Best
Environmental Consultants Inc.

ENVIRONMENTAL WIPE SAMPLING ASSESSMENT

PROJECT
Tallaboa Industrial Park Site's Sorroundings and Background Investigation
Peñuelas, PR

Prepared by: Best Environmental Consultants, Inc.
Lead-Asbestos Consultants
PO Box 560180
Guayanilla, PR 00656-0180

Prepared for:
Homeca Recycling Center Co., Inc. and Tallaboa Industrial Park, LLC

June 4, 2017

Table of Contents

I. Introduction:

On May 23, 2017 wipe sampling was performed at locations in the vicinity of the Tallaboa Industrial Park's Site and other locations at a distance from this site which should serve as background concentrations for the investigation of asbestos fibers in the area. This investigation was performed by Carlos Ocasio, Asbestos Inspector and Project Designer licensed (Licenses numbers: ASB09160497SI/ASB11160578PD). The procedure for selecting the sample locations followed, in general terms, those in the investigation conducted by the U.S. Environmental Protection Agency (EPA) in 2013 and 2014, as part of the removal assessment. Wipe samples for asbestos dust were performed as requested by HOMECA Recycling Center Co., Inc. (Homeca) and Tallaboa Industrial Park, LLC (TIP).

This wipe sampling and indirect analysis test method is used for the general testing of surfaces for asbestos. It is used to assist in the evaluation of surfaces in buildings, such as ceiling tiles, shelving, electrical components, duct work, and so forth. This test method provides an index of the concentration of asbestos structures per unit area sampled as derived from a quantitative measure of the number of asbestos structures detected during analysis.

At present, a single direct relationship between asbestos sampled from a surface and potential human exposure does not exist. Accordingly, the user should consider these data in relationship to other available information (for example, air sampling data) in their evaluation.

II. Scope of the Standard Test Method for Wipe Sampling

1. This test method covers a procedure to identify asbestos in samples wiped from surfaces and to provide an estimate of the concentration of asbestos reported as the number of asbestos structures per unit area of sampled surface. The procedure outlined in this test method employs an indirect sample preparation technique. It is intended to disperse aggregated asbestos into fundamental fibrils, fiber bundles, clusters, or matrices. However, as with all indirect sample preparation techniques, the asbestos observed for quantification may not represent the physical form of the asbestos as sampled. More specifically, the procedure described neither creates nor destroys asbestos, but it may alter the physical form of the mineral fiber aggregates.
2. This test method describes the equipment and procedures necessary for wipe sampling of surfaces for levels of asbestos structures. The sample is collected onto a particle-free wipe material (wipe) from the surface of a sampling area that may contain asbestos.
3. The collection efficiency of this wipe sampling technique is unknown and will vary among substrates. Properties influencing collection efficiency include surface texture, adhesiveness, and other factors.
4. This test method is generally applicable for an estimate of the surface loading of asbestos structures starting from approximately 1000 asbestos structures per square centimeter.

5. Asbestos identification by transmission electron microscopy (TEM) is based on morphology, electron diffraction (ED), and energy dispersive X-ray analysis (EDXA).
6. This test method allows determination of the type(s) of asbestos fibers present.
7. This test method cannot always discriminate between individual fibers of the asbestos and non-asbestos analogues of the same amphibole mineral.
8. There is no lower limit to the dimensions of asbestos fibers that can be detected. However, in practice, the lower limit to the dimensions of asbestos fibers, that can be detected, is variable and dependent on individual microscopists. Therefore, a minimum length of 0.5 μm has been defined as the shortest fiber to be incorporated in the reported results.
9. This test method does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

III. Reference Documents

A. ASTM Standards: ASTM D6480-05(2010), Standard Test Method for Wipe Sampling of Surfaces, Indirect Preparation, and Analysis for Asbestos Structure Number Concentration by Transmission Electron Microscopy, ASTM International, West Conshohocken, PA, 2010

B. Government Standard: 40 CFR 763, USEPA, Asbestos-Containing Materials in Schools: Final Rule and Notice, Appendix A to Sub-Part E.

IV. General Background

Asbestos was used in the construction 1900 to 1989. It is still being used today in various products. The health effects of asbestos have been studied since the 1930's. More health studies have been conducted in asbestos than any other natural substance. The mere presence of asbestos containing materials does not necessarily constitute a health hazard. However, when these materials become disturbed from building renovation, maintenance, or other every day activities that allow fibers to be released into the environment, a potential hazard does exist.

The relationship between exposure level and health risk is very complex. Although this relationship is not completely understood, asbestos exposure has been associated with various types of lung diseases including a debilitating lung disease called Asbestosis; a rare cancer of chest called Mesothelioma; and cancers of the esophagus, stomach, colon and other organs. Asbestosis

is not fatal; it is, however, incurable. One who has it cannot breathe easily and physical activity becomes limited. Mesothelioma is 100% fatal, as there is no cure. These diseases can be directly linked to the mineral of asbestos in the particle form that can be found in the lining of the lung and stomach, since the body cannot absorb these minerals. Tests have determined that asbestos can cause cancer, but scientists disagree on the amount of asbestos fibers that must be inhaled to cause cancer. The nose filters out all visible particles. Therefore, only the microscopic fibers are the ones who cause the problem.

Studies indicate different health effect resulting from exposure to chrysotile asbestos versus exposure to amphibole form of asbestos. The latter, which include tremolite, amosite, actinolite, athophyllite and crocidolite have more significant health impact than chrysotile. Some scientists' studies conclude that the dimensions of the fiber determine which ones enter in the lung area, resulting in cancer. Long, thin fibers, greater than 8 microns (µm) in length and less than 0.25 microns in diameter show the highest potential of cancer development.

V. Selection of Sampling Locations

For the selection of sampling locations, several documents were used. These are:

1. Weston Solutions, Inc. reports identified as Phase I, II, IIIA to IIID and IV for the Removal Assessment of the Puerto Rico Olefins Asbestos Site, in Peñuelas, Puerto Rico, from December 2013 to May 2014 under EPA Contract No. EP-W-06-072;

2. The Atmospheric Assessment Group report titled Sources of Asbestos Chrysotile Structures Along PR2-The Contribution of Asbestos Mineral Contained in Brake Pads, Brake Shoes and Lining Materials to the Levels of Asbestos Structures Determined to be Present in the Tallaboa-Encarnación Auto, July 2014;
3. EPA's Memorandum by Chuck Nace, Environmental Toxicologist, ERRD/PSB/TSS, dated November 6, 2014, Re: Technical Review of "Sources of Asbestos Chrysotile Structures Along PR2";
4. Analytical Environmental Services International, Inc. report titled Report of Initial Fingerprinting Findings Related to Puerto Rico Olefin Site, Peñuelas, Puerto Rico, dated February 2015;
5. EPA's letter dated May 29, 2015, signed Chloe Metz, Chief, Technical Support Section, Emergency and Remedial Response Division and addressed to Rafael A. Toro Ramírez, Re: Report of Initial Fingerprinting Findings, Puerto Rico Olefin Site, Peñuelas, Puerto Rico; and
6. Final Report, Administrative Settlement Agreement and Order of Consent for a Removal Action, Index No. CERCLA-02-2014-2014, by SAQ Environmental Engineers, Inc., dated October 9, 2014.

Based on these reports and the fact that EPA conducted investigations that lead to the clean-up of the Jorge Valdivieso School and the Encarnación Ward Head Start, were based on wipe sampling procedures and their corresponding analytical test, the sample procedure was selected in this investigation. In order to determine the asbestos fibers concentration, using wipe sampling techniques, locations were selected in the mentioned school and Head Start, both of which had already been cleaned-up to the satisfaction of the EPA. In addition, sampling locations were selected at distances from the TIP site, in locations similar to the ones where background data was investigated and developed by the EPA. Also, these distance locations were selected to investigate the current concentrations were the findings form the above-mentioned reports.

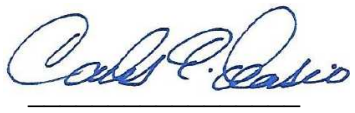
The overall goal of the sampling collection locations is to determine the existing conditions at these locations.

VI. Project Identification/ Description

The ten (10) wipe samples were taken at selected locations. The samples were distributed along Ponce, Guayanilla and Peñuelas, PR. The specific locations with their coordinates are included in Figures 1 thru 5. Samples were taken and analyzed by US ASTM D6480-05: TEM, by CEI Labs in North Carolina (CEI Lab Code T17-1049).

VII. Summary of Wipe Sampling and Analyses Results

Sample ID	Sample Area	Matrix	Asbestos Type	Asbestos Structures	Sample Concentration
136-052317-W-01	100 cm²	Wipe	None Detected	0	<980 s/cm²
136-052317-W-02	100 cm²	Wipe	Chrysotile	34	33,000 s/cm²
136-052317-W-03	100 cm²	Wipe	Chrysotile	2	2,000 s/cm²
136-052317-W-04	100 cm²	Wipe	Chrysotile	28	27,000 s/cm²
136-052317-W-05	100 cm²	Wipe	Chrysotile	1	980 s/cm²
136-052317-W-06	100 cm²	Wipe	Chrysotile	21	21,000 s/cm²
136-052317-W-07	100 cm²	Wipe	Chrysotile	26	25,000 s/cm²
136-052317-W-08	100 cm²	Wipe	Chrysotile	20	20,000 s/cm²
136-052317-W-09	100 cm²	Wipe	Chrysotile	9	18,000 s/cm²
136-052317-W-10	100 cm²	Wipe	Chrysotile	23	45,000 s/cm²



Carlos Ocasio
Asbestos Inspector/Project Design
ASB-0916-0497-SI
ASB-1116-0578-PD

APPENDIX I CREDENTIALS

CERTIFIED ACM INSPECTOR/PROJECT DESIGNER
ENVIRONMENTAL QUALITY BOARD OF PUERTO RICO


TARJETA DE REGISTRO
PARA LA REMOCION DE ASBESTO
Esta tarjeta autoriza a:
Carlos E. Ocasio Feliciano
Inspector
A trabajar en la remoción de asbesto.
Esta persona NO es un empleado, ni un representante de la Junta
ASB-0916-0497-SI
Número de Registro
1-sept-2017
Fecha de vencimiento
Firma Autorizada
Junta de Calidad Ambiental


TARJETA DE REGISTRO
PARA LA REMOCION DE ASBESTO
Esta tarjeta autoriza a:
Carlos E. Ocasio Feliciano
Diseñador
A trabajar en la categoría indicada.
Esta persona NO es un empleado, ni un representante de la Junta
ASB-1116-0578-PD
Número de Registro
27-oct-2017
Fecha de vencimiento
Firma Autorizada
Junta de Calidad Ambiental

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101768-0

CEI Labs, Inc.

Cary, NC

is accredited by the National Voluntary Laboratory Accreditation Program for specific services, listed on the Scope of Accreditation, for:

Asbestos Fiber Analysis

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communique dated January 2009).

2017-04-01 through 2018-03-31

Effective Dates

For the National Voluntary Laboratory Accreditation Program

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

CEI Labs, Inc.
730 SE Maynard Road
Cary, NC 27511
Dr. Tianbao Bai
Phone: 919-481-1413 Fax: 919-481-1442
Email: bai@ceilabs.com
http://www.ceilabs.com

ASBESTOS FIBER ANALYSIS — NVLAP LAB CODE 101768-0

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- Appendix E to Subpart E of Part 763 -- Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

Airborne Asbestos Analysis

Code	*Description*
18/A02	U.S. EPA's "Interim Transmission Electron Microscopy Analytical Methods-Mandatory and Nonmandatory-and Mandatory Section to Determine Completion of Response Actions" as found in 40 CFR, Part 763, Subpart E, Appendix A.

For the National Voluntary Laboratory Accreditation Program

APPENDIX II ANALYTICAL RESULTS

May 31, 2017

Best Environmental Consultants
PO Box 560180
Guayanilla , PR 00656-0180

CLIENT PROJECT: Puerto Rico Olefins Penuelas PR
CEI LAB CODE: T17-1049

Dear Customer:

Enclosed are asbestos analysis results for TEM dust wipe samples received at our laboratory on May 26, 2017. The samples were analyzed for asbestos using transmission electron microscopy (TEM) per ASTM D6480-05 Method.

Currently, there is no regulatory limit for asbestos in dust. The analytical sensitivity for the ASTM D6480-05 method is 1,000 structures per square centimeter.

Thank you for your business and we look forward to continuing good relations. If you have any questions, please feel free to call our office at 919-481-1413.

Kind Regards,

Tianbao Bai, Ph.D., CIH
Laboratory Director

730 SE Maynard Road • Cary, NC 27511 • 919.481.1413

ASBESTOS ANALYTICAL REPORT
By: Transmission Electron Microscopy

Prepared for

Best Environmental Consultants

CLIENT PROJECT: Puerto Rico Olefins Penuelas PR

CEI LAB CODE: T17-1049

TEST METHOD: Dust Wipe
ASTM D6480-05

REPORT DATE: 05/31/17

TEL: 866-481-1412

www.ceilabs.com

ASBESTOS DUST ANALYSIS

By: TRANSMISSION ELECTRON MICROSCOPY

Client: Best Environmental Consultants
PO Box 560180
Guayanilla , PR 00656-0180

CEI Lab Code: T17-1049
Date Received: 05-26-17
Date Analyzed: 05-31-17
Date Reported: 05-31-17

Project: Puerto Rico Olefins Penuelas PR

TEM DUST WIPE (ASTM D6480-05)

Client ID Lab ID	Area Sampled (cm^2)	Area Analyzed (mm^2)	Filtration Factor	Analytical Sensitivity (s/cm^2)	# of Structures	Asbestos Type	Concentration (s/cm^2)
136-052317-W-01 T63119	100	0.098	10	980	0	None Detected	<980
136-052317-W-02 T63120	100	0.098	10	980	34	Chrysotile	33,000
136-052317-W-03 T63121	100	0.098	10	980	2	Chrysotile	2,000
136-052317-W-04 T63122	100	0.098	10	980	28	Chrysotile	27,000
136-052317-W-05 T63123	100	0.098	10	980	1	Chrysotile	980
136-052317-W-06 T63124	100	0.098	10	980	21	Chrysotile	21,000
136-052317-W-07 T63125	100	0.098	10	980	26	Chrysotile	25,000
136-052317-W-08 T63126	100	0.098	10	980	20	Chrysotile	20,000
136-052317-W-09 T63127	100	0.098	20	2,000	9	Chrysotile	18,000

ASBESTOS DUST ANALYSIS

By: TRANSMISSION ELECTRON MICROSCOPY

Client: Best Environmental Consultants
PO Box 560180
Guayanilla , PR 00656-0180

CEI Lab Code: T17-1049
Date Received: 05-26-17
Date Analyzed: 05-31-17
Date Reported: 05-31-17

Project: Puerto Rico Olefins Penuelas PR

TEM DUST WIPE (ASTM D6480-05)

Client ID Lab ID	Area Sampled (cm^2)	Area Analyzed (mm^2)	Filtration Factor	Analytical Sensitivity (s/cm^2)	# of Structures	Asbestos Type	Concentration (s/cm^2)
136-052317-W-10 T63128	100	0.098	20	2,000	23	Chrysotile	45,000
136-052317-W11 T63149	Blank	0.098	10		0	None Detected	

LEGEND: None

METHOD: ASTM D6480-05

ANALYTICAL SENSITIVITY: 1,000 structures/cm^2

REGULATORY LIMIT: None

This report relates only to the samples tested or analyzed and may not be reproduced, except in full, without written approval by CEI Labs, Inc. CEI Labs makes no warranty representation regarding the accuracy of client submitted information in preparing and presenting analytical results. Interpretation of the analytical results is the sole responsibility of the client. Estimated measurement of uncertainty is available on request. Samples were received in acceptable condition unless otherwise noted.

ANALYST: Kamila Reichert
Kamila Reichert

APPROVED BY:
Tianbao Bai, Ph.D., CIH
Laboratory Director

Best Environmental Consultants Inc.

PO BOX 560180, GUAYANILLA PR 00656-0180

CHAIN OF CUSTODY(TRANSMITAL SHEET FOR SAMPLES)

T17-1048
T63118-128 (10)

COC#:	136-052317-TEM-W

Customer Name:	*Homeca Recycling*	**Project Name:**	*Puerto Rico Olefins Peñuelas PR.*		
Contact:	*Benjamin Cintron*	**Total Samples:**	*11*	**Job Number:**	*JN-0136*
Phone/Fax/E-mail:	*787-548-5494*	**EQB Certified Inspector ID:**	*ASB-0916-0497-SI*	**Remarks:**	
Collected by:	*Carlos E. Ocasio Feliciano*	**Structure Address:**		*Wipe Analysis by ASTM D6480-05*	
Analized by Lab:	*Cei Labs Inc.*	*Project : Puerto Rico Olefins, Peñuelas PR.*			
AIHA Lab ID:					
Project Description:	*Wipe Sampling Event Analyzed by ASTM D6480-05*				

Sample No.	Date	Time	Sample Description	Sample Type: Wipe	Soil	Paint Chip	TCLP	Bulk
136-052317-W-01	May 23, 2017	14:30	Wipe Floor Sample 10cm X 10cm, In side Head Start, Tallaboa	X				
136-052317-W-02	May 23, 2017	14:43	Wipe Floor Sample 10cm X 10cm, Out side, Main Entrance,Head Start Tallaboa	X				
136-052317-W-03	May 23, 2017	15:25	Wipe Floor Sample 10cm X 10cm, Exterior, 17° 58' 33"N 66° 41' 29"O	X				
136-052317-W-04	May 23, 2017	15:33	Wipe Floor Sample 10cm X 10cm, Exterior, 17° 58' 60"N 66° 42' 22"O	X				
136-052317-W-05	May 23, 2017	15:58	Wipe Floor Sample 10cm X 10cm, Lunch Room, Jorge Lucas Valdivieso School	X				
136-052317-W-06	May 23, 2017	16:20	Wipe Floor Sample 10cm X 10cm, Lunch Room, Entrance Jorge Lucas Valdivieso School	X				
136-052317-W-07	May 23, 2017	16:35	Wipe Floor Sample 10cm X 10cm, Exterior, 18° 2' 2"N 66° 43' 25" O	X				
136-052317-W-08	May 23, 2017	16:50	Wipe Floor Sample 10cm X 10cm, Exterior, 18° 1' 50"N 66° 43' 45" O	X				
136-052317-W-09	May 23, 2017	17:30	Wipe Floor Sample 10cm X 10cm, Exterior, 18° 2' 19"N 66° 48' 3" O	X				
136-052317-W-10	May 23, 2017	17:50	Wipe Floor Sample 10cm X 10cm, Exterior, 18° 2' 10"N 66° 48' 6" O	X				

Turn Around Time: Normal: ___X___3 days **Rush: _____**

Sampling Collected by:	Relinquished by:	Received by:	Relinquished by:	Received by	Delivery to Lab by:	Received at Lab by:
		TC				
Date: Time:	**Date: Time:**	**Date: Time:**	**Date: Time:**	**Date: Time:**	**Date: Time:**	**Date: Time:**
May-23-17	May-23-17	5-26 12:30				

T17-1048

Best Environmental Consultants Inc.

PO BOX 560180, GUAYANILLA PR 00656-0180

CHAIN OF CUSTODY(TRANSMITAL SHEET FOR SAMPLES)

COC#:	136-052317-TEM-W-2

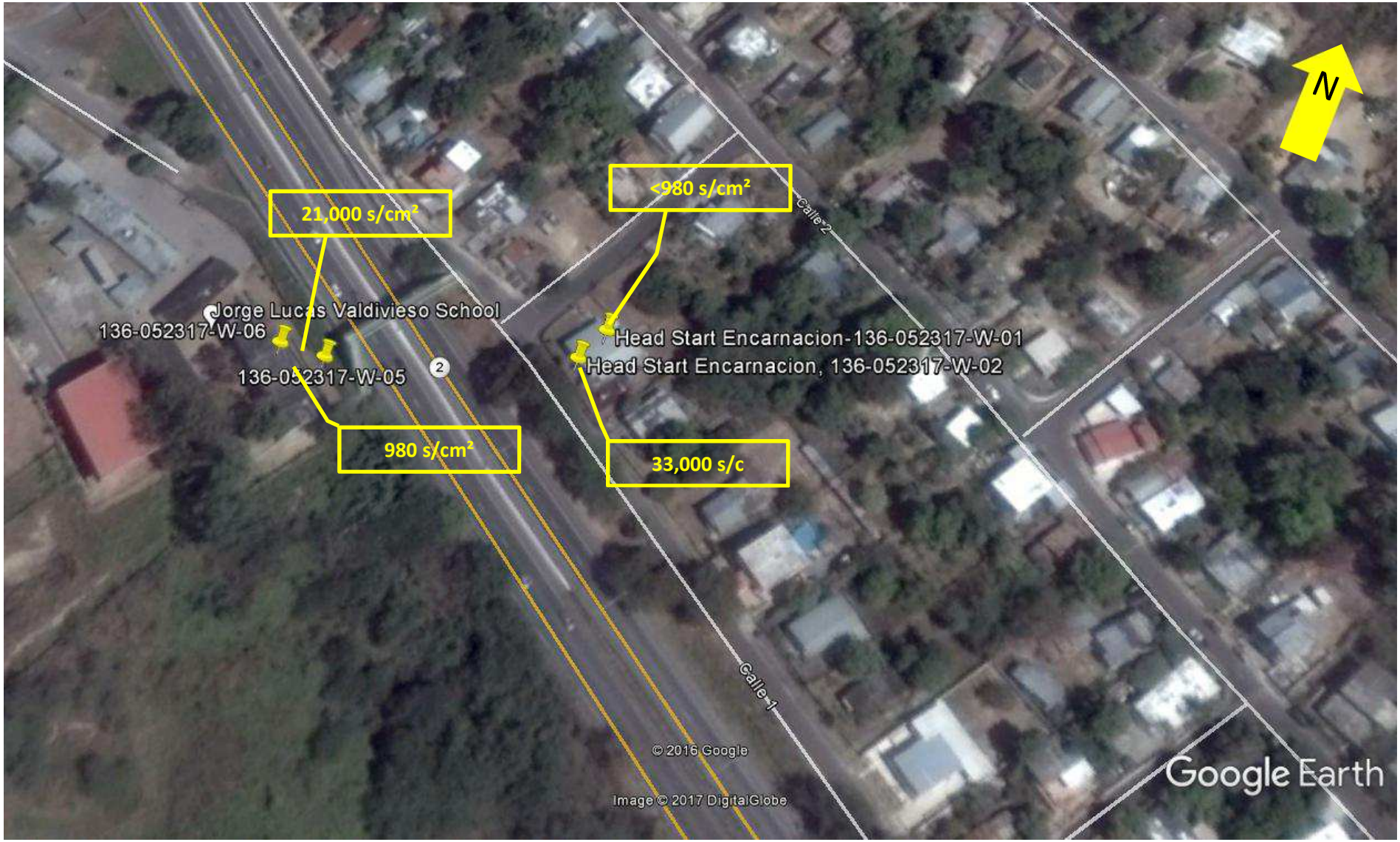
Customer Name:	*Homeca Recycling*	**Project Name:**	*Puerto Rico Olefins Peñuelas PR.*		
Contact:	*Benjamin Cintron*	**Total Samples:**	*11*	**Job Number:**	*JN-0136*
Phone/Fax/E-mail:	*787-548-5494*	**EQB Certified Inspector ID:**	*ASB-0916-0497-SI*	**Remarks:**	
Collected by:	*Carlos E. Ocasio Feliciano*	**Structure Address:**		*Wipe Analysis by ASTM D6480-05*	
Analized by Lab:	*Cei Labs Inc.*	*Project : Puerto Rico Olefins, Peñuelas PR.*			
AIHA Lab ID:					
Project Description:	*Wipe Sampling Event Analyzed by ASTM D6480-05*				

Sample No.	Date	Time	Sample Description	Sample Type: Wipe	Soil	Paint Chip	TCLP	Bulk
136-052317-W-11	May 23, 2017	17:52	Filed Blank	X				

Turn Around Time: Normal: ___X___3 days **Rush: _____**

Sampling Collected by:	Relinquished by:	Received by:	Relinquished by:	Received by	Delivery to Lab by:	Received at Lab by:
Date: Time:	**Date: Time:**	**Date: Time:**	**Date: Time:**	**Date: Time:**	**Date: Time:**	**Date: Time:**
May-23-17	May-23-17					

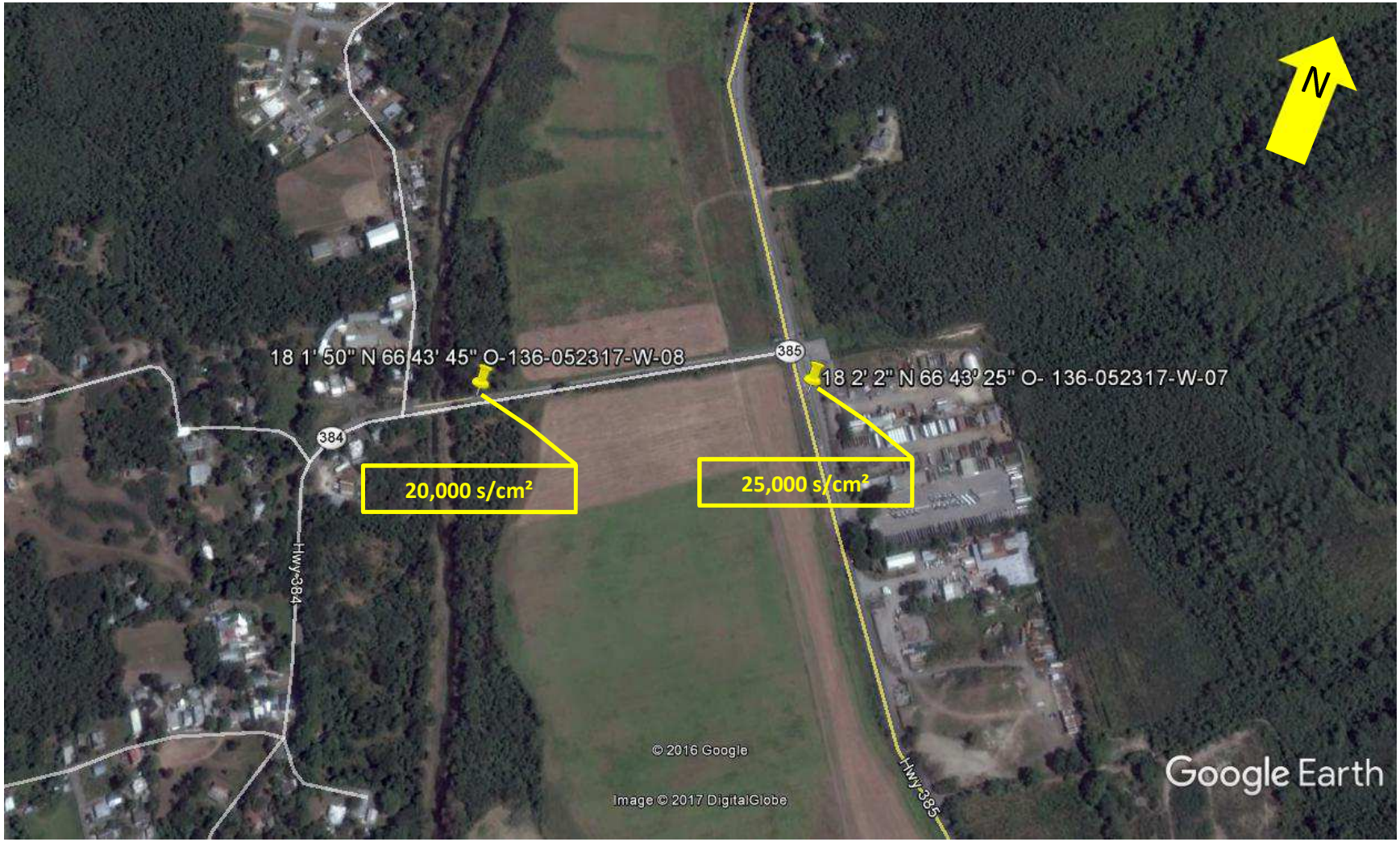
APPENDIX III AERIAL REPRESENTATIVE PHOTOS OF ASBESTOS CONTAINING MATERIALS SAMPLING POINTS



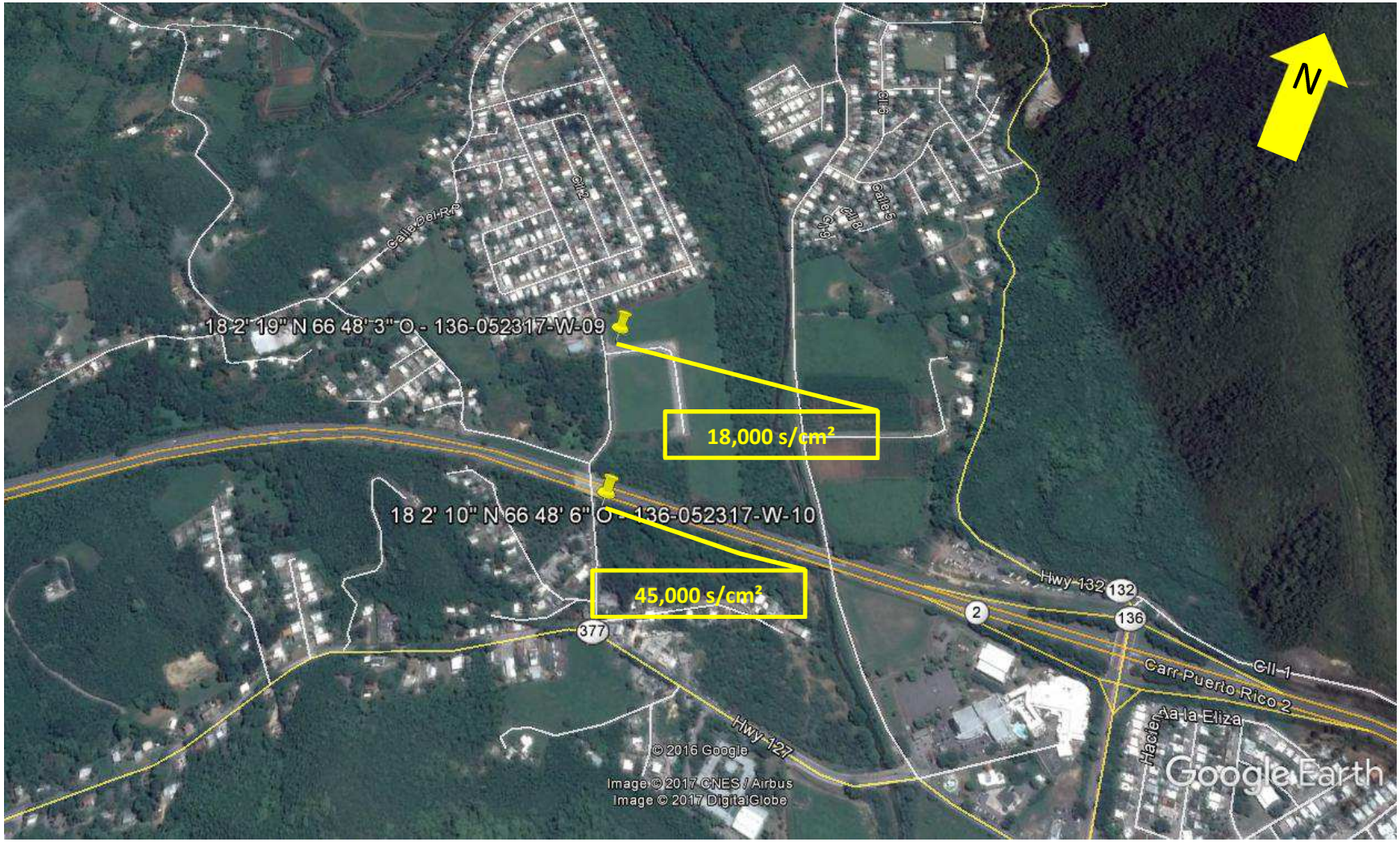
AERIAL PHOTO 1: Wipes Samples Location and Analytical Results

AERIAL PHOTO 2: Wipes Samples Location and Analytical Results

AERIAL PHOTO 3: Wipes Samples Location and Analytical Results



AERIAL PHOTO 4: Wipes Samples Location and Analytical Results

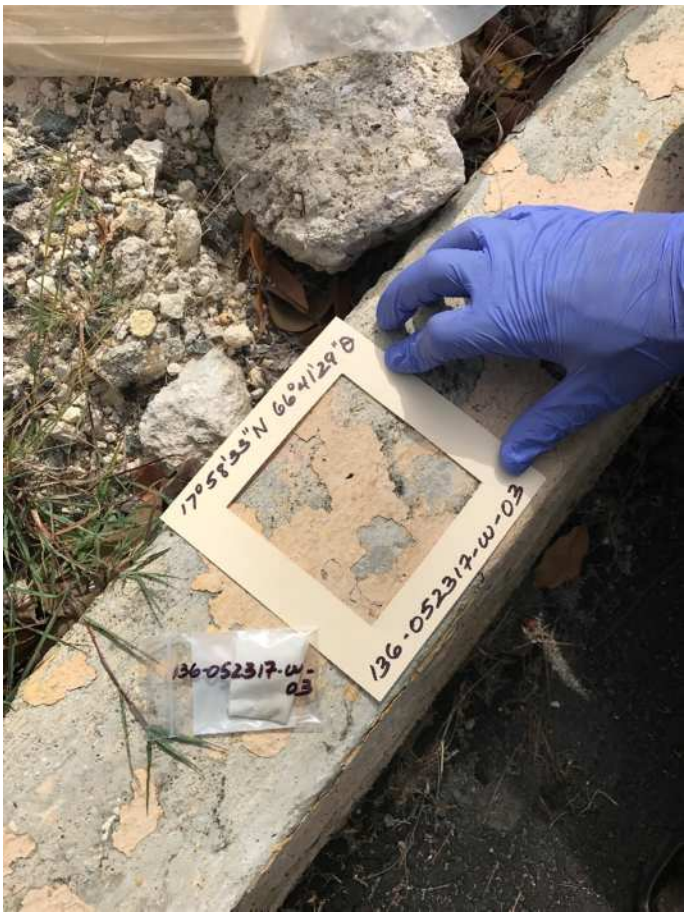


AERIAL PHOTO 5: Wipes Samples Location and Analytical Results

AERIAL PHOTO 6: Wipes Samples Location General View

Representative Photo Sampling Point ID 136-052317-W-01

Representative Photo Sampling Point ID 136-052317-W-02



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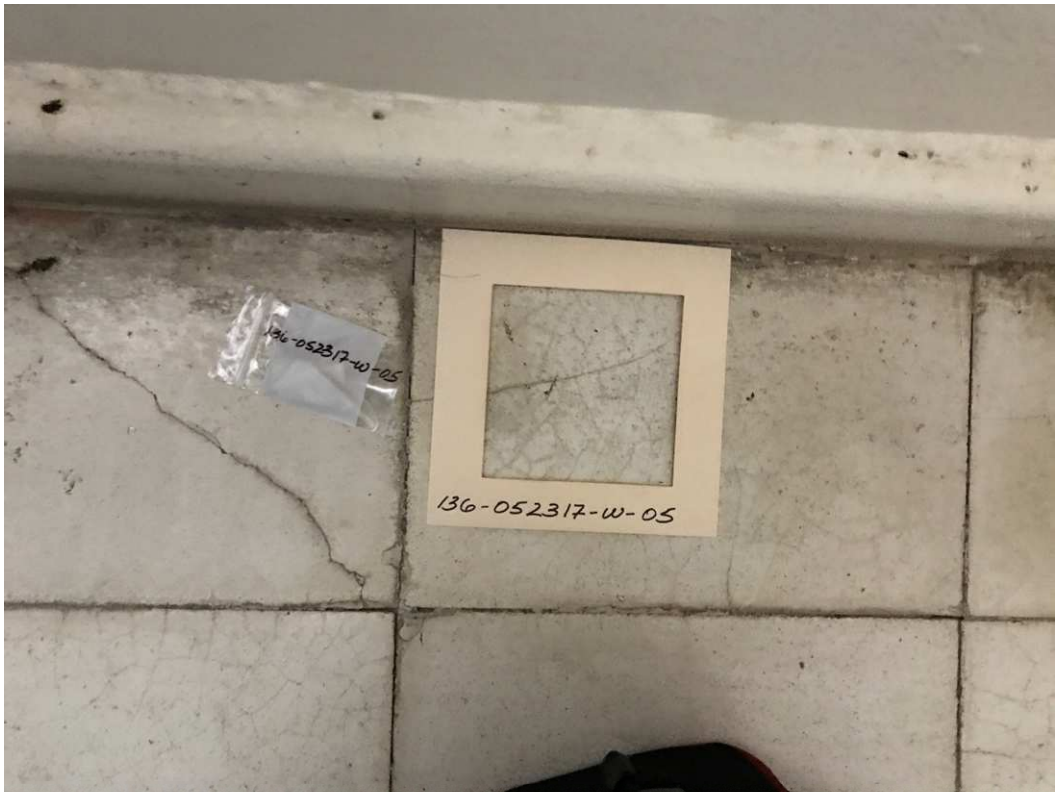

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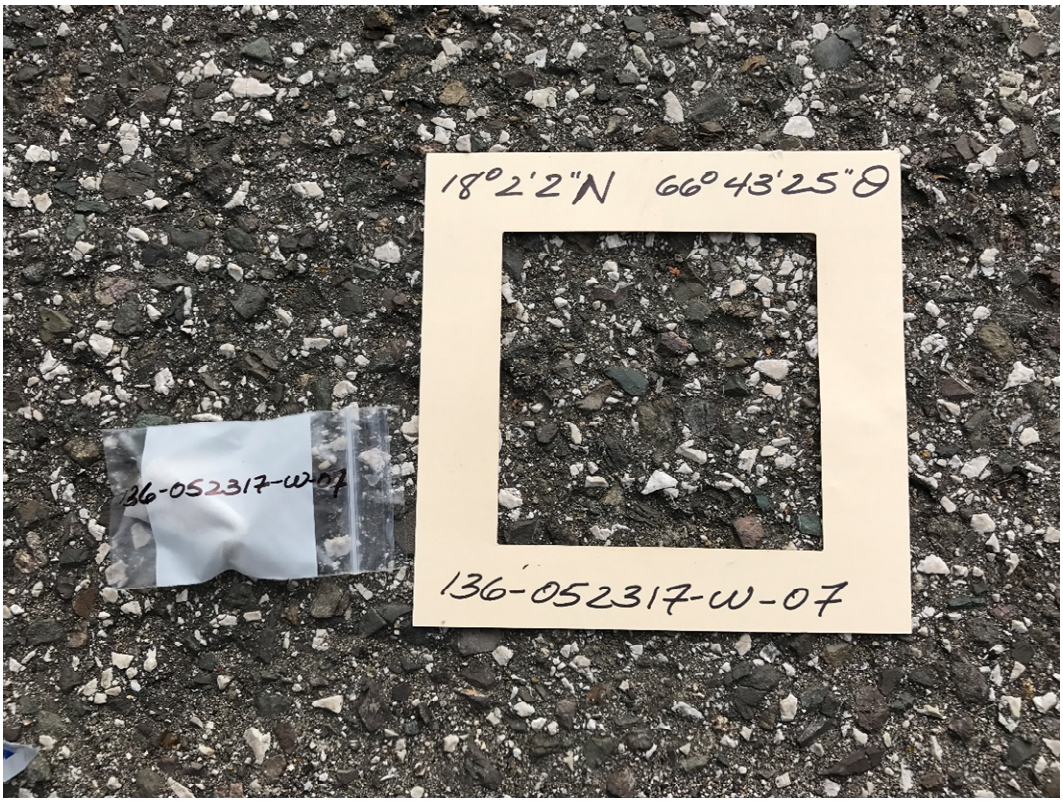

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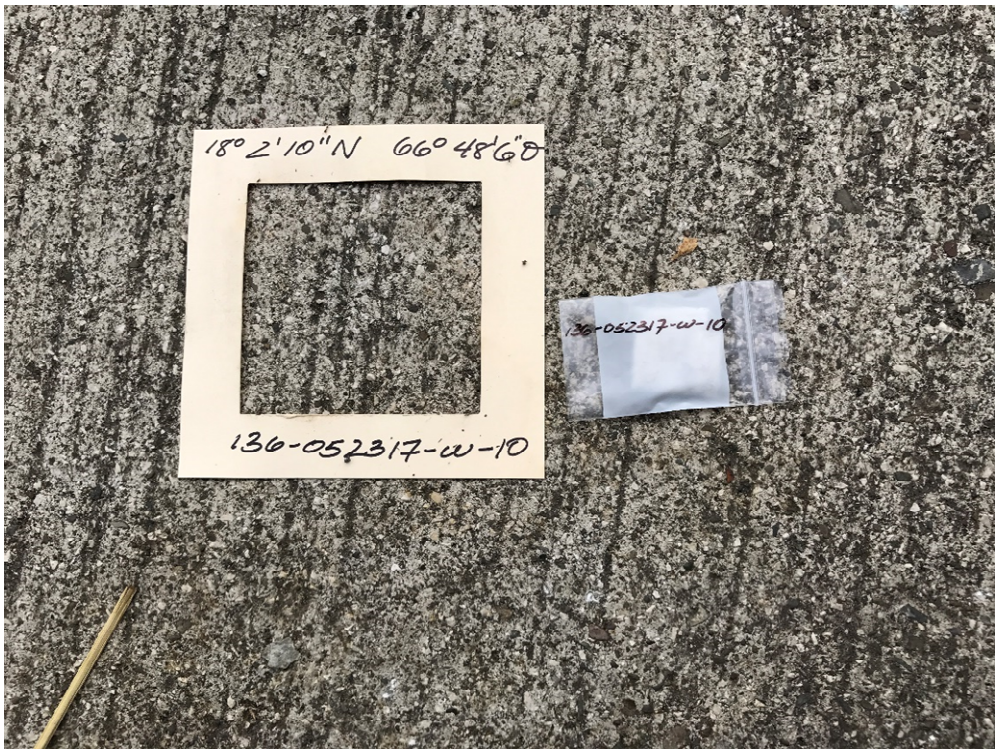

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