

From: Kouretas, Malgorzata E CIV USARMY ARDEC (US)
To: [Lawyer, Dennis](#)
Cc: [Krasnow, Nicholas D Jr CIV USARMY \(US\)](#)
Subject: [External_Sender] RE: RE: Department of the Army, Request for Additional Information Concerning Application for a License Amendment, Control 601500, Lic. No. SUB-348, Docket No. 04006377
Date: Wednesday, January 03, 2018 2:39:47 PM
Attachments: [Response to NRC RAI 14 Dec 2017.pdf](#)

Mr. Lawyer,

Attached please find our response letter to your request for additional information. It includes several figures showing the locations of the random sampling points. The subcontractor was encountering a problem running the D&D code. As a result, a table documenting how the DCGL was determined has been included in the meantime in an attempt to meet your 20-day response request. I hope this is adequate for now.

V/r,
Margaret

Malgorzata Kouretas
Health Physicist/ Radiation Safety Officer
RDAR-CRM
ARDEC Risk Management Office
Bldg. 355, Picatinny Arsenal, NJ 07806
Comm: 973-724-6518
DSN: 880-6518

-----Original Message-----

From: Lawyer, Dennis [<mailto:Dennis.Lawyer@nrc.gov>]
Sent: Monday, December 18, 2017 8:09 AM
To: Kouretas, Malgorzata E CIV USARMY ARDEC (US) <malgorzata.e.kouretas.civ@mail.mil>
Subject: [Non-DoD Source] RE: RE: Department of the Army, Request for Additional Information Concerning Application for a License Amendment, Control 601500, Lic. No. SUB-348, Docket No. 04006377

Ms. Kouretas,

That would not allow me sufficient time to review the response by my management's deadline. Please request withdrawal of the amendment and you may resubmit the amendment request when you have the additional information.

Dennis Lawyer
U.S. NRC Region 1
Health Physicist
610-337-5366

-----Original Message-----

From: Kouretas, Malgorzata E CIV USARMY ARDEC (US) [<mailto:malgorzata.e.kouretas.civ@mail.mil>]
Sent: Friday, December 15, 2017 9:54 AM
To: Lawyer, Dennis <Dennis.Lawyer@nrc.gov>
Subject: [External_Sender] RE: Department of the Army, Request for Additional Information Concerning Application for a License Amendment, Control 601500, Lic. No. SUB-348, Docket No. 04006377

Mr. Lawyer,

601500
NNSG/RGNI MATERIALS-002

After discussing with the Health Physicist at Joint Munitions Command (JMC)-Rock Island, a response in 20 calendar days (which is ~January 3rd) is not feasible right now as a result of the holiday schedule and other high priority disposal projects that JMC is working. We'd like to ask that the deadline be extended until January 26th for the formal RAI response.

Thank you,
Margaret Kouretas

Malgorzata Kouretas
Health Physicist/ Radiation Safety Officer RDAR-CRM Bldg. 355, Picatinny Arsenal, NJ 07806
Comm: 973-724-6518
DSN: 880-6518

-----Original Message-----

From: Lawyer, Dennis [<mailto:Dennis.Lawyer@nrc.gov>]
Sent: Thursday, December 14, 2017 6:59 AM
To: Kouretas, Malgorzata E CIV USARMY ARDEC (US) <malgorzata.e.kouretas.civ@mail.mil>
Subject: [Non-DoD Source] Department of the Army, Request for Additional Information Concerning Application for a License Amendment, Control 601500, Lic. No. SUB-348, Docket No. 04006377

Dear Ms. Kouretas,

This is in reference to your letter dated October 24, 2017, requesting for approval of a survey plan and an amendment to Nuclear Regulatory Commission License No. SUB-348, Docket No. 04006377. In order to continue our review, we need the following additional information:

1. From your request, it appears that the building will be remodeled as office space, except for the Metallography Laboratory. To meet the alternate resuspension factor as given in NUREG-1720, Re-Evaluation of the Indoor Resuspension Factor for the Screening Analysis of the Building Occupancy Scenario for NRC's License Termination Rule, Draft Report, please confirm that the building and its rooms will have similar activities to light industrial use or less, that the ventilation in the building will be comparable ventilation to support light industrial, that surfaces went through cleaning or washing processes to ensure that contamination adheres to the building surfaces.

2. In section 1.3.3 of your survey plan, you state there is potentially contaminated Depleted Uranium (DU) asbestos containing floor tile under the sole plates in the DU room. Based upon the description, it appears this area is not open for surveying. Please state the status of this potentially DU and how it will be removed or surveyed to ensure it meets the release criteria.

3. In section 3.3, you state that you calculated the Derived Concentration Guideline Level (DCGL) as 2,240 disintegrations per minute/100 square centimeters utilizing DandD, Version 2.1. Please submit a copy of that calculation.

4. In section 4.7.1, it states that sections of epoxy will be removed to measure the existing floor. Most methods to remove the epoxy would cause further decontamination and may not reflect an accurate measurement of the remaining level of contamination on the floor. Please state how you will control or ensure an accurate reading of the floor that has epoxy covering the floor to ensure the DCGL is met.

5. In section 4.2, you state that sink drains, fume hoods, and ventilation in the Metallography Lab will be a class one survey. Please describe in detail how you would implement such a survey in these area.

6. In section 3.4.6, it states that you will use WRS Test or Sign Test. Based upon the amount of scoping surveys that have been performed, it would appear that one would have enough information to state which areas would need WRS test if any. Please provide more information on the need to perform WRS testing.

7. Please describe how you will pick random points for surveying. Also please provide maps and survey points associated with the proposed plan.

We will continue our review upon receipt of this information. Please reply to my attention at the Region 1 Office (Address below) and refer to Mail Control No. 601500. If you have technical questions regarding this letter, please call me at (610) 337-5366.

Your reply must be an originally signed and dated letter. The letter may be scanned and submitted as a pdf document attached to an email; or it may be transmitted by facsimile to (610) 337-5269; or it may be sent by regular mail. If we do not receive a reply from you within 20 calendar days from the date of this e-mail, we will assume that you do not wish to pursue your application OR amendment request.

Please respond by e-mail to acknowledge that you have received the e-mail request for additional information.

Region 1 Office Mailing Address: Licensing Assistance Team, US Nuclear Regulatory Commission Region I, 2100 Renaissance Boulevard, Suite 100, King of Prussia, PA 19406-2713.

Dennis Lawyer

U.S. NRC Region 1

Health Physicist

610-337-5366



DEPARTMENT OF THE ARMY
US ARMY RESEARCH, DEVELOPMENT AND ENGINEERING COMMAND
ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER
PICATINNY ARSENAL, NEW JERSEY 07806-5000

2 January 2018

RDAR-CRM

MEMORANDUM FOR NUCLEAR REGULATORY COMMISSION REGION I
ATTN: MR. DENNIS LAWYER

**SUBJECT: Response to Request for Additional Information dated 14 Dec 2017,
Control 601500, License No. SUB-348**

1. RDECOM ARDEC management has confirmed that the building and its rooms will have similar activities to light industrial use or less and that the ventilation in the building is sufficient to support light industrial uses. Surfaces in the building have not gone through a cleaning or washing process in total as part of a decontamination effort; however, many areas have been cleaned prior to previous survey efforts in 2006 and 2010 to prepare the surfaces for the surveys. In addition, the building has continued to be used and has been cleaned as a normal course of housekeeping in the building.
2. Surveys conducted in 2006 and 2010 demonstrated that the floors not under the sole plates in the DU Room met release criteria, so there is no reason to believe that radioactive contamination exists in excess of criteria on the floor under the sole plates. Therefore, the inaccessible area under the sole plates in the DU Room are considered non-impacted and do not require survey. As an added measure of conservatism, an additional 2-3 biased measurements will be collected after removal of wall sections sufficient to allow for survey of the currently inaccessible floor area under the sole plates.
3. The calculated screening level DCGL for U-238 (including use of the revised resuspension factor of $1E-6$ m⁻¹) is 1400 dpm/100 cm² and if using surveys for gross alpha emissions as the primary method of demonstrating compliance, this DCGL would be applicable. However, since the plan is to use beta emissions as the primary method of demonstrating compliance and the alpha to beta ratio for depleted uranium is 1:1.6 (NUREG 1757, Appendix O, Section O.3.3.5), the 2,240 dpm/ 100 cm² should be used as the screening level DCGL for depleted uranium. A copy of the D&D output summary report will be provided. In the meantime, attached is a table which shows DCGLs calculated using the revised resuspension factor guidance from the NUREG.
4. It is no longer planned to remove the epoxy. The Survey Plan will be revised as such. The 2.2 MeV beta can be measured through the epoxy. The calculated approximate range of a 2.2 MeV beta particle through an epoxy material with a density of 1.4 g/cm³ is about 0.8 cm. My research into epoxy floors shows that a 0.25 cm (0.2 to 0.3 cm) is the typical thickness on a self-leveling floor. The 2.2 maximum beta energy has an average beta energy of 0.819 MeV. At the average energy of 0.819 MeV a beta particle will have a range of 0.25 cm when passing through an epoxy layer with a density of 1.4 g/cm³. As



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discussed in NUREG 1507 for beta energies > 0.4 MeV, a surface efficiency of 0.5 is appropriate, however, a surface efficiency of 0.25 will be used when surveying epoxy covered surfaces to account for the lower energy betas below 0.819 MeV that do not pass through the epoxy.

5. Agreed that sinks, ventilation lines and other similar equipment and materials are typically not considered a Class 1 with a triangular grid. However, MARSAME does allow for a MARSSIM Type survey design. The plan will be revised to discuss that sinks and ventilation lines will be sampled at representative accessible locations or that a free release survey on those types of items may be performed similar to what would be done for a tool such as a hammer (i.e., scan survey, loose contamination measurements over 100 cm² or the entire item if less than 100 cm², and fixed measurements if necessary based on the sensitivity of the scan survey).

6. Reference area measurements are planned; therefore, the WRS Test will be used for all areas where final status surveys are conducted on such materials where reference area measurements are able to be collected for a specific media to be surveyed. Note that in cases where the gross results from surveys of a specific media are all below the DCGL, there is no need to apply reference area measurements and in those cases the survey unit automatically passes the statistical test. There may also be cases where an appropriate reference area cannot be located on-site or from applicable reference documents such as NUREG-1507. In those cases, only instrument background will be subtracted from the gross survey results and the Sign Test is the applicable statistical test. The plan will be revised to clarify.

7. Random points are determined through the use of a random number generator to determine the appropriate X and Y coordinate from a pre-determine axis point for each survey unit. The attached figure will be included in the final plan with the random locations shown for any Class 3 survey units.

8. The Point of Contact for this memorandum is the undersigned at 973.724.6518 or malgorzata.e.kouretas.civ@mail.mil.


MALGORZATA E. KOURETAS
Radiation Safety Officer, ARDEC

Encl: Table of Revised Screening Level DCGLs for Building Surfaces
Class 3 Sample Locations- Bldg. 315

Screening Level DCGLs for the Stated Radionuclides

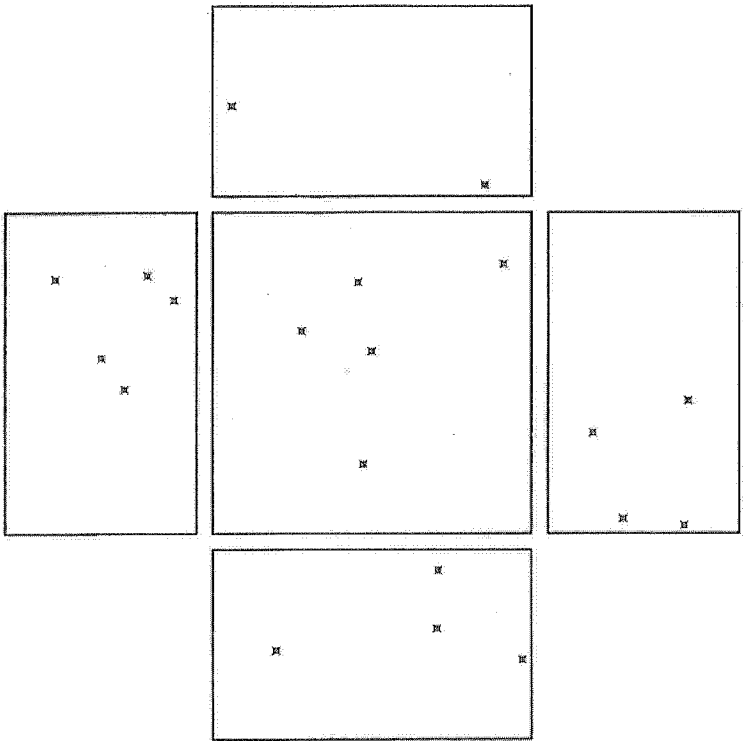
Half-Lives Exceeding 120 Days					
Isotope	Half-Life	Screening Level DCGL ² (dpm/100 cm ²)	Isotope	Half-Life	Screening Level DCGL ² (dpm/100 cm ²)
H-3	12.2 y	1.2 x 10 ⁸	Au-195 ³	183d	NL
C-14	5730 y	9.1 x 10 ⁶	Po-210	138.4 d	2.0 x 10 ⁴
Na-22	2.62 y	9.5 x 10 ³	Ra-226	1602 y	5.0 x 10 ³
Cl-36	3.08 x 10 ³ y	3.2 x 10 ⁶	Th-228	1.91 y	6.0 x 10 ²
K-40	1.26 x 10 ⁹ y	1.1 x 10 ³	Th-230	8.0 x 10 ⁴ y	5.1 x 10 ²
Ca-45	165 d	1.0 x 10 ⁷	Th-232	1.41 x 10 ¹⁰ y	1.0 x 10 ²
Mn-54	303 d	3.2 x 10 ⁴	U-232	72 y	2.3 x 10 ²
Fe-55	2.60 y	4.5 x 10 ⁶	U-233	1.62 x 10 ⁵ y	1.2 x 10 ³
Co-57	270 d	2.3 x 10 ³	U-234	2.47 x 10 ⁵ y	1.3 x 10 ³
Co-60	5.263 y	7.1 x 10 ³	U-235	7.1 x 10 ⁸ y	1.3 x 10 ³
Ni-63	92 y	1.8 x 10 ⁶	U-238	4.51 x 10 ⁹ y	1.4 x 10 ³
Se-75	120.4 d	1.1 x 10 ³	Pu-236	2.85 y	1.2 x 10 ³
Kr-85	10.76 y	NA	Pu-238	86.4 y	4.0 x 10 ²
Sr-90	27.7 y	8.7 x 10 ¹	Pu-239	2.44 x 10 ⁴ y	3.7 x 10 ²
Tc-99	2.12 x 10 ⁵ y	8.3 x 10 ⁶	Am-241	458 y	4.0 x 10 ²
Cd-109	453 d	5.1 x 10 ³	Am-243	7.9 x 10 ⁴ y	4.0 x 10 ²
Cs-137	30 y	3.0 x 10 ⁴	Cm-244	17.6 y	7.0 x 10 ²
Ba-133 ³	10.7 y	NL	Cf-252 ³	2.646 y	Software error
Eu-152	12.7 y	2.0 x 10 ⁴			
Na-24	14.96 h	2.0 x 10 ⁶	Nb-95	35.0 d	1.7 x 10 ³
P-32	14.28 d	2.7 x 10 ⁷	Mo-99	66.7 h	6.4 x 10 ⁶
P-33	24.4 d	1.7 x 10 ⁸	Tc-99m	6.049 h	1.5 x 10 ⁸
S-35	87.9 d	6.2 x 10 ⁷	Ru-103	39.5 d	2.5 x 10 ³
Sc-46	83.9 d	2.9 x 10 ⁴	In-111	2.81 d	4.1 x 10 ⁶
Cr-51	27.8 d	5.3 x 10 ⁹	I-125	60.2 d	9.9 x 10 ³
Fe-59	45.6 d	8.9 x 10 ¹	I-131	8.05 d	1.3 x 10 ⁶
Cr-51	27.8 d	5.3 x 10 ⁶	I-135	6.68 h	9.2 x 10 ⁶
Br-82	35.34 h	1.2 x 10 ⁶	Xe-133	5.27 d	NA
Rb-86	18.66 d	2.4 x 10 ⁶	Ir-192	74.2d	7.8 x 10 ⁴
Sr-85	64.0 d	1.4 x 10 ³	Au-198	2.697 d	4.1 x 10 ⁶
Sr-89	52.7 d	6.3 x 10 ⁶	Hg-203	46.9 d	4.0 x 10 ³

¹ Radionuclides with atomic numbers exceeding 82 (i.e., lead) commonly decay through one or more daughter products prior to decaying to a stable, non-radioactive, constituent. Daughter products of radiological COPCs will be fully evaluated if the parent is detected.

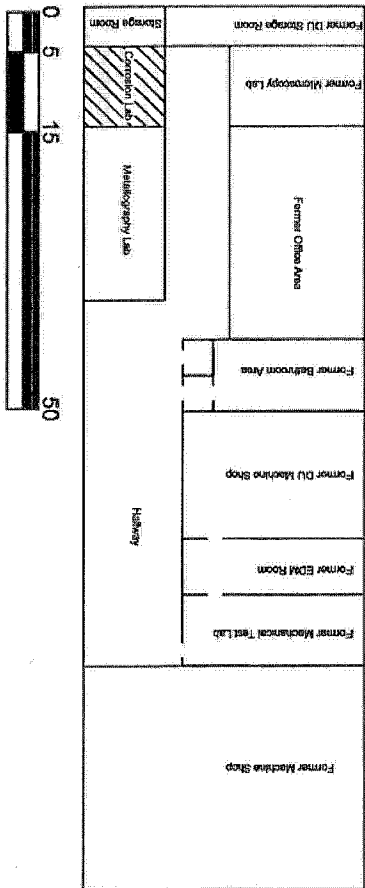
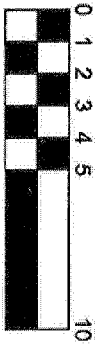
² NRC Screening level DCGLs adjusted pursuant to *Re-Evaluation of the Indoor Resuspension Factor for the Screening Analysis of the Building Occupancy Scenario for NRC's License Termination Rule - Draft Report* (NUREG-1720) by use of a resuspension factor of $1 \times 10^{-6} \text{ m}^{-1}$ while maintaining all other parameters constant. The screening level DCGL for tritium (H-3) is taken directly from NRC guidance and is not modified based on the resuspension factor.

³ Ba-133 and Au-195 are not listed (NL) in D&D V2.1. In addition, D&D V2.1 has an apparent software error which precludes computation of a screening level DCGL for Cf-252. Site specific DCGLs will be developed for these or other radionuclides for which screening level DCGLs do not exist if they are determined to be present.

dpm/100 cm² – disintegrations per minute per 100 square centimeters



Corrosion Lab



Hidden Plates Snc
 3939 W. McKinley Ave
 Milwaukee, WI 53208

Title: Class 3 Sample Locations

Date: December 28, 2017

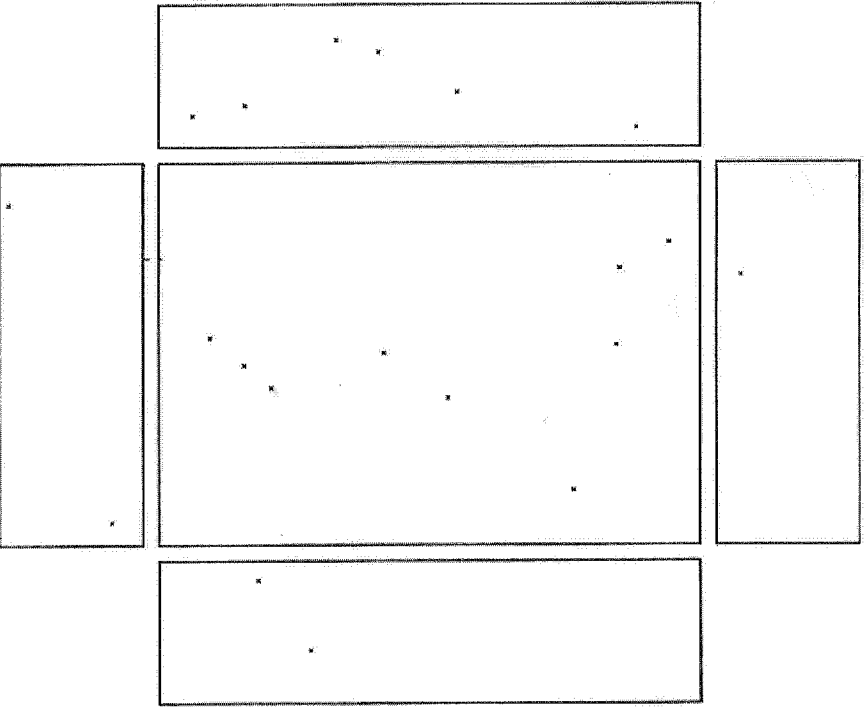
Location: Corrosion Lab

Project: Building 315

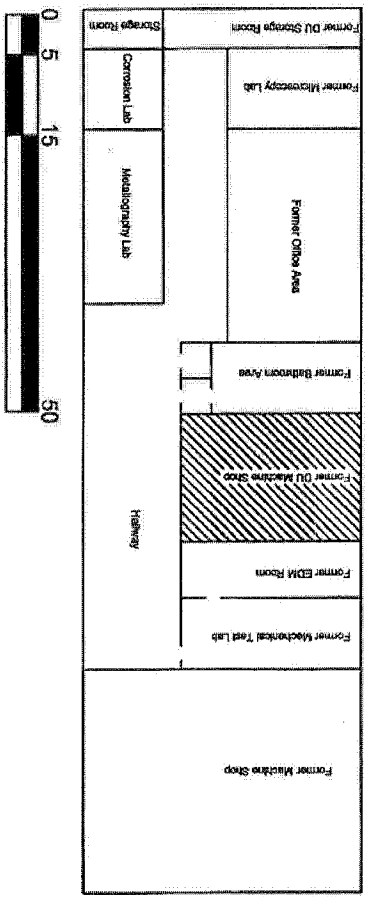
Job Number: USA 2015-017

Scale: As Shown

315



Former DU Machine Shop



Hidden Water Spr.

3939 W. McKinley Ave

Milwaukee, WI 53208

Title: Class 3 Sample Locations

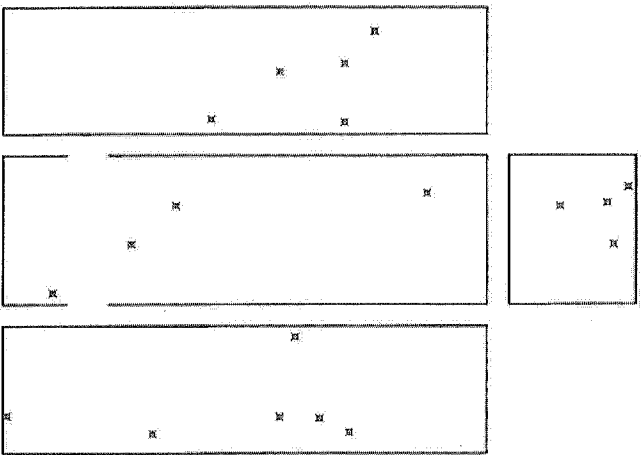
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Location: DU Machine Shop

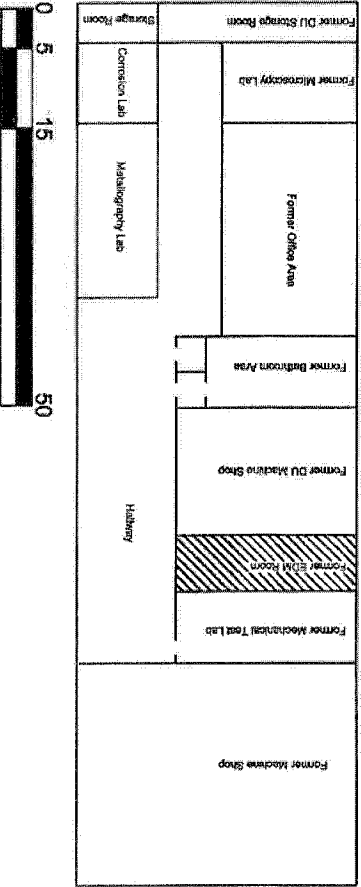
Project: Building 315

Job Number: USA 2015-017

Scale: As Shown

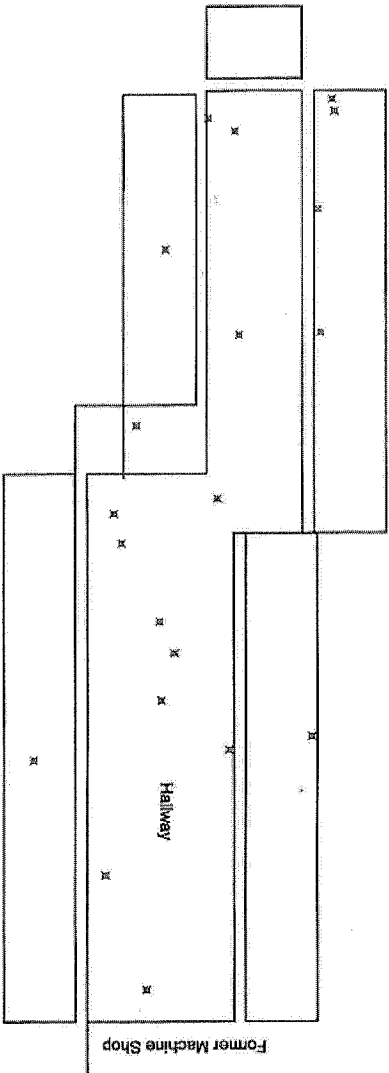
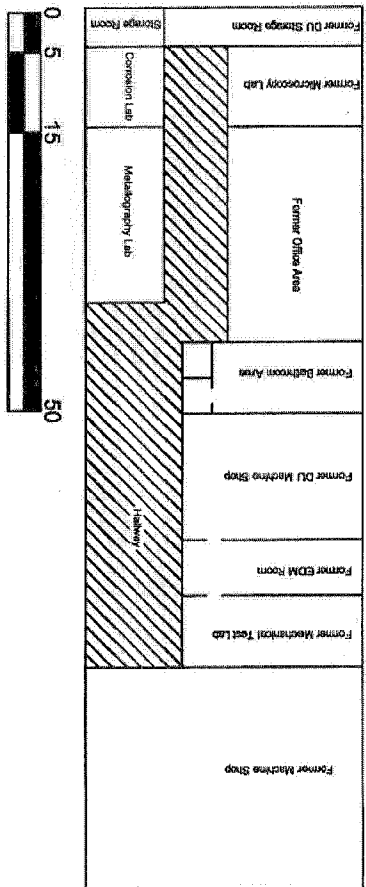


Former EDM Room



*Hidden Water Spas
3939 E. McKinley Ave
Milwaukee, WI 53208*

Title: Class 3 Sample Locations	Date: December 28, 2017	Location: EDM Room
Project: Building 315	Job Number: USA 2015-017	Scale: As Shown



Hidden Plates Found
 3939 W. McKinley Ave
 Milwaukee, WI 53208

Title: Class 3 Sample Locations

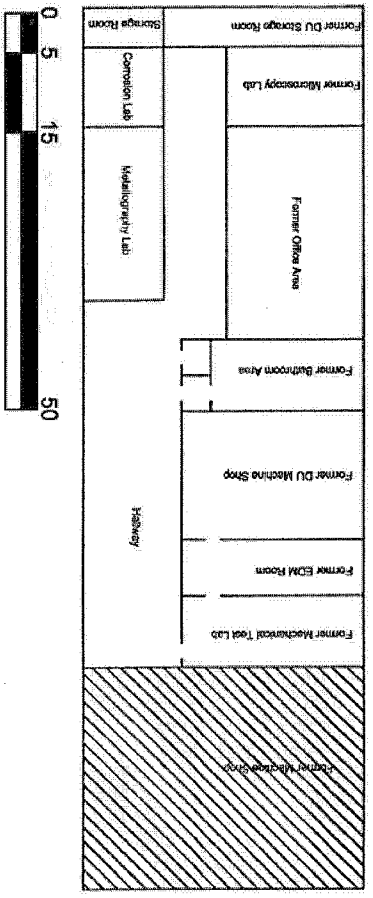
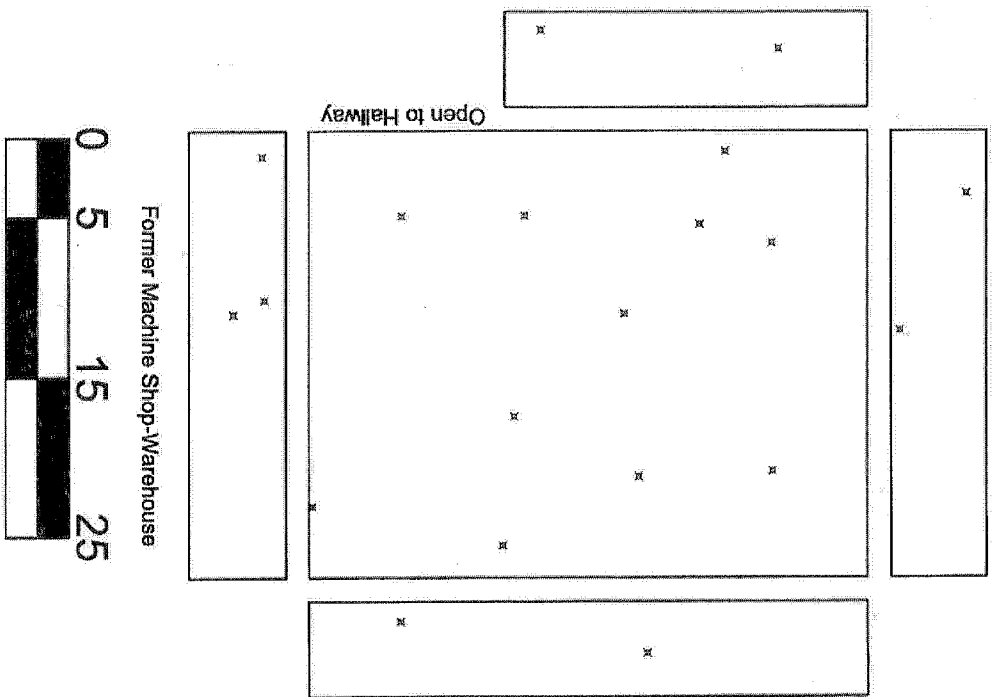
Date: December 28, 2017

Location: Hallway

Project: Building 315

Job Number: USA 2015-017

Scale: As Shown



Hidden Alates Ave
3939 W. Markinsley Ave
Milwaukee, WI 53208

Title: Class 3 Sample Locations

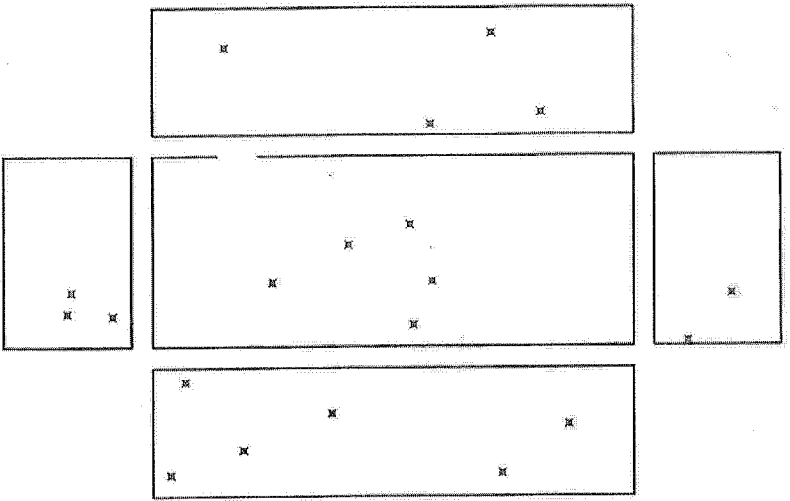
Date: December 28, 2017

Location: Machine Shop/Warehouse

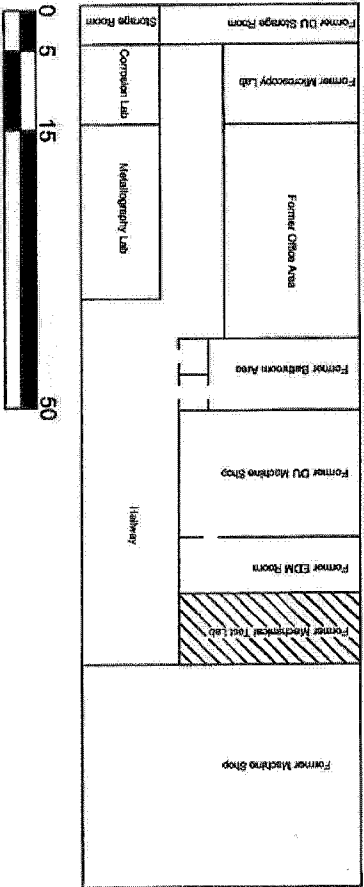
Project: Building 315

Job Number: USA 2015-017

Scale: As Shown



Former Mechanical Test Lab



Hidden Alloys Inc.

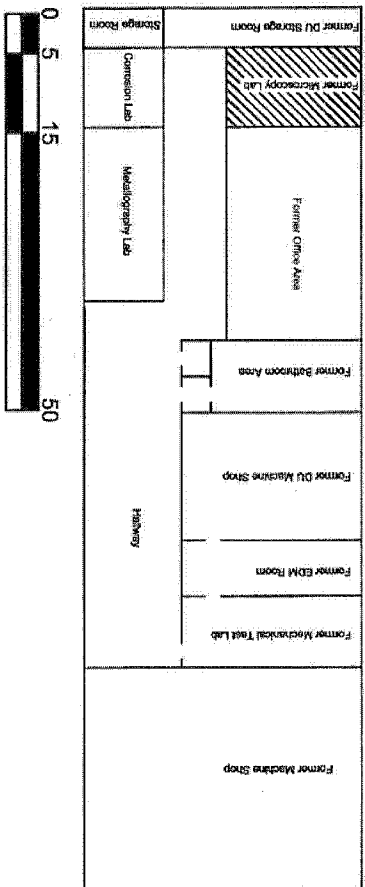
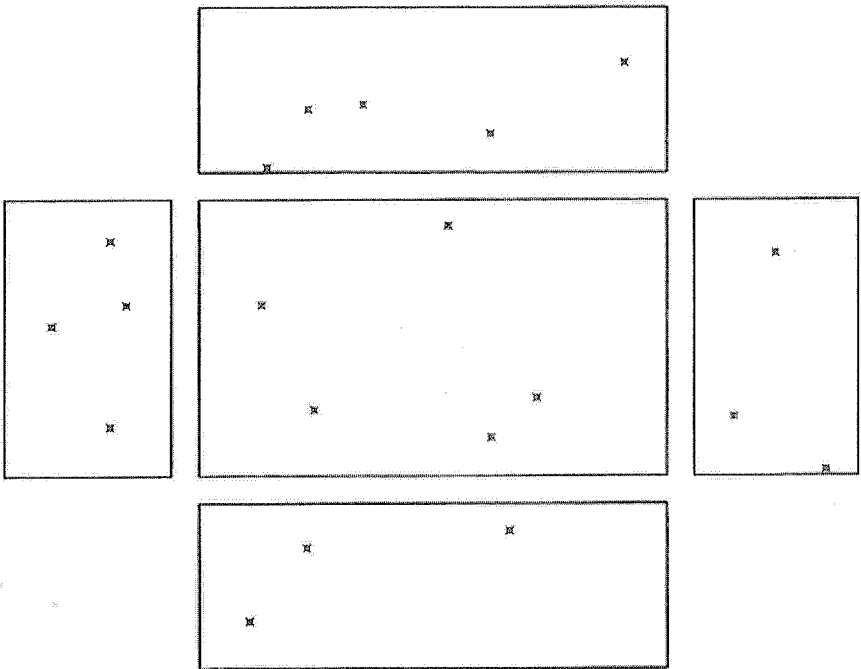
3939 W. Markinley Ave

Milwaukee, WI 53208

Title: Class 3 Sample Locations Date: December 28, 2017 Location: Mechanical Test Lab

Project: Building 315 Job Number: USA 2015-017 Scale: As Shown

Former Microscopy Lab
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Andres Blater Snc
 3939 W. McKinley Ave
 Milwaukee, WI 53208

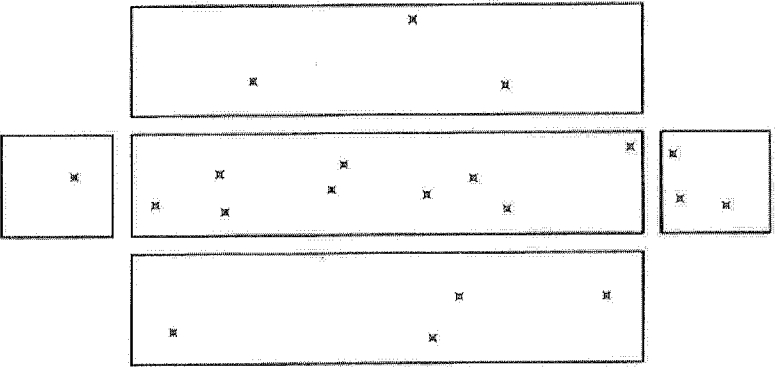
Title: Class 3 Sample Locations
 Project: Building 315

Date: December 28, 2017

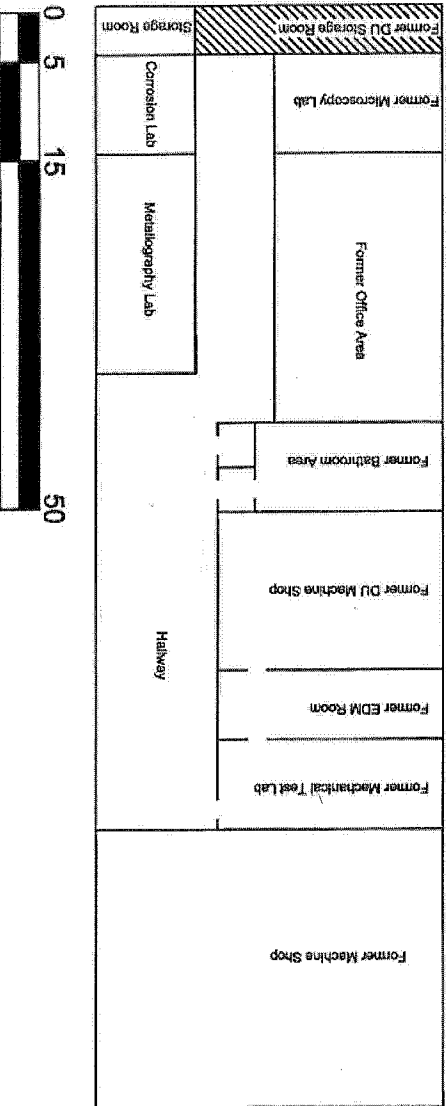
Job Number: USA 2015-017

Location: Microscopy Lab

Scale: As Shown



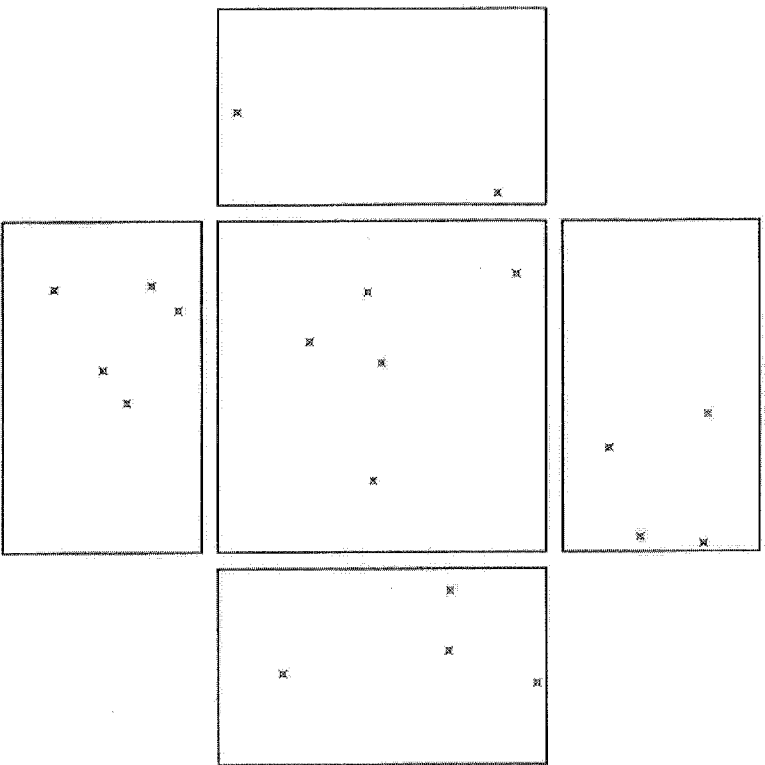
Former DU Storage Room



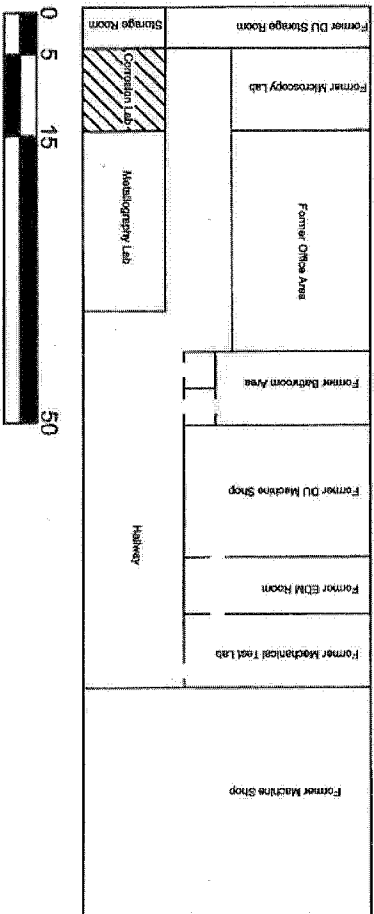
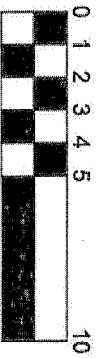
Hidden Plates Inc.
 3939 W. McKinley Ave
 Milwaukee, WI 53208

Title: Class 3 Sample Locations Date: December 28, 2017 Location: DU Storage Room

Project: Building 315 Job Number: USA 2015-017 Scale: As Shown



Corrosion Lab



Hidden Plates Spc.

*3939 W. McKinley Ave
Milwaukee, WI 53208*

Title: Class 3 Sample Locations

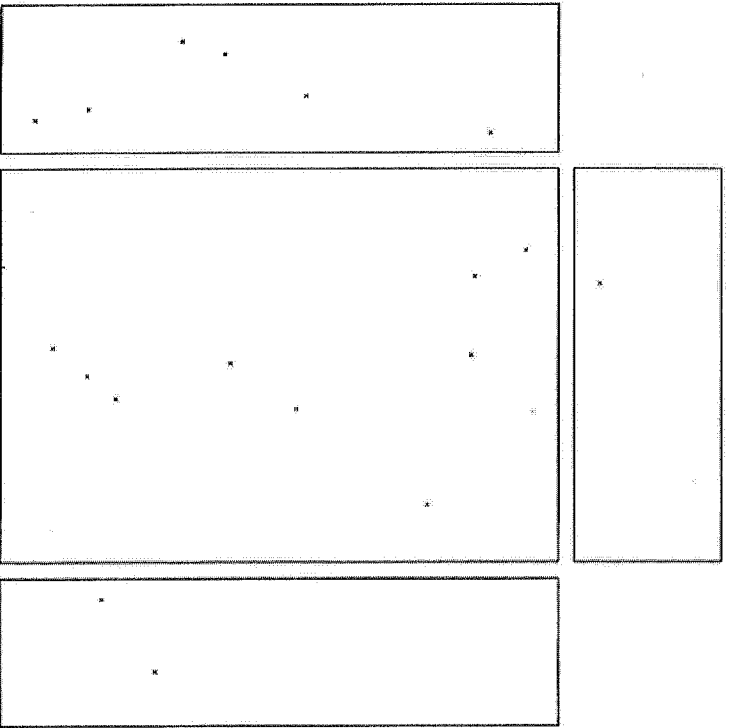
Date: December 28, 2017

Location: Corrosion Lab

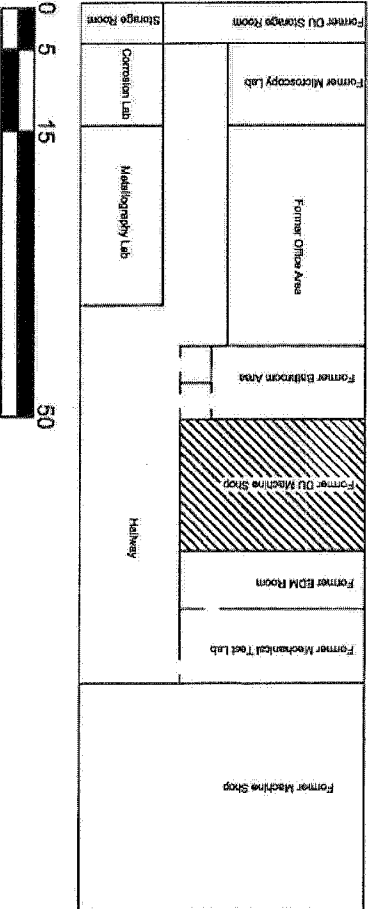
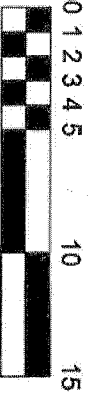
Project: Building 315

Job Number: USA 2015-017

Scale: As Shown



Former DU Machine Shop

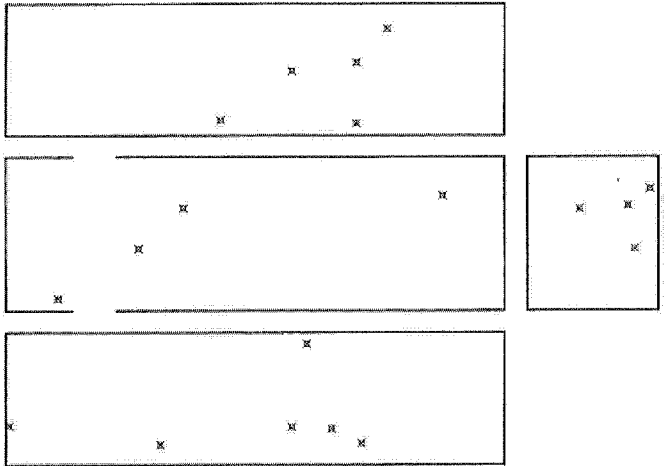


Hidden Water Spur
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 Milwaukee, WI 53208

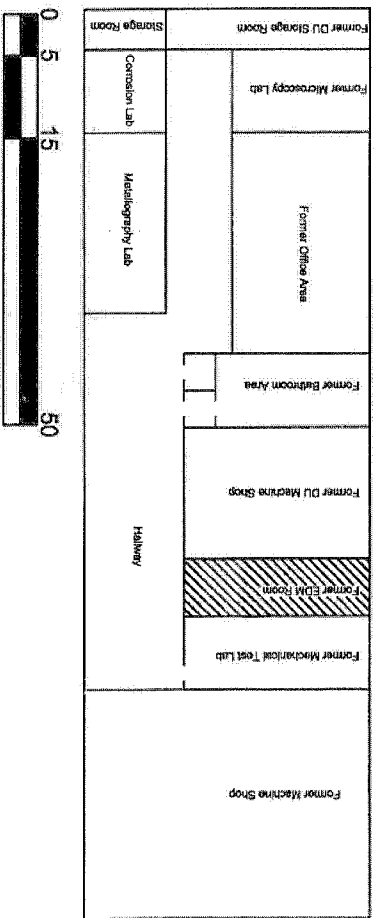
Title: Class 3 Sample Locations
 Project: Building 315

Date: December 28, 2017
 Job Number: USA 2015-017

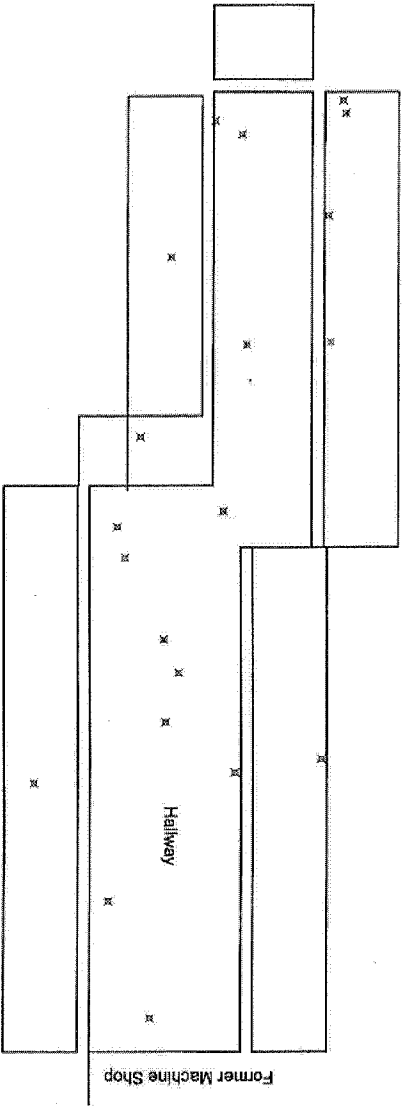
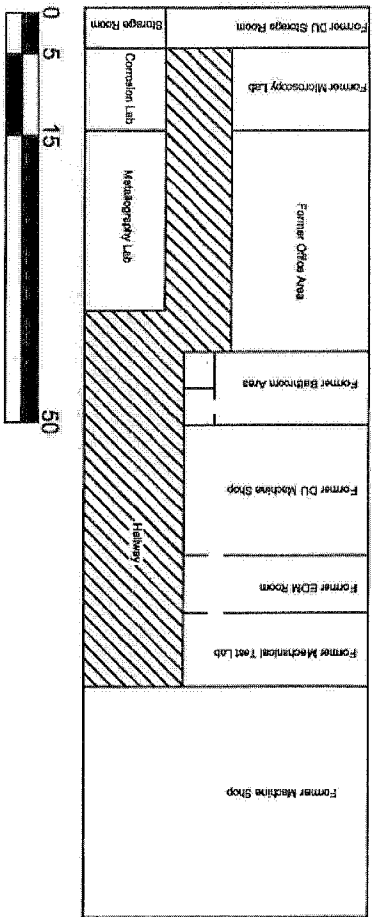
Location: DU Machine Shop
 Scale: As Shown



Former EDM Room



<p><i>Hidden Water Sws</i> 3939 W. McKinley Ave Milwaukee, WI 53208</p>		<p>Title: Class 3 Sample Locations</p>	
<p>Project: Building 315</p>		<p>Date: December 28, 2017</p>	
<p>Job Number: USA 2015-017</p>		<p>Location: EDM Room</p>	
<p>Scale: As Shown</p>			



Hidden Water Sna.

3939 W. McKinley Ave

McWancker, WI 53208

Title: Class 3 Sample Locations

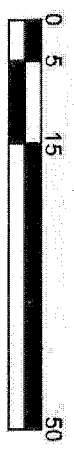
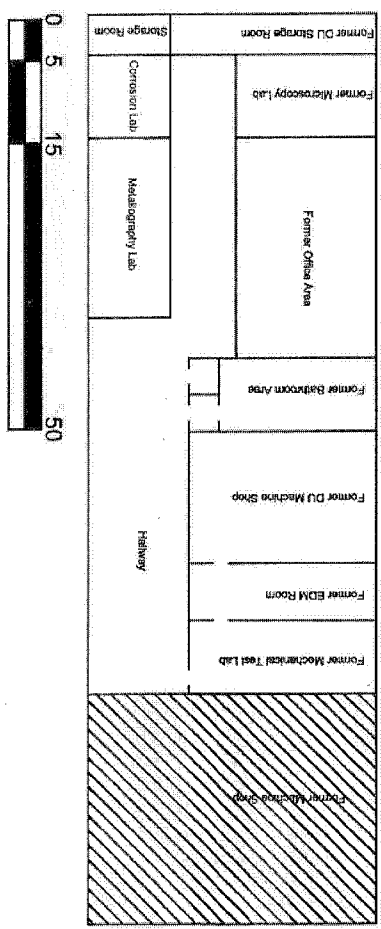
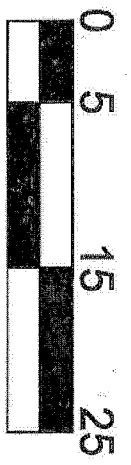
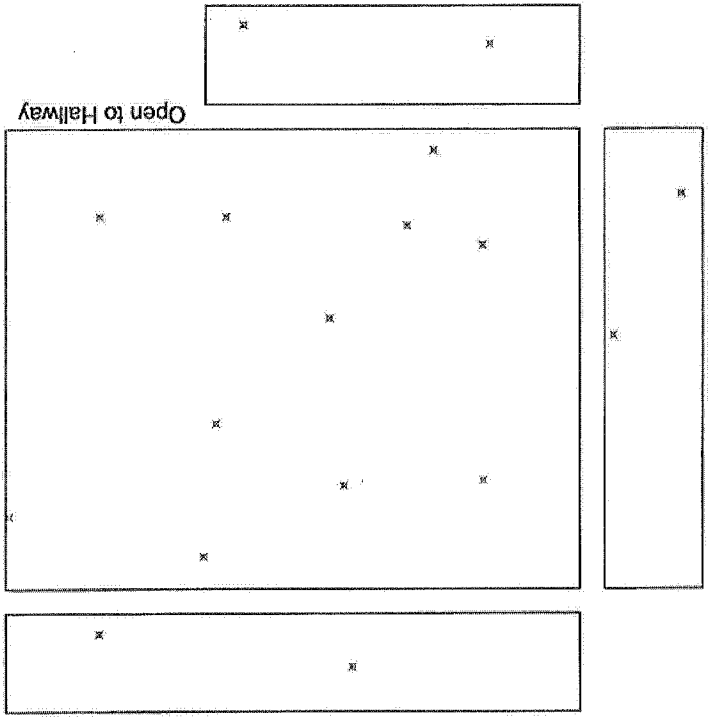
Date: December 28, 2017

Location: Hallway

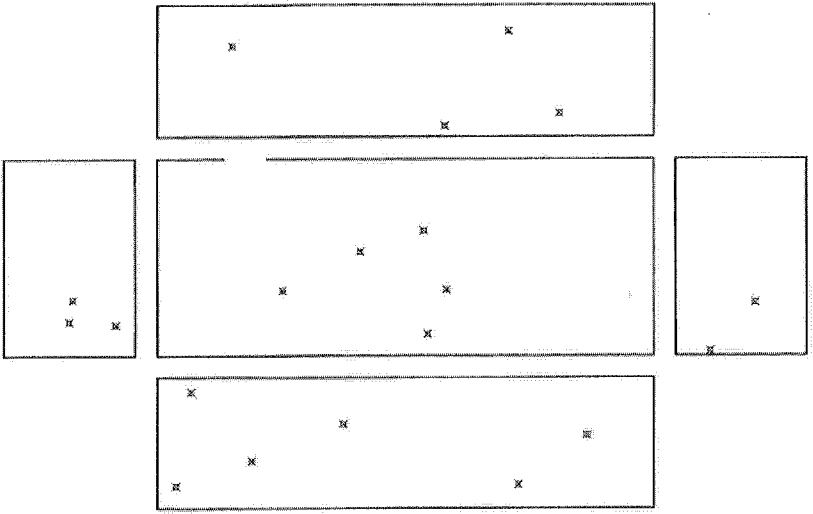
Project: Building 315

Job Number: USA 2015-017

Scale: As Shown



<p><i>Hidden Water Sws</i> 3939 W. McKinley Ave Milwaukee, WI 53208</p>		<p>Title: Class 3 Sample Locations</p>	
<p>Project: Building 315</p>		<p>Date: December 28, 2017</p>	
<p>Job Number: USA 2015-017</p>		<p>Location: Machine Shop/Warehouse</p>	
<p>Scale: As Shown</p>			

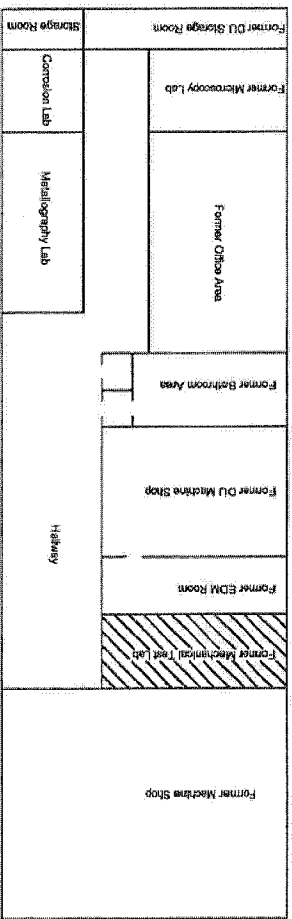


Former Mechanical Test Lab

0 1 2 3 4 5 10 15



0 5 15 50



Hidden Water Svc.

3939 W. McKimby Ave

Midvale, UT 84049 532008

Title: Class 3 Sample Locations

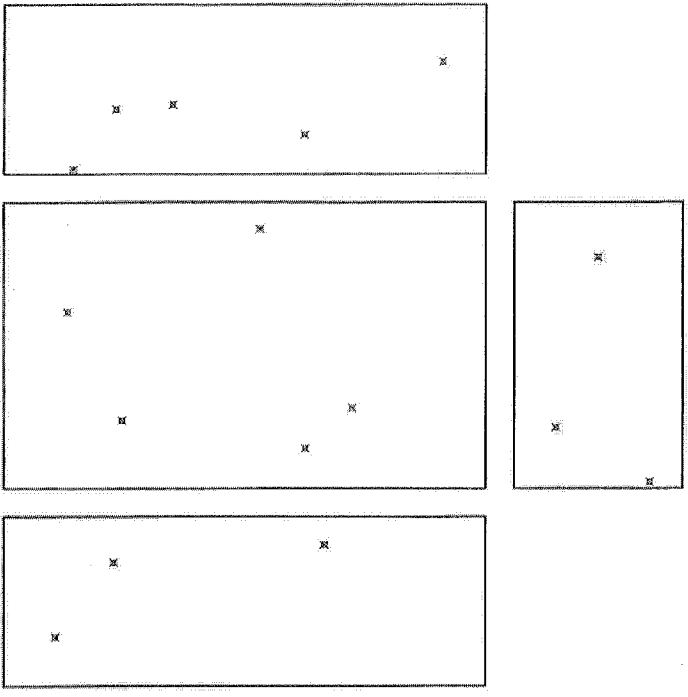
Date: December 28, 2017

Location: Mechanical Test Lab

Project: Building 315

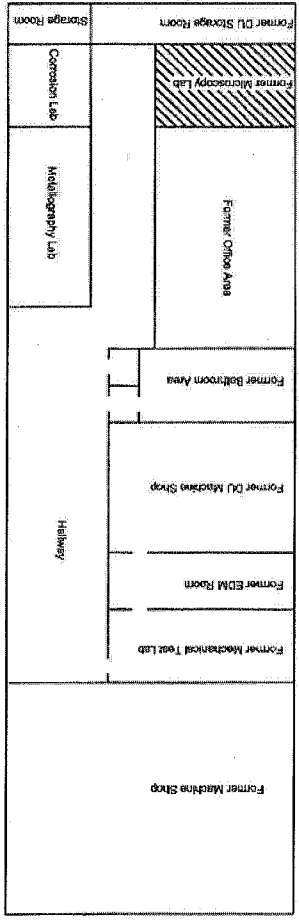
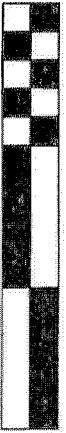
Job Number: USA 2015-017

Scale: As Shown



Former Microscopy Lab

012345 10 15



Title: Class 3 Sample Locations

Date: December 28, 2017

Location: Microscopy Lab

Hidden Water Sws

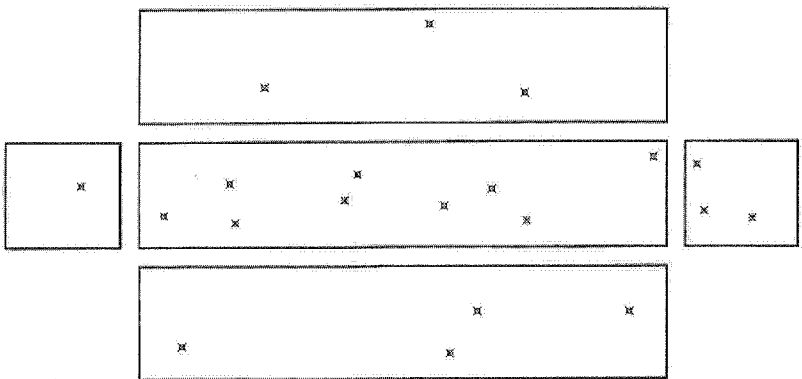
3939 W. McKinley Ave

Milwaukee, WI 53208

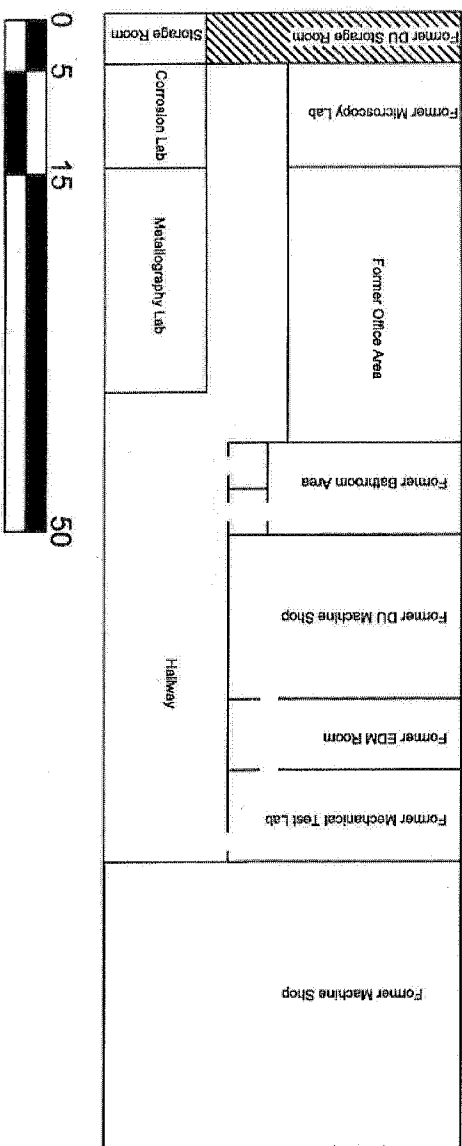
Project: Building 315

Job Number: USA 2015-017

Scale: As Shown



Former DU Storage Room



Hidden Alates Surr.

3939 W. McKinley Ave

McMinnaker, WI 53208

Title: Class 3 Sample Locations

Date: December 28, 2017

Location: DU Storage Room

Project: Building 315

Job Number: USA 2015-017

Scale: As Shown