18**		Hotspot		Floor	27.43	20.07	0.00	P4
454.9629	721.2208	0	**P4-19**		Hotspot		Floor	37.09	20.07	0.00	P4
570.8857	721.2208	0	**P4-20**		Hotspot		Floor	46.75	20.07	0.00	P4
686.8086	721.2208	0	**P4-21**		Hotspot		Floor	56.41	20.07	0.00	P4
802.7315	721.2208	0	**P4-22**		Hotspot		Floor	66.07	20.07	0.00	P4
49.2328	821.6129	0	**P4-23**		Hotspot		Floor	3.28	28.44	0.00	P4
165.1557	821.6129	0	**P4-24**		Hotspot		Floor	12.94	28.44	0.00	P4
281.0786	821.6129	0	**P4-25**		Hotspot		Floor	22.60	28.44	0.00	P4
397.0014	821.6129	0	**P4-26**		Hotspot		Floor	32.26	28.44	0.00	P4
512.9243	821.6129	0	**P4-27**		Hotspot		Floor	41.92	28.44	0.00	P4
628.8472	821.6129	0	**P4-28**		Hotspot		Floor	51.58	28.44	0.00	P4
744.77	821.6129	0	**P4-29**		Hotspot		Floor	61.24	28.44	0.00	P4
860.6929	821.6129	0	**P4-30**		Hotspot		Floor	70.91	28.44	0.00	P4
223.1171	922.0051	0	**P4-31**		Hotspot		Floor	17.77	36.80	0.00	P4
339.04	922.0051	0	**P4-32**		Hotspot		Floor	27.43	36.80	0.00	P4
454.9629	922.0051	0	**P4-33**		Hotspot		Floor	37.09	36.80	0.00	P4
570.8857	922.0051	0	**P4-34**		Hotspot		Floor	46.75	36.80	0.00	P4
686.8086	922.0051	0	**P4-35**		Hotspot		Floor	56.41	36.80	0.00	P4
802.7315	922.0051	0	**P4-36**		Hotspot		Floor	66.07	36.80	0.00	P4
17.4061	594.8278	81.8339	**P4-37**		Hotspot		Wall 3	9.24	6.82	6.82	P4
14.694	710.7189	81.8339	**P4-38**		Hotspot		Wall 3	18.90	6.82	6.82	P4
11.9819	826.6101	81.8339	**P4-39**		Hotspot		Wall 3	28.56	6.82	6.82	P4
18.7622	536.8822	182.2261	**P4-40**		Hotspot		Wall 3	4.41	15.19	15.19	P4
16.0501	652.7734	182.2261	**P4-41**		Hotspot		Wall 3	14.07	15.19	15.19	P4
13.3379	768.6645	182.2261	**P4-42**		Hotspot		Wall 3	23.73	15.19	15.19	P4
10.6258	884.5556	182.2261	**P4-43**		Hotspot		Wall 3	33.39	15.19	15.19	P4
17.4061	594.8278	282.6182	**P4-44**		Hotspot		Wall 3	9.24	23.55	23.55	P4
14.694	710.7189	282.6182	**P4-45**		Hotspot		Wall 3	18.90	23.55	23.55	P4
11.9819	826.6101	282.6182	**P4-46**		Hotspot		Wall 3	28.56	23.55	23.55	P4
Area: P3 - Room 109 East					P3						
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX	LY	LZ	Location
1007.529	526.6051	0	**P3-1**		Hotspot		Floor	10.34	3.73	0.00	P3
1123.452	526.6051	0	**P3-2**		Hotspot		Floor	20.00	3.73	0.00	P3
1239.375	526.6051	0	**P3-3**		Hotspot		Floor	29.66	3.73	0.00	P3

sample points of building 914.xlsx

X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX, ft	LY, ft	LZ, ft	Location
1355.298	526.6051	0	**P3-4**		Hotspot		Floor	39.32	3.73	0.00	P3
1471.22	526.6051	0	**P3-5**		Hotspot		Floor	48.98	3.73	0.00	P3
1587.143	526.6051	0	**P3-6**		Hotspot		Floor	58.64	3.73	0.00	P3
949.5675	626.9973	0	**P3-7**		Hotspot		Floor	5.51	12.10	0.00	P3
1065.49	626.9973	0	**P3-8**		Hotspot		Floor	15.17	12.10	0.00	P3
1181.413	626.9973	0	**P3-9**		Hotspot		Floor	24.83	12.10	0.00	P3
1297.336	626.9973	0	**P3-10**		Hotspot		Floor	34.49	12.10	0.00	P3
1413.259	626.9973	0	**P3-11**		Hotspot		Floor	44.15	12.10	0.00	P3
1529.182	626.9973	0	**P3-12**		Hotspot		Floor	53.81	12.10	0.00	P3
891.6061	727.3894	0	**P3-13**		Hotspot		Floor	0.68	20.46	0.00	P3
1007.529	727.3894	0	**P3-14**		Hotspot		Floor	10.34	20.46	0.00	P3
1123.452	727.3894	0	**P3-15**		Hotspot		Floor	20.00	20.46	0.00	P3
1239.375	727.3894	0	**P3-16**		Hotspot		Floor	29.66	20.46	0.00	P3
1355.298	727.3894	0	**P3-17**		Hotspot		Floor	39.32	20.46	0.00	P3
1471.22	727.3894	0	**P3-18**		Hotspot		Floor	48.98	20.46	0.00	P3
1587.143	727.3894	0	**P3-19**		Hotspot		Floor	58.64	20.46	0.00	P3
949.5675	827.7816	0	**P3-20**		Hotspot		Floor	5.51	28.83	0.00	P3
1065.49	827.7816	0	**P3-21**		Hotspot		Floor	15.17	28.83	0.00	P3
1181.413	827.7816	0	**P3-22**		Hotspot		Floor	24.83	28.83	0.00	P3
1297.336	827.7816	0	**P3-23**		Hotspot		Floor	34.49	28.83	0.00	P3
1413.259	827.7816	0	**P3-24**		Hotspot		Floor	44.15	28.83	0.00	P3
1529.182	827.7816	0	**P3-25**		Hotspot		Floor	53.81	28.83	0.00	P3
891.6061	928.1737	0	**P3-26**		Hotspot		Floor	0.68	37.19	0.00	P3
1007.529	928.1737	0	**P3-27**		Hotspot		Floor	10.34	37.19	0.00	P3
1123.452	928.1737	0	**P3-28**		Hotspot		Floor	20.00	37.19	0.00	P3
1239.375	928.1737	0	**P3-29**		Hotspot		Floor	29.66	37.19	0.00	P3
1355.298	928.1737	0	**P3-30**		Hotspot		Floor	39.32	37.19	0.00	P3
1471.22	928.1737	0	**P3-31**		Hotspot		Floor	48.98	37.19	0.00	P3
Area: P1 - Shop					P1						
X Coord	Y Coord	Z Coord	**Label**	Value	Type	Historical	Surface	LX, Ft	LY, Ft	LZ, Ft	Location
29.5461	37.247	0	**P1-1**		Hotspot		Floor	0.79	2.44	0.00	P1
145.4689	37.247	0	**P1-2**		Hotspot		Floor	10.46	2.44	0.00	P1
261.3918	37.247	0	**P1-3**		Hotspot		Floor	20.12	2.44	0.00	P1
87.5075	137.6391	0	**P1-4**		Hotspot		Floor	5.62	10.80	0.00	P1
203.4304	137.6391	0	**P1-5**		Hotspot		Floor	15.29	10.80	0.00	P1
29.5461	238.0313	0	**P1-6**		Hotspot		Floor	0.79	19.17	0.00	P1
145.4689	238.0313	0	**P1-7**		Hotspot		Floor	10.46	19.17	0.00	P1
261.3918	238.0313	0	**P1-8**		Hotspot		Floor	20.12	19.17	0.00	P1
87.5075	338.4234	0	**P1-9**		Hotspot		Floor	5.62	27.53	0.00	P1
203.4304	338.4234	0	**P1-10**		Hotspot		Floor	15.29	27.53	0.00	P1
29.5461	438.8156	0	**P1-11**		Hotspot		Floor	0.79	35.90	0.00	P1
145.4689	438.8156	0	**P1-12**		Hotspot		Floor	10.46	35.90	0.00	P1
261.3918	438.8156	0	**P1-13**		Hotspot		Floor	20.12	35.90	0.00	P1
257.5646	8.0049	189.0815	**P1-14**		Hotspot		Wall 3	3.54	15.76	15.76	P1
141.6417	8.0049	189.0815	**P1-15**		Hotspot		Wall 3	13.20	15.76	15.76	P1
25.7189	8.0049	189.0815	**P1-16**		Hotspot		Wall 3	22.86	15.76	15.76	P1
20.0079	118.2168	189.0815	**P1-17**		Hotspot		Wall 4	9.18	15.76	15.76	P1
20.0079	234.1397	189.0815	**P1-18**		Hotspot		Wall 4	18.84	15.76	15.76	P1
20.0079	350.0625	189.0815	**P1-19**		Hotspot		Wall 4	28.50	15.76	15.76	P1
20.0079	465.9854	189.0815	**P1-20**		Hotspot		Wall 4	38.17	15.76	15.76	P1
Area: P5 - Room 110											

sample points of building 914.xlsx

X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX, ft	LY, ft	LZ, ft	Location
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX, ft	LY, ft	LZ, ft	Location
345.4181	29.325	0	**P5-1**		Hotspot		Floor	3.95	1.78	0.00	P5
461.341	29.325	0	**P5-2**		Hotspot		Floor	13.61	1.78	0.00	P5
577.2639	29.325	0	**P5-3**		Hotspot		Floor	23.27	1.78	0.00	P5
693.1867	29.325	0	**P5-4**		Hotspot		Floor	32.93	1.78	0.00	P5
809.1096	29.325	0	**P5-5**		Hotspot		Floor	42.59	1.78	0.00	P5
925.0325	29.325	0	**P5-6**		Hotspot		Floor	52.25	1.78	0.00	P5
1040.955	29.325	0	**P5-7**		Hotspot		Floor	61.91	1.78	0.00	P5
1156.878	29.325	0	**P5-8**		Hotspot		Floor	71.57	1.78	0.00	P5
1272.801	29.325	0	**P5-9**		Hotspot		Floor	81.23	1.78	0.00	P5
1388.724	29.325	0	**P5-10**		Hotspot		Floor	90.89	1.78	0.00	P5
1504.647	29.325	0	**P5-11**		Hotspot		Floor	100.55	1.78	0.00	P5
1620.57	29.325	0	**P5-12**		Hotspot		Floor	110.21	1.78	0.00	P5
403.3796	129.7171	0	**P5-13**		Hotspot		Floor	8.78	10.14	0.00	P5
519.3024	129.7171	0	**P5-14**		Hotspot		Floor	18.44	10.14	0.00	P5
635.2253	129.7171	0	**P5-15**		Hotspot		Floor	28.10	10.14	0.00	P5
751.1482	129.7171	0	**P5-16**		Hotspot		Floor	37.76	10.14	0.00	P5
867.071	129.7171	0	**P5-17**		Hotspot		Floor	47.42	10.14	0.00	P5
982.9939	129.7171	0	**P5-18**		Hotspot		Floor	57.08	10.14	0.00	P5
1098.917	129.7171	0	**P5-19**		Hotspot		Floor	66.74	10.14	0.00	P5
1214.84	129.7171	0	**P5-20**		Hotspot		Floor	76.40	10.14	0.00	P5
1330.763	129.7171	0	**P5-21**		Hotspot		Floor	86.06	10.14	0.00	P5
1446.685	129.7171	0	**P5-22**		Hotspot		Floor	95.72	10.14	0.00	P5
1562.608	129.7171	0	**P5-23**		Hotspot		Floor	105.38	10.14	0.00	P5
345.4181	230.1092	0	**P5-24**		Hotspot		Floor	3.95	18.51	0.00	P5
461.341	230.1092	0	**P5-25**		Hotspot		Floor	13.61	18.51	0.00	P5
577.2639	230.1092	0	**P5-26**		Hotspot		Floor	23.27	18.51	0.00	P5
693.1867	230.1092	0	**P5-27**		Hotspot		Floor	32.93	18.51	0.00	P5
809.1096	230.1092	0	**P5-28**		Hotspot		Floor	42.59	18.51	0.00	P5
925.0325	230.1092	0	**P5-29**		Hotspot		Floor	52.25	18.51	0.00	P5
1040.955	230.1092	0	**P5-30**		Hotspot		Floor	61.91	18.51	0.00	P5
1156.878	230.1092	0	**P5-31**		Hotspot		Floor	71.57	18.51	0.00	P5
1272.801	230.1092	0	**P5-32**		Hotspot		Floor	81.23	18.51	0.00	P5
1388.724	230.1092	0	**P5-33**		Hotspot		Floor	90.89	18.51	0.00	P5
1504.647	230.1092	0	**P5-34**		Hotspot		Floor	100.55	18.51	0.00	P5
1620.57	230.1092	0	**P5-35**		Hotspot		Floor	110.21	18.51	0.00	P5
403.3796	330.5014	0	**P5-36**		Hotspot		Floor	8.78	26.87	0.00	P5
519.3024	330.5014	0	**P5-37**		Hotspot		Floor	18.44	26.87	0.00	P5
635.2253	330.5014	0	**P5-38**		Hotspot		Floor	28.10	26.87	0.00	P5
751.1482	330.5014	0	**P5-39**		Hotspot		Floor	37.76	26.87	0.00	P5
867.071	330.5014	0	**P5-40**		Hotspot		Floor	47.42	26.87	0.00	P5
982.9939	330.5014	0	**P5-41**		Hotspot		Floor	57.08	26.87	0.00	P5
1098.917	330.5014	0	**P5-42**		Hotspot		Floor	66.74	26.87	0.00	P5
1214.84	330.5014	0	**P5-43**		Hotspot		Floor	76.40	26.87	0.00	P5
1330.763	330.5014	0	**P5-44**		Hotspot		Floor	86.06	26.87	0.00	P5
1446.685	330.5014	0	**P5-45**		Hotspot		Floor	95.72	26.87	0.00	P5
1562.608	330.5014	0	**P5-46**		Hotspot		Floor	105.38	26.87	0.00	P5
345.4181	430.8935	0	**P5-47**		Hotspot		Floor	3.95	35.24	0.00	P5
461.341	430.8935	0	**P5-48**		Hotspot		Floor	13.61	35.24	0.00	P5
577.2639	430.8935	0	**P5-49**		Hotspot		Floor	23.27	35.24	0.00	P5
693.1867	430.8935	0	**P5-50**		Hotspot		Floor	32.93	35.24	0.00	P5
809.1096	430.8935	0	**P5-51**		Hotspot		Floor	42.59	35.24	0.00	P5
925.0325	430.8935	0	**P5-52**		Hotspot		Floor	52.25	35.24	0.00	P5

sample points of building 914.xlsx

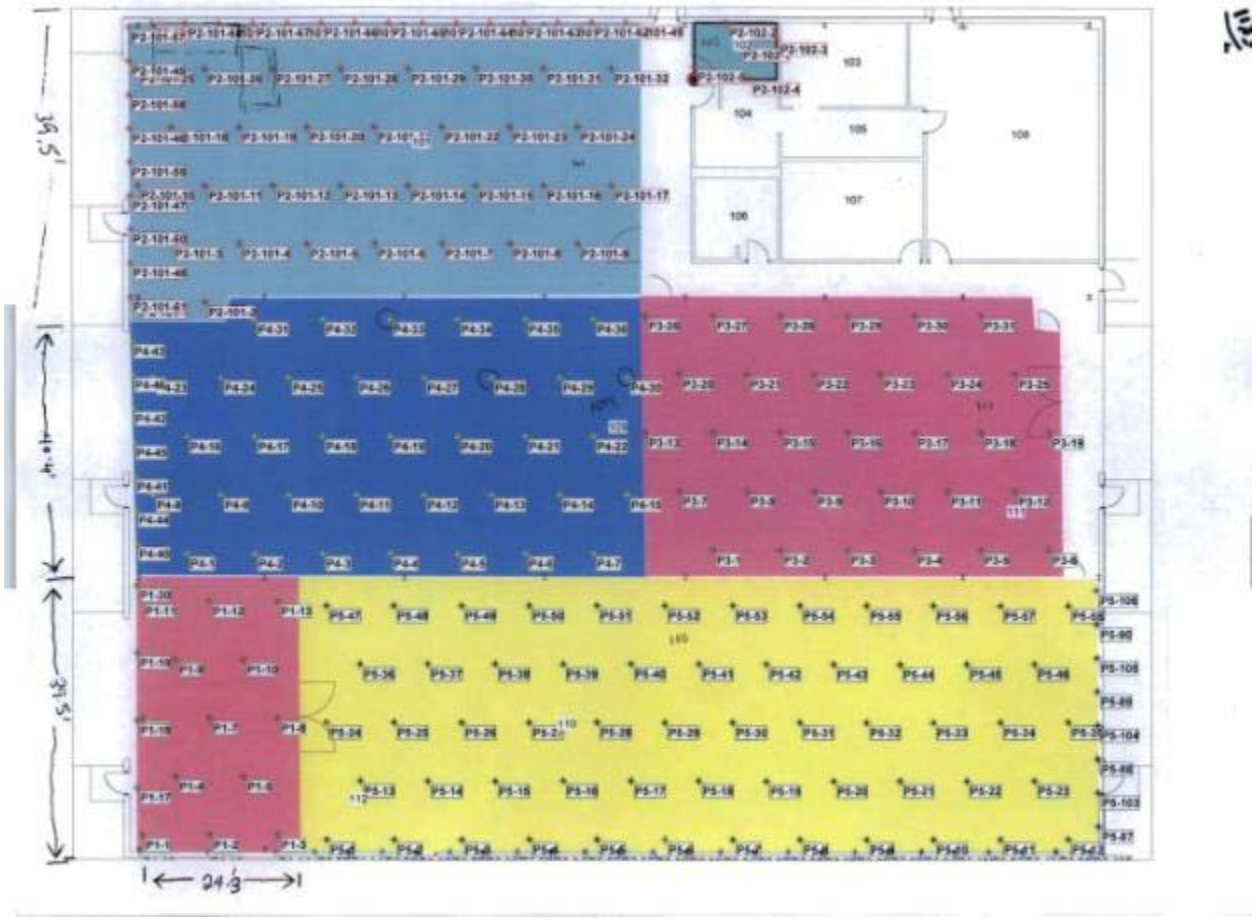
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX, ft	LY, ft	LZ, ft	Location
1040.955	430.8935	0	**P5-53**		Hotspot		Floor	61.91	35.24	0.00	P5
1156.878	430.8935	0	**P5-54**		Hotspot		Floor	71.57	35.24	0.00	P5
1272.801	430.8935	0	**P5-55**		Hotspot		Floor	81.23	35.24	0.00	P5
1388.724	430.8935	0	**P5-56**		Hotspot		Floor	90.89	35.24	0.00	P5
1504.647	430.8935	0	**P5-57**		Hotspot		Floor	100.55	35.24	0.00	P5
1620.57	430.8935	0	**P5-58**		Hotspot		Floor	110.21	35.24	0.00	P5
382.6936	8.0049	72.5264	**P5-59**		Hotspot		Wall 2	107.44	6.04	6.04	P5
498.6164	8.0049	72.5264	**P5-60**		Hotspot		Wall 2	97.78	6.04	6.04	P5
614.5393	8.0049	72.5264	**P5-61**		Hotspot		Wall 2	88.12	6.04	6.04	P5
730.4622	8.0049	72.5264	**P5-62**		Hotspot		Wall 2	78.46	6.04	6.04	P5
846.385	8.0049	72.5264	**P5-63**		Hotspot		Wall 2	68.80	6.04	6.04	P5
962.3079	8.0049	72.5264	**P5-64**		Hotspot		Wall 2	59.14	6.04	6.04	P5
1078.231	8.0049	72.5264	**P5-65**		Hotspot		Wall 2	49.48	6.04	6.04	P5
1194.154	8.0049	72.5264	**P5-66**		Hotspot		Wall 2	39.82	6.04	6.04	P5
1310.077	8.0049	72.5264	**P5-67**		Hotspot		Wall 2	30.16	6.04	6.04	P5
1425.999	8.0049	72.5264	**P5-68**		Hotspot		Wall 2	20.50	6.04	6.04	P5
1541.922	8.0049	72.5264	**P5-69**		Hotspot		Wall 2	10.84	6.04	6.04	P5
1657.845	8.0049	72.5264	**P5-70**		Hotspot		Wall 2	1.18	6.04	6.04	P5
1671.163	109.8141	72.5264	**P5-71**		Hotspot		Wall 1	30.57	6.04	6.04	P5
1670.26	225.7335	72.5264	**P5-72**		Hotspot		Wall 1	20.91	6.04	6.04	P5
1669.357	341.6528	72.5264	**P5-73**		Hotspot		Wall 1	11.25	6.04	6.04	P5
1668.455	457.5722	72.5264	**P5-74**		Hotspot		Wall 1	1.59	6.04	6.04	P5
324.7321	8.0049	172.9185	**P5-75**		Hotspot		Wall 2	112.27	14.41	14.41	P5
440.655	8.0049	172.9185	**P5-76**		Hotspot		Wall 2	102.61	14.41	14.41	P5
556.5779	8.0049	172.9185	**P5-77**		Hotspot		Wall 2	92.95	14.41	14.41	P5
672.5007	8.0049	172.9185	**P5-78**		Hotspot		Wall 2	83.29	14.41	14.41	P5
788.4236	8.0049	172.9185	**P5-79**		Hotspot		Wall 2	73.63	14.41	14.41	P5
904.3465	8.0049	172.9185	**P5-80**		Hotspot		Wall 2	63.97	14.41	14.41	P5
1020.269	8.0049	172.9185	**P5-81**		Hotspot		Wall 2	54.31	14.41	14.41	P5
1136.192	8.0049	172.9185	**P5-82**		Hotspot		Wall 2	44.65	14.41	14.41	P5
1252.115	8.0049	172.9185	**P5-83**		Hotspot		Wall 2	34.99	14.41	14.41	P5
1368.038	8.0049	172.9185	**P5-84**		Hotspot		Wall 2	25.33	14.41	14.41	P5
1483.961	8.0049	172.9185	**P5-85**		Hotspot		Wall 2	15.67	14.41	14.41	P5
1599.884	8.0049	172.9185	**P5-86**		Hotspot		Wall 2	6.01	14.41	14.41	P5
1671.614	51.8544	172.9185	**P5-87**		Hotspot		Wall 1	35.40	14.41	14.41	P5
1670.711	167.7738	172.9185	**P5-88**		Hotspot		Wall 1	25.74	14.41	14.41	P5
1669.809	283.6931	172.9185	**P5-89**		Hotspot		Wall 1	16.08	14.41	14.41	P5
1668.906	399.6125	172.9185	**P5-90**		Hotspot		Wall 1	6.42	14.41	14.41	P5
382.6936	8.0049	273.3107	**P5-91**		Hotspot		Wall 2	107.44	22.78	22.78	P5
498.6164	8.0049	273.3107	**P5-92**		Hotspot		Wall 2	97.78	22.78	22.78	P5
614.5393	8.0049	273.3107	**P5-93**		Hotspot		Wall 2	88.12	22.78	22.78	P5
730.4622	8.0049	273.3107	**P5-94**		Hotspot		Wall 2	78.46	22.78	22.78	P5
846.385	8.0049	273.3107	**P5-95**		Hotspot		Wall 2	68.80	22.78	22.78	P5
962.3079	8.0049	273.3107	**P5-96**		Hotspot		Wall 2	59.14	22.78	22.78	P5
1078.231	8.0049	273.3107	**P5-97**		Hotspot		Wall 2	49.48	22.78	22.78	P5
1194.154	8.0049	273.3107	**P5-98**		Hotspot		Wall 2	39.82	22.78	22.78	P5
1310.077	8.0049	273.3107	**P5-99**		Hotspot		Wall 2	30.16	22.78	22.78	P5
1425.999	8.0049	273.3107	**P5-100**		Hotspot		Wall 2	20.50	22.78	22.78	P5
1541.922	8.0049	273.3107	**P5-101**		Hotspot		Wall 2	10.84	22.78	22.78	P5
1657.845	8.0049	273.3107	**P5-102**		Hotspot		Wall 2	1.18	22.78	22.78	P5
1671.163	109.8141	273.3107	**P5-103**		Hotspot		Wall 1	30.57	22.78	22.78	P5
1670.26	225.7335	273.3107	**P5-104**		Hotspot		Wall 1	20.91	22.78	22.78	P5
1669.357	341.6528	273.3107	**P5-105**		Hotspot		Wall 1	11.25	22.78	22.78	P5

sample points of building 914.xlsx

X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX, ft	LY, ft	LZ, ft	Location
1668.455	457.5722	273.3107	**P5-106**		Hotspot		Wall 1	1.59	22.78	22.78	P5
Area: P2 - Room 101											
X Coord	Y Coord	Z Coord	Label	Value	Type	Historical	Surface	LX, ft	LY, ft	LZ, ft	location
23.6474	951.6378	0	**P2-101-1**		Hotspot		Floor	1.30	2.65	0.00	P2
139.5702	951.6378	0	**P2-101-2**		Hotspot		Floor	10.96	2.65	0.00	P2
81.6088	1052.03	0	**P2-101-3**		Hotspot		Floor	6.13	11.01	0.00	P2
197.5317	1052.03	0	**P2-101-4**		Hotspot		Floor	15.79	11.01	0.00	P2
313.4545	1052.03	0	**P2-101-5**		Hotspot		Floor	25.45	11.01	0.00	P2
429.3774	1052.03	0	**P2-101-6**		Hotspot		Floor	35.11	11.01	0.00	P2
545.3003	1052.03	0	**P2-101-7**		Hotspot		Floor	44.77	11.01	0.00	P2
661.2231	1052.03	0	**P2-101-8**		Hotspot		Floor	54.43	11.01	0.00	P2
777.146	1052.03	0	**P2-101-9**		Hotspot		Floor	64.10	11.01	0.00	P2
23.6474	1152.422	0	**P2-101-10**		Hotspot		Floor	1.30	19.38	0.00	P2
139.5702	1152.422	0	**P2-101-11**		Hotspot		Floor	10.96	19.38	0.00	P2
255.4931	1152.422	0	**P2-101-12**		Hotspot		Floor	20.62	19.38	0.00	P2
371.416	1152.422	0	**P2-101-13**		Hotspot		Floor	30.28	19.38	0.00	P2
487.3388	1152.422	0	**P2-101-14**		Hotspot		Floor	39.94	19.38	0.00	P2
603.2617	1152.422	0	**P2-101-15**		Hotspot		Floor	49.60	19.38	0.00	P2
719.1846	1152.422	0	**P2-101-16**		Hotspot		Floor	59.26	19.38	0.00	P2
835.1074	1152.422	0	**P2-101-17**		Hotspot		Floor	68.93	19.38	0.00	P2
81.6088	1252.814	0	**P2-101-18**		Hotspot		Floor	6.13	27.74	0.00	P2
197.5317	1252.814	0	**P2-101-19**		Hotspot		Floor	15.79	27.74	0.00	P2
313.4545	1252.814	0	**P2-101-20**		Hotspot		Floor	25.45	27.74	0.00	P2
429.3774	1252.814	0	**P2-101-21**		Hotspot		Floor	35.11	27.74	0.00	P2
545.3003	1252.814	0	**P2-101-22**		Hotspot		Floor	44.77	27.74	0.00	P2
661.2231	1252.814	0	**P2-101-23**		Hotspot		Floor	54.43	27.74	0.00	P2
777.146	1252.814	0	**P2-101-24**		Hotspot		Floor	64.10	27.74	0.00	P2
23.6474	1353.206	0	**P2-101-25**		Hotspot		Floor	1.30	36.11	0.00	P2
139.5702	1353.206	0	**P2-101-26**		Hotspot		Floor	10.96	36.11	0.00	P2
255.4931	1353.206	0	**P2-101-27**		Hotspot		Floor	20.62	36.11	0.00	P2
371.416	1353.206	0	**P2-101-28**		Hotspot		Floor	30.28	36.11	0.00	P2
487.3388	1353.206	0	**P2-101-29**		Hotspot		Floor	39.94	36.11	0.00	P2
603.2617	1353.206	0	**P2-101-30**		Hotspot		Floor	49.60	36.11	0.00	P2
719.1846	1353.206	0	**P2-101-31**		Hotspot		Floor	59.26	36.11	0.00	P2
835.1074	1353.206	0	**P2-101-32**		Hotspot		Floor	68.93	36.11	0.00	P2
8.0394	1424.643	24.4452	**P2-101-33**		Hotspot		Wall 5	42.06	2.04	2.04	P2
8.5855	1308.722	24.4452	**P2-101-34**		Hotspot		Wall 5	32.40	2.04	2.04	P2
9.1316	1192.8	24.4452	**P2-101-35**		Hotspot		Wall 5	22.74	2.04	2.04	P2
9.6777	1076.879	24.4452	**P2-101-36**		Hotspot		Wall 5	13.08	2.04	2.04	P2
10.2238	960.9569	24.4452	**P2-101-37**		Hotspot		Wall 5	3.42	2.04	2.04	P2
801.6346	1431.963	24.4452	**P2-101-38**		Hotspot		Wall 6	66.14	2.04	2.04	P2
685.7117	1431.962	24.4452	**P2-101-39**		Hotspot		Wall 6	56.48	2.04	2.04	P2
569.7888	1431.961	24.4452	**P2-101-40**		Hotspot		Wall 6	46.82	2.04	2.04	P2
453.866	1431.96	24.4452	**P2-101-41**		Hotspot		Wall 6	37.16	2.04	2.04	P2
337.9431	1431.959	24.4452	**P2-101-42**		Hotspot		Wall 6	27.49	2.04	2.04	P2
222.0202	1431.958	24.4452	**P2-101-43**		Hotspot		Wall 6	17.83	2.04	2.04	P2
106.0974	1431.957	24.4452	**P2-101-44**		Hotspot		Wall 6	8.17	2.04	2.04	P2
8.3124	1366.682	124.8374	**P2-101-45**		Hotspot		Wall 5	37.23	10.40	10.40	P2
8.8585	1250.761	124.8374	**P2-101-46**		Hotspot		Wall 5	27.57	10.40	10.40	P2
9.4047	1134.839	124.8374	**P2-101-47**		Hotspot		Wall 5	17.91	10.40	10.40	P2
9.9508	1018.918	124.8374	**P2-101-48**		Hotspot		Wall 5	8.25	10.40	10.40	P2
859.596	1431.964	124.8374	**P2-101-49**		Hotspot		Wall 6	70.97	10.40	10.40	P2

sample points of building 914.xlsx

X Coord	Y Coord	Z Coord	**Label**	Value	Type	Historical	Surface	LX, ft	LY, ft	LZ, ft	Location
743.6731	1431.963	124.8374	**P2-101-50**		Hotspot		Wall 6	61.31	10.40	10.40	P2
627.7503	1431.962	124.8374	**P2-101-51**		Hotspot		Wall 6	51.65	10.40	10.40	P2
511.8274	1431.961	124.8374	**P2-101-52**		Hotspot		Wall 6	41.99	10.40	10.40	P2
395.9045	1431.959	124.8374	**P2-101-53**		Hotspot		Wall 6	32.32	10.40	10.40	P2
279.9817	1431.958	124.8374	**P2-101-54**		Hotspot		Wall 6	22.66	10.40	10.40	P2
164.0588	1431.957	124.8374	**P2-101-55**		Hotspot		Wall 6	13.00	10.40	10.40	P2
48.1359	1431.956	124.8374	**P2-101-56**		Hotspot		Wall 6	3.34	10.40	10.40	P2
8.0394	1424.643	225.2295	**P2-101-57**		Hotspot		Wall 5	42.06	18.77	18.77	P2
8.5855	1308.722	225.2295	**P2-101-58**		Hotspot		Wall 5	32.40	18.77	18.77	P2
9.1316	1192.8	225.2295	**P2-101-59**		Hotspot		Wall 5	22.74	18.77	18.77	P2
9.6777	1076.879	225.2295	**P2-101-60**		Hotspot		Wall 5	13.08	18.77	18.77	P2
10.2238	960.9569	225.2295	**P2-101-61**		Hotspot		Wall 5	3.42	18.77	18.77	P2
801.6346	1431.963	225.2295	**P2-101-62**		Hotspot		Wall 6	66.14	18.77	18.77	P2
685.7117	1431.962	225.2295	**P2-101-63**		Hotspot		Wall 6	56.48	18.77	18.77	P2
569.7888	1431.961	225.2295	**P2-101-64**		Hotspot		Wall 6	46.82	18.77	18.77	P2
453.866	1431.96	225.2295	**P2-101-65**		Hotspot		Wall 6	37.16	18.77	18.77	P2
337.9431	1431.959	225.2295	**P2-101-66**		Hotspot		Wall 6	27.49	18.77	18.77	P2
222.0202	1431.958	225.2295	**P2-101-67**		Hotspot		Wall 6	17.83	18.77	18.77	P2
106.0974	1431.957	225.2295	**P2-101-68**		Hotspot		Wall 6	8.17	18.77	18.77	P2
Area: P2 - Room 102											
X Coord	Y Coord	Z Coord	**Label**	Value	Type	Historical	Surface				
1053.883	1393.561	0	**P2-102-1**		Hotspot		Floor	6.49	4.95	0.00	P2-102
1030.704	1431.956	65.5193	**P2-102-2**		Hotspot		Wall 1	4.56	5.46	5.46	P2-102
1117.721	1403.05	65.5193	**P2-102-3**		Hotspot		Wall 2	2.41	5.46	5.46	P2-102
1070.636	1334.212	65.5193	**P2-102-4**		Hotspot		Wall 3	3.92	5.46	5.46	P2-102
975.97	1355.468	65.5193	**P2-102-5**		Hotspot		Wall 4	1.77	5.46	5.46	P2-102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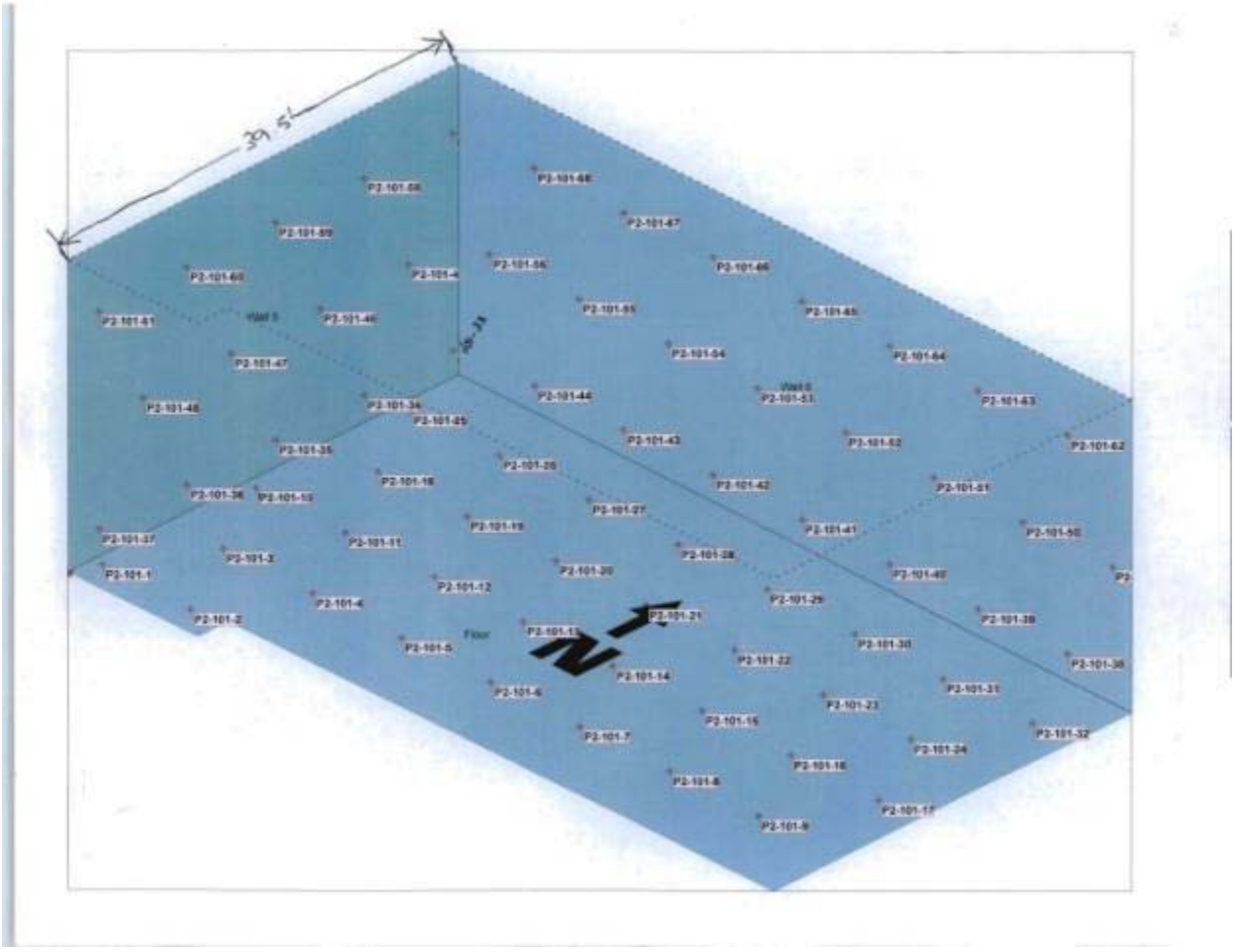
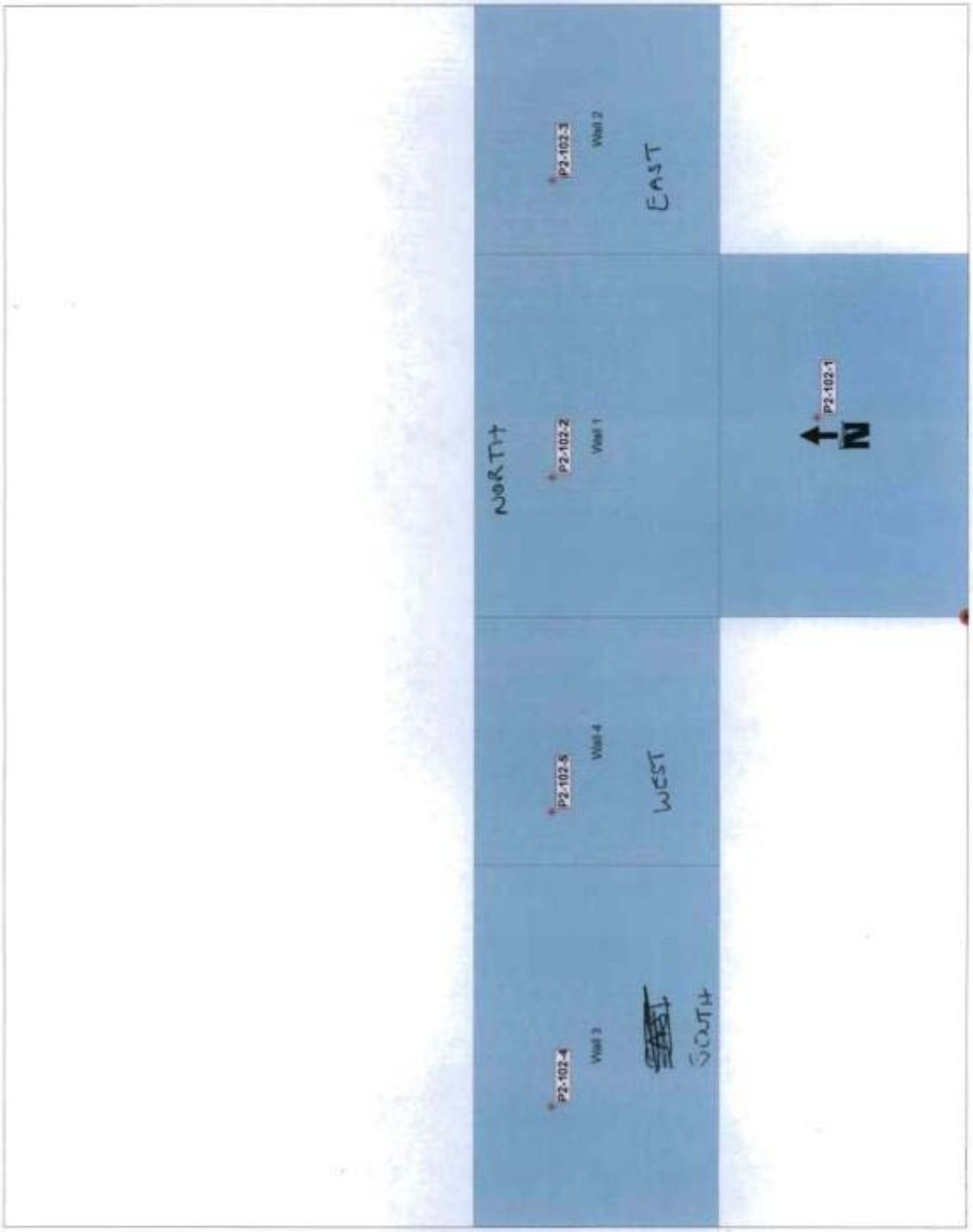
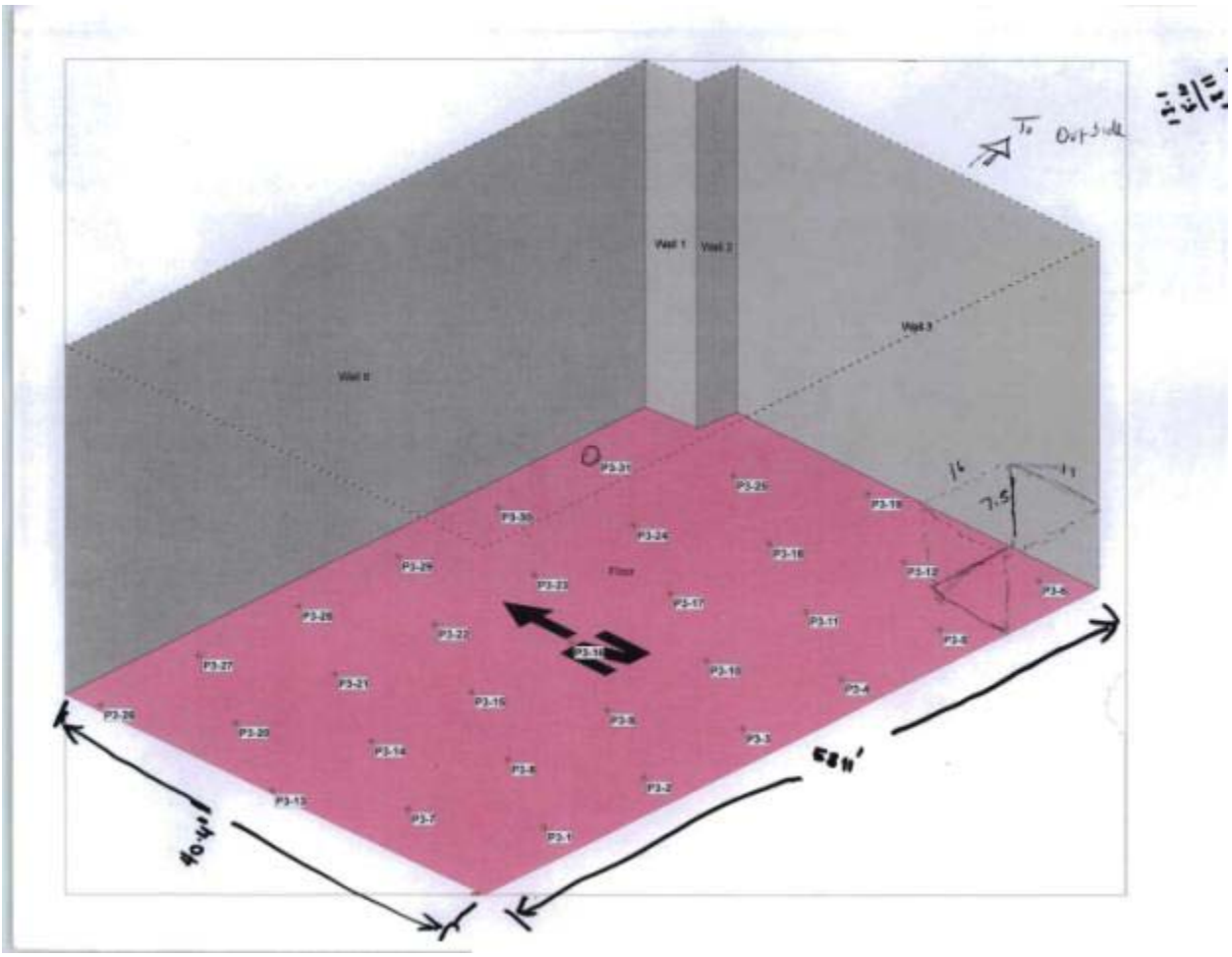
24.3'


39' 5"
Wall 5
Wall 6
Floor
N


P2-102-4
Wall 3
SOUTH
P2-102-5
Wall 4
WEST
P2-102-2
Wall 1
NORTH
P2-102-3
Wall 2
EAST
P2-102-1
N


To Outside
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Wall 3
Wall 0
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P3-31
P3-30
P3-29
P3-28
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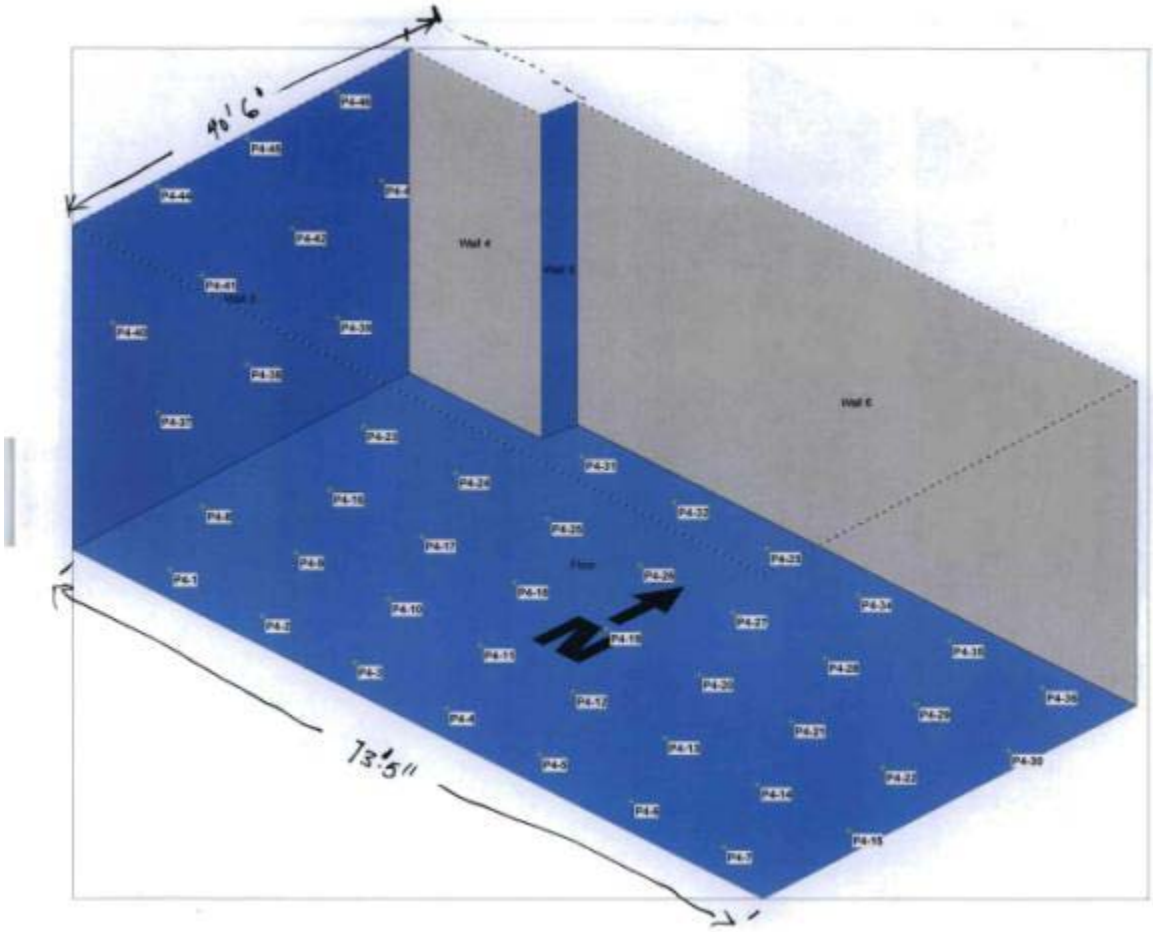
58'11"


90'6"
73'5"
Wall 4
Wall 6
Floor

P5-102
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P5-100
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P5-96
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Wall 2
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P5-12
P5-11
P5-10
P5-9
P5-8
P5-7
P5-6
P5-5
P5-4
P5-3
P5-2
P5-1
N

RESULTS: AIR SAMPLING

The personnel breathing zone air samples and the area air sample results during equipment mobilization, building preparation for cleanup, and building cleanup operations were as shown in Tables 4 and 5 below:

Table 4

Pre-Cleaning Materials Movement Activities			**8-hr TWA Be, µg/m3**	**8-hr TWA Cd, µg/m3**	**8-hr TWA Cr, µg/m3**	**8-hr TWA Pb, µg/m3**	**8-hr TWA Mn, µg/m3**
ACGIH Threshold Limit Value			**0.05**	**10**	**500**	**50**	**200**
DOE/OSHA Action Level			**0.2**	**N/A**	**N/A**	**30**	**N/A**
Date	**Sample Number**	**Sample Location, Activity**					
03/23/11	IH-11-0395	Material movement, personal sample	<0.0042	<0.21	<0.21	<0.21	<0.21
03/23/11	IH-11-0396	Material movement, personal sample	<0.0042	<0.21	<0.21	<0.21	<0.21
03/23/11	IH-11-0397	Field Blank	<0.005	<0.25	<0.25	<0.25	<0.25
03/23/11	IH-11-0398	Field Blank	<0.005	<0.25	<0.25	<0.25	<0.25
03/28/11	IH-11-0399	Area sample	<0.00042	<0.021	<0.021	<0.021	<0.021
03/28/11	IH-11-0400	Area sample	<0.00055	<0.027	<0.027	<0.027	<0.027
03/28/11	IH-11-0401	Area sample	<0.00056	<0.028	<0.028	<0.028	<0.028
03/28/11	IH-11-0402	Field Blank	<0.005	<0.25	<0.25	<0.25	<0.25
03/28/11	IH-11-0403	Field Blank	<0.005	<0.25	<0.25	<0.25	<0.25
04/05/11	IH-11-0454	Material movement, personal sample	<0.0041	<0.21	<0.21	<0.21	<0.21
04/05/11	IH-11-0455	Material movement, personal sample	<0.0042	<0.21	<0.21	<0.21	<0.21
04/05/11	IH-11-0456	Field Blank	<0.005	<0.25	<0.25	<0.25	<0.25

Table 5

Cleaning Activities			8-hr TWA Be, µg/m3	8-hr TWA Cd, µg/m3	8-hr TWA Cr, µg/m3	8-hr TWA Pb, µg/m3	8-hr TWA Mn, µg/m3
ACGIH Threshold Limit Value			**0.05**	**10**	**500**	**50**	**200**
DOE/OSHA Action Level			**0.2**	**N/A**	**N/A**	**30**	**N/A**
Date	**Sample Number**	**Sample Location, Activity**					
04/18/11	IH-11-0474	Decontamination, personal sample	<0.0041	<0.21	<0.21	<0.21	<0.48
04/18/11	IH-11-0475	Decontamination, personal sample	<0.0041	<0.20	<0.20	<0.20	<0.20
04/18/11	IH-11-0476	Field Blank	<0.005	<0.25	<0.25	<0.25	<0.25
04/18/11	IH-11-0477	Area sample, section P2	<0.0010	<0.05	<0.05	<0.05	<0.05
04/18/11	IH-11-0478	Area sample, section P1	<0.0011	<0.05	<0.05	<0.05	<0.05
04/19/11	IH-11-0542	Area sample, southwest corner of building	<0.0010	<0.05	<0.05	<0.05	<0.05
04/19/11	IH-11-0543	Area sample, northwest side of building, P2 area	<0.0010	<0.05	<0.05	<0.05	<0.05
04/19/11	IH-11-0544	Decontamination, personal sample	<0.0042	<0.21	<0.21	<0.21	<0.21
04/19/11	IH-11-0545	Decontamination, personal sample	<0.0041	<0.20	<0.20	<0.20	0.97
04/19/11	IH-11-0546	Field Blank	<0.005	<0.25	<0.25	<0.25	<0.25
04/25/11	IH-11-0659	Decontamination, personal sample	<0.0042	<0.21	<0.21	<0.21	<0.21
04/25/11	IH-11-0660	Decontamination, personal sample	<0.0041	<0.20	<0.20	<0.20	<0.20
04/25/11	IH-11-0661	Area sample in P1	<0.0010	<0.05	<0.05	<0.05	<0.05
04/25/11	IH-11-0662	Area sample in P4 southeast corner	<0.0010	<0.05	<0.05	<0.05	<0.05
04/25/11	IH-11-0663	Field Blank	<0.005	<0.25	<0.25	<0.25	<0.25
04/28/11	IH-11-0835	Area sample	<0.0010	<0.05	<0.05	<0.05	<0.05
04/28/11	IH-11-0836	Decontamination, personal sample	<0.0041	<0.21	0.47	0.42	3.03
04/28/11	IH-11-0837	Field Blank	<0.005	<0.25	<0.25	<0.25	<0.25

RESULTS: SWIPE SAMPLING

The results of the initial swipe sampling event were as shown in Table 6 below:

Table 6

Date	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
	Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**N/A**
03/02/11	Field Blank	<0.05	<0.25	<0.25	<0.25	0.298	N/A
03/02/11	Flat panel on top of door, west wall	1.17	30.6	298	222	6270	2.8
03/02/11	Vertical area by the exit sign, west wall	0.22	6.89	69.1	27.1	809	15.9
03/02/11	Flat panel on top of exit sign, west wall	1.62	49.5	458	300	9260	2.9
03/02/11	Southwest corner on top of brown light box	0.531	15.8	166	82.2	5480	1.7

< = less than; areas highlighted in yellow background indicate values above the housekeeping criteria

The results of the extent of conditions swipe sampling event were as shown in Table 7 below.

Table 7

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
03/02/11	IH-11-0212	Field Blank	<0.05	<0.25	<0.25	<0.25	0.298	N/A
03/02/11	IH-11-0213	Flat panel right on top of door, west wall	1.17	30.6	298	222	6270	2.8
03/02/11	IH-11-0214	Vertical area by the exit sign, west wall	0.22	6.89	69.1	27.1	809	15.9
03/02/11	IH-11-0215	Flat panel on top of exit sign, west wall	1.62	49.5	458	300	9260	2.9
03/02/11	IH-11-0216	Southwest corner on top of brown light box	0.531	15.8	166	82.2	5480	1.7
03/17/11	IH-11-0272	Field Blank	<0.05	<0.25	<0.25	<0.25	0.316	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
03/17/11	IH-11-0273	Room 108 - Lunch Room - floor 5' from west wall, 10' from north wall	<0.05	<0.25	0.65	0.562	1.18	N/A
03/17/11	IH-11-0274	Room 108 - Lunch Room - floor 19' from north wall, 8' from east wall	<0.05	<0.25	0.53	0.941	1.41	N/A
03/17/11	IH-11-0275	Room 108 - Lunch Room - north wall 6' from east wall, 7' up from floor	<0.05	<0.25	1.11	0.515	3.16	N/A
03/17/11	IH-11-0276	Room 108 - Lunch Room, east wall 16' from north wall 3' up, window sill	<0.05	0.538	4.39	2.67	13.5	N/A
03/17/11	IH-11-0277	Room 108 - Lunch Room - table east side, south end	<0.05	<0.25	0.285	<0.25	0.548	N/A
03/17/11	IH-11-0278	Room 105 - Restroom - floor 13' from east wall, 14' north	<0.05	<0.25	0.633	<0.25	0.557	N/A
03/17/11	IH-11-0279	Room 105 - Restroom - top of locker 5' from east wall, 1' from north wall	<0.05	0.549	2.82	1.56	11.5	N/A
03/17/11	IH-11-0280	Room 105 - Restroom - west wall 7' from south wall, 2' from floor	<0.05	<0.25	0.484	<0.25	0.775	N/A
03/17/11	IH-11-0281	Room 107 - Office - south wall 9' from east wall, 4' from north wall		No data - sample lost				
03/17/11	IH-11-0282	Field Blank	<0.05	<0.25	1.12	<0.25	0.396	N/A
03/17/11	IH-11-0283	Room 107 - Office - floor 9' from east wall, 4' from north wall	<0.05	<0.25	0.849	0.504	2.35	N/A
03/17/11	IH-11-0284	Room 107 - Office - shelf 1' from north wall, 1' from east wall, 4' up	<0.05	<0.25	0.89	0.984	1.69	N/A
03/17/11	IH-11-0285	Main hall copy machine, top of paper feed	<0.05	0.655	1.57	1.83	6.85	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
03/17/11	IH-11-0286	Room 106 - Restroom - top of locker 1' from east, 1' from south walls	<0.05	0.806	4.87	4.3	21.1	N/A
03/17/11	IH-11-0287	Room 106 - Restroom - top of light 3' from west wall, 2.5' from ceiling	0.0613	1.21	5.96	4.05	18.3	9
03/17/11	IH-11-0288	Room 101 - floor near north wall by mechanical room	<0.05	0.251	4.42	33.8	16	N/A
03/17/11	IH-11-0289	Room 102 Mechanical - junction box on north wall 5' from west wall 2' up'	0.129	4.24	57	201	60.7	11.3
03/17/11	IH-11-0290	Room 101 - floor 25' from north door, 2nd post from fence entrance	0.235	0.688	12.2	1.63	60.9	0
03/17/11	IH-11-0291	Room 101 - piping to eyewash station on TSI	0.0515	0.624	10.3	21.8	23	7.4
03/17/11	IH-11-0292	Field Blank	<0.05	<0.25	1.15	<0.25	0.35	N/A
03/17/11	IH-11-0293	Room 101 - top of locked cabinet at end of south set of shelves	0.0635	18	10.2	11.6	15.3	7.3
03/17/11	IH-11-0294	Room 101 - floor between roll-up and door 1.5' from west wall, yellow paint	0.336	0.501	8.3	4.49	95.4	7.7
03/17/11	IH-11-0295	Room 101 - north wall 20' from west wall, 7' up from floor on post	<0.05	0.454	4.23	19.5	9.76	N/A
03/17/11	IH-11-0296	Room 109 - west wall 9' up from floor above door #5	0.2	5.32	20.3	14.6	141	9
03/17/11	IH-11-0297	Room 110 - west wall 4' from south wall, 5' up from floor	<0.05	0.785	8.31	3.92	68.1	N/A
03/17/11	IH-11-0298	Room 110 - lower shelf on workbench 3' from south, 4' from west walls	0.147	37.6	14.7	11	223	11
03/17/11	IH-11-0299	Room 110 - floor 23'	0.138	2.82	17.9	11.6	155	10.1

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
		from west wall, 1' from south wall						
03/17/11	IH-11-0300	Room 110 - west wall 12' from south wall, 1' up from floor	<0.05	0.493	8.48	4.4	75.7	N/A
03/17/11	IH-11-0301	Room 110 - ledge above fire cabinet on south wall, 30' from west wall 7.5' up	0.697	24.7	160	144	2,860	15.6
03/17/11	IH-11-0302	Field Blank	<0.05	<0.25	0.5	<0.25	0.304	N/A
03/17/11	IH-11-0303	Room 110 - shelf 36' from west wall, 9' from south wall, 2.5' up on edge	<0.05	<0.25	1.29	1.31	6.56	N/A
03/17/11	IH-11-0304	Room 110 - south wall eyewash station on pedal	0.156	3.19	15.3	17.7	89.3	8.6
03/17/11	IH-11-0305	Room 110 - top of center flood light on south wall	0.451	13.1	49.1	35.9	482	10.9
03/17/11	IH-11-0306	Room 110 - south wall east door, 5' left of door, 4' up	<0.05	1.32	3.21	1.97	12.3	N/A
03/17/11	IH-11-0307	Room 110 - east wall between south roll-up door and door 2' up, 12' from south wall	<0.05	0.389	1.68	0.951	38.8	N/A
03/17/11	IH-11-0308	Room 110 - east wall between south roll-up door and door 7' up, 9.5' from south wall	0.387	13.9	31	34.1	425	10.1
03/17/11	IH-11-0309	Room 110 - class A fork lift TCM #74000 right wheel	0.597	1.1	16	18.4	131	7.8
03/17/11	IH-11-0310	Room 110 - class A fork lift TCM #74000 floor board under clutch pedal	0.125	0.892	4.96	7.99	29.2	7.7
03/17/11	IH-11-0311	Room 110 - light fixture down north fence line, 3rd light from east, top	0.121	3.78	12.8	8.37	73.1	9.5

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
03/17/11	IH-11-0312	Field Blank	<0.05	<0.25	<0.25	<0.25	0.274	N/A
03/17/11	IH-11-0313	Room 110 - floor 12' from south wall, 19' from east wall	<0.05	0.386	1.73	2.74	9.18	
03/17/11	IH-11-0314	Room 110 - floor 20' from south wall, 39' from east wall	0.234	3.22	13.4	15.7	79.4	7.7
03/17/11	IH-11-0315	Room 110 - floor 25' from south wall, 59' from east wall	0.114	1.2	21	71.5	53.7	9.1
03/17/11	IH-11-0316	Room 109 - floor 40' from east wall, 24' from north wall	0.243	12	11.6	15.2	74.2	8.3
03/17/11	IH-11-0317	Room 111 - floor 9' from east wall, 23' from north wall	<0.05	< 0.25	1.29	1.22	4.98	N/A

< = less than; areas highlighted in yellow background indicate values above the housekeeping criteria

The results of the hotspot sampling were as shown in Table 8 below.

Table 8

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/18/11	IH-11-0479	P2-101-01	0.223	1.13	5.55	5.35	44.7	6.9
04/18/11	IH-11-0480	P2-101-02	0.133	2.21	3.28	3.96	22.7	7
04/18/11	IH-11-0481	P2-101-03	0.212	1.58	7.11	4.29	46	7
04/18/11	IH-11-0482	P2-101-04	0.287	1.16	7.42	8.14	57.8	7.2
04/18/11	IH-11-0483	P2-101-05	0.081	0.677	2.2	2.85	14.2	7.9
04/18/11	IH-11-0484	P2-101-06	<0.05	0.331	1.07	3.69	9.15	8.7
04/18/11	IH-11-0485	P2-101-07	0.161	3.79	6.8	10.1	44.5	7.8
04/18/11	IH-11-0486	P2-101-08	<0.05	<0.25	2.43	1.79	6.27	8.6
04/18/11	IH-11-0487	P2-101-09	<0.05	0.491	2.03	3.78	11.1	9.1
04/18/11	IH-11-0488	B-1	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/18/11	IH-11-0489	P2-101-9-1	<0.05	0.479	0.94	2.63	7.12	9.7

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/18/11	IH-11-0490	P2-101-9-2	0.145	1.22	4.59	7.75	33.8	7.5
04/18/11	IH-11-0491	P2-101-10	0.498	0.505	12.1	6.88	104	8.4
04/18/11	IH-11-0492	P2-101-11	0.652	0.919	50.7	16.7	120	7.3
04/18/11	IH-11-0493	P2-101-12	0.143	0.439	11.1	5.93	23.5	6.4
04/18/11	IH-11-0494	P2-101-13	0.0845	0.675	3.71	4.11	15	6.8
04/18/11	IH-11-0495	P2-101-14	0.16	1.5	5.53	6.69	31.6	7.6
04/18/11	IH-11-0496	P2-101-15	0.0736	0.568	3.35	3.91	16.9	8.2
04/18/11	IH-11-0497	P2-101-16	0.0722	0.861	4.46	8.01	17	8
04/18/11	IH-11-0498	B-2	<0.05	<0.25	0.96	<0.25	<0.25	N/A
04/18/11	IH-11-0499	P2-101-16-1	<0.05	<0.25	2.65	1.69	9.27	N/A
04/18/11	IH-11-0500	P2-101-16-2	0.151	0.794	5	6.07	29.8	7
04/18/11	IH-11-0501	P2-101-17	0.062	0.448	3.27	3.24	12.9	7.8
04/18/11	IH-11-0502	P2-101-17-1	<0.05	0.304	1.62	2.06	8.24	N/A
04/18/11	IH-11-0503	P2-101-17-2	0.144	0.812	4.74	6.14	28	6.9
04/18/11	IH-11-0504	P2-101-18	0.387	0.667	14.6	17.5	60.1	7
04/18/11	IH-11-0505	P2-101-19	0.111	<0.25	4.73	3.62	19.7	7.6
04/18/11	IH-11-0506	P2-101-19-1	0.0662	<0.25	1.73	2.57	11.2	7.7
04/18/11	IH-11-0507	P2-101-19-2	<0.05	<0.25	1.13	1.04	7.55	N/A
04/18/11	IH-11-0508	B-3	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/18/11	IH-11-0509	P2-101-20	0.168	1.64	17.8	82.4	31.9	6.8
04/18/11	IH-11-0510	P2-101-21	0.113	2.3	4.27	6.64	23.1	7.7
04/18/11	IH-11-0511	P2-101-22	0.0637	0.922	2.31	3.54	12.7	6.7
04/18/11	IH-11-0512	P2-101-23	0.0574	0.685	2.31	3.28	11.3	7.5
04/18/11	IH-11-0513	P2-101-24	0.0702	0.602	2.59	3.49	15.2	7.7
04/18/11	IH-11-0514	P2-101-24-1	<0.05	<0.25	0.428	0.836	3.5	N/A
04/18/11	IH-11-0515	P2-101-24-2	0.144	0.887	5.24	5.17	26.5	6.7
04/18/11	IH-11-0516	P2-101-25	0.295	0.524	6.77	9.42	48.7	6.5
04/18/11	IH-11-0517	P2-101-26	0.148	0.56	3.46	4.01	26.6	6.6
04/18/11	IH-11-0518	B-4	<0.05	<0.25	0.539	<0.25	0.316	N/A
04/18/11	IH-11-0519	P2-101-26-1	<0.05	0.296	0.75	1.44	4.72	N/A
04/18/11	IH-11-0520	P2-101-26-2	0.0722	0.901	5.25	37.7	15.6	7.9
04/18/11	IH-11-0521	P2-101-27	0.0967	0.398	3.33	5.72	18.6	8.1
04/18/11	IH-11-0522	P2-101-28	0.0953	1.75	5.69	11.4	17.9	8
04/18/11	IH-11-0523	P2-101-29	0.207	1.71	14.2	27.2	34.8	6.9
04/18/11	IH-11-0524	P2-101-30	<0.05	<0.25	0.47	0.71	3.6	7.5

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/18/11	IH-11-0525	P2-101-31	0.188	2.36	9	9.15	46.9	7.2
04/18/11	IH-11-0526	P2-101-32	0.13	1.47	5.45	5.79	33.1	6.6
04/18/11	IH-11-0527	B-5	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/19/11	IH-11-0547	P2-101-33	0.0583	0.826	7.26	8.8	30.3	9.4
04/19/11	IH-11-0548	P2-101-34	0.168	1.52	26.9	67.9	81.4	9.0
04/19/11	IH-11-0549	P2-101-35	0.214	3.01	128	90.5	180	9.0
04/19/11	IH-11-0550	P2-101-36	<0.05	0.388	11.4	5.44	28.3	N/A
04/19/11	IH-11-0551	P2-101-37	<0.05	0.465	3.56	3.82	17.6	N/A
04/19/11	IH-11-0552	P2-101-38	<0.05	<0.25	21.3	9.67	28.5	N/A
04/19/11	IH-11-0553	P2-101-39	<0.05	0.684	4.95	3.28	13.8	N/A
04/19/11	IH-11-0554	P2-101-40	<0.05	0.414	5.11	7.56	18.9	N/A
04/19/11	IH-11-0555	P2-101-41	<0.05	0.470	4.23	5.57	16.8	N/A
04/19/11	IH-11-0556	B-6	<0.05	<0.25	<0.25	<0.25	0.352	N/A
04/19/11	IH-11-0557	P2-101-42	0.0732	1.59	15.9	16.1	48.3	8.8
04/19/11	IH-11-0558	P2-101-43	<0.05	0.797	6.02	8.18	27.3	N/A
04/19/11	IH-11-0559	P2-101-44	<0.05	0.715	8.25	12.2	55.8	N/A
04/19/11	IH-11-0560	P2-101-45	0.0668	5.40	27.2	74.4	87.1	10.5
04/19/11	IH-11-0561	P2-101-46	0.110	0.933	28.8	40.6	87.2	8.7
04/19/11	IH-11-0562	P2-101-47	0.170	0.994	32.1	26.4	84.8	7.4
04/19/11	IH-11-0563	P2-101-48	<0.05	1.66	3.92	3.93	11.2	N/A
04/19/11	IH-11-0564	P2-101-49	0.217	5.65	14.5	14.6	76.1	7.1
04/19/11	IH-11-0565	P2-101-50	0.205	7.54	16.0	16.8	79.1	7.2
04/19/11	IH-11-0566	B-7	<0.05	<0.25		<0.25	<0.25	N/A
04/19/11	IH-11-0567	P2-101-51	0.170	4.14	12.2	13.9	62.0	7.2
04/19/11	IH-11-0568	P2-101-52	0.260	8.36	30.3	50.9	126	7.3
04/19/11	IH-11-0569	P2-101-53	0.122	6.28	12.1	21.3	54.1	7.5
04/19/11	IH-11-0570	P2-101-54	0.0551	2.14	14.1	38.0	46.8	10.9
04/19/11	IH-11-0571	P2-101-55	0.108	7.48	33.2	173	128	10.3
04/19/11	IH-11-0572	P2-101-56	0.132	7.95	55.3	168	177	11.8
04/20/11	IH-11-0592	P2-101-57	1.64	30.8	436	663	2260	10.2
04/20/11	IH-11-0593	P2-101-58	<0.05	2.17	1.31	1.07	7.30	N/A
04/20/11	IH-11-0594	P2-101-59	<0.05	3.61	1.11	1.65	11.1	N/A
04/20/11	IH-11-0595	P2-101-60	<0.05	5.33	1.51	2.56	10.2	N/A
04/20/11	IH-11-0596	P2-101-61	<0.05	3.70	1.67	4.66	8.75	N/A
04/20/11	IH-11-0597	P2-101-62	<0.05	<0.25	1.74	1.29	10.8	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/20/11	IH-11-0598	P2-101-63	<0.05	<0.25	0.699	0.903	6.38	N/A
04/20/11	IH-11-0599	P2-101-64	<0.05	<0.25	0.893	1.10	7.34	N/A
04/20/11	IH-11-0600	P2-101-65	<0.05	<0.25	1.39	1.78	8.32	N/A
04/20/11	IH-11-0601	B-8	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/20/11	IH-11-0602	P2-101-66	<0.05	<0.25	2.35	3.58	12.9	N/A
04/20/11	IH-11-0603	P2-101-67	<0.05	<0.25	1.80	6.93	9.48	N/A
04/20/11	IH-11-0604	P2-101-68	<0.05	<0.25	5.14	15.0	30.7	N/A
04/20/11	IH-11-0605	P2-102-1	<0.05	1.23	0.401	1.17	4.44	N/A
04/20/11	IH-11-0606	P2-102-2	<0.05	<0.25	0.656	0.563	3.55	N/A
04/20/11	IH-11-0607	P2-102-3	<0.05	<0.25	0.341	0.390	1.86	N/A
04/20/11	IH-11-0608	P2-102-4	<0.05	<0.25	0.500	0.446	2.36	N/A
04/20/11	IH-11-0609	P2-102-5	<0.05	<0.25	<0.25	0.284	1.65	N/A
04/20/11	IH-11-0610	B-9	<0.05	<0.25	<0.25	<0.25	0.258	N/A
04/20/11	IH-11-0611	P3-1	<0.05	0.701	1.39	3.05	7.54	N/A
04/20/11	IH-11-0612	P3-2	<0.05	0.157	0.824	1.17	3.79	N/A
04/20/11	IH-11-0613	P3-3	<0.05	0.232	0.907	1.44	4.55	N/A
04/20/11	IH-11-0614	P3-4	<0.05	0.217	0.506	1.18	3.43	N/A
04/20/11	IH-11-0615	P3-5	<0.05	0.539	4.73	4.38	7.03	N/A
04/20/11	IH-11-0616	P3-6	0.142	1.96	5.86	6.51	43.4	7.6
04/20/11	IH-11-0617	P3-7	<0.05	0.419	2.09	3.23	8.79	N/A
04/20/11	IH-11-0618	P3-8	0.0727	1.8	3.6	5.68	18.1	8.6
04/20/11	IH-11-0619	P3-8-1	<0.05	1.1	1.51	4.24	7.45	N/A
04/20/11	IH-11-0620	B-10	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/20/11	IH-11-0621	P3-8-2	<0.05	0.927	2.09	2.63	9.33	N/A
04/20/11	IH-11-0622	P3-8-3	<0.05	0.752	1.55	2.09	8.49	N/A
04/20/11	IH-11-0623	P3-8-4	0.133	1.72	4.85	5.97	33.2	7.5
04/20/11	IH-11-0624	P3-9	0.0601	1.41	2.46	3.82	14.1	8.7
04/20/11	IH-11-0625	P3-9-1	0.114	3.18	9.94	9.1	63.6	8.4
04/20/11	IH-11-0626	P3-9-2	<0.05	0.306	1.49	0.79	2.85	N/A
04/20/11	IH-11-0627	P3-9-3	<0.05	1	2.05	2.29	8.55	N/A
04/20/11	IH-11-0628	P3-9-4	0.0887	1.45	3.57	5.18	20.2	8.2
04/20/11	IH-11-0629	P3-10	<0.05	1.78	2.5	3.82	11.8	N/A
04/20/11	IH-11-0630	B-11	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/20/11	IH-11-0631	P3-10-1	<0.05	1.23	1.9	2.82	6.52	N/A
04/20/11	IH-11-0632	P3-10-2	<0.05	0.338	0.709	0.584	1.97	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/20/11	IH-11-0633	P3-10-3	<0.05	1.24	2.08	2.28	7.85	N/A
04/20/11	IH-11-0634	P3-10-4	0.0687	1.01	3.04	3.83	16.1	8.5
04/20/11	IH-11-0635	P3-11	0.11	1.15	4.88	4.34	13.2	11.1
04/20/11	IH-11-0636	P3-12	<0.05	0.209	1.36	2.07	6.33	N/A
04/20/11	IH-11-0637	P3-13	0.0758	1.49	3.27	5.23	15.7	8.1
04/20/11	IH-11-0638	P3-14	0.0585	0.799	3.14	5.38	11.4	7.8
04/20/11	IH-11-0639	P3-15	<0.05	0.978	2.37	2.82	10.6	N/A
04/20/11	IH-11-0640	B-12	<0.05	<0.25	0.315	<0.25	<0.25	N/A
04/20/11	IH-11-0641	P3-16	0.062	0.927	4.21	3.91	12	8.1
04/20/11	IH-11-0642	P3-17	<0.05	<0.25	0.976	1.33	7.11	N/A
04/20/11	IH-11-0643	P3-18	0.0592	2.51	6.41	6.34	11.8	7.9
04/20/11	IH-11-0644	P3-19	0.0786	0.353	2.27	2.27	11.3	8
04/20/11	IH-11-0645	P3-20	<0.05	1.49	1.79	2.56	7.96	N/A
04/20/11	IH-11-0646	P3-21	0.071	4.92	2.68	4.25	15.8	8.9
04/20/11	IH-11-0647	P3-22	0.0691	0.598	2.61	5.01	12.9	7.8
04/20/11	IH-11-0648	P3-23	0.0829	0.779	2.84	3.99	13.9	7.1
04/20/11	IH-11-0649	P3-24	<0.05	0.139	1.04	0.888	2.82	N/A
04/20/11	IH-11-0650	B-13	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/20/11	IH-11-0651	P3-25	0.0516	0.439	2.02	2.84	9.77	8.3
04/20/11	IH-11-0652	P3-26	<0.05	<0.25	1.18	1.4	4.85	N/A
04/20/11	IH-11-0653	P3-27	<0.05	0.357	1.18	1.4	5.3	N/A
04/20/11	IH-11-0654	P3-28	0.0563	1.12	1.87	3.62	11.2	8
04/20/11	IH-11-0655	P3-29	<0.05	0.907	1.69	3.43	8.38	N/A
04/20/11	IH-11-0656	P3-30	0.05	1.29	1.95	3.31	9.36	7.8
04/20/11	IH-11-0657	P3-31	0.149	11.4	4.45	5.11	26.2	6.8
04/20/11	IH-11-0658	B-14	<0.05	<0.25	0.728	<0.25	<0.25	N/A
04/25/11	IH-11-0664	P4-1	<0.05	<0.25	<0.25	0.534	4.62	N/A
04/25/11	IH-11-0665	P4-2	0.1346	0.464	3.39	3.56	36.8	8.3
04/25/11	IH-11-0666	P4-3	0.0814	0.946	2.57	4.07	19.1	9
04/25/11	IH-11-0667	P4-4	0.0501	1.88	1.23	2.63	10.4	7.8
04/25/11	IH-11-0668	P4-5	<0.05	0.727	1.31	2.32	8.6	N/A
04/25/11	IH-11-0669	P4-6	0.0739	1.16	2.13	2.05	11	6.6
04/25/11	IH-11-0670	P4-7	<0.05	<0.25	0.571	1.67	7.74	N/A
04/25/11	IH-11-0671	P4-8	0.0619	<0.25	1.72	1.83	12.1	7.5
04/25/11	IH-11-0672	P4-9	0.0776	0.297	1.59	2.26	13.7	7.6

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/25/11	IH-11-0673	B-15	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/25/11	IH-11-0674	P4-10	0.0514	0.584	1.96	2.27	9.6	8.1
04/25/11	IH-11-0675	P4-11	0.0631	0.71	2.01	3.19	13.9	9.3
04/25/11	IH-11-0676	P4-12	<0.05	<0.25	0.531	0.615	3.63	N/A
04/25/11	IH-11-0677	P4-12-1	<0.05	<0.25	<0.25	0.383	1.05	N/A
04/25/11	IH-11-0678	P4-12-2	<0.05	<0.25	0.291	0.933	4.25	N/A
04/25/11	IH-11-0679	P4-13	0.12	1.1	3.47	5.35	26.4	8
04/25/11	IH-11-0680	P4-13-1	<0.05	0.268	0.556	1.3	3.8	N/A
04/25/11	IH-11-0681	P4-13-2	<0.05	<0.25	0.344	0.487	2.11	N/A
04/25/11	IH-11-0682	P4-13-3	0.0846	0.568	2.13	3.15	17.6	8.1
04/25/11	IH-11-0683	B-16	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/25/11	IH-11-0684	P4-13-4	0.143	0.735	13.56	3.65	57.3	7.4
04/25/11	IH-11-0685	P4-14	<0.05	<0.25	0.327	0.835	2.13	N/A
04/25/11	IH-11-0686	P4-14-1	0.0588	0.96	3.12	6.48	13.2	8.2
04/25/11	IH-11-0687	P4-14-2	<0.05	0.68	1.16	1.09	4.9	N/A
04/25/11	IH-11-0688	P4-14-3	0.0751	1.38	6.14	19.8	18.5	8.3
04/25/11	IH-11-0689	P4-14-4	0.101	0.8	2.96	3.56	22.1	7.4
04/25/11	IH-11-0690	P4-15	0.146	3.4	5.15	8.59	37.5	7.5
04/25/11	IH-11-0691	P4-15-1	<0.05	1.83	2.37	4.89	9.68	N/A
04/25/11	IH-11-0692	P4-15-2	0.0592	1.88	2.4	3.86	13.6	8
04/25/11	IH-11-0693	B-17	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/25/11	IH-11-0694	P4-15-3	<0.05	1.02	2.15	3.05	9.24	N/A
04/25/11	IH-11-0695	P4-15-4	0.074	0.46	2.39	2.63	15.2	7.9
04/25/11	IH-11-0696	P4-16	0.166	0.694	3.97	3.75	34.5	7.3
04/25/11	IH-11-0697	P4-17	0.114	0.855	2.84	3.48	23.5	7.6
04/25/11	IH-11-0698	P4-18	<0.05	0.739	1.07	1.63	7.28	N/A
04/25/11	IH-11-0699	P4-19	<0.05	0.394	1.19	1.76	6.41	N/A
04/25/11	IH-11-0700	P4-20	<0.05	0.519	1.39	2.5	6.09	N/A
04/25/11	IH-11-0701	P4-21	0.149	1.891	5.06	9.21	36.5	7.8
04/25/11	IH-11-0702	P4-21-1	0.137	1.307	3.43	5.62	29.7	7.7
04/25/11	IH-11-0703	B-18	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/25/11	IH-11-0704	P4-21-2	0.0692	1.354	2.01	4.64	14.7	8.4
04/25/11	IH-11-0705	P4-21-3	0.159	1.192	4.21	6.27	35.7	7.2
04/25/11	IH-11-0706	P4-21-4	0.0779	0.638	1.94	3.47	17	8.1
04/25/11	IH-11-0707	P4-22	<0.05	0.283	1.11	1.6	5.59	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/25/11	IH-11-0708	P4-22-1	0.069	1.32	3.19	3.72	22.2	9.9
04/25/11	IH-11-0709	P4-22-2	<0.05	4.332	1.67	3.5	11.6	N/A
04/25/11	IH-11-0710	P4-22-3	0.129	0.735	3.06	4.93	28.8	7.8
04/25/11	IH-11-0711	P4-22-4	0.16	1.142	4.73	6.68	40.2	7.8
04/25/11	IH-11-0712	P4-23	0.169	0.431	5.42	3.32	41	7.6
04/25/11	IH-11-0713	B-19	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/25/11	IH-11-0714	P4-24	0.161	0.812	4.4	6.11	33.7	7.2
04/25/11	IH-11-0715	P4-25	<0.05	0.305	1.77	1.66	9.37	N/A
04/25/11	IH-11-0716	P4-26	<0.05	0.254	1.14	2.04	9.24	N/A
04/25/11	IH-11-0717	P4-27	<0.05	<0.25	3.89	1.93	26	N/A
04/25/11	IH-11-0718	P4-27-1	0.0772	1.665	4.02	10.7	20.2	9
04/25/11	IH-11-0719	P4-27-2	0.135	0.711	2.67	3.98	27.4	7.4
04/25/11	IH-11-0720	P4-28	0.0583	0.622	1.71	3.74	13.2	9.5
04/25/11	IH-11-0721	P4-28-1	<0.05	<0.25	0.4	1.89	6.1	N/A
04/25/11	IH-11-0722	P4-28-2	0.22	2.526	7.11	22.7	69.9	16
04/25/11	IH-11-0723	B-20	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/25/11	IH-11-0724	P4-28-3	<0.05	<0.25	0.6	1.7	6.02	N/A
04/25/11	IH-11-0725	P4-28-4	0.129	0.727	3.49	7.56	35	18.8
04/25/11	IH-11-0726	P4-29	0.0553	0.502	1.29	3.53	12.7	9.8
04/25/11	IH-11-0727	P4-29-1	<0.05	<0.25	0.39	3.17	5.4	N/A
04/25/11	IH-11-0728	P4-29-2	0.0586	0.613	1.23	7.76	13.6	9.3
04/25/11	IH-11-0729	P4-29-3	0.111	0.805	2.45	4.97	23.1	8
04/25/11	IH-11-0730	P4-29-4	0.0569	0.366	1.25	2.83	12.2	8.3
04/25/11	IH-11-0731	P4-30	<0.05	0.938	1.36	43	10.3	N/A
04/25/11	IH-11-0732	P4-30-1	0.128	3.843	5.01	434	29.1	8
04/25/11	IH-11-0733	B-21	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/25/11	IH-11-0734	P4-30-2	0.056	0.398	1.7	3.02	13.8	12.5
04/25/11	IH-11-0735	P4-30-3	<0.05	<0.25	7.74	31.2	4.62	N/A
04/25/11	IH-11-0736	P4-30-4	0.124	1.093	4.06	7.58	30.3	8
04/25/11	IH-11-0737	P4-31	0.0907	0.476	2.68	3.5	16.9	8.1
04/25/11	IH-11-0738	P4-32	<0.05	0.306	1.37	2.24	8.53	N/A
04/25/11	IH-11-0739	P4-33	<0.05	0.42	19.8	50.7	10	N/A
04/25/11	IH-11-0740	P4-34	0.0569	0.94	1.96	2.72	12.4	8
04/25/11	IH-11-0741	P4-35	<0.05	1.504	1.68	2.04	8.14	N/A
04/25/11	IH-11-0742	P4-36	<0.05	0.328	1.72	2.42	9.8	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/25/11	IH-11-0743	B-22	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/25/11	IH-11-0744	P4-37	<0.05	0.848	3.39	2.79	20.3	N/A
04/25/11	IH-11-0745	P4-38	0.133	1.318	11.98	10.7	73.3	8.3
04/25/11	IH-11-0746	P4-39	0.134	1.415	14.3	10.4	72.2	8.4
04/27/11	IH-11-0755	P4-40	0.0513	2.798	6.7	4.55	56.1	13.4
04/27/11	IH-11-0756	P4-41	<0.05	4.967	2.39	1.43	13.5	N/A
04/27/11	IH-11-0757	P4-42	0.0622	<0.25	6.38	2.96	20.9	8
04/27/11	IH-11-0758	P4-43	0.0501	0.178	3.77	2.33	18.4	7.8
04/27/11	IH-11-0759	P4-44	<0.05	2.866	2.78	1.6	20.1	N/A
04/27/11	IH-11-0760	P4-45	<0.05	4.318	2.29	1.44	16.3	N/A
04/27/11	IH-11-0761	P4-46	<0.05	1.61	0.986	0.817	6	N/A
04/27/11	IH-11-0762	P5-1	0.0678	1.15	6.65	9.13	49.2	9.2
04/27/11	IH-11-0763	P5-2	0.114	0.695	6.32	22.8	28.2	6.7
04/27/11	IH-11-0764	B-23	<0.05	<0.25	0.962	<0.25	0.385	N/A
04/27/11	IH-11-0765	P5-3	<0.05	0.287	1.72	1.45	7.39	N/A
04/27/11	IH-11-0766	P5-3-1	0.0629	1.95	3.76	6.37	22.6	7.8
04/27/11	IH-11-0767	P5-3-2	<0.05	1.04	1.09	2.03	4.81	N/A
04/27/11	IH-11-0768	P5-3-3	<0.05	0.735	1.48	2.2	8.99	N/A
04/27/11	IH-11-0769	P5-3-4	0.0986	11.1	7.82	13	46.1	8.7
04/27/11	IH-11-0770	P5-3-5	0.0987	5.99	6.5	10.6	38.1	8.1
04/27/11	IH-11-0771	P5-4	0.0958	1.6	5.83	9.43	29	7.8
04/27/11	IH-11-0772	P5-5	0.19	1.5	7.12	6.57	50.4	7.1
04/27/11	IH-11-0773	P5-6	0.169	0.463	4.77	3.96	33.3	6.5
04/27/11	IH-11-0774	B-24	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/27/11	IH-11-0775	P5-7	0.0842	2.13	4.84	5.29	31.1	7.8
04/27/11	IH-11-0776	P5-8	0.096	1.35	5.57	6.39	32.9	8.4
04/27/11	IH-11-0777	P5-9	0.122	1.72	6.47	8.38	34.6	7.9
04/27/11	IH-11-0778	P5-9-1	0.0735	1.2	3.94	5.42	22.3	8.1
04/27/11	IH-11-0779	P5-9-2	<0.05	1.15	3.15	3.04	19.1	N/A
04/27/11	IH-11-0780	P5-9-3	0.106	1.98	5.64	7.24	34.1	7.8
04/27/11	IH-11-0781	P5-9-4	0.0972	1.35	6.45	7.46	41.9	7.5
04/27/11	IH-11-0782	P5-10	0.171	7.64	16.1	33.5	68.3	8
04/27/11	IH-11-0783	P5-11	0.117	1.66	6.06	8.07	34.5	7.9
04/27/11	IH-11-0784	B-25	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/27/11	IH-11-0785	P5-11-1	<0.05	<0.25	1.17	2.16	7.02	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/27/11	IH-11-0786	P5-11-2	0.0743	1.16	3.84	4.73	22.4	8.4
04/27/11	IH-11-0787	P5-11-3	<0.05	0.504	2.06	3.06	11.3	N/A
04/27/11	IH-11-0788	P5-11-4	0.103	2.45	5.27	6.28	33	8.1
04/27/11	IH-11-0789	P5-12	<0.05	0.35	7.31	33.5	9.04	N/A
04/27/11	IH-11-0790	P5-13	0.171	2.28	5.39	6.4	38.3	7.8
04/27/11	IH-11-0791	P5-14	<0.05	0.334	2.6	2.37	11	N/A
04/27/11	IH-11-0792	P5-15	<0.05	<0.25	1.86	1.13	4.99	N/A
04/27/11	IH-11-0793	P5-15-1	<0.05	0.611	2.25	2.4	10.9	N/A
04/27/11	IH-11-0794	B-26	<0.05	<0.25	1.32	<0.25	<0.25	N/A
04/27/11	IH-11-0795	P5-15-2	0.124	0.776	4.6	4.21	28.1	6.5
04/27/11	IH-11-0796	P5-15-3	0.0502	<0.25	2.89	1.41	11	6.7
04/27/11	IH-11-0797	P5-16	0.0757	0.502	3.38	4.15	16.7	6.7
04/27/11	IH-11-0798	P5-16-1	<0.05	0.339	1.74	0.807	2.15	N/A
04/27/11	IH-11-0799	P5-16-2	<0.05	<0.25	1.82	1.28	4.85	N/A
04/27/11	IH-11-0800	P5-16-3	<0.05	<0.25	1.5	0.405	2.04	N/A
04/27/11	IH-11-0801	P5-17	<0.05	<0.25	2.69	1.47	5.01	N/A
04/27/11	IH-11-0802	P5-17-1	<0.05	<0.25	2.39	1.69	8.97	N/A
04/27/11	IH-11-0803	P5-17-2	0.0766	0.426	3.33	3.32	17	6.6
04/27/11	IH-11-0804	B-27	<0.05	<0.25	1.12	<0.25	<0.25	N/A
04/27/11	IH-11-0805	P5-17-3	<0.05	<0.25	1.7	0.964	4.46	N/A
04/27/11	IH-11-0806	P5-18	<0.05	0.348	7.98	36.7	5.88	N/A
04/27/11	IH-11-0807	P5-18-1	<0.05	<0.25	1.13	0.295	1.3	N/A
04/27/11	IH-11-0808	P5-18-2	<0.05	<0.25	1.24	0.551	2.01	N/A
04/27/11	IH-11-0809	P5-19	0.18	2.23	14.2	31.6	48.9	7
04/27/11	IH-11-0810	P5-20	0.151	2.14	8.03	14.4	39.8	6.7
04/27/11	IH-11-0811	P5-20-1	<0.05	0.552	3.66	3	13.1	N/A
04/27/11	IH-11-0812	P5-20-2	0.0781	0.324	3.42	2.42	17.2	6.9
04/27/11	IH-11-0813	P5-21	<0.05	<0.25	1.2	0.275	1.2	N/A
04/27/11	IH-11-0814	B-28	<0.05	<0.25	0.521	<0.25	<0.25	N/A
04/27/11	IH-11-0815	P5-21-1	<0.05	0.256	2.8	4.75	7.9	N/A
04/27/11	IH-11-0816	P5-21-2	<0.05	<0.25	1	0.572	1.63	N/A
04/27/11	IH-11-0817	P5-22	<0.05	<0.25	1.96	2.16	5.68	N/A
04/27/11	IH-11-0818	P5-22-1	<0.05	0.297	1.74	2.29	7.29	N/A
04/27/11	IH-11-0819	P5-22-2	<0.05	0.497	1.93	1.41	5.6	N/A
04/27/11	IH-11-0820	P5-23	<0.05	0.26	2.42	2.19	7.63	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/27/11	IH-11-0821	P5-24	<0.05	<0.25	2.35	1.98	9.82	N/A
04/27/11	IH-11-0822	P5-25	<0.05	<0.25	2.22	2.18	10.3	N/A
04/27/11	IH-11-0823	P5-26	<0.05	<0.25	1.43	1.7	6.93	N/A
04/27/11	IH-11-0824	B-29	<0.05	<0.25	1.04	<0.25	<0.25	N/A
04/27/11	IH-11-0825	P5-27	<0.05	0.335	2.84	2.05	11.4	N/A
04/27/11	IH-11-0826	P5-28	<0.05	<0.25	2.76	1.88	10	N/A
04/27/11	IH-11-0827	P5-29	<0.05	<0.25	1.59	1.54	7.77	N/A
04/27/11	IH-11-0828	P5-30	<0.05	<0.25	2.02	2.11	8.48	N/A
04/27/11	IH-11-0829	P5-31	<0.05	<0.25	2.01	1.58	7.72	N/A
04/27/11	IH-11-0830	P5-32	<0.05	<0.25	1.19	1.01	4.76	N/A
04/27/11	IH-11-0831	P5-33	<0.05	<0.25	1.81	1.16	9.52	N/A
04/27/11	IH-11-0832	P5-34	<0.05	<0.25	1.98	1.06	7.9	N/A
04/27/11	IH-11-0833	P5-35	<0.05	<0.25	2.27	1.16	8.85	N/A
04/27/11	IH-11-0834	B-30	<0.05	<0.25	0.883	<0.25	<0.25	N/A
04/28/11	IH-11-0840	P5-36	0.0554	<0.25	1.25	2.12	11.2	9.1
04/28/11	IH-11-0841	P5-37	<0.05	0.276	1.22	1.58	7.4	N/A
04/28/11	IH-11-0842	P5-38	<0.05	0.542	0.778	1.63	6.99	N/A
04/28/11	IH-11-0843	P5-39	<0.05	0.431	1.54	2.34	11.9	N/A
04/28/11	IH-11-0844	P5-40	<0.05	<0.25	1.02	1.49	7.27	N/A
04/28/11	IH-11-0845	P5-41	<0.05	0.356	2.34	2.61	10.9	N/A
04/28/11	IH-11-0846	P5-42	<0.05	<0.25	1.16	1.83	5.79	N/A
04/28/11	IH-11-0847	P5-43	<0.05	<0.25	1.17	2.01	8.35	N/A
04/28/11	IH-11-0848	P5-44	<0.05	<0.25	0.999	1.64	8.19	N/A
04/28/11	IH-11-0849	B-31	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/28/11	IH-11-0850	P5-45	<0.05	<0.25	1.27	4.16	4.08	N/A
04/28/11	IH-11-0851	P5-46	0.0604	<0.25	1.22	2.85	9.84	4.4
04/28/11	IH-11-0852	P5-47	0.062	0.404	3.73	12	15.2	7.5
04/28/11	IH-11-0853	P5-48	0.124	0.869	4.81	6.66	30.4	7.5
04/28/11	IH-11-0854	P5-49	0.0724	1.24	3.85	4.61	23.1	7.7
04/28/11	IH-11-0855	P5-50	0.051	0.621	2.89	4.72	14.6	7.7
04/28/11	IH-11-0856	P5-51	<0.05	0.98	1.59	8.05	8.3	N/A
04/28/11	IH-11-0857	P5-52	<0.05	0.339	2.21	2.62	9.57	N/A
04/28/11	IH-11-0858	P5-53	<0.05	0.308	1.59	2.84	8.29	N/A
04/28/11	IH-11-0859	B-32	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/28/11	IH-11-0860	P5-54	<0.05	0.278	1.16	1.98	6.22	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/28/11	IH-11-0861	P5-55	<0.05	<0.25	1.36	2.59	5.94	N/A
04/28/11	IH-11-0862	P5-56	<0.05	<0.25	1.6	2.73	8.43	N/A
04/28/11	IH-11-0863	P5-57	0.0606	0.625	2.4	3.54	15.9	8.6
04/28/11	IH-11-0864	P5-58	<0.05	<0.25	2.39	5.21	5.49	N/A
04/28/11	IH-11-0865	P5-59	<0.05	0.808	7.49	5.3	68.1	N/A
04/28/11	IH-11-0866	P5-60	<0.05	0.333	5.09	1.94	17.8	N/A
04/28/11	IH-11-0867	P5-61	<0.05	0.344	1.56	1.35	11.2	N/A
04/28/11	IH-11-0868	P5-62	<0.05	0.603	3.62	2.86	20.2	N/A
04/28/11	IH-11-0869	B-33	<0.05	<0.25	0.26	<0.25	<0.25	N/A
04/28/11	IH-11-0870	P5-63	<0.05	0.407	2.38	1.65	12.3	N/A
04/28/11	IH-11-0871	P5-64	<0.05	0.41	1.59	1.24	5.94	N/A
04/28/11	IH-11-0872	P5-65	<0.05	0.766	2.19	1.56	10.2	N/A
04/28/11	IH-11-0873	P5-66	<0.05	0.323	6.03	2.74	12.6	N/A
04/28/11	IH-11-0874	P5-67	<0.05	0.643	2.91	1.88	11.8	N/A
04/28/11	IH-11-0875	P5-68	0.0533	2.23	4.93	3.01	20.1	8
04/28/11	IH-11-0876	P5-69	<0.05	0.872	2.65	2.14	13.4	N/A
04/28/11	IH-11-0877	P5-70	<0.05	0.729	2.53	2.54	12.5	N/A
04/28/11	IH-11-0878	P5-71	<0.05	0.686	1.91	1.48	9.19	N/A
04/28/11	IH-11-0879	B-34	<0.05	<0.25	0.478	<0.25	<0.25	N/A
04/28/11	IH-11-0880	P5-72	<0.05	0.366	1.34	0.944	6.15	N/A
04/28/11	IH-11-0881	P5-73	0.21	5.05	13.1	10.8	91.3	7.8
04/28/11	IH-11-0882	P5-74	0.238	3.79	15.1	15.6	92.7	8
04/28/11	IH-11-0883	P5-75	<0.05	3.19	2.93	0.986	17.5	N/A
04/28/11	IH-11-0884	P5-76	<0.05	3.74	2.58	1.52	14.9	N/A
04/28/11	IH-11-0885	P5-77	0.128	0.68	7.94	5.6	67.3	8.7
04/28/11	IH-11-0886	P5-78	<0.05	<0.25	2.4	1.33	9.94	N/A
04/28/11	IH-11-0887	P5-79	<0.05	9.46	1.58	0.596	7.68	N/A
04/28/11	IH-11-0888	P5-80	0.107	0.335	4.3	3.19	31.9	7.9
04/28/11	IH-11-0889	B-35	<0.05	<0.25	0.41	<0.25	<0.25	N/A
04/28/11	IH-11-0890	P5-81	<0.05	7.94	1.08	0.578	5.42	N/A
04/28/11	IH-11-0891	P5-82	<0.05	15.5	1.31	1.58	4.77	N/A
04/28/11	IH-11-0892	P5-83	<0.05	6.55	2.84	1.99	16.2	N/A
04/28/11	IH-11-0893	P5-84	<0.05	44.1	0.527	4.52	3.74	N/A
04/28/11	IH-11-0894	P5-85	<0.05	11.6	1.49	0.989	7.51	N/A
04/28/11	IH-11-0895	P5-86	<0.05	6.92	1.22	1.06	7.12	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
04/28/11	IH-11-0896	P5-87	<0.05	7.29	2.02	1.83	11.3	N/A
04/28/11	IH-11-0897	P5-88	0.0869	0.6	4.27	3.23	34.2	7.8
04/28/11	IH-11-0898	P5-89	0.119	1.01	9.44	6.84	45.5	7.5
04/28/11	IH-11-0899	B-36	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/28/11	IH-11-0900	P5-90	<0.05	2.93	2.09	1.51	11.6	N/A
04/28/11	IH-11-0901	P5-91	<0.05	<0.25	2.59	1.66	20.1	N/A
04/28/11	IH-11-0902	P5-92	<0.05	<0.25	1.77	1.19	12	N/A
04/28/11	IH-11-0903	P5-93	<0.05	<0.25	2.01	1.22	11	N/A
04/28/11	IH-11-0904	P5-94	<0.05	<0.25	0.921	0.876	6.63	N/A
04/28/11	IH-11-0905	P5-95	<0.05	<0.25	1.24	0.878	7.15	N/A
04/28/11	IH-11-0906	P5-96	<0.05	<0.25	1.22	1.03	7.31	N/A
04/28/11	IH-11-0907	P5-97	<0.05	<0.25	1.48	1.28	7.59	N/A
04/28/11	IH-11-0908	P5-98	<0.05	<0.25	1.18	0.964	6.04	N/A
04/28/11	IH-11-0909	B-37	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
04/28/11	IH-11-0910	P5-99	<0.05	<0.25	1.21	0.837	5.5	N/A
04/28/11	IH-11-0911	P5-100	<0.05	<0.25	0.89	0.706	4.19	N/A
04/28/11	IH-11-0912	P5-101	<0.05	<0.25	0.688	0.436	2.65	N/A
04/28/11	IH-11-0913	P5-102	<0.05	<0.25	0.604	0.614	3.58	N/A
04/28/11	IH-11-0914	P5-103	0.187	9.51	13.7	12.1	94.5	8.2
05/03/11	IH-11-0915	P5-104	0.186	9.93	10.8	9.24	83.4	7.9
05/03/11	IH-11-0916	P5-105	0.231	8.44	13.8	11.7	99.6	7.9
05/03/11	IH-11-0917	P5-106	0.182	5.42	10.5	9.17	77.2	8
05/03/11	IH-11-0918	B-38	<0.05	<0.25	<0.25	<0.25	<0.25	N/A

CONFIRMATORY SAMPLING

After the cleaning was completed, random verification samples were collected to ascertain that the toxic metals of concern were below the NSTec housekeeping limits. A random sampling plan was generated using the VSP program. The sampling plan is provided in Appendix B of this report.

The confirmatory sampling results are shown in Table 9 below.

Table 9

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
05/10/11	IH-11-0938	Field Blank FB-1	<0.05	<0.25	0.514	<0.25	0.276	N/A
05/10/11	IH-11-0939	CC1-1	<0.05	<0.25	2.06	2.86	12	N/A
05/10/11	IH-11-0940	CC1-2	0.679	24.4	23.1	32.7	232	7.6
05/10/11	IH-11-0941	CC1-3	<0.05	3.45	0.509	0.347	3.22	N/A
05/10/11	IH-11-0942	CC1-4	<0.05	0.547	2.9	1.95	17.2	N/A
05/16/11	IH-11-0983	Field Blank FB-1	<0.05	<0.25	0.387	<0.25	<0.25	N/A
05/16/11	IH-11-0984	CC1-2-1 (redo)	0.0976	0.339	2.82	2.55	21.5	8.2
05/16/11	IH-11-0985	CC1-2-2 (redo)	<0.05	<0.25	2.23	1.65	13.9	N/A
05/16/11	IH-11-0986	CC1-2-3(redo)	<0.05	0.503	15.5	6.25	197	N/A
05/16/11	IH-11-0987	CC1-2-4 (redo)	<0.05	<0.25	1.71	2.81	9.26	N/A
05/24/11	IH-11-1017	Field Blank	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
05/24/11	IH-11-1018	Hot zone of the decon area	<0.05	<0.25	1.54	2.97	6.74	N/A
05/24/11	IH-11-1019	Warm zone of the decon area, Tyvek removal area	<0.05	<0.25	5.01	18.4	2.64	N/A
05/24/11	IH-11-1020	Cold zone of the decon area by the east wall of the warehouse	<0.05	2.09	9.65	31.5	7.98	N/A
05/25/11	IH-11-1024	Field Blank FB-2	<0.05	<0.25	<0.25	<0.25	<0.25	N/A
05/25/11	IH-11-1025	CC3 Room 109-1	<0.05	0.281	0.535	0.959	2.47	N/A
05/25/11	IH-11-1026	CC3 Room 109-2	<0.05	<0.25	0.657	1.07	3.23	N/A
05/25/11	IH-11-1027	CC3 Room 109-3	<0.05	0.45	1.29	3.3	8.29	N/A
05/25/11	IH-11-1028	CC3 Room 109-4	<0.05	0.515	0.884	1.45	4.03	N/A
05/25/11	IH-11-1029	CC3 Room 109-5	<0.05	0.406	0.796	1.39	3.91	N/A
6/6/2011	IH-11-1065	Field Blank FB-3	<0.05	<0.25	<0.25	<0.25	<0.5	N/A
6/6/2011	IH-11-1066	CC5 Room 110-1	<0.05	0.59	3.13	2.01	13.5	N/A
6/6/2011	IH-11-1067	CC5 Room 110-2	0.13	0.644	4.04	5.89	31.5	8.3
6/6/2011	IH-11-1068	CC5 Room 110-3	0.0584	0.359	7.88	40.4	23.3	8.6
6/6/2011	IH-11-1069	CC5 Room 110-4	<0.05	0.399	2.25	3.66	14	N/A
6/6/2011	IH-11-1070	CC5 Room 110-5	0.67	17.1	82.9	80.9	664	10.2
6/6/2011	IH-11-1071	CC5 Room 110-6	0.0737	1.46	5.77	10	25.3	8.6
6/6/2011	IH-11-1072	CC5 Room 110-7	<0.05	0.54	3.05	1.75	20.2	N/A
6/6/2011	IH-11-1073	CC5 Room 110-8	0.143	0.715	6.14	8.68	41.2	8.1
6/6/2011	IH-11-1074	CC5 Room 110-9	<0.05	<0.25	1.68	1.43	9.4	N/A
6/6/2011	IH-11-1075	CC5 Room 110-10	<0.05	0.427	2.77	7.01	10.1	N/A
6/6/2011	IH-11-1076	CC5 Room 110-11	0.145	9.02	27.8	16.2	197	11.1
6/6/2011	IH-11-1077	CC5 Room 110-12	<0.05	<0.25	1.52	1.27	7.69	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
6/6/2011	IH-11-1078	CC5 Room 110-13	<0.05	0.286	1.33	1.71	5.63	N/A
6/6/2011	IH-11-1079	CC5 Room 110-14	<0.05	<0.25	0.626	1.11	3.72	N/A
6/6/2011	IH-11-1080	CC5 Room 110-15	0.462	11.3	36.9	27.6	267	8.7
6/6/2011	IH-11-1081	CC5 Room 110-16	<0.05	3.85	0.786	1.09	5.38	N/A
6/13/2011	IH-11-1134	Field Blank FB-4	<0.05	<0.25	<0.25	<0.25	<0.5	N/A
6/13/2011	IH-11-1135	CC2 Room 101-1	<0.05	<0.25	1.46	1.29	2.96	N/A
6/13/2011	IH-11-1136	CC2 Room 101-2	0.11	0.595	4.07	3.74	28.5	7.2
6/13/2011	IH-11-1137	CC2 Room 101-3	<0.05	<0.25	0.647	0.577	1.93	N/A
6/13/2011	IH-11-1138	CC2 Room 101-4	<0.05	0.297	7.35	6.77	24.2	N/A
6/13/2011	IH-11-1139	CC2 Room 101-5	<0.05	1.55	7.49	5.09	32.1	N/A
6/13/2011	IH-11-1140	CC2 Room 101-6	0.0697	0.535	2.65	5.22	19.7	7.8
6/13/2011	IH-11-1141	CC2 Room 101-7	<0.05	2.22	2.35	5.31	10.4	N/A
6/13/2011	IH-11-1142	CC2 Room 101-8	0.0575	0.572	3.46	4.34	15.8	8
6/13/2011	IH-11-1143	CC2 Room 101-9	0.0963	0.77	7.93	11	34.8	7
6/13/2011	IH-11-1144	CC2 Room 101-10	<0.05	14.8	8.09	27.7	37.1	N/A
6/13/2011	IH-11-1145	CC2 Room 101-11	<0.05	4.96	1.33	2.25	6.53	N/A
6/13/2011	IH-11-1146	CC2 Room 101-12	<0.05	<0.25	0.905	2.69	3.34	N/A
6/13/2011	IH-11-1147	CC2 Room 102-1	<0.05	<0.25	1.49	0.637	6.43	N/A
6/15/2011	IH-11-1151	Field Blank FB-5	<0.05	<0.25	<0.25	<0.25	<0.5	N/A
6/15/2011	IH-11-1152	CC4 Room 109-1	<0.05	0.385	1.01	1.63	7.32	N/A
6/15/2011	IH-11-1153	CC4 Room 109-2	<0.05	2.89	0.827	0.518	4.37	N/A
6/15/2011	IH-11-1154	CC4 Room 109-3	0.0661	5.11	3.34	4.69	19.7	8.2
6/15/2011	IH-11-1155	CC4 Room 109-4	<0.05	<0.25	0.925	1.08	4.95	N/A
6/15/2011	IH-11-1156	CC4 Room 109-5	<0.05	<0.25	<0.25	0.334	0.682	N/A
6/15/2011	IH-11-1157	CC4 Room 109-6	0.223	7.74	20.1	15.4	175	8.8
6/15/2011	IH-11-1158	CC4 Room 109-7	<0.05	0.678	1.45	2.89	9.2	N/A
6/15/2011	IH-11-1174	Field Blank FB-6	<0.05	<0.25	<0.25	<0.25	<0.5	N/A
6/15/2011	IH-11-1175	CC5 redo Room 110-1	<0.05	7.29	1.04	0.434	3.4	N/A
6/15/2011	IH-11-1176	CC5 redo Room 110-2	<0.05	0.268	12.2	3.16	14.3	N/A
6/15/2011	IH-11-1177	CC5 redo Room 110-3	<0.05	<0.25	1.68	0.87	5.8	N/A
6/15/2011	IH-11-1178	CC5 redo Room 110-4	<0.05	<0.25	1.75	2.19	5.73	N/A
6/15/2011	IH-11-1179	CC5 redo Room 110-5	<0.05	1.53	2.09	2.76	13.6	N/A
6/15/2011	IH-11-1180	CC5 redo Room 110-6	<0.05	3.38	1.51	1.17	8.14	N/A
6/15/2011	IH-11-1181	CC5 redo Room 110-7	<0.05	<0.25	2.04	2.42	13.1	N/A
6/15/2011	IH-11-1182	CC5 redo Room 110-8	<0.05	0.585	2.34	3.84	11.4	N/A
6/15/2011	IH-11-1183	CC5 redo Room 110-9	<0.05	0.281	2.22	3.09	15.8	N/A

Date	Sample Number	Sample Location	Be (µg/100 cm^2)	Cd (µg/100 cm^2)	Cr (µg/100 cm^2)	Pb (µg/100 cm^2)	Mn (µg/100 cm^2)	Y/Be Ratio
		Surface Metals Housekeeping Threshold	**0.2**	**10**	**50**	**50**	**1,000**	**5 to 15**
6/15/2011	IH-11-1184	CC5 redo Room 110-10	<0.05	0.333	1.2	1.51	4.8	N/A
6/15/2011	IH-11-1185	CC5 redo Room 110-11	<0.05	<0.25	1.38	2.09	3.5	N/A
6/15/2011	IH-11-1186	CC5 redo Room 110-12	<0.05	0.392	1.68	2.24	8.7	N/A
6/15/2011	IH-11-1187	CC5 redo Room 110-13	<0.05	<0.25	1.81	0.612	8.57	N/A
6/15/2011	IH-11-1188	CC5 redo Room 110-14	<0.05	<0.25	1.43	2.46	4.47	N/A
6/15/2011	IH-11-1189	CC5 redo Room 110-15	<0.05	0.371	2.11	3.2	10.8	N/A
6/15/2011	IH-11-1190	CC5 redo Room 110-16	<0.05	<0.25	0.605	0.896	4.04	N/A
6/15/2011	IH-11-1191	CC5 redo Room 110-17	<0.05	0.35	2.25	5.41	10.6	N/A
6/15/2011	IH-11-1192	CC5 redo Room 110-18	<0.05	5.99	1.94	1.47	10.7	N/A
6/29/2011	IH-11-1243	Field Blank FB-7	<0.05	<0.25	<0.25	<0.25	<0.5	N/A
6/29/2011	IH-11-1244	CC2 redo Room 101-1	<0.05	<0.25	2.57	2.13	6.46	N/A
6/29/2011	IH-11-1245	CC2 redo Room 101-2	<0.05	0.345	1.61	2.77	7	N/A
6/29/2011	IH-11-1246	CC2 redo Room 101-3	0.103	1.09	6.24	8.88	36.7	6.7
6/29/2011	IH-11-1247	CC2 redo Room 101-4	0.088	6.06	4.11	6.89	20.4	7.4
6/29/2011	IH-11-1248	CC2 redo Room 101-5	<0.05	0.368	0.725	0.504	2.24	N/A
6/29/2011	IH-11-1249	CC2 redo Room 101-6	<0.05	<0.25	1.59	2.4	6.96	N/A
6/29/2011	IH-11-1250	CC2 redo Room 101-7	<0.05	<0.25	1.44	1.74	5.77	N/A
6/29/2011	IH-11-1251	CC2 redo Room 101-8	<0.05	1.71	1.55	0.634	3.53	N/A
6/29/2011	IH-11-1252	CC2 redo Room 101-9	<0.05	0.819	5.88	4.58	50.4	N/A
6/29/2011	IH-11-1253	CC2 redo Room 101-10	<0.05	<0.25	1.24	1.24	3.75	N/A
6/29/2011	IH-11-1254	CC2 redo Room 101-11	<0.05	2.21	2.97	4.53	11.6	N/A

CC= Confirm Clean

DISCUSSION AND CONCLUSION

Before the cleanup process commenced, IH went inside the building, set up the area for the cleanup process (such as decontamination areas, demarcation of sample areas, etc.), and then collected the "hotspot" samples in specified areas of the building. However, the hotspot sampling plan did not account for the racks and shelves located throughout the warehouse. Therefore, IH determined that if a floor hotspot sample point was below a rack, each shelf on that particular rack was to be sampled. The sample location labeling criteria for the hotspot cleanup was according to the section in which the sample was collected, the sampling event, and the individual sample number. For example, sample number P3-10-4, means that it was a hotspot sample in section P3, sample number 10, rack shelf number 4 and so forth. Once the hotspot sampling was completed and results were obtained, the cleanup of the building started.

The modus operandi of the cleanup process involved HEPA vacuuming and wet wiping. The identified accessible walls, floors, and material in the warehouse were first HEPA vacuumed

then wet-wiped using a solution containing a solvent known as Ledizolv and wet rags. Cleaning of each section began with the high walls working downward, to shelves, and then the floors.

During the cleanup process, IH was concurrently sampling the finished areas to verify the cleanliness of the building. According to the de novo VSP hotspot sampling plan and VSP confirmatory sampling plan methodology, should a hotspot (an area with toxic metal concentration above the NSTec housekeeping limits, ACGIH limits, and DOE ALs) be identified, the hotspot and five feet around it were to be cleaned prior to the confirmatory random sampling of the area of concern. The specific areas sampled during the hotspot sampling event would be different than confirmatory samples as the hotspot sampling event was nonrandom while the confirmatory sampling event was random. If any areas were recognized as indicating high toxic metal surface concentrations during the random confirmatory sampling event, the whole section of concern in the building was re-cleaned and then re-sampled using a new random confirmatory sampling plan. In this case, areas P1, P2, and P5 had to be re-cleaned and re-sampled.

Due to the fact that IH divided the building into sections during the cleanup operations, it was possible to maintain minimal warehouse operations during the building cleanup and sampling. The minimal warehouse operations required appropriate PPE and HEPA vacuuming and/or wet wiping to decontaminate all inventory items that were handled during the cleanup process. The building was considered a controlled area until the cleanup process was completed.

Certain sections of the building were statistically determined to be clean more rapidly than others; namely, sections P3 and P4. The office, break room, and bathroom areas were previously determined to be clean. The warehouse was labeled accordingly such that clean areas could be differentiated from the non-clean areas. The results of the swipe sampling exercise indicated that the southwest and northwest part of the building had the highest surface toxic metal contamination. Although some values were above the NSTec housekeeping criteria, they were in fact below the NSTec surface metal thresholds for air monitoring. This implies that if dust-disturbing activities were to occur in the building, the values obtained would not be expected to reach the ACGIH TLVs, the NSTec criteria, or the OSHA PEL for Be, Cd, Cr, Pb, and Mn. Thus, the likelihood of personnel exposure is low as shown by the air sampling results collected as the employees were cleaning the building. Moreover, there exists no known correlation between surface concentrations at housekeeping levels and airborne exposure to metals.

The cleaning/decontamination of Building 914 has been completed. The building is now statistically determined to be clean; thus, it can be reoccupied and the warehouse operations can be reactivated. Material/equipment leaving the warehouse is no longer required to be cleaned prior to removal. Custodial services and other pertinent activities can resume as scheduled. The scissor lift and man-lifts utilized for this cleanup effort were also surveyed for potential toxic metal contamination. The swipe sample results indicate that the equipment is clean and can be released from the site. No further action is required.

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APPENDIX A: BUILDING 914 PHOTOGRAPHS

APPENDIX B: CONFIRMATORY SAMPLING PLAN

Appendix B
Confirmatory Sampling Plan

Random Sampling Locations for Comparing a Mean with a Fixed Threshold (Parametric)
This section summarizes the sampling design, associated statistical assumptions, as well as general guidelines for conducting post-sampling data analysis. Sampling plan components presented here include how many sampling locations to choose and where within the sampling area to collect those samples. The type of medium to sample (i.e., soil, groundwater, etc.) and how to analyze the samples (in-situ, fixed laboratory, etc.) are addressed in other sections of the sampling plan.

Table 10 below summarizes the sampling design for Be and the driving analyte (the analyte that required the largest number of samples). A figure that shows sampling locations in the field and Tables 11-16 that list sampling location coordinates are also provided below.

Table 10

SUMMARY OF SAMPLING DESIGN	
Primary Objective of Design	Compare a site mean to a fixed threshold
Type of Sampling Design	Parametric
Sample Placement (Location) in the Field	Simple random sampling
Working (Null) Hypothesis	The mean value at the site exceeds the threshold
Formula for calculating number of sampling locations	Student's t-test
Calculated total number of samples	45
Number of samples on map [a]	45
Number of selected sample areas [b]	6
Specified sampling area [c]	40011.945 ft^2

[a] This number may differ from the calculated number because of 1) grid edge effects, 2) adding judgment samples, or 3) selecting or unselecting sample areas.
[b] The number of selected sample areas is the number of colored areas on the map of the site. These sample areas contain the locations where samples are collected.
[c] The sampling area is the total surface area of the selected colored sample areas on the map of the site.

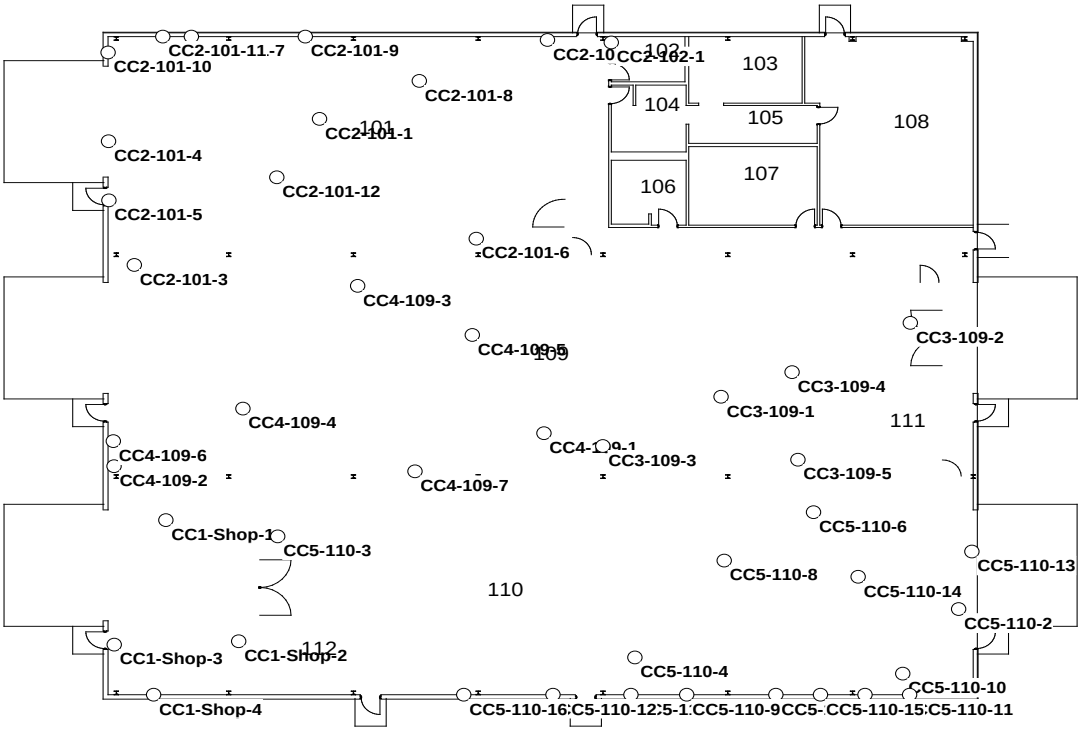

Table 11

Area: P4 - Room 109 West									
X Coord	**Y Coord**	**Z Coord**	**Label**	**Value**	**Type**	**Historical**	**Surface**	**LX**	**LY**
846.52	573.86	0.00	CC4-109-1		Random		Floor	836.69	93.48
19.57	502.31	152.30	CC4-109-2		Random		Wall 3	18.33	152.30
488.13	892.65	0.00	CC4-109-3		Random		Floor	478.30	412.27
267.59	626.99	0.00	CC4-109-4		Random		Floor	257.75	146.61
708.68	786.38	0.00	CC4-109-5		Random		Floor	698.85	306.01
18.30	556.62	280.30	CC4-109-6		Random		Wall 3	72.65	280.30
598.41	491.21	0.00	CC4-109-7		Random		Floor	588.57	10.83

Table 12

Area: P3 - Room 109 East									
X Coord	**Y Coord**	**Z Coord**	**Label**	**Value**	**Type**	**Historical**	**Surface**	**LX**	**LY**
1187.20	652.64	0.00	CC3-109-1		Random		Floor	303.75	170.80
1551.26	812.57	0.00	CC3-109-2		Random		Floor	667.81	330.74
959.66	546.01	0.00	CC3-109-3		Random		Floor	76.22	64.18
1323.72	705.95	0.00	CC3-109-4		Random		Floor	440.28	224.11
1335.10	516.40	0.00	CC3-109-5		Random		Floor	451.65	34.56

Table 13

Area: P1 - Shop									
X Coord	**Y Coord**	**Z Coord**	**Label**	**Value**	**Type**	**Historical**	**Surface**	**LX**	**LY**
119.31	385.79	0.00	CC1-Shop-1		Random		Floor	99.30	377.79
259.30	123.58	0.00	CC1-Shop-2		Random		Floor	239.30	115.57
20.01	116.41	166.52	CC1-Shop-3		Random		Wall 4	108.40	166.52
95.69	8.00	262.52	CC1-Shop-4		Random		Wall 3	204.30	262.52

Table 14

Area: P5 - Room 110									
X Coord	**Y Coord**	**Z Coord**	**Label**	**Value**	**Type**	**Historical**	**Surface**	**LX**	**LY**
1013.86	8.00	17.19	CC5-110-1		Random		Wall 2	658.10	17.19
1644.03	193.35	0.00	CC5-110-2		Random		Floor	1346.00	185.35
334.51	350.55	0.00	CC5-110-3		Random		Floor	36.48	342.54
1021.47	88.55	0.00	CC5-110-4		Random		Floor	723.44	80.55
1292.54	8.00	145.19	CC5-110-5		Random		Wall 2	379.42	145.19
1364.95	402.95	0.00	CC5-110-6		Random		Floor	1066.92	394.94
1464.03	8.00	81.19	CC5-110-7		Random		Wall 2	207.92	81.19
1193.21	298.15	0.00	CC5-110-8		Random		Floor	895.18	290.14
1121.04	8.00	273.19	CC5-110-9		Random		Wall 2	550.91	273.19
1536.69	53.62	0.00	CC5-110-10		Random		Floor	1238.66	45.61
1549.78	8.00	123.86	CC5-110-11		Random		Wall 2	122.17	123.86
863.80	8.00	219.86	CC5-110-12		Random		Wall 2	808.16	219.86
1669.54	317.75	59.86	CC5-110-13		Random		Wall 1	158.90	59.86
1450.82	263.22	0.00	CC5-110-14		Random		Floor	1152.79	255.21
1378.29	8.00	251.86	CC5-110-15		Random		Wall 2	293.67	251.86
692.30	8.00	91.86	CC5-110-16		Random		Wall 2	979.65	91.86

Table 15

Area: P2 - Room 101									
X Coord	**Y Coord**	**Z Coord**	**Label**	**Value**	**Type**	**Historical**	**Surface**	**LX**	**LY**
414.92	1253.90	0.00	CC2-101-1		Random		Floor	406.91	334.02
853.35	1424.60	0.00	CC2-101-2		Random		Floor	845.35	504.72
58.69	937.80	0.00	CC2-101-3		Random		Floor	50.68	17.92
9.07	1205.52	106.08	CC2-101-4		Random		Wall 5	285.64	106.08
9.67	1077.50	202.08	CC2-101-5		Random		Wall 5	157.62	202.08
716.34	994.70	0.00	CC2-101-6		Random		Floor	708.34	74.82
168.30	1431.96	138.08	CC2-101-7		Random		Wall 6	160.29	138.08
606.73	1336.09	0.00	CC2-101-8		Random		Floor	598.73	416.21
387.51	1431.96	74.08	CC2-101-9		Random		Wall 6	379.51	74.08
8.17	1397.54	170.08	CC2-101-10		Random		Wall 5	477.67	170.08
113.49	1431.96	266.08	CC2-101-11		Random		Wall 6	105.49	266.08
332.71	1127.46	0.00	CC2-101-12		Random		Floor	324.71	207.58

Table 16

Area: P2 - Room 102									
X Coord	**Y Coord**	**Z Coord**	**Label**	**Value**	**Type**	**Historical**	**Surface**	**LX**	**LY**
975.97	1419.28	70.92	CC2-102-1		Random		Wall 4	85.07	70.92

Primary Sampling Objective

The primary purpose of sampling at this site was to compare a mean value of a site with a fixed threshold. The working hypothesis (or "null" hypothesis) is that the mean value at the site is equal to or exceeds the threshold. The alternative hypothesis is that the mean value is less than the threshold. VSP calculates the number of samples required to reject the null hypothesis in favor of the alternative hypothesis, given a selected sampling approach and inputs to the associated equation.

Selected Sampling Approach

A parametric random sampling approach was used to determine the number of samples and to specify sampling locations. A parametric formula was chosen because the conceptual model and historical information (e.g., historical data from this site or a very similar site) indicate that parametric assumptions are reasonable. These assumptions will be examined in post-sampling data analysis.

Both parametric and non-parametric approaches rely on assumptions about the population. However, non-parametric approaches typically require fewer assumptions and allow for more uncertainty about the statistical distribution of values at the site. The trade-off is that if the parametric assumptions are valid, the required number of samples is usually less than the number of samples required by non-parametric approaches.

Locating the sample points randomly provides data that are separated by many distances, whereas systematic samples are all equidistant apart. Therefore, random sampling provides more information about the spatial structure of the potential contamination than systematic sampling does. As with systematic sampling, random sampling also provides information regarding the mean value, but there is the possibility that areas of the site will not be represented with the same frequency as if uniform grid sampling were performed.

Number of Total Samples: Calculation Equation and Inputs

The equation used to calculate the number of samples is based on a Student's t-test. For this site, the null hypothesis is rejected in favor of the alternative hypothesis if the sample mean is sufficiently smaller than the threshold. The number of samples to collect is calculated so that 1) there will be a high probability (1-□) of rejecting the null hypothesis if the alternative hypothesis is true and 2) a low probability (□) of rejecting the null hypothesis if the null hypothesis is true.

The formula used to calculate the number of samples is:

$$n = \frac{S^2}{\Delta^2}\left(Z_{1-\alpha} + Z_{1-\beta}\right)^2 + 0.5Z_{1-\alpha}^2$$

where

n is the number of samples;

S is the estimated standard deviation of the measured values including analytical error;

□ is the width of the gray region;

□ is the acceptable probability of incorrectly concluding the site mean is less than the threshold;

□ is the acceptable probability of incorrectly concluding the site mean exceeds the threshold;

$Z_{1-□}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-□}$ is 1-□; and

$Z_{1-□}$ is the value of the standard normal distribution such that the proportion of the distribution less than $Z_{1-□}$ is 1-□.

The values of these inputs that result in the calculated number of sampling locations are provided in Table 17 below.

Table 17

Analyte	**n**	**Parameter**					
		S	□	□	□	$Z_{1-□}$ [a]	$Z_{1-□}$ [b]
Be	45	0.02 ug	0.01 ug	0.05	0.05	1.64485	1.64485
Cd	0	ug	ug				
Cr	0	ug	ug				
Pb	0	ug	ug				
Mn	0	ug	ug				

[a] This value is automatically calculated by VSP based upon the user defined value of □.
[b] This value is automatically calculated by VSP based upon the user defined value of □.

The following figure is a performance goal diagram, described in EPA's QA/G-4 guidance (EPA, 2000) for Be, the driving analyte. It shows the probability of concluding the sample area is dirty on the vertical axis versus a range of possible true mean values for the site on the horizontal axis. This graph contains all of the inputs to the number of samples equation and pictorially represents the calculation.

The red vertical line is shown at the threshold (action limit) on the horizontal axis. The width of the gray shaded area is equal to □; the upper horizontal dashed blue line is positioned at 1-□ on the vertical axis; the lower horizontal dashed blue line is positioned at □ on the vertical axis. The vertical green line is positioned at one standard deviation below the threshold. The shape of the red curve corresponds to the estimates of variability. The calculated number of samples results in the curve that passes through the lower bound of □ at □ and the upper bound of □ at 1-□. If any of the inputs change, the number of samples that result in the correct curve changes.

Statistical Assumptions

The assumptions associated with the formulas for computing the number of samples are:

1. The sample mean is normally distributed (this happens if the data are roughly symmetric or the sample size is more than 30; for extremely skewed data sets, additional samples may be required for the sample mean to be normally distributed);
2. The variance estimate, S^2, is reasonable and representative of the population being sampled;
3. The population values are not spatially or temporally correlated; and
4. The sampling locations will be selected randomly.

The first three assumptions will be assessed in a post data collection analysis. The last assumption is valid because the sample locations were selected using a random process.

Sensitivity Analysis

The sensitivity of the calculation of number of samples was explored by varying the lower bound of gray region (percent of action level), alpha (percent), probability of mistakenly concluding that □ < action level and beta (percent), probability of mistakenly concluding that □ > action level. The following Table 18 shows the results of this analysis.

Table 18

Number of Samples				
AL=0.2		**☐=5**	**☐=10**	**☐=15**
LBGR=90	**☐=5**	13	10	9
	☐=10	10	8	7
	☐=15	8	6	5
LBGR=80	**☐=5**	5	4	4
	☐=10	3	3	3
	☐=15	3	2	2
LBGR=70	**☐=5**	3	3	3
	☐=10	2	2	2
	☐=15	2	2	2

LBGR = Lower Bound of Gray Region (% of Action Level)
☐ = Alpha (%), Probability of mistakenly concluding that ☐< action level
☐ = Beta (%), Probability of mistakenly concluding that ☐> action level
AL = Action Level (Threshold)

Further Recommended Data Analysis Activities

Post data collection activities generally follow those outlined in EPA's Guidance for Data Quality Assessment (EPA, 2000). The data analysts will become familiar with the context of the problem and goals for data collection and assessment. The data will be verified and validated before being subjected to statistical or other analyses. Graphical and analytical tools will be used to verify to the extent possible the assumptions of any statistical analyses that are performed as well as to achieve a general understanding of the data. The data will be assessed to determine whether they are adequate in both quality and quantity to support the primary objective of sampling.

Because the primary objective for sampling for this site is to compare the site mean value with a threshold value, the data will be assessed in this context. Assuming the data are adequate, at least one statistical test will be performed for a comparison between the data and the threshold of interest. Results of the exploratory and quantitative assessments of the data will be reported, along with conclusions that may be supported by them.