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Sent via E-mail & Fed-Ex

November 15, 2019

Gary A. Latsha District Mining Manager Pottsville District Mining Office Pennsylvania Department of Environmental Protection 5 West Laurel Boulevard Pottsville, PA 17901

Re: Transmittal of Qualitative Geologic Survey Report Rock Hill Quarry Hanson Aggregates Pennsylvania LLC SMP # 7974SM1 East Rockhill Twp., Bucks Co., PA

Mr. Latsha:

Hanson Aggregates Pennsylvania LLC (Hanson) is providing the attached Qualitative Geologic Survey Report (QGSR) for review and consideration by the Pennsylvania Department of Environmental Protection (PADEP). The report was prepared by Earthres Group, Inc. (EARTHRES). EARTHRES completed the site investigation and material sampling in accordance with the Department-approved Qualitative Geologic Survey Sampling Plan (QGSSP) submitted on April 3, 2019 and revised on April 25, 2019 to address comments received from the PADEP and East Rockhill Township.

Due to the physical size of the report, Hanson is providing three (3) paper copies to PADEP. An electronic (PDF) version of the report is also being provided on a flash drive to allow its uploading to PADEP's public website for the Rock Hill Quarry. A link to download the electronic version of the report will be e-mailed to everyone included in the CC list at the end of this letter.

Subsequent to this transmittal of the QGSR, Hanson will be submitting the following to the Department for review and consideration:

- A report from Kelly Bailey Consulting, LLC interpreting the QGSR results and providing recommendations for site monitoring during operation of the quarry;
- A Mineral Identification & Management Guide to address inspection and monitoring the Rock Hill Quarry site; and
- An Occupational Health & Safety Monitoring Plan to address potential worker exposure for the Rock Hill Quarry site.

October 3, 2019 Hanson Letter

In our correspondence with the Department dated October 3, 2019, Hanson requested several items to aide in its review of the EMSL, Inc. lab reports (as transmitted to Hanson on August 28, 2019). Hanson is requesting an update on the availability of the following items:

- PLM and TEM photos of the samples;
- EDS and SAED of each particle from the EMSL count sheets;
- Powder x-ray diffraction of each sample;
- Explanation of how EMSL differentiates asbestiform / non-asbestiform for TEM & PLM;
- Explanation of how EMSL distinguished between pyroxenes and amphiboles

Please feel free to contact me at (610) 366-4819 should you wish to discuss this submission or have any questions regarding the enclosed information.

Regards,

Andrew J. Gutshall, P.G. Area Environmental Manager

encl: Qualitative Geologic Survey Report - EARTHRES - November 15, 2019

John Stefanko, PADEP CC: Daniel Sammarco, P.E., PADEP Michael P. Kutney, P.G., PADEP Amiee Bollinger, PADEP James Rebarchak, PADEP Sachin Shankar, P.E., PADEP Robert Fogel, PADEP Neil Shader, PADEP Virginia Cain, PADEP Craig Lambeth, Esq., PADEP Shawn Mountain, PADEP Marianne Morano, East Rockhill Township David Raphael, Esq., K&L Gates Kelly Bailey, CIH, KBC LLC Drew Van Orden, P.E., RJ Lee Group Louis F. Vittorio, P.G., EarthRes Robert Gundlach, Esg., Fox Rothschild Curt Mitchell, R.E. Pierson Mark E. Kendrick, P.E., Hanson Matthew S. Burns, Esg., Hanson Michael C. Lewis, CHMM, Hanson Environmental File

Hanson Aggregates Pennsylvania, LLC 7660 Imperial Way Allentown, PA 18195-1040

QUALITATIVE GEOLOGIC SURVEY REPORT (QGSR) ROCK HILL QUARRY

SMP No. 7974SM1

East Rockhill Township Bucsk County, Pennsylvania

November 15, 2019

Prepared By:

EARTHRES ENGINEERING FOR SUCCESS

Earthres Group, Inc. | www.earthres.com

Qualitative Geologic Survey Report

Rock Hill Quarry, SMP No. 7974SM1

East Rockhill Township, Bucks County, Pennsylvania EARTHRES Project # 061003.051

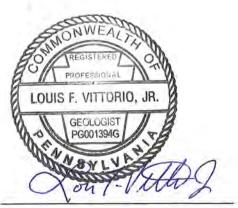
November 15, 2019

Prepared for:

Hanson Aggregates Pennsylvania, LLC 7660 Imperial Way Allentown, PA 18195-1040

Prepared by:

Earthres Group, Inc. P.O. Box 468 Pipersville, PA 18947 Phone: (215) 766-1211



Louis F. Vittorio, Jr., P.G.

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1.0 INTRODUCTION

On behalf of Hanson Aggregates Pennsylvania, LLC (Hanson), Earthres Group, Inc., (EARTHRES) is providing the following Qualitative Geologic Survey Report (QGSR) for assessment of Naturally Occurring Asbestos (NOA) at the Rock Hill Quarry Operation (Site).

This work was completed in accordance with the approved Qualitative Geologic Survey Sampling Plan (QGSSP) prepared and submitted on April 3, 2019, and revised on April 25, 2019, to address comments received from the Pennsylvania Department of Environmental Protection (PADEP) and East Rockhill Township.

The QGSSP was designed to collect sufficient information as part of the preparation of a detailed QGSR for the Site. The data discussed and presented was collected per the QGSSP in 2019. The QGSR also includes presentation of the data and results from data collection efforts completed at the site in 2018.



2.0 PROJECT DESCRIPTION

This section provides the background, purpose, past, and recent work conducted in response to the Cease Order issued by PADEP on December 5, 2018, concerning the potential presence of NOA at the Site.

2.1 Site Setting

The Site is an active aggregate mine permitted by PADEP to operate under Surface Mining Permit (SMP) No. 7974SM1. Historical information indicates that the Site has been a diabase aggregate quarry since 1903. The Site is located on the western side of Rock Hill in East Rockhill Township, Bucks County, within the Gettysburg-Newark Lowland Section of the Piedmont Physiographic Province of Pennsylvania. The Gettysburg-Newark Lowland is characterized by a gently rolling topography of low to moderate relief with broad, shallow valleys and low ridges. The Site is located on a ridge underlain by diabase. The diabase, an intrusive, crystalline, igneous rock, intruded into native sedimentary rock of the Brunswick and Lockatong formations (Figure 5, Appendix A). The Brunswick Formation is a sequence of sedimentary shales and siltstones with interbedded sandstone. The Lockatong Formation is also a sedimentary sequence with laminated beds of siltstone and shale or argillite. The elevation of the Site rises from approximately 540 feet mean sea level (MSL) to 800 feet MSL from southwest to northeast.

The diabase of the Haycock-Rock Hill Sill is a light-grey, medium- to coarse-grained crystalline igneous rock. At the edges of the Sill, the thinner Byram and Clayton diabase sills are dense, fine-grained, and greenish-black. However, mineralogy is generally the same and consists of plagioclase feldspar and augite as the predominant mineralogical species (Bascom et al., U.S. Geological Survey (USGS) 1931). The Bascom et al. (1931) report provides no indication of the presence of NOA in the mineralogy of the diabase. The Mineralogy of Pennsylvania (Gordon 1922) similarly does not indicate the presence of NOA in East Rockhill Township nor at the Site. However, Bradford et al. (1959) indicated that hydrothermal veins of actinolite, prehnite, and albitite (albite) are reported to be present at the Rock Hill Quarry. A USGS report by Van Gosen (2006) lists and maps NOA occurrences in the eastern United States. The report does not identify NOA occurring at the Site nor in the area. The closest known occurrence of NOA indicated by Van Gosen (2006) is within the serpentine rocks of the Easton, Pennsylvania area.

A comprehensive literature survey was conducted as part of this geologic evaluation to address the nature of diabase found at the Site. The results of the literature search are included in Section 3.0.



2.2 Work Plan Development

This subsection provides a summary of correspondence and site efforts that have led to development of the current QGSSP for the Site.

- EARTHRES Asbestos Investigation Results dated January 18, 2018.
- Hanson NOA monitoring plan submitted to PADEP on January 24, 2018.
- PADEP approval of Hanson's NOA monitoring plan on January 25, 2018.
- EARTHRES 2nd Quarter 2018 NOA Monitoring Report to PADEP dated July 27, 2018.
- EARTHRES 3rd Quarter 2018 NOA Monitoring Report to PADEP dated October 24, 2018.
- EARTHRES 4th Quarter 2018 NOA Monitoring Data.
- EARTHRES December 20, 2018 background sampling results for aggregate and surface water.
- EARTHRES *Qualitative Geologic Survey Sampling Plan* to PADEP on behalf of Hanson dated April 3, 2019.
- East Rockhill Township Board of Supervisors issued a comment letter on April 17, 2019, concerning the *Qualitative Geologic Survey Sampling Plan*.
- PADEP issued a comment letter regarding the *Qualitative Geologic Survey Sampling Plan* on April 22, 2019.
- EARTHRES Response to PADEP and East Rockhill Township Comments Qualitative Geologic Survey Sampling Plan letter dated April 25, 2019.

Pertinent correspondence relating to the proposed sampling plan is provided in chronological order in Appendix C. Prior site reports and investigation data are provided in Appendix D.

2.3 Previous Site Investigations

Prior investigation, qualitative geological surveying, and sampling conducted at the Site during 2018 included the collection and analysis of 33 rock samples including: five (5) mineral vein rock samples, 21 composite drill hole cutting samples, five (5) aggregate stockpile samples, and two (2) crusher run (fines) samples. All samples yielded non-detectable (ND) results for NOA, except for one (1) targeted hand sample analysis that indicated NOA to be present.

Five (5) surface water samples were collected from the Site on December 20, 2018, and were analyzed by EMSL Laboratories via U.S. Environmental Protection Agency (EPA) Method 100.2 (EPA 600/R-94/134) for asbestos fibers greater than or equal to (\geq) 0.5 microns (µm), as well as for fibers >10 microns in length. The results indicated non-detectable results for NOA fibers >10 microns in length. The EPA Drinking Water Limit is 7 million fibers per liter (MFL) for fibers >10 microns in length.



The results for the water samples considering NOA fibers ≥ 0.5 microns indicated the presence of one (1) fiber in Sample #1, three (3) fibers in Sample #2, and three (3) fibers in Sample #4. There is no corresponding regulatory limit for NOA detected in the ≥ 0.5 micron to less than (<) 10 micron size range. Results of the previous investigation are documented in the reports included in Appendix D.

2.4 Current Site Investigations

Recent work performed in accordance with the April 3, 2019 QGSSP, and the April 25, 2019 revision provided to PADEP are summarized in this subsection. Field sampling efforts were completed by professional geologists from EARTHRES and were overseen by representatives of PADEP. Split samples were provided to PADEP for all samples collected.

The work adhered to the QGSSP developed in consultation with Hanson's experts: Kelly Bailey, Certified Industrial Hygienist (CIH), of Kelly Bailey Consulting, LLC, and Drew R. Van Orden, P.E. of RJ Lee Group, Inc., and modifications requested by PADEP. The investigations included the collection and analysis of an additional 57 rock samples and seven (7) water samples, including:

- 1) Seven (7) water samples from seven (7) on-site locations.
- 2) Sixteen (16) samples from four (4) aggregate stockpiles.
- 3) Twenty-five (25) mineral vein samples collected from boulders located primarily on the southern and eastern sides of the quarry pit.
- 4) Nine (9) mineral veins observed in rock cores CB-1 through CB-4.
- 5) Four (4) diabase rock cores samples, one each from rock cores CB-1 through CB-4.
- 6) Three (3) additional hand samples collected at the Site that were selected by PADEP for analysis.

The aggregate sampling (16 samples) was completed to assess the presence of NOA in processed end-use materials. The samples collected from the boulder mineral veins, rock core mineral veins, and hand samples, totaling 37 samples, were targeted at mineralized zones that could possibly contain NOA mineralogy if present at the Site. Although the literature assessment and site observations indicate that NOA is not present in the diabase matrix, four (4) diabase core samples were collected and analyzed to quantitatively assess the potential presence of NOA in the diabase matrix.

Prior to completing the rock coring, mineral veins on the exposed bench faces proposed for quarrying were mapped as requested by PADEP. The core locations and drilling angles were subsequently selected to maximize encountering as many mineral veins as possible in each rock



coring. The mineral veining found and rationale for core bore placement are provided in the *Response to PADEP and East Rockhill Township Comments – Qualitative Geologic Survey Sampling Plan* (EARTHRES April 25, 2019) and is included in Appendix C.



3.0 GEOLOGIC EVALUATION

In January 2018, the area surrounding the quarry and proposed mining area was assessed by EARTHRES personnel to determine the presence of mineral veining and/or sedimentary rock contacts. The diabase described by Bascom, et al. (1931) was similarly observed and was indicated to be massive, fine- to medium-grained, and grey to dark grey in color. Borings drilled during 2018 for bench development on the south-southeastern side of the quarry, as well as observations of the exposed highwalls, support USGS publications indicating a homogenous crystalline diabase geology across the entire Site. Refer to Appendix D for prior evaluations conducted at the Site throughout 2018.

As indicated in EARTHRES' January 18, 2018 report (Appendix D), numerous large boulders were assessed on the southern, northern, and eastern sides of the Site. Boulder surfaces were visually inspected to identify the potential presence of NOA. Each boulder observed consisted of a tightly massed, fine- to medium-grained crystalline diabase.

Sedimentary rocks or features (e.g. bedding, folds, cross-beds, etc.) were not visually observed on the highwalls. Near-vertical jointing was observed along much of the eastern highwall. Contacts with sedimentary host rocks were not indicated in the surrounding outcrops or boulder fields. The quarry and investigation area are indicated to be entirely within the diabase bedrock.

EARTHRES conducted field mapping on April 22, 2019, in the proposed mining area and surrounding area, which is discussed in Section 4.3 herein. The findings of the April 22, 2019 field mapping were incorporated into EARTHRES' April 25, 2019 *Response to PADEP and East Rockhill Township Comments*. Field mapping conducted in April 2019 supports EARTHRES' 2018 conclusion and literature survey for feature orientations (i.e. veins and joints) diabase geology. Refer to Appendix C for the April 25, 2019 *Response to PADEP and East Rockhill Township Comments* report, which summarizes the April 2019 geologic evaluation work.

The diabase is indicated to be a single homogenous unit with no geologic facies changes, ductile shear zones, or brittle shear zones that would constitute separate units. Hydrothermal veins that contain various minerals occur within the otherwise homogenous diabase. The diabase and veins in the active mining area at the Site have been mapped, sampled, and tested using both targeted (e.g., rock core veins, boulder veins, and hand samples) and incremental methods (e.g., aggregate stockpiles, crusher fines and drill cuttings). The following literature assessment summarizes the geological research for the diabase at the Site.



3.1 Diabase Geology Literature Assessment

The diabase at the Site is the result of magma from the mantle intruding into sedimentary rock of the Newark Basin during the late Triassic-early Jurassic Periods, about 200 to 201 million years ago (mya) when the Eastern North American margin began its rift with Europe and Africa (Puffer & Husch 1996; Blackburn et al. 2013). The Newark Basin is bounded on its northwestern and northern margins by southeast to south dipping normal extensional faults that created the basin wherein simultaneous sedimentation and igneous activity associated with the rifting occurred (Schlische & Olsen 1988; Herman 2005). The diabase intrusion at the Site is part of a "mega sheet" that extends approximately 150 kilometers (km) from southeastern New York to eastern Pennsylvania and parallels the Brunswick shale bedding planes that dip approximately 10° to 15° W to 5° to 25° NW (Puffer & Husch 1996; Srogi et al. 2017; Bascom et al. 1931). Radiometric dating of the diabase throughout the Newark Basin points consistently to an age of approximately 201 mya, suggesting emplacement from the same or similar source (Schlische & Olsen 1988).

The magma that formed the diabase is indicated to be extremely homogenous and was emplaced during three (3) distinct events that occurred within a few thousand years and resulted in the occurrence of three (3) distinct diabase types in Pennsylvania (Smith et al. 1975). These three (3) types are, in order of emplacement, the Quarryville, the York Haven, and the Rossville diabase, with the olivine-rich Quarryville the closest to the composition of the magma in the mantle, and the latter two (2) units being olivine-depleted (Smith et al. 1975). This is supported by a later finding that concluded a large volume of magma with little compositional heterogeneity established the magmatic system in the Newark Basin at approximately 201 mya (Srogi et al. 2017).

The diabase at the Site is comprised solely of the York Haven-type diabase, which occurs as sheets and dikes along the entire Triassic basin, and is identical in composition regardless of its occurrence (Smith et al. 1975). Generally, the York Haven consists of a dark-gray, medium- to coarse-grained, high titanium oxide, relatively copper-enriched, quartz-normative tholeiite (olivine-poor, quartz-rich basalt) composed of labradorite (a plagioclase feldspar) and various pyroxenes (Van Gosen 2006). Composition of the diabase is consistent, suggesting once the diabase was intruded, it remained a relatively closed system with little late-stage fractionation (Puffer & Husch 1996).

The Site lies within the Haycock diabase sheet and is comprised almost entirely (90% to 95%) of: non-altered labradorite (a feldspar mineral), augite (a pyroxene mineral) with only small quantities of hornblende (a primary amphibole mineral present independent of pyroxene), magnetite, magnetite-ilmenite, and apatite (Bradford et al. 1959). Within the Haycock sheet, the diabase is fine-grained along the margins where cooling occurred faster and gradually coarsens inward where cooling was slower (Bradford et al. 1959). Between the margins and the interior of the Haycock sheet, the "normal phaneritic diabase type" with 1- to 2-millimeter grain sizes is prevalent



(Bradford et al. 1959). The "normal phaneritic diabase type" is observed at the Site. Amphibole constitutes the only mineral within the diabase veins that can exist in an asbestiform habit. However, the development of the asbestiform habit in amphiboles is not common. Plastic deformation to the diabase has not occurred, and the hornblende amphibole is present primarily as a non-altered, mineral. Hydrothermal alteration along some of the mineral veins in the diabase has been observed (Bradford et al. 1959).

Regionally, only a few of the fractures in the diabase sheets in Bucks County are filled with pale green actinolite. At the Rock Hill Quarry, hydrothermal veins of actinolite, prehnite, and albitite are reported to be present (Bradford et al. 1959). Site observations completed in 2018 and 2019 have identified several veins containing actinolite mineralogy. However, asbestiform actinolite has not been observed in the field during site investigations.

The mineral actinolite is the intermediate phase that forms within the solid solution series between tremolite and ferroactinolite (Klein and Hurlbut, 1985). Within this series, ferroactinolite (Ca₂Fe₅Si₈O₂₂(OH)₂) exists at the low temperature range, and tremolite (Ca₂Mg₅Si₈O₂₂(OH)₂) exists at the high temperature range with actinolite (Ca₂(Mg, Fe)₅Si₈O₂₂(OH)₂) occurring between the two states. The color of actinolite ranges from white to green and is the result of the increase in iron content (from tremolite towards ferroactinolite) within this series. The crystalline structure of this series is prismatic, with tremolite often bladed, frequently in radiating columnar aggregates, and in some cases in silky fibers (Klein and Hurlbut, 1985). In high temperature metamorphic and in igneous occurrences, another complete series exists from this tremolite-actinolite-ferroactinolite series to hornblende due to a wide range of aluminum (Al) substitution for silica (Si). In lower-temperature occurrences, tremolite (or actinolite) may coexist with hornblende (Klein and Hurlbut, 1985).

Secondary mineralization of joints and veins within the diabase that intruded into the Newark Basin include analcime, albite, potassium feldspar, calcite, gypsum, quartz, chlorite, epidote, and pyrite (Herman 2005). Joints and veins mapped in the central part of the Newark Basin strike between about N36°E and N50°E, subparallel to the basin's northwestern, faulted margin. A second joint set strikes about N16° to N30°E subparallel to intra-basin faults and regional dikes in Pennsylvania. Veins in Triassic-Jurassic strata strike NNE-SSW and mostly dip steeply at 70° to 80°E. A third set varies from about N5°Wto N10°E and occurs more commonly in the eastern part of the basin in association with early Jurassic rocks (Herman 2005). The majority of veins mapped in the diabase at the Rock Hill Quarry align with an average strike of N45°E and dip of 78°SE.

The USGS mapped 41 NOA localities in Pennsylvania including two (2) consisting of York Haven-type diabase (Van Gosen 2006). The first site, located 110 miles southwest of the Rock Hill Quarry, contains tremolite asbestos. The second site, located 31 miles southwest of the Site, contains crocidolite asbestos (Van Gosen 2006).



The diabase at the Site has not undergone metamorphism upon which asbestos could materialize from the primary minerals of the igneous rock. Testing at the Site indicates that detectable concentrations of asbestos are not present in the diabase rock and rarely in the infrequent actinolite mineral veins. Presentation and discussion of the results from sampling completed at the Site in 2018 and 2019 are provided in the following report sections.



4.0 SAMPLE COLLECTON AND ANALYSIS

Within the 55-acre (0.09 square-mile) permitted area, the Rock Hill Quarry is indicated to occur in one (1) rock type with little geologic variability. Characterization and sample collection based upon this geology were proposed in the April 3, 2019 QGSSP and the April 25, 2019 Response to PADEP and East Rockhill Township Comment letter.

4.1 Surface Water Sampling

Seven (7) surface water samples were collected by EARTHRES and split with PADEP on April 18, 2019. Sample collection proceeded from downgradient to upgradient to minimize potential for sample cross-contamination. The water sampling locations are shown on Figure 1, Appendix A, and include in order of sampling sequence:

- 1) NPDES Discharge;
- 2) Sediment Trap 2;
- 3) Sediment Basin 2;
- 4) Sediment Basin 1;
- 5) Quarry Pit Lake;
- 6) Sediment Trap 1; and
- 7) Sediment Trap 3.

The water samples were collected as grab samples using a telescopic pole sampler containing an attached sampling cup. The sampler was washed with Alconox® and rinsed with distilled water initially and between each sampling location. The sampler cup was inserted into the water at each location in an inverted position until about half-way to the bottom, then inverted to collect a representative sample. Upon retrieval of the sample cup, the sampled water was decanted into a clean laboratory-provided one-liter plastic bottle. To provide the split samples between EARTHRES and PADEP, a portion of each cup was distributed to separate sample bottles. The samples collected by EARTHRES were placed on ice and transmitted under chain-of-custody to RJ Lee Group, Inc., in Monroeville, Pennsylvania for analysis per EPA Method 100.2 600/R-94-134 for fibers >10 μ m in length with a minimum aspect ratio of 3:1. The water samples were further analyzed by the RJ Lee Group, Inc., per EPA Method 100.1 600/4-83-043 modified for fibers > 5 μ m in length with a minimum aspect ratio of 3:1. Sample results are provided on Table 1 in Appendix B. Laboratory sheets are included in Appendix F.



4.2 Aggregate Stockpile Sampling

Per the PADEP's letter of December 19, 2018, aggregate stockpile sampling was to include "...one test per 1,000 tons of material or any fraction thereof..." Hanson mapped the existing aggregate stockpiles and determined the following tonnages and proposed samples as indicated in the below table. The relative locations of the various stockpiles in the aggregate stockpile area are indicated by quadrant in the below table. The aggregate stockpiles sampled are identified on Figure 2, Appendix A.

Stone Type	Location	Tonnage	Proposed Samples
2B Stone	Northwest	9,946	10
1B Stone Pile	Northeast	1,695	2
2A Stone Pile	East	1,585	2
Screenings	South	1,983	2

2019 Aggregate Stockpile Sampling

EARTHRES collected aggregate samples on April 18, 2019, as material composites using the American Association of State Highway and Transportation Officials (AASHTO) R90 Test Method (AASHTO 2018). To accomplish the sampling per AASHTO R90, the 2B stockpile was surveyed and marked into 10 radial sections for subsequent collection of 10 samples. Samples from the remaining stockpiles were collected from opposite sides of the piles. The exact sample locations were determined and marked in the field at the time of sampling and were collected from stockpile locations not previously sampled. The samples were mixed and quartered per AASHTO T248 (AASHTO 2014). One-quarter was chosen for sampling and the sample was split with PADEP. Another quarter of each sample was retained for future reference.

Upon reduction of the sample sizes per AASHTO T248, the samples were transmitted to the laboratory in one-gallon sealed plastic bags under chain-of-custody to RJ Lee Group, Inc., in Monroeville, Pennsylvania for microscopic analysis and Polarized Light Microscopy (PLM) via EPA Method 600/R-93/116. Sample results are provided on Table 2 in Appendix B. Laboratory data sheets are included in Appendix F.

4.3 Rock Coring and Sampling

Four (4) rock cores were advanced in the planned mining area to an elevation of approximately 585 feet above MSL, which is approximately equivalent to the current water level in the quarry pit. On April 22, 2019, EARTHRES and Hanson professional geologists mapped veins on the bench faces of the proposed coring area. The purpose of the mapping was to select coring locations that would intercept the maximum number of mineral veins. The coring locations are shown on Figure



3, Appendix A. Based on the orientation of the mapped features, the cores were drilled on an approximately 30-degree angle from vertical with an azimuth of approximately N45W. This azimuth is projected perpendicular to the geologic structure (ridgeline trend and geological strike) and was chosen to intercept as many potential features as practical. A summary of the bench mapping is provided in our April 25, 2019 *Response to PADEP and East Rockhill Township Comments* letter in Appendix C.

The exact core locations were marked in the field at the time of drilling. From May 1 to May 15, 2019, an EARTHRES professional geologist oversaw the coring at the four (4) chosen locations, which included two (2) core borings on Bench 1 (CB-1 and CB-2) and two (2) core borings on Bench 2 (CB-3 and CB-4). Continuous wetting of the core was accomplished during drilling to abate dust generation. Retrieved cores were boxed, labeled, and stored on-site for logging and analysis.

A professional geologist visually logged the cores to identify and record the following:

- 1) Geological description;
- 2) Mineralogy and grain size;
- 3) The percentage of core recovered;
- 4) Bedding observations;
- 5) Fracture occurrence;
- 6) Mineral veining; and,
- 7) Other pertinent geological features.

Review and sampling of the core boxes for CB-1, CB-2, CB-3, and CB-4 was completed by EARTHRES and PADEP professional geologists on May 10, 2019, and May 23, 2019. The rock cores were examined visually for the features listed above. Thirteen rock core samples from the four (4) borings were selected, labeled, and split for sampling by EARTHRES and PADEP. Each rock core specimen was first cut in half using a wet core saw. One-half of the core was returned to the core box for retention. The remaining portion of the core was split again to provide samples for laboratory analysis for Hanson and PADEP.

Nine (9) of the rock core samples presented with varying mineralogy including elongated and prismatic crystal habits, indicative of the mineral actinolite. The remaining four (4) samples included diabase rock, one (1) from each core boring.

The samples were sent to RJ Lee Group, Inc., in Monroeville, Pennsylvania under chain-ofcustody for microscopic and PLM analysis via EPA Method 600/R-93/116. Sample results are provided on Table 3 in Appendix B. Laboratory data sheets are included in Appendix F.



4.4 Rock Core Vein Volume Determination

EARTHRES Geologists were on-site September 11, 2019, to measure mineral veining in the four (4) core borings. Vein volumes were calculated based on the measurements made of the following dimensions in CB-1 through CB-4:

- Vein Thickness = T (inches)
- Length across core = L (inches)
- Width (or Depth of Core) = W (inches)

Figure 6 in Appendix A illustrates each of the measured core dimensions. The resulting measurements are provided in Appendix E. The veins appear in the core at various angles and the resulting shape of each vein is an oval having an area described by an ellipse. The vein volume was calculated using the area formula for an ellipse multiplied by the measured vein thickness. Measurements (in inches) for each core are provided in Appendix E. The formulas used for vein volume calculation are:

- Ellipse Area = $A = \pi \frac{1}{2}L\frac{1}{2}W$
- Volume = V = Ellipse Area x Vein Thickness (*T*) x (cu. in. to cu. ft. conversion)

The vein volumes were calculated and totaled in the attached spreadsheets (Appendix E) for each vein, in each core. The percentage of actinolite mineral veining per core was calculated by dividing vein volumes by the total core volume. The percentage of asbestos in each core was calculated by multiplying the percent vein volumes by the percent of the asbestos in the vein determined by the NOA testing results. The results are summarized in Table 5 in Appendix B. In accordance with convention, laboratory non-detections of asbestos were considered to be one-half of the detection limit, or 0.05%, for the purpose of producing an average concentration in the rock cores¹. However, this assumes that there is asbestos where laboratory methods do not detect asbestos, which produces an exaggerated high concentration of asbestos in the rock cores (and other non-detect samples). The diabase matrix in the cores was considered to be absent of NOA in agreement with field, literature, and confirmatory laboratory results.



¹ Due to numerous non-detections in the collected data, one-half of the detection limit was used for data averaging in accordance with general industry practice. The TEM results additionally provide justification for using one-half of the detection limit and further indicate that using 0.05% provides a conservatively high result.

4.5 Boulder Field Mapping and Sampling

Boulder fields exist on the southern and eastern sides of the quarry pit. The boulders are indicated to have been historically mined from the quarry. Thirty-three (33) mineral veins were identified after examination of hundreds of boulders in the boulder fields. The identification was completed by EARTHRES and PADEP professional geologists on May 1, 2019. Twenty-five (25) samples were extracted (1 from each boulder) on May 7, May 9, and May 13, 2019 (Boulder locations are provided on Figure 4, Appendix A). Eight (8) mineral veins could not be extracted for analysis due to boulder hardness. The samples were sent to RJ Lee Group, Inc., in Monroeville, Pennsylvania under chain-of-custody for microscopic and PLM analysis via EPA Method 600/R-93/116. Sample results are provided on Table 4 in Appendix B. Laboratory data sheets are included in Appendix F.

4.6 Hand Sample Collection and Analysis

During reconnaissance of the southeastern boulder field by PADEP and EARTHRES personnel on May 1, 2019, Hand Sample #1 was collected from the ground in the boulder field. Hand Sample #2 was collected below Bench 1. Hand Sample #3 was collected from the face of Bench 1 from Vein #7, which was primarily comprised of green-colored, prismatic actinolite. Sample locations are provided on Figure 3 in Appendix A. The samples were collected as requested by PADEP and as agreed to in the field. The hand samples were split with a wet core saw to provide samples for testing for Hanson and PADEP. The samples were sent to RJ Lee Group, Inc., in Monroeville, Pennsylvania under chain-of-custody for microscopic and PLM analysis via EPA Method 600/R-93/116. Sample results are provided on Table 3 in Appendix B. Laboratory data sheets are included in Appendix F.



5.0 INVESTIGATION RESULTS

Collected samples were sent to RJ Lee Group, Inc., in Monroeville, Pennsylvania for microscopic analysis via PLM and selected confirmation with Transmission Electron Microscopy (TEM) for weight percentage and mineral identification. The sampling results are presented in the following subsections below and are provided on Tables 1 through 7 contained in Appendix B.

5.1 Surface Water Sampling

Results for the April 18, 2019 surface water sampling indicated non-detect concentration for NOA >10 μ m in length in compliance with the EPA drinking water standard of 7 MFL. RJ Lee Group, Inc., performed additional analysis on the samples to assess the presence of fibers >5 μ m in length. Sample #1 (NPDES Outfall) had one (1) amphibole fiber >5 μ m in length. The result equals 0.2 MFL. The remaining samples continued to be non-detect for NOA. The data are summarized in Table 1 in Appendix B. Laboratory reports are provided in Appendix F. Photographs documenting the water sampling are included in Appendix G of this report.

5.2 Aggregate Stockpile Sampling

Results for the aggregate stockpile sampling were non-detect via PLM analysis for NOA in 13 of the 16 samples analyzed. Three (3) sample results (Aggregate #3, Aggregate #5, and Aggregate #8) indicated trace concentrations of asbestos at less than the laboratory detection limit of <0.10%. The data are summarized on Table 2 in Appendix B.

The above samples indicated to have trace concentrations via PLM were subsequently analyzed by TEM via EPA Method 600/R-93/116. The TEM results indicated non-detectable NOA in samples Aggregate #3 (<0.00003 %), Aggregate #5 (<0.00004 %), and Aggregate #8 (<0.00006 %) at significantly lower detection limits than the PLM results.

RJ Lee Group, Inc., performed TEM analysis via EPA Method 600/R-93/116 on three (3) additional stockpile samples, Aggregate #11, Aggregate #13, and Aggregate #15, to verify the nondetect PLM results. The TEM sample results for Aggregate #11, Aggregate #13, and Aggregate #15 indicated 0.0048%, 0.05%, and 0.016% NOA by weight, respectively. Although NOA was detected in these samples, the concentrations were all lower than the PLM detection limit. The highest detection was found in the Aggregate #13 sample at 0.05%.

The trace and confirmed detections of NOA are much lower than 1.0% federal limit² enforced by PADEP and the California Air Resources Board (CARB) Air Toxic Control Measures (ATCM) of 0.25% NOA for surface applications (California, 17 CCR Section 93106). The data are summarized



² (a) 40 CFR Part 763.83; (b) 40 CFR Part 61.141; and (c) 15 U.S. Code Chapter 53 Section 2642.

on Table 2 in Appendix B. Laboratory reports are provided in Appendix F. Photographs documenting the sampling are included in Appendix G of this report.

5.3 Rock Core Vein Sampling Results

Laboratory results from the rock core sampling found trace concentrations of NOA in vein samples greater than the 0.10% method quantitation limit in Samples CB-1 #1 (0.20%), CB-2 #6 (0.1%), and CB-1 DB-1 (0.1 %). The results are below the 1.0% federal limit enforced by PADEP and the CARB Surfacing ATCM 0.25% NOA limit.

The initial result for the diabase sample from Core Boring #1 (DB-1) indicated actinolite at the method detection limit of 0.1%. Based upon the literature, diabase mineralogy, and field observations, the NOA detection in DB-1 is anomalous and was further assessed through core log review (Appendix H) and core vein assessment (Section 4.4 and Appendix E). The results show that Sample DB-1 was collected over a vein interval that was mapped and included in the core vein volume assessment. The mineral veining present over the DB-1 interval is shown in pictures provided in Appendix G. The data confirms that the DB-1 sample is not representative of the diabase matrix. However, to confirm the initial result, a duplicate core sample from the remaining portion of DB-1 was collected from the Site on October 17, 2019. The sample was split with a diamond saw at EARTHRES and shipped to RJ Lee Group, Inc., in Monroeville, Pennsylvania under chain-of-custody for PLM and TEM analysis via EPA Method 600/R-93/116. The DB-1 duplicate sample results are shown in Table 3, Appendix B. The results show NOA at 0.6% in the duplicate sample via PLM, and non-detectable concentrations of NOA via TEM (at <000004% and <0.000031% for two sample aliquots tested).

A copy of the data summary table (Table 3) and laboratory report is provided in Appendix B and Appendix F of this report, respectively. Photographs of the core drilling and sampling are included in Appendix G of this report. Core boring logs are provided in Appendix H.

Vein volume measurements and NOA percent determination of the core volumes were completed as described in Section 4.4. To be conservative, the highest NOA result from Sample DB-1 (0.6%) was used in the analysis. Averaging vein measurements from the four (4) cores drilled indicates 0.43% of the drilled rock volume contains actinolite-bearing veins. Multiplying the vein percentage with the PLM results indicates an average of 0.016% of NOA in the cored rock volume (See Table 5 Appendix B). Additionally, the results reported in Table 5 are targeted samples collected from suspect mineral veining, which over exaggerates the actual NOA concentration at the Site. The results indicate that NOA in the cored rock volume is over 62 times below the 1.0% federal limit enforced by PADEP and more than 15 times lower than the 0.25% CARB Surfacing ATCM NOA limit.



5.4 Boulder Field Sampling

Results of the twenty-five (25) boulder vein samples indicated no detections of NOA at the laboratory detection limit (<0.10). Seven (7) of the samples analyzed indicated trace concentrations of NOA below the laboratory detection limit. These samples represent targeted mineral vein samples where NOA would be most likely to occur. The data shows that NOA in the sampled boulder veins is either non-detectable or in trace concentration below the method detection limit. The results indicate NOA is significantly below the 1.0% federal limit enforced by PADEP lower and is lower than the 0.25% CARB Surfacing ATCM NOA limit. The data are summarized in Table 4 in Appendix B. Laboratory reports are provided in Appendix F. Photographs of the boulders and extracted samples are included in Appendix G of this report.

5.5 Hand Sample Results

The PLM testing results for Hand Samples #1 and #2 showed non-detectable concentrations of NOA. The PLM result from Hand Sample #3 (i.e., Vein #7) indicated the presence of NOA at the laboratory detection limit of 0.10%. The data are summarized in Table 3 in Appendix B. Laboratory reports are provided in Appendix F. Photographs of the hand samples are included in Appendix G of this report.

Core Boring #1 was selected to intercept mineral veins identified on the lower bench, specifically Veins #1, #3, #4 and #7 (see the April 25, 2019 QGSSP comment response letter in Appendix C). In review of the core logs (Appendix H), and the Vein #7 description provided in the QGSSP comment response letter, it is indicated that the CB-1 #1 sample is from mineral Vein #7.



6.0 SUMMARY AND CONCLUSIONS

Current (2019) and previous (2018) site investigations included the sampling and collection of a combined 102 samples from across the Site (90 samples of rock and 12 surface water samples) that were submitted for laboratory testing for NOA via PLM and TEM analyses. Overall, 111 analyses were completed as part of site efforts. The results of the investigations are further described below.

6.1 Prior Investigation Results

Prior investigation, qualitative geological surveying, and sampling conducted at the Site during 2018 included the collection and analysis of thirty-three (33) rock samples including: five (5) mineral vein rock samples, 21 drill hole cutting samples, five (5) aggregate stockpile samples, and two (2) crusher run (fines) samples. All samples yielded non-detectable results for NOA, except for one (1) biased rock sample that found asbestiform actinolite in a mineral vein (0.25 % NOA via PLM and 0.8% NOA via TEM from a hand sample collected on November 9, 2018, see Appendix D).

Five (5) surface water samples were collected from the Site on December 20, 2018, and were analyzed via EPA Methods 100.1 and 100.2 for asbestos fibers $\geq 0.5 \ \mu m$ and fibers $\geq 10 \ \mu m$, respectively. The results were non-detectable for NOA fibers $\geq 10 \ \mu m$ (EPA Drinking Water Limit = 7 million fibers/liter). The results for the water samples considering NOA fibers $\geq 0.5 \ \mu m$ and $< 10 \ \mu m$ indicated the presence of NOA in Sample #1 (1 fiber), Sample #2 (3 fibers), and Sample #4 (3 fibers). However, there is no corresponding regulatory limit for NOA detected in the $\geq 0.5 \ \mu m$ and $< 10 \ \mu m$ size range. Results of previous investigation are documented in the reports included chronologically in Appendix D.

6.2 Current Investigation Results

<u>Water Sampling Results</u>: The surface water sampling results via EPA method 100.2 yielded nondetectable concentrations for NOA fibers >10 μ m. Re-analysis of the water samples via a modified EPA Method 100.1 found one (1) fiber > 5 μ m in length in Sample #1 (NPDES Outfall). The remaining samples had non-detectable NOA > 5 μ m in length. The EPA drinking water standard is 7 MFL >10 μ m in length; all samples fall below the EPA standard of 7 MFL.

<u>Aggregate Sampling Results</u>: The laboratory analyses of the aggregate samples indicated nondetectable concentrations (< 0.10%) of NOA in 13 of the 16 samples analyzed. Trace concentrations of NOA at less than the detection limit (< 0.10%) were found in three (3) samples: #3, #5, and #8 from the 2B aggregate stockpile. TEM confirmation analysis of the three (3) samples revealed non-detectable concentrations of NOA.



Additional TEM analysis via EPA Method 600/R-93/116 was completed on stockpile samples, Aggregate #11, Aggregate #13, and Aggregate #15, to verify the non-detect PLM results. The TEM sample results for Aggregate #11, Aggregate #13, and Aggregate #15 indicated, 0.0048%, 0.05%, and 0.016% NOA by weight, respectively. Although NOA was detected in these samples, the concentrations were all lower than the PLM detection limit. The highest detection was found in the Aggregate #13 sample at 0.05%.

<u>Boulder Sampling Results:</u> Results of the twenty-five (25) boulder vein samples indicated no detections of NOA at the laboratory detection limit (<0.10%). Seven (7) of the samples analyzed indicated trace concentrations of NOA below the laboratory detection limit: RH#2, RH#7, RH#11, RH#12, RH#14, RH#26, and RH#29.

<u>Core Sampling Results</u>: The laboratory PLM analysis of core samples indicate 10 of the 13 samples are non-detect (< 0.10%) for NOA. The three (3) detections include CB-1 #1 at 0.20%, CB-2 #6 at 0.10 %, and DB-1 at 0.10%. Based upon the literature, diabase mineralogy, and field observations, the NOA detection in DB-1 is anomalous and was further assessed through core log review (Appendix H) and core vein assessment (Section 4.4 and Appendix E). The results show that Sample DB-1 was collected over a vein interval that was mapped and included in the core vein volume assessment. The mineral veining present over the DB-1 interval is shown in pictures provided in Appendix G. The data confirms that the DB-1 sample is not representative of the diabase matrix. However, to confirm the initial result, a duplicate core sample from the remaining portion of DB-1 was submitted for PLM and TEM analysis. Results indicate the presence of NOA at 0.6% in the duplicate sample via PLM and non-detectable concentrations of NOA via TEM (at <000004% and <0.000031% for two sample aliquots tested).

<u>Core Vein Volume Assessment:</u> Vein volume measurements and NOA percent determination of the core volumes were completed as described in Section 4.4. To be conservative, the highest NOA result (0.6%) from the DB-1 Duplicate sample was used in the analysis. Averaging vein measurements from the four (4) cores drilled at Rock Hill indicates 0.43% of the drilled rock volume contains NOA veins. Multiplying the vein percentage with the PLM results indicates an average of 0.016% of NOA in the cored rock volume (See Table 5 in Appendix B). It should be noted that this average is an over estimate of NOA in the diabase as the core borings were specifically sited to intersect mineral veins.

<u>Hand Sample Results</u>: The laboratory analysis of the hand samples indicated non-detectable concentrations (< 0.10%) of NOA in two (2) of the three (3) samples analyzed. A concentration of NOA at the detection limit of 0.10% was found in the Vein #7 sample, which was comprised of the mineral actinolite.



6.3 Conclusions

The laboratory results from the 65 analyses, completed on 57 rock samples collected in 2019, show that 57 analyses were non-detect for NOA (87.7%) at the method detection limit, ten (10) analyses had trace NOA below the detection limit (15.4%), and eight (8) samples had detections of NOA (12.3%; See Table 6 in Appendix B and the data tables in Appendix E). Of the eight (8) samples that had detections, three (3) were composite samples and five (5) were target samples. Additionally, 43 of the sample analyses for the 2019 investigation are from targeted samples collected specifically where mineral veining occurred and where suspected NOA minerals would occur if present. The results from different media sampled across the Site (including aggregate, rock cores, boulders, and hand samples) during the investigations completed in 2019 indicate the absence of NOA or its very limited presence in trace concentrations in the rock.

The overall 2019 analyses average of NOA is provided in Table 6 in Appendix B and is indicated to be 0.058% (N=65). However, the average percentage calculated is higher than is actually present at the Site, as many samples were non-detect at the PLM detection limit of 0.1%. Accordingly, one-half ($\frac{1}{2}$) of the detection limit was used (0.05%) for non-detect samples, which is numerically close to the averaged results. The TEM data shows that NOA, when present, is at a lower level indicated by the TEM average of 0.01% (N=7).

Table 7, Appendix B includes all rock samples collected at the Site in 2018 and 2019. The laboratory results from the 99 analyses completed on 90 rock samples collected, show that 89 analyses were non-detect for NOA (89.9%) at the method detection limit, ten (10) analyses had trace NOA below the detection limit (10.1%), and ten (10) samples had detections of NOA (10.1%). Similar to the 2019 data, the average for NOA in rock samples collected over the course of 2018 and 2019 is indicated to be 0.076% (N=99) as shown in Table 7. The total 2018-2019 site average is essentially the same as the 2019 data due to the detection limits for the samples, as all 2018 samples (N=33) were non-detect (at <0.1% or <0.25%) except for one (1) result. When conservatively considering the 2018 TEM detection of 0.8% NOA from the hand sample collected on November 9, 2018, TEM data average increases to 0.10% (N=8, Table 7). However, the singular 2018 detection is from a biased targeted sample and is not representative of the materials to be mined from the site.

The sampling at the Site provided a bias towards NOA detection as approximately one-half of all rock analyses (N=49) were completed on targeted samples. However, the veins found in the rock cores represent only 0.43% of the cored rock by volume. When further considering the NOA average found over the core volumes, the percent asbestos present in the cored rock mass is



0.016% as shown in Table 5 in Appendix B. It should be noted that this average is an over estimate of NOA in the diabase, as the core borings were specifically sited to intersect mineral veins.

Overall the Site results indicated NOA concentration significantly below the 1.0% federal limit enforced by PADEP. No analyses of any 2018 or 2019 samples were equal to or in excess of the federal limit. Additionally, the average result for all samples is less than the 0.25% CARB Surfacing ATCM NOA limit.



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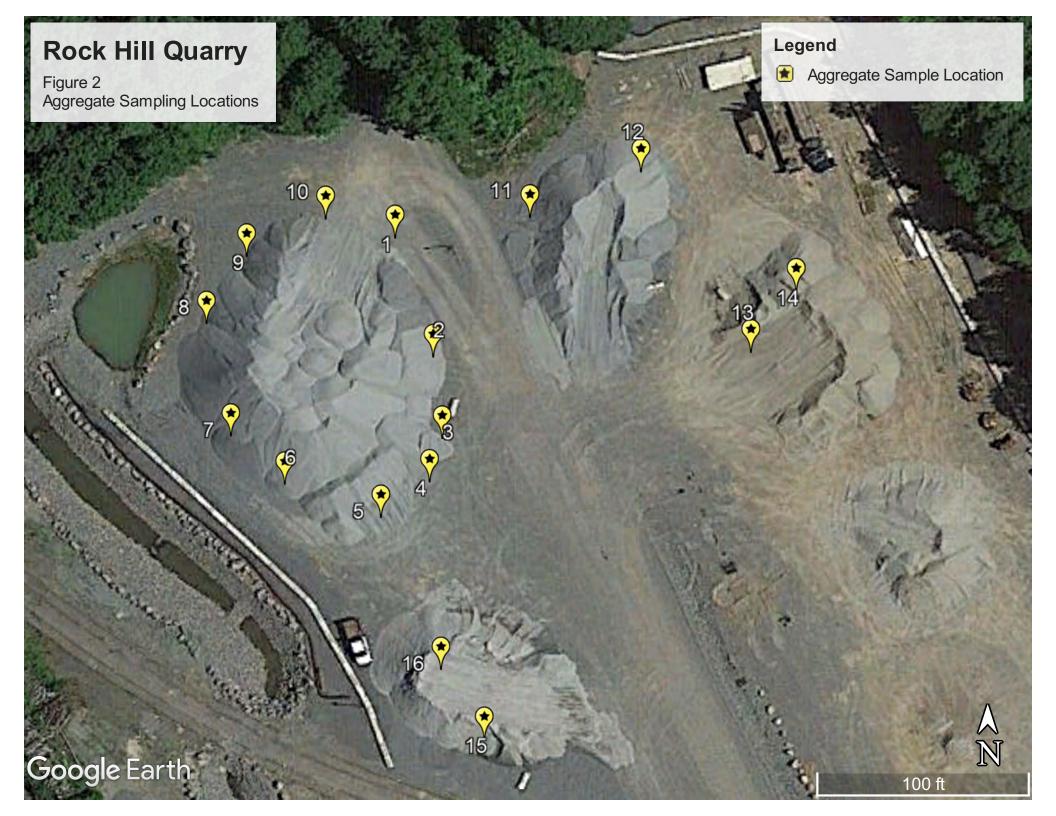


Appendix A - Figures

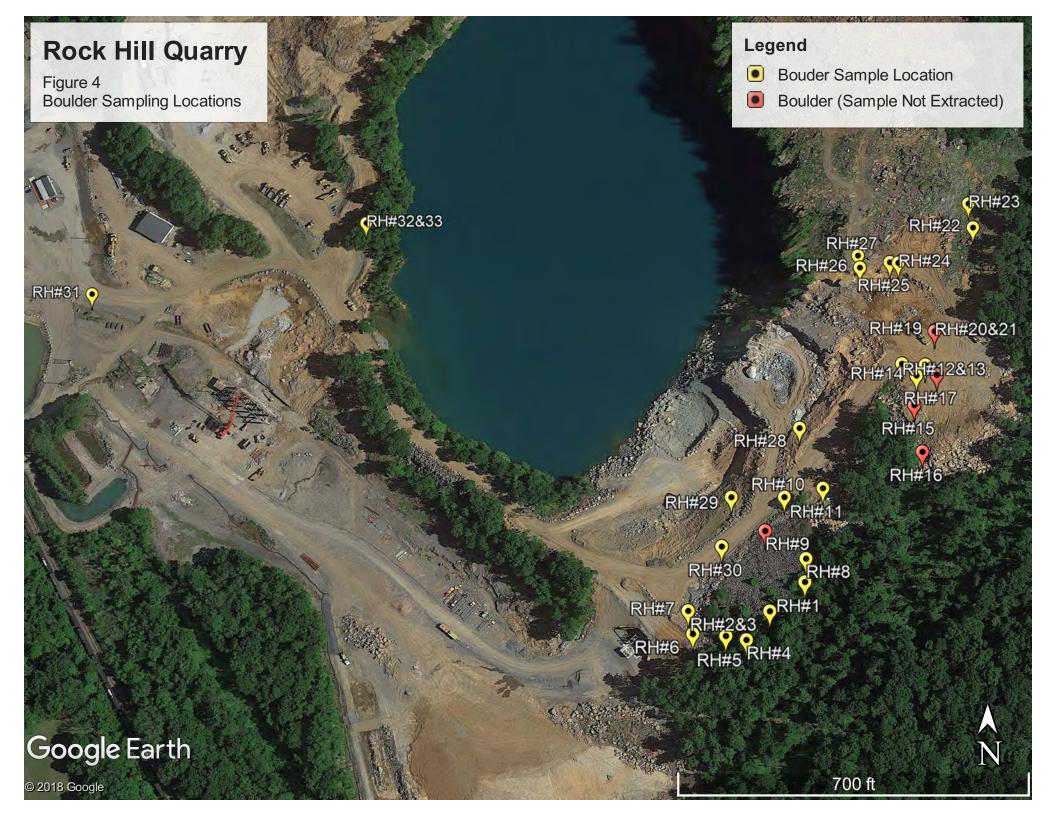


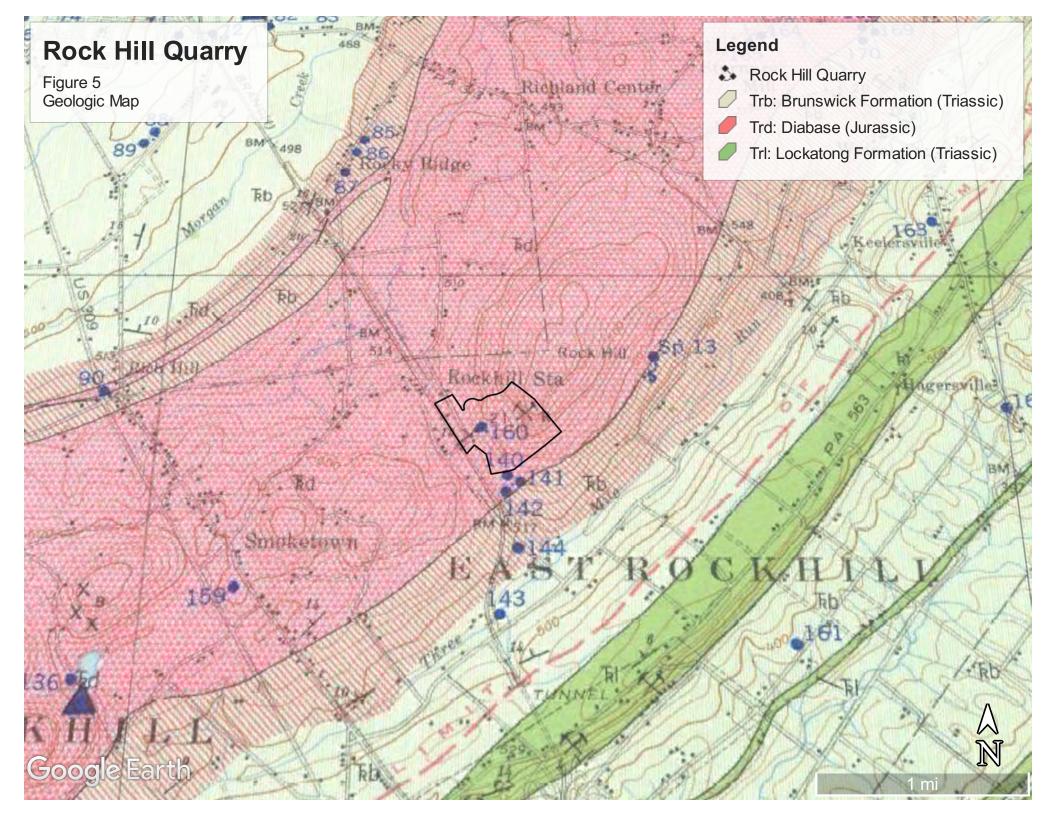
Rock Hill Quarry Sediment Trap 2 PDES Outfall Figure 1 Surface Water Sampling Locations Legend Surface water Sample Location Sediment Basin 2 Quarry Pit Sediment Basin 1 Sediment Trap 3 A N Google Earth Sediment Trap 1 1000 ft

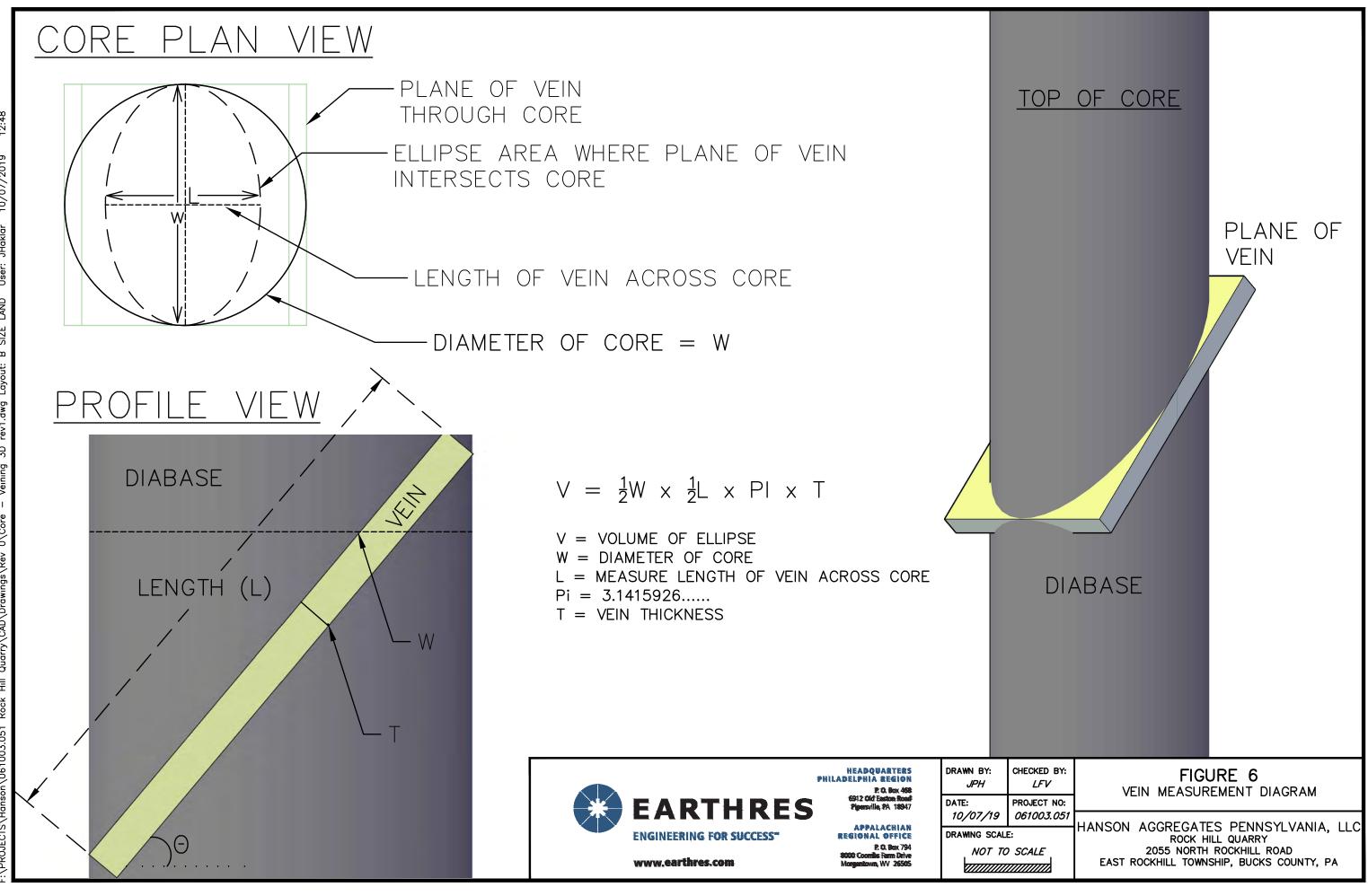
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Appendix B - Tables



	Summarized S Hanson Aggr		•		-			
Field Identification		NPDES Outfall	Sed. Trap 2	Sed. Basin 2	Sed. Basin 1	Quarry Pit	Sed. Trap 1	Sed. Trap 3
Matrix:		Water	Water	Water	Water	Water	Water	Water
Sample Date:		4/18/2019	4/18/2019	4/18/2019	4/18/2019	4/18/2019	4/18/2019	4/18/2019
Parameter (MFL - Million Fibers per Liter	US EPA Safe Drinking Water Standard							
EPA Method 100.2 600/R-94-134, Fibers	greater than 10 μ m	in length						
Amphibole Asbestos Structures	NS	0	0	0	0	0	0	0
Concentration (MFL)	7 MFL	<0.2	<1.0	<1.0	<1.0	<0.2	<1.0	<1.0
EPA Method 100.1 600/4-83-043, Fibers	greater than 5 µm in	length						
Amphibole Asbestos Structures	NS	1	0	0	0	0	0	0
Concentration (MFL)	NS	0.2	<0.9	< 0.3	<0.2	<0.2	<1.0	<0.6

- EPA maximum contaminant level (MCL) for asbestos in drinking water is 7 MFL (million fibers per liter > 10 μ m in length)

- Less than (<) indicates that asbestos was not detected at the analytical detection limit (e.g. <1.0 = a detection limit of 1 MFL)

- EPA Method 100.2 600/R-94-134 for fibers > 10 microns in length with a minimum aspect ratio of 3:1

- EPA Method 100.1 600/4-83-043 modified for fibers > 5 microns in length with a minimum aspect ratio of 3:1

- NS: No Standard

			00 0	Table e Analytic ennsylvan	cal Resu	-	,				
Field Identification	1	2		3	4		5	6	7		8
Analysis	PLM	PLM	PLM	TEM	PLM	PLM	TEM	PLM	PLM	PLM	TEM
Parameter											
Asbestos Detected (%)	ND	ND	<0.1 TR	< 0.00003	ND	<0.1 AC	< 0.00004	ND	ND	<0.1AC <0.1TR	< 0.00006
Field Identification	9	10	1	1	12	1	3	14	1	5	16
Analysis	PLM	PLM	PLM	TEM	PLM	PLM	TEM	PLM	PLM	TEM	PLM
Parameter											
Asbestos Detected (%)	ND	ND	ND	0.0048	ND	ND	0.05	ND	ND	0.016	ND

PLM Analytical Method EPA 600/R-93-116

TEM Weight Percent \geq 5µm per ASTM D-5756 Standard Test Method

ND: not detected above method detection limit. The PLM detection limit is 1/1000 = 0.1%; ND = <0.1%.

ND for TEM results are indicated by "<" at the detection limit listed.

For PLM analysis <0.1 TR and/or <0.1 AC indicates asbestos was identified in the sample, but the concentration was less than the method detection limit of 0.1%

TR: Tremolite

AC: Actinolite

Summarized Co Hanso	re Boring & Ha n Aggregates Pe	-	•		•)
Field Identification	CB-1 #1	CB-1 #3	CB-2 #4	CB-2 #5	CB-2 #6	CB-3 #7
Matrix:	Solid	Solid	Solid	Solid	Solid	Solid
Parameter				•		
Asbestos Detected (%)	0.20 AC	ND	ND	ND	0.10 TR	ND
Field Identification	CB-3 #8	CB-3 #9	CB-4 #10	DB-1	DB-1 (Dup.)	DB-1 (Dup.)
Matrix:	Solid	Solid	Solid	Solid	Solid	Solid
Parameter						
Asbestos Detected (%)	ND	ND	ND	0.1 AC*	0.6 TR*	ND**
Field Identification	DB-2	DB-3	DB-4	Hand Sample #1	Hand Sample #2	Vein 7
Matrix:	Solid	Solid	Solid	Solid	Solid	Solid
Parameter						
Asbestos Detected (%)	ND	ND	ND	ND	ND	0.10 AC

PLM/TEM Analytical Method EPA 600/R-93-116

ND: not detected above method detection limit. The PLM detection limit is 1/1000 = 0.1%; ND = <0.1%. For TEM results, the detection limits are listed below

*: Initial PLM analysis for DB-1 indicated 0.1 % NOA. PLM Analysis on DB-1 Duplicate indicated 0.6% NOA

**: Analysis of DB-1 Duplicate via TEM Method EPA 600/R-93-116 was ND for asbestos as follows: (Aliquot 1) at < 0.00004 %; and (Aliquot 2) at < 0.000031 %. TR: Tremolite

AC: Actinolite

			Tal	ole 4					
	Summ	arized Bou	lder Field A	analytical R	Results - Ap	ril 2019			
	Hanso	on Aggregat	tes Pennsylv	vania, LLC	Rock Hill	Quarry			
Field Identification	RH#1	RH#2	RH#3	RH#4	RH#5	RH#6	RH#7	RH#8	RH#10
Matrix:	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid
Sample Date:	5/8/2019	5/8/2019	5/8/2019	5/8/2019	5/8/2019	5/8/2019	5/8/2019	5/8/2019	5/8/2019
Parameter									
Asbestos Detected (%)	ND	<0.10 AC	ND	ND	ND	ND	<0.10 TR	ND	ND
Field Identification	RH #11	RH#12	RH#14	RH#18	RH#22	RH#23	RH#24	RH#25	RH#26
Matrix:	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid	Solid
Sample Date:	5/8/2019	5/8/2019	5/8/2019	5/7/2019	5/7/2019	5/7/2019	5/7/2019	5/7/2019	5/7/2019
Parameter									
Asbestos Detected (%)	<0.10 AC	<0.10 AC	<0.10 AC	ND	ND	ND	ND	ND	<0.10 AC
Field Identification	RH#27	RH#28	RH#29	RH#30	RH#31	RH#32	RH#33		
Matrix:	Solid	Solid	Solid	Solid	Solid	Solid	Solid		
Sample Date:	5/7/2019	5/8/2019	5/8/2019	5/8/2019	5/7/2019	5/7/2019	5/13/2019		
Parameter									
Asbestos Detected (%)	ND	ND	<0.10 AC	ND	ND	ND	ND		

PLM Analytical Method EPA 600/R-93-116

ND: not detected above method detection limit. The PLM detection limit is 1/1000 = 0.1%; ND = <0.1%.

For PLM analysis <0.1 TR and/or <0.1 AC indicates asbestos was identified in the sample, but the concentration was less than the method detection limit of 0.1%

TR: Tremolite

AC: Actinolite

Table 5Summary of Asbestos Testing in Rock Core BoringsHanson Aggregates Pennsylvania, LLC Rock Hill Quarry

Core	Total Drilled Length of Core feet	<u>Actinolite Vein Volume</u> Total Core Volume	Asbestos Concentration PLM
CB-1	91	1.09%	0.0212%
CB-2	90	0.32%	0.0278%
CB-3	160.5	0.18%	0.0091%
CB-4	160	0.13%	0.0063%
Arithmetic Mean		0.43%	0.016%
	Geometric Mean	0.30%	0.014%

Table 6

QGSR Sampling RJ Lee Laboratory Data Summary Table (2019) Asbestos Concentrations (%) Hanson Aggregates of Pennsylvania, LLC Rock Hill Quarry

	All Samples ¹	Composite Samples ²	Target Samples ³
	ND = 1/2 DL	ND = 1/2 DL	ND = 1/2 DL
Geometric Mean (All):	0.0321	0.0148	0.0479
Average (All):	0.0588	0.0396	0.0686
Number of Samples:	65	22	43
Geometric Mean (PLM Only):	0.0554	0.0500	0.0576
Average (PLM Only):	0.0647	0.0500	0.0702
Number of Samples:	58	16	42
Geometric Mean (TEM Only):	0.0004	0.0006	0.00002
Average (TEM Only):	0.0101	0.0118	0.00002
Number of Samples:	7	6	1

1 - Including all RJ Lee Group Laboratory sample analyses via PLM and TEM (with duplicate analyses averaged)

2 - Stockpile Samples (2019)

3 - Hand Samples, Core Samples and Boulder Vein Samples (2019)

The 2019 data includes the collection of 57 samples and completion of 65 analyses (7 TEM & 1 PLM duplicate sample)

Table 72018-2019 Data Summary TableAsbestos Concentrations (%)Hanson Aggregates of Pennsylvania, LLC Rock Hill Quarry

	All Samples ¹	Composite Samples ²	Target Samples ³
	ND = 1/2 DL	ND = 1/2 DL	ND = 1/2 DL
Geometric Mean (All):	0.0445	0.0378	0.0526
Average (All):	0.0760	0.0664	0.0857
Number of Samples:	99	50	49
Geometric Mean (PLM Only):	0.0626	0.0669	0.0587
Average (PLM Only):	0.0731	0.0739	0.0723
Number of Samples:	91	44	47
Geometric Mean (TEM Only):	0.0009	0.0006	0.00400
Average (TEM Only):	0.1089	0.0118	0.40001
Number of Samples:	8	6	2

1 - Including all 2018-2019 sample analyses via PLM and TEM (with duplicate analyses averaged)

2 - Stockpile Samples (2018-19), Crusher Fines (2018) and Drill Cuttings (2018)

3 - Hand Samples (2018-2019), Core Samples (2019) and Boulder Vein Samples (2019)

The 2018 data set includes the collection of 33 samples and completion of 34 analyses (1 TEM Verification Sample)

The 2019 data set includes the collection of 57 samples and completion of 65 analyses (7 TEM and 1 PLM Duplicate Sample)

Appendix C – Work Plans and DEP Correspondence



Earthres Group, Inc. toll free 800-264-4553

www.earthres.com



HEADQUARTERS / PHILADELPHIA REGION

P. O. Box 468, Pipersville, PA 18947 phone 215-766-1211

APPALACHIAN REGIONAL OFFICE

P. O. Box 794, Morgantown, WV 26505 phone 304-212-6866

April 3, 2019

Michael J. Menghini, District Mining Manager Department of Environmental Protection Pottsville District Mining Office 5 West Laurel Boulevard Pottsville, PA 17901-2454

SUBJECT: Qualitative Geologic Survey Sampling Plan Rock Hill Quarry SMP No. 7974SM1 East Rockhill Township, Bucks County EARTHRES Project No. 061003.051

Dear Mr. Menghini:

On behalf of Hanson Aggregates Pennsylvania, LLC (Hanson), Earthres Group, Inc. is providing the following Qualitative Geologic Survey Sampling Plan for continued assessment of Naturally Occurring Asbestos (NOA) at the Rock Hill Quarry Operation.

The sampling plan was prepared in follow-up to your letter of December 19, 2018, and our joint meeting on February 21, 2019 with the Pennsylvania Department of Environmental Protection (PA DEP), Hanson, Kelly Bailey, CIH, Drew R. Van Orden, P.E., and R.E. Pierson personnel.

This sampling plan has been designed to collect sufficient information for the preparation of a detailed Qualitative Geologic Survey of the site so that, based upon the results, the PA DEP will be able to lift the stop work order and allow Hanson and R.E. Pierson Materials to resume active operation of the Quarry.

CURRENT AND PROPOSED SAMPLING

Prior investigation, qualitative geological surveying and sampling conducted at the site during 2018 included the collection and analysis of thirty-three (33) samples including: 5 mineral vein rock samples, 21 drill hole cutting samples, 5 aggregate storage pile samples and 2 crusher run (fines) samples. All samples yielded non-detectable results for NOA, except for one biased rock sample that found a trace amount of asbestiform actinolite in a mineral vein.

Rock Hill Quarry Qualitative Geologic Survey Sampling Plan April 3, 2019 Page 2 of 5

The following work plan elements were developed in consultation with Hanson's asbestos experts: Kelly Bailey, CIH, of Kelly Bailey Consulting, LLC and Drew R. Van Orden, P.E. of RJ Lee Group, Inc. The proposed work efforts include:

- 1) Aggregate storage pile sampling;
- 2) Rock coring and sampling;
- 3) Surficial geological analysis of the existing boulder field on the southern and eastern sides of the Quarry pit; and,
- 4) Sampling of water from the NPDES discharge, Sediment Basin 1, Sediment Basin 2, and the Quarry pit.

A minimum of two (2) days' notice will be given to the PA DEP to allow for coordination of each field sampling event.

AGGREGATE STORAGE PILE SAMPLING

Per the Department's letter of December 19, 2018, aggregate storage pile sampling is to include "...one test per 1,000 tons of material or any fraction thereof..." Hanson mapped the existing aggregate storage piles and determined the following tonnages and proposed samples as indicated in the below table. The relative locations of the various storage piles are also indicated by compass direction. The aggregate storage piles proposed for sampling are identified on Figure 1A.

Stone Type	Location	Tonnage	Proposed Samples
2B Stone	Northwest	9,946	10
1B Stone Pile	Northeast	1,695	2
2A Stone Pile	East	1,585	2
Screenings	South	1,983	2

Proposed Aggregate Storage Pile Sampling

Aggregate samples will be collected as material composites using AASHTO R90. The samples will be mixed and reduced in size prior to transmittal to the laboratory per AASHTO T248. Samples will be transmitted to the laboratory in one gallon sealed plastic bags. To accomplish the AASHTO R90 sampling, the 2B storage pile will be surveyed and marked into ten radial sections for subsequent collection of ten samples. Samples from the remaining storage piles will be collected from opposite sides of the piles. The exact sample locations will be determined and marked in the field at the time of sampling. Samples will be collected from storage pile locations that were not previously sampled.



Rock Hill Quarry Qualitative Geologic Survey Sampling Plan April 3, 2019 Page 3 of 5

Upon reduction of the sample sizes per AASHTO T248, the samples will be transmitted under chain-of-custody to RJ Lee Group, Inc. in Monroeville, PA for microscopic analysis and Polarized Light Microscopy (PLM). If asbestiform minerals are found via PLM analysis, the sample will be further analyzed by Transmission Electron Microscopy (TEM) to confirm mineral identification and morphology. Analytical methods to be employed for the proposed testing are included in Attachment 1. The Pennsylvania and national laboratory accreditation certificates for RJ Lee Group, Inc. are included in Attachment 2.

ROCK CORING

Four rock cores will be advanced in the planned mining area to an elevation of approximately 585 feet above mean sea level (MSL), which is approximately equivalent to the current water level in the Quarry pit. The approximate coring locations are shown on Figure 1B. The cores will be drilled on an approximately 30-degree angle from vertical with an azimuth of approximately N45W. This azimuth is projected perpendicular to the geologic structure (ridgeline trend and geological strike) and was chosen to intercept as many potential features as practical. Where safely accessible, the highwalls below the coring locations will be examined prior to drilling to assess the presence and trend (dip and azimuth) of mineral veining. Based upon what is observed, the azimuth and location of the core drilling locations may be modified to better intercept found mineral vein trends. The exact core locations will be accomplished during drilling to minimize dust formation. Retrieved cores will be boxed, labeled and stored onsite for logging and analysis.

A professional geologist will visually log the cores to identify and record the following:

- 1) Geological description;
- 2) Mineralogy and grain size;
- 3) The percentage of core recovered;
- 4) Bedding observations;
- 5) Fracture occurrence;
- 6) Mineral veining; and,
- 7) Other pertinent geological features.

Found mineral veins will be examined using a hand lens and fine steel pick to assess the presence of fibrous mineral morphology. If potentially suspect mineral morphology is identified, the mineral veining will be photographed and sampled in the following manner:

- 1) The section of the core containing the suspect mineral vein will be isolated using a wet saw or core splitter;
- 2) The portion of the core to be sampled will be split by wet sawing. Half of the sample will be saved, while the remainder of the sample will be transmitted for laboratory analysis.



Rock Hill Quarry Qualitative Geologic Survey Sampling Plan April 3, 2019 Page 4 of 5

The PA DEP will have the opportunity to collect a split sample from the sampled portion of the core;

- 3) The sample will be sent to RJ Lee Group, Inc. in Monroeville, PA under chain-of-custody for microscopic and PLM analysis; and,
- 4) If asbestiform minerals are found via PLM analysis, the sample will be further analyzed by TEM to confirm mineral identification and morphology.

Additionally, one (1) diabase sample from each rock core (4 samples total) will be collected from a representative core portion where veining is absent. Sample preparation and analysis will be in accordance with the above procedures.

BOULDER FIELD ANALYSIS

A boulder field exists on the southern and eastern sides of the quarry pit. Examinations of at least 30 mineral veins on randomly selected boulders located in the boulder field will be completed. A professional geologist will examine the found mineral veining with a hand lens and fine steel pick to assess the presence of fibrous mineral morphology. If potentially suspect mineral morphology is identified, the mineral veining will be photographed and sampled. The exact boulder and vein locations will be determined and marked in the field at the time of sampling. The samples will be sent to RJ Lee Group, Inc. in Monroeville, PA under chain-of-custody for microscopic and PLM analysis. If asbestiform minerals are found via PLM analysis, the sample will be further analyzed by TEM to confirm mineral identification and morphology.

WATER SAMPLING

Water samples will be collected from the NPDES discharge, Sediment Basin 1 (southern basin), Sediment Basin 2, and the Quarry pit (4 samples total). The water samples will be collected as grab samples using a telescopic pole sampler containing an attached sampling cup. The sampling apparatus will be washed with Alconox® and rinsed with distilled water initially and between each sampling location. Sample collection will proceed from downgradient to upgradient to minimize potential for sample cross-contamination. Proposed water sampling locations are shown on Figure 1A. The water samples will be collected in clean laboratory-provided one liter plastic bottles. The samples will be placed on ice and transmitted under chain-of-custody to RJ Lee Group, Inc. in Monroeville, PA for analysis per EPA Method 100.2.

SAMPLING AND REPORTING

Upon approval of the work plan, Hanson is prepared to commence sampling at the site. Results of the investigation should be available approximately three (3) weeks after submittal of all samples to the laboratory. Status reports will be provided to the PA DEP weekly once sampling has



Rock Hill Quarry Qualitative Geologic Survey Sampling Plan April 3, 2019 Page 5 of 5

commenced. The results of the investigation will be provided in a Qualitative Geologic Survey Report.

If you have any questions or concerns regarding the proposed investigation and sampling, please feel free to contact me at (215) 766-1211.

Sincerely, Earthres Group, Inc.

Louis F. Vittorio, Jr., P.G. Vice President

Figure 1A – Water & Aggregate Sampling Locations Figure 1B – Proposed Coring Locations Attachment 1 – Sample Analysis Procedures and Methods Attachment 2 – Laboratory Certifications

Mark E. Kendrick, Hanson* cc: Andrew J. Gutshall, P.G., Hanson* Matthew S. Burns, Esq, Hanson* Curt Mitchell, R.E. Pierson Mike Logan, CPS* Kelly F. Bailey, CIH, KBC, LLC* Drew R. Van Orden, P.E., RJ Lee Group, Inc* Michael P. Kutney, P.G., PA DEP* Gary Latsha, PA DEP* Amiee Bollinger, PA DEP* James D. Rebarchak, PA DEP* Marianne Morano, East Rockhill Township* David J. Raphael, Esq., K&L Gates* Robert W. Gundlach, Esq., Fox Rothschild* (*via electronic mail)



Rock Hill Quarry Qualitative Geologic Survey Sampling Plan April 3, 2019

FIGURES



Figure 1A Water and Aggregate Sampling Locations

NPDES Outfall 2B Aggregate Storage Pile B Aggregate Storage Pile

Screenings Storage Pile

North Pond Sampling Location

South Pond Sampling Location

A

0

Google Earth

© 2018 Google

Rockhill Rd



Aggregate Storage PileWater Sampling Location

Quarry Pit Sampling Location

400 ft



Proposed Coring #4

Proposed Coring #3

Proposed Coring #2

C Proposed Coring #1

Google Earth



Rock Hill Quarry Qualitative Geologic Survey Sampling Plan April 3, 2019

ATTACHMENT 1

Sample Analysis Methods



Attachment 1

Sample Analysis Procedures and Methods

For obtaining a representative sample from a large bulk sample, the AASHTO procedures for reducing the sample should be used. The subsequent analyses of the submitted samples will follow a three step procedure: 1) Basic microscopic analysis to assess the presence of asbestiform mineral habitat; 2) Polarized Light Microscopy (PLM) to determine the presence and asbestos mineral type, if present; and, 3) Should positive results be indicated by PLM, follow-up Transmission Electron Microscopy (TEM) analysis will be completed to confirm the minerals present and their morphology. The techniques and methods to be employed in sample analysis are provided below:

- A geologist will inspect hand and core samples initially using a stereo binocular microscope, with magnification ranging from 10x to 60x. Using a fine steel pick (dental pick) the geologist will scrape the surface of the suspect mineralization to determine if any of the minerals display typical asbestiform habit and characteristics such as fiber bundles, splayed ends, or matted or fibrous masses.
- Further examination of the sample will then be conducted using the Polarized Light Microscope (PLM) using EPA 600/R-93/116.
- If asbestiform minerals are found, representative samples will be further analyzed by Transmission Electron Microscopy per EPA 600/R-93/116 to confirm mineral identification and morphology.
- Where appropriate, the microscopic PLM and/or TEM analyses will include a count of the asbestiform fibers, representative digital images, and measurements of the width and length dimensions of found fibers counted.

Water samples will be collected as grab samples and will be analyzed by TEM per EPA 100.2.

The samples will be analyzed using the above procedures by RJ Lee Group, which is accredited by the American Industrial Hygiene Association and is in the NIST National Voluntary Laboratory Accreditation Program for asbestos analysis. RJ Lee Group has mineralogical expertise and has vast experience to detect asbestos fibers in the natural environment (e.g. rocks, soils, water, etc.).

Rock Hill Quarry Qualitative Geologic Survey Sampling Plan April 3, 2019

ATTACHMENT 2

Laboratory Accreditation Certificates



COMMONWEALTH OF PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF LABORATORIES LABORATORY ACCREDITATION PROGRAM

Certifies That

02-00396

RJ Lee Group, Inc. 350 Hochberg Road, Monroeville, PA 15146

Having duly met the requirement of The act of June 29, 2002 (P.L. 596, No. 90) dealing with Environmental Laboratories Accreditation (27 Pa. C.S. §§4104-4113) and the National Environmental Laboratory Accreditation Program Standard

is hereby approved as an

Accredited Laboratory

to conduct analysis within the fields of accreditations more fully described in the attached Scope of Accreditation

Expiration Date: 04/30/2019

Certificate Number: 014

liaven alger

Aaren S. Alger, Chief Laboratory Accreditation Program Bureau of Laboratories



To be conspicuously displayed at the Laboratory

PA DEP is a NELAP recognized accreditation body

Customers are urged to verify the laboratory's current accreditation status

Continued accreditation status depends on successful ongoing participation in the program Certificate not transferable Surrender upon revocation Not valid unless accompanied by a valid Scope of Accreditation Shall not be used to imply endorsement by the Commonwealth of Pennsylvania





AIHA Laboratory Accreditation Programs, LLC

acknowledges that

RJ Lee Group, Inc.

350 Hochberg Road, Monroeville, PA 15146

Laboratory ID: 100364

along with all premises from which key activities are performed, as listed above, has fulfilled the requirements of the AIHA Laboratory Accreditation Programs (AIHA-LAP), LLC accreditation to the ISO/IEC 17025:2005 international standard, *General Requirements for the Competence of Testing and Calibration Laboratories* in the following:

LABORATORY ACCREDITATION PROGRAMS

✓ INDUSTRIAL HYGIENE
 ✓ ENVIRONMENTAL LEAD
 □ ENVIRONMENTAL MICROBIOLOGY
 □ FOOD
 □ UNIQUE SCOPES

Accreditation Expires: April 01, 2020 Accreditation Expires: April 01, 2020 Accreditation Expires: Accreditation Expires: Accreditation Expires:

Specific Field(s) of Testing (FoT)/Method(s) within each Accreditation Program for which the above named laboratory maintains accreditation is outlined on the attached **Scope of Accreditation**. Continued accreditation is contingent upon successful on-going compliance with ISO/IEC 17025:2005 and AIHA-LAP, LLC requirements. This certificate is not valid without the attached **Scope of Accreditation**. Please review the AIHA-LAP, LLC website (www.aihaaccreditedlabs.org) for the most current Scope.

Bet Bair

Elizabeth Bair Chairperson, Analytical Accreditation Board

Revision 16: 03/21/2018

Cheryl J. Marton

Cheryl O. Morton Managing Director, AIHA Laboratory Accreditation Programs, LLC

Date Issued: 03/30/2018



AIHA Laboratory Accreditation Programs, LLC SCOPE OF ACCREDITATION

RJ Lee Group, Inc.

350 Hochberg Road, Monroeville, PA 15146

Laboratory ID: **100364** Issue Date: 03/30/2018

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

Industrial Hygiene Laboratory Accreditation Program (IHLAP)

IHLAP Scope Category	Field of Testing (FoT) (FoTs cover all relevant IH matrices)	Technology sub-type/ Detector	Published Reference Method/Title of In- house Method	Method Description or Analyte (for internal methods only)
Chromatography Core	IH matrices) Gas Chromatography	Detector GC/FID	house Method NIOSH 1003 NIOSH 1005 NIOSH 1007 NIOSH 1022 NIOSH 1300 NIOSH 1300 NIOSH 1301 NIOSH 1400 NIOSH 1400 NIOSH 1401 NIOSH 1402 NIOSH 1403 NIOSH 1453 NIOSH 1453 NIOSH 1453 NIOSH 1453 NIOSH 1453 NIOSH 1457 NIOSH 1458 NIOSH 1459 NIOSH 1500 NIOSH 1501 NIOSH 1501 NIOSH 1550 NIOSH 2500 NIOSH 2537 NIOSH 2546 NIOSH 2553	•
			NIOSH 2554	

Initial Accreditation Date: 09/01/1991



IHLAP Scope Category	Field of Testing (FoT) (FoTs cover all relevant IH matrices)	Technology sub-type/ Detector	Published Reference Method/Title of In- house Method	Method Description or Analyte (for internal methods only)
			NIOSH 2555	
			NIOSH 4000	
	Gas Chromatography	GC/FID	NIOSH 5020	
			NIOSH 5515	
			NIOSH 5523	
			NIOSH 1003	
			NIOSH 1005	
			NIOSH 1007	
			NIOSH 1022	
			NIOSH 1300	
			NIOSH 1301	
			NIOSH 1400	
			NIOSH 1401	
			NIOSH 1402	
			NIOSH 1403	
			NIOSH 1450	
			NIOSH 1453	
			NIOSH 1457	
Chromatography			NIOSH 1458	
Core	Gas Chromatography		NIOSH 1459	
	(Diffusive Samplers)		NIOSH 1500	
			NIOSH 1501	
			NIOSH 1550	
			NIOSH 1615	
			NIOSH 2000	
			NIOSH 2500	
			NIOSH 2537	
			NIOSH 2546	
			NIOSH 2553	
			NIOSH 2554	
			NIOSH 2555	
			NIOSH 4000	
			NIOSH 5020	
			NIOSH 5515	
			NIOSH 5523	
	Ion Chromotography (IC)		NIOSH 7903	
	Ion Chromatography (IC)		OSHA ID - 215	
	Liquid Chromatography	HPLC/UV	NIOSH 2016	
			NIOSH 5506	



IHLAP Scope Category	Field of Testing (FoT) (FoTs cover all relevant IH matrices)	Technology sub-type/ Detector	Published Reference Method/Title of In- house Method	Method Description or Analyte (for internal methods only)
Chromatography			OSHA 42	
Core	Liquid Chromatography	HPLC/UV	OSHA 47	
			OSHA 58	
	Atomic Absorption	CVAA	NIOSH 6009	
		ICP/MS	NIOSH 7300 Modified	
	Inductively-Coupled		NIOSH 7300	
Spectrometry Core	Plasma	ICP/AES	NIOSH 7300 Modified	
			NIOSH 7303	
	X-ray Diffraction (XRD)		NIOSH 7500	
	Infrared		NIOSH 5026	
	Polarized Light Microscopy (PLM)		40 CFR Part 763, Sub. E., Appendix E	Interim Method of the Determination of Asbestos in Bulk Insulation Samples
Asbestos/Fiber			EPA 600/R-93/116	
Microscopy Core	Phase Contrast Microscopy (PCM)		NIOSH 7400A	
	Transmission Electron Microscopy (TEM)		40 CFR Part 763, Sub. E, Appendix A NIOSH 7402	
			NIOSH 0500	
			NIOSH 0600	
Miscellaneous Core	Gravimetric		NIOSH 5042	
Wilscenaneous Core	aneous Core		OSHA 58	
	Thermo-optical Analysis (TOA)		NIOSH 5040	
		ICP/MS	NIOSH 7303 Modified	
Beryllium Testing	Inductively-Coupled Plasma	ICP/AES	NIOSH 7300 NIOSH 7300 Modified	

A complete listing of currently accredited Industrial Hygiene laboratories is available on the AIHA-LAP, LLC website at: <u>http://www.aihaaccreditedlabs.org</u>



AIHA Laboratory Accreditation Programs, LLC SCOPE OF ACCREDITATION

RJ Lee Group, Inc.

Laboratory ID: **100364** Issue Date: 04/10/2018

350 Hochberg Road, Monroeville, PA 15146

The laboratory is approved for those specific field(s) of testing/methods listed in the table below. Clients are urged to verify the laboratory's current accreditation status for the particular field(s) of testing/Methods, since these can change due to proficiency status, suspension and/or withdrawal of accreditation.

The EPA recognizes the AIHA-LAP, LLC ELLAP program as meeting the requirements of the National Lead Laboratory Accreditation Program (NLLAP) established under Title X of the Residential Lead-Based Paint Hazard Reduction Act of 1992 and includes paint, soil and dust wipe analysis. Air and composited wipes analyses are not included as part of the NLLAP.

Environmental Lead Laboratory Accreditation Program (ELLAP)

Initial Accreditation Date: 12/05/1995

Field of Testing (FoT)	Technology sub-type/ Detector	Method	Method Description (for internal methods only)
Sottlad Dust by Wine		EPA SW-846 3050B	
Settled Dust by Wipe		EPA SW-846 7000B	

A complete listing of currently accredited Environmental Lead laboratories is available on the AIHA-LAP, LLC website at: <u>http://www.aihaaccreditedlabs.org</u>

United States Department of Commerce National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 101208-0

RJ Lee Group, Inc.

Monroeville, PA

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).

2018-07-01 through 2019-06-30

Effective Dates



For the National Voluntary Laboratory Accreditation Program

National Voluntary Laboratory Accreditation Program



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

RJ Lee Group, Inc. 350 Hochberg Road Monroeville, PA 15146-1516 Ms. Tammie Mussitsch Phone: 724-325-1776 Fax: 724-733-1799 Email: accreditations@rjlg.com http://www.RJLG.COM

ASBESTOS FIBER ANALYSIS

NVLAP LAB CODE 101208-0

Bulk Asbestos Analysis

Code	Description
18/A01	EPA 40 CFR 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

Description

Code 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

James Haklar

From:	Louis Vittorio
Sent:	Wednesday, April 17, 2019 6:46 AM
То:	'Kutney, Michael'; Menghini, Michael; Latsha, Gary; Bollinger, Amiee; Rebarchak, James;
	Tallman, Richard; Cain, Virginia; Fogel, Robert; Sammarco, Daniel; Stefanko, John;
	Shankar, Sachin; Lambeth, Craig; Furlong, Erika
Cc:	Andrew Gutshall; Curt Mitchell (cmitchell@repierson.com); Kendrick, Mark E
	(Allentown) USA; Mike Logan (mlogan@CPS-2Comply.com); Kelly Bailey;
	drew@rjlg.com; Marianne Morano; David Raphael; RGundlach@foxrothschild.com;
	Matthew Burns
Subject:	Response to Comments - Rock Hill Quarry Sampling Plan

Mike:

Thank you for your comments dated April 12, 2019 pertaining to the submitted *Qualitative Survey Sampling Plan* for the Rock Hill Quarry site. On behalf of Hanson Aggregates Pennsylvania, LLC (Hanson), I am providing the following comment responses (*in italic font*):

Regarding the existing stockpiles:

1. The chosen sampling approach uses AASHTO R90. According to the AASHTO R90 method, sampling of stockpiles should be avoided due to problems involved in obtaining a representative gradation of material. Please explain why this is the best choice available for sampling the stockpiles.

AASHTO R90 provides sampling methods for aggregates from: (a) source production (e.g. from conveyors at the crusher), (b) in-place end product (roadways), or (c) stockpiles. Note 3 in the AASHTO R90 method essentially states that when methods/locations (a) and (b) are available for sampling, they are preferred in lieu of stockpile sampling to assure a representative gradation of material is obtained. As sampling of the existing stockpiles is required, a provided AASHTO R90 stockpile sampling method is proposed to be used. Specifically, the sampling is proposed to be conducted with Stockpile Method A. The method requires using a Front End Loader to dig into the pile to obtain a representative sample of the aggregate gradation in place. In regards to the gradation concern, the sampling will entail the collection of samples from piles having differing gradations, including 2B, 1B, and 2A stone and screenings.

Regarding the rock core drilling:

1. A drilling program typically has a goal or target. What are the targets or goals in this case? How will success be determined?

The goal of the drilling program is to further evaluate the presence or absence of trace amounts of naturally occurring asbestos (NOA) in the rock to be mined. Success will be determined through laboratory analysis for NOA in the mineral vein samples identified in the cores as specified in the work plan.

2. Please provide additional explanation for the planned azimuth and dip angle of the drilling. Please explain why the proposed azimuth and dip angle are thought to be the most likely to intercept asbestos-bearing features?

The dip angle of the proposed borings was chosen to maximize the potential to intercept veining, which is indicated to be near vertical from current observations. The azimuth of the drilling program was chosen to be perpendicular to regional geological strike, which is also coincident with the orientation of the diabase ridge. In the extensional geological rift environment that existed during diabase emplacement, the diabase was intruded along geological strike. The strike direction is also perpendicular to the extensional forces that enabled diabase emplacement. Through drilling in the direction perpendicular to the regional geological strike (and parallel to extensional forces), the coring is more likely to cross mineral veins and/or bedding features (i.e. heterogeneities) that may exist in the rock.

3. Please explain the basis for the number of core holes and their spacing.

Core drilling was proposed based upon guidance contained the <u>Aggregates Handbook</u> (NSSGA, 2013, Alexandria, VA, 2nd edition). Typical spacing recommended therein is much larger than proposed (e.g. 1 per four acres). For the current program, we are proposing targeted, oriented core holes (see our response to Comment #2) spaced approximately 50-ft to 70-ft apart on two separate benches. The actual locations of the core holes will be adjusted based upon field conditions (see our response to Comment #4 below). Based upon the results of the coring, including consideration of rock homogeneity and the NOA sampling results, more or less coring will be proposed for future operations.

4. It would seem prudent to perform a field investigation of the mineral vein orientations and spacing before launching a drilling program to investigate them. The number and orientation of the drill holes could change based on the findings. If it is determined that the drilling was directed in a sub-optimal orientation, the Department may require additional drilling.

Per the Department's request, mineral veins visible in the highwalls in the proposed drilling area will be mapped where safely possible to guide the selection of core hole locations, and drilling dip and azimuth.

5. Please include any lithologic contacts as part of the field logging and identifying procedures.

Per the Department's request, any lithologic contacts encountered will be included on the core logs to be prepared as specified in the work plan.

Regarding the water bodies:

1. Please sample all of the sediment traps on the permit in addition to the other water bodies already proposed.

Per the Department's request, the sediment traps in the permit area in addition to the other water bodies proposed will be sampled as specified in the work plan.

The Department would like to be on site for all sampling events. Please provide the schedule for sampling as soon as possible.

It is our intention to commence water and aggregate sampling on Thursday April 18th. Core drilling is to commence April 22nd.

If you have any questions, please contact me or Andrew Gutshall of Hanson at your convenience.

Regards, -Lou

Louis F. Vittorio, Jr., P.G. | Vice President Earthres Group, Inc. | *Engineering for SuccessSM*

Headquarters | Philadelphia Region | P. O. Box 468, Pipersville, PA 18947 215-766-1211 office | 215-768-7064 mobile | 800-264-4553 toll free <u>lvittorio@earthres.com</u> | <u>www.earthres.com</u> | <u>L</u> | <u>t</u> | <u>f</u>



From: Kutney, Michael [mailto:mkutney@pa.gov]

Sent: Friday, April 12, 2019 3:51 PM

To: Louis Vittorio <lvittorio@earthres.com>; Menghini, Michael <mmenghini@pa.gov>; Latsha, Gary <galatsha@pa.gov>; Bollinger, Amiee <ambollinge@pa.gov>; Rebarchak, James <jrebarchak@pa.gov>; Tallman, Richard <rtallman@pa.gov>; Cain, Virginia <vicain@pa.gov>; Fogel, Robert <rofogel@pa.gov>; Sammarco, Daniel <dsammarco@pa.gov>; Stefanko, John <jstefanko@pa.gov>; Shankar, Sachin <sshankar@pa.gov>; Lambeth, Craig <clambeth@pa.gov>; Furlong, Erika <erfurlong@pa.gov>

Cc: Andrew Gutshall <Andrew.Gutshall@LehighHanson.com>; Curt Mitchell (cmitchell@repierson.com) <cmitchell@repierson.com>; Kendrick, Mark E (Allentown) USA <Mark.Kendrick@lehighhanson.com>; Mike Logan (mlogan@CPS-2Comply.com) <mlogan@CPS-2Comply.com>; Kelly Bailey <kfbcih@gmail.com>; drew@rjlg.com; Marianne Morano <MMorano@EastRockHillTownship.org>; David Raphael <dave.raphael@klgates.com>; RGundlach@foxrothschild.com; Matthew Burns <matthew.burns@lehighhanson.com> Subject: RE: [External] Rock Hill Quarry Sampling Plan

Lou-

The Department has reviewed the Qualitative Survey Sampling Plan, dated April 3, 2019, and has the following comments:

Regarding the existing stockpiles:

1. The chosen sampling approach uses AASHTO R90. According to the AASHTO R90 method, sampling of stockpiles should be avoided due to problems involved in obtaining a representative gradation of material. Please explain why this is the best choice available for sampling the stockpiles.

Regarding the rock core drilling:

- 1. A drilling program typically has a goal or target. What are the targets or goals in this case? How will success be determined?
- 2. Please provide additional explanation for the planned azimuth and dip angle of the drilling. Please explain why the proposed azimuth and dip angle are thought to be the most likely to intercept asbestos-bearing features?
- 3. Please explain the basis for the number of core holes and their spacing.
- 4. It would seem prudent to perform a field investigation of the mineral vein orientations and spacing before launching a drilling program to investigate them. The number and orientation of the drill holes could change based on the findings. If it is determined that the drilling was directed in a sub-optimal orientation, the Department may require additional drilling.
- 5. Please include any lithologic contacts as part of the field logging and identifying procedures.

Regarding the water bodies:

1. Please sample all of the sediment traps on the permit in addition to the other water bodies already proposed.

Regarding the boulder field sampling: No comments

The Department would like to be on site for all sampling events. Please provide the schedule for sampling as soon as possible.

If you have any questions, please contact me at 570.621.3470.

Sincerely,

Michael Kutney, P.G. | Chief, Permits & Technical Section Department of Environmental Protection Pottsville District Mining Office 5 West Laurel Boulevard | Pottsville, PA 17901 Phone: 570.621.3118 | Fax: 570.621.3110 www.dep.pa.gov

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From: Louis Vittorio <lvittorio@earthres.com> Sent: Wednesday, April 3, 2019 6:24 PM To: Menghini, Michael <mmenghini@pa.gov>; Kutney, Michael <mkutney@pa.gov>; Latsha, Gary <galatsha@pa.gov>; Bollinger, Amiee <ambollinge@pa.gov>; Rebarchak, James <jrebarchak@pa.gov> Cc: Andrew Gutshall <Andrew.Gutshall@LehighHanson.com>; Curt Mitchell (cmitchell@repierson.com) <cmitchell@repierson.com>; Kendrick, Mark E (Allentown) USA <Mark.Kendrick@lehighhanson.com>; Mike Logan (mlogan@CPS-2Comply.com) <mlogan@CPS-2Comply.com>; Kelly Bailey <kfbcih@gmail.com>; drew@rjlg.com; Marianne Morano RGundlach@foxrothschild.com; Matthew Burns <matthew.burns@lehighhanson.com>

Subject: [External] Rock Hill Quarry Sampling Plan

ATTENTION: This email message is from an external sender. Do not open links or attachments from unknown sources. To report suspicious email, forward the message as an attachment to CWOPA_SPAM@pa.gov.

Mike:

On behalf of Hanson Aggregates Pennsylvania, LLC (Hanson), Earthres Group, Inc. is providing the following Qualitative Geologic Survey Sampling Plan for continued assessment of Naturally Occurring Asbestos (NOA) at the Rock Hill Quarry Operation.

Upon approval, Hanson is prepared to commence sampling at the site. In the meantime, should you have any questions, please contact me or Andrew Gutshall of Hanson at your convenience.

Regards, -Lou

Louis F. Vittorio, Jr., P.G. | Vice President Earthres Group, Inc. | Engineering for SuccessSM

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P. O. Box 794, Morgantown, WV 26505 phone 304-212-6866

April 25, 2019

Michael J. Kutney, P.G. Chief Permits & Technical Session Department of Environmental Protection Pottsville District Mining Office 5 West Laurel Boulevard Pottsville, PA 17901-2454

SUBJECT: Response to PA DEP and East Rockhill Township Comments Qualitative Geologic Survey Sampling Plan Rock Hill Quarry, SMP No. 7974SM1 East Rockhill Township, Bucks County, PA EARTHRES Project No. 061003.051

Dear Mike:

I am in receipt of the Department's comments via email dated April 22, 2019, which pertain to the proposed core drilling investigation submitted in the *Qualitative Geologic Survey Sampling Plan* (QGSSP) dated April 3, 2019 for the Rock Hill Quarry site. On behalf of Hanson Aggregates Pennsylvania, LLC (Hanson), I am providing the following responses to the Department's comments and East Rockhill Township's comments (dated April 17, 2019), which you forwarded to my attention. The comments are presented below, followed by our responses in *italics*:

1) Per our discussion on Friday, April 19, I voiced concerns regarding the Department's (core drilling) comments nos. 1, 3, and 4. It was my position that those had not been adequately addressed and therefore, the Department would not authorize core drilling until those comments are adequately addressed. Below is a summary of those concerns, as well as additional comments resulting from a review of the attached documents.

EARTHRES and Hanson professional geologists were onsite Monday April 22, 2019 to map mineral vein features exposed on the benches proposed for drilling and ultimately mining activities. The results of that effort are attached to these responses. Overall, the features found were trending as expected provided the geological environment, the geological evaluation contained in our report of January 2018, our QGSSP dated April 3, 2019 and our prior comment responses of April 17 and 19, 2019. Additional detailed responses to your questions are provided in the following comment responses and in the attached documents. 2) The Aggregates Handbook appears to be geared toward characterization of the aggregate deposit, not investigating unfavorable components within it (in this case veins which may contain asbestos). Using its guidance for the purpose of investigating mineral veins seems inappropriate. Please explain why following the guidance in the Aggregates Handbook is appropriate in this case (PADEP comment #3).

The Aggregates Handbook, the NSSGA Guide, the condition of the highwalls, and our prior experience at the site, that included significant sampling, were all used as a guide for selecting drilling locations to clear the selected benches for mining. We indicated in prior responses that the work would be iterative and dependent on the results of the drilling and sampling. However, based upon the field work completed this week we have analyzed the data and modified the initially proposed drilling locations as requested.

3) Both the NSSGA Guide and the Aggregates Handbook encourage a proper mapping effort as part of the investigations described in these documents. The Department has notified Hanson during the December and February meetings and during other discussions that it expects the veins at the Rock Hill quarry to be mapped and described. To date, the Department has not received any information from Hanson regarding the mapping effort or its results. Results from a comprehensive mapping effort could effectively answer the Department's comments #1, #3 and #4 regarding the core drilling as well as East Rockhill Township's comment #4.

Please find the attached table that includes the geological data (i.e. strike, dip, and description) of the bench-face features found during the on-site mapping completed on April 22, 2019. The data was statistically analyzed using Rockworks software to determine the average strike and dip of the features. A stereonet plot of the data is attached and indicates an average strike of the vein features to be N45E, dipping steeply at 78 degrees SE. The average feature strike is in agreement with the regional strike direction indicated the QGSSP submitted on April 3, 2019. Also provided herein are photographs of the mapped features that are keyed to their locations on each bench (Drawing D-1: Bench Face Mapping). The data was further plotted in 3D using AutoCAD to evaluate feature trends with respect to the proposed drilling locations.

The proposed coring locations and mapped features are shown in map view on the attached Figure 1. The cores will be drilled on an approximately 30-degree angle from vertical with an azimuth of approximately N45W. The drilling direction is oriented perpendicular to geological strike and is dipping opposite of the found features in order to intercept as many potential features as practical. The core borings will be advanced to an elevation of approximately 585 feet above mean sea level (MSL), which is approximately equivalent to the current water level in the Quarry pit.



Core Borings 1 (B-1) and B-2 are proposed to be located on Bench 1. The B-1 location was chosen to intercept the Veins 1, 3, 4, and 7. Coring B-2 is proposed in an area where face-mapped features are not projected to be present, thus providing additional geological coverage.

Core Borings B-3 and B-4 are proposed to be located on Bench 2. The B-3 location was chosen to intercept the Veins 1, 6, 10 and 11. B-4 is proposed to intercept Veins 12 and 13 and provide additional geological coverage in an area where face-mapped features are not projected to be present.

Logging and sampling of the retrieved cores will be completed as indicated in the April 3, 2019 QGSSP.

4) The NSSGA Guide also describes a program for testing for Settled Dust. Please explain why testing for Settled Dust has not been proposed for this site.

The Site has not operated since November 2018. Based upon the results of the current investigations, settled dust sampling will be proposed if appropriate. Such a recommendation would be outlined in the Qualitative Geologic Survey Report.

Responses to East Rock Hill Township Comments Dated April 17, 2019:

1. <u>Aggregate Storage Pile Sampling:</u> The Plan only lists four aggregate storage piles, but more than four stockpiles are clearly visible on Figure 1A, which appears to be a Google Earth image from June 2018. Please ensure that all material stockpiled at the site is included in the scope of the Plan.

The four (4) aggregate storage piles proposed for sampling, and since sampled with the Department's approval and oversight, were the only processed aggregate stockpiles present at the site in November 2018 when site operations were halted.

2. <u>Aggregate Sampling Frequency:</u> The origin and intent of PADEP's requirement of "one test per 1,000 tons of material or any fraction thereof..." is unknown. This requirement may be based on construction standards which are designed to characterize the mechanical properties of the material and not its hazardous composition. Other PADEP programs, such as for the management of fill, would require an increased sampling frequency. Furthermore, if the storage piles will be divided into "fractions," such as truck or crusher loads, then PADEP should require additional sampling than what is proposed in the Plan.

The sampling frequency of the piles was mandated by the Department and was based upon the California Air Resources Board Method 435 (CARB 435). The sample



Rock Hill Quarry Qualitative Geologic Survey Sampling Plan Response to Comments April 25, 2019 Page 4 of 7

frequency provided therein is for determining the presence of asbestos fibers in Serpentine Aggregate stockpiles. The method is not specifically designed for the geology being mined at the Rock Hill Quarry, as the operators are not proposing to mine Serpentine Aggregate. Rather the site is proposing to mine an asbestos-free host rock (diabase) that contains mineral veins that potentially contain trace actinolite asbestos. However, as California has the most developed programs and guidance for asbestos determinations, we surmise that the Department mandated a conservative (greater) initial sampling frequency for the processed aggregate stockpiles based upon that available guidance.

Future aggregate sampling frequency (if deemed to be appropriate) will be further based upon the results accumulated by the QGSSP data. Currently, thirty-three (33) aggregate and drill cutting samples have been analyzed as previously reported, and an additional sixteen (16) aggregate samples were collected and submitted for analysis on April 18, 2019 as part of the approved QGSSP.

3. <u>Rock Coring and Sampling Location:</u> The rock coring locations are limited to the southeastern corner of the site in an area referred to as the "planned mining area." However, the "planned mining area" is not delineated on the figure and the area/amount of material to be mined is not otherwise described in the Plan. The rock coring locations should not be limited to this area but should cover the entire area covered by the mining permit, but a bare minimum should include coring of the boulder field along the southern and eastern sides of the site, at a minimum frequency no greater than that provided for the "planned mining area." If the mining permit allows the operator to mine and blast in other areas of the quarry, then these areas should also be surveyed for asbestos-containing mineral veins to understand which areas should be avoided.

The drilling program included in the April 3, 2019 QGSSP was designed for the two (2) targeted benches only. As indicated previously, any future sampling will be based upon the results obtained from this initial drilling program.

4. <u>Rock Coring and Sampling Frequency:</u> While the amount of material in the "planned mining area" is not described in the Plan, the number and spacing of the rock cores shown on Figure 1B is insufficient. The cores are spaced approximately 75 to 250 feet apart, and many asbestos-containing mineral veins could exist between the cores and would therefore not be accounted for in the survey.

Please see our detailed response to the Department's Comment #3. The drilling locations were adjusted as described based upon the found geological features. If the results indicate the presence of naturally occurring asbestos-containing mineral veins, additional sampling may be proposed.



5. <u>Boulder Field Size and Location:</u> The Plan describes the boulder field as existing to the southern and eastern sides of the quarry pit, but does not offer any description of the size, depth, or amount of material contained in the boulder field. The Plan also does not describe the geology or the origin of the boulder field. Additionally, sampling 30 boulders on the surface is insufficient to characterize the horizontal and vertical extent of the material.

The boulders are erosional remnants and/or were placed by historical mining. However, the origin and geology of the boulder field will be described in the Qualitative Geologic Survey Report after the investigation of the boulders is complete. The intention of the boulder investigation is to evaluate easily accessible rock for the potential presence of mineral veins, and if found, collect samples as appropriate. The intention is not to map the horizontal and vertical extent of the materials. Similar to other parts of the proposed investigation, if asbestos containing mineral veins are found in the investigation, additional sampling and or handling of the boulders will be proposed.

6. <u>Boulder Field Sampling Bias:</u> The boulder field is proposed to be sampled, and sample locations are to be selected, by the geologist in the field. The geologist employed by the operator should not be left with the discretion to pick and choose boulders to sample, particularly when there may be an interest in avoiding boulders with potential asbestos veins. For this reason, other PADEP programs regulating site remediation and waste characterization require sampling locations to be biased towards observed contamination or to be based on a truly randomized sampling grid to remove the potential for bias when selecting samples for analysis.

By looking for and specifically sampling suspected asbestiform mineral veins, the proposed sampling is actually biased towards finding asbestos, if present, not avoiding it. Additionally, a licensed professional geologist will complete the work and will be accompanied by a Department staff member.

7. <u>Wind Erosion of Aggregate Storage Piles:</u> Wind erosion of the storage piles and open areas of the site can create significant air emissions depending on local wind conditions. If such wind erosion is expected or observed, the Plan should seek to determine the asbestos content of those surfaces that may erode and become airborne.

Air quality sampling is addressed under the air quality permit. Significant background sampling has already been conducted. No detections of airborne Naturally Occurring Asbestos (NOA) were found.



8. <u>Roadway Dust Emissions:</u> Heavy truck traffic on the unpaved roads at the site is a significant source of air emissions. The Plan should include an analysis of the silt and asbestos content of the road surface so that the potential emissions from this source can be understood.

See our response to Comment #7. Additionally, potential fugitive dust emissions from unpaved roads at the site are controlled by engineering controls (i.e. regular use of the site water truck).

9. <u>Water Sampling Locations:</u> The Plan states that water samples will be collected from four locations. However, there are clearly more than four water features present at the quarry. These locations should be included in the Plan and water and sediment samples should be collected from these locations.

Additional water sampling was requested by the Department and completed at the site on April 18, 2019. Water samples were collected from the following locations: NPDES 001 outfall, Sediment Pond No. 1, Sediment Pond No. 2, Quarry Pit, Sediment Trap No. 1, Sediment Trap No. 2, and Sediment Trap No. 3.

10. <u>Sediment Sampling:</u> The Plan states that water samples will be collected from various locations including sedimentation basins. Since any asbestos present in the water would be expected to settle, the Plan should also include sediment sampling at these locations.

The basins and sediment traps were sampled near their discharge structures and towards where captured water containing suspended solids migrates (prior to becoming sediment). The water samples collected were indicated to contain some suspended solids, which will be the focus of the analysis.

11. <u>Sampling Oversight:</u> Due to the potential bias that may be introduced during sampling, we request that a licensed geologist employed by the department be present during all sampling collection activities.

Sampling proposed in the plan was, and will be conducted, in the presence of a PADEP staff member experienced in sampling methodology. In addition, sampling was conducted by or directed by a Pennsylvania licensed Professional Geologist.

12. <u>Potential for Asbestos Releases:</u> The CERCLA Reportable Quantity for friable asbestos is 1 pound. Emission calculations for the crushing/screening plant estimate potential particulate matter emissions to be 83 pounds *per hour*. Mining, blasting, wind erosion, and truck traffic will contribute additional particulate matter emissions. Therefore, even minimal amounts of asbestos contained in the quarry



Rock Hill Quarry Qualitative Geologic Survey Sampling Plan Response to Comments April 25, 2019 Page 7 of 7

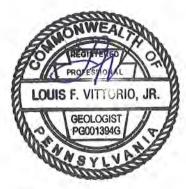
materials could easily create a "CERCLA release" once they have been rendered airborne by the operator. This suggests that a significantly more rigorous and quantitative analysis of the quarry material is necessary.

The Rock Hill Quarry is not a CERCLA site, for which the above referenced emission regulation is intended to address. However, air emissions via air quality sampling is addressed under the air quality permit. The air monitoring requirements may be reevaluated based upon the results of the QGSSP and the potential for asbestos release.

I trust that the information provided herein in response to the presented comments is more than sufficient to allow the core drilling portion of the QGSSP to move forward. In the meantime, if you have any questions regarding the comment responses, please feel free to contact me at (215) 766-1211.

Sincerely, Earthres Group, Inc.

Louis F. Vittorio, Jr., P.G. Vice President



Enclosures: Bench Face Mapping Data Tables Stereonet Plot and Statistics Drawing D-1: Bench Face Mapping Figure 1 – Geologic Features and Coring Location Plan



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Bench Face Mapping Data Tables



Bench Face Mapping Data Rock Hill Quarry April 22, 2019

Face Below Lower Bench

Vein ID	Strike	Dip	Photo Time	Description
1	N40E	75SE	8:31	4" to 6" wide weathered zone; no mineral veining
				visible.
2	N20W	90	8:44	Whitish, thin coating on diabase sub-parallel to wall
				face.
3	N52E	85SE	8:44	8" to 1.5' wide weathered fault/shear zone; whitish
				undulating mineral veining noted, green color noted
				at top of zone.
4	N64E	71SE	8:51	Approx. 8" wide brown highly weathered; whitish
				undulating mineral veining noted.
5	S80E	80SW	8:59	Whitish, very thin coating on diabase trending
				oblique to wall face.
6	N50E	84SE	9:02	Approx. 0.5" white haloed, dark colored vein.
7	N70E	82SE	9:08	Approx. 8" wide weathered vein; apparent Actinolite
				vein; green elongated flattened crystals; appears to
				pinch out further up the wall.
8	N30E	78SE	9:17	Approx. 0.5" white haloed, dark colored vein.
9	N15E	70SE	9:28	Approx. 4" wide banded white/greenish mineral
				vein.

Face Below 2nd Bench

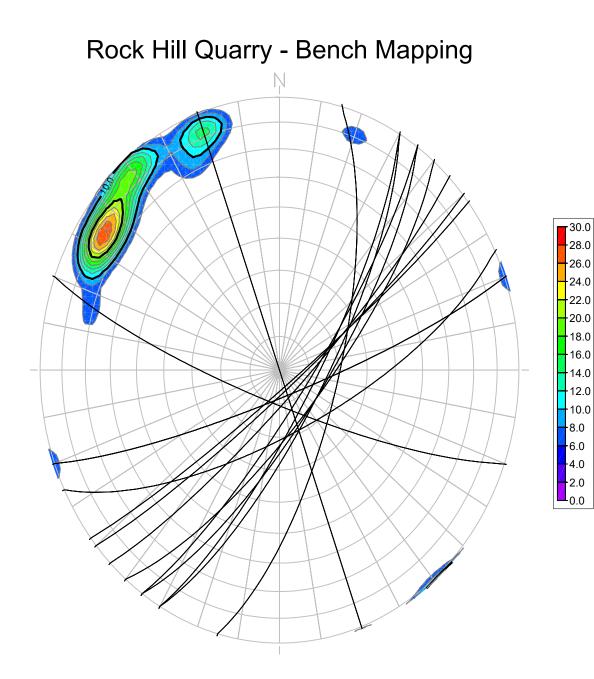
Vein ID	Strike	Dip	Photo Time	Description
10	N35E	80SE	10:04	South side of wall, white vein visible near top of wall; estimated narrow 1" vein.
11	N70E	82SE	10:10	Approx. 0.5" white vein, continuous trending up wall.
12	N30E	75SE	10:14	Approx. 8" to 12" mud vein, discontinuous in upper and lower wall due to weathering and talus; no white veins visibly noticeable.
13	N45E	82SE		Approx. 4" to 8" mud vein, located several feet north on wall from above Vein #3; discontinuous in upper and lower wall due to weathering and talus; central discolored white vein noticeable.

Face Above 2nd Bench

Vein ID	Strike	Dip	Photo Time	Description
NA	N35E	75SE	10:49	Weathered wall, general strike and dip of wall
				structure near center of wall recorded.

Stereonet Plot and Statistics





		Statistical Su	ummary
		Projection:	Schmidt (Equal Area)
		Number of Sample Points:	14
		Mean Lineation Azimuth:	314.7 N44.7E
		Mean Lineation Plunge:	12.1 77.9 SE
		Great Circle Azimuth:	227.9
		Great Circle Plunge:	12.1
		1st Eigenvalue:	0.814
		2nd Eigenvalue:	0.178
_	30.0	3rd Eigenvalue:	0.007
/		LN (E1 / E2):	1.518
/	-28.0	LN (E2 / E3):	3.17
/	26.0	(LN(E1/E2)] / (LN(E2/E3)):	0.479
7	24.0	Spherical Variance:	0.1178
4	22.0	Rbar:	0.8822
/	20.0		

18.0 -16.0 14.0

10.0 8.0

4.0

Drawing D-1: Bench Face Mapping







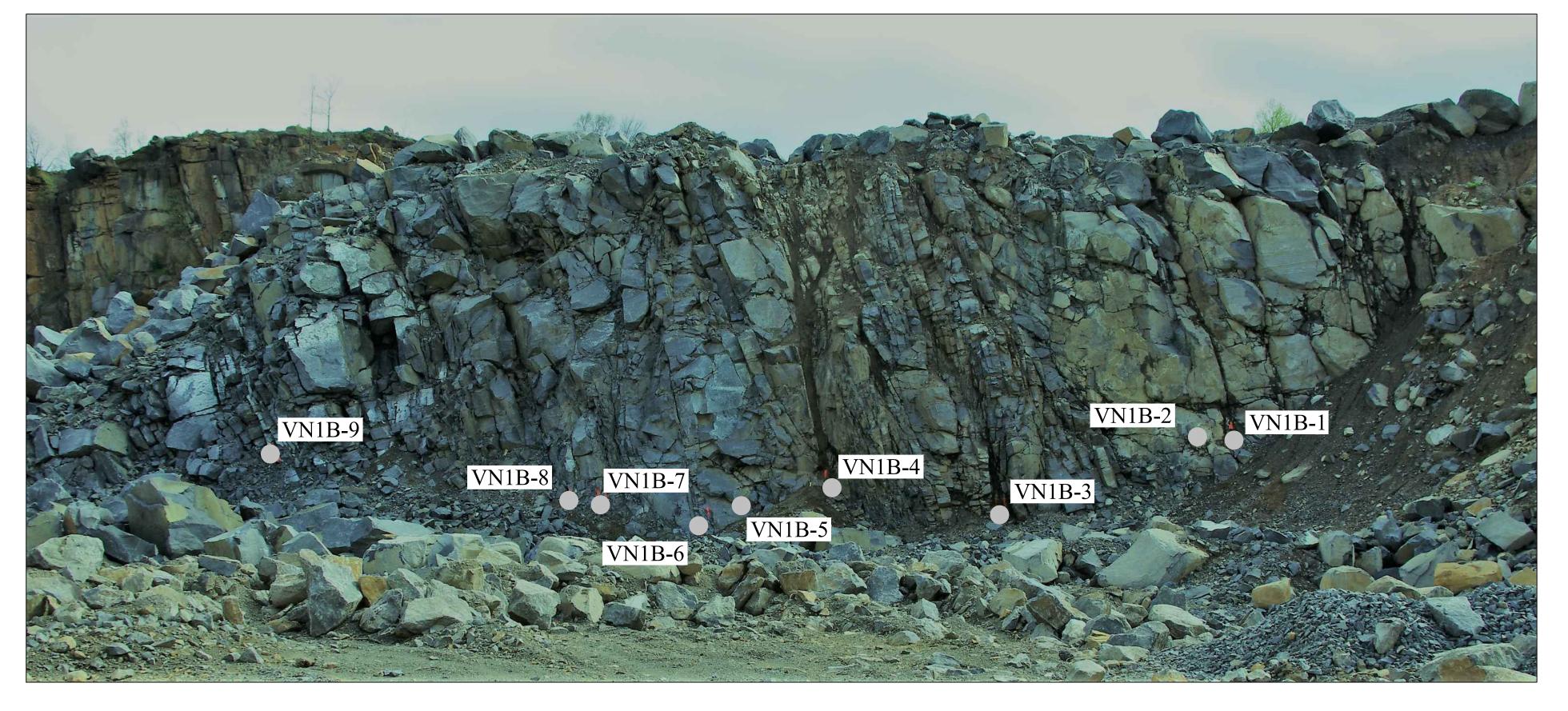








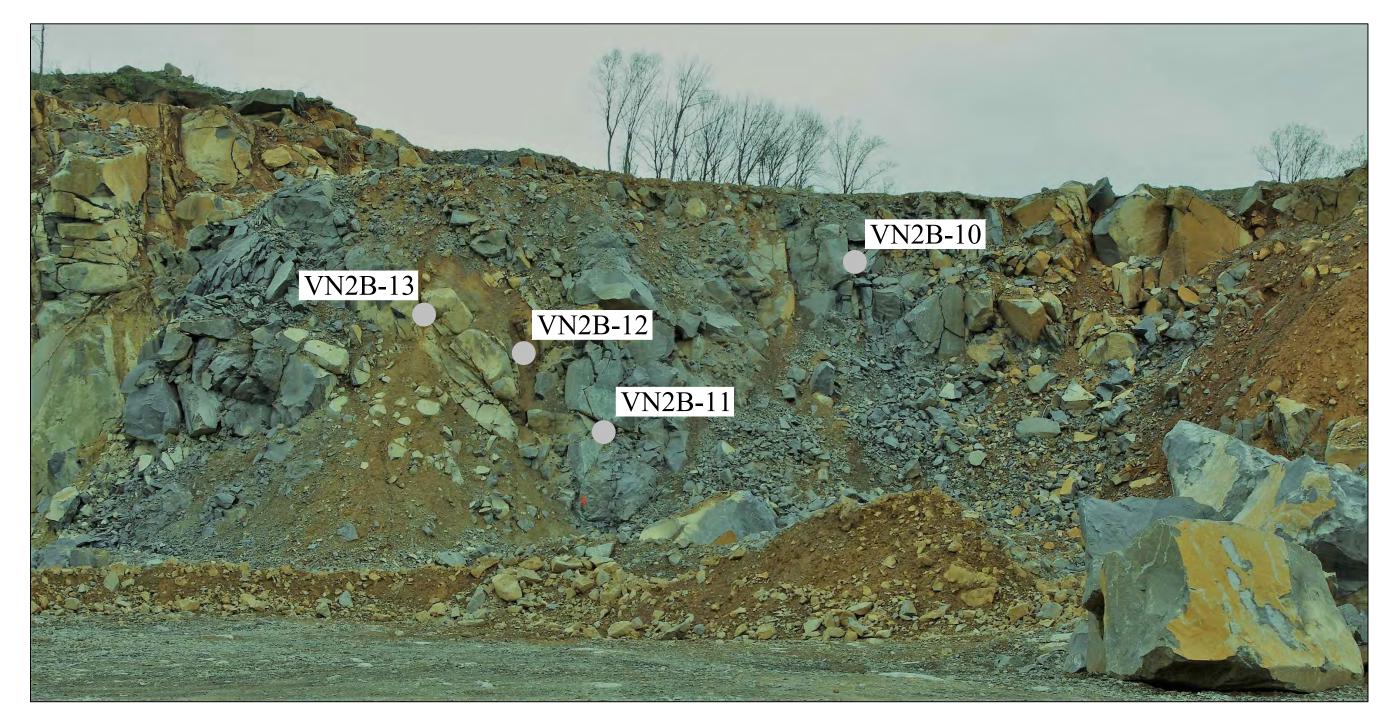




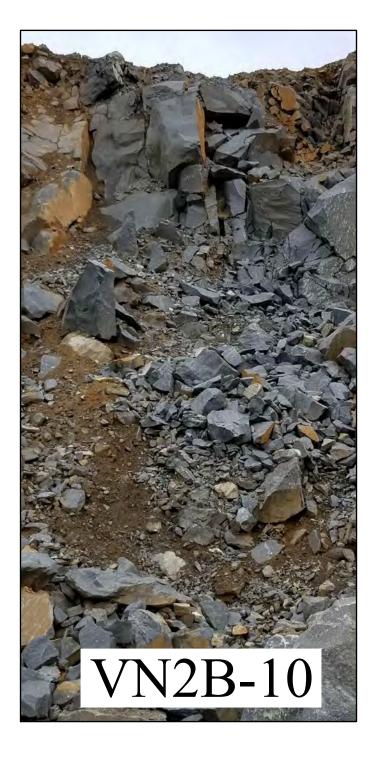
BENCH 3 FACE



BENCH 2 FACE (VN2B)

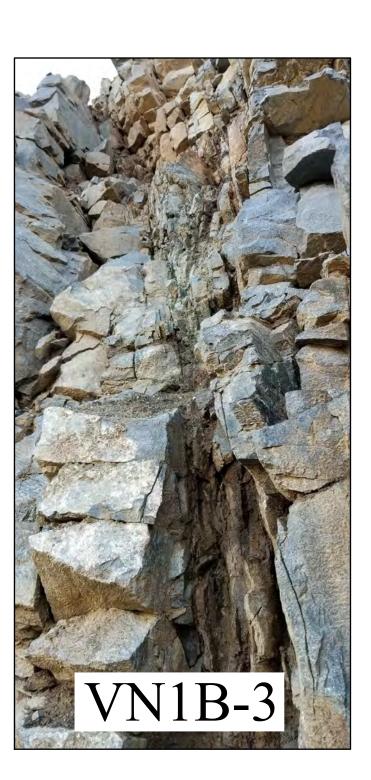


BENCH 1 FACE (VN1B)













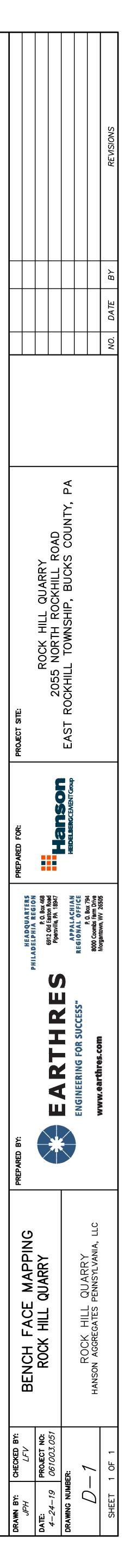
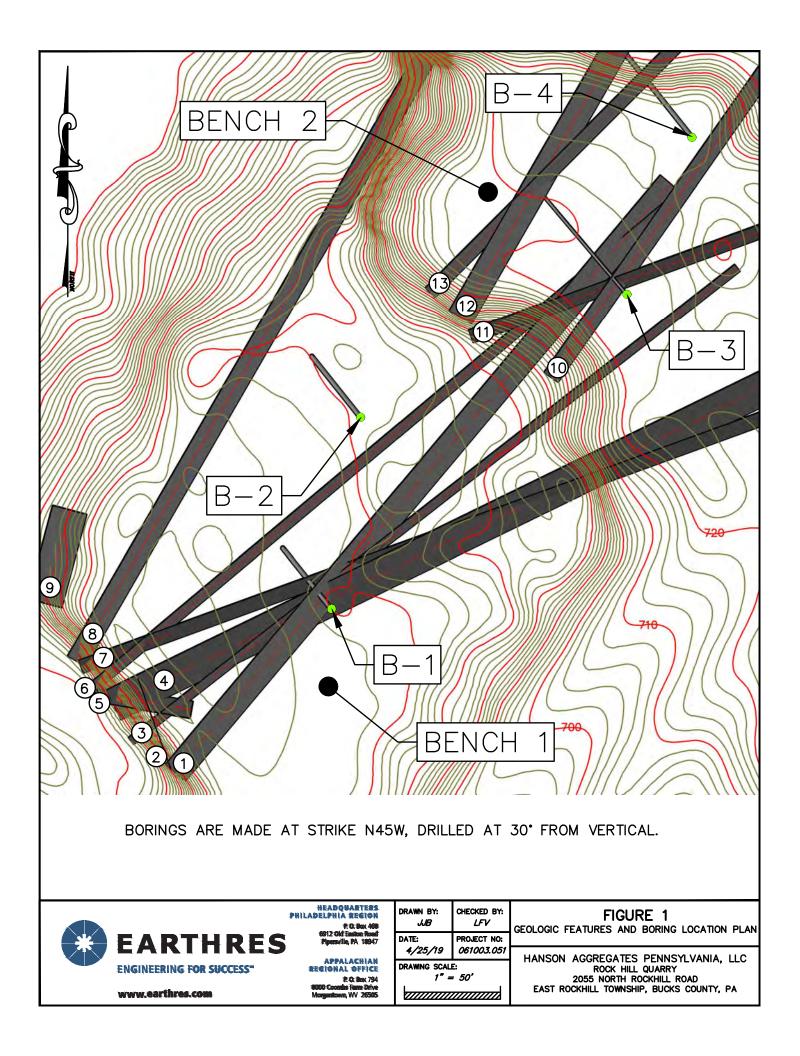


Figure 1 – Geologic Features and Coring Location Plan





Appendix D - Prior Reports and Analytical Reports



Prior investigation, qualitative geological surveying, and sampling conducted at the Site during 2018 included the collection and analysis of five (5) surface water samples and thirty-three (33) rock and aggregate samples including: 5 mineral vein rock samples, 21 drill hole cutting samples, 5 aggregate storage pile samples and 2 crusher run (fines) samples.

Appendix D includes the following table, figures and prior geologic evaluations:

2018 Laboratory Data Summary Table 2018 Quarterly Sampling Locations Figure December 20, 2018 One-Time Background Sample Location Figure ERG's Asbestos Investigation Results report dated January 18, 2018 ERG's 2nd Quarter 2018 NOA Monitoring Report dated July 27, 2018 ERG's 3rd Quarter 2018 NOA Monitoring Report dated October 24, 2018 ERG's 4th Quarter 2018 NOA Monitoring Data EMSL Analytical, Inc. December 20, 2018 Aggregate and Surface Water Laboratory

Results All samples yielded non-detectable results for NOA, except for one biased rock sample collected on November 9, 2018 that found a trace amount of asbestiform actinolite in a mineral vein (Hand Sample 1). After the fibrous asbestos exceedance on November 9, 2018, PA DEP requested one round of background sampling, which occurred on December 20, 2018. Refer to the documents provided in this appendix for a summary of prior geologic evaluations completed from January

2018 to December 2018.



2018 Laboratory Data Summary Table



Quarter	ID	Date	ID On COC	% Fibrous	% Non-Fibrous	% Asbestos
	S-1	1/9/2018	S-1	0	100	ND
	S-2	1/9/2018	S-2	0	100	ND
	S-3	1/9/2018	S-3	0	100	ND
	S-4	1/9/2018	S-4	0	100	ND
	S-5	1/9/2018	S-5	0	100	ND
	S-6	1/9/2018	S-6	0	100	ND
1st	S-7	1/9/2018	S-7	0	100	ND
	S-8	1/9/2018	S-8	0	100	ND
	S-9	1/9/2018	S-9	0	100	ND
	Hand Sample S-1	1/12/2018	S-1	0	100	ND
	Hand Sample S-2	1/12/2018	S-2	0	100	ND
	Hand Sample S-3	1/12/2018	S-3	0	100	ND
	Hand Sample N-1	1/12/2018	N-1	0	100	ND
2nd	DH-1	6/4/2018	Composite*	0	100	ND
Znu	DH-2	6/4/2018	Composite			
	S-1	7/17/2018	Composite #1	0	100	ND
	S-2	7/17/2018	composite #1			
	S-3	7/18/2018	Composite #2	0	100	ND
	S-4	7/18/2018	composite #2		100	ND
	S-5	7/31/2018	Composite #1	0	100	ND
3rd	S-6	7/31/2018	composite #1		100	ND
510	S-7	8/22/2018	Composite #1*	0	100	ND
	S-8	8/22/2018	composite #1		100	ND
	S-9	9/6/2018	Composite*	0	100	ND
	S-10	9/6/2018	composite			
	S-11	9/24/2018	Composite #1		100	
	S-12	9/24/2018	composite #1	0	100	ND

2018 Laboratory Data Summary Table

Samples analyzed via EPA method 600/R-93/116 with PLM via 400 pt. (<0.25%) or 1000 pt. count (<0.1%) PLM detection limit = <0.1% (1000 point count)

* Indicates PLM detection limit of <0.25% (400 point count)

ND - Not detected within analytical limits

US EPA Drinking Water Maximum Contaminant Level (MCL) = 7 MFL (million fibers per liter > 10 μm in lenth) AC = Actinolite

Quarter	ory Data Summary Table ID	Date	ID On COC	% Fibrous	% Non-Fibrous	% Asbestos
	S-1	10/10/2018	Composite #1	0	100	ND
	S-2	10/10/2018				
	S-3	10/19/2018	Composite #1*	0	100	ND
	S-4	10/19/2018				
	S-5	10/30/2018	Composite #1*	0	100	ND
	S-6	10/30/2018	composite #1			
4th	S-7	11/1/2018	Composite #1*	0	100	ND
401	S-8	11/1/2018	composite #1	0	100	ND
	S-9	11/9/2018	Composite #1*	0	100	ND
	S-10	11/9/2018	composite #1	0	100	ND
			Hand Sample 1*	0.25	00 75	0.25 AC
	Hand Sample 1	11/9/2018	(PLM)	0.25	99.75	
	fiand Sample 1		Hand Sample 1			0.80 AC
			(TEM)	-	-	0.80 AC
	2B Aggregate	12/20/2018	1*	0	100	ND
	2B Aggregate	12/20/2018	2*	0	100	ND
	1B Aggregate	12/20/2018	3*	0	100	ND
	2A Aggregate	12/20/2018	4*	0	100	ND
	Screenings	12/20/2018	5*	0	100	ND
	Crusher Fines (West)	12/20/2018	6*	0	100	ND
	Crusher Fines (East)	12/20/2018	7*	0	100	ND
	Surface Wate	er Samples (>10	Analytical Sensitivity	Concentration	Fibers Detected	
12/20/2018	Outfall	12/20/2018	1	2.60	<2.60	ND
Background	Outfall (Dup)	12/20/2018	2	2.60	<2.60	ND
Dackground	North Pond	12/20/2018	3	1.80	<1.80	ND
	South Pond	12/20/2018	4	6.80	<6.80	ND
	Quarry Pit	12/20/2018	5	2.60	<2.60	ND
	Surface Wa	ater Samples (≥	Analytical Sensitivity	Concentration	Fibers Detected	
	Outfall	12/20/2018	1	2.60	2.60 AC	1
	Outfall (Dup)	12/20/2018	2	2.60	7.90 AC	3
	North Pond	12/20/2018	3	1.80	<1.80	ND
	South Pond	12/20/2018	4	6.80	20.00 AC	3
	Quarry Pit	12/20/2018	5	2.60	<2.60	ND

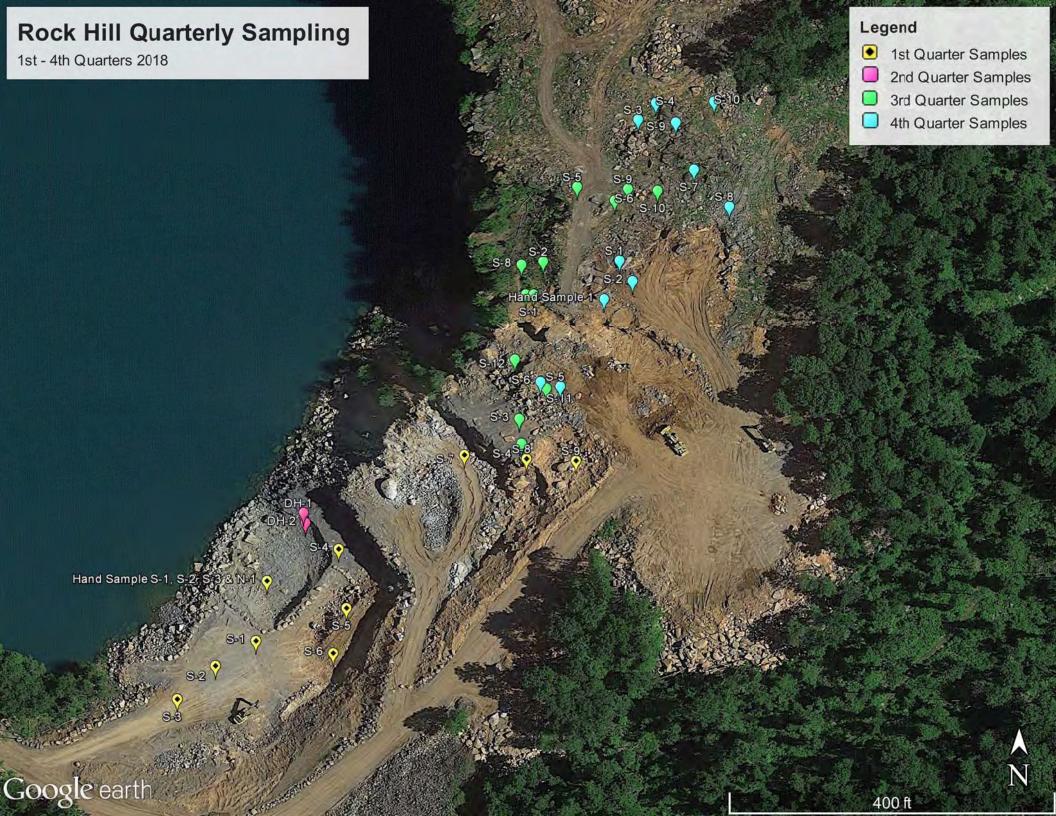
Samples analyzed via EPA method 600/R-93/116 with PLM via 400 pt. (<0.25%) or 1000 pt. count (<0.1%) PLM detection limit = <0.1% (1000 point count)

* Indicates PLM detection limit of <0.25% (400 point count)

ND - Not detected within analytical limits

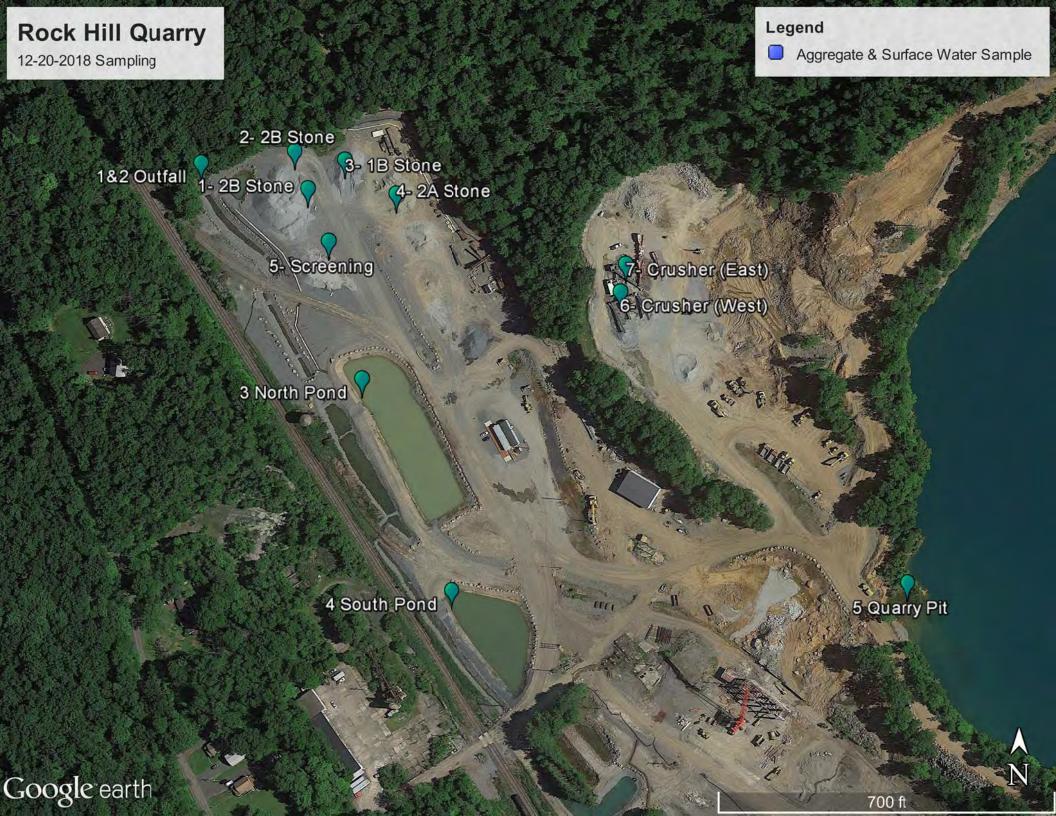
US EPA Drinking Water Maximum Contaminant Level (MCL) = 7 MFL (million fibers per liter > 10 μm in lenth) AC = Actinolite 2018 Quarterly Sampling Locations Figure





December 20, 2018 One-Time Background Sample Location Figure





ERG's Asbestos Investigation Results

January 18, 2018



PENNSYLVANIA



P.O. Box 468 Pipersville, PA 18947 215.766.1211

WEST VIRGINIA

P.O. Box 794 Morgantown, WV 26505 304.212.6866

800.264.4553

January 18, 2018

Michael J. Menghini, District Mining Manager Department of Environmental Protection Pottsville District Mining Office 5 West Laurel Boulevard Pottsville, PA 17901-2454

SUBJECT: Asbestos Investigation Results Rock Hill Quarry Operation SMP No. 7974SM1 East Rockhill Township, Bucks County EarthRes Project No. 061003.051

Dear Mr. Menghini:

On behalf of Hanson Aggregates Pennsylvania, LLC (Hanson) and pursuant to the Pennsylvania Department of Environmental Protection's (herein referred to as PA DEP or the "Department") letter dated January 4, 2018, please find the following investigation and testing results completed by EarthRes Group, Inc. (EarthRes) at the Hanson Rock Hill Quarry (the "site").

INTRODUCTION

The work completed in the following investigation included geological evaluation through publication review, onsite mapping, and sampling and analysis of the rock in the planned active mining area. The work was completed to determine the potential presence of naturally occurring asbestos (NOA) minerals. The work was performed onsite by EarthRes personnel between January 8 and 11, 2018, under the supervision of a Pennsylvania licensed Professional Geologist (P.G.). A site figure showing the quarry and investigation areas is included in Appendix A.

SITE DESCRIPTION AND CONDITIONS

The site is an existing permitted mine located on the western side of Rock Hill. Currently, the southern portion of the mine is being prepared for additional mining of the diabase bedrock. Site preparations include overburden removal and drilling of test holes for sampling and production blasting. However, per the Department's January 4, 2018 letter and directive, production drilling, blasting, and crushing has ceased.

Rock Hill Quarry Asbestos Investigation Results January 18, 2018 Page 2 of 5

GEOLOGICAL SETTING AND LITERATURE REVIEW

The diabase of the Haycock-Rock Hill Sill is a light-grey, medium to coarse grained crystalline igneous rock. At the edges of the Sill, the thinner Byram and Clayton diabase sills are dense, fine-grained, and greenish-black. Constituents, however, are the same and consist of plagioclase feldspar and augite being the predominant mineralogical species (Bascom et al., USGS 1931). The referenced USGS report provides no indication of the presence of NOA in the mineralogy of the diabase. The <u>Mineralogy of Pennsylvania (Gordon, 1922)</u> similarly does not indicate the presence of NOA in East Rockhill Township nor at the current quarry site. Additionally, a <u>USGS report by Van Gosen (2006)</u> lists and maps NOA occurrences in the eastern United States. The report does not identify NOA occurring at the site or in the area. The closest occurrence is within the serpentine rocks of the Easton, PA area.

The internet site www.mindat.org, which is an "open-source" mineral specimen web based database, lists a potential single occurrence of NOA at the site from a sample collected in the 1970s. The <u>mindat.org posting</u> was completed by a third party (not the collector) and it notes that the sample was previously listed to a locale in Quakertown. The posting does not contain analyses for asbestos, but lists "possibly tremolite" as a description.

SITE SPECIFIC INVESTIGATION

Investigation and Sampling Rationale: Investigation at the quarry was targeted in the following manner: 1) assessing the presence of NOA minerals in the proposed mining area through mapping, and sampling of rock and borehole data; 2) evaluating for the presence of contacts with surrounding sedimentary rocks where metamorphism of the host rock could potentially form NOA minerals, and 3) evaluating and sampling found mineralized veins in the diabase bedrock that could potentially contain NOA minerals.

<u>Site Assessment:</u> EarthRes completed site reconnaissance, mapping and sampling activities between January 8 and 11, 2018. Sampling of subsurface rock was accomplished via drill cuttings from borings installed by Maine Drilling and Blasting on January 8, 2018 in three (3) areas currently being prepared for mining. Sampling for potential NOA minerals was biased to these areas. Field geologists from EarthRes mapped the geology and collected samples from the borings on January 9th. Additionally, hand samples from mineral veining observed on the existing southern highwall were collected on January 11th. A map showing the investigation, drilling and sampling locations is attached in Appendix A. Boring logs are included in Appendix B, and Site and hand sample photographs are included in Appendix C.

<u>Sample Collection and Analysis:</u> Nine (9) composite samples were collected from drill cuttings at each boring location. The boreholes were identified on the laboratory chain-of-custody (COC) as Samples 1 through 9. The corresponding sampling locations are shown on the attached Figure



Rock Hill Quarry Asbestos Investigation Results January 18, 2018 Page 3 of 5

in Appendix A. The boring samples were collected using a decontaminated steel shovel that was used to mix and collect a composite sample from the drill cuttings. One (1)-gallon Ziplock® bags were filled with approximately 0.5 gallons of drill cuttings from each borehole. The samples were sealed and placed in 5-gallon buckets for transfer to the laboratory for preparation and testing.

Outcrop hand samples of observed mineral veining from the southern highwall were collected and numbered (from north to south): N-1, S-1, S-2 and S-3, as the highwall in the area of the sampling trends approximately north-south. The general sampling location is shown on the attached Figure in Appendix A. Pictures of the highwall, specific sampling locations and the collected sampled are provided in the photographs in Appendix C.

The samples were transported directly to EMSL Laboratory in Cinnaminson, NJ using standard chain-of-custody procedures. Each sample was analyzed using Polarized Light Microscopy (PLM) via EPA 600/R-93/116 Method with preparation using the CARB 435 Method.

Geological Mapping and Assessment: As shown on the attached Figure, the area surrounding the quarry and proposed mining area was assessed to determine the presence of vein infillings and/or sedimentary rock contacts. The diabase described by Bascom, et al. (1931) was similarly observed and was indicated to be massive, fine to medium grained and grey to dark grey in color.

Numerous large boulders were assessed on the southern, northern, and eastern sides of the site. Freshly-broken surfaces were visually inspected to identify the potential presence of naturally occurring asbestos NOA. Each boulder observed consisted of a tightly-massed, fine to medium grained crystalline diabase. Joints were observed to be weathered and typically covered by an oxide, typically manganese or ferric oxide. Mineral veining containing potential NOA was not observed in the examined boulders. Four (4) mineral veins were observed on the southern highwall adjacent to the proposed mining area and were sampled as described in the preceding paragraph.

Sedimentary rocks or features (e.g. bedding, folds, cross-beds, etc.) were not visually observed on the highwalls. Near-vertical jointing was observed along much of the eastern highwall. Contacts with sedimentary host rocks were not indicated in the surrounding outcrops or boulder fields. Several photographs taken onsite are included in Appendix C showing field conditions at the time of mapping. The investigation area is indicated to be wholly within the diabase bedrock.

INVESTIGATION RESULTS AND RECOMMENDATIONS

The geological data collected and presented herein does not indicate areas of contact metamorphism within the diabase that could potentially contain NOA minerals. Mineral veining was observed on the southern highwall, and the mineral veins were sampled for subsequent



Rock Hill Quarry Asbestos Investigation Results January 18, 2018 Page 4 of 5

laboratory analysis for asbestos. Similarly, the drill cuttings from the adjacent drill holes in the area to be mined were sampled and sent for laboratory analysis.

The laboratory testing results determined that the drill cutting samples were homogeneous, brown to grey and 100% non-fibrous. Asbestos was not detected in any of the samples at the lowest PLM CARB 435 detection limit of 0.1% The laboratory testing results from the southern highwall samples were also analyzed and asbestos was similarly not detected at the 0.1% limit in any of the samples. Overall, thirteen (13) samples were collected and analyzed in the area proposed for mining and the results did not indicate the presence NOA. The laboratory data is consistent with the mapping conducted at the site and the geological literature discussed and referenced in this report.

The 0.1% detection limit is 10 times lower than the material definition for ACM by EPA & OSHA and 2.5 times lower than what the California Air Resources Board defines as a "Restricted Material." The data and results indicate that mining at the site can commence upon the Department's approval.

If you have any questions or concerns regarding the presented investigation and results, please feel free to contact me at (215) 766-1211.

Sincerely, EarthRes Group, Inc.

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Louis F. Vittorio, Jr., P.G. Vice President

Appendices: A – Figure 1

- B Boring Logs
- C Site and Sample Photographs
- D Laboratory Analytical Results





Rock Hill Quarry Asbestos Investigation Results January 18, 2018 Page 5 of 5

References:

- Bascom, F., Wherry, E.T., Stose, G.W., and Jonas, A.I. <u>Geology and Mineral Resources of the Quakertown-</u> <u>Doylestown District Pennsylvania and New Jersey</u>. United States Department of the Interior, Geological Survey Bulletin 828, 1931. <u>https://pubs.usgs.gov/bul/0828/report.pdf</u>
- Gordon, Samuel George, <u>The Mineralogy of Pennsylvania</u>, The Academy of Natural Sciences of Philadelphia, Special Publication No. 1, 1922

https://books.google.com/books/about/The_Mineralogy_of_Pennsylvania.html?id=JjsPAAAAYAAJ

- Occupational Safety and Health Administration; 29 CFR 1926.1101(b), Safety and Health Regulations for Construction, <u>https://www.osha.gov/pls/oshaweb/owadisp.show_document?p_id=10862&p_table=standards</u>
- State of California, Air Resources Board (CARB), <u>Method 435 Determination of Asbestos Content of Serpentine</u> <u>Aggregate</u>, June 6, 1991. <u>https://www3.epa.gov/ttnemc01/ctm/ctm-029.pdf</u>
- State of California, Code of Regulations, 17 CCR Section 93106, Asbestos Airborne Toxic Control for Surfacing Applications, Final Regulation Order. <u>https://www.arb.ca.gov/toxics/atcm/asbeatcm.htm</u>
- Van Gosen, Bradley S., <u>Reported Historic Asbestos Mines, Historic Asbestos Prospects, and Natural Asbestos</u> <u>Occurrences in the Eastern United States, 2006</u> U.S. Department of the Interior, U.S. Geological Survey Open File Report 2005-1189. <u>https://pubs.usgs.gov/of/2005/1189/pdf/Plate.pdf</u>
- cc: Mark Kendrick, Hanson* Andrew Gutshall, Hanson* Mike Kutney, PA DEP* John Stefanko, PA DEP* William Plassio, PA DEP* Gary Latsha, PA DEP* Amiee Bollinger, PA DEP* Ross Klock, PA DEP* Sachin Shankar, PA DEP SERO* James Rebarchak, PA DEP Air Quality* Marianne Morano, East Rockhill Twp.* Bucks County

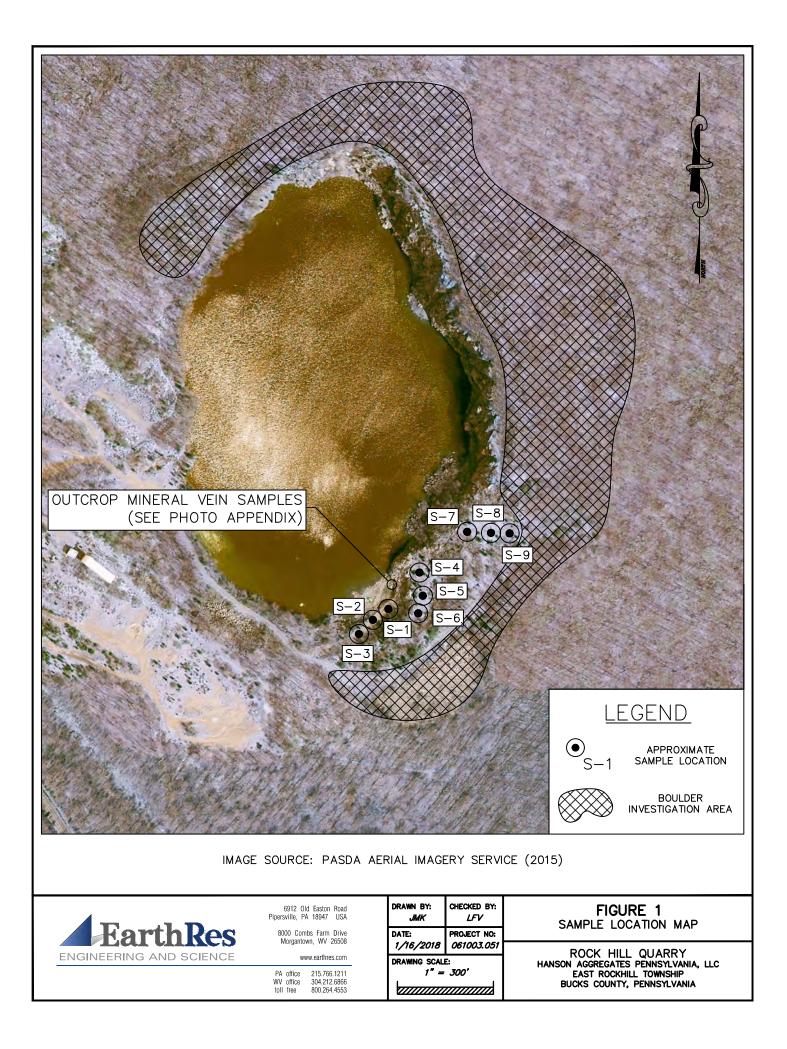
(*via electronic mail)



APPENDIX A

FIGURE 1





APPENDIX B

BORING LOGS



Location: Rock Hill Quarry Date: January 8, 2018 Driller/Logged by: Maine Drilling and Blasting

Boring # 1	Interval 0-4 ft 4-25 ft	Description: Soil/overburden Diabase
2	0-4 ft 4-11 ft 11- 13 ft 13-19 ft	Weathered rock
3	0-9 ft 9-10ft	Soil/overburden Diabase
4	0-4 ft 4-7 ft 7-10 ft 10 -12 ft	Weathered rock
5	0-4 ft 4-17 ft	Soil/overburden Diabase
6	0-4 ft 4-5 ft 5-9 ft 9-10 ft 10-39 ft	Soil/overburden Diabase (boulder) Soil/overburden Diabase (boulder) Soil/overburden
7	0-2 ft 2-13 ft 13-15 ft 15-39 ft 39-42 ft 42-50 ft	Weathered rock Diabase Weathered rock
8	23-26 ft	Soil/overburden Diabase Weathered rock Diabase
9	0-39 ft	Soil/overburden

APPENDIX C

SITE & SAMPLING PHOTOS



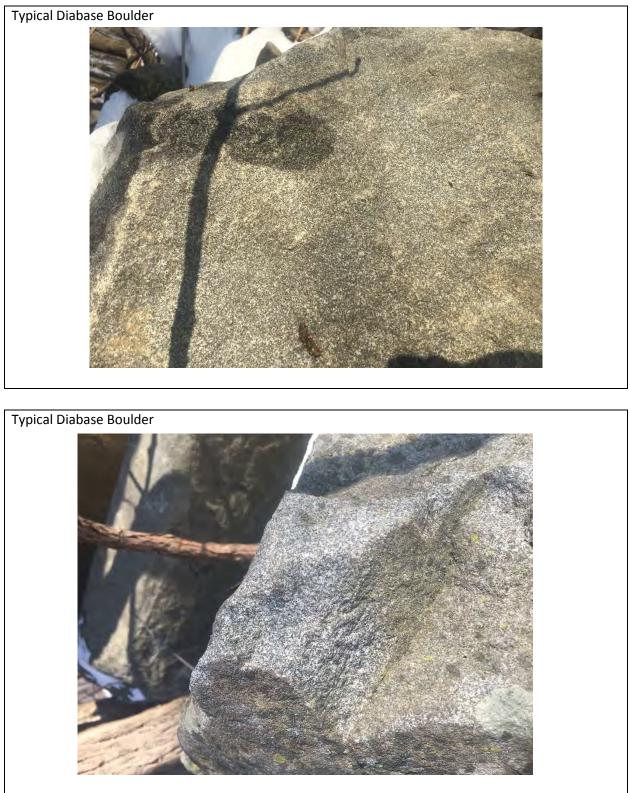
SITE PHOTOS



Eastern Hill Top Diabase Outcrop



SITE PHOTOS



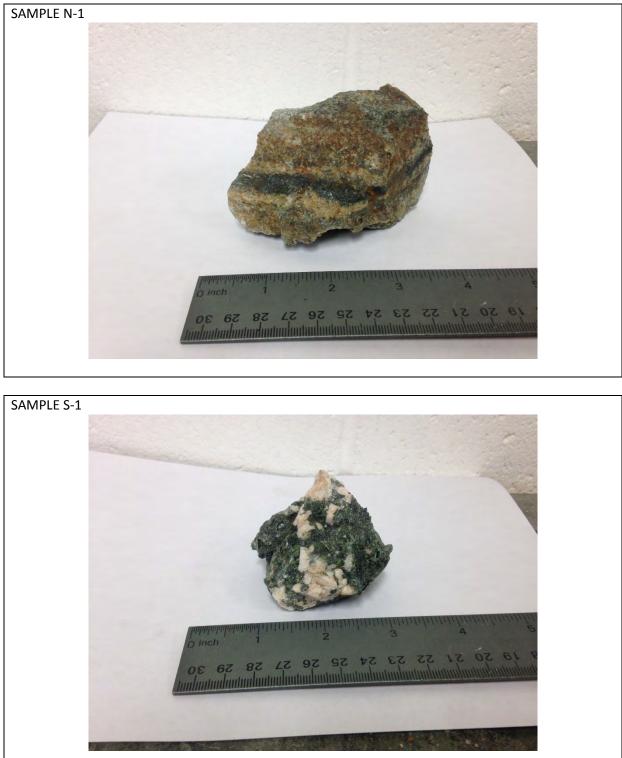
SITE PHOTOS



LOCATION OF SAMPLING



SAMPLE PHOTOS



SAMPLE PHOTOS



APPENDIX D

DRILL CUTTING LABORATORY RESULTS and HIGHWALL HAND SAMPLING RESULTS





EMSL Order: 041800547 Customer ID: ERG51 Customer PO: Project ID:

Attention:	Louis Vittorio
	ERG (EARTHRES GROUP, INC.)
	P.O. BOX 468
	PIPERSVILLE, PA 18947

 Phone:
 (215) 766-1211

 Fax:
 (215) 766-1245

 Received:
 01/09/2018 2:20 PM

 Analysis Date:
 01/09/2018

 Collected:
 01/09/2018

Project: 061003.051

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling). Level B for 0.1% Target Analytical Sensitivity

		<u>Non-Asbestos</u>			<u>Asbestos</u>	
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре	
S-4 041800547-0001	Drill Cuttings - Fines	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	
S-5 041800547-0002	Drill Cuttings - Fines	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	
S-6 041800547-0003	Drill Cuttings - Fines	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	
S-1 041800547-0004	Drill Cuttings - Fines	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	
S-2 041800547-0005	Drill Cuttings - Fines	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	
S-3 041800547-0006	Drill Cuttings - Fines	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	
S-7 041800547-0007	Drill Cuttings - Fines	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	
S-8 041800547-0008	Drill Cuttings - Fines	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	
S-9 041800547-0009	Drill Cuttings - Fines	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	

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Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ

Initial report from: 01/09/2018 23:20:39

ASB_PLMPC_0006_0003 Printed 1/9/2018 11:20:42PM

MSL	EMSL Analytical, Inc. 200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com	EMSL Order: Customer ID: Customer PO: Project ID:	
Attention:	Louis Vittorio	Phone:	(215) 766-1211
	ERG (EARTHRES GROUP, INC.)	Fax:	(215) 766-1245
	P.O. BOX 468	Received:	01/09/2018 2:20 PM
	PIPERSVILLE, PA 18947	Analysis Date:	01/09/2018
		Collected:	01/09/2018
Project:	061003.051		

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling). Level B for 0.1% Target Analytical Sensitivity

			Non-Asbestos Asbestos			
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре	

Analyst(s)

Will DiBella (9)

Zle

Benjamin Ellis, Laboratory Manager or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ

Initial report from: 01/09/2018 23:20:39

ASB_PLMPC_0006_0003 Printed 1/9/2018 11:20:42PM



Asbestos Chain of Custody EMSL Order Number (Lab Use Only):

641400947

CINNA MIRAON. N.J.

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Zip/Postal Code:) 894		Country:	USA	Telephone #		6 1211	Fax #:	
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	EMSL-Bi	ill to: 🗖 Same Third Party Billin	Different - ng requires writ	If Bill to is Differen ten authorizatior	t note instructior from third pa	ns in Comme rty	nts**	
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*For TEM Air 3 hr through 6 hr, authorization form fo								
PCM - Air Check if sam	ples are	TEM - Air	4-4.5hr TAT (AHERA only)	TEM- Dust	t	_	
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w/ OSHA 8hr. TWA						ASTM D64		
PLM - Bulk (reporting limit	<u>n</u>	EPA Level	u		Carpet	Sonication	ר (EPA 600/J	-93/167)
PLM EPA 600/R-93/116	(<1%)	ISO 10312			Soil/Rock	Vermicul	ite	
PLM EPA NOB (<1%)		TEM - Bulk			PLM EF	PA 600/R-	93/116 with n	nilling prep (<1%)
Point Count		TEM EPA N	ЮB		PLM EF	PA 600/R-	93/116 with n	nilling prep (<0.25%)
400 (<0.25%) 1000 (<	<0.1%)		98.4 (non-fria	ble-NY)				nilling prep (<0.1%)
Point Count w/Gravimetric	.0.40()	Chatfield SC		TEM Qualitative via Filtration Prep				
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NYS 198.6 NOB (non-fri	iable-NY)	Fibers >10µm	Waste [Drinking	Other:			
NYS 198.8 SOF-V		All Fiber Sizes	⊡Waste [Drinking	🖾 pln	u Carb	y Limit (
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Comments/Special Instruc	tions:				,			J ^r

Page 1 of _____ pages

OrderID: 041800547



Controlled Document -- Asbestos COC -- R10 -- 05/09/2016

Asbestos Chain of Custody

EMSL Order Number (Lab Use Only): RECE

041600547_

NY: RECEIVED EMSL PHONE: CINNAMINSON, N.J. FAX:

Additional Pages of the Chain of Custody are only necessary if needed for additional samperinger mation

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
S-3.	Drill cutting (Fines)	1/2 gallon	1/1/18 0935
S-7 S-8 S-9	Drill cuttings (Fines) Drill cuttings (Fines) Drill cuttings (Fines)	1/2 gallon	1/1/18 0935 1/1/18 09 44 1/1/18 09 47 1/1/18 09 47 1/1/18 0953
S-8_	Drill cutting (Fines)	1/2 Ballo-	1/9/18 0947
5-9	Drill cuttings (Fining	1/2 gallon	1/9/18 0953
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*Comments/Special Ins			L
Comments/Special ins			
	Page 2 of 2 pages		

Page 2 Of 2



EMSL Order: 041800978 Customer ID: ERG51 Customer PO: Project ID:

Attention: Louis Vittorio ERG (EARTHRES GROUP,INC.) P.O. BOX 468 PIPERSVILLE, PA 18947
 Phone:
 (215) 766-1211

 Fax:
 (215) 766-1245

 Received:
 01/12/2018 2:05 PM

 Analysis Date:
 01/15/2018

 Collected:

Project: 061003.051

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling). Level B for 0.1% Target Analytical Sensitivity

			<u>Non-A</u>	Asbestos	Asbestos
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре
N-1 041800978-0001	Rock Sample	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
S-1 041800978-0002	Rock Sample	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
S-2 041800978-0003	Rock Sample	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
S-3 041800978-0004	Rock Sample	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Andrew Castellano (4)

JA.

Benjamin Ellis, Laboratory Manager or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ

Initial report from: 01/15/2018 16:08:14

ASB_PLMPC_0006_0003 Printed 1/15/2018 4:08:19PM



Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

041800978

PHONE: FAX:

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		,					
Company Name : Earth	Res Grou	up, Inc.	EMSL Custome	er ID:			
Street: 6912 Old Easton	Road		City: Pipersville	ville State/Provinc		nce: PA	
Zip/Postal Code: 18947 Country: USA			Telephone #: 21	15-766-12	211 Fax #: 215	-766-1245	
Report To (Name): Louis	Vittorio		Please Provide	Results:	🗌 Fax 🗹 Email		
Email Address: Ivittorio		com	Purchase Order	r:			
Project Name/Number: 0		、	EMSL Project II		I Use Only):		
U.S. State Samples Take			CT Samples:] Comme	rcial/Taxable 🗌 Res	idential/Tax Exempt	
	EMSL-B	ill to: 🗹 Same 🔲 Different - i Third Party Billing requires writt	en authorization froi	m third par			
	1	Turnaround Time (TAT)					
		24 Hour 48 Hour 48 Hour 48 Hour	charge for 3 Hour Th		6 Hour		
authorization form	for this service	Analysis completed in accordance v	vith EMSL's Terms ar	nd Conditio	ns located in the Analytica	Price Guide.	
PCM - Air Check if sat	mples are	<u>TEM Air</u> 4-4.5hr TAT (4	HERA only) TE	<u>EM- Dust</u>			
NIOSH 7400		AHERA 40 CFR, Part 763	3 []Microva	c - ASTM D 5755	•	
w/ OSHA 8hr. TWA		NIOSH 7402]Wipe - A	STM D6480		
PLM - Bulk (reporting lim	nit)	EPA Levei II		Carpet S	Sonication (EPA 600/	2 3/167)	
PLM EPA 600/R-93/11	6 (<1%)	[] ISO 10312	<u>Sc</u>		vennicunte	ANN ANN	
PLM EPA NOB (<1%)		TEM - Bulk		PLM EP	A 600/R-93/116 with	miling prep (异%)	
Point Count					A 600/R-93/116 with r	nilling prep (\$4.25%)	
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Point Count w/Gravimetric	(<በ 1%)	Chatfield SOP			alitative via Filtration F		
					A Qualitative via Drop Mount Prep cinnati Method EPA 600/R-04/004 PLM/TEM		
NYS 198.1 (friable in N				BC only)			
NYS 198.6 NOB (non-1	friable-NY)	Fibers >10µm Waste Drinking Other:			LM CARB 435 Lev	vel в	
└── NYS 198.8 SOF-V └── NIOSH 9002 (<1%)		All Fiber Sizes DWaste]Drinking		reporting limit	: to <0.1%)	
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Sample #		Sample Description	n		Volume/Area (Air) HA # (Bulk)	Date/Time Sampled	
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S-3	Rock Sa	•			<1 lb. '	1/12/18/12@	
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Client Sample # (s): - Total # of Samples:							
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Comments/Special Instru	íctions:		1 1'			Ŷ	
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		Page 1 of _	· pages			(URA	

Controlled Document - Asbestos COC - R10 - 05/09/2016

Page 1 Of 1

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ERG's 2nd Quarter 2018 NOA Monitoring Report

July 27, 2018



PENNSYLVANIA



P.O. Box 468 Pipersville, PA 18947 215.766.1211

WEST VIRGINIA

P.O. Box 794 Morgantown, WV 26505 304.212.6866

800.264.4553

July 27, 2018

Andrew J. Gutshall, P.G. Environmental Manager Hanson Aggregates Pennsylvania, LLC 7660 Imperial Way Allentown, PA 18195

SUBJECT:2nd Quarter 2018 NOA Monitoring Report
Rock Hill Quarry Operation
SMP No. 7974SM1
East Rockhill Township, Bucks County
EarthRes Project No. 061003.051

Dear Mr. Gutshall:

Pursuant to the site monitoring plan approved by the Pennsylvania Department of Environmental Protection (PA DEP), EarthRes Group, Inc. (EarthRes) is pleased to provide the following 2nd Quarter 2018 Monitoring Report for the Rock Hill Quarry

INTRODUCTION

Site work was in completed accordance with the Monitoring Plan prepared by Hanson Aggregates Pennsylvania, LLC (Hanson), as approved by PA DEP in their letter dated January 25, 2018. The ongoing work is being performed to assess the potential presence of naturally occurring asbestos (NOA) minerals in the areas to be mined. Prior site investigation and sampling detailed in our report of January 18, 2018 (1st Quarter 2018), did not indicate the presence of NOA in the proposed mining area.

The current monitoring and sampling effort included site observation, collection and analysis of rock and rock cuttings in the active southeast quarry development area. The work was performed onsite by EarthRes personnel on June 4, 2018, under the supervision of a Pennsylvania licensed Professional Geologist (P.G.). A site figure showing the quarry and sample locations is included in Appendix A.

SITE SPECIFIC INVESTIGATION

Per the NOA Monitoring Plan, a single active bench (face) area was being prepared for drilling and subsequent blasting at the time of sampling. One (1) composite drill-cutting sample was collected

Rock Hill Quarry 2nd Quarter 2018 NOA Monitoring Report July 27, 2018 Page 2 of 2

from two (2) drill holes on the active bench. The corresponding sampling locations are shown on the attached Figure in Appendix A. The composite samples were collected using a sterile plastic scoop that was used to mix and collect the drill cuttings. One (1)-gallon Ziplock® bags were filled with approximately 0.5 gallons of drill cuttings from each borehole. The two drill cutting samples were then combined into a single one-gallon Ziplock® bag evenly and mixed.

An outcrop hand sample of observed mineral veining from the bench face was collected while onsite. The hand sample was compared to previously collected samples, and was found to be similar and from the same location that was sampled and reported as non-detect for NOA in our report of January 18, 2018. The sample location is shown on the attached Figure in Appendix A. Pictures of the highwall, specific sampling locations and the collected sampled are provided on the photographs in Appendix B.

The composite sample was shipped via FedEx priority overnight to EMSL Laboratory in Cinnaminson, NJ using standard chain-of-custody procedures. The sample was analyzed using Polarized Light Microscopy (PLM) via EPA 600/R-93/116 Method with preparation using the CARB 435 Method.

SAMPLE RESULTS

The laboratory testing results determined that the composite drill cutting sample was homogeneous, grey and 100% non-fibrous. Asbestos was not detected in the sample at the lowest PLM CARB 435 detection limit of 0.1%. The laboratory report is in Appendix C.

Please feel free to contact me at (215) 766-1211 should you have any questions or require any additional information.

Sincerely, EarthRes Group, Inc.

Louis F. Vittorio, Jr., P.G. Vice President

Appendices: A – Figure 1 B – Site and Sample Photographs C – Laboratory Analytical Results

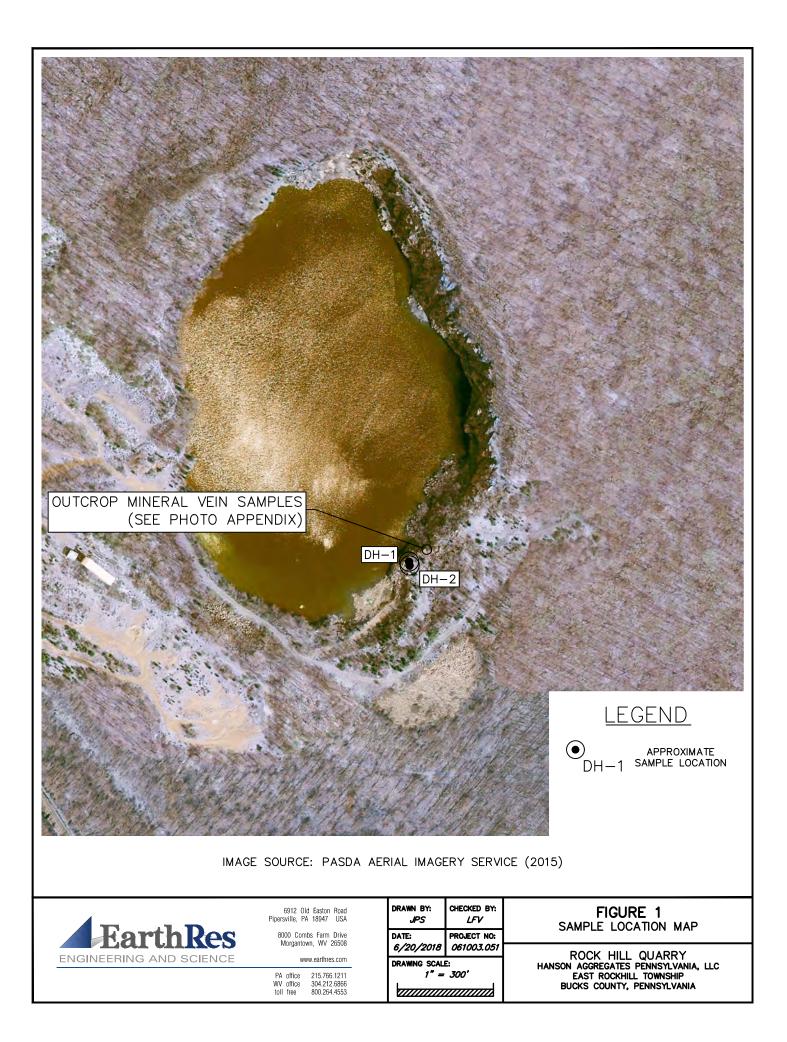




APPENDIX A

FIGURE 1





APPENDIX B

SITE & SAMPLING PHOTOS





Photo 1: Vein exposed in active face.



Photo 2: DH-1 drill cuttings and sample location.



Photo 3: DH-2 drill cuttings and sample location.

APPENDIX C

LABORATORY RESULTS



EMSL	EMSL Analytical, Inc. 200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com	EMSL Order: Customer ID: Customer PO: Project ID:	
Attention:	Louis Vittorio	Phone:	(215) 766-1211
	ERG (EARTHRES GROUP,INC.)	Fax:	(215) 766-1245
	P.O. BOX 468	Received:	06/05/2018 9:20 AM
	PIPERSVILLE, PA 18947	Analysis Date:	06/19/2018
		Collected:	06/04/2018

Project: 061003.051

Test Report: Asbestos Analysis of Bulk Building Materials via EPA 600/R-93/116 Method using PLM and Milling Prep. Quantitation using 400 Point Count Procedure

			<u>Non-Asbestos</u>		
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре
Composite	Drill Cuttings	Gray		100% Non-fibrous (Other)	None Detected
041817020-0001		Non-Fibrous			
		Homogeneous			

Analyst(s)

Samantha Rundstorm-Cruz (1)

A

Benjamin Ellis, Laboratory Manager or other approved signatory

Disclaimer:Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. The limit of detection as stated in the method is 0.25%. EMSL Analytical Inc suggests that samples reported as <0.25% or none detected undergo additional analysis via TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval of EMSL Analytical Inc. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States Government . EMSL Analytical Inc., bears no responsibility for sample collection activities, analytical method limitations, or the accuracy of results when requested to separate layered samples. EMSL Analytical Inc., liability is limited to the cost of sample analysis. The test results contained within this report meet the requirements of NELAC unless otherwise noted. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 06/19/2018 19:22:38

ASB_PLMPC_0006_0003 Printed 6/19/2018 7:22:39PM

EMSL

EMSL ANALYTICAL, INC.

Asbestos Chain of Custody EMSL Order Number (Lab Use Only):

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Zip/Postal Code: 18947 Country: USA				one #: 215 7661211 Fax #:			
Report To (Name): Louis Vittorio			Please Pro	vide Results:	Fax	Email	
Email Address: Livitorio @ earth Res.com			Purchase (Order:			
Project Name/Number:	06100			ect ID (Interna			
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		Third Party Billing requires writt	ten authorizatio	on from third par	s in comments ty	3	
		Turnaround Time (TAT)			·		
	Hour [r, please call ah	24 Hour 48 Hour ead to schedule.*There is a premium	1 charge for 3 H		6 Hour	□ 1 Week	
authorization form	for this service.	Analysis completed in accordance	with EMSL's Te	ms and Condition	ns located in	the Analytical	Price Guide.
PCM - Air Check if sar	nples are	<u>TEM – Air</u> 4-4.5hr TAT (/	AHERA only)	TEM- Dust			
NIOSH 7400		AHERA 40 CFR, Part 76	3		c - ASTM D	5755	
w/ OSHA 8hr. TWA		NIOSH 7402		Wipe - A	STM D648	0	
PLM - Bulk (reporting lim	nit)	EPA Level II		Carpet S	Sonication (EPA 600/J-	93/167)
PLM EPA 600/R-93/11	6 (<1%)	□ ISO 10312		Soil/Rock/	Vermiculite	2	
PLM EPA NOB (<1%)		TEM - Bulk					nilling prep (<1%)
Point Count	(~0.49/)						nilling prep (<0.25%)
Point Count w/Gravimetric		L_NYS NOB 198.4 (non-frial	DIE-INT)	in the second	alitative via		nilling prep (<0.1%) Prep
<u>400 (<0.25%)</u>		TEM Mass Analysis-EPA	600 sec. 2.5		alitative via	Drop Mou	nt Prep
NYS 198.1 (friable in N	4Y)	TEM – Water: EPA 100.2	Cincinnati Method EPA 600/R-04/004 – PLM/TE				04/004 - PLM/TEM
NYS 198.6 NOB (non-	friable-NY)	Fibers >10µm Waste	Drinking Other: $400 pf W/m_i ling$				
NYS 198.8 SOF-V	,	All Fiber Sizes Waste	Drinking Reporting Limit (<0,1%)				
NIOSH 9002 (<1%)				k	Reporting	Limit (<	0,1%)
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Samplers Name:			Sampler	s Signature:			
Sample #		Sample Description	07	_	Volume/A HA # (Area (Air) (Bulk)	Date/Time Sampled
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Relinquished (Client): Jarred Swiewick with Date: 6/4/18 Time: 10:00							
Received (Lab):	Chi	U Date:	(- 5 -1)	6		Time	$e^{9'n_{2}}$
Comments/Special Instructions:							
See Back Page".							
		Page 1 of	_/ pages	. 1			
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ERG's 3rd Quarter 2018 NOA Monitoring Report

October 24, 2018



Earthres Group, Inc. toll free 800-264-4553

www.earthres.com



HEADQUARTERS / PHILADELPHIA REGION

P. O. Box 468, Pipersville, PA 18947 phone 215-766-1211

APPALACHIAN REGIONAL OFFICE

P. O. Box 794, Morgantown, WV 26505 phone 304-212-6866

October 24, 2018

Andrew J. Gutshall, P.G. Environmental Manager Hanson Aggregates Pennsylvania, LLC 7660 Imperial Way Allentown, PA 18195

SUBJECT: 3rd Quarter 2018 NOA Monitoring Report Rock Hill Quarry Operation SMP No. 7974SM1 East Rockhill Township, Bucks County EARTHRES Project No. 061003.051

Dear Mr. Gutshall:

Pursuant to the site monitoring plan approved by the Pennsylvania Department of Environmental Protection (PA DEP), Earthres Group, Inc. (EARTHRES) is pleased to provide the following 3rd Quarter 2018 Monitoring Report for the Rock Hill Quarry.

INTRODUCTION

Site work was completed in accordance with the Monitoring Plan prepared by Hanson Aggregates Pennsylvania, LLC (Hanson), as approved by PA DEP in their letter dated January 25, 2018. The ongoing work is being performed to assess the potential presence of naturally occurring asbestos (NOA) in the areas to be mined. Prior site investigation and sampling detailed in our reports of January 18, 2018 (1st Quarter 2018) and June 4, 2018 (2nd Quarter 2018), did not indicate the presence of NOA in the proposed mining area.

The current monitoring and sampling effort included site observation, collection and analysis of rock and rock cuttings in the active southeast quarry development area. The work was performed onsite by EARTHRES personnel on July 17th, July 18th, July 31st, August 22nd, September 6th, & September 24th, 2018, under the supervision of a Pennsylvania licensed Professional Geologist (P.G.). A site figure showing the quarry area and sample locations is included in Appendix A.

SITE SPECIFIC INVESTIGATION

Per the NOA Monitoring Plan, one (1) composite drill-cutting sample was collected from two (2) drill holes on each active bench. The corresponding sampling locations are shown on the

attached Figure in Appendix A. The highwall faces below the bench were inspected and did not show evidence of mineral veining and additional samples were not collected.

The composite samples were collected using a sterile plastic scoop that was used to mix and collect the drill cuttings. One (1)-gallon Ziplock® bags were filled with approximately 0.5 gallons of drill cuttings from each borehole. The two drill cutting samples were then combined into a single one-gallon Ziplock® bag evenly and mixed. A total of two (2) composite samples were collected, one (1) from each active bench. The composite samples were identified as "Composite" on the laboratory chain-of custody (COC). A table is provided below indicating sample location and combination.

The sample location is shown on the attached Figure in Appendix A. Pictures of the highwall, specific sampling locations and the collected samples are provided on the photographs in Appendix B.

Table 1						
Rock Hill Quarry Drill Samples for Asbestos						
Sample	Location	Combination	Sample Date			
S-1	Middle Bench	Composite #1	7/17/2018			
S-2	Middle Belleli	Composite #1	//1//2018			
S-3	Lower Bench	Composito #2	7/18/2018			
S-4	Lower Delicit	Composite #2	//18/2018			
S-5	Linnar Danah	Composite #1	7/31/2018			
S-6	Upper Bench	Composite #1				
S-7	Middle Bench	Composito #1	8/22/2018			
S-8	Middle Belleli	Composite #1	0/22/2010			
S-9	Linn on Donoh	Commonite #1	9/6/2018			
S-10	Upper Bench	Composite #1	9/0/2018			
S-11	Middle Bench	(iddle Danch Commonite #1	0/24/2019			
S-12	Midule Bench	Composite #1	9/24/2018			
See Figure 1 for sample locations.						

The composite samples were transported directly by EARTHRES to EMSL Analytical, Inc. laboratory in Cinnaminson, NJ. The samples were analyzed using Polarized Light Microscopy (PLM) via EPA 600/R-93/116 Method.



Rock Hill Quarry 3rd Quarter 2018 NOA Monitoring Report October 24, 2018 Page 3 of 3

SAMPLE RESULTS

The laboratory testing results determined that the drill cutting composite samples were homogeneous and 100% non-fibrous. NOA was not detected in any of the samples at the method detection limit of 0.1%. The laboratory reports are included as in Appendix C.

The sampling results from this quarter (6 samples) and prior sampling events (10 samples), continue to show the absence NOA in the mining area. Based upon the sampling conducted and field observations, a reduction in sampling frequency is warranted.

If you have any questions or concerns regarding the presented investigation and results, please feel free to contact me at (215) 766-1211.

Sincerely, Earthres Group, Inc.

Louis F. Vittorio, Jr., P.G. Vice President

Appendices: A – Figure 1 B – Site and Sample Photographs C – Laboratory Analytical Results



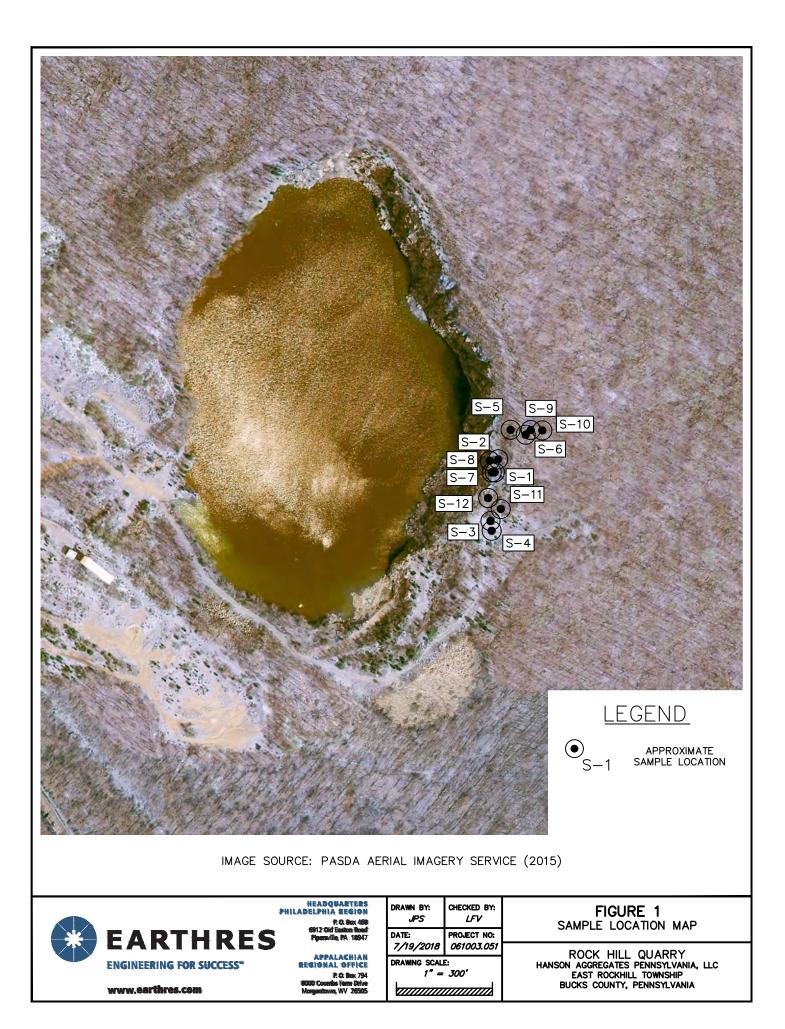


Rock Hill Quarry 3rd Quarter 2018 NOA Monitoring Report

APPENDIX A

FIGURE 1





APPENDIX B

SITE & SAMPLING PHOTOS





Photo 1 – S-1 Drill Cuttings and Sample Location



Photo 2 – S-2 Drill Cuttings and Sample Location





Photo 3 – S-3 Drill Cuttings and Sample Location



Photo 4 – S-4 Drill Cuttings and Sample Location



Photo 5 – S-5 and S-6 Drill Cuttings and Sample Locations





Photo 6 – S-7 Drill Cuttings and Location



Photo 7 – S-8 Drill Cuttings and Location



ENGINEERING FOR SUCCESS"



Photo 8 – S-11 and S-12 Drill Cuttings and Locations



Photo 9 – Highwall of S-11 and S-12 Location



ENGINEERING FOR SUCCESS*

APPENDIX C

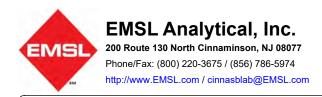
DRILL CUTTING LABORATORY RESULTS



Rock Hill Quarry 3rd Quarter 2018 NOA Monitoring Report

July 17-18, 2018





P.O. BOX 468

ERG (EARTHRES GROUP, INC.)

PIPERSVILLE, PA 18947

EMSL Order: 041821670 Customer ID: ERG51 Customer PO: Project ID:

 Phone:
 (215) 766-1211

 Fax:
 (215) 766-1245

 Received:
 07/18/2018 5:50 PM

 Analysis Date:
 07/19/2018

 Collected:
 07/19/2018

Project: 061003.051

Attention: Louis Vittorio

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling). Level B for 0.1% Target Analytical Sensitivity

			Non-Asbestos		
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре
Composite #1 041821670-0001	Drill Cuttings Composite Sample	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected
Composite #2 041821670-0002	Drill Cuttings Composite Sample	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Andrew Castellano (2)

1

Benjamin Ellis, Laboratory Manager or other approved signatory

This report relates only to the samples listed above and may not be reproduced except in full, without EMSL's written approval. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. EMSL is not responsible for sample collection activities or method limitations. Some samples may contain asbestos fibers below the resolution limit of PLM. EMSL recommends that samples reported as none detected or less then the limit of detection undergo additional analysis via TEM. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ

Initial report from: 07/19/2018 12:00:06

ASB_PLMPC_0006_0003 Printed 7/19/2018 12:00:08PM

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Asbestos Chain of Custody EMSL Order Number (Lab Use OFID): EMSL II821670 CIMINAMINSON. H.J.

041821670

PHONE: Fax:

				A 154 St -	51		
Company Name : Earth	2010 HILL 18 PH 5: 51 Entrest-Customer ID:						
Street: 6913 Old Easton Road			City: Pipersy	ville		State/Provin	nce: PA
Zip/Postal Code: 18947 Country: USA			Telephone #: 2157661211 Fax #:				
Report To (Name): Louis Vittorio			Please Prov	ide Results:	🗌 Fax	Email	
Email Address: Lvittorio		.com	Purchase Or	der:			
Project Name/Number: 0	61003.051	·····	EMSL Projec				
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authorization form f	or this service	Analysis completed in accordance	with EMSL's Terr	ns and Conditio	ns located	in the Analytical	Price Guide.
PCM - Air Check if san	npies are	<u>TEM – Air</u> 4-4.5hr TAT (AHERA only)	TEM-Dust			
NIOSH 7400		AHERA 40 CFR, Part 76	3	Microva	c - ASTM	D 5755	
w/ OSHA 8hr. TWA		NIOSH 7402		Wipe - A	STM D6	480	
PLM - Bulk (reporting lim	<u>nit)</u>	EPA Level II		Carpet S	et Sonication (EPA 600/J-93/167)		
PLM EPA 600/R-93/11	6 (<1%)	ISO 10312		Soil/Rock/			
PLM EPA NOB (<1%)		TEM - Bulk					nilling prep (<1%)
	(40,40/)						nilling prep (<0.25%) nilling prep (<0.1%)
400 (<0.25%) 1000 Point Count w/Gravimetric	(<0.1%)	NYS NOB 198.4 (non-fria	DIE-INY)				
☐400 (<0.25%) []1000 ((<0.1%)	TEM Mass Analysis-EPA					
NYS 198.1 (friable in N		TEM Water: EPA 100.2	Cincinnati Method EPA 600/R-04/004 – PLM/TEM				
NYS 198.6 NOB (non-1		Fibers >10µm Waste	(BC only) Drinking Other:				
NYS 198.8 SOF-V		· <u> </u>	PLM Carb 435 Level B Reporting Limit				
□ NTS 198.8 SOF-V All Fiber Sizes □ □ NIOSH 9002 (<1%)						e Order #0	
Check For Positive St	op – Clearly	Identify Homogenous Group	5 Filter	Pore Size (A	ir Sampl	es):0.8µ	um []0.45µm
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Relinquished (Client): Julit And An Date: 7/18/18/7/18/18 Time: 7545/							
Received (Lab): Date: 7/8/18 Time: 550							
Comments/Special Instructions:							
Bill to. Andrew J Gutshalt, Area Environmental Manager -ECPA/NJ Company: Lehigh Hanson, Inc. Address. 7660 Inperial Way Alientown, PA 18195 Office phone (610) 366-4819							
		Page 1 of	pages				
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Rock Hill Quarry 3rd Quarter 2018 NOA Monitoring Report

July 31, 2018



MSL	EMSL Analytical, Inc. 200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com	EMSL Order: Customer ID: Customer PO: Project ID:	
Attention:	Louis Vittorio	Phone:	(215) 766-1211
	ERG (EARTHRES GROUP,INC.)	Fax:	(215) 766-1245
	P.O. BOX 468	Received:	08/01/2018 9:30 AM
	PIPERSVILLE, PA 18947	Analysis Date:	08/07/2018
		Collected:	07/31/2018
Project:	061003.051		

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling). Level B for 0.1% Target Analytical Sensitivity

		Non-Asbestos			<u>Asbestos</u>
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре
Composite #1 041823264-0001	Drill Cutting Sample - Composite	Brown Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Andrew Castellano (1)

Zle

Benjamin Ellis, Laboratory Manager or other approved signatory

EMSL maintains liability limited to the cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. The test results contained within this report meet the requirements of NELAP unless otherwise specified. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ

Initial report from: 08/07/2018 09:44:10

ASB_PLMPC_0006_0003 Printed 8/7/2018 9:44:11AM

/ _	
OrderID:	041823264



Asbestos Chain of Custody EMSL Order Number (Lab Use Only):

EIVISL		`ı	e Oniy):	1	RECT.	
—	04/41	3264		PAONE.	RECEIVED EMSL AMINSON, NJ -1 AM nce: PAID: 24	
EMSL ANALYTICAL, INC.		0 (J FAX	AMINIC	
				19	<u>"INSON N</u>	
Company Name : EarthRes Gr	oup	EMSL Custo	mar ID.	JUG .	-1	
	<u> </u>					
Street: 6913 Old Easton Road		City: Pipersy		State/Provin		
Zip/Postal Code: 18947	Country: USA	Telephone #	2157661211	Fax #:	· · ·	
Report To (Name): Louis Vittorio		Please Prov	ide Results:	🛛 Fax 🗹 Email		
Email Address: Lvittorio@earthro	es.com	Purchase Or	rder:			
Project Name/Number: 061003.051			ct ID (Internal U			
U.S. State Samples Taken:			: 🗌 Commerci		idential/Tax Exempt	
ENSL	-Bill to: Same 🔽 Different - Third Party Billing requires wri			Comments"*		
	Turnaround Time (TAT)					
3 Hour 6 Hour	24 Hour 48 Hour	🗌 🗌 72 Ho	ur 🗌 96 H	lour 🛛 🗶 1 Week		
*For TEM Air 3 hr through 6 hr, please call authorization form for this servic						
PCM - Air Check if samples are				iocated in the Analyticar		
from NY	$\frac{\text{TEM} - \text{Air}}{-}$		TEM- Dust			
NIOSH 7400	AHERA 40 CFR, Part 76	33	Microvac -	ASTM D 5755		
w/ OSHA 8hr. TWA	NIOSH 7402		Wipe - AS1	FM D6480		
PLM - Bulk (reporting limit)	EPA Level 11		Carpet Sor	nication (EPA 600/J-	93/167)	
PLM EPA 600/R-93/116 (<1%)	ISO 10312		Soil/Rock/Ve	rmiculite		
PLM EPA NOB (<1%)	TEM - Bulk			600/R-93/116 with m		
Point Count					nilling prep (<0.25%)	
400 (<0.25%) 1000 (<0.1%)		NYS NOB 198.4 (non-friable-NY)		TEM EPA 600/R-93/116 with milling prep (<0.1%)		
Point Count w/Gravimetric		LChatfield SOP		TEM Qualitative via Filtration Prep		
☐400 (<0.25%) <u></u> 1000 (<0.1%)		1000 Sec. 2.5		Method EPA 600/R-		
NYS 198.1 (friable in NY)	TEM – Water: EPA 100.2		(BC only)			
NYS 198.6 NOB (non-friable-NY)	Fibers >10µm ⊡Waste	Drinking	Other:		Descrition I instead	
NYS 198.8 SOF-V	All Fiber Sizes Waste	Drinking			Reporting Limit	
NIOSH 9002 (<1%)			(<0.1%	%) (See Order #0	41817020)	
Check For Positive Stop – Clea	rly Identify Homogenous Grou	p Filter	Pore Size (Air-	Samples):	um 0.45µm	
			1	NO LA		
Samplers Name: JPS		Samplers	Signature:	MARD		
Sample #	Sample Descript	ion	<u></u>	/olume/Area (Air) HA # (Bulk)	Date/Time Sampled	
Con uside the T	illente si la	Composil	LS	1 gallon	7/31/18 1135	
Composite 1	Shinching same	Cergoon				
	0 1		{	-		
					\frown	
	<u> </u>					
Client Sample # (s):			Τσ	tal # of Samples:	1 (104)	
Relinquished (Client):	Date Date	$\rightarrow 13$	dix .	Time	: 15 BP)	
	ha		.16		O ha	
Received (Lab):	Date	: 4-1	-14	Time	: 1.5~	
Comments/Special Instructions: Bill to: Andrew J Gutshall Area Environmental	Manager -ECPA/NJ Company [,] Lehigh Hanson, I	nc Address 7660 Ion	erial Way Allentown PA	18195 Office phone (610) 364	6-4819	
	me thron a rand this				·-	
	1	1				
	- Page 1 of	I ,_ pages				
Controlled Document – Achieving COC – 240 – 05/09/2011						

Document – Asbestos COC – R10 – 05/09

Page 1 Of 1

Rock Hill Quarry 3rd Quarter 2018 NOA Monitoring Report

August 22, 2018



ENGINEERING FOR SUCCESS"

MSL	EMSL Analytical, Inc. 200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com	EMSL Order: Customer ID: Customer PO: Project ID:	
Attention:	Louis Vittorio	Phone:	(215) 766-1211
	ERG (EARTHRES GROUP,INC.)	Fax:	(215) 766-1245
	P.O. BOX 468	Received:	08/22/2018 12:00 PM
	PIPERSVILLE, PA 18947	Analysis Date:	08/23/2018
		Collected:	08/22/2018
Project:	061003.051		

Test Report: Asbestos Analysis of Soils via EPA 600/R-93/116 Method using PLM and Milling Prep. Quantitation using 400 Point Count Procedure

			<u>Asbestos</u>		
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре
Composite #1 041825501-0001	Composite Drill Cuttings	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Juli Patel (1)

Ú

Benjamin Ellis, Laboratory Manager or other approved signatory

Disclaimer:Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. The limit of detection as stated in the method is 0.25%. EMSL Analytical Inc suggests that samples reported as <0.25% or none detected undergo additional analysis via TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval of EMSL Analytical Inc. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States Government . EMSL Analytical Inc., bears no responsibility for sample collection activities, analytical method limitations, or the accuracy of results when requested to separate layered samples. EMSL Analytical Inc., liability is limited to the cost of sample analysis. The test results contained within this report meet the requirements of NELAC unless otherwise noted. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 08/23/2018 10:08:55

ASB_PLMPC_0006_0003 Printed 8/23/2018 10:08:57AM



Asbestos Chain of Custody EMSL Order Number (Lab Use Only):

0-4/62550

PHONE: Fax:

Company Name : Earth	Res Grou	up qu	EMSL Custo	omer ID:			
Street: 6913 Old Easton F			City: Pipersville		State/Provi	nce: PA	
Zip/Postal Code: 18947		Country: USA		: 215766121	1	Fax #:	
Report To (Name): Louis	Vittorio		· · · · · · · · · · · · · · · · · · ·	ide Results:		K 🗹 Email	
Email Address: Lvittorio		.com	Purchase O	rder:			
Project Name/Number: 00			EMSL Proje		l Use On	ly):	
U.S. State Samples Taker			CT Samples				idential/Tax Exempt
	EMSL-B	ill to: Different - Third Party Billing requires writ				ents**	
		Turnaround Time (TAT)					
*For TEM Air 3 hr through 6 hr	r, please call an	24 Hour 48 Hour 48 Hour 46 Hour 47 Hore is a premium	n charge for 3 Ho	ur TEM AHERA	6 Hour	evel II TAT. You	will be asked to sign an
authorization form f		Anatysis completed in accordance		ns and Conditio	ns located	in the Analytical	Price Guide.
from NY	inples are	<u> TEM Air</u> 4-4.5hr TAT (AHERA only)	TEM- Dust			
NIOSH 7400		AHERA 40 CFR, Part 76	3	Microva	c - ASTM	1 D 5755	
🔲 w/ OSHA 8hr. TWA		NIOSH 7402			STM D6	480	
PLM - Bulk (reporting lim	iit)	EPA Level II		Carpet S	Sonicatio	n (EPA 600/J-	-93/167)
PLM EPA 600/R-93/116	6 (<1%)	SO 10312		Soil/Rock/			
PLM EPA NOB (<1%)		TEM - Bulk			EPA 600/R-93/116 with milling rep 31%		
Point Count					A 600/R	-93/116 with л	nilling.prep <u>25</u> 2 <u>5</u> %)
400 (<0.25%) 1000 ((<0.1%)	NYS NOB 198.4 (non-friable-NY)			EPA 600/R-93/116 with milling prep 301		
Point Count w/Gravimetric	(-0.40/)				Qualitative via Filtration Prep		
400 (<0.25%) 1000 (TEM Mass Analysis-EPA 600 sec. 2.5 TEM Qualitative via Drop Mount Prep			nt P <u>tep</u> +	
NYS 198.1 (friable in N	•	TEM – Water: EPA 100.2		(BC only)			
NYS 198.6 NOB (non-f	friable-NY)	Fibers >10µm ☐ Waste [Drinking	Other:	(0)		
NYS 198.8 SOF-V		All Fiber Sizes Waste	Drinking				Reporting Limit
NIOSH 9002 (<1%)				(<0.	.1%) (Se	ee Order #0	41817020)
Check For Positive St	op Clearly	Identify Homogenous Grou	p Filter	Pore Size (A	ir Samp	les): 🚺 0.8	µm 0.45µm
Samplers Name: JPS			Samplers	Signature:	h. L.	1 A	
			•		Volum	e/Area (Air)	Date/Time
Sample #		Sample Descripti	on	v	HA	# (Bulk)	Sampled
Composite #1	Compos	ite Drill Cuttings	<u> </u>		1 g	allon	8/22/180845
	Ļ						
Client Semula # (a):					T - 4 - 1 - 44	<u> </u>	l
Client Sample # (s):	1		ol. lin		i otal # 0	of Samples: 1	
Relinquished (Client):	<u>Uary 1.5</u>	Wwl Date:	8/22/18			Time	12:00 PM
Received (Lab):	Den	Wel Date: 	822	118 .		Time	12:00n
Comments/Special Instru	uctions:		- Adda.s. Soon -		D4 40400 -	N	
Bill to: Anorew J Gutshall, Area E	environmental Man	ager -ECPA/NJ Company: Lehigh Hanson, In	c Address 7660 Inp	erial Way Allentown,	, PA 18195 O	ittice phone (610) 36	6-4819

Page 1 of 1 pages

September 6, 2018



MSL	EMSL Analytical, Inc. 200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com	EMSL Order: Customer ID: Customer PO: Project ID:	
Attention:	Louis Vittorio	Phone:	(215) 766-1211
	ERG (EARTHRES GROUP,INC.)	Fax:	(215) 766-1245
	P.O. BOX 468	Received:	09/06/2018 4:25 PM
	PIPERSVILLE, PA 18947	Analysis Date:	09/07/2018
		Collected:	
Project:	061003.051		

Test Report: Asbestos Analysis of Soils via EPA 600/R-93/116 Method using PLM and Milling Prep. Quantitation using 400 Point Count Procedure

		Non-Asbestos			Asbestos
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре
Composite	Composite Sample of	Tan		100% Non-fibrous (Other)	None Detected
041827054-0001	Drill Cuttings	Non-Fibrous			
		Homogeneous			

Analyst(s)

Andrew Castellano (1)

Al

Benjamin Ellis, Laboratory Manager or other approved signatory

Disclaimer:Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. The limit of detection as stated in the method is 0.25%. EMSL Analytical Inc suggests that samples reported as <0.25% or none detected undergo additional analysis via TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval of EMSL Analytical Inc. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States Government . EMSL Analytical Inc., bears no responsibility for sample collection activities, analytical method limitations, or the accuracy of results when requested to separate layered samples. EMSL Analytical Inc., liability is limited to the cost of sample analysis. The test results contained within this report meet the requirements of NELAC unless otherwise noted. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 09/07/2018 14:58:10

ASB_PLMPC_0006_0003 Printed 9/7/2018 2:58:12PM

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Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

041827054

PHONE: FAX:

Company Name : Earth	Res Grou	p	EMSL Custo	mer ID:			
Street: 6913 Old Easton I			City: Pipersville State/Province: PA			nce: PA	
Zip/Postal Code: 18947		Country: USA	Telephone #		11	Fax #:	
Report To (Name): Louis	Vittorio		Please Prov		_	c 🗹 Email	
Email Address: Lvittorio@earthres.com			Purchase O	rder:			
Project Name/Number: 0	EMSL Projec		l Use On	ly):			
U.S. State Samples Take			CT Samples				idential/Tax Exempt
	ENIST-BII	I to: Same 🗹 Different - Third Party Billing requires write				ents**	
		Turnaround Time (TAT)				· 1 =	
		24 Hour 48 Hour ad to schedule.*There is a premium	charge for 3 Ho		6 Hour	evel II TAT. You	
authorization form i	for this service	Analysis completed in accordance					
PCM - Air Check if sar	npies are	<u>TEM – Air</u> 🔲 4-4.5hr TAT (AHERA only)	TEM- Dust			
NIOSH 7400		AHERA 40 CFR, Part 76	3	Microva	ic - ASTN	1 D 5755	
w/ OSHA 8hr. TWA		NIOSH 7402		Wipe - /	ASTM D6	480	
PLM - Bulk (reporting lim		EPA Level II				n (EPA 600/J-	-93/167)
PLM EPA 600/R-93/110	· · · ⊢	SO 10312		Soil/Rock/			
PLM EPA NOB (<1%)		<u>TEM - Bulk</u> TEM EPA NOB					nilling prep (<1%) nilling prep (<0.25%)
□ 4 00 (<0.25%) [1]1000	(<0.1%)	NYS NOB 198.4 (non-fria	hle-NY)	·			nilling prep (<0.25%) nilling prep (<0.1%)
Point Count w/Gravimetric	· /	Chatfield SOP				via Filtration F	
400 (<0.25%)	(<0.1%)	TEM Mass Analysis-EPA	600 sec. 2.5			via Drop Mou	
NYS 198.1 (friable in N	IY)	<u>TEM – Water:</u> EPA 100.2		Cincinnati Method EPA 600/R-04/004 PLM/TEM (BC only)			04/004 PLM/TEM
NYS 198.6 NOB (non-1	friable-NY)	Fibers >10µm Waste Drinking		Other:			
UNYS 198.8 SOF-V		I All Eiher Sizes I IW/aste I II)rinking I					Reporting Limit
NIOSH 9002 (<1%)				(<0	<u>.1%) (S</u>	ee Order #0	41817020)
		dentify Homogenous Group	D Filter	Pore Size (A	lin Samp	les):0.8	µm []0.45µm
Samplers Name: JPS			Samplers	Signature:	h	htt	
Sample #		Sample Descripti	on	•		e/Area (Air) # (Bulk)	Date/Time Sampled
Composite	Composit	e Sample of Drill Cutt	ings		1 g	jallon	09/06/18 1355
						<i>.</i>	
Client Sample # (s):			Total # o	f Samples:	· · · · · · · · · · · · · · · · · · ·		
Relinquished (Client):				Time	:		
Received (Lab):		,		Time			
Comments/Special Justru		Date:					
Bill to: Andrew J Gutenall, Area	Environmental Manag	ger -ECPA/NJ Company. Lehigh Hanson, In-	c. Address. 7660 Inpe	erial Way Allentown	n, PA 18195 C	ffice phone (610) 36	6-4819
		Page 1 of	l pages		5A A		(.01)
			(~~3-3	PL	M Opt Mil		
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		Page 1 Of	1	υ U	1	6	

Rock Hill Quarry 3rd Quarter 2018 NOA Monitoring Report

September 24, 2018



MSL	EMSL Analytical, Inc. 200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com	EMSL Order: Customer ID: Customer PO: Project ID:	
Attention:	Louis Vittorio	Phone:	(215) 766-1211
	ERG (EARTHRES GROUP,INC.)	Fax:	(215) 766-1245
	P.O. BOX 468	Received:	09/24/2018 3:30 PM
	PIPERSVILLE, PA 18947	Analysis Date:	09/25/2018
		Collected:	
Project:	061003.051		

Test Report: PLM Analysis of Bulk Samples for Asbestos via EPA 600/R-93/116 Method with CARB 435 Prep (Milling). Level B for 0.1% Target Analytical Sensitivity

			<u>Non-A</u>	<u>Asbestos</u>	
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре
Compsite 1 041828867-0001	Drill Cuttings Composite	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected

Analyst(s)

Andrew Castellano (1)

Zle

Benjamin Ellis, Laboratory Manager or other approved signatory

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Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ

Initial report from: 09/25/2018 17:24:02

ASB_PLMPC_0006_0003 Printed 9/25/2018 5:24:04PM

OrderID: 041828867

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Asbestos Chain of Custody EMSL Order Number (Lab Use Only):

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С	RESEVED	
7215		
2070	SEP 24 P 3 22	
-		1

1

			EMSL Customer ID:					
Street-0913 Old Easton Road		City: Pipersville State/Province: PA						
		Telephone #: 2157661211 Fax #:						
Report To (Name): Louis			Please Provi	de Results:	🗌 Fax	C 🗹 Email		
Email Address: Lvittorio		om	Purchase Or				···	
Project Name/Number: 06			EMSL Projec				deptial/Tex France	
U.S. State Samples Taker		to: Same 🖌 Different -	CT Samples: If Bill to is Different				dential/Tax Exem	2
		Third Party Billing requires write	ten authorization	from third part				
3 Hour61	Hour	Turnaround Time (TAT) 24 Hour	Options* – Pl		6 Hour	1 Week	2 Week	_
*For TEM Air 3 hr through 6 hr	, please call ahea	ad to schedule. "There is a premiun Analysis completed in accordance	n charge for 3 Ho	ur TEM AHERA	or EPA Le	evel II TAT. You	will be asked to sign a	7
PCM - Air Check if san	aples are	TEM - Air 4-4.5hr TAT (TEM- Dust	13 1008180	in the Analytical		
from NY		AHERA 40 CFR, Part 76	3		C - ASTN	1 D 5755		
w/ OSHA 8hr. TWA				Wipe - A				
PLM - Bulk (reporting lim	<u>it)</u>	EPA Level II				n (EPA 600/J-	93/167)	
PLM EPA 600/R-93/116		ISO 10312		Soil/Rock/	Vermicu	lite		
PLM EPA NOB (<1%)		TEM - Bulk					iilling prep (<1%)	
Point Count							illing prep (<0.25%	
□ 400 (<0.25%) □ 1000 ((<0.1%)	NYS NOB 198.4 (non-fria	uble-NY)				nilling prep (<0.1%)	1
Point Count w/Gravimetric	(~0.1%)	Chatfield SOP		TEM Qualitative via Filtration Prep				1
	· · ·	<u>TEM – Water:</u> EPA 100.2		Cincinnati Method EPA 600/R-04/004 – PLM/TEM				1
NYS 198.1 (friable in N	-			(BC only) Other:				
NYS 198.8 SOF-V					A Carb	435 Level B	Reporting Lim	it
NIOSH 9002 (<1%)		All Fiber Sizes Waste	Drinking			ee Order #0		
Check For Positive St	op – Clearly I	dentify Homogenous Grou	p Filter	Pore Size (A	ir Samp	lles): /0.8	um 🔲 0. <u>45µm</u>	
Samplers Name: JPS			Samplers	Signature:		1 JAA	\sim –	
			1			né/Area ('Air)	Date/Time	
Sample #		Sample Descript	ion			. # (Bulk)	Sampled	
Composite 1	Drill Cutti	ngs Composite			1	gallon	9/24/18/13	<u>_</u>
							/ / _/	
	· · · ·							
	-				}	· -		
L								
Client Sample # (s):				· · · · · ·	Total #	of Samples:		
Relinquished (Client):	a	Date	:			Time	:	
Received (Lab):	60I	Date	: 9/24	18		Time	15:30	
Comments/Special Instru Bull to: Andrew J Gutshail, Area		ger -ECPA/NJ Company: Lehigh Hanson, I	nc. Address: 7660 inc	enal Way Allentow	1. PA 18195	Office phone (610) 36	6-4819	

Page 1 of 1 pages

ERG's 4th Quarter 2018 NOA Data

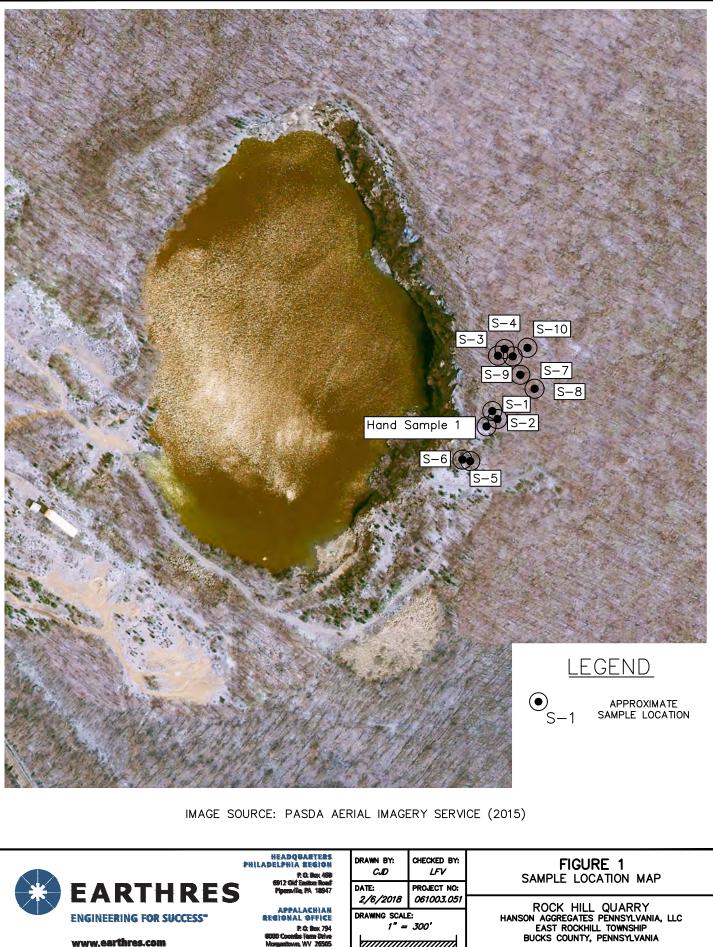


Rock Hill Quarry 4th Quarter 2018 NOA Monitoring Report

APPENDIX A

FIGURE 1





www.earthres.com

R.Q. Box 794 nbs Farm Drive vm, WV 26505 Ma

CUD	LFV			
DATE:	PROJECT NO:			
2/6/2018	061003.051			
DRAWING SCALE: 1'' = 300'				

APPENDIX B

SITE & SAMPLING PHOTOS





Photo 1 – S-1 Drill Cuttings and Sample Location



Photo 2 – S-2 Drill Cuttings and Sample Location



ENGINEERING FOR SUCCESS"



Photo 3 – S-3 and S-4 Drill Cuttings and Sample Location



Photo 4 – S-5 Drill Cuttings and Sample Locations





Photo 5 – S-6 Drill Cuttings and Sample Locations



Photo 6 – S-7 and S-8 Drill Cuttings and Sample Locations





Photo 4 – S-9 and S-10 Drill Cuttings and Location



Photo 5 – Hand Sample Blast Pile and Location



ENGINEERING FOR SUCCESS"

APPENDIX C

DRILL CUTTING LABORATORY RESULTS



Rock Hill Quarry 4th Quarter 2018 NOA Monitoring Report

October 10, 2018



MSL	EMSL Analytical, Inc. 200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com	EMSL Order: Customer ID: Customer PO: Project ID:	
Attention:	Louis Vittorio	Phone:	(215) 766-1211
	ERG (EARTHRES GROUP, INC.)	Fax:	(215) 766-1245
	P.O. BOX 468	Received:	10/10/2018 6:20 PM
	PIPERSVILLE, PA 18947	Analysis Date:	10/11/2018
		Collected:	
Project:	061003.051		

Test Report: Asbestos Analysis of Bulk Building Materials via EPA 600/R-93/116 Method using PLM and Milling Prep. Quantitation using 1000 Point Count Procedure

			Non-Asbestos			
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре	
Composite 1 041830600-0001	Drill Cuttings Composite	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	

Analyst(s)

Benjamin Verghese (1)

Al

Benjamin Ellis, Laboratory Manager or other approved signatory

Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. The limit of detection as stated in the method is 0.1%. EMSL Analytical Inc suggests that samples reported as <0.1% or none detected undergo additional analysis via TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval EMSL Analytical Inc. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States Government . EMSL Analytical Inc. bears no responsibility for sample collection activities, analytical method limitations, or the accuracy of results when requested to separate layered samples. EMSL Analytical Inc liability is limited to the cost of sample analysis. The test results contained within this report meet the requirements of NELAC unless otherwise noted. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 10/11/2018 10:20:59

ASB_PLMPC_0006_0003 Printed 10/11/2018 10:21:01AM



Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

0-11830600

PHONE: FAX:

3RII

Company Name : Earth	Res Grou	qL		EMSL Custo	omer ID:		_
			City: Pipersy	sville State/Province		nce: PA	
Zip/Postal Code: 18947		Country: U	JSA	Telephone #	215766121	11 Fax #:	
Report To (Name): Louis	Vittorio			Please Prov	ide Results:	🗌 Fax 🗹 Email	
Email Address: Lvittorio	@earthres.	.com		Purchase O	rder:		
Project Name/Number: 0				EMSL Project			
U.S. State Samples Taker							idential/Tax Exempt
	EMST-B	ill to: Same Third Party Bil	Unterent - I ling requires writt				
			nd Time (TAT)				
3 Hour *For TEM Air 3 hr through 6 hi		24 Hour	bere is a premium	charge for 3 Ho		6 Hour	
authorization form i	for this service	Analysis complete	ed in accordance v	with EMSL's Tem	ns and Conditio	ons located in the Analytical	Price Guide
P <u>CM - Air</u> Check if san from NY	nples are	TEM – Air]4-4.5hr TAT (/	AHERA only)	TEM- Dust		~ .
NIOSH 7400		AHERA 40	0 CFR, Part 76	3	 Microva	c - ASTM D 5755	C1
w/ OSHA 8hr. TWA		🔲 NIOSH 74	02			ASTM D6480	18 OC
PLM - Bulk (reporting lim	iit)	EPA Leve	មប		Carpet	Sonication (EPA 600/J-	937167) Ž
PLM EPA 600/R-93/11	6 (<1%)	🗌 ISO 10312	2			Vermiculite	I DECE
PLM EPA NOB (<1%)		TEM - Bulk				PA 600/R-93/116 with n	
Point Count					PLM EPA 600/R-93/116 with miling prep (-25%)		
☐400 (<0.25%) <u></u> 1000 ((<0.1%)		198.4 (non-frial	ble-NY)		A 600/R-93/116 with m	
Point Count w/Gravimetric	(<0.1%)	Chatfield S		600 sec. 2.5			- '
NYS 198.1 (friable in N		TEM - Water		000 360. 2.0		ati Method EPA 600/R-	
`	-		<u> </u>		(BC only)		<u> </u>
LJ NYS 198.6 NOB (non-1	riadie-NY)	Fibers >10µm		_Drinking	<u>Other:</u> ✔ PLN	M Carb 435 Level B	Reporting Limit
NIOSH 9002 (<1%)		All Fiber Sizes	s 🔲 Waste [Drinking		.1%) (See Order #0	- v
Check For Positive St	op – Clearly	Identify Homo	aenous Groux	Filter		Air Samples): $\Box 0.8$	
		<u></u>	<u></u>			1	
Samplers Name: CJD	, r			Samplers	Signature:		
Sample #		San	nple Descriptio	on		Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
S-1	Drill Cutt	tinas				1 Gallon	10/10/18
S-2	Drill Cutt					1 Gallon	1330
			·				1330
Composite 1	Drill Cutt	tings Compo		_		1 Gallon	10/10/18
Client Sample # (s):	<u> </u>					Total # of Samples:	
Relinquished (Client):			Date:		1	Time	:
Received (Lab):	Thk	1 PD	Date:	10/10	2/18	Time	$(n)n_{n-1}$
Comments/Special Instru	/				rial Way Allentown	, PA 18195 Office phone (610) 36	- ap

Page 1 of <u>1</u> pages

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Rock Hill Quarry 4th Quarter 2018 NOA Monitoring Report

October 19, 2018



MSL	EMSL Analytical, Inc. 200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com	EMSL Order: Customer ID: Customer PO: Project ID:	
Attention:	Louis Vittorio	Phone:	(215) 766-1211
	ERG (EARTHRES GROUP, INC.)	Fax:	(215) 766-1245
	P.O. BOX 468	Received:	10/20/2018 10:30 AM
	PIPERSVILLE, PA 18947	Analysis Date:	10/24/2018
		Collected:	10/19/2018

Project: 061003.051

Test Report: Asbestos Analysis of Bulk Building Materials via EPA 600/R-93/116 Method using PLM and Milling Prep. Quantitation using 400 Point Count Procedure

			Non-Asbestos			
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре	
Composite	Drill Cuttings	Gray		100% Non-fibrous (Other)	None Detected	
041831563-0001		Non-Fibrous				
		Homogeneous				

Analyst(s)

Andrew Castellano (1)

Al

Benjamin Ellis, Laboratory Manager or other approved signatory

Disclaimer:Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. The limit of detection as stated in the method is 0.25%. EMSL Analytical Inc suggests that samples reported as <0.25% or none detected undergo additional analysis via TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval of EMSL Analytical Inc. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States Government . EMSL Analytical Inc., bears no responsibility for sample collection activities, analytical method limitations, or the accuracy of results when requested to separate layered samples. EMSL Analytical Inc., liability is limited to the cost of sample analysis. The test results contained within this report meet the requirements of NELAC unless otherwise noted. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

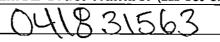
Initial report from: 10/24/2018 11:34:48

ASB_PLMPC_0006_0003 Printed 10/24/2018 11:34:50AM



Asbestos Chain of Custody EMSL Order Number (Lab Use Only):

5



PHONE:

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Company Name : Earth	nRes Grou	ip	EMSL Cust	omer ID:				
Street: 6913 Old Easton Road			City: Pipersville			 State/Provi	nce: PA	
Zip/Postal Code: 18947	8947 Country: USA		Telephone #: 2157661211		Fax #;			
Report To (Name): Louis	Vittorio		Please Prov	vide Results:	Fax	🗹 Email	_	
Email Address: Lvittoric	@earthres.	com	Purchase C	rder:				
Project Name/Number: 0			EMSL Proje	ct ID (Internal	Use Onl			
U.S. State Samples Take		II to: 🔲 Same 📝 Different -		s: 🔲 Commer		able 🛄 Res	idential/Tax	Exempt
		Third Party Billing requires write				nis		
		Turnaround Time (TAT)						
*For TEM Air 3 hr through 6 h	Hour [r, please call ahe for this service.	24 Hour A Hour A Hour A Hour Analysis completed in accordance	n chárge for S-Ho with EMSL's Ter	OUT TEM AHERA	5 Hour or EPA Let is located i	Vel II TAT. You	will be asked to	Week o sign an
PCM - Air Check if sar		<u>TEM – Air</u> 4-4.5hr TAT (TEM- Dust	\leq	Please b		18
NIOSH 7400		AHERA 40 CFR, Part 76	3	Microvac	- ASTM	D 5755	<u></u>	
🔲 w/ OSHA 8hr. TWA		NIOSH 7402		Wipe - A	STM D64	180		1
PLM - Bulk (reporting lim	<u>nit)</u>	EPA Level II		Carpet S	onication	(EPA 600/J	-93/167)	
PLM EPA 600/R-93/11	6 (<1%)	SO 10312		Soil/Rock/V	/ermiculi	ite		
PLM EPA NOB (<1%)		TEM - Bulk				93/116 with n		· · ·
Point Count	(-0.19/)					93/116 with n		
Point Count w/Gravimetric	· /	NYS NOB 198.4 (non-fria	DIE-INT)			93/116 with r ia Filtration F	- · · ·	-0.1%)
400 (<0.25%)		TEM Mass Analysis-EPA	600 sec. 2.5			ia Drop Mou	·	
NYS 198.1 (friable in N	1Y) [TEM - Water: EPA 100.2	Cincinnati Method EPA 600/R-04/004 – PLM/TEM			, ,		
NYS 198.6 NOB (non-1	· ·	Fibers >10µm Waste	(BC only) Other:	Other: 400 Pt w - nutter			malling	
NYS 198.8 SOF-V	,				I Carb 4	13 5 Level B	Reporting	<u>Timit</u> P
NIOSH 9002 (<1%)		All Fiber Sizes Waste	Drinking	(<0.1	1%) (Se	<u>e Orde</u> r #0	41817020)	
Check For Positive St	op – Clearly I	dentify Homogenous Group	5 Filter	Pore Size (Ai	r <u>S</u> ample	∋≴): /[]0.8	µm 🔲 0.4€	iμm
Samplers Name: JPS			Samplers	Signature:	hl	£6		
Sample #		Sample Description	on	/		/Area ⁽ Air) # (Bulk)	Date/T Samp	
Composite	Drill cuttir	ngs		Ĭ	1 ga	allon	>14	1305
								R
							1111S HINS 20	
		-						
							L.N.J	
Client Sample # (s):		-		L Ti	otal # of	Samples: ¹	0	· · ·
Relinquished (Client):		Date:				Time	•	
Received (Lab):	MB-	- CX Date:	10-20	2-18		Time	10.0	<u>n</u> A
Comments/Special Instru Bill to Andrew J Gutshall, Area B		jer -ECPA/NJ Company: Lehigh Hanson, Inc	Address: 7660 Inp	erial Way Allentown, F	PA 18195 Offi		$-\infty$	
		Page 1 of _	1 pages		7			

Page 1 Of 2

Rock Hill Quarry 4th Quarter 2018 NOA Monitoring Report

October 30, 2018



MSL	EMSL Analytical, Inc. 200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com	EMSL Order: Customer ID: Customer PO: Project ID:	
Attention:	Louis Vittorio	Phone:	(215) 766-1211
	ERG (EARTHRES GROUP,INC.)	Fax:	(215) 766-1245
	P.O. BOX 468	Received:	10/30/2018 3:35 PM
	PIPERSVILLE, PA 18947	Analysis Date:	10/31/2018
		Collected:	
Project:	061003.051		

Test Report: Asbestos Analysis of Soils via EPA 600/R-93/116 Method using PLM and Milling Prep. Quantitation using 400 Point Count Procedure

			<u>Non-A</u>	<u>sbestos</u>	Asbestos		
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре		
Composite 1 041832561-0001	Composite Drill Cuttings	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected		

Analyst(s)

Andrew Castellano (1)

Ú

Benjamin Ellis, Laboratory Manager or other approved signatory

Disclaimer:Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. The limit of detection as stated in the method is 0.25%. EMSL Analytical Inc suggests that samples reported as <0.25% or none detected undergo additional analysis via TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval of EMSL Analytical Inc. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States Government . EMSL Analytical Inc., bears no responsibility for sample collection activities, analytical method limitations, or the accuracy of results when requested to separate layered samples. EMSL Analytical Inc., liability is limited to the cost of sample analysis. The test results contained within this report meet the requirements of NELAC unless otherwise noted. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 10/31/2018 09:51:13

ASB_PLMPC_0006_0003 Printed 10/31/2018 9:51:15AM



Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

041832561



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Company Name : EarthRes Group			EMSL Customer ID:			\sim		
			City: Pipers	sville State/Provi			nce: PA ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
Zip/Postal Code: 18947 Country: USA		Country: USA	Telephone #	215766121	[1	Fax #:		
Report To (Name): Louis Vittorio			Please Prov	ide Results:	, 🔲 Fax	t 🗹 Email	9 ¹⁷	
Email Address: Lvittoric	@earthres.	.çom	Purchase O	rder:				
Project Name/Number: 0			EMSL Proje					
U.S. State Samples Take		ill to: 🗖 Same 🔽 Different -	CT Samples: Commercial/Taxable Residential/Tax Exempt If Bill to is Different note instructions in Comments**					
		Third Party Billing requires write	ten authorizatior	n from third par	rty	ante		
		Turnaround Time (TAT)						
*For TEM Air 3 hr through 6 h authorization form	r, please call ah	24 Hour 24 Hour 24 Hour 24 Hour 24 Hour 25 A Ho	n charge for 3 Ho with EMSL's Terr	UT TEM AHERA	6 Hour or EPA Le	in the Analytical	will be asked to sign an	
FCM - Air Check if sar	nples are	<u>TEM – Air</u> 4-4.5hr TAT (AHERA only)	TEM- Dust	. 1			
NIOSH 7400		AHERA 40 CFR, Part 76	3	Microva	ç - ASTM	D 5755		
w/ OSHA 8hr. TWA		NIOSH 7402		Wipe - A	STM D6	480		
PLM - Bulk (reporting lim	<u>rit)</u>	EPA Level II		Carpet S	Sonicatio	n, (EPA 600/J-	93/167)	
PLM EPA 600/R-93/11	6 (<1%)	ISO 10312		Soil/Rock/	Vermicu	ite		
PLM EPA NOB (<1%)		TEM - Bulk					nilling prep (<1%)	
Point Count							nilling prep (<0.25%)	
Point Count w/Gravimetric	• •	NYS NOB 198.4 (non-fria				00/R-93/116 with milling prep (<0.1%) ative via Filtration Prep		
400 (<0.25%) □ 1000					Qualitative via Drop Mount Prep			
NYS 198.1 (friable in N		TEM - Water: EPA 100.2	Cincinnati Method EPA 600/R-04/004 – PLM/TE			04/004 - PLM/ŢEM		
NYS 198.6 NOB (non-		Fibers >10µm Waste		(BC only)	(BC only) 400 נור גאד אל היוויים) Other:			
NYS 198.8 SOF-V		· — -		- PLM Carb 435 Level B Reporting Lit			Reporting Limit	
NIOSH 9002 (<1%)		All Fiber Sizes Waste	Drinking			ee Order #0	, Ç	
Check For Positive St	op – Clearly	Identify Homogenous Group	o Filter	Pore Size (A	l Air Sampl	les): 🔲 0.8	µm0.45µm	
Samplers Name: CJE)		Samplers	Signature:			2	
Sample #		Sample Descripti	on			e/Area (Air) # (Bulk)	Date/Time Sampled	
Composite 1	Composi	ite Drill Cuttings						
					ļ	•	· · · · · ·	
							· · · · · · · · · · · · · · · · · · ·	
	-				1	5		
	1				<u> </u>			
Client Sample # (s):		_			iotai#o	f Samples:		
Relinquished (Client):	7 6	Date:		14		Time	:	
Received (Lab):	<u> </u>	C) Date:	10-30	-16	-	Time	: <u>5:35</u> ~	
Comments/Special Instru Bill to. Andrew J Gutshall, Area		ager -ECPA/NJ Company. Lehigh Hanson, In	c. Address; 7660 Inpr	erial Way Alfentown	, PA 18195 0 '	ffice phone (610) 36	r 6-4819	
							1	

Page 1 of _____ pages

I.

8

November 1, 2018





Project: 061003.051

Test Report: Asbestos Analysis of Bulk Building Materials via EPA 600/R-93/116 Method using PLM and Milling Prep. Quantitation using 400 Point Count Procedure

			<u>Asbestos</u>		
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре
Composite 1	Composite Drilling	Brown		100% Non-fibrous (Other)	None Detected
041832938-0001	Sample	Non-Fibrous			
		Homogeneous			

Analyst(s)

Juli Patel (1)

4

Collected: 11/01/2018

Benjamin Ellis, Laboratory Manager or other approved signatory

Disclaimer:Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. The limit of detection as stated in the method is 0.25%. EMSL Analytical Inc suggests that samples reported as <0.25% or none detected undergo additional analysis via TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval of EMSL Analytical Inc. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States Government . EMSL Analytical Inc., bears no responsibility for sample collection activities, analytical method limitations, or the accuracy of results when requested to separate layered samples. EMSL Analytical Inc., liability is limited to the cost of sample analysis. The test results contained within this report meet the requirements of NELAC unless otherwise noted. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 11/05/2018 14:48:15

ASB_PLMPC_0006_0003 Printed 11/5/2018 2:48:17PM

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Asbestos Chain of Custody EMSL Order Number (Lab Use Only):

041832938

PHONE: FAX: -

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Company Name : Earth	EMSL Customer ID:								
Street: 6912 Old Easton	City: Pipersville State/Province: PA			PAP	Ē				
Zip/Postal Code: 18947 Country: USA			Telephone #: 2157661211 Fax #: 1 = 3				ίm		
Report To (Name): Louis	Report To (Name): Louis Vittorio			ide Results:	🗌 Fax	C 🗹 Email		<u>00</u>	- [1]
Email Address: Lvittoric		com	Purchase O	rder:			\mathcal{P}		
Project Name/Number: 0		-	EMSL Proje		l Use On	ly):	- Ö	, <u> </u>	
U.S. State Samples Take	n:		CT Samples	: 🗌 Comme	rcial/Tax	able 🔲 Res	ident	al/Tax	Exempt
	EMSL-Bi	II to: Same 🗹 Different - Third Party Billing requires writ				ents**	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	-	
	· · · · · · · · · · · · · · · · · · ·	Turnaround Time (TAT)			.y				
*For TEM Air 3 hr through 6 h	Hour [24 Hour 48 Hour and to schedule. *There is a premiur Analysis completed in accordance	n charge for 3 Ho	ur [🛄 9 ur TEM AHERA	6 Hour	vel II TAT. You	will be	asked to	Neek sign an
PCM - Air Check if sar		TEM – Air 4-4.5hr TAT (TEM- Dust					
from NY NIOSH 7400		AHERA 40 CFR, Part 76			c - ASTN	D 5755			
w/ OSHA 8hr. TWA					ASTM D6				
PLM - Bulk (reporting lim	nit)					n:(EPA 600/J-	-93/16	37)	
PLM EPA 600/R-93/11		[] ISO 10312		Soil/Rock/			00,10	,	
PLM EPA NOB (<1%)		TEM - Bulk				93/116 with n	nillina	prep (<	:1%)
Point Count						93/116 with n	-		-
400 (<0.25%) 1000	(<0.1%)	NYS NOB 198.4 (non-fria	ıble-NY)	+		-93/116 with r	-	• • •	-
Point Count w/Gravimetric		Chatfield SOP				via Filtration F	-		
	(<0.1%)	TEM Mass Analysis-EPA	-EPA 600 sec. 2.5						
NYS 198.1 (friable in N	۱Y)	TEM - Water: EPA 100.2	U.2 (BC only)						
NYS 198.6 NOB (non-	friable-NY)	Fibers >10µm 🔲 Waste [Drinking Other: 400 pt ct w/ Multur			ing <u>S</u>			
UNYS 198.8 SOF-V		All Fiber Sizes Waste	Drinking PLM Carb 435 Level B Reporting Lir						
NIOSH 9002 (<1%)				(<0	.1%) (Se	ee Order #0	4181	.7020)	$\langle \checkmark$
Check For Positive St	top – Clearly I	Identify Homogenous Grou	p Filter	Pore Size (A	ir Sampl	es): 0.8	μm	0.45	μm
Samplers Name: CJC)		Samplers	Signature:	an	- Qullh	~~~		
	[*		Volum	e/Area (Air)	Ĺ	Date/Ti	ime
Sample #		Sample Descripti				Sampl	led		
Composite 1	Composi	te Drilling Sample			10	Sallon	1-1-	-18	11:15
							İ –		
							<u> </u>		
Client Sample # (s):	<u></u>				L Total # o	f Samples:	$\overline{1}$		
Relinguished (Client):	:		TOLAI IF O	Time	<u>ر</u> ن.				
Received (Lab):	11.7 1	χ		Time	a	20,			
Comments/Special Instru	uctions:	Date:		<u>v</u>	_	1 mle	<u> </u>	<u> </u>	
		iger -ECPAINJ Company, Lehigh Hanson, In	c Address 7660 Inpe	erial Way Allentown	, PA 18195 O	ffice phone (610) 36	6-4819		
		Dago 4 of)EI,
		Page 1 of	pages			1		Ċ	, -0
Controlled Document – Asbestos COC -	- R10 - 05/09/2016								

Page 1 Of 1

November 9, 2018





EMSL Order: 041833717 Customer ID: ERG51 Customer PO: Project ID:

Α

Attention	Louis Vittorio
	ERG (EARTHRES GROUP,INC.)
	P.O. BOX 468
	PIPERSVILLE, PA 18947

Phone:	(215) 766-1211
Fax:	(215) 766-1245
Received:	11/10/2018 10:30 AM
nalysis Date:	11/12/2018
Collected:	11/09/2018

Project: 061003.051

Test Report: Asbestos Analysis of Bulk Building Materials via EPA 600/R-93/116 Method using PLM and Milling Prep. Quantitation using 400 Point Count Procedure

		Non-Asbestos			Asbestos	
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре	
Composite 1 041833717-0001	Composite Drill Cuttings Sample	Gray Non-Fibrous Homogeneous		100% Non-fibrous (Other)	None Detected	
Hand Sample 1 041833717-0002	Hand Sampled Rock from Blast Pile	Gray Non-Fibrous Homogeneous		99.75% Non-fibrous (Other)	0.25% Actinolite	

Analyst(s)

Juli Patel (2)

4

Benjamin Ellis, Laboratory Manager or other approved signatory

Disclaimer:Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. The limit of detection as stated in the method is 0.25%. EMSL Analytical Inc suggests that samples reported as <0.25% or none detected undergo additional analysis via TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval of EMSL Analytical Inc. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States Government . EMSL Analytical Inc., bears no responsibility for sample collection activities, analytical method limitations, or the accuracy of results when requested to separate layered samples. EMSL Analytical Inc., liability is limited to the cost of sample analysis. The test results contained within this report meet the requirements of NELAC unless otherwise noted. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 11/12/2018 14:05:16

ASB_PLMPC_0006_0003 Printed 11/12/2018 2:05:18PM



EMSL Analytical, Inc. 200 Route 130 North, Cinnaminson, NJ 08077 Phone: (800) 220-3675 Fax: (856) 858-1292 Email: CinnAsblab@emsl.com

Attn: Louis Vittorio ERG (EARTHRES GROUP, INC.) P.O. BOX 468 PIPERSVILLE, PA, 18947

EMSL Order: 041833717 Customer ID: ERG51 Customer PO: Project ID:

> Phone: (215) 766-1211 Fax: (215) 766-1245 Collected: 11/09/2018 Received: 11/10/18 10:30

Project: 061003.051

Analyzed: 11/30/18

SUMMARY REPORT :

					Reporting	Asbestos	
Sample ID		Minerals Present	Results	Structures	Limit	Weight	Comments
Hand Sample 1	Actinolite		Regulated Asbestos	37	0.1%	0.8%	
041833717-0002			Other Minerals	0		< 0.1%	
Hand Sample Rock from Bla	st		Unknown	0		-	
Pile			Total	37		0.8%	

Stelles

S. BURANY Analyst

Approved Signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL is not responsible for sample collection activities or analytical method limitations. Interpretation and use of results are the responsibility of the client. Regulated asbestos includes the 6 Federally regulated types: Chrysotile, Amosite, Crocidolite, Actinolite, Tremolite, Anthophyllite. Other minerals can include: Libby Amphibole, Erionite, and other Non-regulated minerals.

TEM CARB Spreadsheet Version: 6.1

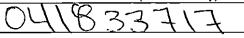
This is the Last Page of the Report Page 1 of 1

www.emsl.com

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Asbestos Chain of Custody EMSL Order Number (Lab Use Only):



PHONE: FAX:

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Company Name : Earth	Res Grou	up	EMSL Custo	mer ID:			
Street: 6913 Old Easton F			City: Pipers	ville		State/Province: PA	
Zip/Postal Code: 18947		Country: USA	Telephone #		1	Fax #:	
Report To (Name): Louis	Vittorio	-	Please Provide Results: T Fax I Email				
Email Address: Lvittorio		.com	Purchase O	rder:			
Project Name/Number: 0			EMSL Proje		l Use Onl	v):	
U.S. State Samples Taker	n:		CT Samples	: 🗌 Comme	rcial/Taxa	able 🔲 Res	idential/Tax Exempt
	EMSL-B	ill to: Same 📝 Different - Third Party Billing requires writ				nts**	
		Turnaround Time (TAT)			ly		_
	Hour	24 Hour	72 Ho	ur 🗌 9	6 Hour	🗌 1 Week	
*For TEM Air 3 hr through 6 hr authorization form f	r, please call ah for this service	nead to schedule.*There is a premiur Analysis completed in accordance	n charge for 3 Ho with EMSL's Ten	ur TEM AHERA	or EPA Lev ns located i	vel II TAT. You n the Analytical	will be asked to sign an
PCM - Air Check if san		TEM – Air 4-4.5hr TAT (TEM- Dust		n ne vstelytee	
from NY						D 5755	-
		AHERA 40 CFR, Part 76	5		C - ASTM		
w/ OSHA 8hr. TWA	•••	4 🚞			STM D64		00(407)
PLM - Bulk (reporting lim		EPA Level II		·		(EPA 600/J	-93/107)
□ PLM EPA 600/R-93/116 □ PLM EPA NOB (<1%)	5 (< 1%)	ISO 10312 TEM - Bulk		Soil/Rock/			nilling prep (<1%)
Point Count			•				nilling prep (<0.25%)
400 (<0.25%) 1000	(<0.1%)	NYS NOB 198.4 (non-fria	ble-NY)				nilling prep (<0.1%)
Point Count w/Gravimetric		Chatfield SOP	,			ia Filtration F	•••••
	(<0.1%)	TEM Mass Analysis-EPA	600 sec. 2.5			ia Drop Mou	
NYS 198.1 (friable in N	IY)	TEM Water: EPA 100.2			ati Methoc	I EPA 600/R-	04/004 – PLM/TEM
5 198.6 NOB (non-1		Fibers >10µm ⊡Waste [Drinking	(BC only) Other:			
山 山 山 小 小 小 小 S 1 昭.8 SOF-V					/f Carb 4	135 Level B	Reporting Limit
1. NOSH 9002 (<1%)		All Fiber Sizes Waste	Drinking	(<0.	.1%) (Se	e Order #0	41817020)
Check For Positive St	op Clearly	Identify Homogenous Grou	p Filter	Pore Size (A	ir Sample	es):	um [0.45µm
						_/	
Samplers Name: CJD	, 		Samplers	Signature:			
Sample #		Sample Descripti	ion			/Area (Air) # (Bulk)	Date/Time Sampled
Composite 1	Compos					allon	11/9/18 1040
	Compos	ite Drill Cuttings Sam	plC		19		
Hand Sample	Hand	Sampled Fock from	Rlact P.	10	Hand	Sa male	11/9/18 1020
		<u> </u>					
Client Sample # (s):					Total # of	Samples:	
Relinquished (Client):		Date				Time	:
Received (Lab): VG		Date	. 1110	118		Time	: 10:30
Comments/Special Instru	uctions:	Date	· · · · · · · · · · · · · · · · · · ·	110		THUG	
		nager -ECPA/NJ Company, Lehigh Hanson, Ir	nc. Address 7660 Inp	erial Way Allentown,	, PA 18195 Of	fice phone (610) 36	6-4819
L							
		Page 1 of	pages				(avD)
			•		, -		(d^{VF})

EMSL Analytical, Inc. December 20, 2018 Aggregate and Surface Water Laboratory Results



2 - 2B Stone Pile (NE) (Pile Duplicate) 1&2 - NPDES Outfall & Duplicate 4 - 2A Stone Pile

1 - 2B Stone Pile (SE)

6 - Screenings Stone Pile

7 - Crusher Fines Composite 2 (East)

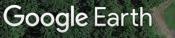
5 - Quarry Pit

600 ft

6 - Crusher Fines Composite 1 (West)

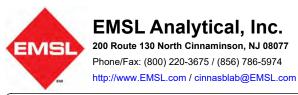
4 - South Pond

3 - North Pond



N Rockhill Rd

© 2018 Google



EMSL Order: 041837322 Customer ID: ERG51 Customer PO: Project ID:

Α

Attention: Louis Vittorio ERG (EARTHRES GROUP,INC.) P.O. BOX 468 PIPERSVILLE, PA 18947

Phone:	(215) 766-1211
Fax:	(215) 766-1245
Received:	12/20/2018 5:30 PM
nalysis Date:	12/21/2018
Collected:	

Project: 061003.051

Test Report: Asbestos Analysis of Soils via EPA 600/R-93/116 Method using PLM and Milling Prep. Quantitation using 400 Point Count Procedure

			Non-	Asbestos	<u>Asbestos</u>
Sample	Description	Appearance	% Fibrous	% Non-Fibrous	% Туре
1 041837322-0001	Aggregate	Gray Non-Fibrous Homogeneous		100.0% Non-fibrous (Other)	None Detected
2 041837322-0002	Aggregate	Gray Non-Fibrous Homogeneous		100.0% Non-fibrous (Other)	None Detected
3 041837322-0003	Aggregate	Gray Non-Fibrous Homogeneous		100.0% Non-fibrous (Other)	None Detected
4 041837322-0004	Aggregate	Gray Non-Fibrous Homogeneous		100.0% Non-fibrous (Other)	None Detected
5 041837322-0005	Aggregate	Gray Non-Fibrous Homogeneous		100.0% Non-fibrous (Other)	None Detected
6 041837322-0006	Aggregate	Gray Non-Fibrous Homogeneous		100.0% Non-fibrous (Other)	None Detected
7 041837322-0007	Aggregate	Tan Non-Fibrous Homogeneous		100.0% Non-fibrous (Other)	None Detected

Analyst(s)

Andrew Castellano (7)

4

Benjamin Ellis, Laboratory Manager or other approved signatory

Disclaimer:Some samples may contain asbestos fibers present in dimensions below PLM resolution limits. The limit of detection as stated in the method is 0.25%. EMSL Analytical Inc suggests that samples reported as <0.25% or none detected undergo additional analysis via TEM. The above test report relates only to the items tested. This report may not be reproduced, except in full, without written approval of EMSL Analytical Inc. This test report must not be used by the client to claim product endorsement by NVLAP or any agency of the United States Government . EMSL Analytical Inc., bears no responsibility for sample collection activities, analytical method limitations, or the accuracy of results when requested to separate layered samples. EMSL Analytical Inc., liability is limited to the cost of sample analysis. The test results contained within this report meet the requirements of NELAC unless otherwise noted. Samples received in good condition unless otherwise noted. Unless requested by the client, building materials manufactured with multiple layers (i.e. linoleum, wallboard, etc.) are reported as a single sample.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Initial report from: 12/21/2018 16:32:33

ASB_PLMPC_0006_0003 Printed 12/21/2018 4:32:35PM



Asbestos Chain of Custody

EMSL Order Number (Lab Use Only):

EMSL ANALYTICAL, INC. 200 ROUTE 130 NORTH CINNAMINSON, NJ 08077

041837322

PHONE:	(856)858-4800
FAX:	(856)858-1292

Company : Earthres	Group, Inc.			EMSL-Bill to: Same Different				
Street: 6912 Old East				1	quires written authorizati	J SREE		
City: Pipersville		State/P	rovince: PA	Zip/Postal Code: 1894	-	ntry: USA		
Report To (Name): L	ouis Vittorio	outen		Fax #: 215-766-1245				
· · · · ·				Email Address: lvittorio@earthres.com				
Telephone #: 215-76 Project Name/Numbe				Email Address: IVillo	nowearmes.com			
Please Provide Resu		Email	Purchase Order	r: 3 rd Party Billing U.S	6. State Samples Tak	en: PA		
		Turn		Options* - Please Cher				
	Hour 🕱 2	24 Hour	48 Hour		6 Hour			
*For TEM Air 3 hr through an authorization fo	6 hr, please call an orm for this service.	ead to sch Analysis	completed in accordance	im charge for 3 Hour TEM AH e with EMSL's Terms and Con	ERA or EPA Level II TAT. ditions located in the Analy	You will be asked to sign tical Price Guide.		
PCM - Air				5hr TAT (AHERA only)	TEM- Dust			
□ NIOSH 7400			🔲 AHERA 40 CFI	R, Part 763	🔲 Microvac - ASTM	D 5755		
w/ OSHA 8hr. TW/	<u> </u>		□ NIOSH 7402		🔲 Wipe - ASTM D64	180		
PLM - Bulk (reporting			EPA Level II		Carpet Sonication			
D PLM EPA 600/R-93	. ,		□ ISO 10312		Soil/Rock/Vermiculi			
PLM EPA NOB (<1	%)		TEM - Bulk			A (0.25% sensitivity)		
Point Count						• • • •		
400 (<0.25%) [] 10	, ,		NYS NOB 198.4	4 (non-triable-NY)	│			
Point Count w/Gravim				lysis-EPA 600 sec. 2.5	EPA Protocol (Se			
0 400 (<0.25%) ⊡ 10 10 10 10 10 10 10 10 10 10 10 10 10	• •		TEM – Water: EPA		4	1		
□ NYS 198.6 NOB (r	•		Fibers >10µm					
· ·	·			<u>د</u> آ	PLM by EPA/600	/R-93/116 mith		
NIOSH 9002 (<1%	·			Waste Drinking	Milling Prep Level A	0.25% DL)		
·	Chec	k For P	ositive Stop – Cle	early Identify Homoge	enous Group	<u>ប</u> ្ម <u>z</u>		
Samplers Name: LFV	//CJD			Samplers Signature:	b.F.H.l.	Blar que		
Sample #			Sample Description		Volume/Area (Air) HA⁺# (Bulk) <i>←</i>	Date/Time Sampled		
	-		• • • •					
1	Aggregate				1 gallon zip lock	12/20 9:04		
2	Aggregate				1 gallon zip lock	12/20 9:35		
3	Aggregate				1 gallon zip lock	12/20 9:55		
4	Aggregate				1 gallon zip lock	12/20 10:16		
5	Aggregate				1 gallon zip lock	12/20 10:40		
6	Aggregate				1 gallon zip lock	12/20 11:20		
7	Aggregate				1 gallon zip lock	12/20 11:45		
Client Sample # (s):	l 1 through 7	7		<u> </u>] Total # of Samples:	7		
	\sim	- /8		1-1-110	•	21. 4.4		
Relinquished (Client	; Tomt	<u> w a</u>	they Date:	12/20/18	Time	<u>: 5.00pm</u>		
Received (Lab):	40	$\overline{\mathcal{C}}$	Date:	12/20/18	Time	: \$139 <u>-</u>		
Comments/Special I	nstructions:					r		
	/							
Controlled Document – Asbestos COC	- R2 - 1/12/2010	_	Page 1 of page	ges		TRH		

Page 1 Of 1



EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com EMSL Order ID:041837324Customer ID:ERG51Customer PO:Project ID:

|--|

Proj: 061003.051

Test Report: Determination of Asbestos Structures ≥ 0.5 μm & > 10μm in Water Performed by the 100.2 Method (EPA 600/R-94/134)

						ASBESTOS						
Sample ID Client / EMSL	Sample Filtration Date/Time	Original Sample Vol. Filtered	Effective Filter Area	Area Analyzeo		Asbestos Types	Fibers Detected	Analytical Sensitivity	Concentration	Confidence Limits		
		(ml)	(mm²)	(mm²)				MFI	L (million fibers per	liter)		
1 041837324-0001	12/24/2018 10:00 AM	2	1360	0.2580	≥ 0.5 µm	Actinolite	1	2.60	2.60	0.07 - 15.00		
Collection Date/Time:					> 10 µm	None Detected	ND	2.60	<2.60	0.00 - 9.70		
Due to excessive particul required by the method w		sensitivity of 0.2	2 MFL as		only							
2 041837324-0002	12/24/2018 10:00 AM	2	1360	0.2580	≥ 0.5 µm	Actinolite	3	2.60	7.90	1.60 - 23.00		
Collection Date/Time:					> 10 µm	None Detected	ND	2.60	<2.60	0.00 - 9.70		
Due to excessive particul required by the method w		sensitivity of 0.2	2 MFL as		only							
3 041837324-0003	12/24/2018 10:00 AM	3	1360	0.2580	≥ 0.5 µm	None Detected	ND	1.80	<1.80	0.00 - 6.50		
Collection Date/Time:					> 10 µm	None Detected	ND	1.80	<1.80	0.00 - 6.50		
Due to excessive particul required by the method w		sensitivity of 0.2	2 MFL as		only							
4 041837324-0004	12/24/2018 10:00 AM	0.50	1360	0.3999	≥ 0.5 µm	Actinolite	3	6.80	20.00	4.20 - 60.00		
Collection Date/Time:					> 10 µm	None Detected	ND	6.80	<6.80	0.00 - 25.00		
Due to excessive particul required by the method w	,	sensitivity of 0.2	2 MFL as		only							

Analyst(s)

Sarah Richey

(5)

1

Benjamin Ellis, Laboratory Manager or Other Approved Signatory

Any questions please contact Benjamin Ellis.

Report amended: 01/09/2019 10:22:33 Replaces initial report from: 12/27/2018 00:25:21 Reason Code: Client-Additional Analysis

Sample collection and containers provided by the client, acceptable bottle blank level is defined as ≤0.01MFL>10um. ND=None Detected. This report may not be reproduced, except in full, without written permission by EMSL Analytical, Inc. The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report relates only to the samples reported above. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAC NJ DEP 03036, PA ID# 68-00367



EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077 Phone/Fax: (800) 220-3675 / (856) 786-5974 http://www.EMSL.com / cinnasblab@EMSL.com

EMSL Order ID: 041837324 ERG51 Customer ID: Customer PO: Project ID:

Attn:	Louis Vittorio	Phone:	(215) 766-1245	
	ERG (EARTHRES GROUP, INC.)	Fax:	(215) 766-1245	
	P.O. BOX 468	Received:	12/20/2018	
	PIPERSVILLE, PA 18947	Analyzed:	12/26/2018	

061003.051 Proj:

Test Report: Determination of Asbestos Structures ≥ 0.5 µm & > 10µm in Water Performed by the 100.2 Method (EPA 600/R-94/134)

						ASBESTOS					
Sample ID Client / EMSL	Sample Filtration Date/Time	Original Sample Vol. Filtered	Effective Filter Area	Filter Area		Asbestos Types	Fibers Detected	Analytical Sensitivity	Concentration	Confidence Limits	
		(ml)	(mm²)	(mm²)			MFL (million fibers per liter)			liter)	
5 041837324-0005	12/24/2018 10:00 AM	2	1360	0.2580	≥ 0.5 µm	None Detected	ND	2.60	<2.60	0.00 - 9.70	
Collection Date/Time:					> 10 µm	None Detected	ND	2.60	<2.60	0.00 - 9.70	
Due to excessive particular		sensitivity of 0.2	2 MFL as		only						

equired by the method was not reached

Analyst(s) Sarah Richey

(5)

1

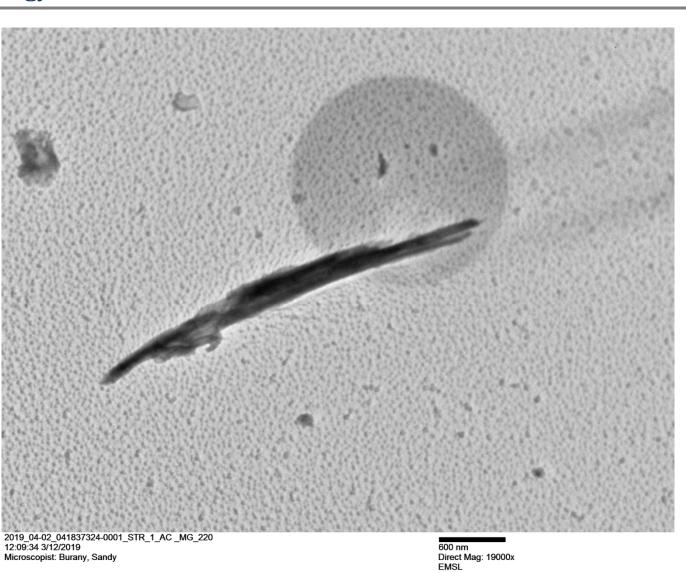
Benjamin Ellis, Laboratory Manager or Other Approved Signatory

Any questions please contact Benjamin Ellis.

Report amended: 01/09/2019 10:22:33 Replaces initial report from:12/27/2018 00:25:21 Reason Code: Client-Additional Analysis

Sample collection and containers provided by the client, acceptable bottle blank level is defined as <0.01MFL>10um. ND=None Detected. This report may not be reproduced, except in full, without written permission by EMSL Analytical, Inc. The test results contained within this report meet the requirements of NELAC unless otherwise noted. This report relates only to the samples reported above. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NELAC NJ DEP 03036, PA ID# 68-00367



EMS

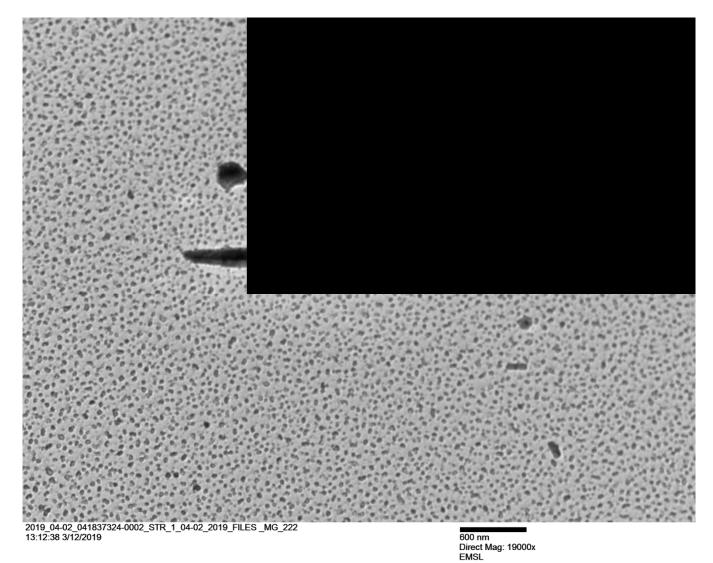
EMSL ANALYTICAL, INC.

041837324-0001



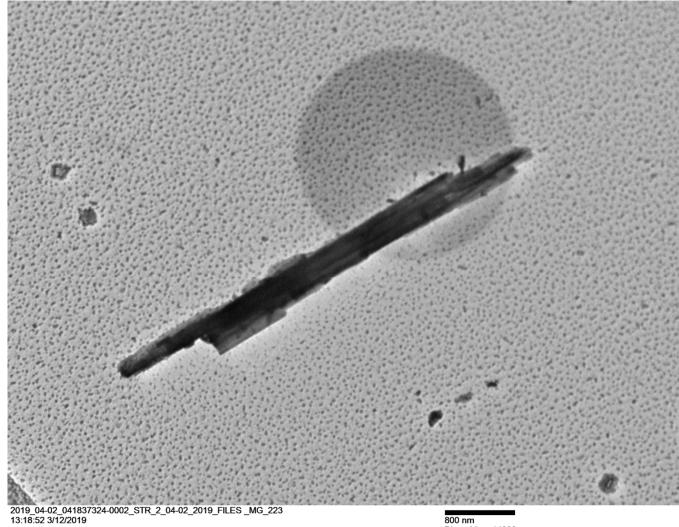
www.EMSL.com







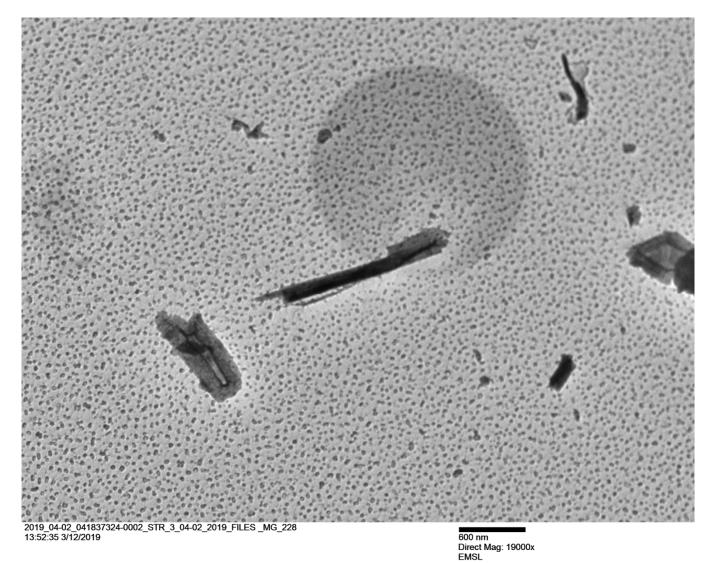






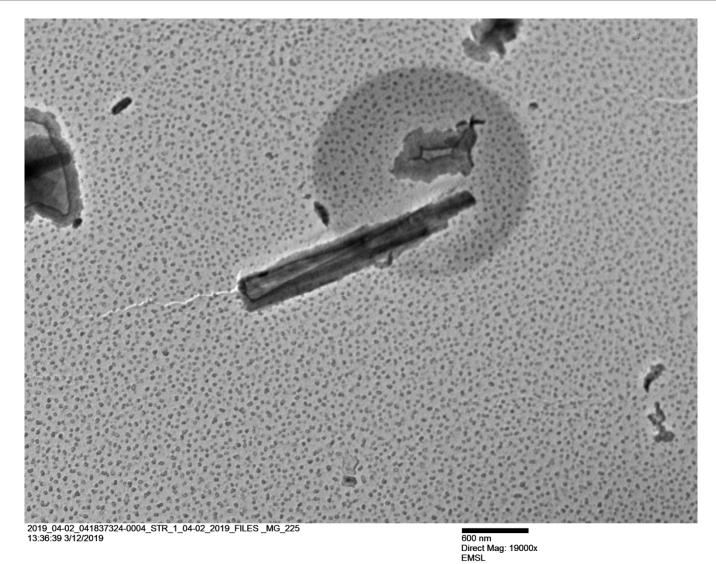


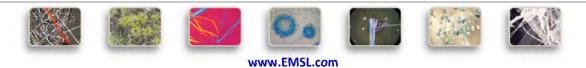




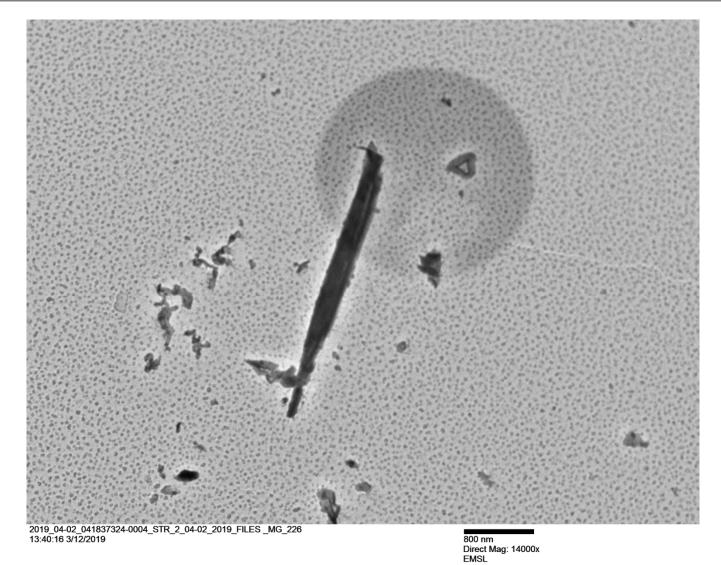








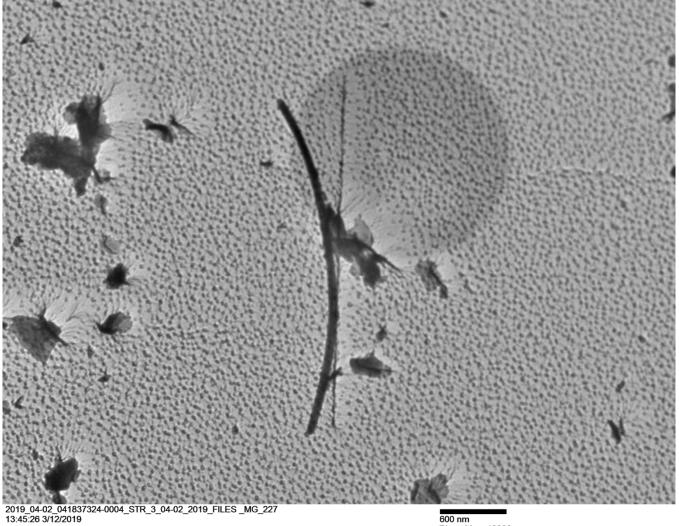






www.EMSL.com





600 nm Direct Mag: 19000x EMSL



Appendix E - Core Vein Measurement and Data Summary Tables



Core CB-1 Vein Calculation										
Depth of Vein	Depth of Vein Thickness (T) Length across Core (L) Width (W) Vein Angle Vein Volume *Lithologic Description Comments									
(ft)	(inches)	(inches)	(inches)	(Degree)	(ft3)					
19.5-20.9	2.63	6.00	2.00	55	0.0143172	Plagioclase, Chlorite, Albite, Actinolite	CB-1#1 at 19.9'	0.20%		
74-79.6	0.06	65.00	2.00	88	0.0036929	Hornblende, Pyroxene	DB-1 at 78.0'	0.60%		
90.4-90.8	2.50	3.25	2.00	50	0.0073858	Actinolite	CB-1#3 at 90.4'	ND		
Total					0.0217030	1.09% Actinolite Veining		0.0212%		

Notes:

*Lithology and total depth (D) of corehole was obtained from May 2019 boring logs in Appendix G.

**Percent asbestos as determined by RJ Lee Group by PLM US EPA 600/R-93/116

ND: Not Detected

Total Core Volume = $V = \pi r^2 D$, where r is 1/2W and D is total depth of core hole = 1.985310347 ft³

Core CB #2 Vein Calculation									
Depth of Vein	Thickness (T)	Length across Core (L)	Width (W)	Vein Angle	Vein Volume	*Lithologic Description	Comments	via PLM**	
(ft)	(inches)	(inches)	(inches)	(Degree)	(ft3)				
84.3-84.5	0.50	4.00	2.00	60	0.0018181	Plagioclase, Mica, Actinolite	CB-2#4 at 84.3	ND	
85.0-86.3	1.00	5.00	2.00	60	0.0045451	Plagioclase, Mica, Quartz, Actinolite	CB-2#5 at 85.2', CB-2#6 at 86.0'	ND, 0.10%	
Total			-	-	0.0063632	0.32% Actinolite Veining		0.0278%	

Notes:

*Lithology and total depth (D) of corehole was obtained from May 2019 boring logs in Appendix G.

**Percent asbestos as determined by RJ Lee Group by PLM US EPA 600/R-93/116

ND: Not Detected

Total Core Volume = $V = \pi r^2 D$, where r is 1/2W and D is total depth of core hole = 1.96349375 ft^3

Core CB #3 Vein Calculation										
Depth of Vein	f VeinThickness (T)Length across Core (L)Width (W)Vein AngleVein Volume*Lithologic DescriptionComments									
(ft)	(inches)	(inches)	(inches)	(Degree)	(ft3)					
18.0-18.2	0.13	2.13	2.00	50	0.0002415	Plagioclase	CB-3#7 at 17.8'	ND		
36.4	0.13	2.25	2.00	40	0.0002557	Quartz	DB-3 at 30.5'	ND		
146.2-146.8	2.00	3.50	2.00	55	0.0063632	Quartz, Actinolite, Augite	CB-3#8 at 146.2'	ND		
Total					0.0171472	0.18% Actinolite Veining		0.0091%		

Notes:

*Lithology and total depth (D) of corehole was obtained from May 2019 boring logs in Appendix G.

**Percent asbestos as determined by RJ Lee Group by PLM US EPA 600/R-93/116

ND: Not Detected

Total Core Volume = $V = \pi r^2 D$, where r is 1/2W and D is total depth of core hole = 3.501563854 ft^3

Core CB #4 Vein Calculation							Percent Asbestos	
Depth of Vein	Thickness (T)	Length across Core (L)	Width (W)	Vein Angle	Vein Volume	*Lithologic Description	Comments	via PLM**
(ft)	(inches)	(inches)	(inches)	(Degree)	(ft3)			
70.3	0.13	2.63	2.00	50	0.0002983	Quartz	DB-4 at 69.0'	ND
147.5-148.0	0.88	5.50	2.00	75	0.0043747	Plagioclase, Actinolite, Chlorite	CB-4#10 at 147.5'	ND
Total					0.0207371	0.13% Actinolite Veining		0.0063%

•

Notes:

*Lithology and total depth (D) of corehole was obtained from May 2019 boring logs in Appendix G.

**Percent asbestos as determined by RJ Lee Group by PLM US EPA 600/R-93/116

ND: Not Detected

Total Core Volume = $V = \pi r^2 D$, where r is 1/2W and D is total depth of core hole = 3.490655556 ft^3

Table 6 - 2019 All Data Listings

Location	ID	Date	ID On COC	% Asbestos	ND = 1/2 R
2B Pile	1	4/18/2019	1	ND	0.05
2B Pile	2	4/18/2019	2	ND	0.05
2B Pile	3	4/18/2019	3 (PLM)	<0.1 TR	0.05
2B Pile	3	4/18/2019	3 (TEM)	< 0.00003	0.000015
2B Pile	4	4/18/2019	4	ND	0.05
2B Pile	5	4/18/2019	5 (PLM)	<0.1 AC	0.05
2B Pile	5	4/18/2019	5 (TEM)	< 0.00004	0.00002
2B Pile	6	4/18/2019	6	ND	0.05
2B Pile	7	4/18/2019	7	ND	0.05
2B Pile	8	4/18/2019	8 (PLM)	<0.1 AC, <0.1 TR	0.05
2B Pile	8	4/18/2019	8 (TEM)	< 0.00006	0.00003
2B Pile	9	4/18/2019	9	ND	0.05
2B Pile	10	4/18/2019	10	ND	0.05
1B Pile	11	4/18/2019	11 (PLM)	ND	0.05
1B Pile	11	4/18/2019	11 (TEM)	0.0048	0.0048
1B Pile	12	4/18/2019	12	ND	0.05
2A Pile	13	4/18/2019	13 (PLM)	ND	0.05
2A Pile	13	4/18/2019	13 (TEM 9/10)	0.05	0.05
2A Pile	14	4/18/2019	14	ND	0.05
Screening	15	4/18/2019	15 (PLM)	ND	0.05
Screening	15	4/18/2019	15 (TEM)	0.016	0.016
Screening	16	4/18/2019	16	ND	0.010
Boulder	RH#1	5/8/2019	RH#1	ND	0.05
Boulder	RH#1	5/8/2019	RH#1	<0.10 AC	
Boulder	RH#2		RH#2	ND	0.05
Boulder	RH#4	5/8/2019	RH#3	ND	0.05
		5/8/2019			0.05
Boulder	RH#5	5/8/2019	RH#5	ND	0.05
Boulder	RH#6	5/8/2019	RH#6	ND	0.05
Boulder	RH#7	5/8/2019	RH#7	<0.10 TR	0.05
Boulder	RH#8	5/8/2019	RH#8	ND	0.05
Boulder	RH#10	5/8/2019	RH#10	ND	0.05
Boulder	RH#11	5/8/2019	RH#11	<0.10 AC	0.05
Boulder	RH#12	5/8/2019	RH#12	<0.10 AC	0.05
Boulder	RH#14	5/8/2019	RH#14	<0.10 AC	0.05
Boulder	RH#18	5/7/2019	RH#18	ND	0.05
Boulder	RH#22	5/7/2019	RH#22	ND	0.05
Boulder	RH#23	5/7/2019	RH#23	ND	0.05
Boulder	RH#24	5/7/2019	RH#24	ND	0.05
Boulder	RH#25	5/7/2019	RH#25	ND	0.05
Boulder	RH#26	5/7/2019	RH#26	<0.10 AC	0.05
Boulder	RH#27	5/7/2019	RH#27	ND	0.05
Boulder	RH#28	5/8/2019	RH#28	ND	0.05
Boulder	RH#29	5/8/2019	RH#29	<0.10 AC	0.05
Boulder	RH#30	5/8/2019	RH#30	ND	0.05
Boulder	RH#31	5/7/2019	RH#31	ND	0.05
Boulder	RH#32	5/7/2019	RH#32	ND	0.05
Boulder	RH#33	5/13/2019	RH#33	ND	0.05
Core	CB-1 #1	5/23/2019	CB-1 #1	0.20 AC	0.20
Core	CB-1 #3	5/23/2019	CB-1 #3	ND	0.05
Core	DB-1	5/23/2019	DB-1 (PLM)	0.10 AC	0.1
Core	DB-1	5/23/2019	DB-1 Dup (PLM)	0.60 TR	0.6
Core	DB-1	5/23/2019	DB-1 Dup (TEM)	< 0.00004	0.00002
Core	CB-2 #4	5/23/2019	CB-2 #4	ND	0.05
Core	CB-2 #5	5/23/2019	CB-2 #5	ND	0.05
Core	CB-2 #6	5/23/2019	CB-2 #6	0.10 TR	0.10
Core	DB-2	5/23/2019	DB-2	ND	0.05
Core	CB-3 #7	5/23/2019	CB-3 #7	ND	0.05
Core	CB-3 #8	5/23/2019	CB-3 #8	ND	0.05
Core	CB-3 #9	5/23/2019	CB-3 #9	ND	0.05
Core	DB-3	5/23/2019	DB-3	ND	0.05
Core	CB-4 #10	5/23/2019	CB-4 #10	ND	0.05
	DB-4		DB-4	ND	0.05
Core		5/23/2019 5/23/2019			
Hand Sample	Hand Sample 1		Hand Sample 1	ND	0.05
land Sample	Hand Sample 2	5/23/2019	Hand Sample 2	ND	0.05

ND = 1/2 DL

Geomean (All):	0.03214708
Number of Samples:	65
Geomean (All PLM Only):	0.05540225
Number of Samples:	58
Geomean (All TEM Only):	0.0003536
Number of Samples:	7

Average (All):	0.05878285
Number of Samples:	65
Average (All PLM Only):	0.06465517
Number of Samples:	58
Average (All TEM Only):	0.01013
Number of Samples:	7

Table 6 - 2	2019 Co	mposite l	Data I	Listing
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Location	ID	Date	ID On COC	% Asbestos	ND = 1/2 RL
2B Pile	1	4/18/2019	1	ND	0.05
2B Pile	2	4/18/2019	2	ND	0.05
2B Pile	3	4/18/2019	3 (PLM)	<0.1 TR	0.05
2B Pile	3	4/18/2019	3 (TEM)	< 0.00003	0.000015
2B Pile	4	4/18/2019	4	ND	0.05
2B Pile	5	4/18/2019	5 (PLM)	<0.1 AC	0.05
2B Pile	5	4/18/2019	5 (TEM)	< 0.00004	0.00002
2B Pile	6	4/18/2019	6	ND	0.05
2B Pile	7	4/18/2019	7	ND	0.05
2B Pile	8	4/18/2019	8 (PLM)	<0.1 AC, <0.1 TR	0.05
2B Pile	8	4/18/2019	8 (TEM)	< 0.00006	0.00003
2B Pile	9	4/18/2019	9	ND	0.05
2B Pile	10	4/18/2019	10	ND	0.05
1B Pile	11	4/18/2019	11 (PLM)	ND	0.05
1B Pile	11	4/18/2019	11 (TEM)	0.0048	0.0048
1B Pile	12	4/18/2019	12	ND	0.05
2A Pile	13	4/18/2019	13 (PLM)	ND	0.05
2A Pile	13	4/18/2019	13 (TEM)	0.05	0.05
2A Pile	14	4/18/2019	14	ND	0.05
Screening	15	4/18/2019	15 (PLM)	ND	0.05
Screening	15	4/18/2019	15 (TEM)	0.016	0.016
Screening	16	4/18/2019	16	ND	0.05

	ND = 1/2 DL
Geomean (Composite):	0.01476339
Number of Samples:	22
Geomean (Composite PLM Only):	0.05
Number of Samples:	16
Geomean (All TEM Only):	0.000570728
Number of Samples:	6

Average (Composite):	0.039584773
Number of Samples:	22
Average (Composite PLM Only):	0.05
Number of Samples:	16
Average Compo. TEM Only):	0.011810833
Number of Samples:	6

Table 6 - 2019 Target Sample Listing

Туре	ID	Date	ID On COC	% Asbestos	ND = 1/2 RL
Boulder	RH#1	5/8/2019	RH#1	ND	0.05
Boulder	RH#2	5/8/2019	RH#2	<0.10 AC	0.05
Boulder	RH#3	5/8/2019	RH#3	ND	0.05
Boulder	RH#4	5/8/2019	RH#4	ND	0.05
Boulder	RH#5	5/8/2019	RH#5	ND	0.05
Boulder	RH#6	5/8/2019	RH#6	ND	0.05
Boulder	RH#7	5/8/2019	RH#7	<0.10 TR	0.05
Boulder	RH#8	5/8/2019	RH#8	ND	0.05
Boulder	RH#10	5/8/2019	RH#10	ND	0.05
Boulder	RH#11	5/8/2019	RH#11	<0.10 AC	0.05
Boulder	RH#12	5/8/2019	RH#12	<0.10 AC	0.05
Boulder	RH#14	5/8/2019	RH#14	<0.10 AC	0.05
Boulder	RH#18	5/7/2019	RH#18	ND	0.05
Boulder	RH#22	5/7/2019	RH#22	ND	0.05
Boulder	RH#23	5/7/2019	RH#23	ND	0.05
Boulder	RH#24	5/7/2019	RH#24	ND	0.05
Boulder	RH#25	5/7/2019	RH#25	ND	0.05
Boulder	RH#26	5/7/2019	RH#26	<0.10 AC	0.05
Boulder	RH#27	5/7/2019	RH#27	ND	0.05
Boulder	RH#28	5/8/2019	RH#28	ND	0.05
Boulder	RH#29	5/8/2019	RH#29	<0.10 AC	0.05
Boulder	RH#30	5/8/2019	RH#30	ND	0.05
Boulder	RH#31	5/7/2019	RH#31	ND	0.05
Boulder	RH#32	5/7/2019	RH#32	ND	0.05
Boulder	RH#33	5/13/2019	RH#33	ND	0.05
Core	CB-1 #1	5/23/2019	CB-1 #1	0.20 AC	0.20
Core	CB-1 #3	5/23/2019	CB-1 #3	ND	0.05
Core	DB-1	5/23/2019	DB-1	0.10 AC	0.10
Core	DB-1	5/23/2019	DB-1 Dup (PLM)	0.60 TR	0.6
Core	DB-1	5/23/2019	DB-1 Dup (TEM)	< 0.00004	0.00002
Core	CB-2 #4	5/23/2019	CB-2 #4	ND	0.05
Core	CB-2 #5	5/23/2019	CB-2 #5	ND	0.05
Core	CB-2 #6	5/23/2019	CB-2 #6	0.10 TR	0.10
Core	DB-2	5/23/2019	DB-2	ND	0.05
Core	CB-3 #7	5/23/2019	CB-3 #7	ND	0.05
Core	CB-3 #8	5/23/2019	CB-3 #8	ND	0.05
Core	CB-3 #9	5/23/2019	CB-3 #9	ND	0.05
Core	DB-3	5/23/2019	DB-3	ND	0.05
Core	CB-4 #10	5/23/2019	CB-4 #10	ND	0.05
Core	DB-4	5/23/2019	DB-4	ND	0.05
Hand Sample	Hand Sample 1	5/23/2019	Hand Sample 1	ND	0.05
Hand Sample	Hand Sample 2	5/23/2019	Hand Sample 2	ND	0.05
Hand Sample	Vein 7	5/23/2019	Vein 7	0.10 AC	0.10

	ND = 1/2 DL
Geomean (Targeted):	0.047868395
Number of Samples:	43
Geomean (Targeted PLM Only):	0.057610507
Number of Samples:	42
Geomean (All TEM Only):	0.00002
Number of Samples:	1

Average (Targeted):	0.068605116
Number of Samples:	43
Average (Targeted PLM Only):	0.070238095
Number of Samples:	42
Average (All TEM Only):	0.00002
Number of Samples:	1

Location	ID	Date	ID On COC	% Asbestos	ND = 1/2 I
	5-1 5-2	1/9/2018 1/9/2018	S-1 S-2	ND ND	0.05
	5-3	1/9/2018	5-3	ND	0.05
1st	S-4	1/9/2018	S-4	ND	0.05
Quarter	S-5	1/9/2018	S-5	ND	0.05
2018	S-6	1/9/2018	S-6	ND	0.05
	S-7	1/9/2018	S-7	ND	0.05
	S-8	1/9/2018	S-8 S-9	ND	0.05
	S-9 Hand Sample S-1	1/9/2018 1/12/2018	S-9 S-1	ND ND	0.05
	Hand Sample S-2	1/12/2018	S-2	ND	0.05
	Hand Sample S-3	1/12/2018	S-3	ND	0.05
	Hand Sample N-1	1/12/2018	N-1	ND	0.05
nd Quarter 18	DH-1 & DH-2	6/4/2018	Composite*	ND	0.125
	S-1 & S-2	7/17/2018	Composite #1	ND	0.05
	S-3 & S-4	7/18/2018	Composite #2	ND	0.05
3rd	S-5 & S-6	7/31/2018	Composite #1	ND	0.05
Quarter 2018	S-7 & S-8 S-9 & S-10	8/22/2018 9/6/2018	Composite #1*	ND ND	0.125
2018	S-11 & S-12	9/24/2018	Composite* Composite #1	ND	0.123
	S-11 & S-12	10/10/2018	Composite #1	ND	0.05
4th	S-3 & S-4	10/19/2018	Composite #1	ND	0.125
Quarter	S-5 & S-6	10/30/2018	Composite #1	ND	0.125
2018	S-7 & S-8	11/1/2018	Composite #1	ND	0.125
	S-9 & S-10	11/9/2018	Composite #1	ND	0.125
	Hand Sample 1	11/9/2018	Hand Sample 1*	0.25 (PLM)	0.25
	Hand Sample 1	11/9/2018 12/20/2018	Hand Sample 1 1*	0.8 (TEM) ND	0.8
	2B Aggregate 2B Aggregate	12/20/2018	2*	ND	0.125
	1B Aggregate	12/20/2018	3*	ND	0.125
	2A Aggregate	12/20/2018	4*	ND	0.125
	Screenings	12/20/2018	5*	ND	0.125
	Crusher Fines (West)	12/20/2018	6*	ND	0.125
	Crusher Fines (East)	12/20/2018	7*	ND	0.125
2B Pile	1	4/18/2019	1	ND	0.05
2B Pile 2B Pile	2	4/18/2019 4/18/2019	2 3 (PLM)	ND <0.1 TR	0.05
2B Pile 2B Pile	3	4/18/2019 4/18/2019	3 (PLM) 3 (TEM)	<0.1 TR < 0.00003	0.05
2B Pile	4	4/18/2019	4	ND	0.00001
2B Pile	5	4/18/2019	5 (PLM)	<0.1 AC	0.05
2B Pile	5	4/18/2019	5 (TEM)	< 0.00004	0.00002
2B Pile	6	4/18/2019	6	ND	0.05
2B Pile	7	4/18/2019	7	ND	0.05
2B Pile	8	4/18/2019	8 (PLM)	<0.1 AC, <0.1 TR	0.05
2B Pile 2B Pile	8	4/18/2019 4/18/2019	8 (TEM) 9	< 0.00006 ND	0.00003
2B Pile	10	4/18/2019	10	ND	0.05
1B Pile	10	4/18/2019	11 (PLM)	ND	0.05
1B Pile	11	4/18/2019	11 (TEM)	0.0048	0.0048
1B Pile	12	4/18/2019	12	ND	0.05
2A Pile	13	4/18/2019	13 (PLM)	ND	0.05
2A Pile	13	4/18/2019	13 (TEM 9/10)	0.05	0.0500
2A Pile	14 15	4/18/2019	14 15 (PLM)	ND ND	0.0500
Screening Screening	15	4/18/2019 4/18/2019	15 (FEM)	0.016	0.0300
Screening	16	4/18/2019	16	ND	0.0500
Boulder	RH#1	5/8/2019	RH#1	ND	0
Boulder	RH#2	5/8/2019	RH#2	<0.10 AC	0.05
Boulder	RH#3	5/8/2019	RH#3	ND	0.0500
Boulder	RH#4	5/8/2019	RH#4	ND	0
Boulder	RH#5	5/8/2019	RH#5	ND	0.0500
Boulder Boulder	RH#6 RH#7	5/8/2019 5/8/2019	RH#6 RH#7	ND <0.10 TR	0.0500
Boulder	RH#7 RH#8	5/8/2019	RH#7 RH#8	<0.10 TR ND	0.0500
Boulder	RH#10	5/8/2019	RH#10	ND	0.05
Boulder	RH#11	5/8/2019	RH#11	<0.10 AC	0.05
Boulder	RH#12	5/8/2019	RH#12	<0.10 AC	0.05
Boulder	RH#14	5/8/2019	RH#14	<0.10 AC	0.05
Boulder	RH#18	5/7/2019	RH#18	ND	0.05
Boulder Boulder	RH#22 RH#23	5/7/2019 5/7/2019	RH#22 RH#23	ND ND	0.05
Boulder Boulder	RH#23 RH#24	5/7/2019 5/7/2019	RH#23 RH#24	ND ND	0.05
Boulder	RH#24 RH#25	5/7/2019	RH#24 RH#25	ND	0.05
Boulder	RH#26	5/7/2019	RH#26	<0.10 AC	0.05
Boulder	RH#27	5/7/2019	RH#27	ND	0.05
Boulder	RH#28	5/8/2019	RH#28	ND	0.05
Boulder	RH#29	5/8/2019	RH#29	<0.10 AC	0.05
Boulder	RH#30	5/8/2019	RH#30	ND	0.05
Boulder	RH#31	5/7/2019	RH#31	ND	0.05
Boulder Boulder	RH#32 RH#33	5/7/2019 5/13/2019	RH#32 RH#33	ND ND	0.05
Core	CB-1 #1	5/23/2019	CB-1 #1	0.20 AC	0.05
Core	CB-1#1 CB-1#3	5/23/2019	CB-1 #3	ND	0.20
Core	DB-1	5/23/2019	DB-1 (PLM)	0.10 AC	0.05
Core	DB-1	5/23/2019	DB-1 Dup (PLM)	0.60 TR	0.6
Core	DB-1	5/23/2019	DB-1 Dup (TEM)	< 0.00004	0.00002
Core	CB-2 #4	5/23/2019	CB-2 #4	ND	0.05
Core	CB-2 #5	5/23/2019	CB-2 #5	ND	0.05
Core	CB-2 #6	5/23/2019	CB-2 #6	0.10 TR	0.10
Core	DB-2	5/23/2019	DB-2	ND	0.05
Core	CB-3 #7 CB-3 #8	5/23/2019	CB-3 #7 CB-3 #8	ND ND	0.05
Core Core	CB-3 #8 CB-3 #9	5/23/2019 5/23/2019	CB-3 #8 CB-3 #9	ND	0.05
Core	DB-3	5/23/2019	DB-3	ND	0.05
Core	CB-4 #10	5/23/2019	CB-4 #10	ND	0.05
Core	DB-4	5/23/2019	DB-4	ND	0.05
	Hand Sample 1	5/23/2019	Hand Sample 1	ND	0.05
Hand Sample Hand Sample	Hand Sample 2	5/23/2019	Hand Sample 2	ND	0.05

Table 7 - 2018-2019 All Data Listing

	ND = 1/2 DL
Geomean (All):	0.0445
Number of Samples:	99
Geomean (All PLM Only):	0.0626
Number of Samples:	91
Geomean (All TEM Only):	0.0009
Number of Samples:	8

Average (All):	0.0760
Number of Samples:	99
Average (All PLM Only):	0.0731
Number of Samples:	91
Average (All TEM Only):	0.1089
Number of Samples:	8

Location	ID	Date	ID On COC	% Asbestos	ND = 1/2 RL
	S-1	1/9/2018	S-1	ND	0.05
	S-2	1/9/2018	S-2	ND	0.05
1at Overster	S-3	1/9/2018	S-3	ND	0.05
	S-4	1/9/2018	S-4	ND	0.05
1st Quarter 2018	S-5	1/9/2018	S-5	ND	0.05
2018	S-6	1/9/2018	S-6	ND	0.05
	S-7	1/9/2018	S-7	ND	0.05
	S-8	1/9/2018	S-8	ND	0.05
	S-9	1/9/2018	S-9	ND	0.05
2nd Q 2018	DH-1 & DH-2	6/4/2018	Composite*	ND	0.125
	S-1 & S-2	7/17/2018	Composite #1	ND	0.05
	S-3 & S-4	7/18/2018	Composite #2	ND	0.05
3rd Quarter	S-5 & S-6	7/31/2018	Composite #1	ND	0.05
2018	S-7 & S-8	8/22/2018	Composite #1*	ND	0.125
	S-9 & S-10	9/6/2018	Composite*	ND	0.125
	S-11 & S-12	9/24/2018	Composite #1	ND	0.05
	S-1 & S-2	10/10/2018	Composite #1	ND	0.05
	S-3 & S-4	10/19/2018	Composite #1	ND	0.125
	S-5 & S-6	10/30/2018	Composite #1	ND	0.125
	S-7 & S-8	11/1/2018	Composite #1	ND	0.125
	S-9 & S-10	11/9/2018	Composite #1	ND	0.125
4th Quarter	2B Aggregate	12/20/2018	1*	ND	0.125
2018	2B Aggregate	12/20/2018	2*	ND	0.125
	1B Aggregate	12/20/2018	3*	ND	0.125
	2A Aggregate	12/20/2018	4*	ND	0.125
	Screenings	12/20/2018	5*	ND	0.125
	Crusher Fines (West)	12/20/2018	6*	ND	0.125
	Crusher Fines (East)	12/20/2018	7*	ND	0.125
2B Pile	1	4/18/2019	1	ND	0.05
2B Pile	2	4/18/2019	2	ND	0.05
2B Pile	3	4/18/2019	3 (PLM)	<0.1 TR	0.05
2B Pile	3	4/18/2019	3 (TEM)	< 0.00003	0.000015
2B Pile	4	4/18/2019	4	ND	0.05
2B Pile	5	4/18/2019	5 (PLM)	<0.1 AC	0.05
2B Pile	5	4/18/2019	5 (TEM)	< 0.00004	0.00002
2B Pile	6	4/18/2019	6	ND	0.05
2B Pile	7	4/18/2019	7	ND	0.05
2B Pile	8	4/18/2019	8 (PLM)	<0.1 AC, <0.1 TR	0.05
2B Pile	8	4/18/2019	8 (TEM)	< 0.00006	0.00003
2B Pile	9	4/18/2019	9	ND	0.05
2B Pile	10	4/18/2019	10	ND	0.05
1B Pile	11	4/18/2019	11 (PLM)	ND	0.05
1B Pile	11	4/18/2019	11 (TEM)	0.0048	0.0048
1B Pile	12	4/18/2019	12	ND	0.05
2A Pile	13	4/18/2019	13 (PLM)	ND	0.05
2A Pile	13	4/18/2019	13 (TEM)	0.05	0.05
2A Pile	14	4/18/2019	14	ND	0.05
Screening	15	4/18/2019	15 (PLM)	ND	0.05
Screening	15	4/18/2019	15 (TEM)	0.016	0.016
Screening	16	4/18/2019	16	ND	0.05

Table 7 - 2018-2019 Compositie Data Listing

	ND = 1/2 DL
Geomean (Composite):	0.0378
Number of Samples:	50
Geomean (Composite PLM Only):	0.0669
Number of Samples:	44
Geomean (All TEM Only):	0.0006
Number of Samples:	6

Average (Composite):	0.0664
Number of Samples:	50
Average (Composite PLM Only):	0.0739
Number of Samples:	44
Average Compo. TEM Only):	0.0118
Number of Samples:	6

Туре	ID	Date	ID On COC	% Asbestos	ND = 1/2 RL
Type	10	Date	ib on coc		ND - 1/2 NE
	Hand Sample S-1	1/12/2018	S-1	ND	0.05
1st Quarter	Hand Sample S-2	1/12/2018	S-2	ND	0.05
2018	Hand Sample S-3	1/12/2018	S-3	ND	0.05
	Hand Sample N-1	1/12/2018	N-1	ND	0.05
4th Quarter	Hand Sample 1	11/9/2018	Hand Sample 1*	0.25 (PLM)	0.25
2018	Hand Sample 1	11/9/2018	Hand Sample 1	0.8 (TEM)	0.8
Boulder	RH#1	5/8/2019	RH#1	ND	0.05
Boulder	RH#2	5/8/2019	RH#2	<0.10 AC	0.05
Boulder	RH#3	5/8/2019	RH#3	ND	0.05
Boulder	RH#4	5/8/2019	RH#4	ND	0.05
Boulder	RH#5	5/8/2019	RH#5	ND	0.05
Boulder	RH#6	5/8/2019	RH#6	ND	0.05
Boulder	RH#7	5/8/2019	RH#7	<0.10 TR	0.05
Boulder	RH#8	5/8/2019	RH#8	ND	0.05
Boulder	RH#10	5/8/2019	RH#10	ND	0.05
Boulder	RH#11	5/8/2019	RH#11	<0.10 AC	0.05
Boulder	RH#12	5/8/2019	RH#12	<0.10 AC	0.05
Boulder	RH#14	5/8/2019	RH#14	<0.10 AC	0.05
Boulder	RH#18	5/7/2019	RH#18	ND	0.05
Boulder	RH#22	5/7/2019	RH#22	ND	0.05
Boulder	RH#23	5/7/2019	RH#23	ND	0.05
Boulder	RH#24	5/7/2019	RH#24	ND	0.05
Boulder	RH#25	5/7/2019	RH#25	ND	0.05
Boulder	RH#26	5/7/2019	RH#26	<0.10 AC	0.05
Boulder	RH#27	5/7/2019	RH#27	ND	0.05
Boulder	RH#28	5/8/2019	RH#28	ND	0.05
Boulder	RH#29	5/8/2019	RH#29	<0.10 AC	0.05
Boulder	RH#30	5/8/2019	RH#30	ND	0.05
Boulder	RH#31	5/7/2019	RH#31	ND	0.05
Boulder	RH#32	5/7/2019	RH#32	ND	0.05
Boulder	RH#33	5/13/2019	RH#33	ND	0.05
Core	CB-1 #1	5/23/2019	CB-1 #1	0.20 AC	0.20
Core	CB-1 #3	5/23/2019	CB-1 #3	ND	0.05
Core	DB-1	5/23/2019	DB-1	0.10 AC	0.10
Core	DB-1	5/23/2019	DB-1 Dup (PLM)	0.60 TR	0.6
Core	DB-1	5/23/2019	DB-1 Dup (TEM)	< 0.00004	0.00002
Core	CB-2 #4	5/23/2019	CB-2 #4	ND	0.00002
Core	CB-2 #5	5/23/2019	CB-2 #5	ND	0.05
Core	CB-2 #5	5/23/2019	CB-2 #5	0.10 TR	0.00
Core	DB-2	5/23/2019	DB-2	ND	0.10
Core	CB-3 #7	5/23/2019	CB-3 #7	ND	0.05
Core	CB-3 #8	5/23/2019	CB-3 #8	ND	0.05
Core	CB-3 #9	5/23/2019	CB-3 #9	ND	0.05
Core	DB-3	5/23/2019	DB-3	ND	0.05
Core	CB-4 #10	5/23/2019	CB-4 #10	ND	0.05
Core	DB-4	5/23/2019	DB-4	ND	0.05
Hand Sample	Hand Sample 1	5/23/2019	Hand Sample 1	ND	0.05
Hand Sample	Hand Sample 1	5/23/2019	Hand Sample 1	ND	0.05
Hand Sample	Vein 7	5/23/2019	Vein 7	0.10 AC	
nanu sampie	velli /	5/25/2019	veni /	0.10 AC	0.10

Table 7 - 2018-2019 Target Sample Listing

	ND = 1/2 DL
Geomean (Targeted):	0.0526
Number of Samples:	49
Geomean (Targeted PLM Only):	0.0587
Number of Samples:	47
Geomean (All TEM Only):	0.0040
Number of Samples:	2

Average (Targeted):	0.0857
Number of Samples:	49
Average (Targeted PLM Only):	0.0723
Number of Samples:	47
Average (All TEM Only):	0.4000
Number of Samples:	2

Appendix F - 2019 Laboratory Results



SURFACE WATER ANALYTICAL RESULTS



ENGINEERING FOR SUCCESS"



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Final Laboratory Report TEM EPA Water Analysis

Mr. David Raphael K & L Gates 17 North Second Street 18th Floor Harrisburg, PA 17101 US Report Date:05/01/2019Sample Receipt Date:04/23/2019RJ Lee Group Job No.:LLH901997-4Authorization/P.O. No.:Samples Received:7Client Job No.:7

. .

Method: EPA Method 100.2 600/R-94-134

		Date	Date	Filter Area	Volume	Area Analyzed	Confidence Interval	Stru	estos ctures 0µm	Analytical Sensitivity (MFL)	Concentration (MFL)
Client Sample Number	RJLG Sample Number	Prepped	Analyzed	(mm²)	(ml)	(mm²)	>10 µ m	Chry	Amph	>10 µ m	>10 µ m
#1 NPDES Outfall	3158173.HTW1	04/24/2019	04/29/2019	1220	20	0.31072	0-4	0	0	0.2	< 0.2
#2 Sed. Trap 2	3158174.HTW1	04/24/2019	04/29/2019	1220	2	0.61203	0-4	0	0	1.0	< 1.0
#3 Sed. Basin 2	3158175.HTW1	04/24/2019	04/29/2019	1220	10	0.12241	0-4	0	0	1.0	< 1.0
#4 Sed. Basin 1	3158176.HTW2	04/24/2019	04/29/2019	1220	10	0.12241	0-4	0	0	1.0	< 1.0
#5 Quarry Pit	3158177.HTW1	04/24/2019	04/30/2019	1220	20	0.31072	0-4	0	0	0.2	< 0.2
#6 Sed. Trap 1	3158178.HTW3	04/29/2019	04/30/2019	1220	0.5	2.44812	0-4	0	0	1.0	< 1.0
#7 Sed. Trap 3	3158179.HTW1	04/24/2019	04/29/2019	1220	5	0.24481	0-4	0	0	1.0	< 1.0

NOTES

1. Water samples collected more than 24 hours before receipt may be out of compliance. Drinking water samples are filtered within 24 hours of receipt.

2. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.

3. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NVLAP #101208-0, NY ELAP #10884) facility.

4. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.

5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, MFL-million fibers per liter.

6. Samples will be held for 30 days and then disposed of per Federal regulations.

7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

DISCLAIMER

RJ Lee Group, Inc. is accredited by the New York Department of Health Environmental Laboratory Program (NY ELAP) and the Pennsylvania Department of Environmental Protection (PA DEP) for asbestos in water analysis by TEM. This report may not be used to claim product endorsement by NY ELAP, PA DEP or any other regulatory or laboratory accrediting agency. Any reproduction of this document must be in full in order for the report to be valid. This report is not valid unless it bears the name of a NY ELAP and PA-DEP approved signatory.

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limiting provisions and no responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of thirty (30) days before discarding. A shipping and handling fee will be assessed for the return of any sample.

RJ Lee Group, Inc.

RJ Lee Group Job No: LLH901997-4 Client Job No/Name:

Final Laboratory Report (cont'd)

Client: Report Date: K & L Gates 05\01\2019

///Shifoeone Monn

Authorized Signature:

Monica McGrath-Koerner, Scientist

NOTES

- 1. Water samples collected more than 24 hours before receipt may be out of compliance. Drinking water samples are filtered within 24 hours of receipt.
- 2. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
- 3. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NVLAP #101208-0, NY ELAP #10884) facility.
- 4. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
- 5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, MFL-million fibers per liter.
- 6. Samples will be held for 30 days and then disposed of per Federal regulations.
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RJ Lee Group, Inc. is accredited by the New York Department of Health Environmental Laboratory Program (NY ELAP) and the Pennsylvania Department of Environmental Protection (PA DEP) for asbestos in water analysis by TEM. This report may not be used to claim product endorsement by NY ELAP, PA DEP or any other regulatory or laboratory accrediting agency. Any reproduction of this document must be in full in order for the report to be valid. This report is not valid unless it bears the name of a NY ELAP and PA-DEP approved signatory.

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RJ Lee Group, Inc. TEM Count Sheet EPA Water RJL: LLH901997-4 3158173.HTW1 Microscope tem2000fx1 **Grid Openings** 33 #1 NPDES Outfall K & L Gates Magnification 21 KX Asbestos 0.0 Acc. Voltage 120 KV Vol: 20.0 mL Grid: 0.0094 mm²

Operator: Ashleigh Sload

Cv = 0

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1		<u></u>		NSD	1					1	
2				NSD							
3				NSD							
4				NSD							
5				NSD							
6				NSD							
7				NSD							
8				NSD							
9				NSD							
10				NSD							
11				NSD							
12				NSD							
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25				NSD							
26				NSD							
27				NSD							
28				NSD							
29				NSD							
30				NSD							
31				NSD							
32				NSD							
33	10%	Particulate		NSD							

10% Particulate

Filter Size: 47 mm

HQ44199

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 4/29/2019 3:29:16 PM approve by Ashleigh Sload Final Review: 5/1/19 12:57 PM approve by Monica Mcgrath

Acc. Voltage 120 KV

Operator: Jon Swope

Cv = 0

Grid: 0.0094 mm²

HQ44199

Vol: 2.0 mL

Filter Size: 47 mm

									•· · ·- •/·
Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED AmpID C/A
1				NSD					
2				NSD					
3				NSD					
4				NSD					
5				NSD					
6				NSD					
7				NSD					
8 9				NSD					
9 10				NSD NSD					
10				NSD					
12				NSD					
13				NSD					
14				NSD					
15				NSD					
16				NSD					
17				NSD					
18				NSD					
19				NSD					
20				NSD					
21				NSD					
22				NSD					
23				NSD					
24				NSD					
25				NSD					
26				NSD					
27				NSD					
28				NSD					
29 30				NSD NSD					
30 31				NSD					
32				NSD					
33				NSD					
34				NSD					
35				NSD					
36				NSD					
37				NSD					
38				NSD					
39				NSD					
40				NSD					
41				NSD					
42				NSD					
43				NSD					
44				NSD					

Operator: Jon Swope

Cv = 0

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED AmplE	D C/A
45				NSD						
46				NSD						
47				NSD						
48				NSD						
49				NSD						
50				NSD						
51				NSD						
52				NSD						
53				NSD						
54				NSD						
55				NSD						
56				NSD						
57				NSD						
58				NSD						
59				NSD						
60				NSD						
61				NSD						
62				NSD						
63				NSD						
64				NSD						
65				NSD						

12% Particulate

Filter Size: 47 mm

HQ44199

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 4/29/2019 3:10:21 PM approve by Jon Swope Final Review: 4/30/19 3:49 PM approve by Monica Mcgrath

Operator: Ashleigh Sload

Cv = 0

Field	Fiber	Length Width	FiberType	Morph	EDX	File #	Photo SAED AmpID C/A
1			NSD				
2			NSD				
3			NSD				
4			NSD				
5			NSD				
6			NSD				
7			NSD				
8			NSD				
9			NSD				
10			NSD				
11			NSD				
12			NSD				
13			NSD				
	20%	Particulate					

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 4/29/2019 4:04:12 PM approve by Ashleigh Sload Final Review: 4/30/19 3:50 PM approve by Monica Mcgrath

Filter Size: 47 mm

HQ44199

Operator: Ashleigh Sload

Cv = 0

Field	Fiber	Length Wid	h FiberType	Morph	EDX	File #	Photo SAED AmpID C/A
1			NSD				
2			NSD				
3			NSD				
4			NSD				
5			NSD				
6			NSD				
7			NSD				
8			NSD				
9			NSD				
10			NSD				
11			NSD				
12			NSD				
13			NSD				
.0	10%	Particulate	NOD				

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 4/30/2019 7:29:05 AM approve by Ashleigh Sload Final Review: 4/30/19 3:50 PM approve by Monica Mcgrath

Filter Size: 47 mm

HQ44200

RJ Lee Group, Inc. TEM Count Sheet EPA Water **Grid Openings** RJL: LLH901997-4 3158177.HTW1 Microscope tem2000fx1 33 #5 Quarry Pit K & L Gates Magnification 21 KX Asbestos 0.0 Acc. Voltage 120 KV

Operator: Ashleigh Sload

Cv = 0

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1		0		NSD	1						
2				NSD							
3				NSD							
4				NSD							
5				NSD							
6				NSD							
7				NSD							
8				NSD							
9				NSD							
10				NSD							
11				NSD							
12				NSD							
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25				NSD							
26				NSD							
27				NSD							
28				NSD							
29				NSD							
30				NSD							
31				NSD							
32				NSD							
33				NSD							
	8% P	articulate									

8% Particulate

Vol: 20.0 mL

Filter Size: 47 mm

Grid: 0.0094 mm²

HQ44200

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 4/30/2019 8:15:53 AM approve by Ashleigh Sload Final Review: 5/1/19 12:57 PM approve by Monica Mcgrath

Acc. Voltage 120 KV

Operator: Jon Swope

Cv = 0

Grid: 0.0094 mm²

HQ44200

Vol: .5 mL

Filter Size: 47 mm

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2				NSD							
3				NSD							
4				NSD							
5				NSD							
6				NSD							
7				NSD							
8				NSD							
9				NSD							
10				NSD							
11				NSD							
12				NSD							
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25				NSD							
26				NSD							
27				NSD							
28				NSD							
29				NSD							
30				NSD							
31				NSD							
32				NSD							
33				NSD							
34				NSD							
35				NSD							
36				NSD							
37				NSD							
38				NSD							
39				NSD							
40				NSD							
41				NSD							
42				NSD							
43				NSD							
44				NSD							

Operator: Jon Swope

Cv = 0

Grid: 0.0094 mm²

HQ44200

Vol: .5 mL

88

Filter Size: 47 mm

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED Am	DID C/A
45				NSD	•				•	
46				NSD						
47				NSD						
48				NSD						
49				NSD						
50				NSD						
51				NSD						
52				NSD						
53				NSD						
54				NSD						
55				NSD						
56				NSD						
57				NSD						
58				NSD						
59				NSD						
60				NSD						
61				NSD						
62				NSD						
63				NSD						
64				NSD						
65				NSD						
66				NSD						
67				NSD						
68				NSD						
69				NSD						
70				NSD						
71				NSD						
72				NSD						
73				NSD						
74				NSD						
75				NSD						
76				NSD						
77				NSD						
78				NSD						
79				NSD						
80				NSD						
81				NSD						
82				NSD						
83				NSD						
84				NSD						
85				NSD						
86				NSD						
87				NSD						

NSD

RJL: LLH901997-4	3158178.01783	Microscope tem20001x2	Grid Openings	260
#6 Sed. Trap 1	K & L Gates	Magnification 21 KX	Asbestos	0.0
Vol: .5 mL	Grid: 0.0094 mm ²	Acc. Voltage 120 KV		
Filter Size: 47 mm	HQ44200	Operator: Jon Swope		
		Cv = 0		

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED AmpID	C/A
89		0		NSD					· · ·	
90				NSD						
91				NSD						
92				NSD						
93				NSD						
94				NSD						
95				NSD						
96				NSD						
97				NSD						
98				NSD						
99				NSD						
100				NSD						
101				NSD						
102				NSD						
103				NSD						
104				NSD						
105				NSD						
106				NSD						
107				NSD						
108				NSD						
109				NSD						
110				NSD						
111				NSD						
112				NSD NSD						
113 114				NSD						
114				NSD						
116				NSD						
117				NSD						
118				NSD						
119				NSD						
120				NSD						
121				NSD						
122				NSD						
123				NSD						
124				NSD						
125				NSD						
126				NSD						
127				NSD						
128				NSD						
129				NSD						
130				NSD						
131				NSD						
132				NSD						

RJL: LLH901997-4	3158178.01883	wicroscope tem20001x2	Gna Openings	260
#6 Sed. Trap 1	K & L Gates	Magnification 21 KX	Asbestos	0.0
Vol: .5 mL	Grid: 0.0094 mm ²	Acc. Voltage 120 KV		
Filter Size: 47 mm	HQ44200	Operator: Jon Swope		
		Cv = 0		

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED AmpID C/A
133		0		NSD	•				•
134				NSD					
135				NSD					
136				NSD					
137				NSD					
138				NSD					
139				NSD					
140				NSD					
141				NSD					
142				NSD					
143				NSD					
144				NSD					
145				NSD					
146				NSD					
147				NSD					
148				NSD					
149				NSD					
150				NSD					
151				NSD					
152				NSD					
153				NSD					
154				NSD					
155				NSD					
156				NSD					
157				NSD					
158				NSD					
159				NSD					
160				NSD					
161				NSD					
162				NSD					
163				NSD					
164				NSD					
165				NSD					
166				NSD					
167 168				NSD NSD					
169				NSD					
170				NSD					
170				NSD					
172				NSD					
172				NSD					
173				NSD					
175				NSD					
176				NSD					

RJL: LLH901997-4	3158178.01883	wicroscope tem2000tx2	Grid Openings	260
#6 Sed. Trap 1	K & L Gates	Magnification 21 KX	Asbestos	0.0
Vol: .5 mL	Grid: 0.0094 mm ²	Acc. Voltage 120 KV		
Filter Size: 47 mm	HQ44200	Operator: Jon Swope		
		Cv = 0		

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED AmpID C/A
177				NSD	•				· · · ·
178				NSD					
179				NSD					
180				NSD					
181				NSD					
182				NSD					
183				NSD					
184				NSD					
185				NSD					
186				NSD					
187				NSD					
188				NSD					
189				NSD					
190				NSD					
191				NSD					
192				NSD					
193				NSD					
194				NSD					
195				NSD					
196				NSD					
197				NSD					
198				NSD					
199				NSD					
200				NSD					
201				NSD					
202				NSD					
203				NSD					
204				NSD					
205				NSD					
206				NSD					
207				NSD					
208				NSD					
209				NSD					
210				NSD					
211 212				NSD NSD					
212				NSD					
213				NSD					
214				NSD					
215				NSD					
210				NSD					
217				NSD					
219				NSD					
220				NSD					

NJL. LLN901997-4	3130170.01703		Gilu Operiings	200
#6 Sed. Trap 1	K & L Gates	Magnification 21 KX	Asbestos	0.0
Vol: .5 mL	Grid: 0.0094 mm ²	Acc. Voltage 120 KV		
Filter Size: 47 mm	HQ44200	Operator: Jon Swope		
		Cv = 0		

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED AmpID	C/A
221		Ŭ		NSD	•				•	
222				NSD						
223				NSD						
224				NSD						
225				NSD						
226				NSD						
227				NSD						
228				NSD						
229				NSD						
230				NSD						
231				NSD						
232				NSD						
233				NSD						
234				NSD						
235				NSD						
236				NSD						
237				NSD						
238				NSD						
239				NSD						
240				NSD						
241				NSD						
242				NSD						
243				NSD						
244				NSD						
245				NSD						
246				NSD						
247				NSD						
248				NSD						
249				NSD						
250				NSD						
251				NSD						
252				NSD						
253				NSD						
254				NSD						
255 256				NSD						
256 257				NSD NSD						
257 258				NSD						
258 259				NSD						
259 260				NSD						
200	12%	Particulate		NOD						

12% Particulate

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 4/30/2019 1:28:01 PM approve by Jon Swope Final Review: 4/30/19 3:50 PM approve by Monica Mcgrath Operator: Jon Swope

Cv = 0

Field	Fiber	Length V	Vidth	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2				NSD							
3				NSD							
4				NSD							
5				NSD							
6				NSD							
7				NSD							
8				NSD							
9				NSD							
10				NSD							
11				NSD							
12				NSD							
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25				NSD							
26	100/	Particulate		NSD							
			er, C - Clu	ister, B - Bundle, N	/ - Matrix, Cle	- Cleavage,	Asb - Asbes	tiform, Bys	- Byssolite	Э	

bbreviations: F - Fiber, C - Cluster, B - Bundle, N

Initial Review: 4/29/2019 2:17:20 PM approve by Jon Swope Final Review: 4/30/19 3:50 PM approve by Monica Mcgrath

Grid: 0.0094 mm²

HQ44200

Vol: 5.0 mL

Filter Size: 47 mm

Request for Environmental and IH Laboratory Analytical Services

ATTENTION				_	_	_	1						_		Page	1	of	
ATTENTION							Purchase Order	r No.:				Client J	ob No.:	Rock H	ill Qua	rry		
Lab Use Only	Project No.: Date Logged In:	Client No					Date Results C11 TAT Rush Charg					ad 2						
Only	00	Logged Ir ew Gutshall	п Ву:				Needed	2	HC,	IAI	(check or	ie)	NO					
		on Aggregates Pa, LLC						-		formation D R	egulatory	Accre	editation	(please	e list be	low):		
Dennet	Address: 7660	Imperial Way					Drinking Water		stem ID #: N/A DH Source #: N/A				-					
Report	Report City, State, Zip: Allentown, PA 18195 Sample Only Multiple Sources #: N/A					-	N/A	-										
To		66-4819 Fax:									N/A					_		_
	Email Results To:	Andrew Gutshall@LehighHanson.com					Chemistry	Unpres 4°C	vation: s H ₂ SO ₄ HCI	H ₂ SO ₄ WW=Wastewater				ter ater	Conta P=Pla G=Gla	stic ass		
	Name:		If a hard co	py of invoice is r	needed, check	here	Analysis Key	HNO ₃ Other	NaOH	S=Soil/Slu E=Extract	dge	O=Oil X=Othe	er		W=W A=Air		or tube)	ē.
	Company:	Email:						other	Na ₂ SO ₄									
Invoice To	Address: City, State, Zip:									Analysis Requ	ested		2					
	Phone:	Fax:							AN				t (Y,	-		e		S
Special Instructions		t setup with Drew Van Orden							ber EP/				Upon Receipt (Y/N)	Preservation	Matrix	Container Type	Hď	No. Containers
Clie	ent Sample ID	Sample Description	Sample Date	Start	e Time Stop	Wipe Area / Air Volume	Sample Location specify if NY s		NOA Per EPA Method 100.2				Pres. Upo	Pre	-	Cont		No. O
	1	NPDES Outfall	4/18	9:41	Grab	N/A	N/A		V		1			lce	SW	Ρ	7.0	1
	2	Sed. Trap 2	4/18	9:55	Grab	N/A	N/A	-0.1	1				-	lce	SW	Р	7.2	1
-	3	Sed. Basin 2	4/18	10:12	Grab	N/A	N/A		V						SW	P	7.7	1
· · · · ·	4	Sed. Basin 1	4/18	10:25	Grab	N/A	N/A		V						SW	P	7.8	1
	5	Quarry Pit	4/18	10:50	Grab	N/A	N/A	-	V						SW	P	8.0	1
	6	Sed. Trap 1	4/18	11:05	Grab	N/A	N/A		V				-		SW	P	8.2	1
	7	Sed. Trap 3	4/18	11:15	Grab	N/A	N/A		V				1	ce	SW	Ρ	8.0	1
Chain of Custody	Relinquished By (Print	ature): Now FVILLING Name): Lou Vittorio	Relinquish	ed To:	Time: 17	:30	Custody	Receive	ed By (Signa ed By (Print	Name): Lizi		5	Date: 4 Relinqui	shed	To:			
		Carthres			edex				iny Name:	RIL	5		Method	of Shi	ipment	t:		
Chain of Custody	Relinquished By (Signa Relinquished By (Print Company Name:		Date: Relinquishe Method of	ed To:	Time:		Custody	Receive	ed By (Signa ed By (Print ny Name:			1	Date: Relinqui Method		To:	Time:		_

Pennsylvania - HQ

724.325.1776 Phone

724.733.1799 Fax

350 Hochberg Road Monroeville, PA 15146 Columbia Basin Analytical Laboratories 2710 North 20th Avenue Pasco, WA 99301 509.545.4989 **Phone**

509.544.6010 Fax

Washington

O RJ LEE GROUP

Attachment 1

Sample Analysis Procedures and Methods

For obtaining a representative sample from a large bulk sample, the AASHTO procedures for reducing the sample should be used. The subsequent analyses of the submitted samples will follow a three step procedure: 1) Basic microscopic analysis to assess the presence of asbestiform mineral habitat; 2) Polarized Light Microscopy (PLM) to determine the presence and asbestos mineral type, if present; and, 3) Should positive results be indicated by PLM, follow-up Transmission Electron Microscopy (TEM) analysis will be completed to confirm the minerals present and their morphology. The techniques and methods to be employed in sample analysis are provided below:

- A geologist will inspect hand and core samples initially using a stereo binocular microscope, with magnification ranging from 10x to 60x. Using a fine steel pick (dental pick) the geologist will scrape the surface of the suspect mineralization to determine if any of the minerals display typical asbestiform habit and characteristics such as fiber bundles, splayed ends, or matted or fibrous masses.
- Further examination of the sample will then be conducted using the Polarized Light Microscope (PLM) using EPA 600/R-93/116.
- If asbestiform minerals are found, representative samples will be further analyzed by Transmission Electron Microscopy per EPA 600/R-93/116 to confirm mineral identification and morphology.
- Where appropriate, the microscopic PLM and/or TEM analyses will include a count of the asbestiform fibers, representative digital images, and measurements of the width and length dimensions of found fibers counted.

Water samples will be collected as grab samples and will be analyzed by TEM per EPA 100.2.

The samples will be analyzed using the above procedures by RJ Lee Group, which is accredited by the American Industrial Hygiene Association and is in the NIST National Voluntary Laboratory Accreditation Program for asbestos analysis. RJ Lee Group has mineralogical expertise and has vast experience to detect asbestos fibers in the natural environment (e.g. rocks, soils, water, etc.).





A 1 (* 1

Final Laboratory Report TEM EPA Water Analysis

Attention: David Raphael K & L Gates 17 North Second Street Harrisburg, PA 17101 US Report Date:08/06/2019Sample Receipt Date:04/23/2019RJ Lee Group Job No.:LLH901997-13Authorization/P.O. No.:Samples Received:Samples Received:7Client Job No.:7

Method: EPA Method 100.1 600/4-83-043

		Date	Date	Filter Area	Volume	Area Analyzed	Confidence Interval	Stru	estos ctures 5µm	Analytical Sensitivity (MFL)	Concentration (MFL)
Client Sample Number	RJLG Sample Number	Prepped	Analyzed	(mm²)	(ml)	(mm²)	>5 µ m	Chry	Amph	>5 µ m	>5 µ m
#1 NPDES Outfall	3158173.HTW1	04/24/2019	08/01/2019	1220	20	0.37663	0-4	0	1	0.2	0.2
#2 Sed. Trap 2	3158174.HTW1	04/24/2019	08/01/2019	1220	2	0.65911	0-4	0	0	0.9	< 0.9
#3 Sed. Basin 2	3158175.HTW1	04/24/2019	08/01/2019	1220	10	0.37663	0-4	0	0	0.3	< 0.3
#4 Sed. Basin 1	3158176.HTW1	04/24/2019	08/01/2019	1220	20	0.37663	0-4	0	0	0.2	< 0.2
#5 Quarry Pit	3158177.HTW1	04/24/2019	08/01/2019	1220	20	0.37663	0-4	0	0	0.2	< 0.2
#6 Sed. Trap 1	3158178.HTW2	04/24/2019	08/04/2019	1220	1	1.22406	0-4	0	0	1.0	< 1.0
#7 Sed. Trap 3	3158179.HTW1	04/24/2019	08/02/2019	1220	5	0.37663	0-4	0	0	0.6	< 0.6

NOTES

1. Water samples collected more than 24 hours before receipt may be out of compliance. Drinking water samples are filtered within 24 hours of receipt.

2. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.

3. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NVLAP #101208-0, NY ELAP #10884) facility.

4. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.

5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, MFL-million fibers per liter.

6. Samples will be held for 30 days and then disposed of per Federal regulations.

7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

DISCLAIMER

RJ Lee Group, Inc. is accredited by the New York Department of Health Environmental Laboratory Program (NY ELAP) and the Pennsylvania Department of Environmental Protection (PA DEP) for asbestos in water analysis by TEM. This report may not be used to claim product endorsement by NY ELAP, PA DEP or any other regulatory or laboratory accrediting agency. Any reproduction of this document must be in full in order for the report to be valid. This report is not valid unless it bears the name of a NY ELAP and PA-DEP approved signatory.

These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limiting provisions and no responsibility or liability is assumed for the manner in which the results are used or interpreted. Unless notified in writing to return the samples covered by this report, RJ Lee Group will store the samples for a period of thirty (30) days before discarding. A shipping and handling fee will be assessed for the return of any sample.

RJ Lee Group, Inc.

RJ Lee Group Job No: LLH901997-13 Client Job No/Name:

Final Laboratory Report (cont'd)

Client: Report Date: K & L Gates 08\06\2019

Monn MShippeone

Authorized Signature:

Monica McGrath-Koerner, Scientist

NOTES

- 1. Water samples collected more than 24 hours before receipt may be out of compliance. Drinking water samples are filtered within 24 hours of receipt.
- 2. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
- 3. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NVLAP #101208-0, NY ELAP #10884) facility.
- 4. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
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Operator: Jon Swope

Cv = 0

Grid: 0.0094 mm²

HQ44494

Vol: 5.0 mL

Filter Size: 47 mm

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED AmpID	C/A
1				NSD						
2				NSD						
3				NSD						
4				NSD						
5				NSD						
6				NSD						
7				NSD						
8				NSD						
9				NSD						
10				NSD						
11				NSD						
12				NSD						
13				NSD						
14				NSD						
15				NSD						
16				NSD						
17				NSD						
18				NSD						
19				NSD						
20				NSD						
21				NSD						
22				NSD						
23				NSD						
24				NSD						
25				NSD						
26				NSD						
27				NSD						
28				NSD						
29				NSD						
30				NSD						
31				NSD						
32				NSD						
33				NSD						
34				NSD						
35				NSD						
36 27				NSD						
37 38				NSD						
38 39				NSD NSD						
39 40				NSD						
40	10%	Particulate							.	

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 8/2/2019 8:09:21 AM approve by Jon Swope Final Review: 8/5/19 12:41 PM approve by Monica Mcgrath

Operator: Jon Swope

Cv = 0.024

Filter Size: 47 mm

HQ44494

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
$ \begin{array}{c} 1\\ 2\\ 3\\ 4\\ 5\\ 6\\ 7\\ 8\\ 9\\ 10\\ 11\\ 12\\ 13\\ 14\\ 15\\ 16\\ 17\\ 18\\ 19\\ 20\\ 21\\ 22\\ 23\\ 24\\ 25\\ 26\\ 27\\ 28\\ 29\\ 30\\ 31\\ 32\\ 33\\ 34\\ 35\\ 36\\ 37\\ 38\\ 39\\ 40\\ \end{array} $	1	6.8 articulate	0.1	NSD NSD NSD NSD NSD NSD NSD NSD NSD NSD		MgSiCaFe				Acti	Asb

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 8/1/2019 10:38:16 AM approve by Jon Swope Final Review: 8/5/19 12:41 PM approve by Monica Mcgrath

70

Acc. Voltage 120 KV

Operator: Jon Swope

Cv = 0

Grid: 0.0094 mm²

HQ44494

Vol: 2.0 mL

Filter Size: 47 mm

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo SAED AmpID	C/A
1				NSD	•			·	
2				NSD					
3				NSD					
4				NSD					
5				NSD					
6				NSD					
7				NSD					
8				NSD					
9				NSD					
10				NSD					
11				NSD					
12				NSD					
13				NSD					
14				NSD					
15				NSD					
16 17				NSD NSD					
18				NSD					
19				NSD					
20				NSD					
21				NSD					
22				NSD					
23				NSD					
24				NSD					
25				NSD					
26				NSD					
27				NSD					
28				NSD					
29				NSD					
30				NSD					
31				NSD					
32				NSD					
33				NSD					
34				NSD					
35 36				NSD NSD					
30				NSD					
38				NSD					
39				NSD					
40				NSD					
41				NSD					
42				NSD					
43				NSD					
44				NSD					

RJL: LLH901997-13	3158174.HTW1	Microscope tem2000fx1	Grid Openings	70
#2 Sed. Trap 2	K & L Gates	Magnification 21 KX	Asbestos	0.0
Vol: 2.0 mL	Grid: 0.0094 mm ²	Acc. Voltage 120 KV		
Filter Size: 47 mm	HQ44494	Operator: Jon Swope		
		Cv = 0		

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo SAED AmpID C/A
45				NSD				•
46				NSD				
47				NSD				
48				NSD				
49				NSD				
50				NSD				
51				NSD				
52				NSD				
53				NSD				
54				NSD				
55				NSD				
56				NSD				
57				NSD				
58				NSD				
59				NSD				
60				NSD				
61				NSD				
62				NSD				
63				NSD				
64				NSD				
65				NSD				
66				NSD				
67				NSD				
68				NSD				
69				NSD				
70				NSD				
	10%	Particulate	•					

10% Particulate

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 8/1/2019 11:05:41 AM approve by Jon Swope Final Review: 8/5/19 12:41 PM approve by Monica Mcgrath

Operator: Jon Swope

Cv = 0

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED AmpID C/A
1				NSD					
2				NSD					
3				NSD					
4				NSD					
5				NSD					
6				NSD					
7				NSD					
8				NSD					
9				NSD					
10				NSD					
11				NSD					
12				NSD					
13				NSD					
14				NSD					
15				NSD					
16				NSD					
17				NSD					
18				NSD					
19				NSD					
20 21				NSD NSD					
21				NSD					
23				NSD					
24				NSD					
25				NSD					
26				NSD					
27				NSD					
28				NSD					
29				NSD					
30				NSD					
31				NSD					
32				NSD					
33				NSD					
34				NSD					
35				NSD					
36				NSD					
37				NSD					
38 39				NSD NSD					
39 40				NSD					
40	150/	Darticulate		INSU					

15% Particulate

Filter Size: 47 mm

HQ44494

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 8/1/2019 11:51:34 AM approve by Jon Swope Final Review: 8/5/19 12:41 PM approve by Monica Mcgrath

Operator: Jon Swope

Cv = 0

Vol: 20.0 mL

Filter Size: 47 mm

Grid: 0.0094 mm²

HQ44494

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED AmpID C/A
1				NSD					
2				NSD					
3				NSD					
4				NSD					
5				NSD					
6				NSD					
7				NSD					
8				NSD					
9				NSD					
10				NSD					
11				NSD					
12				NSD					
13				NSD					
14				NSD					
15				NSD					
16				NSD					
17				NSD					
18				NSD					
19				NSD					
20				NSD					
21 22				NSD					
22				NSD NSD					
23 24				NSD					
24 25				NSD					
26				NSD					
20				NSD					
28				NSD					
29				NSD					
30				NSD					
31				NSD					
32				NSD					
33				NSD					
34				NSD					
35				NSD					
36				NSD					
37				NSD					
38				NSD					
39				NSD					
40				NSD					
		Particulate		ustor D. Dundlo N	A Motrix Clo	0	Ach Achoo	tiform Dua	Duccelite

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 8/1/2019 1:07:24 PM approve by Jon Swope Final Review: 8/5/19 12:41 PM approve by Monica Mcgrath

Operator: Jon Swope

Cv = 0

Grid: 0.0094 mm²

HQ44494

Vol: 20.0 mL

Filter Size: 47 mm

40

0.0

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED AmpID C/A
1				NSD					
2				NSD					
3				NSD					
4				NSD					
5				NSD					
6				NSD					
7				NSD					
8				NSD					
9				NSD					
10				NSD					
11				NSD					
12				NSD					
13				NSD					
14				NSD					
15				NSD					
16				NSD					
17				NSD					
18 19				NSD NSD					
20				NSD					
20				NSD					
22				NSD					
23				NSD					
24				NSD					
25				NSD					
26				NSD					
27				NSD					
28				NSD					
29				NSD					
30				NSD					
31				NSD					
32				NSD					
33				NSD					
34				NSD					
35				NSD					
36				NSD					
37				NSD					
38				NSD					
39 40				NSD					
40	12%	Particulate		NSD					
	1 2 /0								

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 8/1/2019 1:50:58 PM approve by Jon Swope Final Review: 8/5/19 12:41 PM approve by Monica Mcgrath

Operator: Jon Swope

Cv = 0

Grid: 0.0094 mm²

HQ44494

Vol: 1. mL

Filter Size: 47 mm

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1		ŭ		NSD	•					•	
2				NSD							
3				NSD							
4				NSD							
4 5				NSD							
6				NSD							
7				NSD							
8				NSD							
9				NSD							
10				NSD							
10				NSD							
12				NSD							
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25				NSD							
26				NSD							
27				NSD							
28				NSD							
29				NSD							
30				NSD							
31				NSD							
32				NSD							
33				NSD							
34				NSD							
35				NSD							
36				NSD							
37				NSD							
38				NSD							
39				NSD							
40				NSD							
41				NSD							
42				NSD							
43				NSD							
44				NSD							

RJL: LLH901997-13 #6 Sed. Trap 1 Vol: 1. mL Filter Size: 47 mm	3158178.HTW2 K & L Gates Grid: 0.0094 mm² HQ44494	Microscope tem2000fx1 Magnification 21 KX Acc. Voltage 120 KV Operator: Jon Swope Cy = 0	Grid Openings Asbestos	130 0.0
		Cv = 0		

Field	Fiber	Length Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
45			NSD	I						
46			NSD							
47			NSD							
48			NSD							
49			NSD							
50			NSD							
51			NSD							
52			NSD							
53			NSD							
54			NSD							
55			NSD							
56			NSD							
57			NSD							
58			NSD							
59			NSD							
60			NSD							
61			NSD							
62			NSD							
63			NSD							
64			NSD							
65			NSD							
66			NSD							
67			NSD							
68			NSD							
69			NSD							
70			NSD							
71			NSD							
72 72			NSD							
73 74			NSD NSD							
74 75			NSD							
76			NSD							
70			NSD							
78			NSD							
79			NSD							
80			NSD							
81			NSD							
82			NSD							
83			NSD							
84			NSD							
85			NSD							
86			NSD							
87			NSD							
88			NSD							

Operator: Jon Swope

Cv = 0

Grid: 0.0094 mm²

HQ44494

Vol: 1. mL

Filter Size: 47 mm

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
89				NSD							
90				NSD							
91				NSD							
92				NSD							
93				NSD							
94				NSD							
95				NSD							
96				NSD							
97				NSD							
98				NSD							
99				NSD							
100				NSD							
101				NSD							
102				NSD							
103				NSD							
104				NSD							
105				NSD							
106				NSD							
107				NSD							
108				NSD							
109				NSD							
110				NSD NSD							
111											
112 113				NSD NSD							
113				NSD							
114				NSD							
115				NSD							
117				NSD							
118				NSD							
119				NSD							
120				NSD							
121				NSD							
122				NSD							
123				NSD							
124				NSD							
125				NSD							
126				NSD							
127				NSD							
128				NSD							
129				NSD							
130				NSD							

16% Particulate Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

RJ Lee Group, Inc. TEM Count Sheet

RJL: LLH901997-13	3158178.HTW2	Microscope tem2000fx1	Grid Openings	130
#6 Sed. Trap 1	K & L Gates	Magnification 21 KX	Asbestos	0.0
Vol: 1. mL	Grid: 0.0094 mm ²	Acc. Voltage 120 KV		
Filter Size: 47 mm	HQ44494	Operator: Jon Swope		
		Cv = 0		

Initial Review: 8/4/2019 11:59:24 AM approve by Jon Swope Final Review: 8/5/19 12:41 PM approve by Monica Mcgrath

AGGREGATE ANALYTICAL RESULTS



ENGINEERING FOR SUCCESS"



Laboratory Report

K & L Gates	Report Date	05/29/2019
17 North Second Street	Sample Receipt Date	04/24/2019
18th Floor	RJ Lee Group Job No.	LLH901997-5
Harrisburg, PA 17101	· · · · · ·	EE11001007-0
United States	Authorization/P.O. No.	
Attention: Mr. David Raphael	Client Job No./Name	
Telephone: 717-231-4504		

Analysis: Asbestos in Bulk Samples by Point Count Method: EPA/600/R-93/116

RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158163.HPL	1	Yes	1	ND	<0.1 OF	100.00	Q, CA, AM, OP, M	WT-05/29/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%.							
Weight Loss: 0.0%								
3158164.HPL	2	Yes	1	ND	<0.1 OF	100.00	Q, CA, AM, OP, M	WT-05/29/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%.							
Weight Loss: 0.0%								
3158165.HPL	3	Yes	1	<0.1 TR		100.00	Q, CA, AM, OP, M	WT-05/29/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%.							
Weight Loss: 0.0%								



Laboratory Report (Cont)

Client Job No./Na	ame:					RJ Lee (Group Job No:	LLH901997-5
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158166.HPL	4	Yes	1	ND	0.70 OF	99.30	CA, AM, OP, M	JM-05/29/2019
Description:	Gray Crushed Rock 1000 points counted. Detection limit of 0.19	6.						
Weight Loss: 0.0%								
3158167.HPL	5	Yes	1	<0.1 AC	<0.1 OF	100.00	CA, AM, OP, M	JM-05/29/2019
Description:	Gray Crushed Rock 1000 points counted. Detection limit of 0.19	6.						
Weight Loss: 0.0%								
3158168.HPL	6	Yes	1	ND	0.10 OF	99.90	CA, AM, OP, M	JM-05/29/2019
Description:	Gray Crushed Rock 1000 points counted. Detection limit of 0.19	6.						
Weight Loss: 0.0%								
3158169.HPL	7	Yes	1	ND	<0.1 OF	100.00	AM, OP, M	WT-05/29/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%.							
Weight Loss: 0.0%								
3158170.HPL	8	Yes	1	<0.1 AC <0.1 TR	<0.1 OF	100.00	Q, AM, OP, M	WT-05/29/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%.							
Weight Loss: 0.0%								



Laboratory Report (Cont)

Client Job No./Nar	me:								RJ Lee Gro	up Job No:	LLH901997
RJLG Sample Number	Client Sample Number		Homogeneous	# of Layer	s Asbestos Detected(%))	Non-Asbestos Fibers(%)		-Fibrous erials(%)	Matrix Material	Analyst - Analysi Date
					Authorized Sig	gnatur	e:_	h pong			
							Wei Tseng,	Micro	oscopist		
								-			
ASBESTOS		NON-ASBESTOS					OUS MATERIAL				
M = Amosite		CE = Cellulose MW = Mineral Wool			Amphibole Binder		HydromagnesiteMiscellaneous	Q T	= Quartz = Tar		
C = Actinolite		FG = Fibrous Glass			Carbonates		= Miscellaneous = Mica	V	= Tar = Vermiculite		
N = Anthophyllite H = Chrysotile		SF = Synthetic Fiber	e	-	Clay		= Opaque	v	= verniculite		
CR = Crocidolite		H = Hair	5	_	Feldspar		= Organic				
rR = Tremolite		W = Wollastonite OF = Other Fibers		_	Gypsum		= Perlite				
DISCLAIMER NO	TES										
	estos was detected	; the method detection lim ntified in the sample, but t									

• "I race" or "<" indicates asbestos was identified in the sample, but the concentration is less than the method quantitation limit. PLM coefficients of variance range from approximately 1.8 at the quantitation limit of 0.1% to 0.32 at high fiber concentrations.

 \cdot Samples are archived for three months following analysis and are then properly discarded.

• These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

 \cdot This test report relates to the items tested.

 \cdot This report is not valid unless it bears the name of a NVLAP Lab Code 101208-0 approved signatory.

 \cdot Any reproduction of this document must be in full in order for the report to be valid.

• This report may not be used to claim product endorsement by NVLAP Lab Code 101208-0, any agency of the U.S. Government or any other laboratory accrediting agency.

• Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar nonfriable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as "non-asbestos-containing."

- Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NY ELAP #10884) facility.

· If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratorys results are limited to the reported values.

· ((100-A)/B)*C = Asbestos Detected (%), where A=weight loss, B=total # of points counted, and C=total # of asbestos fibers counted.



Laboratory Report

K & L Gates	Report Date 05/29/2019
17 North Second Street	Sample Receipt Date 04/24/2019
18th Floor	RJ Lee Group Job No. LLH901997-6
Harrisburg, PA 17101	·
United States	Authorization/P.O. No.
Attention: Mr. David Raphael	Client Job No./Name
Telephone: 717-231-4504	

Analysis: Asbestos in Bulk Samples by Point Count Method: EPA/600/R-93/116

RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158157.HPL	11	Yes	1	ND		100.00	Q, CA, AM, OP, M	DF-05/29/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%							
Weight Loss: 0.0%								
3158158.HPL	12	Yes	1	ND	1.00 OF	99.00	Q, CA, AM, OP	DF-05/29/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit= 0.1%							
Weight Loss: 0.0%								
3158159.HPL	13	Yes	1	ND		100.00	Q, CA, M	DF-05/29/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit - 0.1%							
Weight Loss: 0.0%								



Laboratory Report (Cont)

Client Job No./Na	ame:					RJ Lee (Group Job No:	LLH901997-6
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158160.HPL	14	Yes	1	ND		100.00	Q, CA, AM, OP, M	DF-05/29/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit =0.1%							
Weight Loss: 0.0%								
3158161.HPL	15	Yes	1	ND	0.40 OF	99.60	Q, CA, OP, M	DF-05/29/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%							
Weight Loss: 0.0%								
3158162.HPL	16	Yes	1	ND		100.00	Q, CA, AM, OP, M	DF-05/29/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%							
Weight Loss: 0.0%								
3158171.HPL	9	Yes	1	ND		100.00	Q, CA, AM, OP, M	DF-05/29/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%							
Weight Loss: 0.0%								
3158172.HPL	10	Yes	1	ND		100.00	Q, CA, OP, M	DF-05/29/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%							
Weight Loss: 0.0%								



Laboratory Report (Cont)

Client Job No./Na	me:								RJ Lee Gro	oup Job No:	LLH901997-6
RJLG Sample Number	Client Sample Number		Homogeneous	# of Laye	ers Asbestos Detected(%))	Non-Asbestos Fibers(%)		Fibrous rials(%)	Matrix Material	Analyst - Analysis Date
					Authorized Sig	gnatu	re: Donald Fik		. Fal		
ASBESTOS			6						Questa		
AM = Amosite		CE = Cellulose	8		= Amphibole	ΗY	= Hydromagnesite	Q	= Quartz = Tar		
AM = Amosite AC = Actinolite		CE = Cellulose MW = Mineral Wool FG = Fibrous Glass		В :		HY M MI	= Hydromagnesite = Miscellaneous = Mica	Q	= Quartz = Tar = Vermiculite		
M = Amosite AC = Actinolite N = Anthophyllite CH = Chrysotile		CE = Cellulose MW = Mineral Wool FG = Fibrous Glass SF = Synthetic Fibe		B = CA = CL =	= Amphibole = Binder = Carbonates = Clay	HY M MI OP	= Hydromagnesite = Miscellaneous = Mica = Opaque	Q T	= Tar		
AM = Amosite AC = Actinolite AN = Anthophyllite		CE = Cellulose MW = Mineral Wool FG = Fibrous Glass		B = CA = CL = F =	= Amphibole = Binder = Carbonates	HY M MI	= Hydromagnesite = Miscellaneous = Mica	Q T	= Tar		

DISCLAIMER NOTES

 \cdot "ND" indicates no asbestos was detected; the method detection limit is 0.1%.

• "Trace" or "<" indicates asbestos was identified in the sample, but the concentration is less than the method quantitation limit. PLM coefficients of variance range from approximately 1.8 at the quantitation limit of 0.1% to 0.32 at high fiber concentrations.

 \cdot Samples are archived for three months following analysis and are then properly discarded.

• These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

 \cdot This test report relates to the items tested.

 \cdot This report is not valid unless it bears the name of a NVLAP Lab Code 101208-0 approved signatory.

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• Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar nonfriable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as "non-asbestos-containing."

 \cdot Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NY ELAP #10884) facility.

· If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratorys results are limited to the reported values.

 \cdot ((100-A)/B)*C = Asbestos Detected (%), where A=weight loss, B=total # of points counted, and C=total # of asbestos fibers counted.

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Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: 🕻	15/15/19	Analyst:	WT	Scope:	023-0P	<u>.</u>	Sample Description:	Grow	Crushe	A Rock	<u> </u>		
RJ Lee Gro Sample Nu RJ Lee Gro Project Nu	mber: 3 up mber: L	158163 LH9019					Comments / # of Layers:				Detectio	in Limi	+=0,1%
Analysis M Stereo- scope	emoa:						# of Preps: しつ	Homo	ogenous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple	ochroism L		f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% (V	0/0	
			wcs					LM	P N		Quartz	Carbonates	Vermiculite
			wcs					LM	P N	· · · · · · · · · · · · · · · · · · ·	Tar	Binder	Opaques
			wcs					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Taic	Feldspar	Mica
	20.1%	Tremolite	Cleavage	R.I					1		Clay	Organic Part.	Diatoms
			Ű								Mise Particles	Foam	Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total	
ASIS	ð	0	0	0	0	D	0	0	0	
CLE	0	0	о	0	Э	0	0	0	0	
NAS	100	100	100	100	(00	(00	(00	(00	fus	
Total	100	100	100	100	100	- 100	100	100	- 700	
Detection Limit = - (1000 ×100% = 0.1%										

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Effective Date: March 2019 Form F OPT.001

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RJ LEE GROUP

			PLM Point	<u>Count Addi</u>	tional Slide	s Workshe	<u>et</u>			
Date:	05/15/19	A	nalyst:	WT	Mi	croscope: _	023-0PT			
RJ Lee Gr	roup Sample	e Number:	31581	63	RJ Lee Gr	oup Project	Number:	11-190199	7	
Туре	Slide 9	Slide (0	Slide	Slide	Slide	Slide	Slide	Slide	Total	7
ASB	0	0							0	0
CLE	0	0							0	0
NAS	(00	100							200	0001
Total	00)	[00]							200	1000
Type	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total	

1700		 the second se		 		
		 	l	 		
Total					•	

Туре	Slide	Total							
Total									

Effective Date: March 2019 Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	05/16/19	Analyst:	WT	_ Scope:	823-0Y	<u>"</u>	Sample Description:	Giray	Crushed	Rock	•		
	umber: 3	158164					Comments / # of Layers:	· J				.wit=0.	10
Analysis N Stereo- scope							# of Preps: (O	Home	genous N	QC Y N	QC Analyst:	·	
%	%	Asbestos Type	Morphology	Color/Ple	eochroism	Indices o	f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% (60%	
			wcs					LM	PN		Quartz	Carbonates	Vermiculite
			wcs					LM	P N		Quartz Tar	Binder	Opaques
	194946		wcs					LM	P N		Perlite	Amphibele	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Lavered Re	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	50.1%	Tremolite	CLEANAR	(R.1	£						Clay	Organic Part.	Diatoms
			. 0								Misc Rarticles	Foam	Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
AS13	0	0	ð	0	0	0	0	0	Ð
CLE-	д	0	Ð	Ð	J	0	д	б	0
NAS	(00	(00	((00	(00	(৩০	(00	100	A20
Total	100	100	/00	(00	(00	(00	(00	(00	fur
	Detect	ion L	mit =	1000	x(00% ;	0.1%			

Page _____ of _____

ffective D orm F OP	Date: March 20 T.001)19							
			<u>PLM Poin</u>	t Count Ado	ditional Slid	es Workshe	et		
Date:	05/16/19	A	nalyst:	Wi	N	licroscope:	023-017		
								LLH931	997
Туре	Slide 9	Slide (o	Slide	_ Slide	_ Slide	Slide	Slide	_ Slide	Total
ASB	6	Ô							0
CLG	0	9							0
NAS	[00	(აე							200
Total	100	[0]							200
Туре	Slide	Slide	Slide	_ Slide	_ Slide	_ Slide	_ Slide	_ Slide	Total
		· ·							
	1								

Туре	Slide	Total							
					1				
Total									

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Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	05/16/14	Analyst:	WT	Scope:	023-0	2197	Sample Description:	Gray	Crusha	el Rock	۲		
RJ Lee Gro Sample Nu	up Imber: 3	158165						1000	Paint 1	COUNT. 6)-etectl	on Limit	+=0.1%
RJ Lee Gro Project Nu	up mber: Ll	157165 1-190190	97				Comments / # of Layers:						
Analysis N Stereo-							#of (a)	Нора	genous	QC	QC		
scope							# of Preps: (つ	(Y)	N	Y N	Analyst:		wine is a second second
		Asbestos		Color/Ple	ochroism		f Refraction	Birefrin-	Sign of	Extinction	NFM% (0	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	
%	%	Туре	Morphology					gence	Elongation			~	
	<0.1%	Tremolite	wcls	CDL	N	(.608	1.601	L (M)	(<u>p</u>) N	PL	Quartz	Carbonates	Vermiculite
			wcs					LM	PN		Tar	Binder	Opaques
			wcs					LM	PN		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Res	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part.	Diatoms
											MiscParticle	s Foam	Foil
	관련적인												

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
ASB	0	0	0	0	J	Õ	อ	0	0
CLE	0	ð	0	0	0	0	0	0	0
NAS	100	100	(00)	(0)	(00	(00)	(0)	(00	foo
,					······································				
Total	100	00	100	(00	100	100	00	100	foc
	Peter	tion L	imit=	1000)	K(00% =	0.1%			

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Effective Date: March 2019 Form F OPT.001

BILEE GROUP

			PLM Poin	<u>t Count Ado</u>	ditional Slid	es Worksh	<u>eet</u>		
Date:	05/16/19	Α	nalyst:	WT	N	licroscope:	023-0P1		
RJ Lee Gi	roup Sample	e Number:	315F	165	RJ Lee G	iroup Proje	ct Number:	LLH901	997
							na posta de la constante de constante (de la desente de la constante de la constante de la constante de la cons		antan <mark>gen mangan stati (sa stati " a stati a stati</mark>
Туре	Slide <u></u>	Slide <u>10</u>	Slide	_ Slide	_ Slide	_ Slide	_ Slide	_ Slide	Total
ASUS	0	0							<u> </u>
CLE	0	0							0
NAS	[00]	(00)							200
Total	[00]	100							200
Туре	Slide	Slide	Slide	_ Slide	_ Slide	_ Slide	_ Slide	_ Slide	Total
Total			1			1			

Туре	Slide	Total							
Total									

Effective Date: March 2019

Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: 0	5/21/10	Analyst:	JM	Scope:	055-	OPT	Sample Description:	Gran	1 Cru	She	troc	ik		
RJ Lee Gro	umber: 31 up Imber: 1.1	5816 .H901					Comments / # of Layers:	1000 po	ints co	unted	. Detr	ection	limit c)f 0.1%
Stereo- scope							# of Preps: 1 ()	Home Y	ogenous N		QC Analyst:			
%	%	Asbestos Type	Morphology		eochroism 上		of Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%	19.3		
			wcs					LM	PN		Quartz	Carbonates	Vermiculite	
			wcs					LM	ΡN		Tar	Binder	Opaques	
			wcs					LM	P N		Perlite	Amphibole	Gypsum	
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Re	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica	
	0.7	Hornk	dende		465						Clay	Organic Part.	Diatoms	
				上 1.	4SS						Misc Particles	Foam	Foil	

Type NAS	Slide 1	slide 2	Slide 3	Slide 4	Slide 5 99	Slide 6	Slide 7 99	Slide 8	Total 195
Hornblende	Ċ)	0	ł		1	Ò	1		5
Total	100	100	100	100	100	100	100	100	800
	Dete	ction	n li	mit	= 100	<u>o x l</u>	00%	= ().	170

Page 1_____ of _____

OPT.027 revision 0	
Effective Date: October 2016	

RILEE GROUP

Date: 05/21/19 Analyst: JM Microscope: 055-0PT RJ Lee Group Sample Number: 3158166 RJ Lee Group Project Number: 14901997 Type NAS Slide 9 Slide 10 Slide Slide Slide Slide Slide Slide Total 99 99 198 Homblende 2 Total 100 100 200

Туре	Slide	Total							
_							1.1		
									1
		3							
Total									1

Туре	Slide	Slide	Slide	Slide	Slide	Slide	_ Slide _	Slide	Total
							1.1.2		
			1						
				1					
							-	-	
Total		-	-			1			

Page 1 of 1

CO RJ LEE GROUP

Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: C	05/21/1°	Analyst:	JM	Scope:	055-0	<u>o</u> pt	Sample Description:	Gran	n chu	shed	roc	6	
RJ Lee Gro Sample Nu RJ Lee Gro Project Nu Analysis M	up mber: LL	58167 H9010	297				Comments /					n limit	of 0.1°
Stereo- scope							# of Preps:	Homo Y	ogenous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology		eochroism 上	Indices of II	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%	100	
	<u> </u>	Actinolite	w (s)	COL	COL	1.640	1.630	LM	(P)N	0°	Quartz	Carbonates	Vermieulite
			wcs					LM	P N		Tar	Binder	Opaques
			wcs					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Res		Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	(0.1	Actinolite	cleavage		1.63	05/22/10	n JM				Clay	Organic Part.	Diatoms
			•	11 1	.440						Misc Particle	s Foam	Foil
				上 1.	630								

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
	100	100	1/1/1	100	100	100	100	100	<u>200</u>
Total	100			100	100		<u></u>	100	
				l		100	,	61	0

Detection limit = $\frac{1}{1000} \times 1007_0 = 0.17_0$

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BI LEE GROUP

			PLM Point	t Count Add	itional Slic	des Workshe	<u>et</u>		
_{Date:} 0	5/22/	19A	nalyst:	JM	N	Aicroscope:	065 -	OPT	
5		LLH90	1997						
Туре	Slide 9	Slide 10	Slide	Slide	Slide	Slide	Slide	Slide	Total
NAS	100	100							200
							-		
Total	100	100							200
		1	1	1	1	1			<u> </u>
Туре	Slide	Slide	Slide	_ Slide	Slide	Slide	Slide	Slide	Total
			:						
Tatal		1						· · · · ·	
Total		and the second sec	<u> </u>						
						I			
Type	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total

Туре	Slide	Total							
Total									

	RJ	Lee	
Partition .	DELIVE	RING SCIEN	TIPIC ASSOLUTION

π.

Polarized Light Microscopy Point Count Wor	ksheet for Asbestos Analysis of Bulk Samples

RI Lee Gro	un	Analyst:		_ Scope:	055-	OPT	Sample Description:	Gran	y cru	Shec	tro	ck	
Sample Nu	umber: 31 up umber: LL	58169 H901					Comments / # of Layers: \	000 poir	nts courn	ted. De	tection	limit of	0,1%
Stereo- scope	scope							Homo Y	ogenous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple	ochroism	Indices o	f Refraction 	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% 0	9.9	
			wcs					LM	P N		Quartz	Carbonates) Vermiculite
			wcs					LM	ΡN		Tar	Binder	Opaques
			wcs					LM	ΡN		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.1	Actinolite	cleavage		.630	1.440					Clay	Organic Part.	Diatoms
			0		\\	1.030					Misc Particle	Foam	Foil
	a serie a la composición a composición de la c			05/22	/19 JM						\square	/	
	an an an tart												

Type NIAS	Slide 1	Slide 2	Slide 3 99	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total 799
actividite Cleanage	0	0	1	0	0 -	1000	0	0	1
						95/23/19			
Total	2100	100	100	100	100	106	100	100	800
0	5/22/19								

JM

Detection limit = $\frac{1}{1000} \times 100\% = 0.1\%$

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Effective Da OPT.027 rev	ite: October 2 vision 0	016							Page 1 of 1
			PLM Point (Count Addit	ional Slide	s Workshee	t		
Date: _O	5/23/1	9 AI	nalyst:	JM	Mic	croscope: _	055-(OPT	
RJ Lee Gr	oup Sample	Number:	31581	68	RJ Lee Gro	oup Project	Number:	LLH90	1997
Туре	Slide 💁	Slide <u>\0</u>	Slide	Slide	Slide	Slide	Slide	Slide	Total
NAS	100	100							200
Actinolite	0	0							0
- U									
Total	100	001							100
								<u></u>	
Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
		·~							
•							**		

BI LEE GROUP

Total

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
	· · · · · · · · · · · · · · · · · · ·								
Total									

Effective Date: March 2019

Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

RJ Lee Grou Sample Nu RJ Lee Grou Project Nu Analysis M	mber: 27- up mber: 22	58169 H9019	97				Description: Comments / # of Layers:		Crushed Point C		etection	Limit =	0,1%
Stereo- scope	ethod.						# of Preps: (O	Horm	genous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple	eochroism	Indices II	of Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% [0	0%	
			WCS WCS WCS					L M L M L M	P N P N P N		Quartz Tar Perlite	Carbonates Binder Atophibole	Vermiculite Opaques Gypsum
		Non-Asbestos Hornklen		Optical Pr	operties 1.654	Layered R	esults	Asbestos	Non-Asb.	Matrix	Talc Clay Misc Particles	Feldspar Organic Part. Foam	Mica Diatoms Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
A53	0	J	D	Ð	Э	0	0	J	2
CLE	0	2	0	0	D	D	0	Q	U
NAS	100	100	[00	100	(00	100	(00	100	800
Total	601	100	109	100	501	100	(03	[00	Aor

Detection Limit = 1000 ×100% = 0, 1%

Page _____ of _____

	LEE GR								Nichard - millional and y did a set of the	=
Effective D Form F OP	ate: March 20 T.001	919								_
	<u> </u>	_	PLM Poin	t Count Add	ditional Slid	les Worksh	eet			
Date:	05/23/10	A	nalyst:	WT	Ν	licroscope:	023-0P	Γ		
	-							LLH901	99J	-
Туре	Slide	Slide <u>(</u>	Slide	_ Slide	_ Slide	_ Slide	_ Slide	_ Slide	Total	
ASB	0	Э							0	0
CLE	Э	б							0	0
NAS	(00	(00							200	100
										_
										_
Total	100	[00]							200	/00
			1							
Туре	Slide	Slide	Slide	_ Slide	_ Slide	Slide	_ Slide	Slide	_ Total	
										_
										_
Total										
						l				
		1								_

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
				· · · · · · · · · · · · · · · · · · ·					
Total									

CORPUSING SCIENTIFIC RESOLUTION Effective Date: March 2019 Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	05/23/19	Analyst:	WT	Scope:	023-0P	?[Sample Description:	Gray	Crushed	1 Rock	•		
RJ Lee Gro Sample Nu	up Imber: 3/	57170					Description:	(000)	Point C	sunt, D	letection	Limit	=0.1%
RJ Lee Gro Project Nu	imber: LL,	57170 1190/99	7				Comments / # of Layers:		,				
Analysis N													
Stereo- scope							# of Preps: (つ		genous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple II	ochroism 上	Indices o II	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% (~		
	<01%	Actinolile	wcs	GrR	N	1.638	1.632	LØ	Ø٢	PL	Quartz	Carbonates	Vermiculite
	20,1%	Tremalite	wcs	COL	N	1.633	1.625	LQ	ΦN	PL	Tar	Binder	Opaques
		_	wcs					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0.1%	Activoli	te Cleanape.	RI	- 						Clay	Organic Part.	Diatoms
		-	8				4.				MisoParticles	Foam	Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total		
ASIB	0	Ο	о	0	θ	Ð	0	O	0		
CLE	I	0	ο	0	0	Э	0	0	0		
NAS	(00	(00	(00	(20	(00	(00	(0)	(00	800		
Total	(00	100	100	(00	100	(00	(00	(00	for		
Defection Limit = 100% = 0,1%											

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			PLM Poin	t Count Ado	ditional Slid	les Worksh	eet		
Date:	05/23/1	<u>ĝ</u> A	nalyst:	WT	N	licroscope:	023-01	ſ	
							ct Number:		1997
Туре	Slide 9	Slide 0	Slide	Slide	_ Slide	Slide	Slide	Slide	Total
ASIS	0	0							6
CLE	ð	0							0
NAS	(00	(00							200 (
Total	100	(00							2.01
Туре	Slide	Slide	Slide	_ Slide	_ Slide	_ Slide	_ Slide	Slide	Total
Total									
	<u>, , , , , , , , , , , , , , , , , , , </u>								
Туре	Slide	Slide	Slide	_ Slide	_ Slide	Slide	Slide	Slide	Total

Туре	Slide	Total							
Total									

CORJUSTIC RESOLUTION DELIVERING SCIENTIFIC RESOLUTION Effective Date: March 2019 Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	ostrilia	Analyst:	DF	Scope:	036-0F	π	Sample Description:	Gra	Crus hed	Rock				
RJ Lee Gr	umber: 315										jon Limi	1	x 100%	- - 0 1
Analysis N Stereo-							# of Layers:	·	ogenous	Derect		T 1000	~ 10012	
scope							Preps:	Y	N		Analyst:			
		Asbestos		Color/Ple	eochroism	Indices of	of Refraction	Birefrin-	Sign of	Extinction				
%	5 %	Туре	Morphology					gence	Elongation	Angle	NFM%			
			wcs					LM	ΡN		Quartz)	Carbonates	Vermiculite	
			WCS					LM	PN			Binder	Opaques	5
			wcs					LM	P N		Perlite	Amphibole	Gypsum	ſ
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Re	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica	
											Clay	Organic Part.	Diatoms	
										5	Misc Particles	- Foam	Foil	
<u> </u>				+t										

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
ASB	Ø	Ľ	Ø	Ø	0	0	Ð	þ	
	•								
Total	100	100	100	100	160	100	100	100	800
		De	, lection	Lim	+ = 1. 1000	x 100	% = 0.1		

Page _ l__ of _ 2

O RJ LEE GROUP

		<u> </u>	PLM Point	<u>Count Add</u>	itional Slide	es Workshe	<u>et</u>		
Date:	5/21/19	A	nalyst:]	DF	M	icroscope:	036-0	рТ	
RJ Lee Gi	roup Sample	e Number: _.	LLH90190	97	RJ Lee Gi	roup Project	t Number:	3158/5	7
Туре	Slide 9	Slide <u>10</u>	Slide	Slide	Slide	Slide	Slide	Slide	Total
NAS	100	100							Total
ASB	0	Ð							
Total	100	100							1000
Type	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total

Туре	Slide	Total							
Total									

Туре	Slide	Total							
Total									

,

CORJ LEE GROUP Effective Date: March 2019 Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

RJ Lee Grou	mber: 3/5 Ip	8158 H901997					Comments / # of Layers:		Clushed f Count		1 Limit 100% - 0.1
Stereo- scope					_		# of Preps:	Hom Y	ogenous N	QC Y N	QC Analyst:
%	%	Asbestos Type	Morphology	Color/Pla	eochroism L	Indices	of Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%
			WCS					LM	PN		Quartz Carbonates Vermiculite
			wcs	1				LM	PN		Tar Binder Opaques
			WCS			1	· · · · · · · · · · · · · · · · · · ·	LM	P N	1	Perlite Amphibole Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered R	esults	Asbestos	Non-Asb.	Matrix	Talc Feldspar Mica
	1 %	Trem. (2/20							<	Clay Organic Part. Diatoms Misc Particles Foam Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	98	100	100	99	98	99	99	99	792
ASB	0	0	0	0	0	0	0	0	0
clev	2	0	0	1	2	1	_ l	I	8
Total	100	100	100	100	100	100	100	100	800

BI LEE GROUP

Date:	5/14/19	A	nalyst:	DF	N	licroscope:	036-01	oT	
RJ Lee G	roup Sampl	e Number:	315815	8	_ RJ Lee G	97			
Туре	Slide 9	Slide 10	Slide	Slide	Slide	Slide	Slide	Slide	Total
	Slide <u>9</u> 99	Slide <u>10</u> 100	Slide	_ Slide	_ Slide	Slide	_ Slide	_ Slide	Total
VAS			Slide	_ Slide	_ Slide	_ Slide	_ Slide	_ Slide	-
Type VAS ASB Jev	99		Slide	_ Slide	_ Slide	_ Slide	_ Slide	_ Slide	-

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
		1	12.01.2			1	1111		
-									
		-					1		
		1.1.1					-	-	-
							-		
Total					-		-		

Туре	Slide	Slide	Total						
	-						1111111	-	
			1						
	1								
					-				
Total		-	1						

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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: 🤇	05/21/19	Analyst:	DF	_ Scope:	036-6P	ŗ	Sample Description:	Grush	ed Gro	y Rocl	۲		
RJ Lee Gro	up	<u> </u>											
Sample Nu	1mber: 315	8159								_			
RJ Lee Gro	up						Comments /		De	ection Limi	4 z		
11 -	mber: LLH	761997					# of Layers:	1000 of	count	1000 × 100	0% = 01		
Analysis M	ethod:							(r					
Stereo-							# of		ogenous	QC	QC		
scope				1/			Preps:	Y	<u>N</u>	Y N	Analyst:		
		Asbestos		//	ochroism	Indices o	f Refraction	Birefrin-	Sign of	Extinction			
%	%	Туре	Morphology					gence	Elongation	Angle	NFM%		
			wcs					LM	ΡN		Quartz	Carbonates	Vermiculite
			wcs					LM	ΡN		Tar	Binder	(Opaques)
			wcs					LM	ΡN		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Re	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part,	Diatoms
											Misc Particles	Foam	Foil
											C VII Strategieren of Ord	roam	Poil
———													

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
ABS	E	ø	Ø	ø	0	0	٥	0	
Total	100	100	100	100	100	100	100	100	800
			~ 1 1	. 1.		100	1 20		

Detection Limit = 100 x 100% = 0.1

Page 1 of <u>2</u>

BI LEE GROUP

	PLM Point Count Ad	ditional Slides Worksheet
Date: 05/21/19	Analyst: DF	Microscope: 036-0PT
RJ Lee Group Sample N	umber: 3158159	RJ Lee Group Project Number: LLH901997

Туре	Slide q	Slide	Total						
NAS	100	100							200
ABS	0	K							0
_			-	_				111	
_				_					
	1				-				-1
Total	100	100							1000

Туре	Slide	Total							
		1 1	10.0			1		1101	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
						-			
	-								
									-
	-	-						-	-
						-	-		-
Total		1							

Туре	Slide	_ Slide	Total						
						-		11	
		11							
		-					-		-
	-							-	-
T-1-1	-					-			
Total	1 m		4						-

Page <u>a</u> of <u>a</u>

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

	nber: 315 nber: LL	-8160 H901997	L				Sample Description: Comments / # of Layers:					1 x 100 k	5 20,1
Stereo- scope							# of Preps:	Hom Y	ogenous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology		eochroism L	Indices II	of Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
			WCS WCS WCS					L M L M L M	P N P N P N		Quartz Tar Perlite	Carbonates Binder Amphibole	Vermiculite Opaques Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered R	esults	Asbestos	Non-Asb.	Matrix	Talc Clay Misc Particles	Feldspar Organic Part.	Mica Diatoms Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
ASB	Ø	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	300

Detection Limit = 1 x 100% = 0.1

Page ____ of _Z

Total

BJ LEE GROUP

		<u> </u>	PLM Poin	t Count Ad	ditional Slid	les Workshe	eet		
Date: 🙆	5/22/19	A	nalyst:	DF	N	licroscope:	036-0	PT	
RJ Lee G	iroup Sample	Number:	315816	0	RJ Lee G	Froup Projec	t Number:	LLHgo	1997
Туре	Slide 9	Slide <u>10</u>	Slide	Slide	Slide	_ Slide	Slide	Slide	_ Tota

Туре	Slide	Slide	Slide	Slide	_ Slide	Slide	Slide	Slide	Total
			_	-	-	1			
			_	-		-			
			-	-	-		_		
		-	-	-			-		-
Total				-			-	-	

Туре	Slide	Slide	Slide	_ Slide	Slide	Slide	Slide	Slide	Total
			1						
					1		20.00		
Total								-	

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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

	•	Analyst:	DF	_ Scope:	036-01	T	Sample Description:	Gray	Crushed	Rock			
RJ Lee Gr Sample N	umber: 315	8161						Т					
RJ Lee Gr Project N	oup umber: LLH	901997					Comments / # of Layers:	1000	pt count	Detect	ion Limit:	= 1000 × 10	00% = 0,1
Analysis M Stereo- scope	/lethod:						# of Preps: 10	Home	, genous N		QC Analyst:		
%	5 %	Asbestos Type	Morphology		ochroism 上	Indices o	f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
			wcs					LM	ΡN		Quartz	Carbonates	Vermiculite
			wcs					LM	P N		Tar	Binder	Opaques
			wcs					LΜ	ΡN		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Re:	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part.	Diatoms
											Misc Particles	Foam	Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
ASB	0	ø	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	100	400
			De	tection	Limit	- 1000	x100%	= 0.1	

Page $_$ of $_$ 2

O RJ LEE GROUP

		ļ	PLM Point	Count Addi	tional Slide	s Workshee	t		
Date: O	5/16/19	Aı	nalyst:		Mio	croscope: _	036-0	pT	
RJ Lee Gr	oup Sample	e Number: _	315-8161		RJ Lee Gro	oup Project	Number: _	LLH9010	197
Туре	Slide <u>9</u>	Slide <u>10</u>	Slide	Slide	Slide	Slide	Slide	Slide	Total
NAS	100	100							200
ASB	0	0							
Total	100	100							1000
							#9975-00-0		
Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
							· · · · ·		
Total									

Туре	Slide	_ Slide	Total						
							-		
Total			**		×				

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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

RJ Lee Group Sample Num RJ Lee Group Project Num Analysis Met	ber: 315	8162 901997					Sample Description: Comments / # of Layers:					+ toon x10	0% = 0
Stereo- scope							# of Preps:	Home	ogenous) N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Pla	eochroism L	Indices II	of Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
i lü			WCS			1		LM	P N		Quartz	Carbonates) Vermiculite
1			WCS					LM	PN	1	Tar	Binder	Opaques
			wcs				(i	LM	P N	0	Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered R	<u>esults</u>	Asbestos	Non-Asb.	Matrix	Talc Clay Misc Particle	Feldspar Organic Part.	Mica Diatoms Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	106	100	100	100	100	800
					1				
Total	1.1.1.1.1.1								400

Detection Limit = 1000 x 100% = 0.1

Page ____ of ____

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BJ LEE GROUP

ate: 05/22/19	Analyst: DF	Microscope: 036-opT
---------------	-------------	---------------------

Туре	Slide 9	Slide 10	Slide	Slide	Slide	Slide	Slide	Slide	Total
	100	100							200
				1.1	1				
					-	-		_	
				_	_				-
	1		1.			1		-	
Total									1000

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
		_		1.11	1	1			1.000
			i 11 1						
				· · · · · · · · · · · · · · · · · · ·	-				
Total	1			-					

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	_ Slide	Total
				- P					
			1						1
		-							
		-							
				-					
Total				1.		2 17	0	C 1	

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

RJ Lee Group Sample Numb RJ Lee Group Project Numb Analysis Meth	er: LLIt						Sample Description: Comments / # of Layers:	/			Detection Limit: 100 ×100%
Stereo- scope				1		1	# of Preps:	Hom Y	ogenous N	QC Y N	QC Analyst:
%	%	Asbestos Type	Morphology	Color/Ple	ochroism L	Indices II	of Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%
			WCS					LM	PN		Quartz Carbonates Vermiculite
			WCS					LM	PN	1	Tar Binder Opaques
			WCS					LM	P N	11 22 2	Perlite Amphibole Gypsum
	%1	Non-Asbestos	Fibers	Optical Pro	operties	<u>Layered R</u>	<u>esults</u>	Asbestos	Non-Asb.	Matrix	Talc Feldspar Mica Clay Organic Part. Diatoms Misc Particles Foam Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
ABS	0	0	0	0	0	0	0	0	1
	1.000	$1 \in \{0, \dots, \ell\}$	1.000	1.5					
1 1 1	· · · · · ·	1000	1						
		100			1.0		1.0		
Total	(00)	100	100	100	100	(00)	100	(00)	800

Detection Limits : 100 × 100% = 0.1



(00)

100

Total

Effective Date: March 2019 Form F OPT.001

	ļ	PLM Poir	it Count Add	ditional Slid	es Workshe	et		
<u>[zz]</u> a	Aı	nalyst:	DF	N	licroscope:	036-0	ρτ	
oup Sample	e Number: _	31581	71	RJ Lee G	roup Projec	t Number:	<u>LLH 901</u>	997
Slide <u>9</u>	Slide <u>10</u>	Slide	Slide	Slide	Slide	Slide	Slide	Total
00	100							200
0	0							Ø
				-				
	Slide <u>9</u>	Slide <u>9</u> Slide <u>10</u>	5/22/19 Analyst: oup Sample Number: 315 81 Slide 9 Slide Slide 00 100 Slide Slide	5/22/19 Analyst: DF oup Sample Number: 315 8171 Slide 9 Slide Slide 00 100 Slide Slide	Side 9 Slide 10 Slide 10 Slide 10 Slide 10 Slide 10 Slide 10	Side 9 Slide 10 S	oup Sample Number: 315 8171 RJ Lee Group Project Number: Slide 9 Slide Slide <td>Side 9 Slide 10 Slide Slide</td>	Side 9 Slide 10 Slide Slide

Туре	Slide	Slide	Slide	Slide	_ Slide	Slide	Slide	Slide	Total
		-							
Total			1 (1997)						

Туре	Slide	Total							
· · · · · · · · · · · · · · · · · · ·									
Total									

1000

CORJ LEE GROUP Effective Date: March 2019 Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

RJ Lee Grou	mber: 315 19	8172	7-				Comments / # of Layers:	/	Crusher	-		+ : 1000)	×100% = 0
Stereo- scope							# of Preps:	Home	ogenous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple	eochroism L	Indices	of Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
			WCS			1		LM	ΡN		Quartz	Carbonates	Vermiculite
			WCS					LM	PN		Tar	Binder	Opáques
		1	WCS		11 A			LM	PN	LL	Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Re	esults	Asbestos	Non-Asb.	Matrix	Talc Clay Misc Particles	Feldspar Organic Part, Foam	Mica Diatoms Foil

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RJ Lee Group Sample Nu	umber: 3158172	RJ Lee Group Project Number: <u>LLH901997</u>

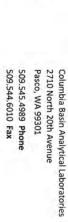
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Washington Columbia Basin Analytical Laboratories 2710 North 20th Avenue Pasco, WA 99301 500 Charles Asson Phone		Name):	ture):	servines "	Name): John H. Yenchike	ture): Muthinghi		2B Aggregate	Sample Description	Invoice per project setup with Drew Van Orden	Fax:			Email:		Andrew Gutshall@LehighHanson.com		Allentown, PA 18195	7660 Imperial Way	Hanson Aggregates Pa, LLC	Andrew Gutshall	Logged in By:	Client No:					
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Request for Environmental and IH Laboratory Analytical Services

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Request for Environmental and IH Laboratory Analytical Services

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Attachment 1

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- A geologist will inspect hand and core samples initially using a stereo binocular microscope, with magnification ranging from 10x to 60x. Using a fine steel pick (dental pick) the geologist will scrape the surface of the suspect mineralization to determine if any of the minerals display typical asbestiform habit and characteristics such as fiber bundles, splayed ends, or matted or fibrous masses.
- Further examination of the sample will then be conducted using the Polarized Light Microscope (PLM) using EPA 600/R-93/116.
- If asbestiform minerals are found, representative samples will be further analyzed by Transmission Electron Microscopy per EPA 600/R-93/116 to confirm mineral identification and morphology.
- Where appropriate, the microscopic PLM and/or TEM analyses will include a count of the asbestiform fibers, representative digital images, and measurements of the width and length dimensions of found fibers counted.

Water samples will be collected as grab samples and will be analyzed by TEM per EPA 100.2.

The samples will be analyzed using the above procedures by RJ Lee Group, which is accredited by the American Industrial Hygiene Association and is in the NIST National Voluntary Laboratory Accreditation Program for asbestos analysis. RJ Lee Group has mineralogical expertise and has vast experience to detect asbestos fibers in the natural environment (e.g. rocks, soils, water, etc.).

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Request for Environmental and IH Laboratory Analytical Services

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Final Laboratory Report TEM Bulk Protocol

Attention: David Raphael K & L Gates 17 North Second Street Harrisburg, PA 17101 US

Method: EPA/R-93/600/116

Report Date:11/14/2019Sample Receipt Date:09/03/2019RJ Lee Group Job No.:LLH901997-14Authorization/P.O. No.:Samples Received:Samples Received:6Client Job No.:6

TABLE 1 -- Weight Percent of Asbestos, Cleavage Fragment Amphibole and Non-Asbestos

			Total S	Structures			Weight <u>Total Str</u> Analytical	ructures	
Client Sample Number	RJLG Sample Number	Chry	Amph	Cleavage	Non Asbestos	Chry	Amph Asb	Amph Cleavage Fragment	Non Asbestos
11	3158157	0	10	9	1	<u>< 1.9E-6</u> 1.9E-6	<u>6.2E-3</u> 2.4E-6	<u>2.2E-2</u> 1.5E-6	<u>2.7E-3</u> 1.4E-6
13	3158159	0	48	39	19	<u>< 1.4E-6</u> 1.4E-6	<u>5.4E-2</u> 1.7E-6	<u>2.7E-1</u> 1.1E-6	<u>5.3E-2</u> 1.0E-6

NOTES

- 1. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
- 2. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA LAP, LLC #100364, NVLAP #101208-0, NY ELAP #10884) facility.
- 3. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
- 4. Density of amphibole: 3.2 * 10⁻³ ng/ µ m³, density of chrysotile: 2.55 * 10⁻³ ng/ µ m³, density of non-asbestos: 3.00 * 10⁻³ ng/ µ m³.
- 5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, Asb-Asbestos Amphibole, Cleavage-Cleavage Amphibole.
- 6. Samples will be held for 90 days and then disposed of per Federal regulations.
- 7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

DISCLAIMER

This report may not be used to claim product endorsement by NVLAP, NY ELAP, AIHA LAP, LLC, or any other regulatory or laboratory accrediting agency. Any reproduction of this document must be in full in order for the report to be valid. This report is not valid unless it bears a RJ Lee Group approved signatory.

RJ Lee Group, Inc.

RJ Lee Group Job No: LLH901997-14 Client Job No/Name:

Final Laboratory Report (cont'd)

Client: Report Date: K & L Gates 11\14\2019

TABLE 1 -- Weight Percent of Asbestos, Cleavage Fragment Amphibole and Non-Asbestos

Total Structures

Weight Percent	
Total Structures	
Analytical Sensitivity	

Client Sample Number	RJLG Sample Number	Chry	Amph	Cleavage	Non Asbestos	Chry	Amph Asb	Amph Cleavage Fragment	Non Asbestos
15	3158161	0	7	6	0	<u>< 4.8E-6</u> 4.8E-6	<u>2.5E-2</u> 6.0E-6	<u>4.2E-2</u> 3.8E-6	<u>< 3.6E-6</u> 3.6E-6
3	3158165	0	0	1	2	<u>< 2.4E-6</u> 2.4E-6	<u>< 3.0E-6</u> 3.0E-6	<u>8.8E-4</u> 1.9E-6	<u>7.7E-4</u> 1.8E-6
5	3158167	0	0	3	1	<u>< 3.2E-6</u> 3.2E-6	<u>< 4.0E-6</u> 4.0E-6	<u>1.6E-3</u> 2.6E-6	<u>3.9E-3</u> 2.4E-6
8	3158170	0	0	1	1	<u>< 4.8E-6</u> 4.8E-6	<u>< 6.0E-6</u> 6.0E-6	<u>2.0E-3</u> 3.8E-6	<u>3.0E-2</u> 3.6E-6

NOTES

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RJ Lee Group, Inc.

RJ Lee Group Job No: LLH901997-14 Client Job No/Name:

Final Laboratory Report (cont'd)

Client: Report Date: K & L Gates 11\14\2019

TABLE 2 -- Weight Percent of Asbestos, Cleavage Fragment Amphibole and Non-Asbestos 5 µ m

						Weight Percent <u>Structures 5_μm</u> Analytical Sensitivity				
			Structures	5 µm	-	Amphibole				
Client Sample Number	RJLG Sample Number	Chry	Amph	Cleavage	Non-Asbestos	Chry	Asb	Cleavage Fragment	Non-Asbestos	
11	3158157	0	1	1	0	<u>< 1.9E-5</u> 1.9E-5	<u>4.8E-3</u> 2.4E-5	<u>1.5E-2</u> 1.5E-5	<u>< 1.4E-5</u> 1.4E-5	
13	3158159	0	27	2	4	<u>< 1.4E-5</u> 1.4E-5	<u>5.0E-2</u> 1.7E-5	<u>2.5E-1</u> 1.1E-5	<u>3.6E-2</u> 1.0E-5	
15	3158161	0	4	1	0	<u>< 4.8E-5</u> 4.8E-5	<u>1.6E-2</u> 6.0E-5	<u>3.0E-2</u> 3.8E-5	<u>< 3.6E-5</u> 3.6E-5	
3	3158165	0	0	0	0	<u>< 2.4E-5</u> 2.4E-5	<u>< 3.0E-5</u> 3.0E-5	<u>< 1.9E-5</u> 1.9E-5	<mark>< 1.8E-5</mark> 1.8E-5	
5	3158167	0	0	0	0	<u>< 3.2E-5</u> 3.2E-5	<u>< 4.0E-5</u> 4.0E-5	<u>< 2.6E-5</u> 2.6E-5	<mark>< 2.4E-5</mark> 2.4E-5	
8	3158170	0	0	0	1	<u>< 4.8E-5</u> 4.8E-5	<u>< 6.0E-5</u> 6.0E-5	<u>< 3.8E-5</u> 3.8E-5	<u>3.0E-2</u> 3.6E-5	

NOTES

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RJ Lee Group, Inc.

RJ Lee Group Job No: LLH901997-14 Client Job No/Name:

Final Laboratory Report (cont'd)

K & L Gates

11\14\2019

Client: Report Date:

Client Sample Number	RJLG Sample Number	Material Used (gm)	Area Analyzed Total (mm²)	Area Analyzed 5µm (mm²)	Effective Filter Area (mm²)	Dilution Factor
11	3158157	0.0005	0.31704	0.31704	1220	1.0
13	3158159	0.0007	0.31704	0.31704	1220	1.0
15	3158161	0.0002	0.31704	0.31704	1220	1.0
3	3158165	0.0004	0.31704	0.31704	1220	1.0
5	3158167	0.0003	0.31704	0.31704	1220	1.0
8	3158170	0.0002	0.31704	0.31704	1220	1.0

Authorized Signature:

Monn / Shipoeone

Monica McGrath-Koerner, Scientist

NOTES

- 1. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
- 2. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA LAP, LLC #100364, NVLAP #101208-0, NY ELAP #10884) facility.
- 3. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
- 4. Density of amphibole: 3.2 * 10⁻³ ng/ µ m³, density of chrysotile: 2.55 * 10⁻³ ng/ µ m³, density of non-asbestos: 3.00 * 10⁻³ ng/ µ m³.
- 5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, Asb-Asbestos Amphibole. Cleavage-Cleavage Amphibole.
- 6. Samples will be held for 90 days and then disposed of per Federal regulations.
- 7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

DISCLAIMER

This report may not be used to claim product endorsement by NVLAP, NY ELAP, AIHA LAP, LLC, or any other regulatory or laboratory accrediting agency. Any reproduction of this document must be in full in order for the report to be valid. This report is not valid unless it bears a RJ Lee Group approved signatory.

RJ Lee Group, Inc. TEM Count Sheet

RJL: LLH901997-14	3158157.HTA2	Microscope tem2000fx1	Grid Openings	10
11	K & L Gates	Magnification 21 KX	Asbestos	9.0
Wt: 0.0005 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	0.0
Dil: 1.	Filter Size: 47 mm	Operator: Jon Swope	Nonasbestos	10.0
HQ44614		Cv = 0.89	Nonasbestos >= 5µm	1.0
			% Wt of largest asbestos	%
			structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1	1	1.95	0.05	Amphibole	F	MgSiCaFe	15649C	Image1	Х	Acti	Asb
1	2	1.95	0.05	Amphibole	В	MgSiCaFe	15650C	Image2 Image3 Image4	Diff1	Acti	Asb
1	3	2.3	0.25	Amphibole		MgSiCaFe	15651C	Image5	Diff2	Acti	Cle
1	4	1.85	0.2	Amphibole		MgSiCaFe		Image6	Х	Acti	Cle
1	5	2.3	0.18	Amphibole		MgSiCaFe		Image7	Х	Acti	Cle
1	6	2.5	0.22	Amphibole	В	MgSiCaFe	15652C	Image8 Image9	Diff3	Acti	Asb
2	1	3.45	0.05	Amphibole	F	MgSiCaFe		Image10	Х	Acti	Asb
3	1	2.8	0.06	Amphibole	F	MgSiCaFe		Image11	Х	Acti	Asb
4	1	3.22	0.46	Amphibole		MgSiCaFe		Image12 Image13		Acti	Cle
4	2	3.3	0.06	Amphibole	F	MgSiCaFe		Image14	Х	Acti	Asb
5	1	1.15	0.08	Amphibole		MgSiCaFe		Image15	Х	Acti	Cle
5	2	2.45	0.1	Amphibole	F	MgSiCaFe	15653C	Image16	Diff4	Acti	Asb
6	1	2.9	0.3	Amphibole		MgSiCaFe		Image17	X	Acti	Cle
7	1	3.2	0.46	Non-Asbestos		AlSiCaFeNa	1 5654C	Image18	Х		
7	2	7.1	0.7	Amphibole		MgSiCaFe		Image19	Х	Acti	Cle
8	1	0.95	0.1	Amphibole		MgSiCaFe		Image20	Х	Acti	Cle
9				ŃSD		•					
10	1	3.75	0.4	Amphibole		MgSiCaFeA	15655C	Image21	Х	Acti	Cle
10	2	1.5	0.05	Amphibole	F	MgSiCaFe		Image22	Х	Acti	Asb
10	3 10%	2.5 Particulate	0.1	Amphibole	F	MgSiCaFe		Image23	Х	Acti	Asb

Analyst's Comments: N/A Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/8/2019 1:18:07 PM approve by Jon Swope Final Review: 9/10/2019 9:40:00 AM approve by Monica Mcgrath

RJ Lee Group, Inc. TEM Count Sheet

RJL: LLH901997-14	3158157.HTA2	Microscope tem2000fx1	Grid Openings	25
11	K & L Gates	Magnification 10 KX	Asbestos	1.0
Wt: 0.0005 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Nonasbestos	0.0
Dil: 1.	Filter Size: 47 mm	Operator: Jon Swope	% Wt of largest asbestos	%
HQ44614		Cv = 0.038	structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1 2 3 4 5 6 7 8				NSD NSD NSD NSD NSD NSD NSD NSD							
9				NSD							
10	4	0.4	0.45	NSD Amabibala	Р		450500		D:#4	∧ at:	1 a b
11 12	1	9.1	0.45	Amphibole NSD	В	MgSiCaFe	-12020C	imager	Diff1	Acti	Asb
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25				NSD							
		Particulate									
		yst's Cor		: N/A Ister B - Bundle M	L-Matrix C	e - Cleavago	Ach - Achoo	tiform Buc	- Byssolit	2	

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/8/2019 2:41:51 PM approve by Jon Swope Final Review: 9/10/2019 9:40:00 AM approve by Monica Mcgrath

RJL: LLH901997-14	3158159.HTA1	Microscope tem1200_2	Grid Openings	10
13	K & L Gates	Magnification 21 KX	Asbestos	36.0
Wt: 0.0007 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	15.0
Dil: 1.0	Filter Size: 47 mm	Operator: Ashleigh Sload	Nonasbestos	54.0
HQ44614		Cv = 3.44	Nonasbestos >= 5µm	2.0
			% Wt of largest asbestos	%
			structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1	1	15.9	0.4	Amphibole	В	MgSiCaFe1	5642C	Image1 Image2 Image3	Diff1	Acti	Asb
1	2	2.8	0.5	Non-Asbestos		MgAlSiFe 1	5643C	Image4	Х		
1	3	1.38	0.2	Amphibole		MgSiCaFe		Image5	Х	Acti	Cle
1	4	0.9	0.12	Non-Asbestos		MgAlSiFe			Х		
1	5	1.12	0.12	Non-Asbestos		MgAlSiFe			Х		
1	6	3.68	0.1	Amphibole	F	MgSiCaFe		Image6	Х	Acti	Asb
1	7	3.22	0.6	Amphibole		MgSiCaFe		Image7	Х	Acti	Cle
1	8	2.9	0.05	Amphibole	Μ	MgSiCaFe		Image8	Х	Acti	Asb
1	9	1.84	0.15	Amphibole		MgSiCaFe		Image9	Х	Acti	Cle
1	10	2.3	0.7	Non-Asbestos		MgAlSiFe			Х		
2	1	2.45	0.25	Non-Asbestos		MgAlSiFe			Х		
2	2	3.22	0.05	Amphibole	F	MgSiCaFe		Image10	Х	Acti	Asb
2	3	9.89	0.05	Amphibole	F	MgSiCaFe		Image11	Х	Acti	Asb
2	4	1.84	0.05	Amphibole	F	MgSiCaFe		Image12		Acti	Asb
2	5	2.99	0.25	Amphibole	В	MgSiCaFe			Х	Acti	Asb
2	6	10.1	0.12	Amphibole	В	MgSiCaFeA	l5644C	Image13	Diff2	Acti	Asb
2	7	3.45	0.66	Non-Asbestos		MgAlSiFe			Х		
2	8	3.91	0.45	Amphibole		MgSiCaFe		Image14	Х	Acti	Cle
2	9	5.98	0.18	Amphibole	В	MgSiCaFe			Х	Acti	Asb
2	10	2.64	0.25	Amphibole		MgSiCaFe		Image15		Acti	Cle
2	11	1.15	0.12	Amphibole		MgSiCaFe			Х	Acti	Cle
3	1	3.33	0.25	Non-Asbestos		AlSiFe 1	5645C	Image16			
3	2	4.37	0.15	Amphibole	В	MgSiCaFe			Х	Acti	Asb
3	3	12.2	0.12	Amphibole	F	MgSiCaFe			Х	Acti	Asb
3	4	2.4	0.15	Amphibole		MgSiCaFe			Х	Acti	Cle
3	5	1.5	0.15	Amphibole		MgSiCaFe			Х	Acti	Cle
3	6	13.6	0.1	Amphibole	М	MgSiCaFe			Х	Acti	Asb
3	7	2.3	0.05	Amphibole	F	MgSiCaFe			Х	Acti	Asb
3	8	15.2	0.05	Amphibole	F	MgSiCaFe			Х	Acti	Asb
3	9	2.3	0.18	Amphibole		MgSiCaFe			Х	Acti	Cle
3	10	8.51	0.15	Amphibole	F	MgSiCaFe			Х	Acti	Asb
4	1	2.5	0.05	Amphibole	F	MgSiCaFe			Х	Acti	Asb
4	2	2.05	0.35	Amphibole		MgSiCaFe1	5646C	Image17		Acti	Cle
4	3	2.1	0.25	Amphibole		MgSiCaFe			Х	Acti	Cle
4	4	2.99	0.25	Amphibole		MgSiCaFe			Х	Acti	Cle
4	5	2.7	0.12	Amphibole	В	MgSiCaFe			Х	Acti	Asb
4	6	3.91	0.05	Amphibole	F	MgSiCaFe			Х	Acti	Asb
4	7	1.84	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
4	8	7.45	0.2	Amphibole	F	MgSiCaFe			Х	Acti	Asb
4	9	2.76	0.3	Non-Asbestos		MgAlSiCaF	5647C	Image18	Х		
4	10	8.05	0.05	Amphibole	F	MgSiCaFe			Х	Acti	Asb
4	11	1.61	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle

RJL: LLH901997-14	3158159.HTA1	Microscope tem1200_2	Grid Openings	10
13	K & L Gates	Magnification 21 KX	Asbestos	36.0
Wt: 0.0007 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	15.0
Dil: 1.0	Filter Size: 47 mm	Operator: Ashleigh Sload	Nonasbestos	54.0
HQ44614		Cv = 3.44	Nonasbestos >= 5µm	2.0
			% Wt of largest asbestos	%
			structure	

Field	Fiber	Length	Width	FiberType	Morph		File #	Photo	SAED	AmpID	C/A
5	1	3.22	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
5	2	1.9	0.15	Amphibole		MgSiCaFe			Х	Acti	Cle
5	3	1.15	0.1	Amphibole		MgSiCaFe			Х	Acti	Cle
5	4	12.88	2.3	Amphibole		MgAlSiCaFe	5648C	Image19	Diff5	Horn	Cle
5	5	1.84	0.2	Amphibole		MgAlSiCaFe			Х	Horn	Cle
5	6	0.8	0.15	Amphibole		MgSiCaFe			Х	Acti	Cle
5	7	1.15	0.1	Amphibole		MgSiCaFe			Х	Acti	Cle
6	1	1.84	0.15	Non-Asbestos		AlSiFe			Х		
6	2	1.61	0.2	Amphibole		MgSiCaFe		Image20	Х	Acti	Cle
6	3	2.88	0.5	Non-Asbestos		AlSiFe			Х		
6	4	3.22	0.08	Amphibole	F	MgSiCaFe		Image21	Х	Acti	Asb
6	5	6.65	0.12	Amphibole	FΝ	∕lgSiCaFeAl₩	5661C	Image22	Diff6	Acti	Asb
6	6	1.7	0.15	Non-Asbestos		AlSiFe			Х		
6	7	2.1	0.3	Amphibole		MgSiCaFe			Х	Acti	Cle
6	8	2.3	0.1	Amphibole	F	MgSiCaFe			Х	Acti	Asb
6	9	5.1	0.05	Amphibole	F	MgSiCaFe			Х	Acti	Asb
6	10	3.45	0.12	Amphibole	В	MgSiCaFe			Х	Acti	Asb
6	11	1.45	0.25	Amphibole		MgSiCaFe			Х	Acti	Cle
6	12	4.83	0.6	Amphibole		MgAlSiCaFe			Х	Horn	Cle
7	1	1.15	0.1	Non-Asbestos		AlSiFe			Х		
7	2	1.61	0.3	Amphibole		MgSiCaFe			Х	Acti	Cle
7	3	2.64	0.35	Non-Asbestos		AlSiFeMg			Х		
7	4	5.98	0.4	Amphibole	В	MgSiCaFe			Х	Acti	Asb
7	5	7.82	0.2	Amphibole	F	MgSiCaFe			Х	Acti	Asb
8	1	2.64	0.15	Amphibole	F	MgSiCaFe1	5662C	Image23	Diff7	Acti	Asb
8	2	2.53	0.05	Amphibole	F	MgSiCaFe		U		Acti	Asb
8	3	2.99	0.35	Non-Asbestos		ĂlSiFe			Х		
8	4	2.99	0.5	Amphibole		MgAlSiCaFe			Х	Horn	Cle
8	5	1.4	0.15	Amphibole		MgSiCaFe			Х	Acti	Cle
8	6	0.9	0.1	Amphibole		MgSiCaFe			Х	Acti	Cle
8	7	2.3	0.1	Amphibole	F	MgSiCaFe			Х	Acti	Asb
8	8	3.45	0.6	Amphibole		MgSiCaFeAl	5663C	Image24	Diff8	Acti	Cle
8	9	3.22	0.05	Amphibole	F	MgSiCaFeAl		U	Х	Acti	Asb
8	10	1.5	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
9	1	0.9	0.15	Amphibole		MgSiCaFe			Х	Acti	Cle
9	2	8.7	0.35	Amphibole	В	MgSiCaFe			Х	Acti	Asb
9	3	2.76	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
9	4	2.02	0.1	Amphibole		MgSiCaFe			Х	Acti	Cle
9	5	1.84	0.05	Amphibole	F	MgSiCaFe			Х	Acti	Asb
9	6	1.35	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
10	1	3.91	0.2	Amphibole	F	MgSiCaFe			Х	Acti	Asb
10									Х		
	2	1.84	0.05	Ampnibole	F	музісаге			~	Acti	A20
10	2 3	1.84 2.5	0.05 0.35	Amphibole Non-Asbestos	F	MgSiCaFe AlSiFe			x	ACII	Asb

RJL: LLH901997-14	3158159.HTA1	Microscope tem1200_2	Grid Openings	10
13	K & L Gates	Magnification 21 KX	Asbestos	36.0
Wt: 0.0007 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	15.0
Dil: 1.0	Filter Size: 47 mm	Operator: Ashleigh Sload	Nonasbestos	54.0
HQ44614		Cv = 3.44	Nonasbestos >= 5µm	2.0
			% Wt of largest asbestos	%
			structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
10	5	1.2	0.15	Amphibole		MgSiCaFe	e		Х	Acti	Cle
10	6	1.85	0.15	Amphibole		MgSiCaFe	Э		Х	Acti	Cle
10	7	9.66	1.4	Amphibole	Ν	IgAlSiCaF	e		Х	Horn	Cle
10	8	0.9	0.15	Amphibole		MgSiCaFe	Э		Х	Acti	Cle
	400/	D = ""		-		-					

12% Particulate

Analyst's Comments: Sample Analayzed on TEM-2000i Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/6/2019 2:40:26 PM approve by Ashleigh Sload Final Review: 9/10/2019 9:40:00 AM approve by Monica Mcgrath

RJL: LLH901997-14	3158159.HTA1	Microscope tem2000fx1	Grid Openings	25
13	K & L Gates	Magnification 10 KX	Asbestos	12.0
Wt: 0.0007 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Nonasbestos	4.0
Dil: 1.0	Filter Size: 47 mm	Operator: Ashleigh Sload	% Wt of largest asbestos	%
HQ44614		Cv = 0.41	structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1 2 3 4 5 6	1	8.2	1.6	Non-Asbestos NSD NSD NSD NSD NSD		MgAlSiFe	15637C	Image1	Diff1		
7	1	8.9	0.1	Amphibole	F	MgSiCaFe	15639C	Image2	Diff3 Diff4	Acti	Asb
8	1	12.6	0.1	Amphibole	В	MgSiCaFe		Image3 Image4 Image5	Х	Acti	Asb
8 9	2	7.4	0.22	Amphibole NSD	F	MgSiCaFe	15640C	Image6	Diff5	Acti	Asb
10	1	6.3	0.36	Amphibole	В	MgSiCaFe		Image7	Х	Acti	Asb
10 11	2	7.7	0.1	Amphibole NSD	F	MgSiCaFe		Image8	Х	Acti	Asb
12	1	8.8	0.15	Amphibole	F	MgSiCaFe		Image9	Х	Acti	Asb
12	2	5.4	0.54	Non-Asbestos	_	MgAlSiFe			Х		
13	1	7.2	0.2	Amphibole	F	MgSiCaFe		Image10		Acti	Asb
14	1	7.7	0.27	Amphibole	F	MgSiCaFe	15641C	Image11	Diff6 Diff7	Acti	Asb
15 16 17 18 19	1 1	9.9 10.8	0.9 0.1	Non-Asbestos Amphibole NSD NSD NSD	F	MgAlSiFe MgSiCaFe		Image12	X X	Acti	Asb
20	1	8.1	0.4	Non-Asbestos		MgAlSiFe			Х		
21	1	18.2	0.45	Amphibole	В	MgSiCaFe		Image14 Image15	Х	Acti	Asb
22 23 24	1	7.7	0.4	Amphibole NSD NSD	В	MgSiCaFe		Image16	Х	Acti	Asb
25	1 12%	17.3 Particulate	0.45	Amphibole	F	MgSiCaFe		Image17	Х	Acti	Asb

Analyst's Comments: N/A Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/6/2019 10:37:59 AM approve by Ashleigh Sload Final Review: 9/10/2019 9:40:00 AM approve by Monica Mcgrath

RJL: LLH901997-14	3158161.HTA2	Microscope tem1200_2	Grid Openings	10
15	K & L Gates	Magnification 20 KX	Asbestos	5.0
Wt: 0.0002 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	2.0
Dil: 1.	Filter Size: 47 mm	Operator: Jon Swope	Nonasbestos	6.0
HQ44614		Cv = 0.45	Nonasbestos >= 5µm	1.0
			% Wt of largest asbestos	%
			structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1	1	2.1	0.06	Amphibole	F	MgSiCaFe	19424B	Image1	Diff1	Acti	Asb
2	1	1.12	0.18	Amphibole		MgSiCaFe		Image2	Х	Acti	Cle
3	1	6.5	0.66	Amphibole		MgSiCaFe	19425B	Image3	Diff2	Acti	Cle
4	1	1.35	0.12	Amphibole		MgSiCaFe		Image4	Х	Acti	Cle
5				NSD		-					
6				NSD							
								Image5			
7	1	5.1	0.4	Amphibole	В	MgSiCaFe	19426B	Image6	Diff3	Acti	Asb
	_				_			Image7			
7	2	1.8	0.18	Amphibole	В	MgSiCaFe		Image8	Х	Acti	Asb
8	1	4.7	0.4	Amphibole		MgSiCaFe		Image9	Х	Acti	Cle
9	1	3.95	0.35	Amphibole	В	MgSiCaFe		Image10) Х	Acti	Asb
9	2	2.5	0.33	Amphibole		MgSiCaFe		Image11	Х	Acti	Cle
10	1	2.8	0.18	Amphibole		MgSiCaFe		Image12	2 X	Acti	Cle
10	2	11.1	0.08	Amphibole	F	MgSiCaFe	19427B	Image13	B Diff4	Acti	Asb
	10%	Particulate		-		-					

Analyst's Comments: N/A

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/8/2019 12:54:52 PM approve by Jon Swope Final Review: 9/10/2019 9:41:00 AM approve by Monica Mcgrath

RJL: LLH901997-14	3158161.HTA2	Microscope tem1200_2	Grid Openings	25
15	K & L Gates	Magnification 10 KX	Asbestos	2.0
Wt: 0.0002 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Nonasbestos	0.0
Dil: 1.	Filter Size: 47 mm	Operator: Jon Swope	% Wt of largest asbestos	%
HQ44614		Cv = 0.074	structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1 2 3 4 5 6 7 8 9				NSD NSD NSD NSD NSD NSD NSD NSD							
10	1	5.2	0.12	Amphibole	F	MgSiCaFe		Image1		Acti	Asb
11 12	1	7.4	0.08	Amphibole NSD	F	MgSiCaFe	3	Image2	Х	Acti	Asb
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25				NSD							
		Particulate									
		yst's Cor		: N/A Ister B - Bundle M	1 - Matrix C	le - Cleavago	Ach - Achoo	tiform Bye	- Byseolit	2	

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/8/2019 2:27:48 PM approve by Jon Swope Final Review: 9/10/2019 9:41:00 AM approve by Monica Mcgrath

RJL: LLH901997-14	3158165.HTA1	Microscope tem2000fx1	Grid Openings	10
3	K & L Gates	Magnification 21 KX	Asbestos	0.0
Wt: 0.0004 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	0.0
Dil: 1.0	Filter Size: 47 mm	Operator: Jon Swope	Nonasbestos	3.0
HQ44614		Cv = 0	Nonasbestos >= 5µm	0.0
			% Wt of largest asbestos	%
			structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2				NSD							
3	1	1.15	0.1	Non-Asbestos		MgSiCaFe	15657C	Image1	Diff1	CPX	
4				NSD							
5	1	3.45	0.22	Amphibole		MgSiCaFe/	415658C	Image2	Diff2	Acti	Cle
6				NSD							
7				NSD							
8				NSD							
9	1	3.5	0.2	Non-Asbestos		MgSiCaFe	15659C	Image3	Diff3 Diff4	CPX	
10				NSD							
	10%	Particulate									

Analyst's Comments: N/A Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/8/2019 4:16:22 PM approve by Jon Swope Final Review: 9/10/2019 9:41:00 AM approve by Monica Mcgrath

RJL: LLH901997-14	3158165.HTA1	Microscope tem2000fx1	Grid Openings	25
3	K & L Gates	Magnification 10 KX	Asbestos	0.0
Wt: 0.0004 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Nonasbestos	0.0
Dil: 1.0	Filter Size: 47 mm	Operator: Jon Swope	% Wt of largest asbestos	%
HQ44614		Cv = 0	structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2				NSD							
3				NSD							
4				NSD							
5				NSD							
6				NSD							
7				NSD							
8				NSD							
9				NSD							
10				NSD							
11				NSD							
12				NSD							
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25	100/	Dortioulate		NSD							
		Particulate		- NI/A							
	Anal	yst's Cor	mients	. IN/A							

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/8/2019 4:18:43 PM approve by Jon Swope Final Review: 9/10/2019 9:41:00 AM approve by Monica Mcgrath

structure

RJL: LLH901997-14	3158167.HTA1	Microscope tem2000fx1	Grid Openings	10
5	K & L Gates	Magnification 21 KX	Asbestos	0.0
Wt: 0.0003 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	0.0
Dil: 1.0	Filter Size: 47 mm	Operator: Jon Swope	Nonasbestos	4.0
HQ44614		Cv = 0	Nonasbestos >= 5µm	0.0
			% Wt of largest asbestos	%

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1	1	1.8	0.2	Amphibole		MgSiCaFe	A115660C	Image1	Diff1	Acti	Cle
2				ŃSD		C					
3	1	1.65	0.1	Amphibole		MgAlSiCa	-@ 5667C	Image2	Diff2	Horn	Cle
4	1	2.85	0.45	Non-Asbestos		MgAlSiCal	-@ 5668C	Image3	Diff3	CPX	
4	2	2.4	0.25	Amphibole		MgSiCaF	е	Image4	Х	Acti	Cle
5				NSD							
6				NSD							
7				NSD							
8				NSD							
9				NSD							
10				NSD							
	10%	Particulate									

10% Particulate

Analyst's Comments: N/A Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/8/2019 4:37:43 PM approve by Jon Swope Final Review: 9/10/2019 9:41:00 AM approve by Monica Mcgrath

RJL: LLH901997-14	3158167.HTA1	Microscope tem2000fx1	Grid Openings	25
5	K & L Gates	Magnification 10 KX	Asbestos	0.0
Wt: 0.0003 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Nonasbestos	0.0
Dil: 1.0	Filter Size: 47 mm	Operator: Jon Swope	% Wt of largest asbestos	%
HQ44614		Cv = 0	structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2				NSD							
3				NSD							
4				NSD							
5				NSD							
6				NSD							
7				NSD							
8				NSD							
9				NSD							
10				NSD							
11				NSD							
12				NSD							
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25		-		NSD							
		Particulate		N1/A							
		yst's Cor		: N/A uster B - Bundle N	A Motrix Clo	Cloavego	Ach Achoo	tiform Duo	Pusselit	<u>^</u>	

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/9/2019 12:07:41 PM approve by Jon Swope Final Review: 9/10/2019 9:41:00 AM approve by Monica Mcgrath

RJL: LLH901997-14	3158170.HTA2	Microscope tem2000fx1	Grid Openings	10
8	K & L Gates	Magnification 21 KX	Asbestos	0.0
Wt: 0.0002 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	0.0
Dil: 1.	Filter Size: 47 mm	Operator: Ashleigh Sload	Nonasbestos	2.0
HQ44614		Cv = 0	Nonasbestos >= 5µm	1.0
			% Wt of largest asbestos	%
			structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2				NSD							
3				NSD							
4				NSD							
5				NSD							
6	1	2.99	0.25	Amphibole	ſ	MgSiCaFeA	15664C	Image1	Diff1	Acti	Cle
7				NSD							
8	1	5.98	0.7	Non-Asbestos		NaAlSiCa	15665C	Image2	Diff2		
9				NSD							
10				NSD							
	7% P	articulate									

Analyst's Comments: N/A Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 9/9/2019 10:25:46 AM approve by Ashleigh Sload Final Review: 9/10/2019 9:41:00 AM approve by Monica Mcgrath

RJL: LLH901997-14	3158170.HTA2	Microscope tem2000fx1	Grid Openings	25
8	K & L Gates	Magnification 10 KX	Asbestos	0.0
Wt: 0.0002 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Nonasbestos	0.0
Dil: 1.	Filter Size: 47 mm	Operator: Ashleigh Sload	% Wt of largest asbestos	%
HQ44614		Cv = 0	structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2				NSD							
3				NSD							
4				NSD							
5				NSD							
6				NSD							
7				NSD							
8				NSD							
9				NSD							
10				NSD							
11				NSD							
12				NSD							
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25				NSD							
		articulate									
		yst's Cor		: N/A			A		Duranti	_	

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

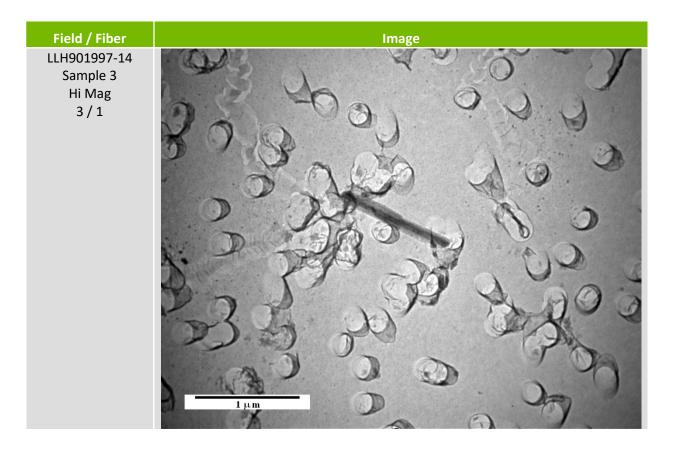
Initial Review: 9/9/2019 10:00:43 AM approve by Ashleigh Sload Final Review: 9/10/2019 9:41:00 AM approve by Monica Mcgrath



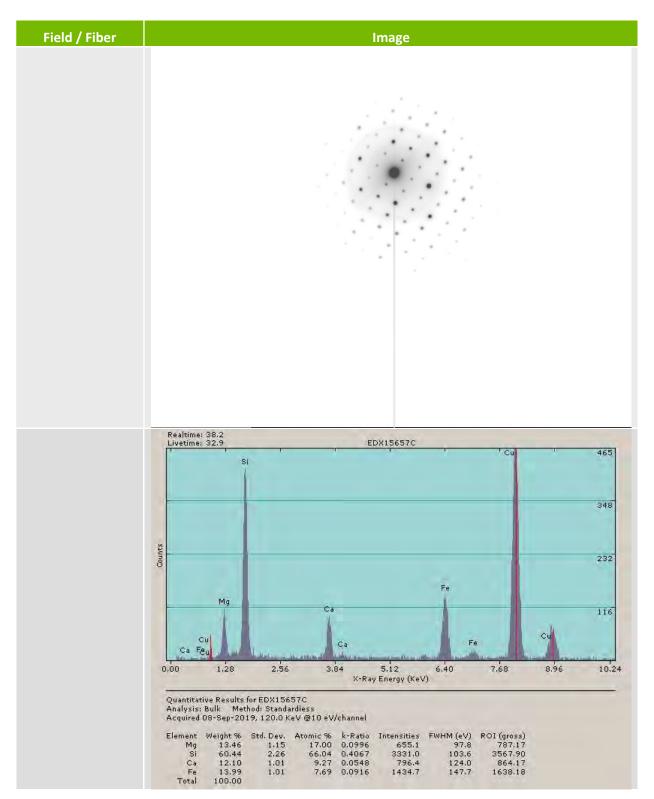
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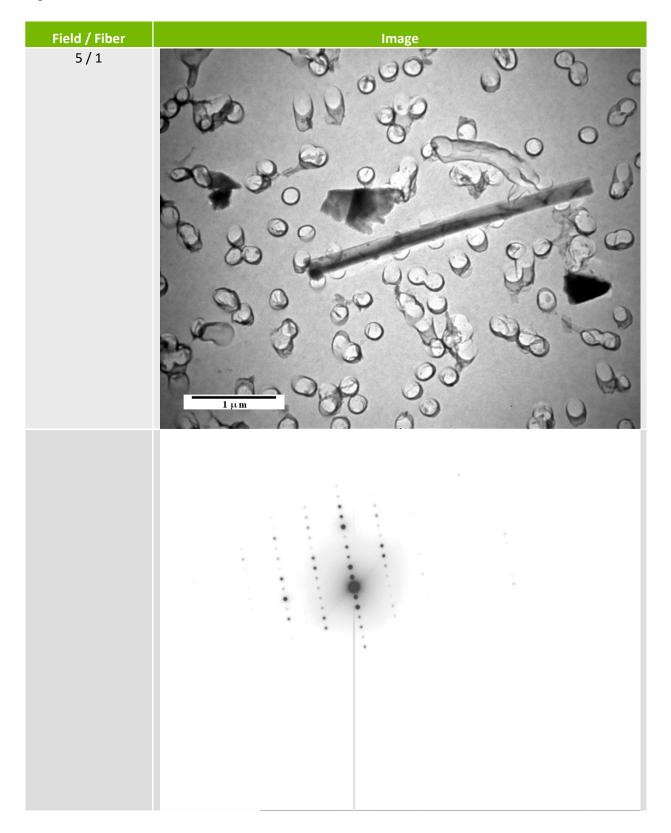
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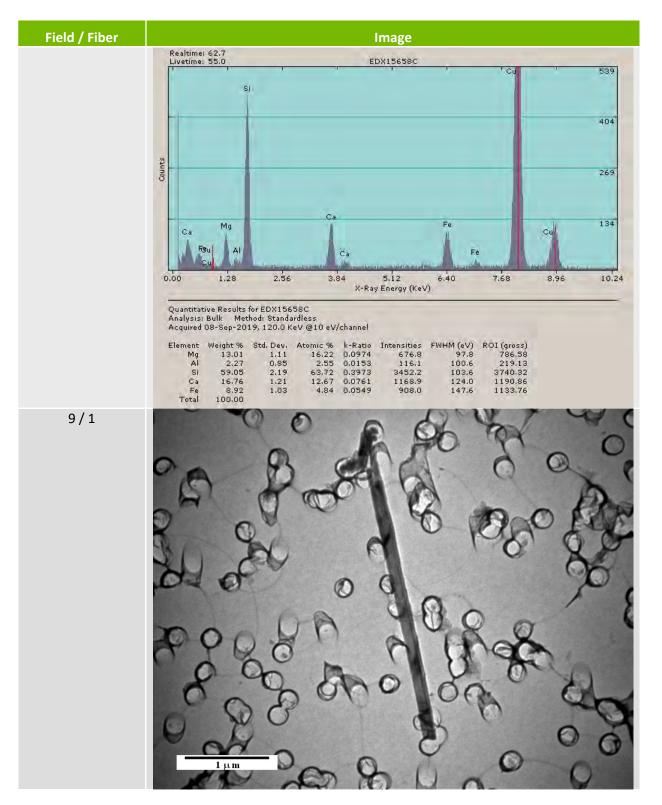
Analysis of Samples 3, 5, 8, 11, 13, and 15



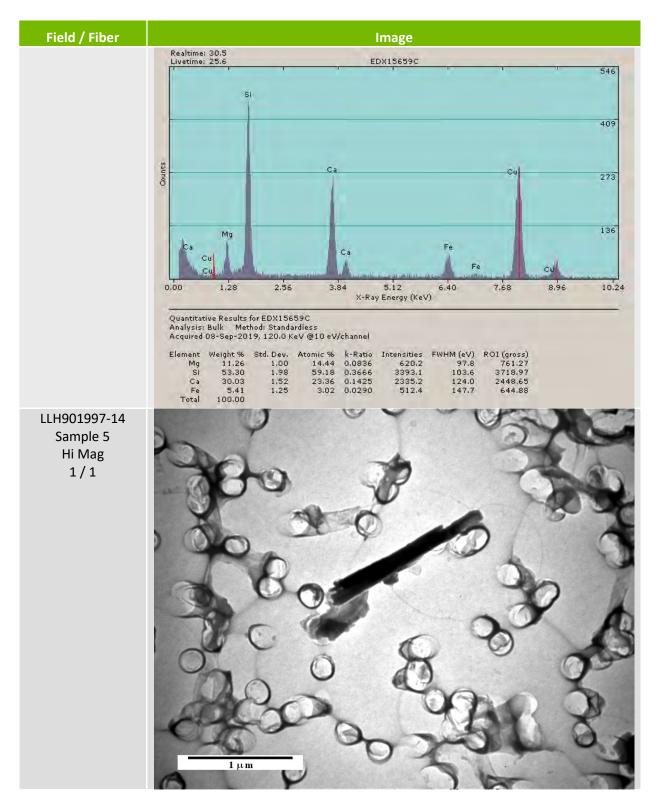
350 Hochberg Road, Monroeville PA 15146 | P 724.325.1776 F 724.733.1799



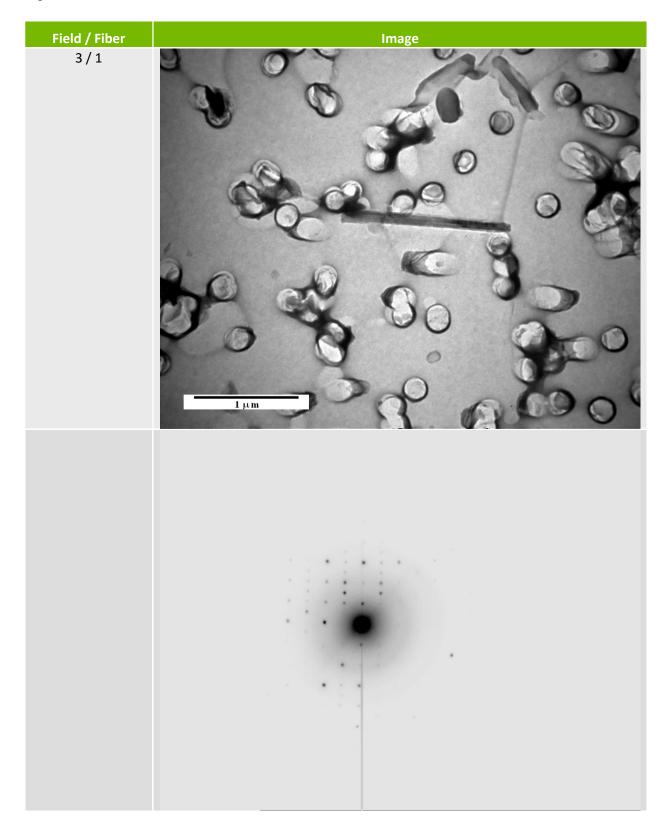


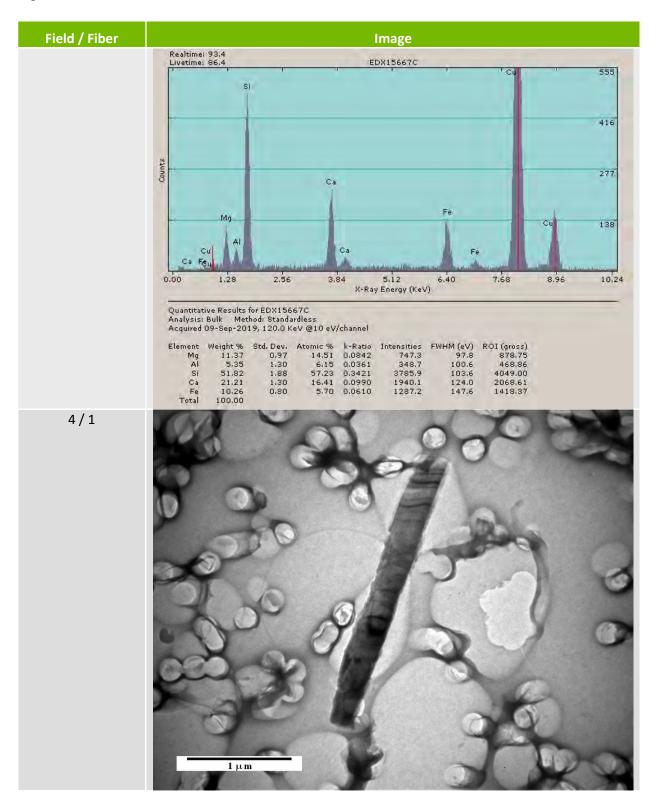


Field / Fiber	Image

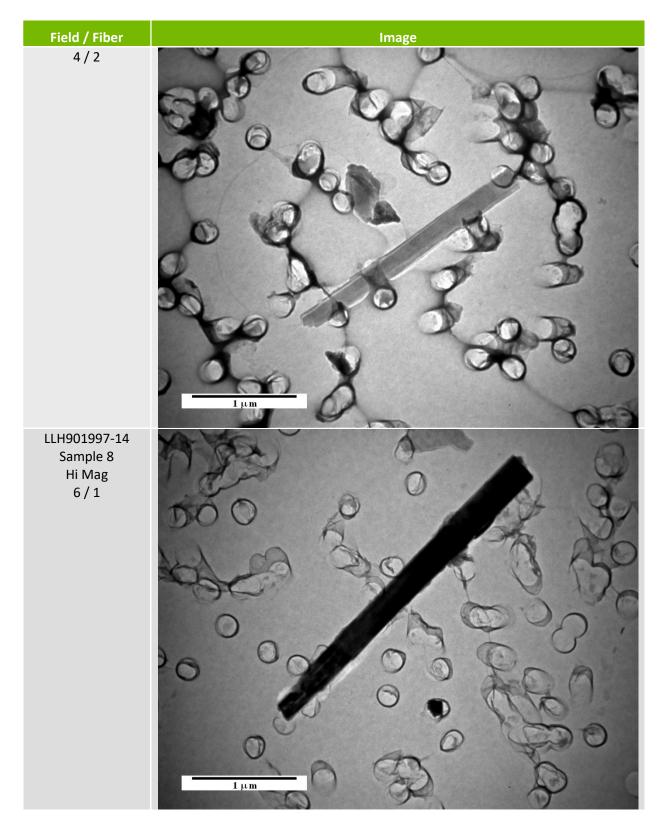


Field / Fiber	Image	
	Realtime: 15.9 Livetime: 13.2 EDX15660C	679
		509
	Counts	339
	Mg Ca Fe Cu Cu Al Ca Feu	169
	0.00 1.28 2.56 3.84 5.12 6.40 7.68 8.96 X-Ray Energy (KeV)	10.24
	Quantitative Results for EDX15660C Analysis: Bulk Method: Standardless Acquired 08-Sep-2019, 120.0 KeV @10 eV/channel	
	Element Weight % Std. Dev. Atomic % k-Ratio Intensities FWHM (eV) ROI (gross) Mg 15.53 1.17 19.13 0.1168 1062.8 97.8 1168.78 Al 3.91 1.15 4.34 0.0262 259.6 100.5 365.90 Si 57.49 2.03 61.27 0.3794 4311.6 103.6 4606.37 Ca 13.76 1.03 10.28 0.0595 1288.7 147.6 1485.21 Total 100.00	

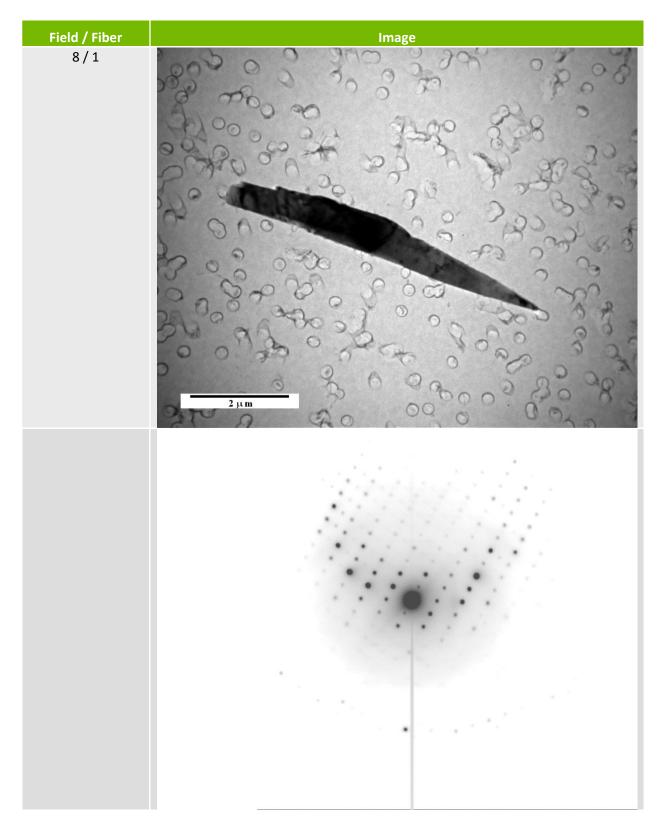


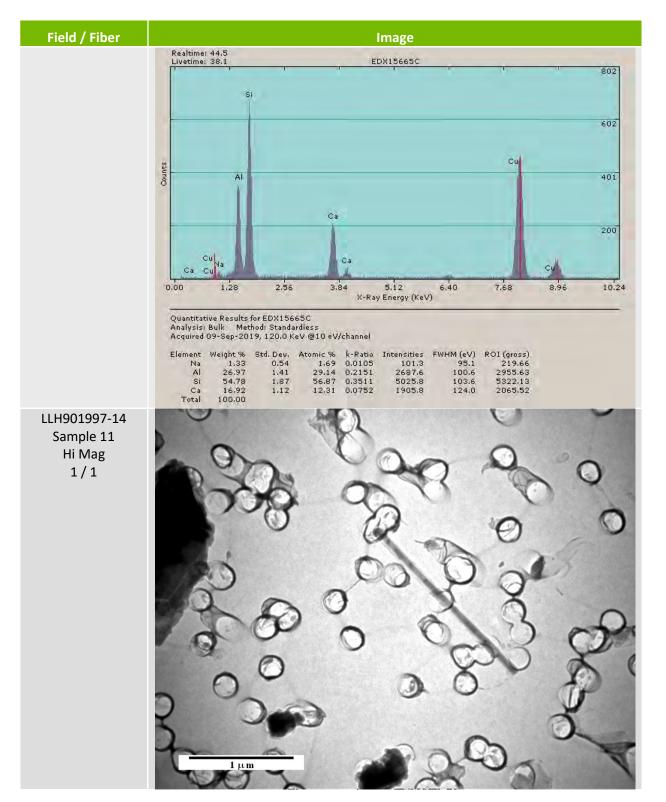


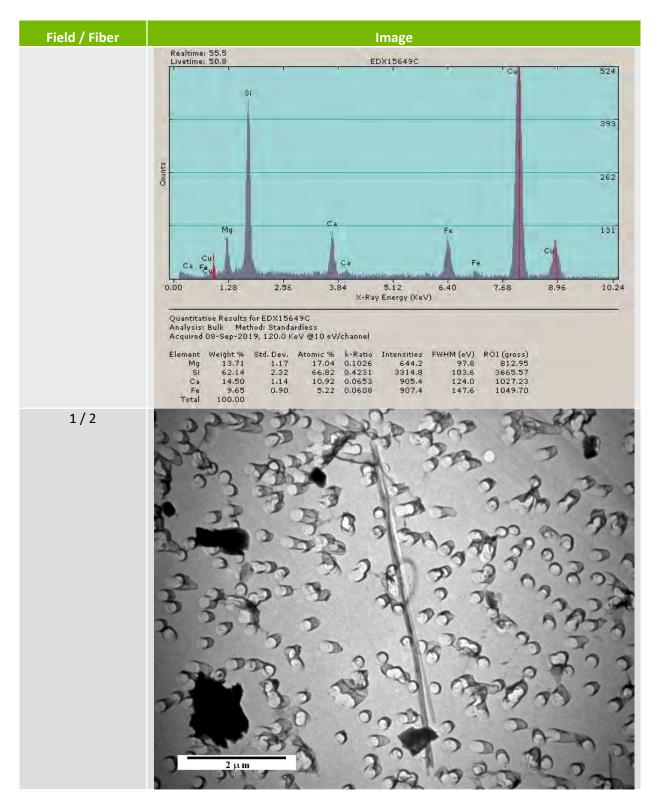
Field / Fiber	Image
	Realtime: 62.6 Livetime: 54.6 EDX15668C 11118
	Si 838 559
	Ca Mg Fe 279 Cu Al Ca Fe Cu
	0.00 1.28 2.56 3.84 5.12 6.40 7.68 8.96 10.24 X-Ray Energy (KeV)
	Analysis: Bulk Method: Standardless Acquired 09-Sep-2019, 120.0 KeV @10 eV/channel Element Weight % Mg 13.34 1.00 10 16.80 0.0994 1239.1 97.8 1429.10 Al 2.85 0.93 3.24 0.0192 260.2 100.6 41 2.85 0.93 3.24 0.0192 53 54.76 1.82 59.70 0.3651 5681.9 103.6 6001.98 Ca 20.14 1.20 15.38 0.0931 2563.9 124.0 2645.67 Fe 8.91 0.06 4.88 0.0532 1579.7 147.7 1797.63 Total 100.00 100.00 1579.7 147.7 1797.63

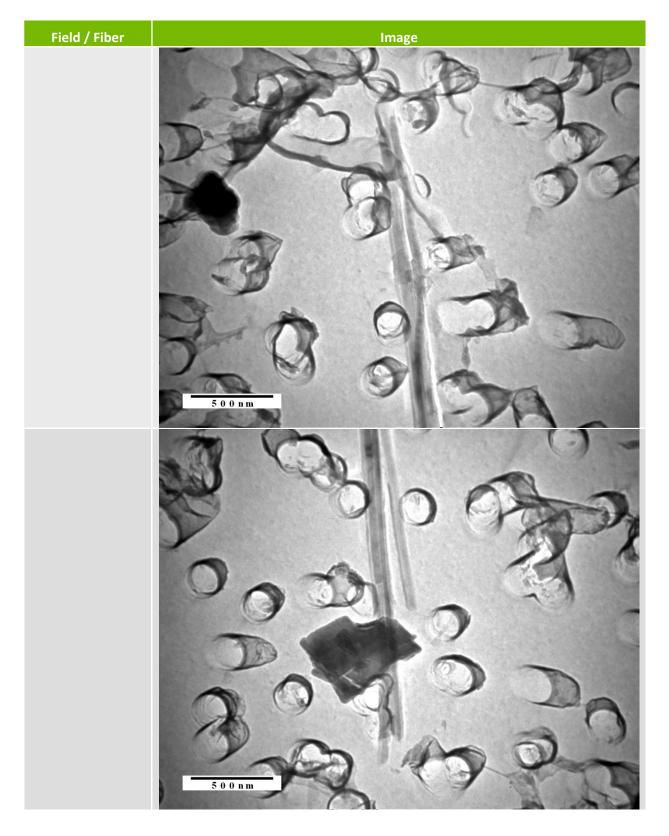


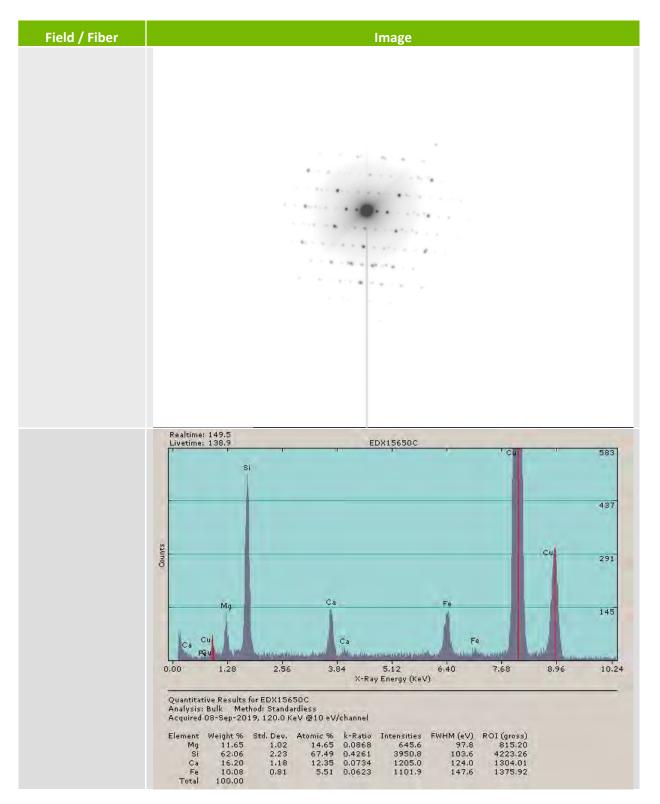
Field / Fiber	Image
	Realtime: 10.5 Livetime: 5.4 EDX15664C 1212 Si
	909
	606 Ca
	Mg Fe 303 Cu Al Ca Fe Cu Ca Feu
	0.00 1.28 2.56 3.84 5.12 6.40 7.68 8.96 10.24 X-Ray Energy (KeV)
	Quantitative Results for EDX15664C Analysis: Bulk Method: Standardless Acquired 09-Sep-2019, 120.0 KeV @10 eV/channel Element Weight % Std. Dev. Mg 13.80 0.98 13.80 0.98 17.08 Al 2.65 0.87 2.96 Si 59,68 1.86 63.90 0.4000 8001.5 103.6 8598.86 Ca 15.15 0.99 11.37 0.0684 2419.9 124.0 2723.59 Fe 8.71 0.96 4.69 0.0545 2075.9 147.7 2225.23 Total 100.00 100.00 103.4 100.90 147.7 2225.23

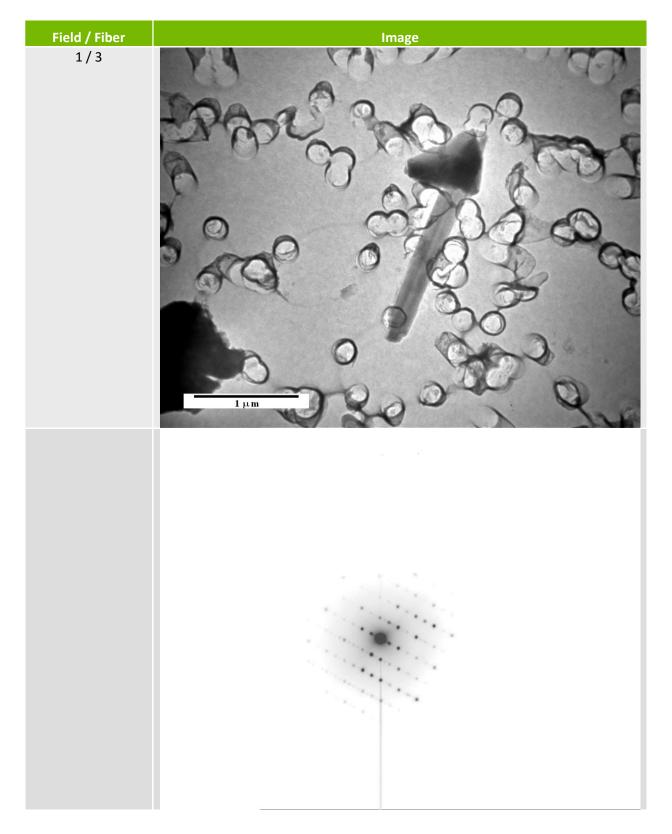


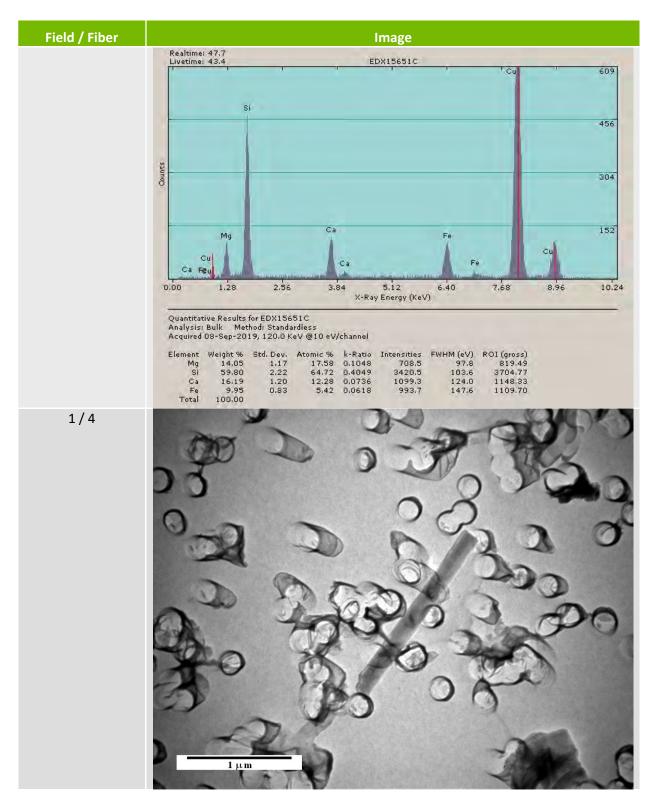


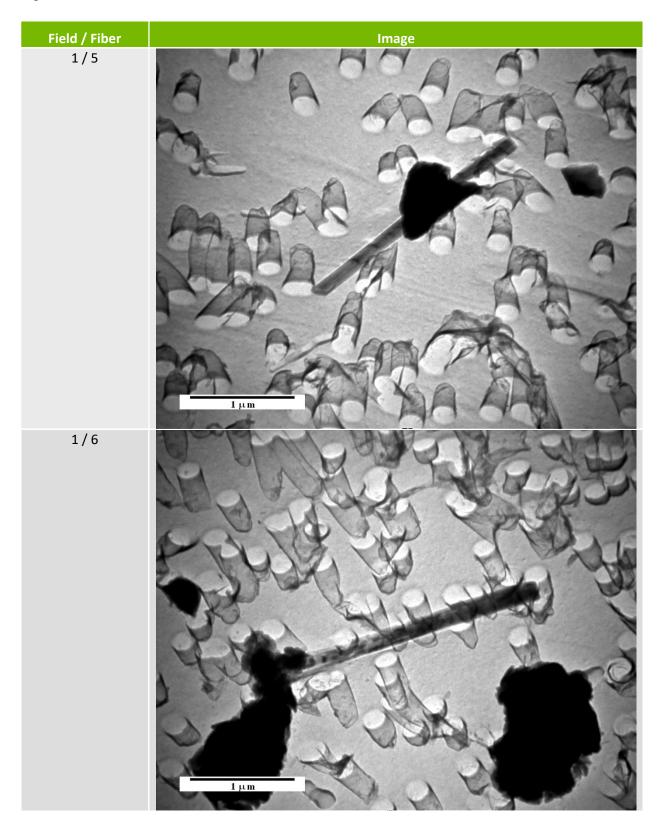


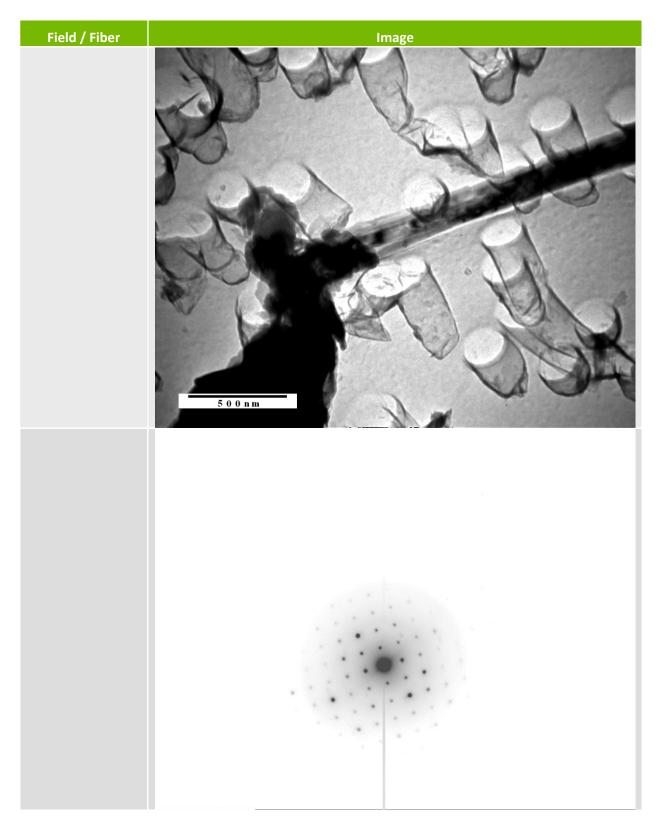


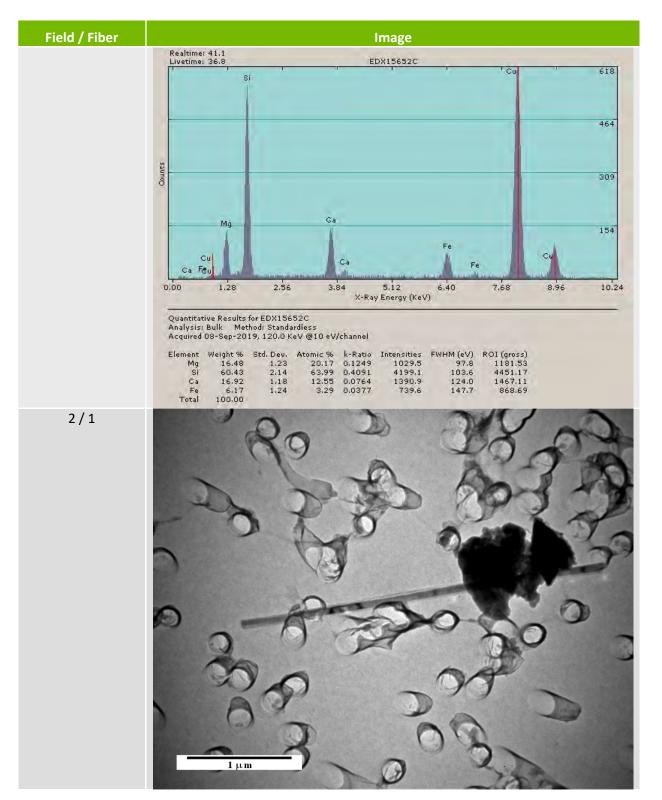


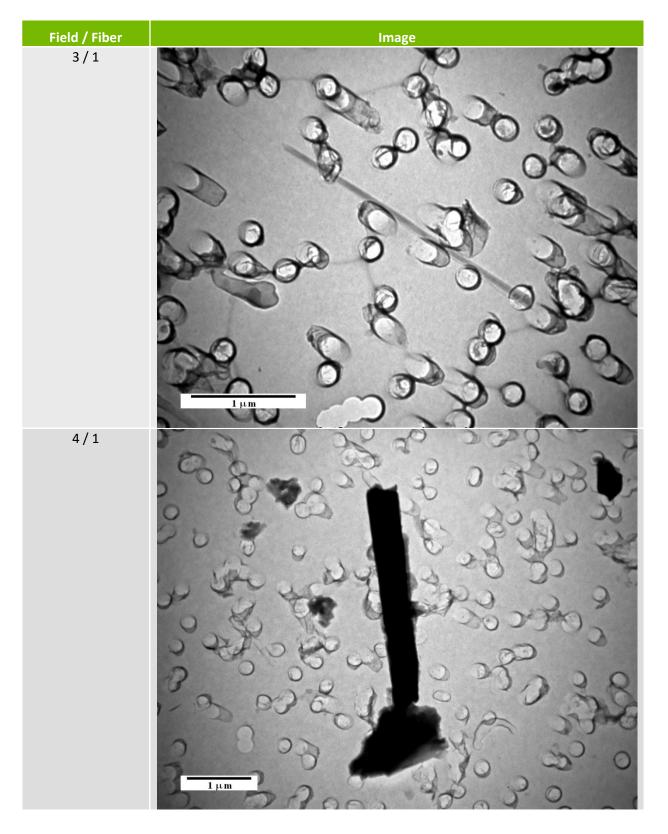


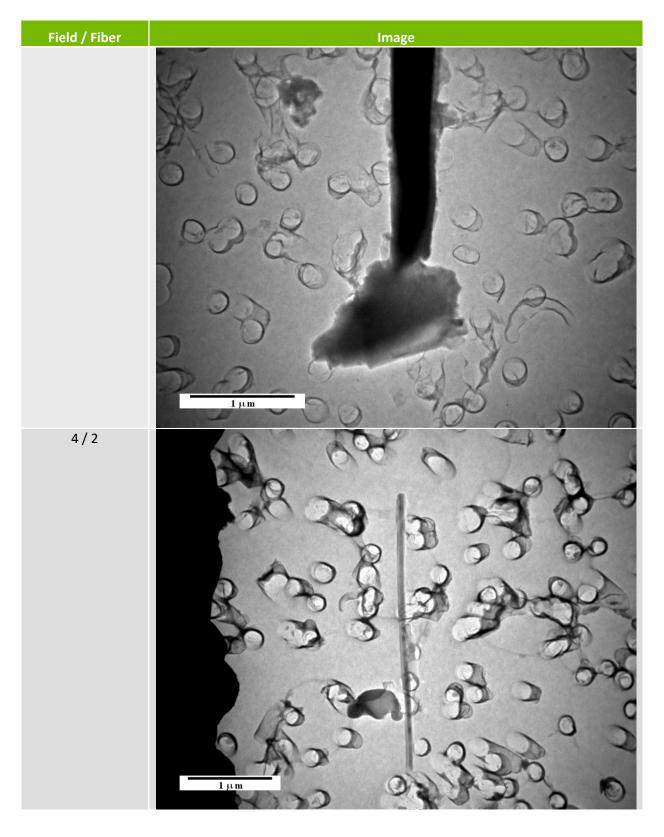


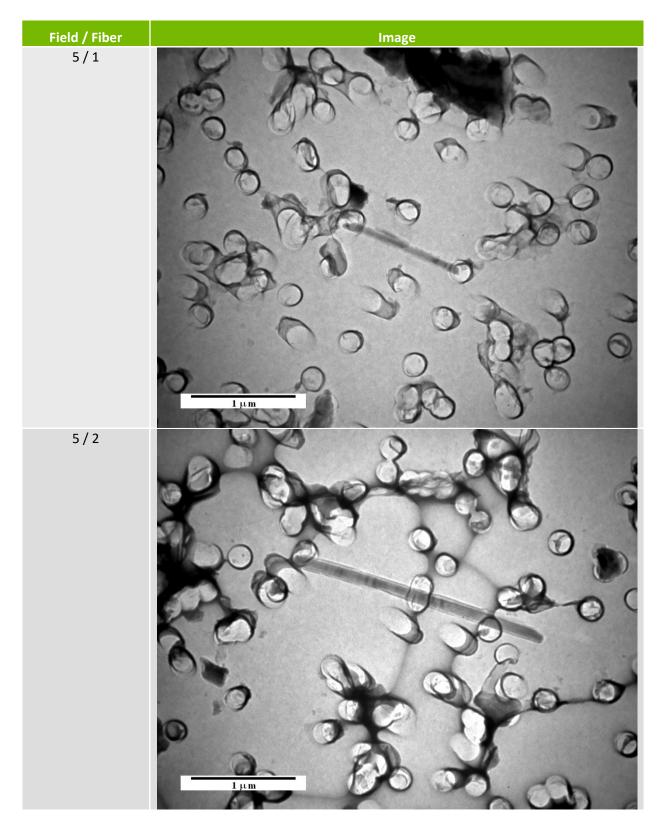


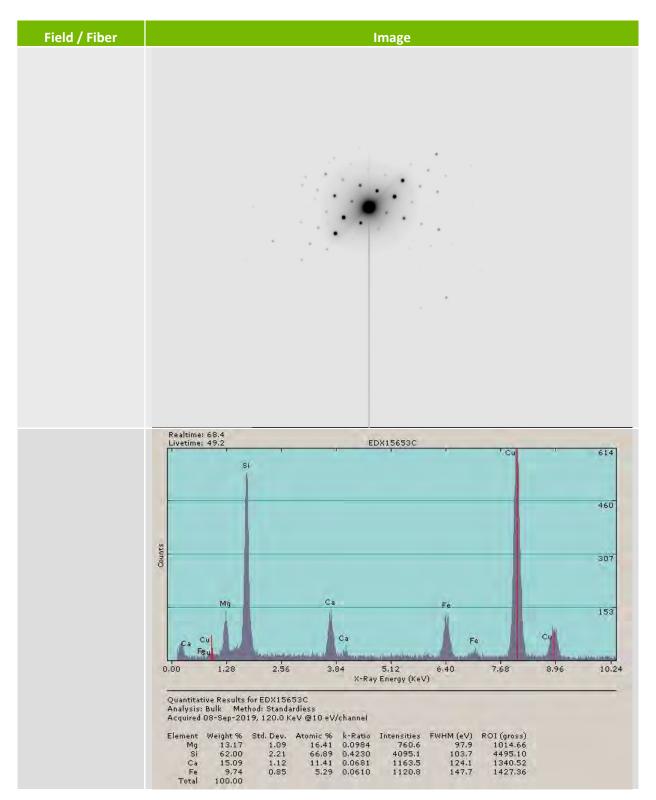


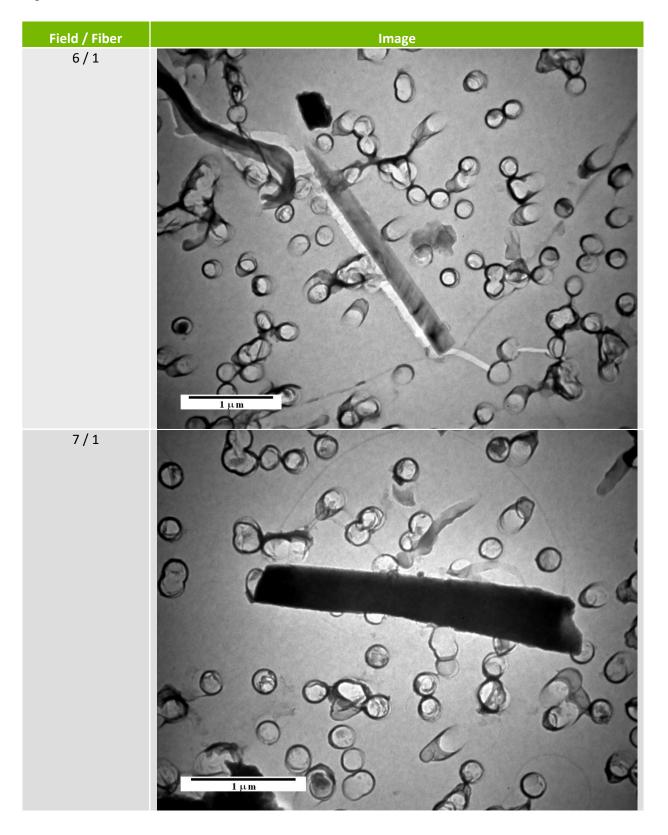


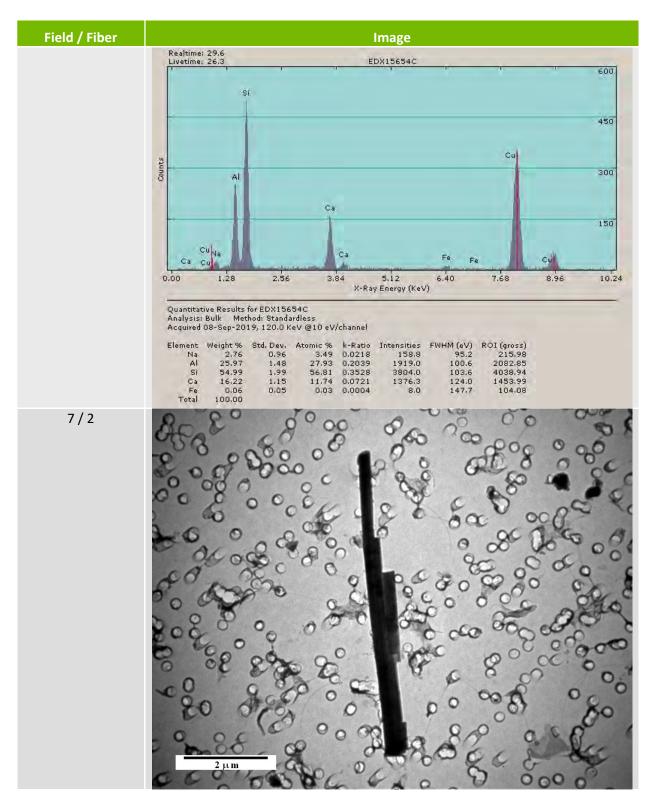


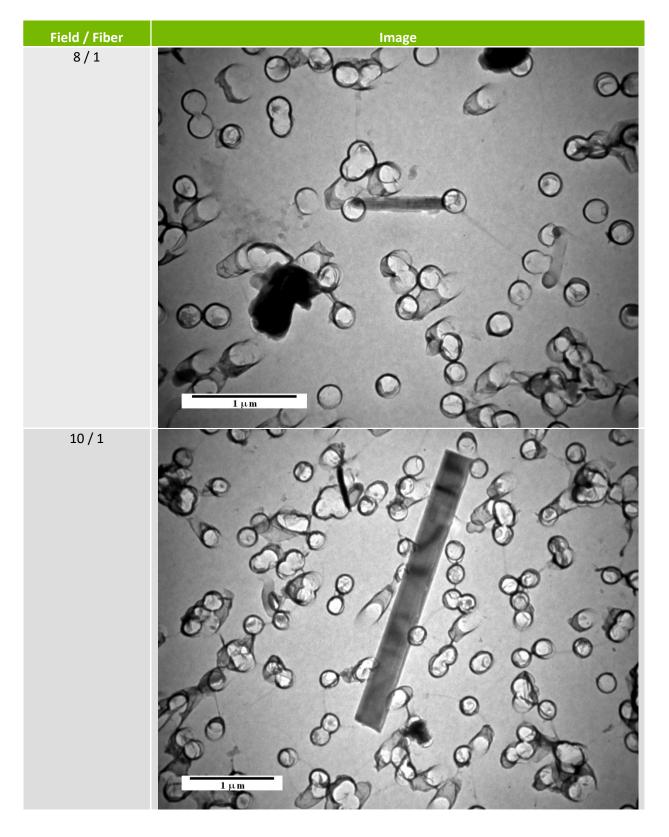


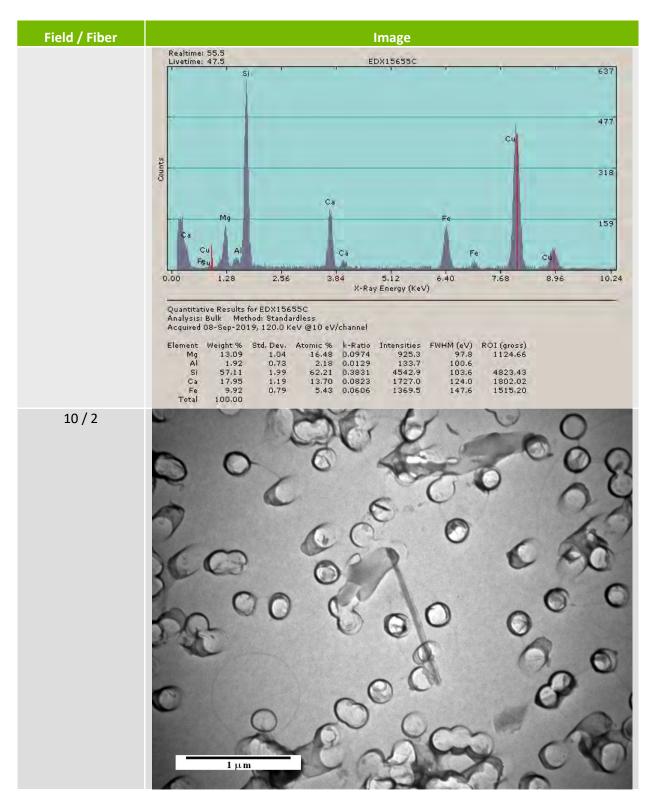


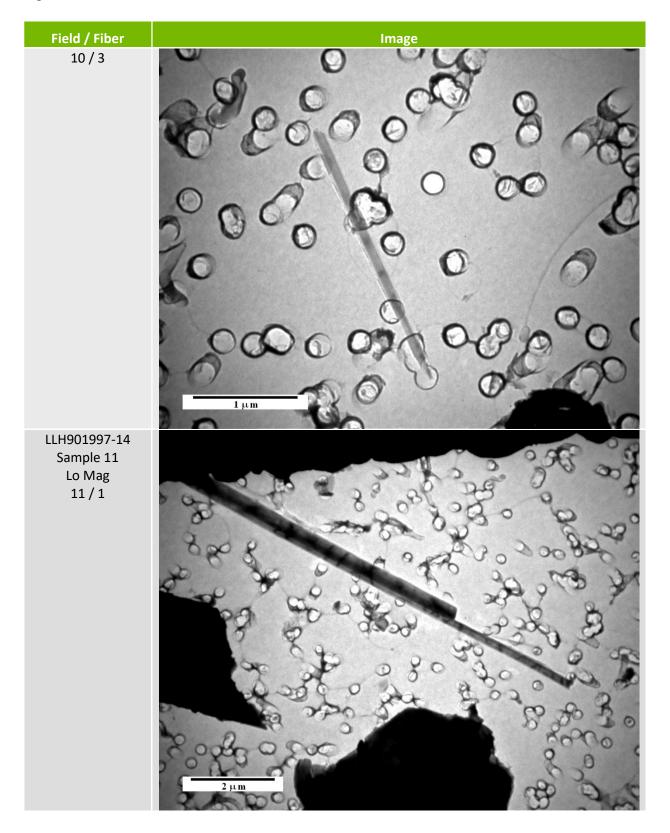


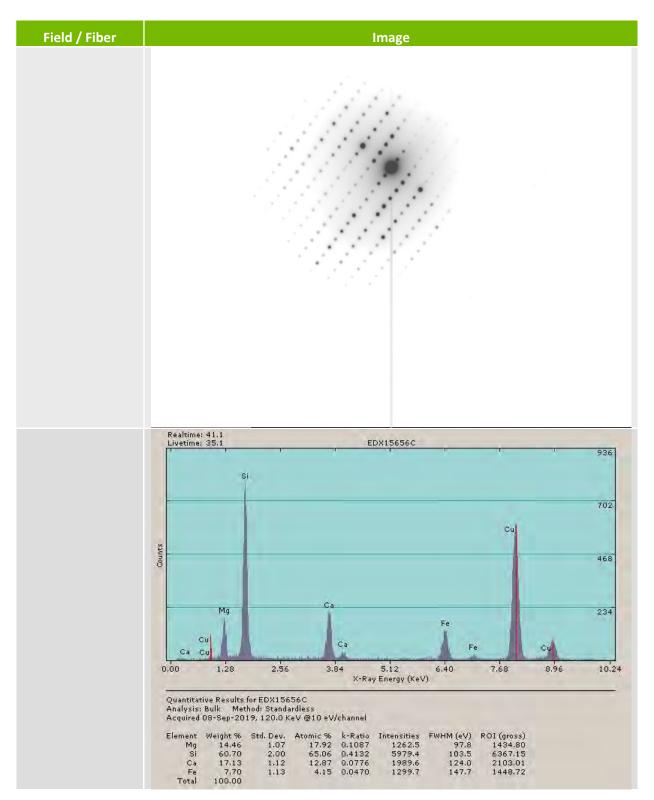


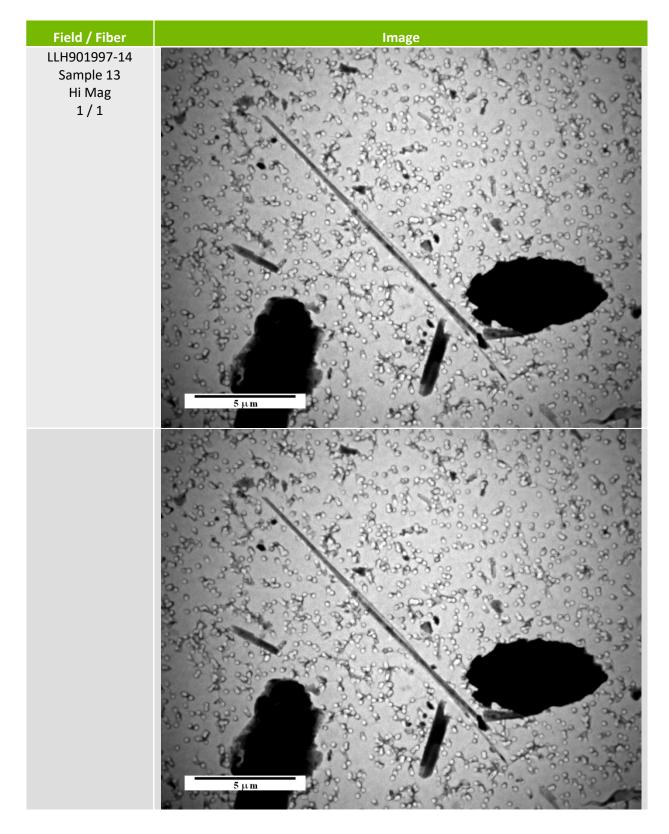


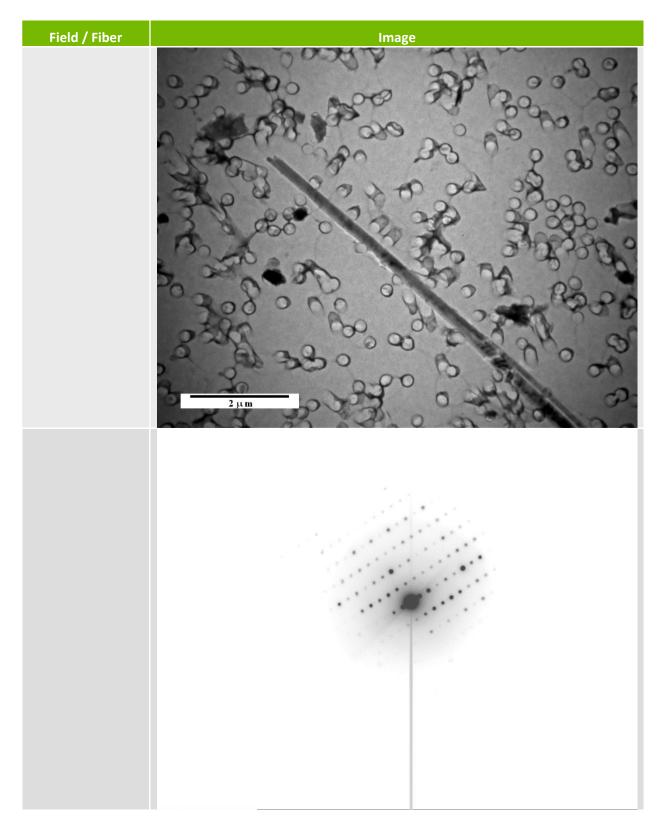


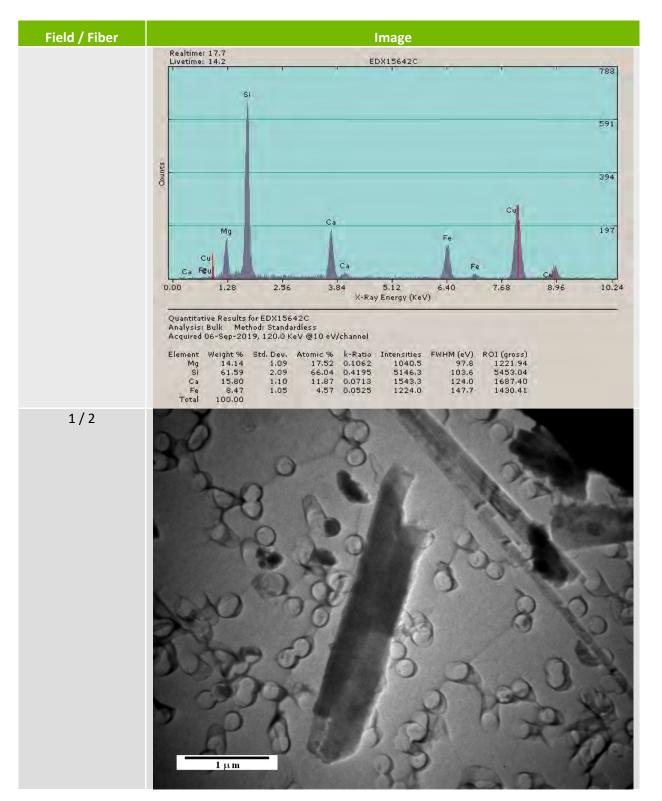


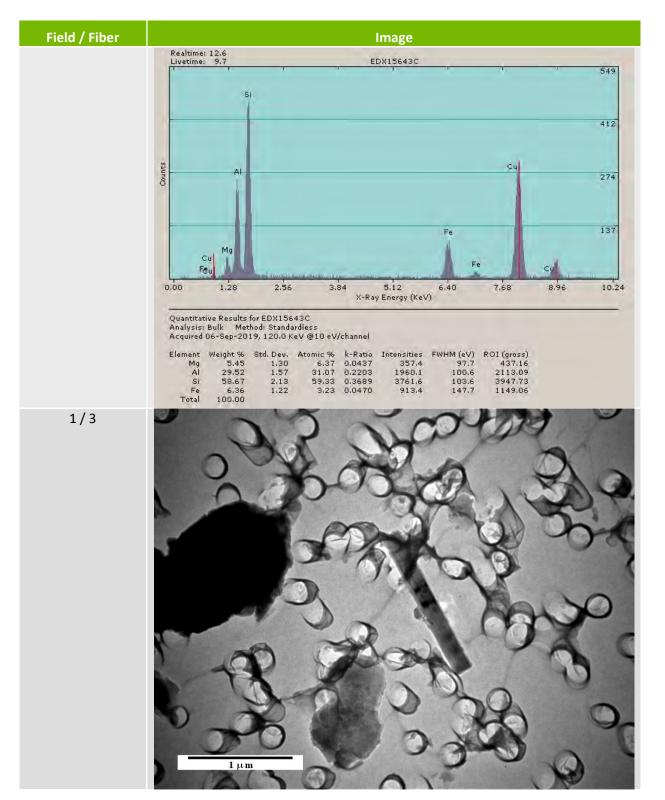


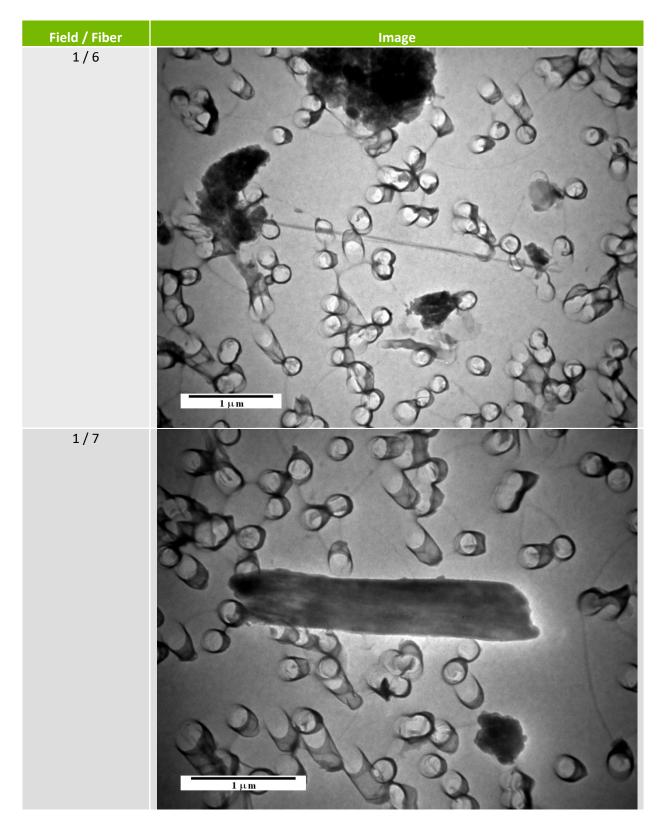


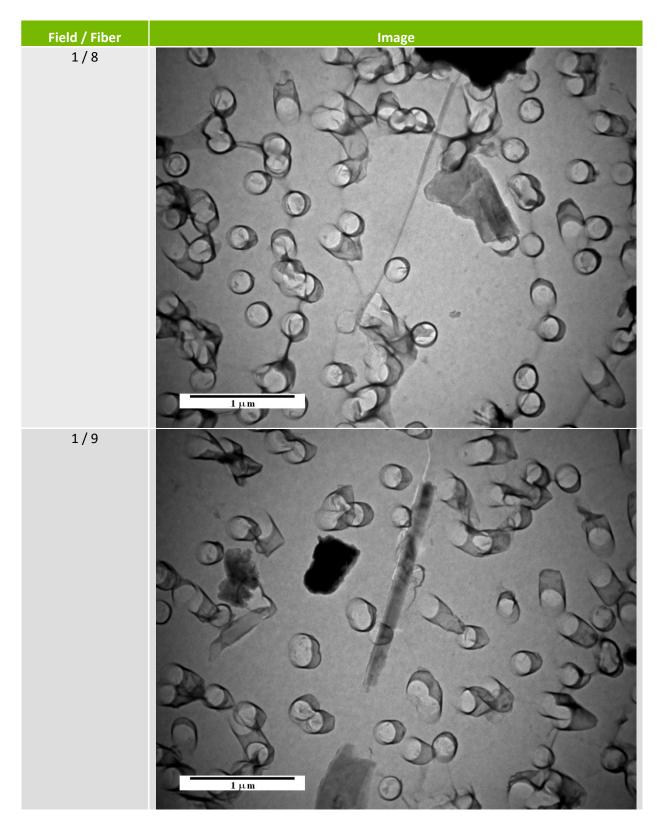


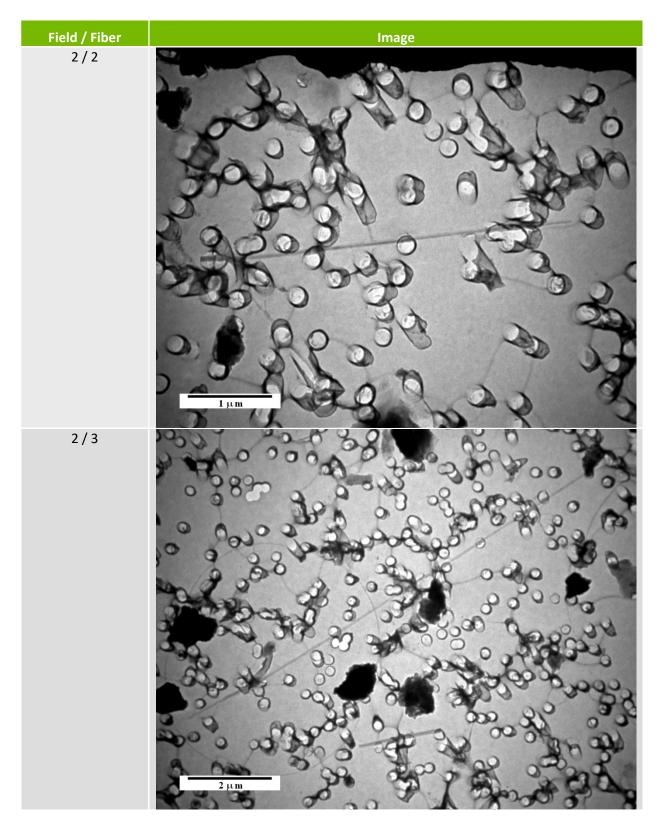


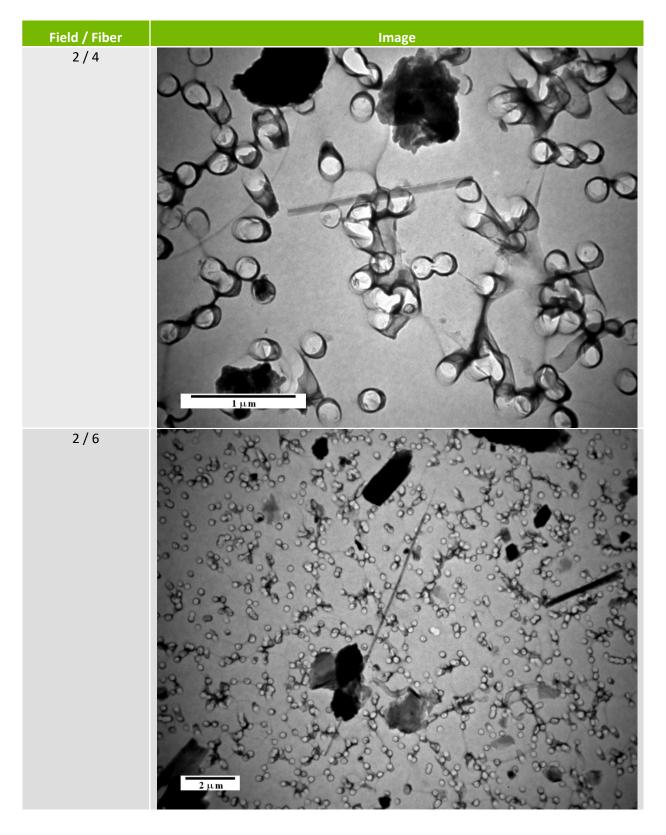




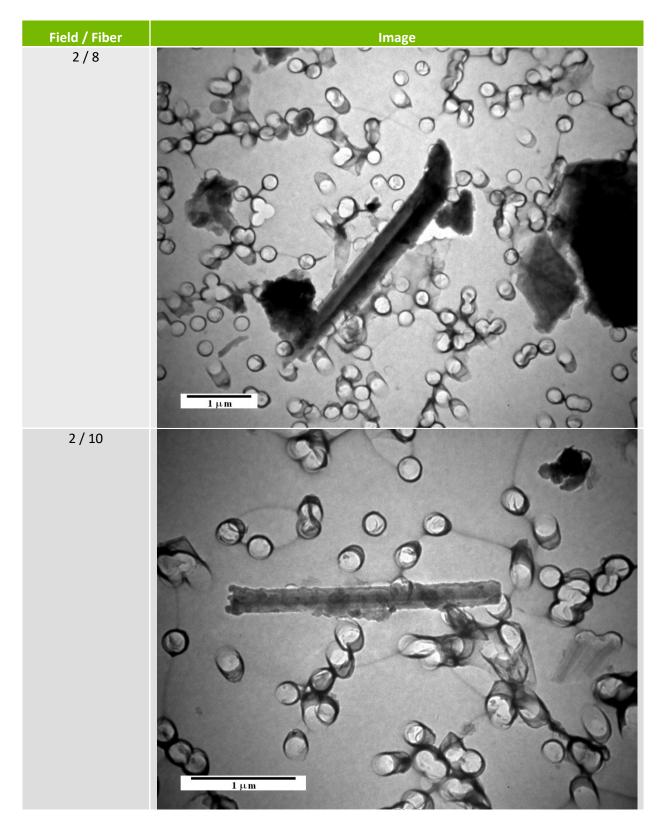


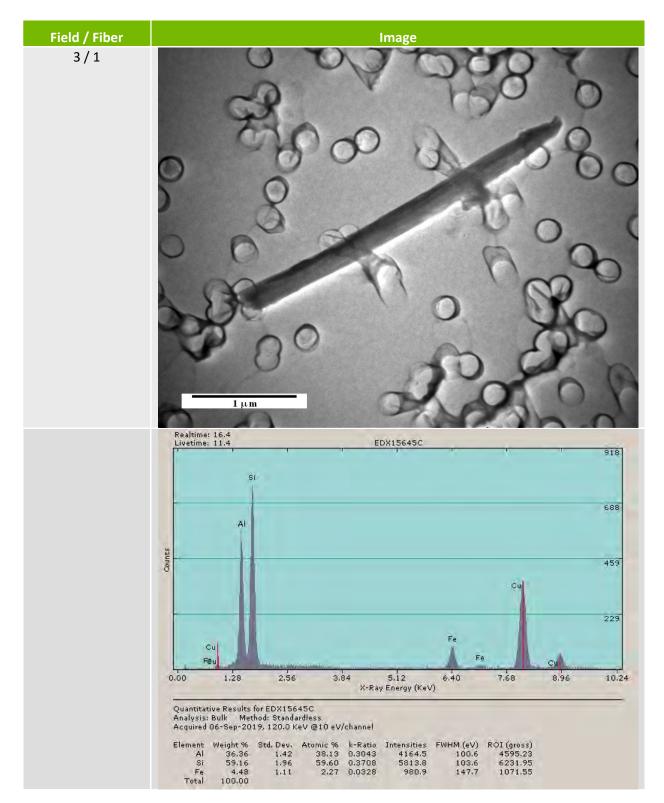


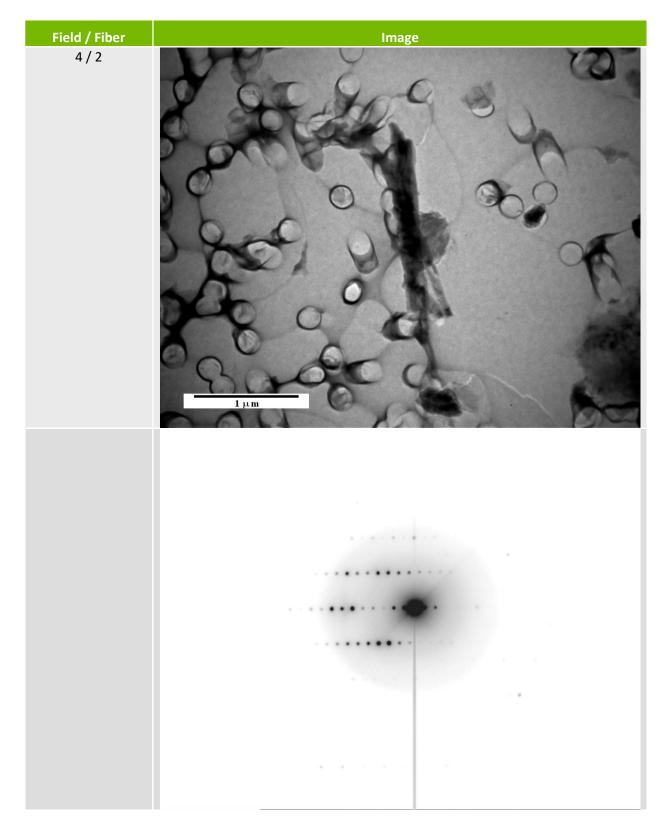


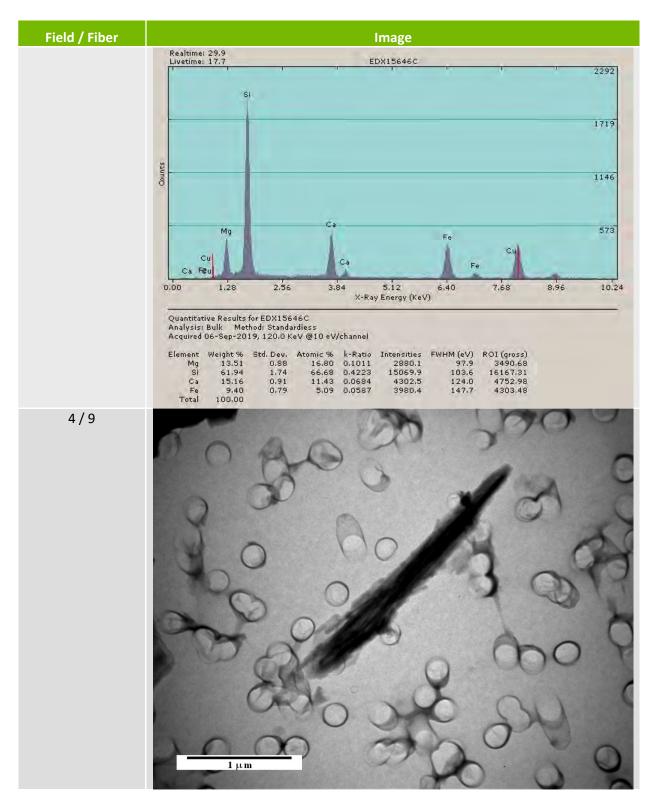


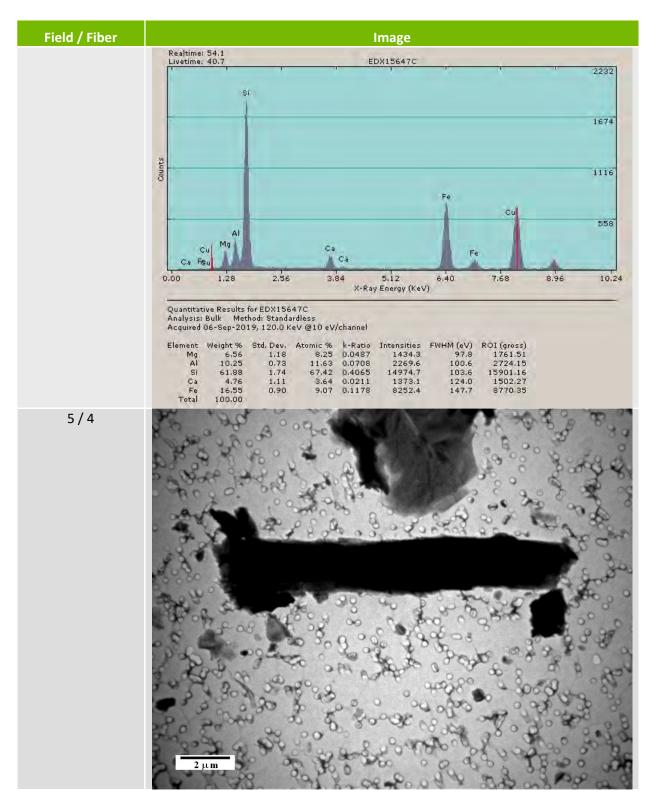
Field / Fiber	Image	
	Realtime: 114.7 Livetime: 95.9 EDX15644C	4059
	ST.	
		3044
	Counts	2029
	Mg Ca Cul	1014
	Fe	
	Ca Feu Al Ca Fe	10.01
	0.00 1.28 2.56 3.84 5.12 6.40 7.68 8.96 X-Ray Energy (KeV)	10.24
	Quantitative Results for EDX15644C Analysis: Bulk Method: Standardless Acquired 06-Sep-2019, 120.0 KeV @10 eV/channel	
	Element Weight % Std. Dev. Atomic % k-Ratio Intensities FWHM (eV) ROI (gross)	
	Mg 15.00 0.87 18.50 0.1129 5978.6 97.8 6885.20 Al 1.08 0.39 1.20 0.0072 417.2 100.5 1199.65 Si 60.10 1.57 64.15 0.4051 26813.0 103.6 28625.37	
	Ca 15.91 0.88 11.90 0.0719 8410.9 124.0 9047.86 Fe 7,91 0.99 4.25 0.0491 6179.0 147.7 6728.11 Total 100.00	



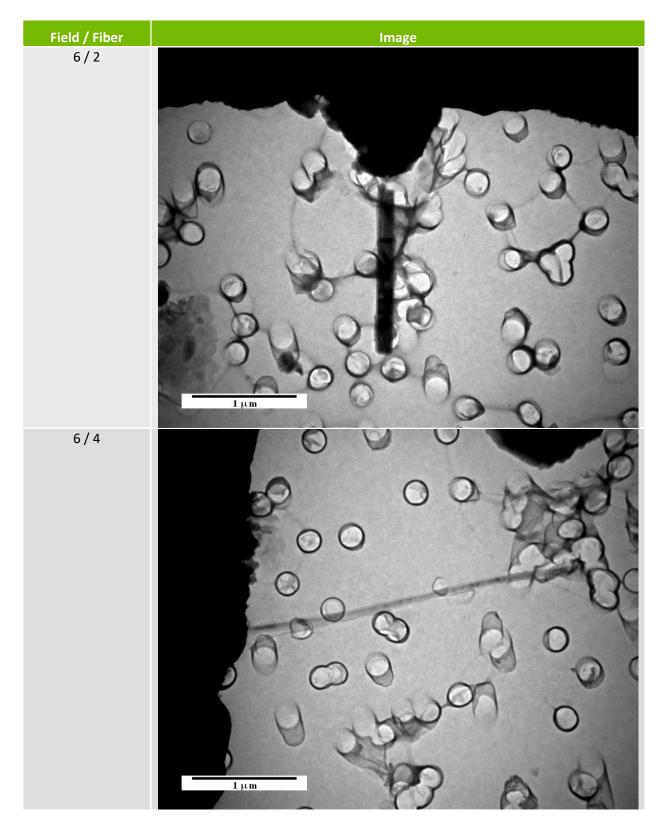


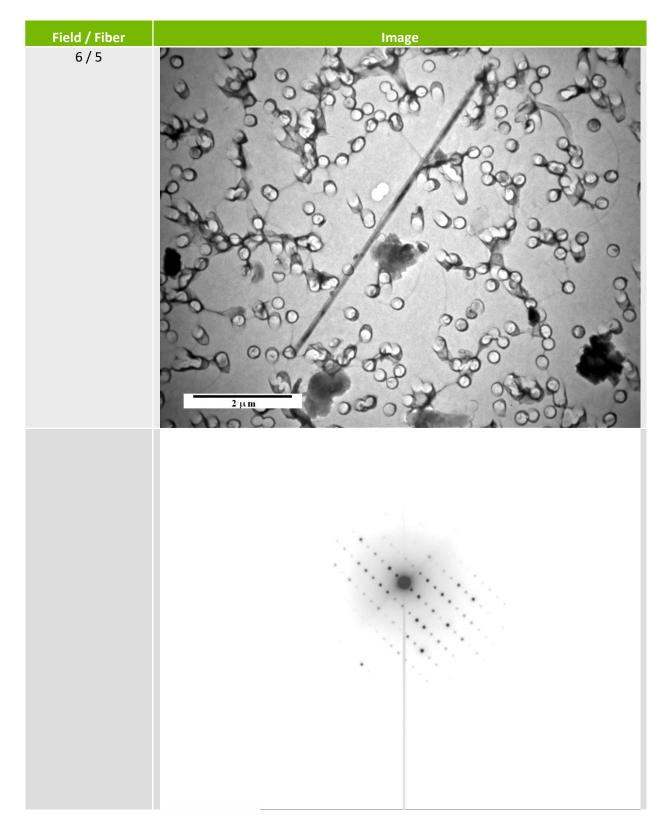


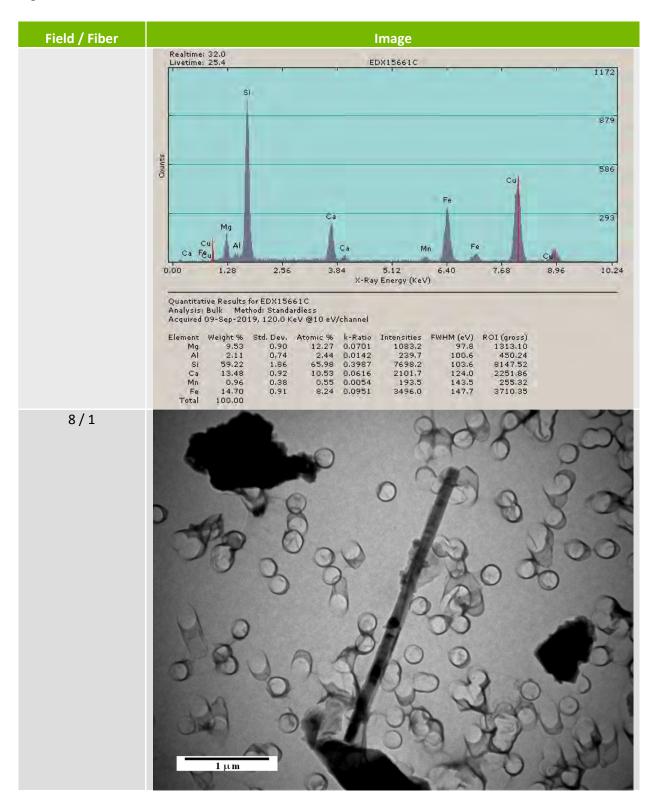


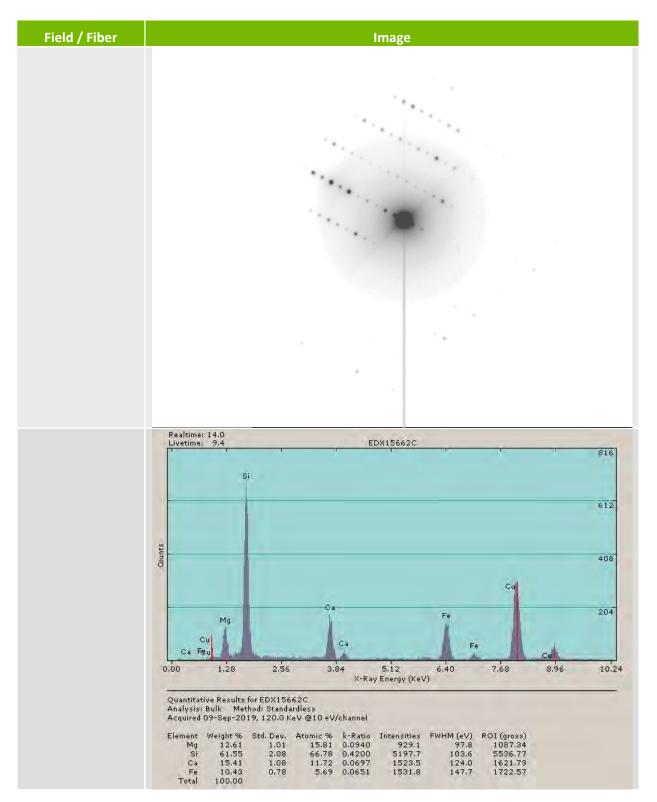


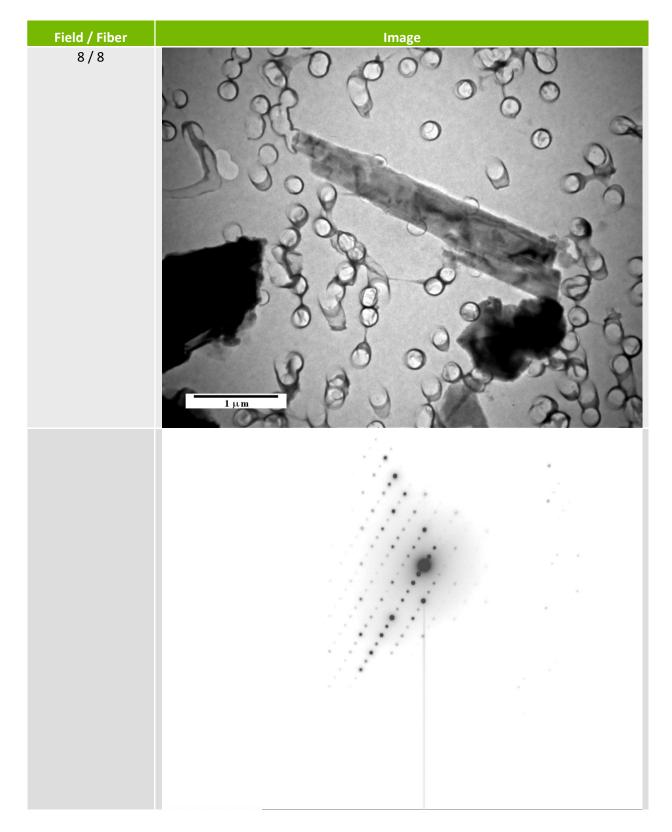
Field / Fiber	Image	
	Realtime: 24.5 Livetime: 16.2 EDX15648C	ť,
	Si 1580	
	1185	
	हु हु	
	Mg Fe	
	Al Ca 395 Cu Cu Cu Cu Cu	
	0.00 1.28 2.56 3.84 5.12 6.40 7.68 8.96 10.24 X-Ray Energy (KeV)	
	Quantitative Results for EDX15648C Analysis: Bulk Method: Standardless Acquired 06-Sep-2019, 120.0 KeV @10 eV/channel	
	Element Weight % Std. Dev. Atomic % k-Ratio Intensities FWHM (eV) ROI (gross) Mg 16.89 1.02 20.68 0.1269 3300.3 97.8 3741.01 Al 10.19 0.74 11.23 0.0679 1922.0 100.7 2417.65 Si 51.55 1.53 54.62 0.3293 10679.2 103.6 11425.82 Ca 9.90 0.72 7.35 0.0448 2574.1 124.0 2800.11 Fe 11.47 0.72 6.11 0.0778 4810.7 147.7 5113.61 Total 100.00 574 1.0778 4810.7 147.7 5113.61	

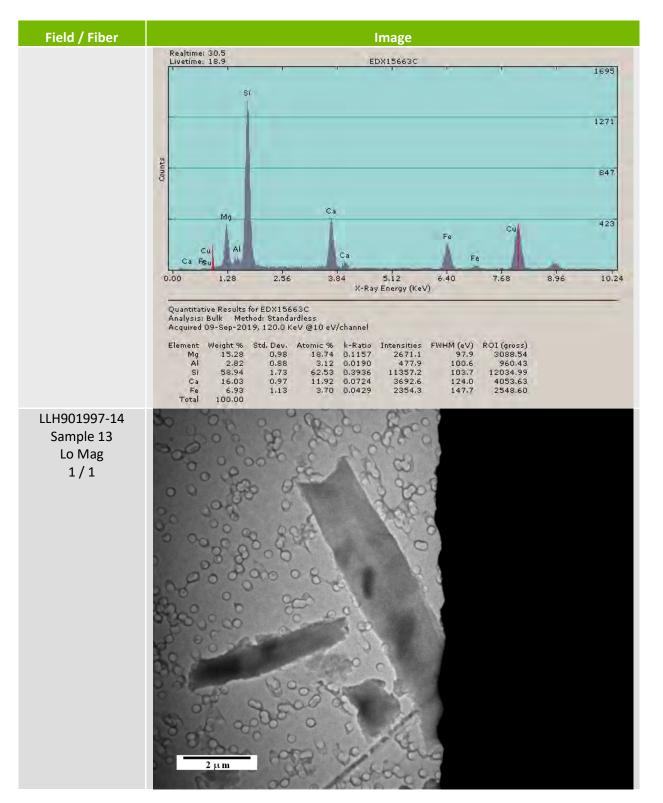




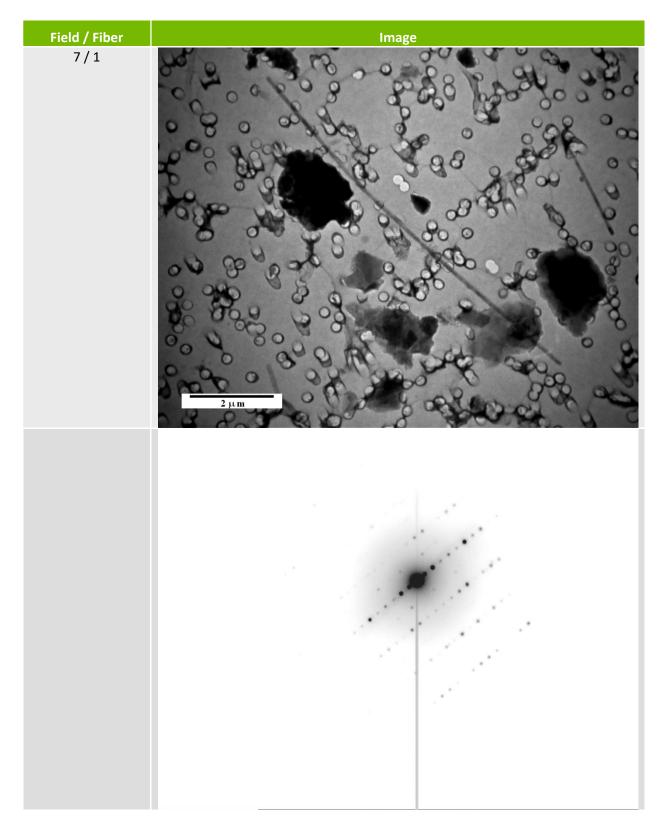




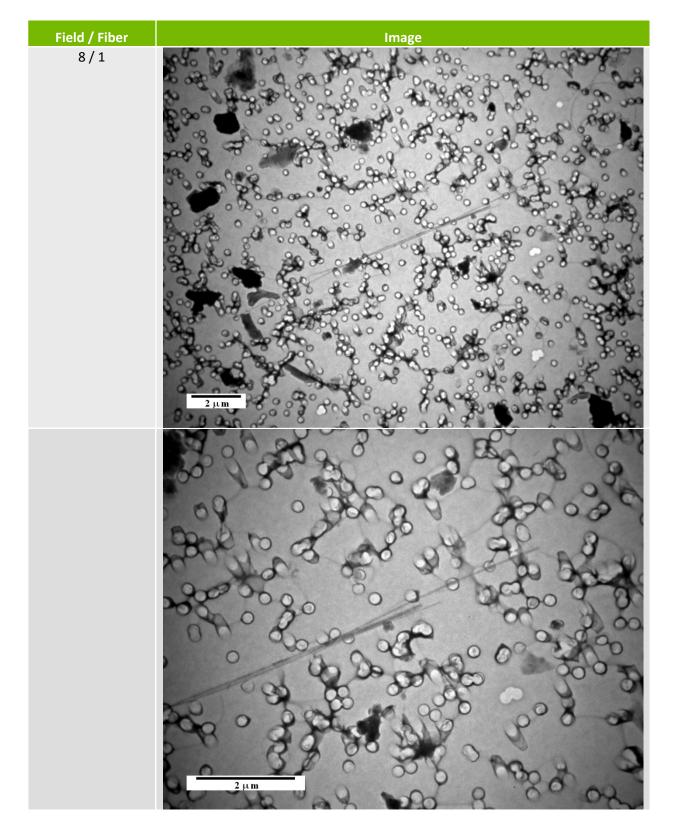


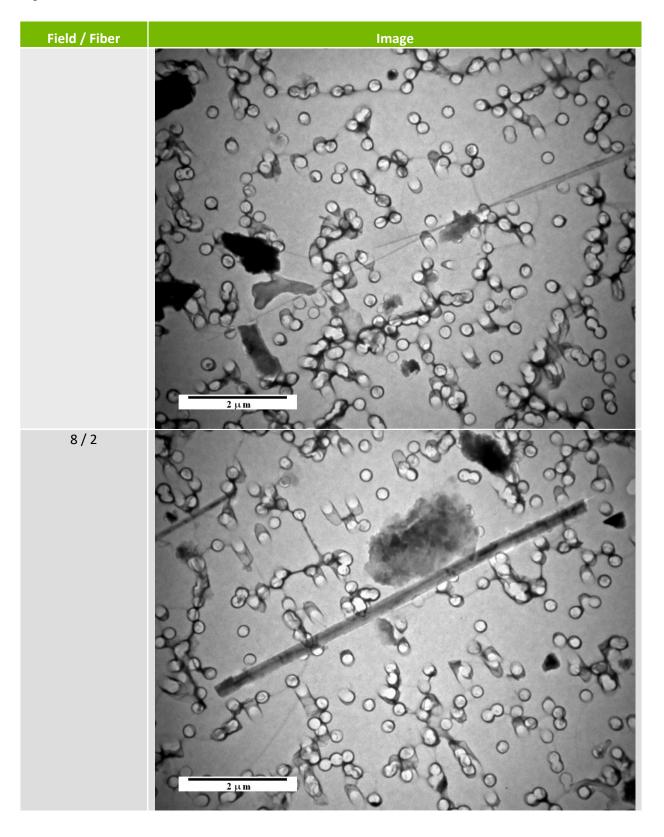


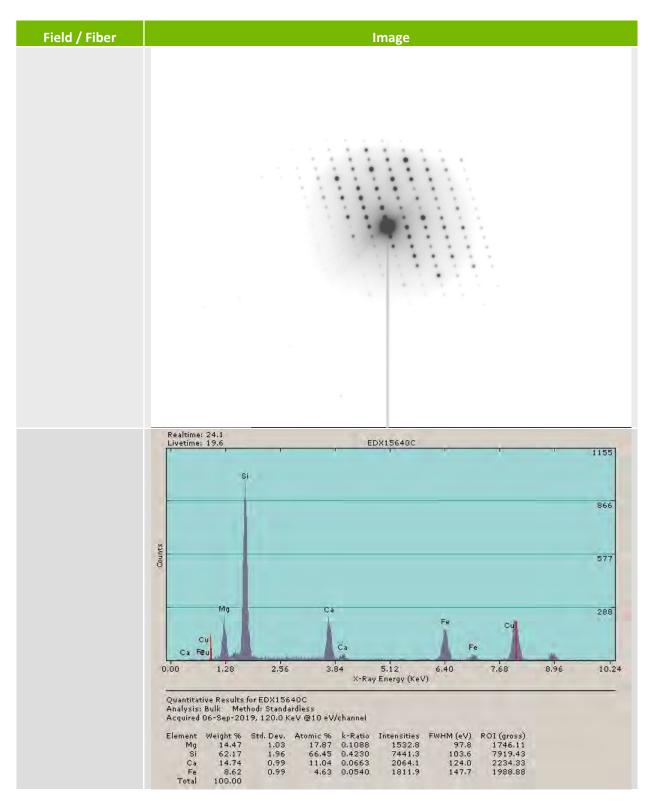
Field / Fiber	Image
	Realtime: 23.6 Livetime: 17.8 EDX15637C Si
	936
	524 Mg Cul
	Al Fe 312 Cul Feu Fe Cu
	0.00 1.28 2.56 3.84 5.12 6.40 7.68 8.96 10.24 X-Ray Energy (KeV)
	Quantitative Results for EDX15637C Analysis: Bulk Method: Standardless Acquired 06-Sep-2019, 120.0 KeV @10 eV/channel
	Element Weight % Std. Dev. Atomic % k-Ratio Intensities FWHM (eV) ROI (gross) Mg 17.26 1.10 20.18 0.1347 2242.9 97.8 2537.49 Al 13.49 0.96 14.21 0.0913 1654.9 100.6 2007.48 Si 60.39 1.88 61.10 0.3849 7997.9 103.6 8537.31 Fe 8.85 0.92 4.50 0.0663 2627.2 147.7 2896.68 Total 100.00 100.00 100.00 100.00 100.00 100.00

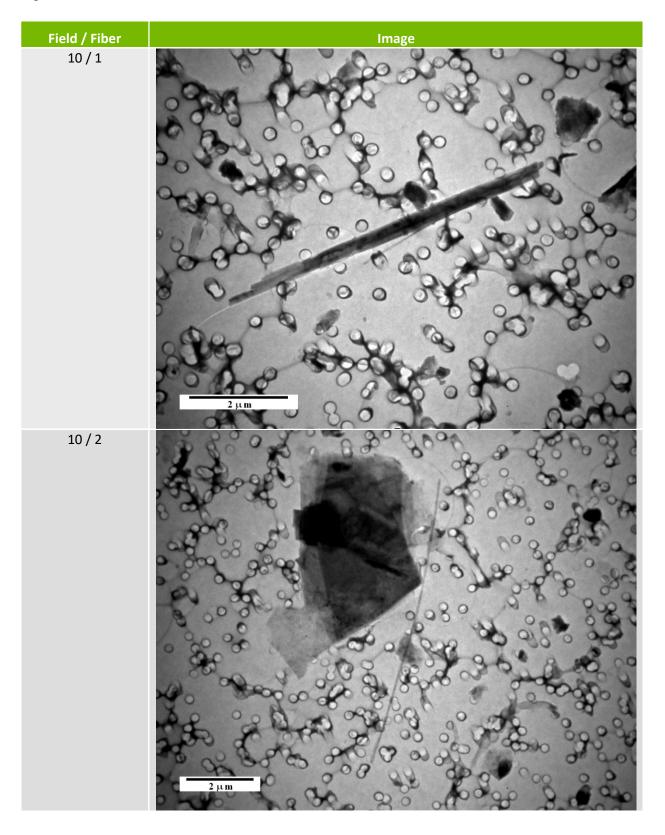


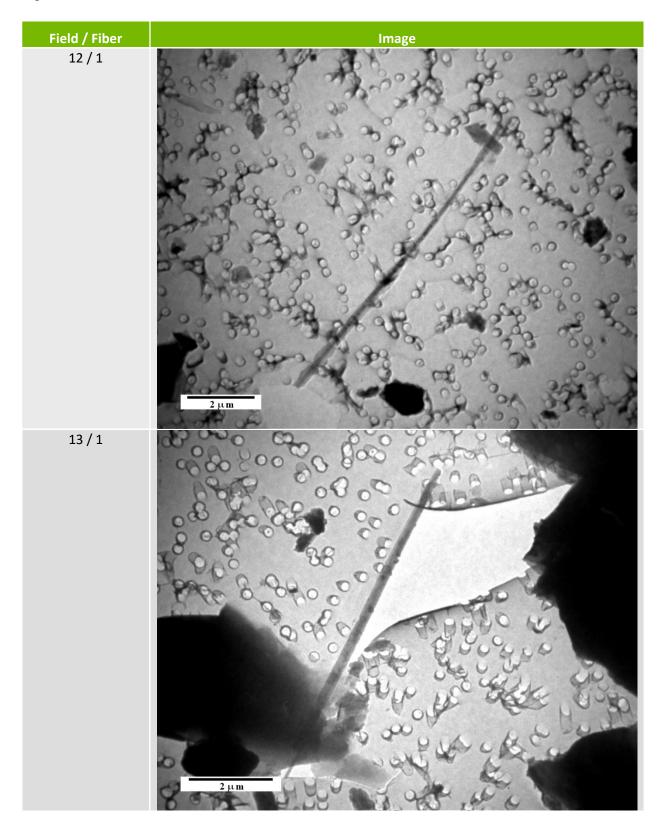
Field / Fiber	Image
	Realtime: 57.9 Livetime: 51.8 EDX15639C Si Cu 634
	5000 423 423 Mg Ca Fe 211 Cu Ca Fe Cu
	C3 FGU 0.00 1.28 2.56 3.84 5.12 6.40 7.68 8.96 10.24 V-Ray Energy (KeV) Quantitative Results for EDX15639C Analysis: Bulk Method: Standardless Acquired 06-Sep-2019, 120.0 KeV @10 eV/channel Element Weight % Std. Dev. Atomic % k-Ratio Intensities FWHM (eV) ROI (gross) Mg 11.89 0.97 15.08 0.0881 891.2 97.8 1152.62 Si 60.34 2.05 66.21 0.4105 5174.7 103.6 5651.12 Ca 15.63 1.09 12.02 0.0712 1591.3 124.0 1716.84

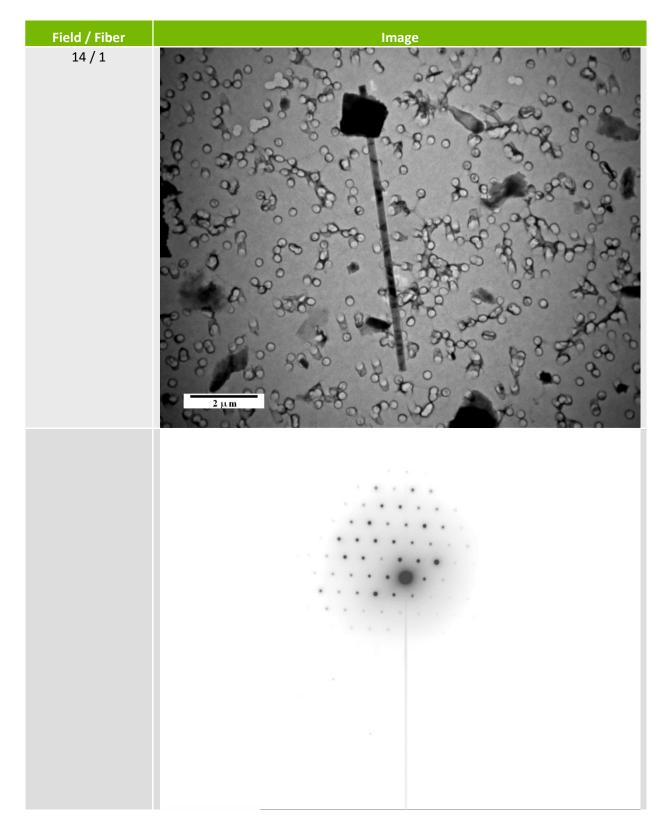


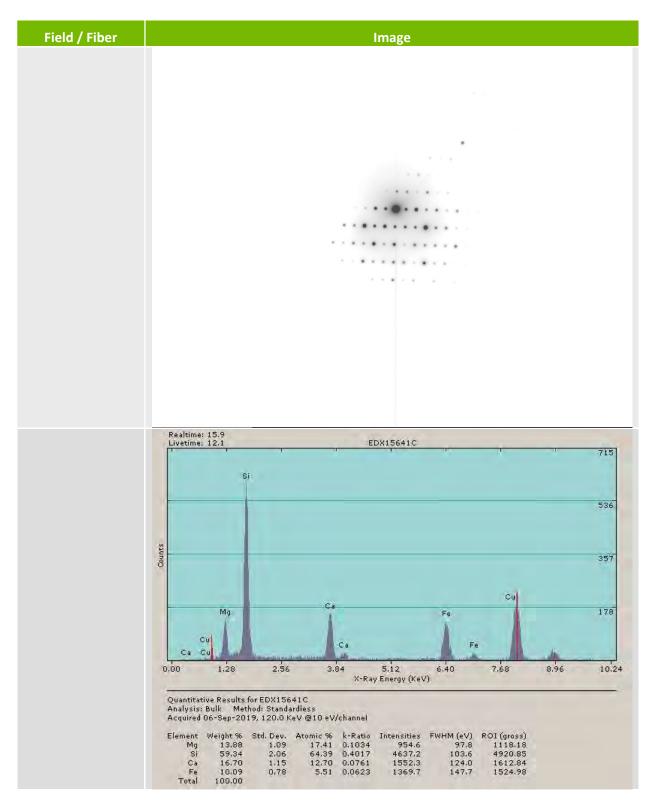




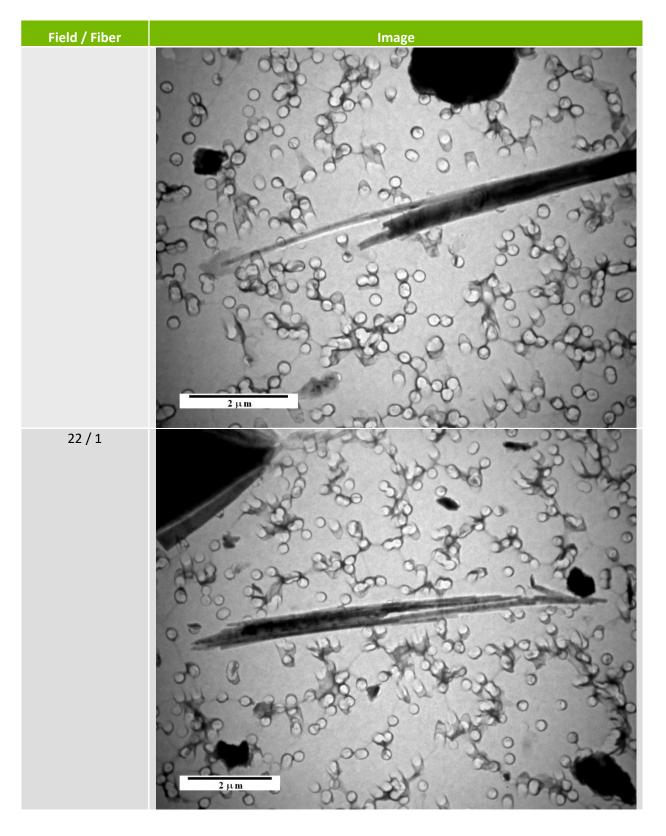


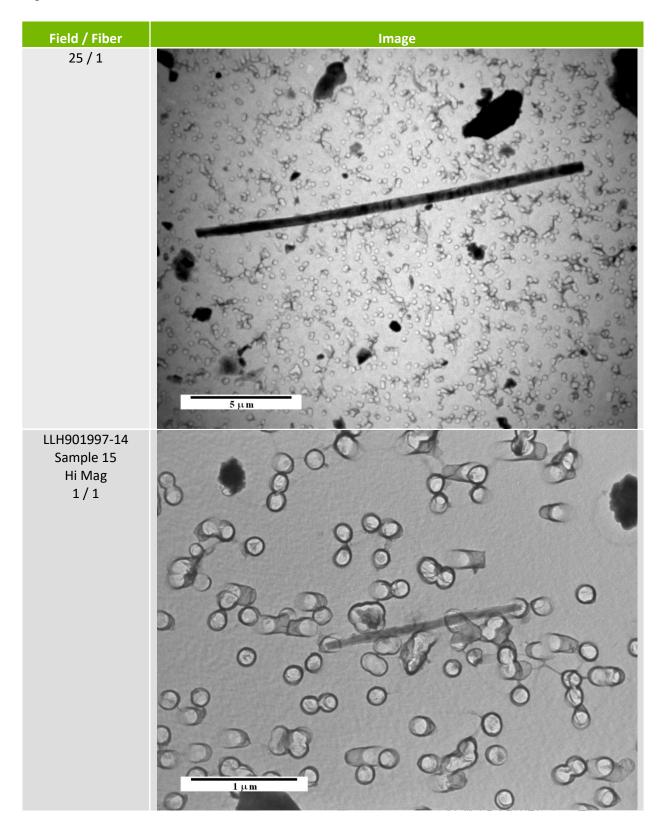


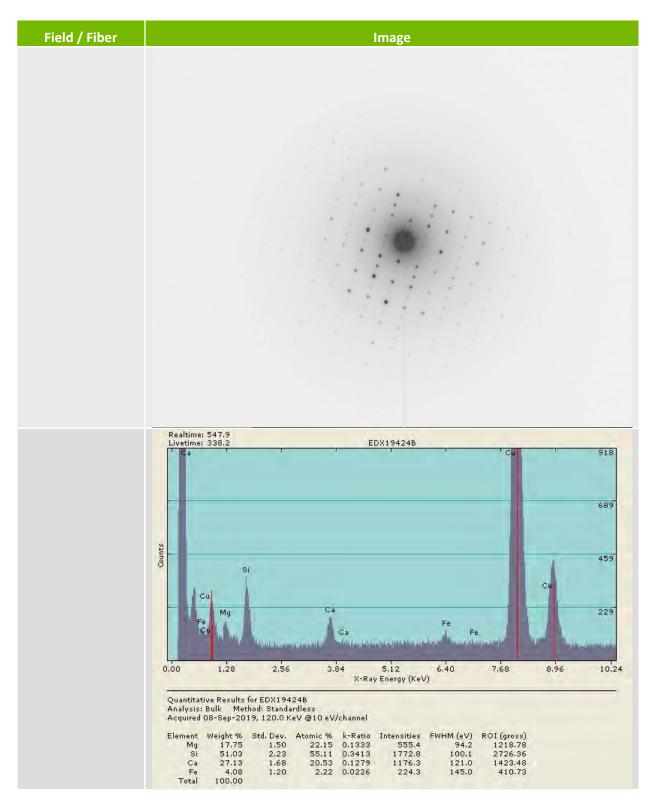


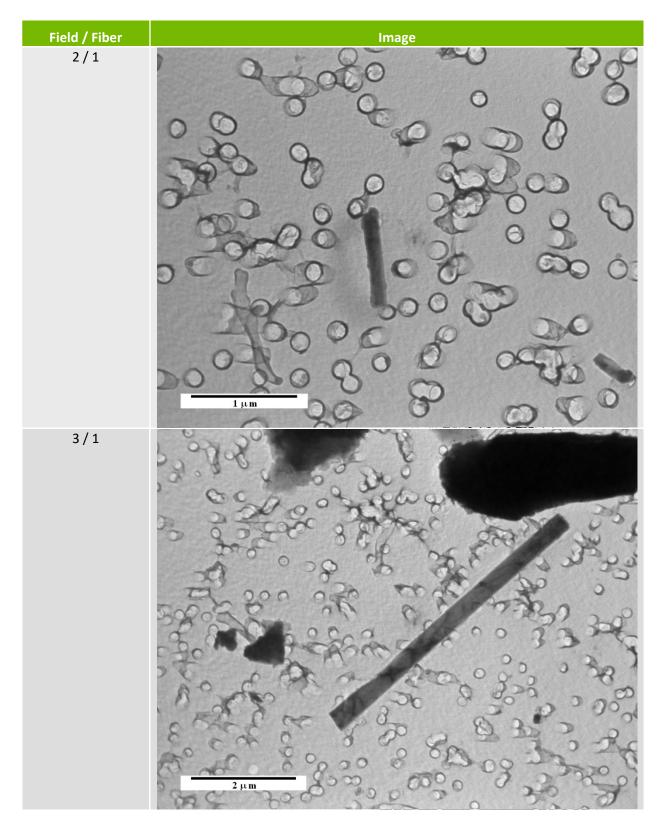


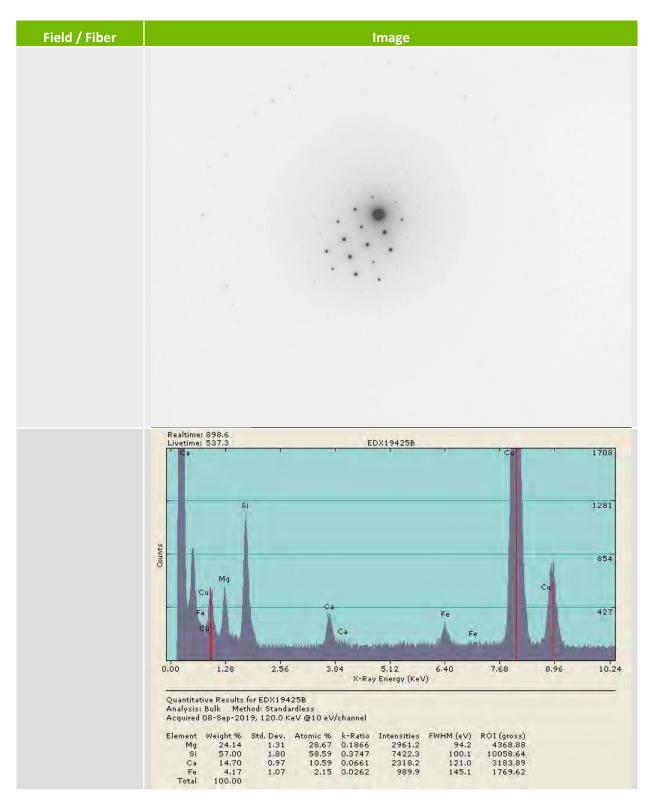
Field / Fiber	Image
Field / Fiber 16 / 1	<u>- 2 µm</u>
21/1	

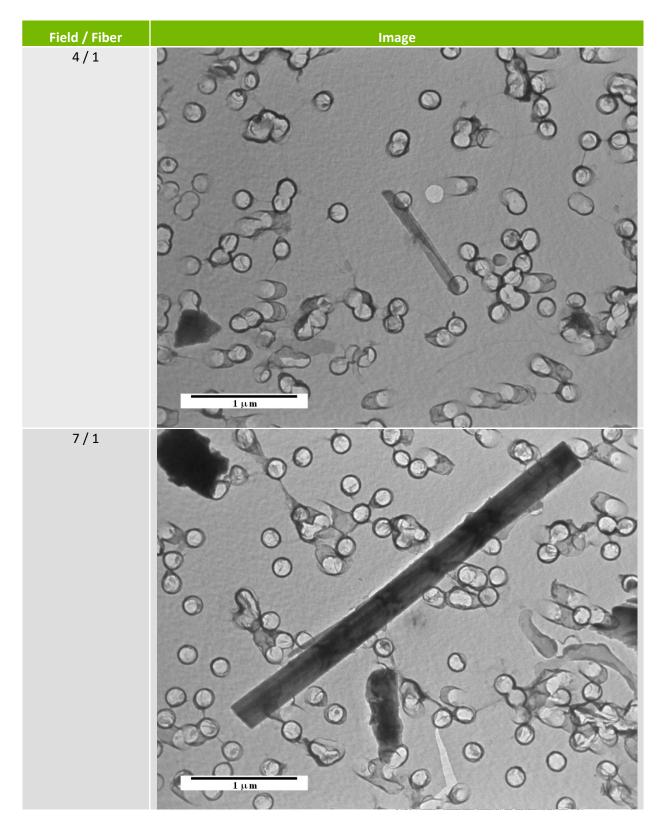


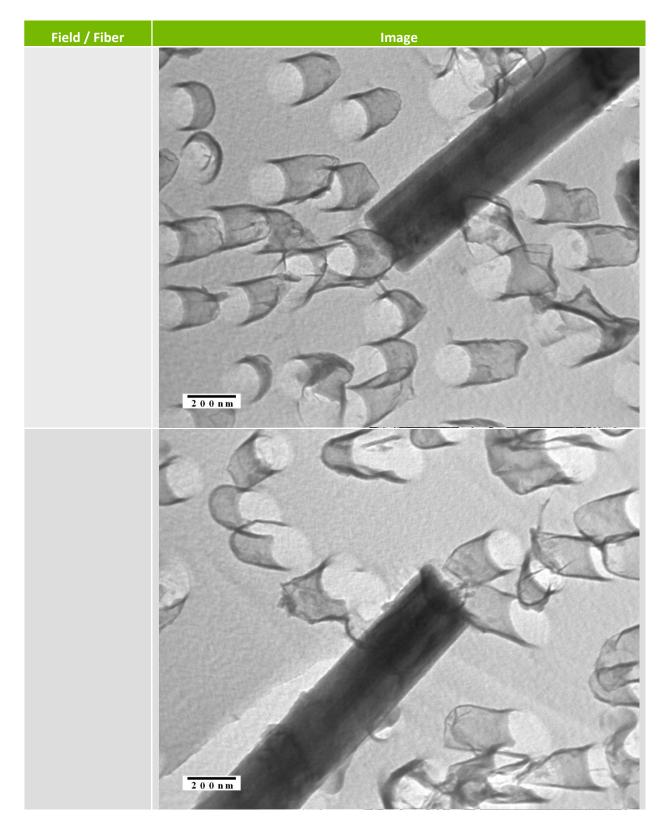


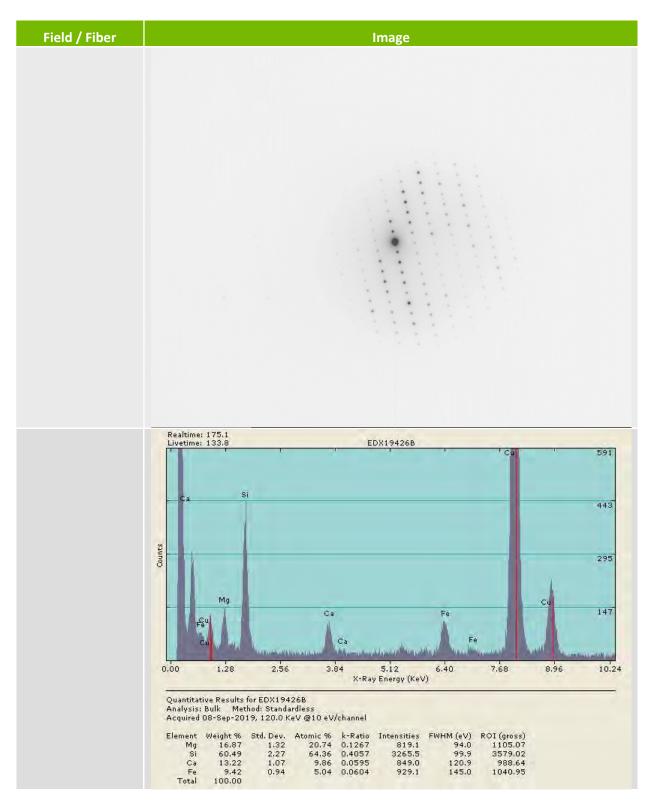


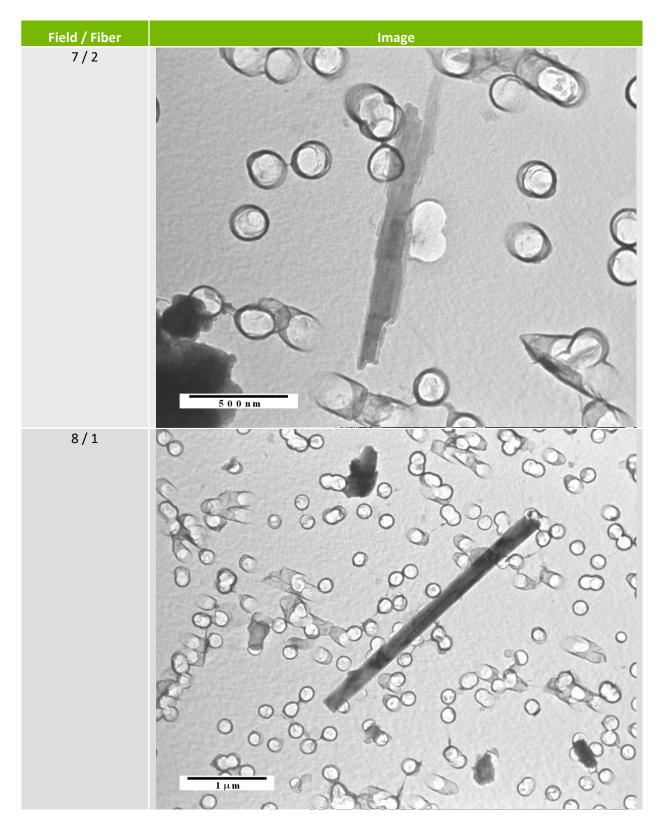


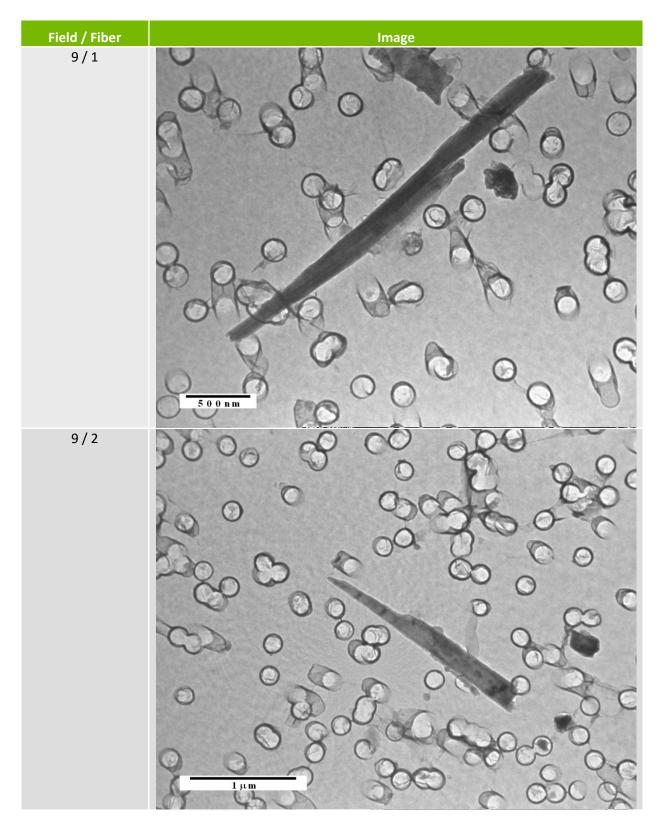


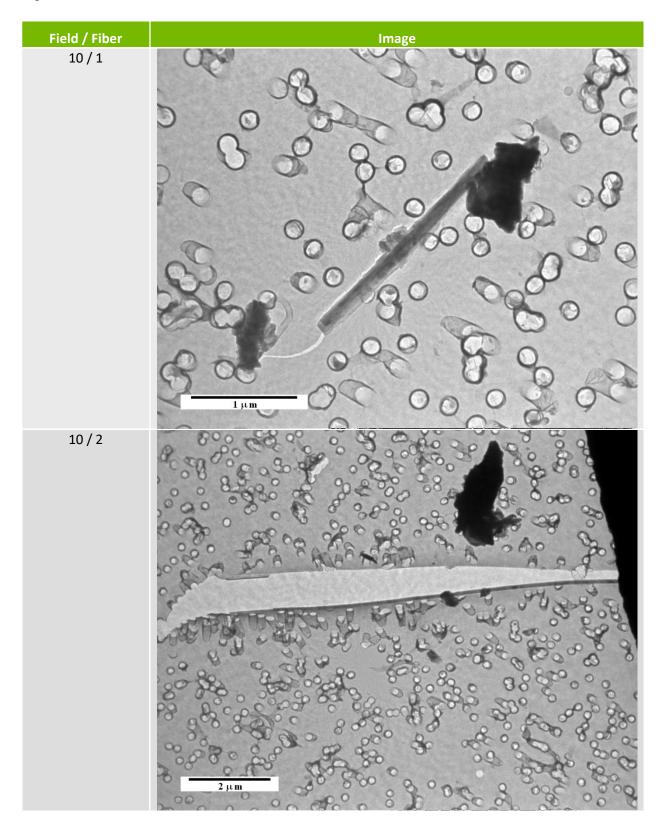






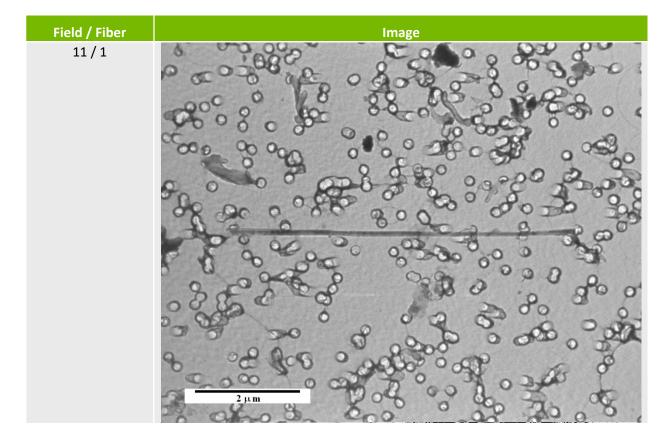






Field / Fiber	Image
LLH901997-14 Sample 15 Lo Mag 10 / 1	- <u>μm</u>

Field / Fiber	Image
	Realtime: 356.6 Livetime: 255.4 EDX19428B
	Store Cu 642 Store 481 Store 321 Cu Ms Cu Ms Cu Ca Fe 160 Cu Ms Cu Ms Cu Ms Cu Ms
	0.00 1.28 2.56 3.84 5.12 6.40 7.68 8.96 10.24 X-Ray Energy (KeV) Quantitative Results for EDX19428B Analysis: Bulk Method: Standardless Acquired 08-Sep-2019, 120.0 KeV @10 eV/channel Element Weight % Std. Dev. Atomic % k-Ratio Intensities FWHM (eV) ROI (gross) Mg 18.21 1.54 22.15 0.1383 547.2 94.3 1032.31 Si 59.54 2.53 62.69 0.3997 1975.8 100.1 2634.08 Ca 16.17 1.35 11.93 0.0730 637.3 121.0 824.81 Fe 6.09 1.34 3.22 0.0376 353.5 145.1 593.68 Total 100.00



CORE BORING AND HAND SAMPLE ANALYTICAL RESULTS



Laboratory Report TX North Second Stret: TX North Second Stret: Report Data TX North Second Stret: TX North Second Stret: Report Data TA Endor TX North Second Stret: Report Data Finite Stret: Finite Stret: Report Data Anathorization Multice Stret: Report Data Multice Stret: Multice Stret: Multice Stret: Multice Stret: Multice Stret: Multice Stret: Multice Stret: Multice Multice Stret: Multice Stret: Multice Multice Stret: Multice Stret: Multice Multice Multice Stret: Multice Multice Multice: Multice Multice Multice: Multice Multice Multice: Multice Multice Multice: Multice Multice <	THE BIT	RJ LeeGroup, Inc.					350 Hoch Tel: 7	RJ Le berg Road, Mor 24-325-1776	RJ Lee Group, Inc. 350 Hochberg Road, Monroeville, PA 15146 Tel: 724-325-1776 Fax: 724-733-1799
Imples by Point Count and Samples Int Int Int Int Int Int Int Int Int Int			Ľ	aboratory	Report				
emples by Point Count ent Sample Number Honogeneous # of Layers Asbestos Number Brock CB-1 #1 0.20 AC CB-1 #1 0.20 AC CB-1 #3 1 0.20 AC Crushed Rock 0.1% Actinolite Clevage 1.% Actinolite C	K & L Gates 17 North Second Stre 18th Floor Harrisburg, PA 1710 United States Attention: Mr. David I Telephone: 717-231-	et 1 Raphael 4504				Report Date Sample Receipt Date RJ Lee Group Job No. Authorization/P.O. No. Client Job No./Name		06/26/2019 05/30/2019 LLH901997-8	
Indext Client Sample # of Layers Asbestos Number Number Percedd(%) Detected(%) #1 - CB-1 #1 Yes 1 0.20 AC fray Crushed Rock Ciray Crushed Rock 1 0.20 AC 0.0% #2 - CB-1 #3 Yes 1 ND #3 - CB-1 #3 Yes 1 ND #3 - CB-2 % Actinolite Clevage 1 ND MD #3 - CB-2 #4 Yes 1 ND Class Crushed Rock 1 ND 1000 Point Count. Detection Limit=0.1% 0.0% #3 - CB-2 #4 Yes 1 ND 0.0% Cleavage 1 ND 1000 Point Count. Detecti	Analysis: Asbestos it Method: EPA/600/R-	ו Bulk Samples by Point Count 93/116							
#1 - CB-1 #1 Yes 1 0.20 AC Gray Crushed Rock Gray Crushed Rock 1 0.20 AC 1000 Point Count. Detection Limit=0.1% 7 7 7 0.0% #2 - CB-1 #3 7 7 ND 1000 Point Count. Detection Limit=0.1% 7 7 ND 1000 #2 - CB-1 #3 7 7 ND 1000 Point Count. Detection Limit=0.1% 7 ND 7 ND 1000 Point Count. Detection Limit=0.1% 7 7 ND 7 ND 7 ND 7 ND 7 1 ND 1 ND 1 ND 1	RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.1% Actinolite Clevage #2 - CB-1 #3 Yes 1 ND Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actinolite Clevage #3 - CB-2 #4 Yes 1 ND #3 - CB-2 #4 Yes 1 ND Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actinolite Clevage	3158814.HPL	#1 - CB-1 #1	Yes	4	0.20 AC	0.10 OF	99.70	Q, AM, OP, M	DF-06/26/2019
#2 - CB-1 #3 Yes 1 ND Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actinolite Clevage #3 - CB-2 #4 Yes 1 ND #3 - CB-2 #4 Yes 1 ND Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actinolite Clevage	Description: Weiaht Loss: 0.0%	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.1% Actinolite Clevage							
Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actinolite Clevage #3 - CB-2 #4 Yes 1 ND Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actinolite Clevage	3158815.HPL	#2 - CB-1 #3	Yes	4	QN	0.20 OF	99.80	Q, AM, OP, M	DF-06/26/2019
#3 - CB-2 #4 Yes 1 ND Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actinolite Clevage	Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actinolite Clevage						1	
#3 - CB-2 #4 Yes 1 ND Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actinolite Clevage 0.0%	Weight Loss: 0.0%								
	3158816.HPL Description:	#3 - CB-2 #4 Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%	Yes	-	QN	0.20 OF	08.66	Q, AM, OP, M	DF-06/26/2019
	Weight Loss: 0.0%	OF=0.2% Actinolite Clevage			-				
									Page 1 of 4

Client Job No./Name:	ame:					RJ Lee G	RJ Lee Group Job No:	LLH901997-8
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158817.HPL	#4 - CB-2 #5	Yes	-	Q	0.10 OF	99.90	Q, AM, OP, M	DF-06/26/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.1% Actinolite Clevage						Ē	
Weight Loss: 0.0%								
3158818.HPL	#5 - CB-2 #6	Yes	~	0.10 TR	0.30 OF	09.60	Q, AM, OP, M	DF-06/26/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.3% Actinolite Clevage							
Weight Loss: 0.0%								
3158819.HPL	#6 - CB-3 #7	Yes	-	QN	0.30 OF	99.70	Q, AM, OP, M	AV-06/26/2019
Description:	Grey Crushed Rock 1000 Point Count. Detection Limit=0.1% OF= Actinolite Clevage							
Weight Loss: 0.0%								
3158820.HPL	#7 - CB-3 #8	Yes		QN	0.20 OF	99.80	Q, AM, OP, MI, M	DF-06/26/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actinolite Clevage							
Weight Loss: 0.0%								
3158821.HPL	#8 - CB-3 #9	Yes	-	DN	<0.1 OF	100.00	CA, OP, M	DF-06/26/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=<0.1% Actinolite Clevage							
Weight Loss: 0.0%								

Page 2 of 4

R RJ LeeGroup, Inc.	up, Inc.				Laboratory	Laboratory Report (Cont)
Client Job No./Name:				RJ Lee Gr	Group Job No:	LLH901997-8
RJLG Sample Clie Number N	Client Sample . Number Homogeneous	# of Layers Asbestos ineous Detected(%)	os Non-Asbestos (%) Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
		Authorized Signature:	Signature:	M w Fall		
			Donald Fike	<u>ey</u>		
ASBESTOS AM = Amosite	NON-ASBESTOS CE = Cellulose	N(AM = Amphibole	NON-FIBROUS MATERIALS HY = Hydromagnesite			
	MW = Mineral Wool FG = Fibrous Glass SF = Switheric Fibers	B = Binder CA = Carbonates C1 = Clav	M = Miscellaneous MI = Mica OP = Opague	T = Tar V = Vermiculite	¢	
			OR = Organic P = Perlite			
DISCLAIMER NOTES						
 "ND" indicates no asbestos was detected; the m. "Trace" or "<" indicates asbestos was identified i limit of 0.25% to 0.32 at high fiber concentrations. Samples are archived for three months following These results are submitted pursuant to RJ Lee 	 "ND" indicates no asbestos was detected: the method detection limit is 0.25%. "Trace" or " "indicates asbestos was identified in the sample, but the concentration is less than the method quantitation limit. PLM coefficients of variance range from approximately 1.8 at the quantitation limit of 0.25% to 0.32 at high fiber concentrations. Samples are archived for three months following analysis and are then properly discarded. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is 	%. entration is less than the method qu oerly discarded. conditions of sale, including the con	antitation limit. PLM coefficier npany's standard warranty an	its of variance range fr d limitation of liability p	om approximately rovisions. No res	 at the quantitation ponsibility or liability is
assumed for the manner in which these rest . This test report relates to the items tested. . This report is not valid unless it bears the r . Any reproduction of this document must be . This report may not be used to daim prodi. . Polarized-light microscopy is not consisten the only method that can be used to determ the only method that can be used to determ . Sample(s) for this project were analyzed a . If RJ Lee Group, Inc. did not collect the sal . ((100-A)/B)*C = Asbestos Detected (%), w	 assumed for the manner in which these results are used or interpreted. This test report relates to the items tested. This report relates to the items tested. This report is not valid unless it bears the name of a NVLAP Lab Code 101208-0 approved signatory. Any reproduction of this document must be in full in order for the report to be valid. This report may not be used to daim product endorsement by NVLAP Lab Code 101208-0, any agency of the U.S. Government or any other laboratory accrediting agency. Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar nonfriable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as "non-asbestos-containing." Sample(s) for this project were analyzed is an similar 100364, NY ELAP #100364, NF E	208-0 approved signatory. e valid. Code 101208-0, any agency of the I in floor coverings and similar nonfri ered or treated as "non-asbestos-co 0364, NY ELAP #10884) facility. of the laboratorys results are limited points counted, and C=total # of asi	J.S. Government or any other able organically bound materi ntaining." to the reported values.	laboratory accrediting als. Quantitative trans	agency. mission electron I	nicroscopy is currently

Page 4 of 4

ATTENTION TO: Lab Use P Only D															
ab Use Only	ö						Purchase Order No.:	10.5			Client Job No.;		Rock Hill Quarry	LLV	
Only	Project No.:	Client No:					Date Results			Rush Charges Authorized ?		T YES			
	Date Logged In:	Logged in By:	By:		1		Needed			(check one)	ne)	OND			
	Name: Andrew Gutshal	D					-	Sample Purpose:	se: Information	Regulatory	Г	-Accreditation (please list below):	ase list b	elow):	
	Company: Hanson Agg	Hanson Aggregates Pa, LLC					-	System ID #:			_				
	Address: 7660 Imperial Way	ial Way					_	DOH Source #:	N/A		_		N/A		
Report	e, Zi	Allentown, PA 18195					Sample Only	Multiple Sources #s:	N						
Results	10-36							Sample Purpose: A	8	Cother N/A					
<u>e</u>	esults To:	Autrew Guishall ©Lehdthenson.com					Chemistry Analvsis Kev	Preservation: Unpres H ₂ Si 4°C HCl HNO NaO	0 H	Matrix: W/W=Wastewater GW=Groundwater S=Soil/Sludge	SW=Surfa DW=Drink O=Oil	SW=Surface Water DW=Drinking Water O=Oil	12.21	Container: P=Plastic G=Glass W=Wipe A - Air (filter or triba)	ladint
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	_	Email:							11	Anduric Docupated		(1	-		-
Invoice To	-							L	Wildiv	i vednesren		N/A)			
	City, State, Zip: Dhone:	Fax:					16		9τ	-		_	-	ΞĄΡε	_
Special		o with Drew Van Orden							EW E			oon Rec	watris Watris	19nis:	Hq
Instructions				Commo	ula Tima			T	-8/		_	-		tuo	
Ğ	Client Sample ID	Sample Description	Sample Date	Start	Stop	Wipe Area / Air Volume	Sample Location (Please specify if NY state)	(Please ate)	/009			-		c	1
	1	CB-1 #1	5/23/19	1123	Grab	N/A			×		4	N/A N/A	X A	٩	N/A
	2	CB-1 #3	5/23/19	1134		N/A			×		4	N/A N/A	X A	Р	N/A
	m	CB-2 #4	5/23/19	1139		N/A			×		4	N/A N/A	X A	Р	N/A
	4	CB-2 #5	5/23/19	147		N/A		1	×		-	N/A N/A	X A	٩	N/A
	G	CB-2 #6	5/23/19	1157		N/A			×		-	N/A N/A	X A	٩	N/A
	9	CB-3 #7	5/23/19	1157		N/A			×		-	N/A N/A	X A	٩.	N/A
	7	CB-3 #8	5/23/19	1203		N/A			×		-	N/A N/A	X A/	٩	N/A
	∞	CB-3 #9	5/23/19	1207		N/A			×		-	N/A N/A	A X	4	N/A
	6	CB-4 #10	5/23/19	1171	×	N/A			×			N/A N/A	/A X	٩	N/A
													-		
Chain of		any a und	Date:	5/23/19	Time: /5	230	Chain of	Received B Received B	Received By (Signature); Received By (Print Name):	Kr Va	Under F	Date: S/24/1' Relinquished To:	124 15 hed To:	Time:	
Custody	Company Name: Far H	110000 R - 100000	Method of Shipment:	hipment:	FUEX		Custoay	Company Name	lame;		1	Method of Shipment:	of Shipm	ent:	
Chain of Custody	1.00	: e):	Date: Relinquished To:	d To:	Time:		Chain of Custody	Received By (Sigr Received By (Prir Company Name	Received By (Signature): MWU Received By (Print Name): Und Commany Name:	Received By (Signature): Awrlin Miller Ju. Received By (Print Name): Under Mill April Commany Name		Date()5-30-19 Til Relinquished To: Method of Shipment:	30-19 hed To: of Shipm	Time: ent:	B -10Pm
	Company Name:		Method of Shipment:	upment:				Aundunoo		1				ĺ,	
Pennsylvania - HQ 350 Hochberg Road Monnewille PA 15146		Washington Columbia Basin Analytical Laboratories 2710 North 20th Avenue							5	H	RJ LEE GROU	LEE	E	GR	0

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	06/11/19	Analyst:	DF	Scope:	<u>036-0PT</u>	•	Sample Description:	Gray	Crushed	Rock			
RJ Lee Gro Sample N	oup umber: 315	8814											
RJ Lee Gro Project Nu	oup umber: LLH	901997-8					Comments / # of Layers:	1000 f)t count	. Detec	tion Limit	0.1%	6. 10 06/11/14 p
Analysis N Stereo- scope	/ethod:						# of Preps:	Homo Y	ogenous N		QC Analyst:		
%	%	Asbestos Type	Morphology		ochroism L	Indices o	f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
	0.2%	Act	w 🕼	GolGR	Col	1.634	1.627	LØ	ΒN	AL	Quartz	Carbonates	Vermiculite
			wcs					LM	PN		Tar	Binder	Opaques
			wcs					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pre	operties	Layered Re:	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.1%	Act. Clev	nge	R.I.							Clay	Organic Part.	Diatoms
											Misc Particles	Foam	Foil
								-					
	terret 2												

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Sllde 8	Total
NAS	100 99	99	160	100	100	100	100	99	797
clev	1	0	0	-0-	ø	.0	0	0	1
ASD	G	1	0	Ð	2	T	0	1	2
-									
								1	
Total	100	100	100	100	100	100	100	100	800

Detection Limit = 1000 × 100% = 0.1%

Page _____ of ____

BI LEE GROUP

		<u>I</u>	PLM Point	t Count Add	<u>itional Slid</u>	es Workshe	<u>et</u>		
Date: <u>6</u>	0/11/19	Ar	nalyst:	DF	N	licroscope:	036-01	Γ	
RJ Lee Gr	oup Sample	e Number: _	315881	4	RJ Lee G	iroup Projec	: Number:	LLH 90199	7-8
				····					
Туре	Slide <u>9</u>	Slide <u>10</u>	Slide	_ Slide	_ Slide	Slide	Slide	_ Slide	Total
NAS	100	100							997
Asb	0	0							Z
Clev	0	0							4
Total									1000

Туре	Slide	Total							
Total	-								

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
			· ·····						
		s						<u> </u>	
Total				date-altra atta					

Date: (56/13/19	Analyst:	DF	Scope:	036- <i>0</i> p	T ·	Sample Description:	Gray C	rushed k	loc K			
RJ Lee Gro	up Imber: 315	8015						1					
RJ Lee Gro	-	6100					Comments /	•					
		11901997-8	3				# of Layers:	1000 f	St count	-, Deter	tion Limi	+=0.1%	•
Analysis M	ethod: L	4901997-8						1		r			
Stereo- scope							# of Preps:	Homo Y	ogenous N		QC Analyst:		
		Asbestos		Color/Ple	ochroism	Indices o	f Refraction	Birefrin-	Sign of	Extinction			
%	%	Туре	Morphology			11	<u>ــــــــــــــــــــــــــــــــــــ</u>	gence	Elongation	Angle	NFM%		
		ND	wcs					LM	P N		Quartz	Carbonates	Vermiculite
			wcs					LM	PN		Tar	Binder	Opaques
			WCS					LM	PN		Perlite	<amphibole< td=""><td>Gypsum</td></amphibole<>	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.2%	Actin. Cl	CW.	R.I							Clay	Organic Part.	Diatoms
											Misc.Particles	Foam	Foll
				-									

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	99	100	100	100	100	100	799
Cle	0	0	1	Ó	Ø	0	0	v	t
ASD	0	0	0	0	0	0	0	0	0
Total	100	100	100	100	100	100	100	+8-100	800
								oc/is/igpF	

Total

100

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BILEE GROUP

		ļ	PLM Poir	nt Count Add	litional Slid	es Workshe	et		
o Date: م	0/13/19	Aı	nalyst:	DF	N	licroscope:	036-01	T	
RJ Lee Gr	oup Sample	Number:	315881	5	RJ Lee G	roup Projec	t Number:	LLH9019	17-8
						alana ya Kasaki da			
Туре	Slide <u>9</u>	Slide <u>10</u>	Slide	_ Slide	_ Slide	_ Slide	_ Slide	_ Slide	Total
NAS	99 jocolisty	100							199
NAS cle	octuring 1	0							1
Asb	6	6							Ø

Туре	Slide	_ Slide	_ Slide	Slide	Slide	Slide	Slide	Slide	Total
				· · · · · · · · · · · · · · · · · · ·					
Total									

Туре	Slide	Slide	_ Slide	_ Slide	Slide	Slide	Slide	Slide	Total
								·····	
Total									

1000

CORUSERED SCIENTIFIC REGULATION Effective Date: March 2019 Form C OPT.001.9

Date:	06/20/19	Analyst:	DF	Scope:	036-0P7		Sample Description:	Grav C	roshed A	ocK			
RJ Lee Gr Sample N	oup umber: 315	8816						/					
RJ Lee Gr Project N	oup umber: LL († *						Comments / # of Layers:	1000 po;	nt count.	Detect	ion Limit	= 0.1%	· · ·
Analysis N Stereo- scope	/lethod:						# of Preps: [O	Homo	ogenous N	QC Y N	QC Analyst:		
9	5 %	Asbestos Type	Morphology	Color/Pie	ochroism 上		f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
		ND	wcs					LM	ΡN		Quartz	Carbonates	Vermiculite
			wcs					LM	ΡN		Tar	Binder	Opaques
			wcs					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Re	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.2%	Actin. C	levage	R.I							Clay	Organic Part.	Diatoms
			v								Misc Particles	Foam	Foil

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Sllde 6	Slide 7	Sllde 8	Total
NAS	100	100	100	100	100	98	100	100	798
Clev.	0	0	0	0	0	2	0	0	2,
ASD	0	0	0	Ø	O	0	0	0	0
Total	100	100	100	601	100	100	100	100	800

BI LEE GROUP

Date: 06/20/19 Analyst: DF Microscope: 036-0PT

RJ Lee Group Sample Number: 3158816 RJ Lee Group Project Number: <u>LLH401997-8</u>

Туре	Slide <u>9</u>	Slide <u>ι</u> ø	Slide	Slide	Slide	_ Slide	Slide	_ Slide	Total
NAS	100	100							200
Clev	O	0							C
ASD	0	0							ø
Total	100	100							1000

Туре	Slide	Total							
	-								
			-						
Total									

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
							· · · · · · · · · · · · · · · · · · ·		
	· · · · · · · · · · · · · · · · · · ·								
	<u>.</u>								
Total				L <u>.</u>		<u> </u>			

BI LEE GROUP DELIVERING SCHNTHIC REGULITION Effective Date: March 2019 Form C OPT.001.9

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Date:	06/20/19	Analyst:	DF	_ Scope:	036-0PT		Sample Description:	Gray	Crushed	Rock			
RJ Lee Gi Sample N	roup Number: 315	8817						0.1					
RJ Lee Gi	roup lumber: LLH 4						Comments / # of Layers:	1000 p	t count	. Deko	lion Limi	1 = 0.1%)
Stereo- scope							# of Preps: 10	Home	ogenous N	QC Y N	QC Analyst:		
	%	Asbestos Type	Morphology		ochroism 上	Indices o	f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
		ND	wcs					LM	P N		Quartz	Carbonates	Vermiculite
			wcs					LM	P N		Tar	Binder	Opaques
			WCS					L M	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	opertles	Layered Re	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.1%	Actin, cle	evage	R.Ib							Clay	Organic Part.	Diatoms
											Misc Particles	Foam	Foil
						1							
			-										

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	99	100	799
Cle	0	0	0	0	0	0	1	0	ι
Asb	0	0	O	0	0	6	0	0	0
Total	100	(00	100	100	100	100	100	100	800

BI LEE GROUP

PLM Point Count Additional Slides Worksheet											
Date:	06/20/19	Analyst:	DF	Microscope:	036-0pT						

RJ Lee Group Sample Number: 3158817 RJ Lee Group Project Number: LL1901997-8

Туре	Slide <u>9</u>	Slide <u>10</u>	Slide	Slide	Slide	Slide	_ Slide	_ Slide	Total
NAS	100	100							200
cle.	0	0							Ô
Asb	C	Ø							0
Total	100)	100	:						1000

Туре	Slide	Total							
								· · · · ·	
		1							
Total									

Туре	Slide	Total							
Total									

C) RJ LEE GROUP OLIVERING SCIENTIFIC RESOLUTION Effective Date: March 2019 Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	06/20/19	Analyst:	DF	Scope:	<i>036</i> -0PT	• ,	Sample Description:	Groy	Crushed	Rock			
RJ Lee Gr													
Sample N	umber: 3 \$5	- 88 <i>1</i> 8											
RJ Lee Gr							Comments /						
Project N	umber: LLH	901997-8					# of Layers:	1000 p.	- count .	Detection	on Limit	=0,1%	
Analysis M	/lethod:							1					
Stereo- scope					-		# of Preps: [O	Homo	ogenous N	QC Y N	QC Analyst:		
		Asbestos		Color/Ple	eochroism		f Refraction	Birefrin-	Sign of	Extinction			
9	%	Туре	Morphology	11				gence	Elongation	Angle	NFM%		
	0.1%	Tiem	(W)c s	Col	co1	1.635	1.625	LØ	@ N	00	Quartz	Carbonates	Vermiculite
			WCS					LM	P N		Tar	Binder	Opaques
			W C S					<u>ьм</u>	P N		Perilte	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Lavered Res	ults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.3%	Actin. Cl	evage	R. 1	[,						Clay	Organic Part.	Diatoms
			-								Misc Particies	Foam	Foli

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	99	99	98	100	100	100	796
cle	0	0		0	2	0	6	0	3
A5.5	0	0	0	1	0	0	0	0	1
_									
Total	100	100	100	100	100	100	100	100	800

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Effective Date: March 2019

BILEE GROUP

Form F OPT.001

PLM Point Count Additional Slides Worksheet

Date: 06/20/19 Analyst: DF Microscope: 036-0PT

RJ Lee Group Sample Number: 3158818 RJ Lee Group Project Number: LLH 90/997-8

Туре	Slide <u>අ</u>	Slide <u>10</u>	Slide	_ Slide	Slide	_ Slide	_ Slide	_ Slide	Total
NAS	100	100	1						200
cle	0	0							0
Asb	d	0							U
Total	100	(00							1000

Туре	Slide	_ Slide	_ Slide	_ Slide	Slide	_ Slide	Slide	_ Slide	Total
Total									

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
				<u> </u>					
							·		
Total									

Date:	1 1	Analyst:	AVD	Scope:	025-0	PT.	Sample Description:	Greu	Cru	sned	Rack	.	
	^{up} mber:315૧	2819)	1				
RJ Lee Gro		30.1					Comments /	·					
		1901997.	-8				# of Layers:	1000 Pc	int Cour	nt.Deta	ection Li	mte a.	1%
Analysis M	ethod:												
Stereo- scope							# of Preps:	Homo Y	ogenous N		QC Analyst:		
		Asbestos		Color/Ple	ochroism	Indices o	f Refraction	Birefrin-	Sign of	Extinction	<u> </u>	_	
%	%	Туре	Morphology	11		<u> </u>	L	gence	Elongation	Angle	NFM% 90	<u>1.71</u>	
	ND		wcs					LM	ΡN		Quartz)	Carbonates	Vermiculite
			wcs					LM	ΡN		Tar	Binder	(Opaques)
			wcs					LM	ΡN		Perlite 🤇	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.3%	Activalite	clevage								Clay	Organic Part.	Diatoms
			J								Misc Particles	Foam	Foil
												, outin	101
													1
· · ·													

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	98	100	100	100	99	IOO	100	100	797
der	2日子 2	0	0	0	and I	0	0	0	3
ASD	0	a	0	0	Co poin	0	0	0	0
Total									



PLM Point Count Additional Slides Worksheet										
Date: <u>O</u>	6/20/19	Ar	nalyst: 🚽	AVP	Microscope: 025-0PT					
RJ Lee Gr	oup Sample	Number:	31588	19	RJ Lee Group Project Number: <u>LLH901997 - 8</u>					
Туре	Slide <u> </u>	Slide <u>1 O</u>	Slide	Slide	Slide	Slide	Slide	Slide	Total	
NAS	100	100							997	
der	٥	٩							3	
ASD	0	٥							0	
								-		
Total	. <u></u>								1000	
								1		
Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total	

	 	 			· · · · · · · · · · · · · · · · · · ·		
	:						
	 	 				· · · · · · · · · · · · · · · · · · ·	
Total							
	 	· · · · · · · · · · · · · · · · · · ·	L	l	L		I

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
						- coto			
Total									

Date:	06/20/19	Analyst:	DF	Scope:	036·0PT	• .	Sample Description:	Gray	Crushed	. Rock	F		
RJ Lee Gr Sample N	oup lumber: 315	8820								-			
RJ Lee Gr Project N	roup lumber: <i>LLは</i>						Comments / # of Layers:	1000	nt coun	t. Dete	action L	init= 0	.1%
Analysis Stereo- scope	-1						# of Preps:] O	Homo	egenous N	QC Y N	QC Analyst:	<u></u>	
	%	Asbestos Type	Morphology	Color/Ple II	eochroism L		FRefraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
		ND	wcs					LM	ΡN		Quartz	Carbonates	Vermiculite
			WCS					LM	P N		Tar	Binder	Opaques>
			wcs			L		LM	P N		Perlite	Amphibole	Gypsum
	/ %	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	<u>ults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	MICE
	0.2%	Actin cl	lev.	R	L,						Clay	Organic Part.	Diatoms
											Misc Particles	Foam	Foil
				,		ļ							

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	99	99	100	100	798
Cle	0	0	0	0	1	1	0	O	Z
Asb	0	0	0	Ó	0	0	0	0	0
Total	100	100	601	100	100	100	100	100	800

BI LEE GROUP

PLM Point Count Additional Slides Worksheet										
Date: 06/20/19	Analyst: DP	Microscope: 036-0PT								
RJ Lee Group Sample Nu	mber: 31588 Z0	RJ Lee Group Project Number: LLH901997-8								

Туре	Slide 9	Slide <u>10</u>	Slide	Slide	Slide	Slide	Slide	Slide	Total
NAS	100	100							200
cle	0	O							Ö
Asb	0	0							0
Total	100	100							1000

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
					<u> </u>				
Total									

Туре	Slide	Slide	Slide	_ Slide	Slide	_ Slide	Slide	_ Slide	Total
	-							·····	
Total									

CORLEE GROUP DELIVERING SCIENTING RESOLUTION Effective Date: March 2019 Form C OPT.001.9

Date:	06/20/19	Analyst:	DF	Scope:	<u>036-0P</u>	T	Sample Description:	Gray	Crushec	1 Rock	、		
RJ Lee Gro								/					
Sample N	umber: 3158	3821											
RJ Lee Gro	Jup						Comments /				11.	1	
Project Ni	umber: レムト	901997-8					# of Layers:	1000 pc	oint cou	1t. Det	lection L	imit = 0,1	10
Analysis N	/lethod:							, 					
Stereo-							# of Preps: 10	Homo O	genous N		QC Analyst:		
scope	- Calendary	Asbestos	,	Color/Ple	ochroism		f Refraction	Birefrin-	Sign of	Extinction		<u></u>	
%	%		Morphology				<u></u> Ц		Elongation		NFM%		
		ND	wcs					LM	PN		Quartz	Carbonates	Vermiculite
			wcs					LM	P N		Tar	Binder	Opaques
			WCS					L M	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Lavered Res	<u>ults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part.	Diatoms
											Misc Particle	s Foam	Foil
		1											
									_				

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide S	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
Cle	ø	0	ø	.0-	0	0	0	ß	0
Asb	Q	Æ	Q	0	ø	0	0	C	d
Total	100	100	103	100	100	100	100	100	800

RJ LEE GROUP DELIVERING SCIENTIFIC RESOLUTION

Effective Date: March 2019 Form F OPT.001

PLM Point Count Additional Slides Worksheet

Date: 06/20/19 Analyst: DF Microscope: 036-0pT

RJ Lee Group Sample Number: <u>3158821</u> RJ Lee Group Project Number: <u>LLI4 %1997-8</u>

Туре	Slide <u>9</u>	Slide 10	Slide	Slide	Slide	_ Slide	_ Slide	Slide	Total
NAS	100	100							200
cle	0	0							Ø
Ash	0	0							0
Total	100	100							1000

Туре	Slide	Total							
Total									

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
			-						
			- m.						
			•						
Total			<u> </u>		<u></u>				

CORLINGIANCE SCIENTIFIC RESOLUTION Effective Date: March 2019 Form C OPT.001.9

Date:	<u>66/24/17</u>	Analyst:	DF	Scope:	<u>036-091</u>	 	Sample Description:	Gray (rushed	Rock			
RJ Lee Gr	oup lumber: 3/5	8822						,					
RJ Lee Gr	oup	901497-8					Comments / # of Layers:	1000 p	oint cou	nt. De	fection L	imit = o	.1°i
Analysis I Stereo- scope	-						# of Preps: 10	Homo	genous N		QC Analyst:		
	6 %	Asbestos Type	Morphology	Color/Ple	ochroism 上		f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
		ND	wcs					LM	ΡŇ		Quartz	Carbonates	Vermiculite
			WCS					LM	PN		Tar	Binder	Opaques
			wcs					LM	P N		Periite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part.	Diatoms
								1			Misc Particles	Foam	Foil

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Silde 8	Total
NAS	100	100	100gg	100	100	100	100	100	799
Clev	6	6	1	0	0	C	Ø	0	(
Asb	0	0	0	0	0	U	0	0	0
		_							
Total	100	100	100	100	100	,00	100	100	800

BI LEE GROUP

		Ē	PLM Point	t Count Addi	tional Slid	<u>es Workshe</u>	<u>et</u>		
Date: 🕂	e/24/1a	Ar	nalyst:	DF	M	icroscope:	036-01	o'T	
RJ Lee Gr	oup Sample	Number: _	315882	.2	RJ Lee G	roup Projec	t Number:	<u>LL11901</u>	997-8
Туре	Slide <u>1</u>	Slide 10	Slide	Slide	Slide	Slide	Slide	Slide	Total
NAS	100	100							200
cle	Ö	0						-	
Asb	0	0							
Total	100	100		a. 415-00-00-00-00-00-00-00-00-00-00-00-00-00					1000
								- r	
Type	Slide	Slide	Slide	_ Slide	Slide	Slide	_ Slide	Slide	Total

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
	· · · · · · · · · · · · · · · · · · ·							
		·····						
							1	
Total								

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
							· · · · · · · · · · · · · · · · · · ·		
				<u></u>					
Tetal									
Total									

						Tel:	724-325-1776	Tel: 724-325-1776 Fax: 724-733-1799
			Laboratory Report	' Report				
K & L Gates 17 North Second Street 18th Floor Harrisburg, PA 17101 United States Attention: Mr. David Raphael Telephone: 717-231-4504	eet 1 Raphael -4504				Report Date Sample Receipt Date RJ Lee Group Job No. Authorization/P.O. No. Client Job No./Name		06/27/2019 05/30/2019 LLH901997-7	
Analysis: Asbestos in Bulk S Method: EPA/600/R-93/116	Analysis: Asbestos in Bulk Samples by Point Count Method: EPA/600/R-93/116							
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158807.HPL	#1 - DB-1	Yes	r.	0.10 AC	0.20 OF	<u>99.70</u>	Q, AM, OP, M	DF-06/26/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.2% Actin. Clevage						Ξ	
Weight Loss: 0.0%								
3158808.HPL	#2 - DB-2	Yes	-	QN		100.00	Q, AM, OP, M	DF-06/27/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%							
Weight Loss: 0.0%								
3158809.HPL	#3 - DB-3	Yes	-	QN		100.00	Q, AM, OP, M	DF-06/27/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%							
Weight Loss: 0.0%								

RJG RJ L	RJC RJ LeeGroup, Inc.						Laboratory	Laboratory Report (Cont)
Client Job No./Name:	ame:					RJ Lee C	RJ Lee Group Job No:	LLH901997-7
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158810.HPL	#4 - DB-4	Yes	~	DN		100.00	Q, CA, OP, M	DF-06/27/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1%							
Weight Loss: 0.0%								
3158811.HPL	#1 - Hand Sample #1	Yes	.	QN	0.10 OF	06.66	Q, CA, OP, M	DF-06/27/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF= 0.1% Actinolite Clevage							
Weight Loss: 0.0%								
3158812.HPL	#2 - Hand Sample #2	Yes	-	QN		100.00	Q, CA, OP, M	DF-06/27/2019
Description:	White Crushed Rock 1000 Point Count. Detection Limit=0.1%							
Weight Loss: 0.0%								
3158813.HPL	#3 - Vein 7	Yes	÷	0.10 AC	0.40 OF	99.50	Q, AM, OP, M	DF-06/27/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=0.4% Actinolite Clevage							

Weight Loss: 0.0%

Client Job No./Name:					RJ Lee G	RJ Lee Group Job No:	LLH901997-7
RJLG Sample Cli Number	Client Sample Number Hc	# of Layers Homogeneous	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
			Authorized Signature:	ture:	I w B		
)	Donald Fike	Q		
A CDECTOC	NON-AGREATOS			NON-FIRPOLIS MATERIALS	ď		
AM = Amosite	CE = Cellulose	AM = A	= Amphibole H	HY = Hydromagnesite			
	MW = Mineral Wool		= Binder M	1 = Miscellaneous	T = Tar		
AN = Anthophyllite	FG = Fibrous Glass		onates		V = Vermiculite	te	
	SF = Synthetic Fibers	CL = 0		OP = Opaque			
CR = Crocidolite			= Feldspar	= Perlite			
DISCLAIMER NOTES							
"ND" indicates no asbestos "Trace" or "<" indicates ash	• "ND" indicates no asbestos was detected; the method detection limit is 0.1%. • "Trare" or "~" indicates asbestos was identified in the sample but the concentration	tration	ne method duantitatio	is less than the method culantitation limit. PI M coefficients of variance range from annrovimately 1.8 at the guantitation	s of variance rande fr	om annroximatelv	1 8 at the duantitation
 Trace or series aspestos was identified i limit of 0.25% to 0.32 at high fiber concentrations. Samples are archived for three months following 	 Trace or set indicates assestions was identified in the sample, but the concentration is less limit of 0.25% to 0.32 at high fiber concentrations. Samples are archived for three months following analysis and are then properly discarded. 	concentration is less than tr properly discarded.	ne mernoa quantitatio	n limit. PLM coefficients	s or variance range n	om approximately	1.8 at the quantitation
 These results are submitted pursuant to R assumed for the manner in which these res This test report relates to the items tested 	 These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted. This test report relates to the items tested. 	and conditions of sale, incl	uding the company's	standard warranty and	limitation of liability p	rovisions. No resp	onsibility or liability is
This report is not valid unlet This report is not valid unlet Any reproduction of this do This report may not be used Polarizad-light microsconvie	This reproduction of a manufactorial of a NVLAP Lab Code 101208-0 approved signatory. This reportation of this document must be in full in order for the report to be valid. This report may not be used to claim product endorsement by NVLAP Lab Code 101208-0, any agency of the U.S. Government or any other laboratory accrediting agency.	 101208-0 approved signatory. t to be valid. Lab Code 101208-0, any agen- settes in floor covarings and sim 	ory. jency of the U.S. Gov similar nonfriable ord	/ernment or any other Is anically bound material	aboratory accrediting	agency. mission electron m	icroscoov is currently
the only method that can be i . Sample(s) for this project w	the only method that can be used to determine if this material can be considered or treated as "non-asbestos-containing." Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NY ELAP #10884) facility.	onsidered or treated as "non 4 #100364, NY ELAP #1088		מווכמווץ צכטווע וווגועיועיי י	ס. עומוווומויע וימויס		נייוישרושי זע לעוסטטו
			•				

CO RILLEE GROUP Effective Date: March 2019 Form C OPT.001.9

Date: (06/25/19	Analyst:	DF	Scope:	CBC OPT		Sample Description:	Gray	Conshed	Rock			
RI Lee Gro	umber: 315 oup umber: LLH	8807 961997-7					Comments /				lion Limin	1=0.1%	
Stereo- scope							# of Preps: [O	Homo Y	ogenous N		QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Plo	eochroism	Indices o II	f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
	o,t	Frem Actor	w c 🕲	GR	Col	1.634	1.627	ιØ	ΘN		Quartz	Carbonates	Vermiculite
		oclarinof	WCS					LM	PN		Tar	Binder	opaques
			WCS					LM	<u>PN</u>		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Re	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mlca
<u> </u>	6.2	Actin, Cl	ev.	R.I	•						Clay	Organic Part.	Diatoms
		<u>, , , , , , , , , , , , , , , , , , , </u>				ļ					Misc Particles	Foam	Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Sllde 8	Total
NAS	99	100	99	99	100	100	100	100	797
Clev.	0	0	t)	0	0	O	0	え
Asb	1	0	Ö	0	0	0	0	0	1
Total	100	100	100	100	100	100	100	100	800



			PLM Point	t Count Add	litional Slid	<u>es Workshe</u>	<u>et</u>		
Date: <u>0</u>) as/19	A	nalyst:	DF	N	licroscope:	036-01	s.T	
RJ Lee Gr	oup Sampl	e Number:	3158807	1	_ RJ Lee G	roup Projec	t Number:	LLH901997	1-7
Туре	Slide 9	Slide in	Slide	Slide	Slide	Slide	Slido	Slido	Total

Туре	Slide <u>1</u>	Slide <u>10</u>	Slide	_ Slide	_ Slide	_ Slide	_ Slide	_ Slide	Total
NAS	100	100							200
clev.	0	0							0
Asb	0	0							0
			1963 1979 1979 1979 1979 1979 1979 1979 197						
Total	100	100							1000

Туре	Slide	_ Slide	_ Slide	_ Slide	Slide	_ Slide	Slide	Slide	Total
,	<u> </u>								
Total		· ·							

Туре	Slide	_ Slide	_ Slide	_ Slide	Slide	_ Slide	Slide	_ Slide	Total
· · · · · · · · · · · · · · · · · · ·									
Total								20.	

Date:	oulaelia	Analyst:	DF	Scope:	036-0PT		Sample Description:	Gray	1 Crushe	d Roci	Қ		
RJ Lee Gro	umber: 3151 oup umber: LL 1						Comments / # of Layers:	, ام متعا	count.	Detect	Ion Limi	+=0.1%	
Stereo- scope							# of Preps: LO	Homo Y	genous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple	ochroism 上	Indices of	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
<u> </u>		ND	wcs					LM	ΡN		Quartz	Carbonates	Vermiculite
			WCS					LM	PN		Tar	Binder	Opaques
			WCS					LM	<u>PN</u>		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Lavered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part.	Diatoms
											Misc Particles	> Foam	Foli
	333.355												

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
cle	0	0	0	0	0	0	0	0	6
Asb	0	0	0	0	0	O	0	0	0
				·····					
Total	100	100	100	100	100	160	100	100	200

BI LEE GROUP

		<u> </u>	PLM Point	<u>Count Addi</u>	tional Slide	s Workshee	<u>et</u>		
Date:	6/26/19	AI	nalyst: <u>D</u>	F	Mio	croscope: _	036-0	PT	
RJ Lee Gr	oup Sample	e Number: _.	<u>3158808</u>	, 	RJ Lee Gro	oup Project	Number:	LLH9019	97-7
Туре	Slide <u>9</u>	Slide <u>10</u>	Slide	Slide	Slide	Slide	Slide	Slide	Total
NAS	100	100							2.00
cle	0	0							
ASb	0	0							
Total	100	100							1000
T	Clink	Cline	Clide	Clide	Clide	Clide	Clide	Cline	Tatal

Туре	Slide	Total							
Total									

Туре	Slide	Total							
		r							
Total									

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T

CO RJ LEE GROUP DELIVERING SCIENTIFIC RESOLUTION Effective Date: March 2019 Form C OPT.001.9

Date: 🕻	16/26/19	Analyst:	DF	Scope:	<u>036-0P</u>	Г ·	Sample Description:	Giay	Crushed	Rock			
RJ Lee Gro	mber: 3156 up mber: ムムド	3809 701997-7	<u>, , , , , , , , , , , , , , , , , , , </u>					• 			tection	Limit =	0.1%
Stereo- scope	our our						# of Preps: 10	Homo Y	ogenous N	QC Y N	QC Analyst:		
<u>300pc</u>	%	Asbestos Type	Morphology	Color/Ple	ochroism L	Indices o	f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
/0		ND	wcs					LM	PN		Quartz	Carbonates	Vermiculite
			WCS					LM	P N		Tar	Binder	Opaques
			WCS					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part.	Diatoms
											Misc Particles	Foam	Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
cle	0	0	C	C	0	O	0	0	0
Asb	0	O	0	0	0	0	0	0	0
	ļ				· ·				
Total	100	100	100	00	100	100	100	100	800

Effective Date: March 2019

RJ LEE GROUP

Form F OPT.001

PLM Point Count Additional Slides Worksheet Date: <u>66/26/19</u> Analyst: <u>DF</u> Microscope: <u>036-0PT</u> RJ Lee Group Sample Number: <u>3158809</u> RJ Lee Group Project Number: <u>LL #901997-7</u> Slide 9 Slide 10 Туре Slide Slide _ Slide Slide Slide Slide Total NAS 100 100 200 cle 0 0

Asb	0	0				
Total	100	100				1000

Туре	Slide	_ Slide	_ Slide	Slide	Slide	Slide	_ Slide	_ Slide	. Total
							· · · · · · · · · · · · · · · · · · ·		
Total									

Туре	Slide	Slide	_ Slide	_ Slide	_ Slide	_ Slide	_ Slide	_ Slide	Total
							· · · · · · · · · · · · · · · · · · ·		
Total					<u> </u>				

Date:	<u>06/27/19</u>	_ Analyst:	DF	Scope:	036-007	-	Sample Description: 1	Gray Cr	ushed Ro	сK			
RJ Lee Gr		A								·····			
Sample N	umber: 3157	6810											
RJ Lee Gr	oup						Comments /						
Project N	umber: LLH	901997-7					# of Layers:	1000 pt.	Lount. De	stection L	init: 0	.1%	
Analysis N	<u>A</u> ethod:												
Stereo-],						# of		ogenous	QC	QC		
scope							Preps: 10	<u>Y</u>	N	Y N	Analyst:		
		Asbestos		1 · · · · · · · · · · · · · · · · · · ·	ochroism	Indices o	f Refraction	Birefrin-	Sign of	Extinction			
%	%	Туре	Morphology	1		<u> </u>		gence	Elongation	Angle	NFM%		
		ND	wcs					LM	P N		Quarta	Carbonates	Vermiculite
			wcs					LM	ΡN		Tar	Binder	Opaques
			wcs					L M	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Lavered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
-											Clay	Organic Part.	Diatoms
											Misc Particle	Foam	Foil
												<i></i>	

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
Cle	0	0	Ð	0	0	0	0	0	0
Ash	ð	0	٥	0	Ø	0	d	U	0
Total	100	100	100	100	100	100	100	100	800



			PLM Poin	t Count Add	ditional Slid	les Worksho	eet		
Date: <u>o</u> d	6/27/19	A	nalyst:	DF	N	licroscope:	036-0PT		
RJ Lee G	roup Sample	e Number:	3158810)	RJ Lee G	Group Projec	ct Number:	LLH 90190	17-7
T									
Туре	Slide <u>9</u>	Slide <u>10</u>	Slide	Slide	Slide	_ Slide	_ Slide	_ Slide	_ Total
NAS	100	100							200
Cle	0	G							
Asb	0	9							
Total	100	100							1000
Type	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
						-			
Total					(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)				

Туре	Slide	Total							
			·····						
Total									· · · · · · · · · · · · · · · · · · ·

Date:	<u>oula7/19</u>	Analyst:	DF		055-0P <u>019-0P</u> 00007/10		Sample Description:	Grad	Crushed	Rock			
RJ Lee Gr	lumber: 315 & oup umber: LLHๆ		<u>, , , , , , , , , , , , , , , , , , , </u>				Comments / # of Layers:				Limit:	0.1%	
Stereo- scope							# of Preps: \ 0	Homo Y	ogenous N	QC Y N	QC Analyst:		
9	6 %	Asbestos Type	Morphology	Color/Ple	eochroism L	Indices o II	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
	ND		wcs					LM	PN		Quartz	Carbonate	Vermiculite
			wcs					LM	P N		Tar	Binder	Opaques
			wcs					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr		Layered Re	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.1%	Actin, C	ler	R.1	-						Clay	Organic Part.	Diatoms
											Misc Particle	S) Foam	Foil
												-	
					•						1		

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	99	100	100	100	100	799
Clev	0	O	0	1	0	0	0	0	1
Asp	0	0	0	U	Ø	Ø	0	Ø	0
Total	100	100	160	100	100	100	100	100	800



	<u>PLM Poi</u>	int Count Ad	ditional Slides Worksheet
Date: 3158811 0(e/a7/19	Analyst:	DF	055-007 Microscope: <u>⊖19-00</u> ۵۵/۵7/196

RJ Lee Group Sample Number: 3158811 RJ Lee Group Project Number: LLH901997-7

Туре	Slide <u>9</u>	Slide <u>I</u>	Slide	Slide	Slide	Slide	Slide	_ Slide	Total
NAS	100	100							999
Clev Ash	0	0							1
Ash	0	0							0
Total	100	160							1000

Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
					<u> </u>				
Total									

Туре	Slide	Total							
									····
			-						
Total							-		

Page _____ of _____

BILLEE GROUP Effective Date: March 2019 Form C OPT.001.9

Date:	06/27/19	Analyst:	PF	Scope:	ଓ ୭୫-୦୧୮	-	Sample Description:	White	2 Crush	ed Rock	ζ		
RJ Lee Gr Sample N	oup lumber: 315;	8812									,		
RJ Lee Gr		100 0					Comments /	10000		~ 1 1	· .1		
Project N Analysis I	umber: LLH9 Method:	0 199 7- +					# of Layers:	1000 1.	t count.	Detection	Limit = 0	1.1%	
Stereo- scope							# of Preps: 10	Homo y	ogenous N	QC Y N	QC Analyst:		
		Asbestos		Color/Ple	ochroism		f Refraction	Birefrin-	Sign of	Extinction			
9	6 %	Туре	Morphology					gence	Elongation	Angle	NFM%		
		ND	wcs					LM	ΡN		Quartz	Carbonates	Vermiculite
		•	wcs					LM	ΡN		Tar	Binder	Opaques
			wcs					LM	ΡŇ		Perlite	Amphibole	Gypsum
	%	Von-Asbestos	Fibers	Optical Pro	operties	Lavered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part.	Diatoms
											Misc Particles	Foam	Foil
						1							

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	(00	160	100	100	100	BOD
Clev	6	0	C	a	0	0	C	0	
Asb	0	0	U	Û	0	O	0	0	
Total	(00	୍ତଠ	001	100	100	100	100	100	800



	PLM Point Count Additional Slides Worksheet										
Date: <u>06</u>	lazliq	Aı	nalyst:	DF	Microscope: 055-00T						
RJ Lee Group Sample Number: <u>315881</u> RJ Lee Group Project Number: <u>LLH 961997</u>									7-7		
	a an and the second										
Туре	Slide <u>9</u>	Slide <u>10</u>	Slide	Slide	Slide	Slide	Slide	Slide	Total		
NAS	100	100							(000		
Clev	0	0							0		
Asb	N	6							0		
· · · · · · · ·											
Total	100	60					1		1600		
				<u></u>							
Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total		

T 1					
Total					
		Land and the second	 	 	 J

Туре	Slide	Total							
	ļ								
Total									

CORLEE GROUP DELIVERAND SCIENTIFIC ASSOLUTION Effective Date: March 2019 Form C OPT.001.9

Analyst: <u>UF</u> Scope: <u>055-007</u> Sample Description: <u>Gray Crusked Rock</u>
Commente /
Having 7-7 Comments/ # of Layers: 1000 pt count. Detection Limit= 0.1%
rollayers. 100 NT COURT. Detection Cimin - Orre
of Homogenous QC QC Preps: / /2 Y N Y N Analyst:
Asbestos Color/Pleochroism Indices of Refraction Birefrin- Sign of Extinction
Actin WCS Gr Col 1.634 1.627 LOD (PN AL Quarter Carbonates Vermiculite
WCS LM PN Tar Binder Opaques
WCS LM PN Perlite Amphibole Gypsum
Non-Asbestos Fibers Optical Properties Lavered Results Asbestos Non-Asb. Matrix Talc Feldspar Mica
Actinolite Clev, R.I. Diatoms
Misc Particles Foam Foll
Type Morphology II II II I gence Elongation Angle NFM% Actin W C S Cr Col 1.634 1.627 L M P N AL Quar W C S L M P N Law P N Perlin Non-Asbestos Fibers Optical Properties Layered Results Asbestos Non-Asb. Matrix Taic Actinolite Cleu R.T. Cleu Clau Clau Clau Clau

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	98	99	99	99	100	100	795
CLE	0	0	2	1	σ]	Ô	0	4
Asb	Ø	0	0	0	1	0	0	Ø	1
						ļ			
Total	100	100	100	100	100	100	100	100	800



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Effective Date: March 2019 Form F OPT.001

Total

PLM Point Count Additional Slides Worksheet										
6/27/19	Ar	nalyst:])F	Mic	croscope: _	055-0P,	1			
RJ Lee Group Sample Number: <u>3158813</u> RJ Lee Group Project N								7-7		
Slide	Slide <u>10</u>	Slide	Slide	Slide	Slide	Slide	Slide	Total		
100	100							995		
Ø	6							4		
0	0							1		
100	100							1000		
					1	<u> </u>	<u></u>			
Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total		
	oup Sample	(a)(a)(a)(a)(a)(a)(a)(a)(a)(a)(a)(a)(a)($@/27/19$ Analyst: DE oup Sample Number: 3158813 Slide 9 Slide Slide 160 100 100 σ G G 0 0 G 100 G G 100 G G	$G/27/19$ Analyst: DE Mid oup Sample Number: 3158813 RJ Lee Gro Slide 9158813 Slide Slide 160 100 Slide Slide Slide σ G G G G G 0 O G G G G σ G G G G G O O G G G G IOO IOO G G G G	G/27/19 Analyst: DF Microscope: Outpoint oup Sample Number: 3158813 RJ Lee Group Project Slide 9 Slide Sli	G/27/19 Analyst: DF Microscope: $OSS-OF$ oup Sample Number: $3ISBBI3$ RJ Lee Group Project Number: Slide 9 Slide Slide Slide Slide Slide Slide 100 O	G/27/19 Analyst: DE Microscope: $OSS - OPT$ oup Sample Number: 3159813 RJ Lee Group Project Number: $LLH90199$ Slide 9 Slide Slide Slide Slide Slide Slide $ILH90199$ Slide 9 Slide Slide Slide Slide Slide Slide $ILH90199$ Slide 9 Slide Slide Slide Slide Slide $ILH90199$ $I60$ 100 I00 I00		

Туре	Slide	Total							
Total									



Laboratory Report

K & L Gates	Report Date	11/07/2019
17 North Second Street	Sample Receipt Date	11/06/2019
Harrisburg, PA 17101 United States	RJ Lee Group Job No.	LLH901997-20
Attention: David Raphael	Authorization/P.O. No.	
Telephone: 717-231-4504	Client Job No./Name	

Analysis: Asbestos in Bulk Samples by Point Count Method: EPA/600/R-93/116

RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3161701.HPL	DB-1 Duplicatae	Yes	1	0.60 TR	5.0 OF	94.40	Q, F, OP, M	AC-11/07/2019
Description:	Grey Powder 1000 Point Count. Detection Limit of 0.1%. 5.0% OF= 5.0% Amphibole Cleavage							
Weight Loss: 0.0%								



Laboratory Report (Cont)

Client Job No./Name:					RJ Lee Group Job No:			
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date

Alfunnelaut

Authorized Signature:

Alexandra Cheek

ASBESTOS	NON-ASBESTOS	NON-FIBROUS MATERIALS
AM = Amosite	CE = Cellulose	AM = Amphibole HY = Hydromagnesite Q = Quartz
AC = Actinolite	MW = Mineral Wool	B = Binder M = Miscellaneous T = Tar
AN = Anthophyllite	FG = Fibrous Glass	CA = Carbonates MI = Mica V = Vermiculite
CH = Chrysotile	SF = Synthetic Fibers	CL = Clay OP = Opaque
CR = Crocidolite	H = Hair	F = Feldspar OR = Organic
TR = Tremolite	W = Wollastonite	G ₌ Gypsum P = Perlite

DISCLAIMER NOTES

• "ND" indicates no asbestos was detected; the method detection limit is 0.1%.

. "Trace" or "<" indicates asbestos was identified in the sample, but the concentration is less than the method guantitation limit. PLM coefficients of variance range from approximately 1.8 at the quantitation limit of 0.25% to 0.32 at high fiber concentrations.

· Samples are archived for three months following analysis and are then properly discarded.

 These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

· This test report relates to the items tested.

This report is not valid unless it bears the name of a NVLAP Lab Code 101208-0 approved signatory.

Any reproduction of this document must be in full in order for the report to be valid.

• This report may not be used to claim product endorsement by NVLAP Lab Code 101208-0, any agency of the U.S. Government or any other laboratory accrediting agency.

· Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar nonfriable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as "non-asbestos-containing."

Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NY ELAP #10884) facility.

OF = Other Fibers

· If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratorys results are limited to the reported values.

· ((100-A)/B)*C = Asbestos Detected (%), where A=weight loss, B=total # of points counted, and C=total # of asbestos fibers counted.



Final Laboratory Report TEM Bulk Protocol

Attention: David Raphael K & L Gates 17 North Second Street Harrisburg, PA 17101 US

Method: EPA/R-93/600/116

Report Date:10/28/2019Sample Receipt Date:10/21/2019RJ Lee Group Job No.:LLH901997-16Authorization/P.O. No.:Samples Received:Samples Received:1Client Job No.:LLH901997-16

TABLE 1 -- Weight Percent of Asbestos, Cleavage Fragment Amphibole and Non-Asbestos

			Weight Percent <u>Total Structures</u> Analytical Sensitivity						
Client Sample Number	RJLG Sample Number	Chry	Amph	Cleavage	Non Asbestos	Chry	Amph Asb	Amph Cleavage Fragment	Non Asbestos
DB-1 Duplicatae	3161701	0	0	39	0	<u>< 3.2E-6</u> 3.2E-6	<u>< 4.0E-6</u> 4.0E-6	<u>8.5E-2</u> 2.6E-6	<u>< 2.4E-6</u> 2.4E-6

NOTES

- 1. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
- 2. Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NVLAP #101208-0, NY ELAP #10884) facility.
- 3. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratory's results are limited to the reported values.
- 4. Density of amphibole: 3.2 * 10⁻³ ng/µ m³, density of chrysotile: 2.55 * 10⁻³ ng/µ m³, density of non-asbestos: 3.00 * 10⁻³ ng/µ m³,
- 5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, Asb-Asbestos Amphibole, Cleavage-Cleavage Amphibole.
- 6. Samples will be held for 90 days and then disposed of per Federal regulations.
- 7. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted.

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RJ Lee Group, Inc.

RJ Lee Group Job No: LLH901997-16 Client Job No/Name:

Final Laboratory Report (cont'd)

Client: Report Date: K & L Gates 10\28\2019

TABLE 2 -- Weight Percent of Asbestos, Cleavage Fragment Amphibole and Non-Asbestos 5 µ m

						Weight Percent <u>Structures 5_μm</u> Analytical Sensitivity			
			Structure	es 5 μm		Amphibole			
Client Sample Number	RJLG Sample Number	Chry	Amph	Cleavage	Non-Asbestos	Chry	Asb	Cleavage Fragment	Non-Asbestos
DB-1 Duplicatae	3161701	0	0	0	0	<u>< 3.2E-5</u> 3.2E-5	<u>< 4.0E-5</u> 4.0E-5	<u>< 2.6E-5</u> 2.6E-5	<u>< 2.4E-5</u> 2.4E-5

NOTES

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- 5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, Asb-Asbestos Amphibole, Cleavage-Cleavage Amphibole.
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RJ Lee Group,	RJ Lee Group, Inc.	
RJ Lee Group Job No:	LLH901997-16	Client:
Client Job No/Name:		Report Date:

Final Laboratory Report (cont'd)

t: K & L Gates b: 10\28\2019

Client Sample Number	RJLG Sample Number	Material Used (gm)	Area Analyzed Total (mm²)	Area Analyzed 5 µ m (mm²)	Effective Filter Area (mm²)	Dilution Factor
DB-1 Duplicatae	3161701	0.0003	0.31853	0.31853	1220	1.0
		Authorized	Signature:	the	(See	$\overline{\mathcal{Q}}$

Ashleigh Sload, Scientist

NOTES

- 1. "<" indicates results less than analytical sensitivity. "---" indicates that sample was not analyzed.
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RJL: LLH901997-16	3161701.HTA2	Microscope tem2000fx2	Grid Openings	10
DB-1 Duplicatae	K & L Gates	Magnification 21 KX	Asbestos	0.0
Wt: 0.0003 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	0.0
Dil: 1.	Filter Size: 47 mm	Operator: Jon Swope	Nonasbestos	39.0
HQ44739		Cv = 0	Nonasbestos >= 5µm	0.0
			% Wt of largest asbestos	%
			structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1	1	1.3	0.2	Amphibole	Ν	lgSiCaFe	A115572D	Image1	Diff1	Acti	Cle
1	2	4.1	0.5	Amphibole		MgSiCaFe		0	Х	Acti	Cle
1	3	4.9	0.4	Amphibole	MgSiCaFe				Х	Acti	Cle
1	4	1.2	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
1	5	1.5	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
1	6	1.3	0.1	Amphibole		MgSiCaFe	Э		Х	Acti	Cle
1	7	1.5	0.22	Amphibole		MgSiCaFe			Х	Acti	Cle
1	8	4.3	0.3	Amphibole		MgSiCaFe			Х	Acti	Cle
1	9	1.2	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
1	10	2.1	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
2	1	3.6	0.4	Amphibole		MgSiCaFe	Э		Х	Acti	Cle
2	2	4.8	0.7	Amphibole		MgSiCaFe			Х	Acti	Cle
2	3	1.1	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
2	4	3.2	0.2	Amphibole		lgSiCaFe		Image2	Diff2	Acti	Cle
3	1	2.2	0.2	Amphibole		MgSiCaFe	Э	-	Х	Acti	Cle
3	2	2.8	0.4	Amphibole		MgSiCaFe			Х	Acti	Cle
3	3	0.9	0.1	Amphibole		MgSiCaFe			Х	Acti	Cle
3	4	4.2	0.4	Amphibole		MgSiCaFe			Х	Acti	Cle
3	5	3.9	0.5	Amphibole		MgSiCaFe	Э		Х	Acti	Cle
4	1	2.1	0.4	Amphibole		MgSiCaFe	Э		Х	Acti	Cle
4	2	3.4	0.3	Amphibole		MgSiCaFe	Э		Х	Acti	Cle
4	3	1.1	0.2	Amphibole	I	MgSiCaFe	e15574D	Image3	Diff3	Acti	Cle
4	4	3.2	0.2	Amphibole		MgSiCaFe	Э		Х	Acti	Cle
4	5	2.7	0.4	Amphibole	I	MgSiCaFe	Э		Х	Acti	Cle
4	6	1.9	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
5	1	1.6	0.3	Amphibole	I	MgSiCaFe	e		Х	Acti	Cle
5	2	1.1	0.2	Amphibole	l	MgSiCaFe	e		Х	Acti	Cle
5	3	1.4	0.15	Amphibole		MgSiCaFe			Х	Acti	Cle
6	1	2.3	0.3	Amphibole		MgSiCaFe			Х	Acti	Cle
6	2	3.7	0.3	Amphibole		MgSiCaFe			Х	Acti	Cle
6	3	2.4	0.3	Amphibole	l	MgSiCaFe	Э		Х	Acti	Cle
7	1	1.9	0.3	Amphibole	l	MgSiCaFe	Э		Х	Acti	Cle
7	2	4.1	0.3	Amphibole	l	MgSiCaFe	Э		Х	Acti	Cle
8	1	1.2	0.2	Amphibole		lgSiCaFe		Image4	Diff4	Acti	Cle
8	2	3.2	0.6	Amphibole	I	MgSiCaFe	Э		Х	Acti	Cle
8	3	1.4	0.2	Amphibole		MgSiCaFe			Х	Acti	Cle
9	1	3.2	0.2	Amphibole	I	MgSiCaFe	Э		Х	Acti	Cle
9	2	4.3	0.3	Amphibole		MgSiCaFe			Х	Acti	Cle
10	1	1.6	0.22	Amphibole	l	MgSiCaFe	Э		Х	Acti	Cle
	12%	Particulate									

Analyst's Comments: N/A

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 10/25/2019 3:41:03 PM approve by Jon Swope Final Review: 10/28/19 9:43 AM approve by Ashleigh Sload

RJL: LLH901997-16	3161701.HTA2	Microscope tem2000fx2	Grid Openings	25
DB-1 Duplicatae	K & L Gates	Magnification 10 KX	Asbestos	0.0
Wt: 0.0003 gm	Grid: 0.0091 mm ²	Acc. Voltage 120 KV	Nonasbestos	0.0
Dil: 1.	Filter Size: 47 mm	Operator: Jon Swope	% Wt of largest asbestos	%
HQ44739		Cv = 0	structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2				NSD							
3				NSD							
4				NSD							
5				NSD							
6				NSD							
7				NSD							
8				NSD							
9				NSD							
10				NSD							
11				NSD							
12				NSD							
13				NSD							
14				NSD							
15				NSD							
16				NSD							
17				NSD							
18				NSD							
19				NSD							
20				NSD							
21				NSD							
22				NSD							
23				NSD							
24				NSD							
25	4.00/			NSD							
		Particulate		- NI/A							
		yst's Cor		:N/A			Ash Ashas	4:4 a mar - Di va	Duranalit	-	

Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 10/26/2019 9:09:00 AM approve by Jon Swope Final Review: 10/28/19 9:43 AM approve by Ashleigh Sload



Final Laboratory Report TEM Bulk Protocol

Attention: David Raphael K & L Gates 17 North Second Street Harrisburg, PA 17101 US

Method: EPA/R-93/600/116

Report Date:11/04/2019Sample Receipt Date:10/21/2019RJ Lee Group Job No.:LLH901997-19Authorization/P.O. No.:Samples Received:Samples Received:1Client Job No.:LLH901997-19

TABLE 1 -- Weight Percent of Asbestos, Cleavage Fragment Amphibole and Non-Asbestos

			Weight Percent <u>Total Structures</u> Analytical Sensitivity						
Client Sample Number	RJLG Sample Number	Chry	Amph	Cleavage	Non Asbestos	Chry	Amph Asb	Amph Cleavage Fragment	Non Asbestos
DB-1 Duplicatae	3161701	0	0	49	0	<u>< 2.4E-6</u> 2.4E-6	<u>< 3.1E-6</u> 3.1E-6	<u>2.8E-1</u> 1.9E-6	<u>< 1.8E-6</u> 1.8E-6

NOTES

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- 5. Abbreviations: N/A-Not Applicable, Chry-Chrysotile Asbestos, Amph-Amphibole Asbestos, Asb-Asbestos Amphibole, Cleavage-Cleavage Amphibole.
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RJ Lee Group Job No: LLH901997-19 Client Job No/Name:

Final Laboratory Report (cont'd)

Client: Report Date: K & L Gates 11\04\2019

TABLE 2 -- Weight Percent of Asbestos, Cleavage Fragment Amphibole and Non-Asbestos 5 µ m

						Weight Percent <u>Structures_5μm</u> Analytical Sensitivity			
			Structure	-Structures 5 µm Amphibole					
Client Sample Number	RJLG Sample Number	Chry	Amph	Cleavage	Non-Asbestos	Chry	Asb	Cleavage Fragment	Non-Asbestos
DB-1 Duplicatae	3161701	0	0	10	0	<u>< 2.4E-5</u> 2.4E-5	<u>< 3.1E-5</u> 3.1E-5	<u>2.5E-1</u> 1.9E-5	<u>< 1.8E-5</u> 1.8E-5

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RJ Lee Group, Inc.			Final Laboratory Report (cont'd)				
RJ Lee Group Job No: LLH901997-19 Client Job No/Name:			Rep	Client: port Date:	-	< & L Gates 11\04\2019	
Client Sample Number	RJLG Sample Number	Material Used	Area Analyzed A Total (mm²)	Area Analyzed 5μm (mm²)	Effective Filter Area (mm ²)	Dilution Factor	

3161701

DB-1 Duplicatae

Authorized Signature:

0.31360

0.0004

1220

1.0

Ashleigh Sload, Scientist

0.31360

NOTES

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RJL: LLH901997-19	3161701.HTA2	Microscope tem2000fx2	Grid Openings	10
DB-1 Duplicatae	K & L Gates	Magnification 21 KX	Asbestos	0.0
Wt: 0.0004 gm	Grid: 0.009 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	0.0
Dil: 1.	Filter Size: 47 mm	Operator: Jon Swope	Nonasbestos	43.0
HQ44772		Cv = 0	Nonasbestos >= 5µm	4.0
			% Wt of largest asbestos	%
			structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1	1	1.5	0.25	Amphibole	М	gSiCaFe	A115591D	Image1	Diff1	Acti	Cle
1	2	1.2	0.12	Amphibole	MgSiCaFe			Ū	Х	Acti	Cle
1	3	1.25	0.18	Amphibole	MgSiCaFe				Х	Acti	Cle
1	4	2.4	0.45	Amphibole		∕lgSiCaFe			Х	Acti	Cle
1	5	1.7	0.3	Amphibole		∕lgSiCaFe			Х	Acti	Cle
2	1	2.3	0.3	Amphibole		∕lgSiCaFe			Х	Acti	Cle
2	2	2.6	0.4	Amphibole		∕lgSiCaFe			Х	Acti	Cle
2	3	1.2	0.12	Amphibole	Ν	∕lgSiCaFe	e		Х	Acti	Cle
2	4	1.1	0.15	Amphibole	Ν	∕lgSiCaFe	Э		Х	Acti	Cle
3	1	2.3	0.4	Amphibole	Ν	∕lgSiCaFe	e		Х	Acti	Cle
3	2	1.4	0.15	Amphibole	Ν	∕lgSiCaFe	e		Х	Acti	Cle
3	3	1.3	0.2	Amphibole	Ν	∕lgSiCaFe	e		Х	Acti	Cle
3	4	1.5	0.25	Amphibole	Μ	gSiCaFe	A115592D	Image2	Diff2	Acti	Cle
3	5	1.4	0.2	Amphibole	Ν	∕IgSiCaF∉	Э		Х	Acti	Cle
3	6	5.3	0.6	Amphibole	Ν	/IgSiCaFe	Э		Х	Acti	Cle
4	1	3.6	0.3	Amphibole	Ν	/IgSiCaFe	Э		Х	Acti	Cle
4	2	5.2	0.4	Amphibole	Ν	/IgSiCaFe	Э		Х	Acti	Cle
4	3	2.1	0.3	Amphibole	Ν	/IgSiCaFe	Э		Х	Acti	Cle
4	4	1.8	0.3	Amphibole	Ν	MgSiCaFe			Х	Acti	Cle
5	1	2.2	0.4	Amphibole	MgSiCaFe			Х	Acti	Cle	
5	2	2.6	0.4	Amphibole	Ν	/IgSiCaFe	Э		Х	Acti	Cle
5	3	1.6	0.2	Amphibole	Ν	∕lgSiCaFe	Э		Х	Acti	Cle
5	4	2.1	0.3	Amphibole	Ν	∕lgSiCaFe	Э		Х	Acti	Cle
6	1	1.6	0.25	Amphibole	N	∕lgSiCaFe	Э		Х	Acti	Cle
6	2	1.1	0.2	Amphibole		∕lgSiCaFe		Image3	Diff3	Acti	Cle
6	3	1.8	0.3	Amphibole		∕lgSiCaFe			Х	Acti	Cle
6	4	1.6	0.3	Amphibole		∕lgSiCaFe			Х	Acti	Cle
6	5	1.2	0.22	Amphibole		∕lgSiCaFe			Х	Acti	Cle
6	6	2.8	0.5	Amphibole		∕lgSiCaFe			Х	Acti	Cle
7	1	1.55	0.22	Amphibole		∕lgSiCaFe			Х	Acti	Cle
7	2	1.3	0.25	Amphibole		∕lgSiCaFe			Х	Acti	Cle
7	3	1.6	0.22	Amphibole		∕lgSiCaFe			Х	Acti	Cle
8	1	0.8	0.15	Amphibole		∕lgSiCaFe			Х	Acti	Cle
8	2	1.2	0.15	Amphibole	Ν	∕lgSiCaFe	Э		Х	Acti	Cle
8	3	0.6	0.12	Amphibole		∕lgSiCaFe			Х	Acti	Cle
9	1	2.4	0.25	Amphibole		∕lgSiCaFe			Х	Acti	Cle
9	2	1.2	0.2	Amphibole		∕lgSiCaFe			Х	Acti	Cle
9	3	1.5	0.18	Amphibole		∕lgSiCaFe			Х	Acti	Cle
10	1	1.3	0.2	Amphibole		∕lgSiCaFe			Х	Acti	Cle
10	2	2.4	0.3	Amphibole		∕lgSiCaFe			Х	Acti	Cle
10	3	7.6	0.65	Amphibole		gSiCaFe		Image4		Acti	Cle
10	4	1.1	0.1	Amphibole		∕lgSiCaFe			Х	Acti	Cle
10	5	8.9	1.1	Amphibole	Ν	∕lgSiCaFe	Э		Х	Acti	Cle
	12%	Particulate									

RJL: LLH901997-19	3161701.HTA2	Microscope tem2000fx2	Grid Openings	10
DB-1 Duplicatae	K & L Gates	Magnification 21 KX	Asbestos	0.0
Wt: 0.0004 gm	Grid: 0.009 mm ²	Acc. Voltage 120 KV	Asbestos >= 5µm	0.0
Dil: 1.	Filter Size: 47 mm	Operator: Jon Swope	Nonasbestos	43.0
HQ44772		Cv = 0	Nonasbestos >= 5µm	4.0
			% Wt of largest asbestos	%
			structure	

Analyst's Comments: N/A Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 11/3/2019 1:03:18 PM approve by Jon Swope Final Review: 11/4/2019 12:39:00 PM approve by Ashleigh Sload

RJL: LLH901997-19	3161701.HTA2	Microscope tem2000fx2	Grid Openings	25
DB-1 Duplicatae	K & L Gates	Magnification 10 KX	Asbestos	0.0
Wt: 0.0004 gm	Grid: 0.009 mm ²	Acc. Voltage 120 KV	Nonasbestos	6.0
Dil: 1.	Filter Size: 47 mm	Operator: Jon Swope	% Wt of largest asbestos	%
HQ44772		Cv = 0	structure	

Field	Fiber	Length	Width	FiberType	Morph	EDX	File #	Photo	SAED	AmpID	C/A
1				NSD							
2				NSD							
3	1	5.3	0.8	Amphibole		MgSiCaFe	•		Х	Acti	Cle
4	1	6.1	0.6	Amphibole	Ν	lgSiCaFe/	₩5593D	Image1	Diff1	Acti	Cle
5				NSD							
6				NSD							
7	1	8.2	0.9	Amphibole	I	MgSiCaFe	;		Х	Acti	Cle
8				NSD							
9				NSD							
10			<u> </u>	NSD					Ň	• •	
11	1	5.2	0.4	Amphibole		MgSiCaFe	•		Х	Acti	Cle
12				NSD							
13 14	1	5.8	0.4	NSD Amphiholo					Х	∧ oti	Cle
14	I	0.0	0.4	Amphibole NSD	1	MgSiCaFe			^	Acti	Cie
16				NSD							
17				NSD							
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Analyst's Comments: N/A Abbreviations: F - Fiber, C - Cluster, B - Bundle, M - Matrix, Cle - Cleavage, Asb - Asbestiform, Bys - Byssolite

Initial Review: 11/3/2019 1:43:24 PM approve by Jon Swope Final Review: 11/4/2019 12:39:00 PM approve by Ashleigh Sload

Request for Environmental and IH Laboratory Analytical Services

Lab Use Only Project No.: Client No.: Bock Hill Quarry Date Logged In: Logged In By: Date Results 10/25/19 Rush Charges (heck care) Image: Name: Andrew Gutshall Company: Hanson Aggregates Pa, LLC Drinking Sample Purpose: Information Regulatory Recedition (please list below): Address: 7660 Imperial Way Sample Only Water DOH Source #: N/A N/A Phone: 610-366-4819 Fax: Sample Purpose: A Important Der Source #: N/A N/A Address: Andrew.Gutshall@LehighHanson.com Chemistry Andrew Solidslog Other N/A Name: If a hard copy of invoice is needed, check here Chemistry Analysis Key Www.Wastewater Sw-Surface Water P=Rastric Invoice To Fax: Company: Email: Address: Analysis Requested Important Important Special Invoice per project setup with Drew Van Orden Fax: Analysis Requested Important Imp	ATTENTION	10.					_	1	_							_	Page	1	of	1
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Pennsylvania - HQ

350 Hochberg Road

Monroeville, PA 15146

Washington Columbia Basin Analytical Laboratories 2710 North 20th Avenue Pasco, WA 99301 509.545.4989 Phone

DELIVERING SCIENTIFIC RESOLUTION

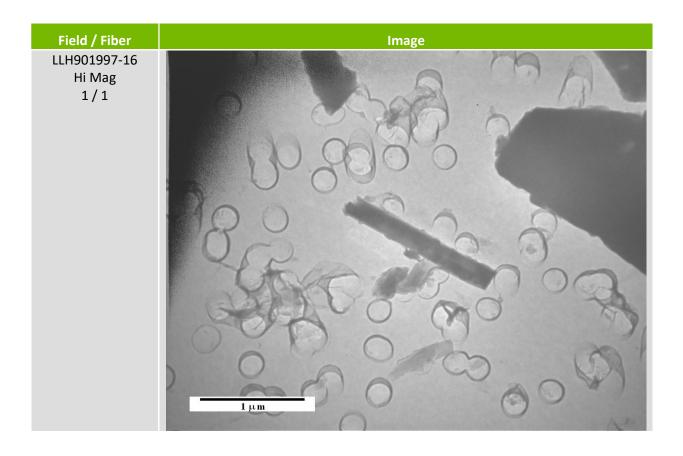
724.325.1776 Phone



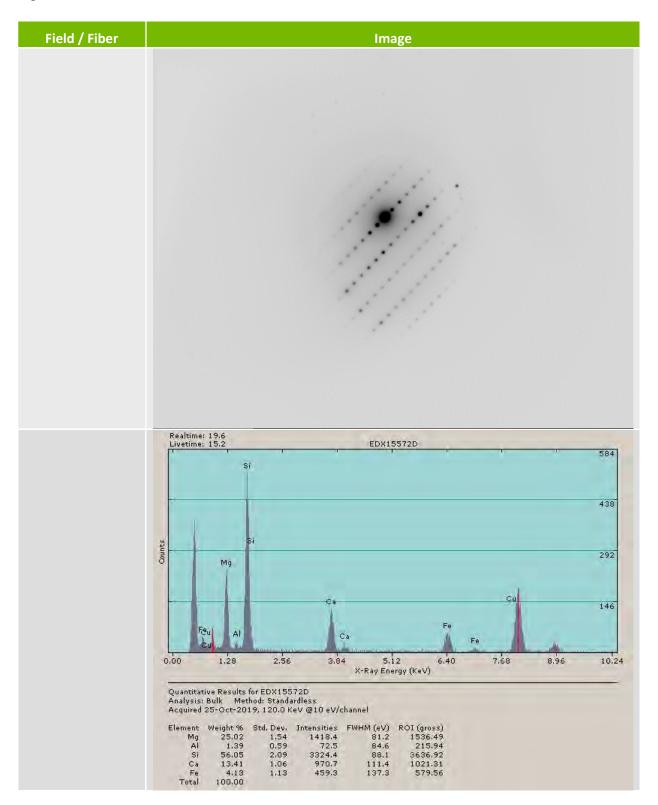
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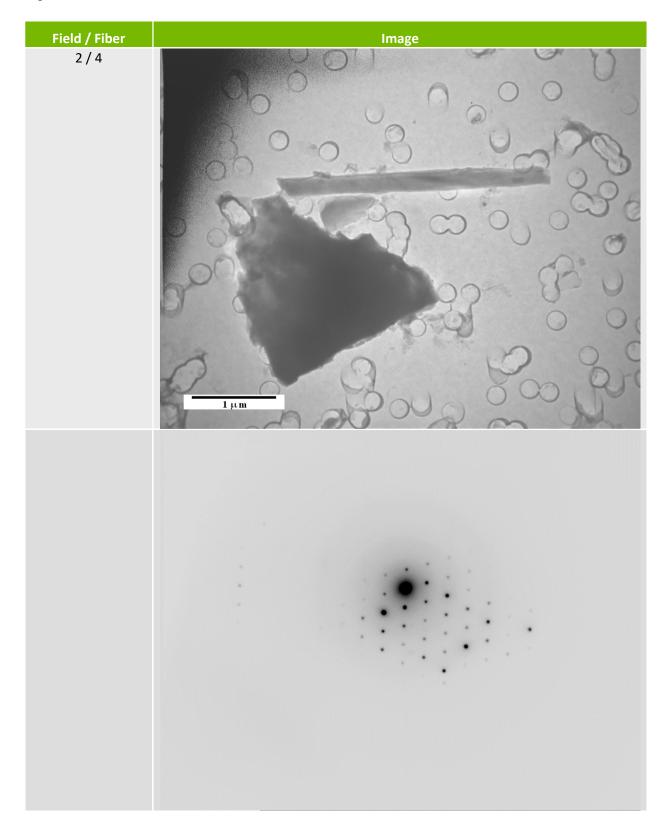
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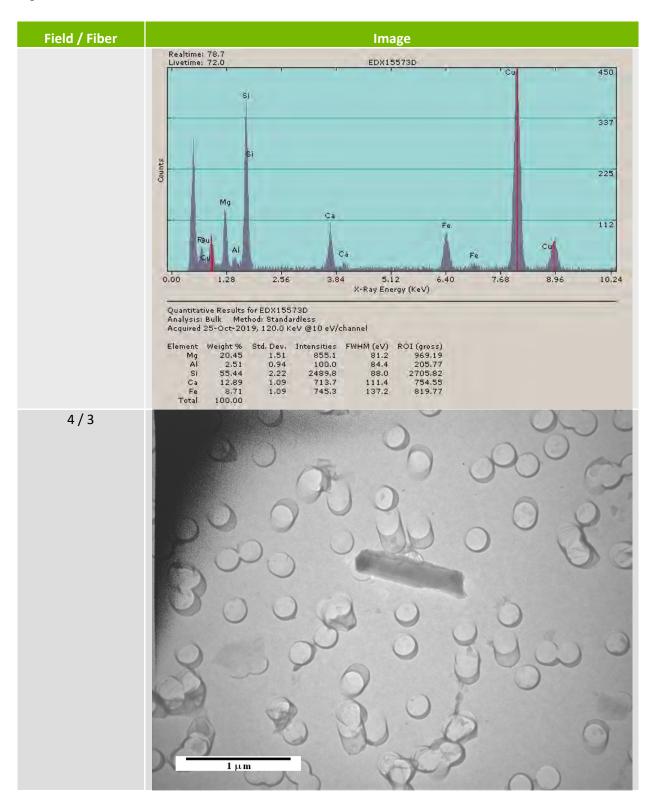
Analysis of Sample DB-1

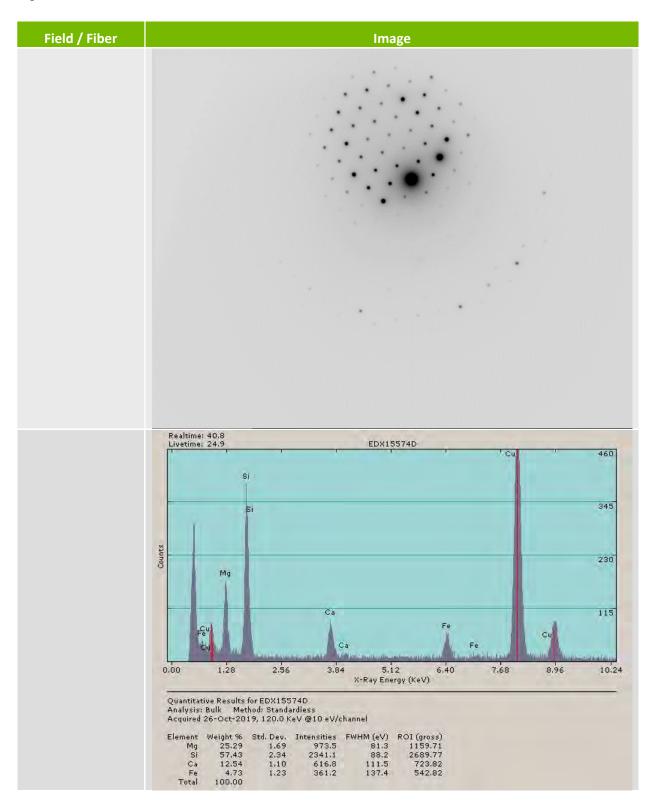


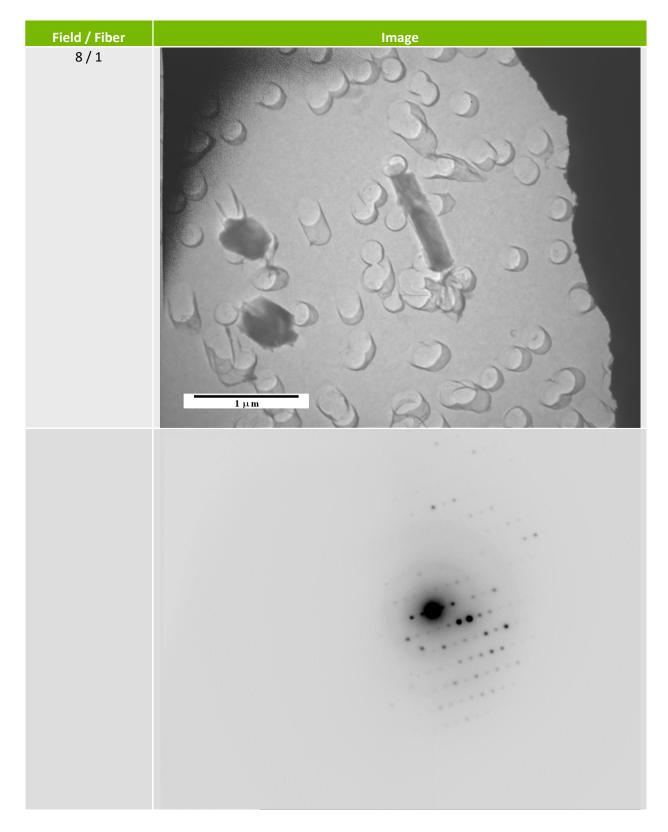
350 Hochberg Road, Monroeville PA 15146 | P 724.325.1776 F 724.733.1799

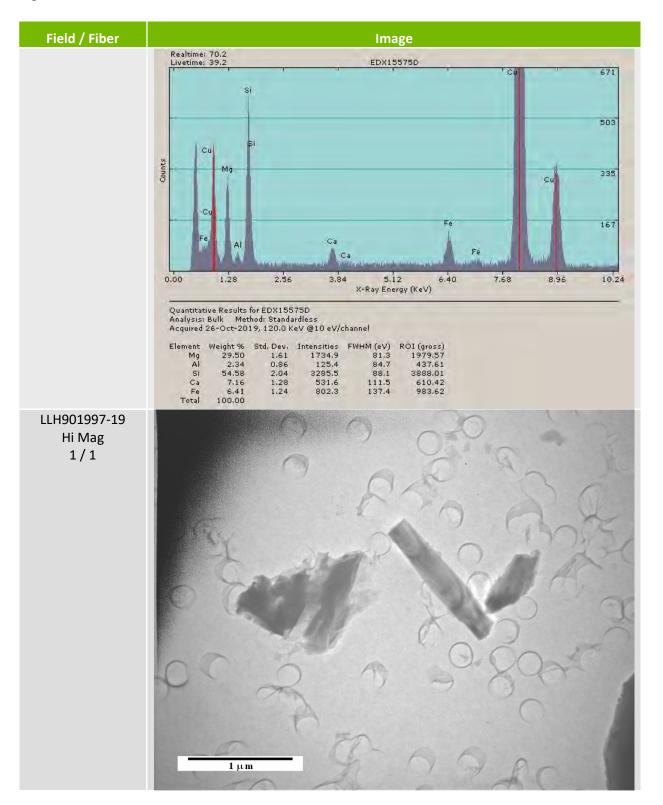




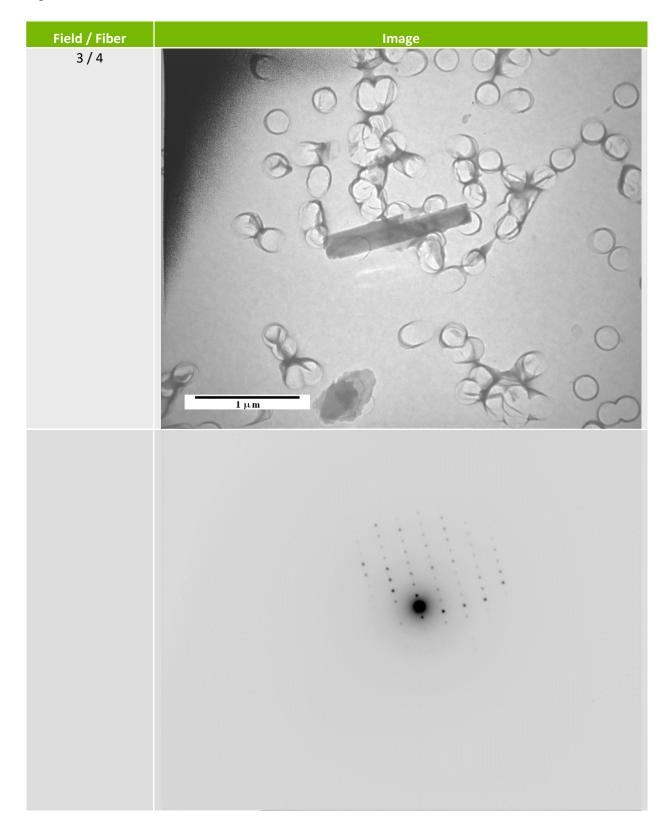


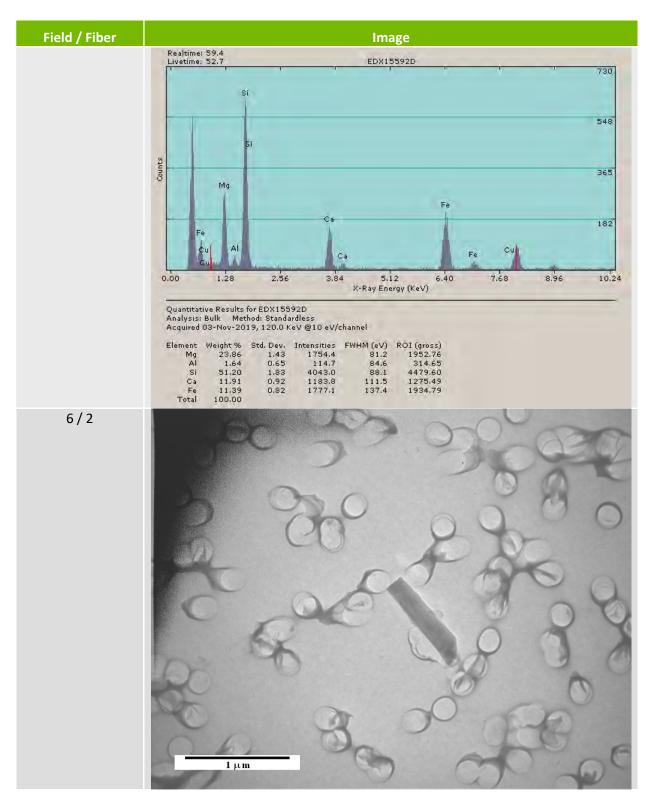


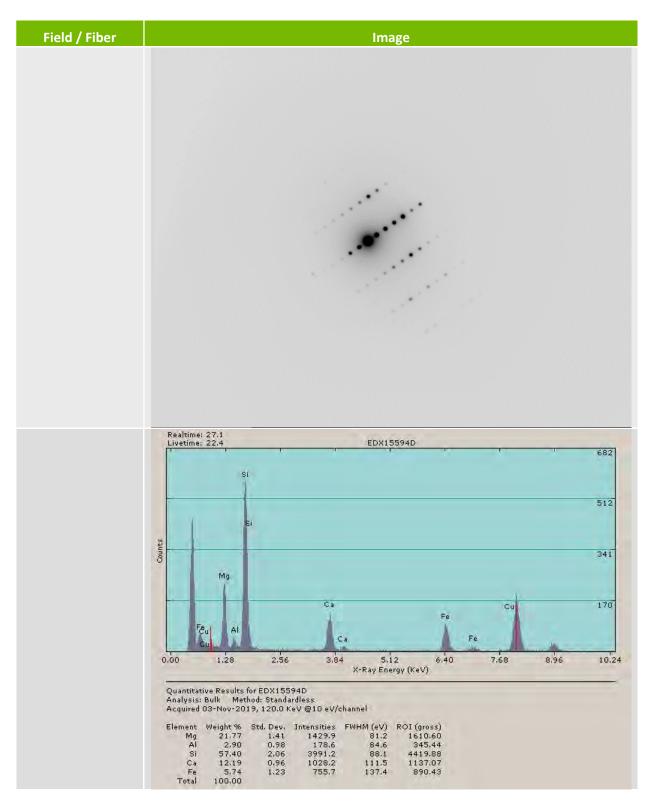


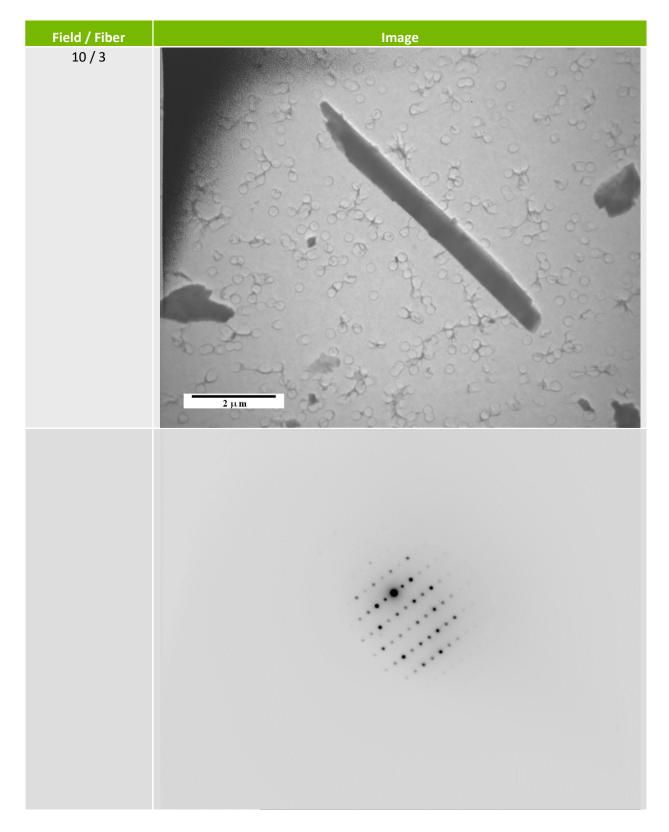


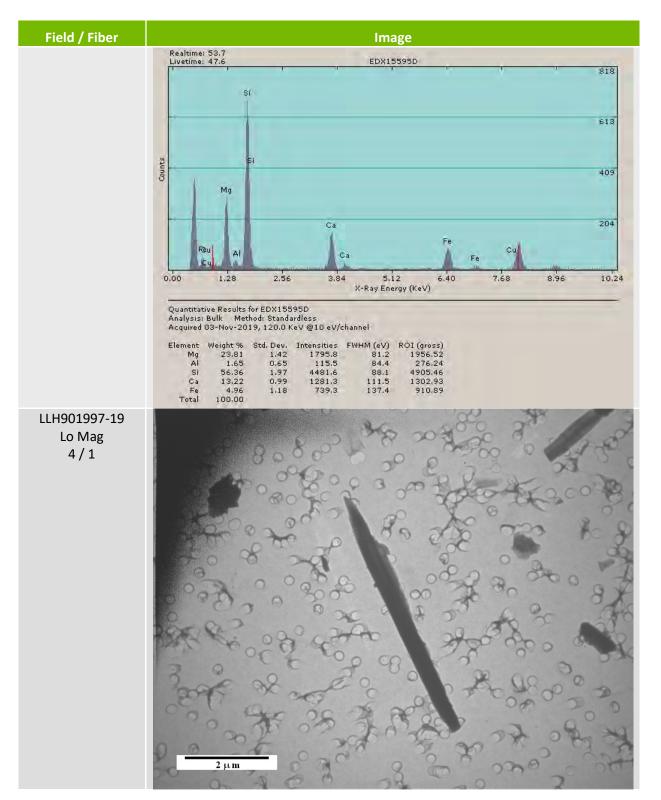
Field / Fiber	Image	
	Realtime: 167.2 Livetime: 163.1 Livetime: 163.1	834
	Si	625
	Si te	
	Mg	417
	Ca Fe Cu Ca Fe Cu	208
	0.00 1.28 2.56 3.84 5.12 6.40 7.68 8.96 X-Ray Energy (KeV)	10.24
	- Quantitative Results for EDX15591D Analysis: Bulk Method: Standardless Acquired 03-Nov-2019, 120.0 KeV @10 eV/channel	
	Element Weight % Std. Dev. Intensities FWHM (eV) ROI (gross) Mg 25.60 1.44 2131.3 81.2 2314.17 Al 2.13 0.78 163.1 84.6 301.49 Si 55.54 1.91 4806.9 88.1 5203.90 Ca 12.11 0.92 1284.5 111.4 1356.17 Fe 4.62 1.14 766.8 137.3 856.46 Total 100.00 100.00 100.00 100.00	











Field / Fiber	Image
	Realtime: 83.0 Livetime: 79.7 EDX15593D 501 Si
	376 Si 250
	Mg Ca Cu 125 Fe Cu Fe Ru Al Ca Fe
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	Element Weight % Std. Dev. Intensities FWHM (eV) ROI (gross) Mg 23.53 1.58 1072.6 81.2 1165.38 Al 2.04 0.81 86.2 84.5 124.64 Si 55.94 2.20 2684.1 88.1 2934.19 Ca 14.01 1.13 821.3 111.4 826.99 Fe 4.48 1.19 399.8 137.4 495.99 Total 100.00

BOULDER FIELD ANALYTICAL RESULTS



The shi	RJ LeeGroup, Inc.						350 Hochberg Koad, Montoeville, PA 15140 Tel: 724-325-1776 Fax: 724-733-1799	ionroeville, PA 15 Fax: 724-733-1
			Laboratory Report	Report				
K & L Gates 17 North Second Street 18th Floor Harrisburg, PA 17101 United States Attention: Mr. David Raphael	eet 1 Raphael				Report Date Sample Receipt Date RJ Lee Group Job No. Authorization/P.O. No. Client Job No./Name	eipt Date up Job No. n/P.O. No.	06/26/2019 06/03/2019 LLH901997-9	
Telephone: 717-231-4504 Analysis: Asbestos in Bulk S Method: EPA/600/R-93/116	Telephone: 717-231-4504 Analysis: Asbestos in Bulk Samples by Point Count Method: EPA/600/R-93/116							
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	us Matrix %) Material	Analyst - Analysis Date
3158823.HPL	1 - RH #1	Yes	1	Q	<0.1 OF	100.00	Q, AM, OP, M	WT-06/26/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. <0.1% OF= <0.1% Tremolite Cleavage.	0.1% OF= <0.1% ⁻	Tremolite Cleave	age.			:	
Weight Loss: 0.0%		;						
3158824.HPL Description	2 - RH #2 Reire Crushed Book	Yes	~	<0.1 AC	0.50 OF	99 . 50	Q, AM, OP, M	WT-06/26/2019
.indiperat	beige orusited rook. 1000 Point Count. Detection Limit=0.1%. 0.5% OF≐ 0.5% Actinolite Cleavage.	.5% OF= 0.5% Ac	inolite Cleavage	ġ				
Weight Loss: 0.0%								
3158825.HPL	3 - RH #3	Yes	£	QN	<0.1 OF	100.00	Q, AM, OP, M	WT-06/26/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. <0.1% OF= <0.1% Actinolite Cleavage.	0.1% OF= <0.1%	Actinolite Cleava	åge.				
Weight Loss: 0.0%								

Page 1 of 4

Client Lob No.Americ RJ Lee Group Job No: L11901397-3 Client Lob No.Americ Rule Group Job No: RJ Lee Group Job No: L11901397-3 FUL Set Simple Olen Simple Matrix Simple Matrix Simple Matrix Simple State Simple Olen Simple Human & Cluence Advances Nor-About Matrix Simple Matrix Simple State Simple Client Simple Human & Cluence Advances Operations Matrix Simple Matrix Simple Matrix Simple State Simple Client Simple Nor-About Client Simple Matrix Simple Matrix Simple Matrix Simple Matrix Simple State Simple Client Simple Client Simple Nor-About Client Simple Nor-About Nor-About <th></th> <th>RJ LeeGroup, Inc.</th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>Laboratory</th> <th>Laboratory Report (Cont)</th>		RJ LeeGroup, Inc.						Laboratory	Laboratory Report (Cont)
	Client Job No./N	ame:					RJ Lee G	Group Job No:	LLH901997-9
$- \text{PH} \# 4$ $- \text{PO}_1 = 0$ $- \text{O}_1 = 0$ - \text	RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
Gay Custined Rox. Care of the curr. Detection Limit=0.1%G.1% Actinoite Cleavage. N N All OF 10000 Q, M, OP N 5 - RH #5 Yes 1 N N -G.1 G 10000 Q, M, OP N </td <td>3158826.HPL</td> <td>4 - RH #4</td> <td>Yes</td> <td>~</td> <td>DN</td> <td><0.1 OF</td> <td>100.00</td> <td>Q, AM, OP, M</td> <td>WT-06/26/2019</td>	3158826.HPL	4 - RH #4	Yes	~	DN	<0.1 OF	100.00	Q, AM, OP, M	WT-06/26/2019
5 - RH #5 Yes 1 ND <0.1 OF 100.00 Q, AM, OP, M, Correlection Limite-0.1%, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 100.00 Q, AM, OP, M, Correlection Limite-0.1%, -0.1 %, -0.1 %, -0.1 ND <0.1 OF 100.00 Q, AM, OP, M, Correlection Limite-0.1%, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 ND <0.1 OF 100.00 Q, AM, OP, M, Correlection Limite-0.1%, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 ND <0.1 OF 100.00 Q, AM, OP, M, Correlection Limite-0.1%, -0.1 %, -0.1 %, -0.1 ND <0.1 OF 100.00 Q, AM, OP, M, Correlection Limite-0.1%, -0.1 %, -0.1 %, -0.1 ND <0.1 OF 100.00 Q, AM, OP, M, Correlection Limite-0.1%, -0.1 %, -0.1 %, -0.1 %, -0.1 ND <0.1 OF 100.00 Q, AM, OP, M, Correlection Limite-0.1%, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 % ND <0.1 OF 100.00 Q, AM, OP, M, Correlection Limite-0.1%, -0.1 ND -0.1 OF Q, AM, OP, M, Correlection Limite-0.1%, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 %, -0.1 -0.1 OF -0.1 OF -0.1 -0.1 M, -0.1 $-$	Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. ·	:0.1% OF= <0.1% ₽	ctinolite Cleava	ge.			Ξ	
5 - RH #5 Yes 1 ND <0.1 OF	Weight Loss: 0.0%								
Gray Crushed Rock. Count. Detection Limit=0.1%, <0.1% OF = <0.1% Actinotie Cleavage. ND <0.1 OF 100.00 Q. AM, OP, M,	3158827.HPL	5 - RH #5	Yes	-	QN	<0.1 OF	100.00	Q, AM, OP, M	WT-06/26/2019
6 - RH #6 Yes 1 ND <0.1 CF 100.00 Q, AM, OP, M, OP, M, OP, M, OP, CHarbed Rock. Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%, -0.1% OF = <0.1% Actinotite Cleavage.	Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. ·	:0.1% OF= <0.1% /	ctinolite Cleava	ge.			E	
6 - RH #5 Yes 1 ND <0.1 OF	Weight Loss: 0.0%								
Gray Crushed Rock. 7 - RH #7 Yes 1 <0.1 TR	3158828.HPL	6 - RH #6	Yes	-	QN	<0.1 OF	100.00	Q, AM, OP,	WT-06/26/2019
7 - RH #7 Yes 1 <0.1 TR <0.1 OF 100.00 Q, AM, OP, M Green Crushed Rook. 1000 Point Count. Detection Limit=0.1%. <0.1% Actinolite Cleavage.	Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%.	:0.1% OF= <0.1% /	vctinolite Cleava	ge.			2	
$7 - \text{RH} \# 7$ Yes 1 $< 0.1 \text{ TR}$ $< 0.1 \text{ OF}$ 100.00 0.0^{1} , M_{OP} Green Crushed Rock.Green Crushed Rock. 0.01% , $O.1\%$ $O.1\%$ $O.9^{1}$, M_{OP} 1000 Point Count. Detection Limit=0.1%. $< 0.1\%$ Ves 1 ND $< 0.1 \text{ OF}$ 100.00 Q_{1} , M_{OP} $8 - \text{RH} \# 8$ Yes 1 ND $< 0.1 \text{ OF}$ 100.00 Q_{1} , M_{OP} Q_{1} , M_{OP} $6 - \text{RH} \# 10$ Yes 1 ND $< 0.1 \text{ OF}$ 100.00 Q_{1} , M_{OP} $9 - \text{RH} \# 10$ Yes 1 ND $< 0.1 \text{ OF}$ 100.00 Q_{1} , M_{OP} $6 - \text{RH} \# 10$ Yes 1 ND $< 0.1 \text{ OF}$ 100.00 Q_{1} , M_{OP} $6 - \text{RH} \# 10$ Yes 1 ND $< 0.1 \text{ OF}$ 100.00 Q_{1} , M_{OP} 1000 Point Count. Detection Limit=0.1%. $< 0.1\%$ OF = $< 0.1\%$ Actinolite Cleavage. $< 0.1 \text{ OF}$ 100.00 Q_{1} , M_{OP}	Weight Loss: 0.0%								
Green Crushed Rock. 1% OF = <0.1% Actinolite Cleavage.	3158829.HPL	7 - RH #7	Yes	۳-	<0.1 TR	<0.1 OF	100.00	Q, CA, AM, OD M	WT-06/26/2019
8 - RH #Yes1ND<0.1 OF100.00Q, AM, OPGray Crushed Rock.1000 Point Count. Detection Limit=0.1%. <0.1% OF = <0.1% Actinolite Cleavage.	Description:	Green Crushed Rock. 1000 Point Count. Detection Limit=0.1%.	:0.1% OF= <0.1% /	uctinolite Cleava	ige.			5	
B - RH # BYes1ND<0.1 OF100.00Q, AM, OPGray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. <0.1% OF = <0.1% Actinolite Cleavage.	Weight Loss: 0.0%								
Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. <0.1% OF = <0.1% Actinolite Cleavage.	3158830.HPL	8 - RH #8	Yes	-	QN	<0.1 OF	100.00	Q, AM, OP	WT-06/26/2019
9 - RH #10 Yes 1 ND <0.1 OF 100.00 Q, AM, OP, M Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. <0.1% OF= <0.1% Actinolite Cleavage.	Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%.	:0.1% OF= <0.1% /	Actinolite Cleava	íge,				
9 - RH #10 Yes 1 ND <0.1 OF	Weight Loss: 0.0%								
Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. <0.1% OF= <0.1% Actinolite Cleavage.	3158831.HPL	9 - RH #10	Yes	Ţ	QN	<0.1 OF	100.00	Q, AM, OP, M	WT-06/26/2019
Weight Loss: 0.0%	Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%.	:0.1% OF= <0.1% /	Actinolite Cleava	ige.				
	Weight Loss: 0.0%								

Page 2 of 4

RJ LeeGroup, Inc.	eGroup, Inc.						Laboratory	Laboratory Report (Cont)
Client Job No./Name:	ne:					RJ Lee G	RJ Lee Group Job No:	LLH901997-9
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158832.HPL	10 - RH #11	Yes	٢	<0.1 AC	<0.1 OF	100.00	Q, AM, OP, M	WT-06/26/2019
Description:	Beige Crushed Rock. 1000 Point Count. Detection Limit=0.1%. <0.1% OF= <0.1% Actinolite Cleavage.	Ι% ΟF= <0.1% Α	ctinolite Cleava	ge.				
Weight Loss: 0.0%								
3158833.HPL	11 - RH #12	Yes	٢	<0.1 AC	0.30 OF	99.70	Q, AM, OP, M	WT-06/26/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. 0.3% OF= 0.3% Actinolite Cleavage.	% OF= 0.3% Acti	nolite Cleavage	·				
Weight Loss: 0.0%								
3158834.HPL	12 - RH #14	Yes	~ -	<0.1 AC	0.50 OF	99.50	Q, AM, OP, M	WT-06/26/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. 0.5% OF= 0.5% Actinolite Cleavage.	% OF= 0.5% Acti	inolite Cleavage	·				
Weight Loss: 0.0%								
3158835.HPL	13 - RH #18	Yes	۲	QN	<0.1 OF	100.00	Q, AM, OP, M	DF-06/26/2019
Description:	Gray Crushed Rock 1000 Point Count. Detection Limit=0.1% OF=<0.1% Actinolite/Tremolite Clevage							
Weight Loss: 0.0%								

RJG RJ LeeGroup, Inc.	o <i>up</i> , Inc.						Laboratory	Laboratory Report (Cont)
Client Job No./Name:						RJ Lee G	RJ Lee Group Job No:	LLH901997-9
RJLG Sample Cl Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
			Auth	Authorized Signature:	ure:	M Fall		
					Donald Fike	۵		
ASBESTOS	NON-ASBESTOS			NON-FIB	NON-FIBROUS MATERIALS	۵ م		
AM = Amosite	CE = Cellulose M/// = Mineral M/col		AM = Amphibole B = Binder	ibole HY	 Hydromagnesite Miscellaneous 	Q = Quartz T - Tor		
							te	
	SF = Synthetic Fibers H		CL = Clay E	do do	o = Opaque			
UR = Urociaolite TR = Tremolite			G = Gypsum					
	OF = Other Fibers							
DISCLAIMER NOTES								
 "ND" indicates no asbestos was detected; the m. "Trace" or "<" indicates asbestos was identified i limit of 0.25% to 0.32 at high fiber concentrations. 	- "ND" indicates no asbestos was detected; the method detection limit is 0.25%. - "Trace" or "<" indicates asbestos was identified in the sample, but the concentration is less than the method quantitation limit. PLM coefficients of variance range from approximately 1.8 at the quantitation limit of 0.25% to 0.32 at high fiber concentrations.	tt is 0.25%. The concentration is	less than the me	ethod quantitatior	ı limit. PLM coefficients	of variance range fi	rom approximately	1.8 at the quantitation
 Samples are archived for the archived for the archived for the archived for the manner in v 	 Samples are accounted on the months following analysis and are then properly discarded. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which these results are used or interpreted. 	nen properly discar ms and conditions id.	ded. of sale, including	J the company's s	tandard warranty and	imitation of liability p	orovisions. No resp	onsibility or liability is
 This test report relates to the items tested. This report is not valid unless it bears the r Any reproduction of this document must be 	 This test report relates to the items tested. This report is not valid unless it bears the name of a NVLAP Lab Code 101208-0 approved signatory. Any reproduction of this document must be in full in order for the report to be valid. 	de 101208-0 appr oort to be valid.	oved signatory.					
 This report may not be use Polarized-light microscopy the only method that can be 	 This report may not be used to claim product endorsement by NVLAP Lab Code 101208-0, any agency of the U.S. Government or any other laboratory accrediting agency. Polarized-light microscopy is not consistently reliable in detecting asbestos in floor coverings and similar nonfriable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as "non-asbestos-containing." 	AP Lab Code 1012 sbestos in floor cov considered or trea	08-0, any agency /erings and simila ted as "non-asbe	y of the U.S. Gow ar nonfriable orga estos-containing.'	ernment or any other la inically bound material	aboratory accrediting s. Quantitative trans	j agency. smission electron m	licroscopy is currently
 Sample(s) for this project w If RJ Lee Group, Inc. did no ((100-A)/B)*C = Asbestos I 	 Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NY ELAP #10884) facility. If RJ Lee Group, Inc. did not collect the samples analyzed, the verifiability of the laboratorys results are limited to the reported values. ((100-A)/B)*C = Asbestos Detected (%), where A=weight loss, B=total # of points counted, and C=total # of asbestos fibers counted. 	HA #100364, NY E iability of the labor tal # of points cour	ELAP #10884) far atorys results are ited, and C=total	cility. e limited to the rep l # of asbestos fib	oorted values. ers counted.			

Page 4 of 4

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	Project No.:	Client No:					Date Results			Rush Charges		res			
	Date Logged In:	Logged In By:	By:				Needed			Authorized 7 (check ane)	10	NO.			
-		Andrew Gutshall						Sample Pu	Sample Purpose: Information	Reg		Accreditation (please list below):	list below		
		Hanson Aggregates Pa, LLC					Drinking	System ID #:	#: N/A						
	Address: 7660 lm	7660 Imperial Way					Water	DOH Source #:	ce #: N/A				N/A		
Reculte UILY	ate, Zip:	Allentown, PA 18195					Sample Only		Multiple Sources #5: N/A						
	ne: 610-366-4819	5-4819 Fax:						Sample Purpose: A	0.0	C Other N/A					
	Email Results To:	Arehene Turkheid 2.1 mildeleisen aans					Chemistry		0,	Matrix: WW=Wastewater GW=Groundwater	SW=Surface Water DW=Drinking Water	e Water ing Water	Container: P=Plastic G=Glass	Container: P=Plastic G=Glass	1.
Name:	ne:		If a hard coov of invoice		is needed. check here	here []	- Analysis Key			5=50il/Sludge E=Extract	X=Other		A=Air (fil	er or tube	-
Corr	Company:	Email:					_	Other	Na ₂ SO ₄		200				
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Client Sample ID	ample ID	Sample Description	Date	Start	Stop	Wipe Area / Air Volume	Sample Location (Please specify if NY state)	n (Please state)	009			Pres.		2	N
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2	6	RH#2	5/8/19	1130		N/A			×		Z	N/A N/A	×	P N/A	H
(T)	3	RH#3	5/8/19	135		N/A			×		Z	N/A N/A		P N/A	H
4	t	RH#4	5/8/19	ilds		N/A			×		Z	N/A N/A	-	P N/A	
S	10	RH#5	5/8/19	1150		N/A		1	×		Z	N/A N/A	×	P N/A	
9	6	RH#6	5/8/19	1200		N/A			×		Z	N/A N/A	-	P N/A	-
1	7	RH#7	5/8/19	1205		N/A			×		Z	N/A N/A	×	P N/A	-
3	80	RH#8	5/8/19	1110		N/A			×		Z	N/A N/A	×	P N/A	H
01	6	RH#10	5/8/19	0350		N/A			×		Z	N/A N/A	×	P N/A	-
1	10	RH#11	5/8/19	0440		N/A			×		Z	N/A N/A	×	P N/A	-
1	11	RH#12	5/8/19	0845	Grab	N/A			×		Z	N/A N/A	×	P N/A	-
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City. State. 2(): Fas: Fas: <td>Invoice To</td> <td>-</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>-</td> <td>Analysi</td> <td>is Requested</td> <td>-</td> <td>(1)</td> <td>-</td> <td></td> <td></td>	Invoice To	-							-	Analysi	is Requested	-	(1)	-		
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12 RH#14 5/8/19 $0q/5$ S_{Tab} N/A	σ	ient Sample ID	Sample Description	Sample Date		Stop	Wipe Area / Air Volume	Sample Location specify if NY	r (Please state)	009			Pres.		c	
13 RH#18 5/7/19 6 35 N/A N/A X N/A X N/A X P N/A 14 RH#22 5/7/19 2 46 N/A N/A X N/A N/A X P N/A 15 RH#22 5/7/19 2 46 N/A N/A X N/A N/A X P N/A 16 RH#23 5/7/19 2 56 N/A N/A X N/A N/A X P N/A 17 RH#25 5/7/19 2 36 N/A N/A X N/A N/A X P N/A 18 RH#26 5/7/19 3 30 N/A N/A X P N/A N N/A N/A N/A N N/A		12	RH#14	5/8/19		Brak	N/A			×		Z		1000	a	N/A
14 RH#22 $5/7/19$ $7/46$ N/A N/A X N/A X P N/A 15 RH#23 $5/7/19$ $7/26$ N/A N/A X N/A X P N/A 16 RH#24 $5/7/19$ $7/26$ N/A N/A X N/A X P N/A 17 RH#25 $5/7/19$ $7/3/2$		13	RH#18	5/7/19	10:35		N/A			×		Z	I/A N/		٩	N/A
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16 RH#24 5/7/19 (3/c) N/A N/A X N/A X P N/A 17 RH#25 5/7/19 (3/c) N/A N/A X N/A X P N/A 18 RH#26 5/7/19 (3/25) N/A N/A X N/A N/A X P N/A 19 RH#27 5/7/19 (3/25) N/A N/A X N/A N/A X P N/A 20 RH#27 5/7/19 (3/25) N/A N/A X N/A N/A X P N/A 20 RH#28 5/8/19 0/0/20 N/A N/A X N/A N/A X P N/A 21 RH#28 5/8/19 0/0/20 V/A N/A X N/A N/A N/A N/A N/A N/A N/A N/A N/A 21 RH#29 5/8/19 10/10 6/7ab N/A X N/A N/A N/A N/A N/A N/A </td <td></td> <td>15</td> <td>RH#23</td> <td>5/7/19</td> <td>1250</td> <td></td> <td>N/A</td> <td></td> <td></td> <td>×</td> <td></td> <td>Z</td> <td>I/A N/</td> <td>-</td> <td>Р</td> <td>N/A</td>		15	RH#23	5/7/19	1250		N/A			×		Z	I/A N/	-	Р	N/A
17 RH#25 5/7/19 (3/5) N/A N/A X N/A X P N/A 18 RH#26 5/7/19 (3/25) N/A X X N/A X P N/A 19 RH#27 5/7/19 (3/25) N/A X X N/A X P N/A 19 RH#27 5/7/19 (3/26) N/A N/A X N/A X P N/A 20 RH#27 5/8/19 (0/30) N/A N/A X N/A X P N/A 21 RH#29 5/8/19 (0/00) V N/A X N/A X P N/A 22 RH#30 5/8/19 /0/10 5/8/19 /0/10 5/8/19 /0/10 X P N/A P N/A 22 RH#30 5/8/19 /0/10 5/8/19 /0/10 5/8/19 /0/10 X P N/A P N/A 22 RH#30 5/8/19 /0/10 fme: /5/3/11 </td <td></td> <td>16</td> <td>RH#24</td> <td>5/7/19</td> <td>-</td> <td></td> <td>N/A</td> <td></td> <td></td> <td>×</td> <td></td> <td>Z</td> <td></td> <td></td> <td>٩</td> <td>N/A</td>		16	RH#24	5/7/19	-		N/A			×		Z			٩	N/A
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20 RH#28 5/8/19 0@30 N/A N/A X N/A X P N/A 21 RH#29 5/8/19 1000 V N/A X P N/A X P N/A 21 RH#29 5/8/19 1000 V N/A X P N/A X P N/A 22 RH#30 5/8/19 1010 6srab N/A X N/A X P N/A Relinquished By (Signature): MM Date: 5/2.3/1 % Time: / 5 3:0 Chain of Received By (Signature): Active Signature): 5/3.4/1% Time:		19	RH#27	5/7/19	1330		N/A			×		Z	1		Р	N/A
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22 RH#30 5/8/19 //0/0 6 rob N/A X N/A X P N/A Z Z Z Z Z Z Z Z <td></td> <td>21</td> <td>RH#29</td> <td>5/8/19</td> <td>000/</td> <td>2</td> <td>N/A</td> <td></td> <td></td> <td>×</td> <td></td> <td>Z</td> <td></td> <td></td> <td>۵.</td> <td>N/A</td>		21	RH#29	5/8/19	000/	2	N/A			×		Z			۵.	N/A
Relinquished By (Signature): 144 Date: 5/23/19 Time: 1530 Chain of Received By (Signature): 22 UL Qu Date: 5/24/19		22	RH#30	5/8/19	1010	Grab	N/A			×		Z			٩	N/A
	Chain of		re): 144	Date: 5/	23/14	1	127	Chain of	Received E	3y (Signature):	X. W	Que D	ate: 5/3	-	Time:	

DELIVERING SCIENTIFIC RESOLUTION **RJ LEE GROUP**

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Received By (Signature): Received By (Print Name):

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Relinquished To: Method of Shipment:

Pasco, WA 99301

509.545.4989 Phone

Columbia Basin Analytical Laboratories 2710 North 20th Avenue Washington

> Monroeville, PA 15146 350 Hochberg Road

Pennsylvania - HQ

724.325.1776 Phone

	ATTENTION TO:					0	Purchase Order No -	. No.			Clinet	Cliant Joh No. Dee	ager		5
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DELIVERING SCIENTIFIC RESOLUTION RJ LEE GROUP

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724.325.1776 Phone

Pennsylvania - HQ 350 Hochberg Road Monroeville, PA 15146

Washington Columbia Basin Analytical Laboratories 2710 North 20th Avenue Pasco, WA 99301

CONTRACTOR OF CONTRACTOR CONTRACT

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	06112/19	Analyst:	M	Scope:	023-011	r	Sample Description:	Gray	Crushed	Rock			
RJ Lee Gro Sample Nu		158823						(000	Point Ce	unt. D	etection	n Limit :	= U1 (1/2
RJ Lee Gro Project Nu	· ·	LH 9019	77-9				Comments / # of Layers:						
Analysis M Stereo-	ethod:						#of La	Ното	genous	QC	QC		1
scope							Preps: 0	<u>(Y)</u>	<u>N</u>	Y N	Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple	ochrolsm 上	Indices of II	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%	00%	
	0%	ND	WCS					LM	PN		Quartz	Carbonates	Vermiculite
			WCS					LΜ	ΡN		í Ťar	Binder	Opeques
			WCS					LM	PN		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Lavered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0,1%	Tremol:1	- e cleanape	R.	I,						Clay	Organic Part,	Diatoms
			0								Misceaticle	s Foam	Foll

_{Туре} АSB	Slide 1	Slide 2 J	Slide 3 O	Slide 4 O	Slide 5 O	Slide 6 O	Slide 7	Slide 8	Total O
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Total	00	100	(00	00	[00]	(00	(00	100	fvv
	Dete	ction L	limit =	- (000 ×1	00% -0	.1%	•		

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ffective D orm F OP	ate: March 20 Г.001)19							
			PLM Poin	it Count Add	litional Slic	les Workshe	et		
Date:	06/ m/1	9 A	nalyst:	W	N	Aicroscope:	023-01	τ	
RJ Lee G	roup Sample	e Number:	315PF	23	RJ Lee G	Group Project	t Number:	LUH90199	7-9
Tupo	Slide 9	Slide [0	Slide	Slide	Slide	Slide	Slide	Slide	Total
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06/13/19	Analyst:	WT	Scope:	023-UP	<u></u>	Sample Description:	Beig	e Crush	ed Roc	k.		
RJ Lee Gro Sample Nu RJ Lee Gro	imber: 3 up [/	158824 L149019'					Comments /				ection Li	mit = 0	.1%
Project Nu Analysis M	mber:						# of Layers:		· · · · · · · · · · · · · · · · · · ·	00			
Stereo- scope							# of Preps:(の		n N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple II	ochroism 上		f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% 94	9.5%,	
	<0.1%		w c(s)	GR	N	1.638	1.628	LM	ÐN	PL	Quartz	Carbonates	Vermiculite
			wcs					LM	P N		Tar	Binder	pagdes
	eres fets		WCS					LM	P N		Perlite	Amphibole	Gypsum
		Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.5%	Achualite	cleanage	Rot	•						Clay	Organic Part.	Diatoms
			0								MiscParticles	Foam	Foll
											~		

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
ASB	Θ	0	Э	Ð	0	ð	Ô	0	U U
CLE	0	Э	0	0	Z	0	2	- O WIN	13174
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					<u> </u>				
Total	[00]	(00)	(00	(00	100 .	(00	00	(00)	800
		1.5	1	- 1	[1 01	9		

Detection limit= toox100%=0.1%

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Effective D Form F OP	ate: March 20 T.001	019							
			<u>PLM Poin</u>	it Count Ad	ditional Slic	les Worksh	<u>eet</u>		
Date:	06/13/19	ΑΑ	nalyst:	WT	N	/licroscope:	023-0191		
RJ Lee G	roup Sampl	e Number:	31588	24	RJ Lee G	Group Proje	ct Number:	2217 901	997-9
Туре	Slide 9	Slide <u>10</u>	Slide	_ Slide	Slide	Slide	Slide	Slide	Total
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CLE		0							(99
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Total	(00)	66]							200
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Туре	Slide	Total							
Total									

Effective Date: March 2019 Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	06/13/19	Analyst:	WF	Scope:	823-01	17	Sample Description:	Gray	Crushe	d Rock	. 1		
RJ Lee Gro Sample Nu	up Imber: 3(58825									utection	LSmit =	0.(%
RJ Lee Gro Project Nu	up mber: Ll	-1-190199	7-9				Comments / # of Layers:						
Analysis M Stereo-	ethod:						# of		ogenous	QC	QC		
scope	a an	A 1		Calar (Dia			Preps: (O	(Y)	N Clan of		Analyst:		
%	%	Asbestos Type	Morphology	II	ochroism 上	II		Birefrin- gence	Sign of Elongation	Angle	NFM% (00	2.	
	0%	ND	WCS					LM	P N		Quarty	Carbonates	Vermiculite
			wcs					LM	P N		Tar	Binder	Opaques
	y see see		wcs					LM	P N		Perlite	Amphibale	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Lavered Res	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0.1%	Actinolity	e Cleavage	R.S							Clay	Organic Part.	Diatoms
			J								Miso Particles	Foam	Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
ASB	0	0	0	0	О	Э	0	0	0
CLE	Ο	υ	0	0	0	υ	υ	0	0
NAS	100	100	100	100	100	100	100	100	fu
Total	100	100	(00	100	(00	(00	100	(00)	Au

Detection Limit = too x100%, =0,1%

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ffective orm F O	Date: March 20 PT.001	019							10 St. 10 - 10 - 10 - 10 - 10 - 10 - 10 - 10
			PLM Poi	nt Count Ad	ditional Slic	les Worksh	et		
Date: _	06/13/19	A	nalyst:	WT	N	licroscope:	023-007		
RJ Lee (Group Sample	e Number:	3158	F25	RJ Lee G	Group Projec	t Number:	LL14901	997-9
Туре	Slide 9	Slide <u>(</u> 0	Slide	Slide	Slide	Slide	Slide	Slide	Total
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CLE	0	0							0
NAS	100	୦୦)							200
Total	601	[00]							200
Туре	Slide	Slide	Slide	Slide	Slide	_ Slide	Slide	Slide	Total
Total									

Туре	Slide	Total							
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								·····	
Total									

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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date: (26/16/19	Analyst:	M	Scope:	023-0p	<u>[</u>	Sample Description:	Gray	Crushe	d Rock			
RJ Lee Gro Sample Nu	ир Imber: З	158F26					Sample Description: Comments /	1000	Point	Count.	Detection	on Limi	$t = 0.1/_{2}$
RJ Lee Gro Project Nu	up II	179019	17-9				Comments / # of Layers:				•		
Analysis M Stereo-	ethod:						# of Preps: []	Homa	genous	QC Y N	QC Analyst:		
scope %	%	Asbestos Type	Morphology	Color/Ple	eochroism 上		f Refraction	Birefrin- gence	Sign of Elongation	Extinction		o%	
	0%	ND	w <u>c s</u>					LM	ΡN		Quartz	Carbonates	Vermiculite
	jeta era Geodera		WCS WCS					LM	P N P N		Tar Perlite	Binder Amphibole	Opaques Gypsum
		Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0.(%	<u>Ac tinolit</u>	e Cleavage	R.I.							Clay Misc Particles	Organic Part. Foam	Diatoms Foll

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
ASB	0	0	0	0	Ô	D	0	ð	б
CLĖ	0	0	0	0	0	U	0	0	0
NAS	(00	(00	<i>G</i> 0)	00]	(00)	(00	(00	(00)	800
Total	100	100	100	100	100	100	100	100	800
	\cap		1.4	·	1-11-	- <i>(</i>)	1 0		

Detection Limit = 1100 × 100% = 0,1%

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			<u>PLM Point</u>	Count Add	itional Slide	s Workshe	<u>et</u>		2021	4
Date: _C	6/16/19	A	nalyst:	WT	Mi	croscope:	023-01	2		
RJ Lee G	roup Sampl	e Number:	315A2	26	RJ Lee Gr	oup Project	Number:	LLH 901	997-9	-
		T	T		1	- <u>1</u>	<u></u>			المجي
Туре	Slide <u>9</u>	Slide (O	Slide	Slide	Slide	Slide	Slide	Slide	Total	
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Total	[00]	100							200	1000
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Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total]
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Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total	7
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date: 🕻	06/16/10	Analyst:	WT	Scope:	023-01	?T	Sample Description:	Gray	Crushe	A Rock	<u>(,</u>		
RJ Lee Gro Sample Nu	up Imber: 3	158827 -H9019	-					1000	Point	Comit.	c. Detectio	n Limit	= 0.1%
RJ Lee Gro Project Nu	up mber: Ll	19019	97-9				Comments / # of Layers:						
Analysis M Stereo-	ethod:						# of しい Preps:	Home	genous	QC Y N	QC		
scope			<u></u>		la via la via	Participanti	f Refraction	Birefrin~	N Slan of	Extinction	Analyst:	<u></u>	
%	%	Asbestos Type	Morphology	Color/Ple		Indices o		gence	Sign of Elongation	Angle	NFM% 10	s/,	
	0%	MD	wcs					LM	ΡN		Quartz	Carbonates	Vermiculite
			wcs					LM	ΡN		Tar	Binder	aques
	at se estas		wcs					LM	P N		Perlite	Artphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0.1%	Actival	ite cleavage	p.I	a						Clay	Organic Part.	Diatoms
			U								Mise Particles	Foam	Foll
											5		
		· · · · · · · · · · · · · · · · · · ·											

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total			
ASB	ð	0	ð	0	ð	0	д	ð	0			
CLE	0	0	Ô	Э	д	0	J	0	υ			
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Total	00	[00]	[00]	100	[00]	00]	100	[09	800			
Detection Limit = 100% =0,1%												

Page _____ of _____

BI LEE GROUP Effective Date: March 2019 Form F OPT.001 **PLM Point Count Additional Slides Worksheet** Date: 06/16/19 Analyst: WT Microscope: 023-0PF RJ Lee Group Sample Number: <u>3(58Pンテ</u> RJ Lee Group Project Number: <u>LL/190199テー</u>9 Slide 9 Slide (O Slide Slide Slide Slide Slide Slide Туре Total 0 ASB д 0 0 0 0 0 CLE 100 100 200 1000 NAS (00 200 1000 Total (00) Slide Slide Slide Slide Slide Slide Slide Slide Total Туре

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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06/16/19	Analyst:	WT	Scope:	023-01	21	Sample Description:	Gray	y Crust	ned Ro	u(c.		
RJ Lee Gro Sample No	imber JI	58828						(000)	Point (ount.	Detectio	n Limit	=0.(%
RJ Lee Gro Project Nu	und umber: LLI	190199	7-9				Comments / # of Layers:						
Analysis N Stereo- scope	1ethod:						# of Preps: (O	Home (Y)	ogenous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology		ochroism 上	Indices of II	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% (0	0%	
	0%	ND	WCS					LM	PN		Quartz	Carbonates	Vermiculite
			WCS					LM	PN		Tar	Binder	Opaques
•			WCS					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0.1%	Actinolite	Cleanage	R.I	•						Clay Misc Particles	Organic Part. Foam	Diatoms Foll
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Total	(00	100	[00	100	100	100	(00	00]	dvo			
Detection Limit = $\frac{1}{1000} \times 100\% = 0.1\%$												

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			PLM Poin	t Count Ad	ditional Slic	des Workshe	et		
Date:	06/16/19	م	nalyst:	WT	N	Aicroscope:	023-012	T	
RJ Lee G	iroup Sampl	e Number:	315882	8	RJ Lee O	Group Projec	t Number:	62179010	197-9
							1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.		
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06/20/11	Analyst:	WT	Scope:	023-01	25	Sample Description:	Green	Crush	ned R	ock.		
RJ Lee Gro Sample Nu	up Imber: 3	158829						1000	Point Co	iunt. D	etection	Limit =	0.1%
RJ Lee Gro Project Nu	up Imber: LL	158829 1-19019	97-9				Comments / # of Layers:						
Analysis N Stereo- scope	lethod:						# of Preps: (O	Home	genous N	QC Y N	QC Analyst:		<u></u>
%	%	Asbestos Type	Morphology	Color/Ple II	ochrolsm 上	Indices of II	Refraction	Birefrin- gence	Sign of Elongation	ExtInction Angle	NFM% 10	0%	
	<0.1%	Tremolite	W (S)	COL	N	1.611	1.602	LM	(P) N	PL	Quartz	Carbonates	Vermiculite
			wcs					LM	PN		Tar	Binder	Opaques
	entre entre		WCS					LM	P N		Perlite	Anphibole	Gypsum
	%	Non-Asbestos	Flbers	Optical Pro	perties	Layered Res	<u>ults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0.1%	Actinolite	Cleanage	R.J	- -						Clay	Organic Part.	Diatoms
											Misc Particles	Foam	Foll
	1997 - A. F.										\bigcirc		
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Total	00	100	(00)	100	[00]	(00	(00	100	800			
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			PLM Poin	it Count Ad	ditional Slic	les Workshe	et		
Date:	06/20/19	A	nalyst:	M	N	licroscope:	023-01	7F	
					RJ Lee G				997-9
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(NAC)	100	100							
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06/20/19	Analyst:	MT	Scope:	023-01	<i>1</i> 1	Sample Description:	Gray	Crusha	a Rock	<u>.</u>	10	
RJ Lee Gro Sample Nu	mber: 3	158839	0					(000)	POINT	Count. (<i>letection</i>	1 Limit =	0.1%
RJ Lee Gro Project Nu	up mber: LL	1-190199	7-9				Comments / # of Layers:						
Analysis M Stereo- scope	ethod:						# of Preps: (O	Hom	ogenous N	QC Y N	QC Analyst:		
<u> </u>	%	Asbestos Type	Morphology	Color/Ple	ochrolsm _L	Indices of	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% 10	0%	
	0%	ND	WCS					LM	PN		Quartz	Carbonates	Vermiculite
			wcs					L.M	PN		Tar	Binder	Opaques
			wcs					LM	P N		Perlite	Amphilole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	<u>ults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0.1%	Activolit	e Cleavage	RIL							Clay	Organic Part.	Diatoms
		. 1-	8								MisdParticles	Foam	Foll
						L <u></u>							

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
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Total	(00	100	100	(00)	(ని	(00)	(00	(00	800
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		PLM Point	t Count Ado	litional Slid	les Worksh	eet			-
6/20/19	A	nalyst:	WT	N	licroscope:	023-005			
roup Sample	e Number:	31 588.	30	RJ Lee G	iroup Projec	ct Number:	LL1-1901	997-9	_
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06/23/19	Analyst:	MT	_ Scope:	023-012	<u></u>	Sample Description:	Gra	Line	hed k	lsc K		
RJ Lee Gro Sample Nu RJ Lee Gro Project Nu Analysis N	umber: 375 up umber: LL	58831 H90199	7-9				Comments / # of Layers:	(\))	point	Count	Derec	tion Lin	<u></u>
Stereo- scope							# of Preps: (つ	Homo	ogenous N	QC Y N	QC Analyst:	<u></u>	
%	%	Asbestos Type	Morphology	Color/Ple	ochroism 上	Indices of II	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% (0	0%	
	0%	ND	WCS					LM	P N		Quartz	Carbonates	Vermiculite
			WCS					LM	P N		Tar	Binder	Opeques
			WCS					LM	P N		Perilte	Amphibole	Gypsüm
	%	Non-Asbestos	Flbers	Optical Pro	operties	Layered Res	ults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0.(%	Activalite	Cleanage	K.I	·						Clay	Organic Part.	Diatoms
			0								MiseParticles	Foam	Foil
							,						

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
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CLE	0	Э	ð	0	Э	0	0	0	Ð
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Total	00	[00]	100	00	100	(00)	(00)	100	800
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Detection Limit= 1000 × 100% = 0.1%

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PLM Point Count Additional Slides Worksheet	
Date: $D_{6/23}/l_{19}$ Analyst: WT Microscope: $D_{23}-D_{7}$	
RJ Lee Group Sample Number: <u>315F831</u> RJ Lee Group Project Number: <u>LLH901997-9</u>	
Type Slide 4 Slide 🔿 Slide Tota	
ASB 0 0	-0
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06/23/0	Analyst:	Wr	Scope:	023-0	PF .	Sample Description: il	Beige	Crushe	d Roc	<		
RJ Lee Gro Sample Nu RJ Lee Gro	umber: 3(up ()	5883Z 1490199:	7-9				Comments /					1 Limit =	0.1%
Project Nu Analysis M	in the second se		1				# of Layers:						
Stereo- scope							# of Preps: (つ	Home	pgenous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple	ochroism 上	Indices of	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%	(00%	
	<0,1%	Actinolite	w (s)	GIR	N	1.638	1.628	LM	(R) N	PL	Quartz	Carbonates	Vermiculite
			WCS			·····		LM	PN		Tar	Binder	opaques
			WCS					LM	<u>PN</u>		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	pertles	Layered Res	<u>ults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0,1%	Actinolite	clenninge	R.I.							Clay	Organic Part.	Diatoms
											MisdParticle	s Foam	Foll

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
ASIB	Ó	0	б	Э	0	0	0	0	3
CLE	0	Э	Э	Э	0	0	0	0	0
NAS	(00)	(00	(00	(00	((20	(00	(00	000
Total	00	(00	100	(00)	(00	(00	100	(00	ĥo

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			PLM Poin	t Count Add	titional Slic	les Workshe	et		1
Date:	26/23/19	A	nalyst:	NT	N	licroscope:	023-019	٢	
								LLH90190	97-9
Туре	Slide	Slide <u>(</u> 0_	Slide	_ Slide	_ Slide	Slide	Slide	_ Slide	Total
ASB	0	0					-		0
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date: 4	26/23/19	Analyst:	WT	Scope:	523-0P1	[Sample Description:	Gray	Grush	ed Ro	. K		
RJ Lee Gro Sample Nu		58833						1000	Point C	iount.1	Detection	Limit	= 0.1%
RJ Lee Gro Project Nu	in son	190199	7-9				Comments / # of Layers:						
Analysis M Stereo- scope	lethod:						# of Preps: (つ	Home	genous N	QC Y N	QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple	ochroism 止	Indices of II	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% 99.	7%	
	<0.1%	Activalite	w c 🕥	GR	N	1.638	1.628	ιØ	R) N	PL	Quartz	Carbonates	Vermiculite
			WCS					LM	P N		Tar	Binder	Qoaques
	eti, sa katu		WCS					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Lavered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.3%	Actival: te	Cleanage	K.I	,						Clay	Organic Part.	Diatoms
			0								Misc Particles	Foam	Foil
								i					

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
ASB	Ø	О	0	0	0	0	0	Э	0
CLE	0	Ο	Z	υ	1	0	υ	0	3
NAS	100	(00	98	601	99	100	100	601	797
Total	100	(00	(00	(00	(00	(00	(00	(00	fuo

BI LEE GROUP Effective Date: March 2019 Form F OPT.001 PLM Point Count Additional Slides Worksheet Date: $\frac{\partial G}{\partial 3}$ Analyst: W_{1} Microscope: $\frac{\partial 2}{\partial 3}$ - $\frac{\partial V}{\partial 1}$ RJ Lee Group Sample Number: 3158833 RJ Lee Group Project Number: <u>LL1(901997-9</u> Slide 9 Slide (O Slide Slide Slide Slide Slide Slide Туре Total ASB 0 $\frac{\partial}{\partial}$ 0 0 ÜE 0 100 100 NAS 200 200 Total (0) (00) Slide Slide Slide Slide Slide Slide Slide Slide Туре Total Total

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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06(25/19	Analyst: (wT	Scope:	023-04	۲	Sample Description:	Grav	Crush	ed Roc	k		
RJ Lee Gr Sample N	umber: 31	58834						1000	Point G	ount. D+	tection	Limit=0	1.1%
RJ Lee Gr Project N	oup II	4901997	f -9				Comments / # of Layers:		•		- <u>4</u>		
Analysis N Stereo- scope	1ethod:						#of Preps: (0	Home (Y)	ogenous N	QC Y N	QC Analyst:	û <u>i na</u>	
<u>scope</u> %	%	Asbestos Type	Morphology	Color/Ple II	ochrolsm 上	Indices of II	f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% Q	í.5%	
[<0,1%	Activalite	w cs	GR	N	(.638	1.628	LM	ΦN	PL	Quartz	Carbonates	Vermiculite
			wcs					LM	ΡN		Tar	Binder	Opaques
			WCS					LM	PN		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.5%	Activalite	C (earaya	N.	~						Clay	Organic Part.	Diatoms
			8								MiscParticles	Foam	Foll

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
ASIB	υ	0	S	J	2	0	I	0	0
CLE	2	0	Ο	0	O	0	0	1	3
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	<u></u>								
Total	100	100	(00)	(00	100	(00	(00	100	foo
ĺ	Petectic	in Lir	nit=	1 X10	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1%			

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Effective Date: March 2019 Form F OPT.001

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			PLM Poin	t Count Add	litional Slic	les Workshe	et		
Date:	06/25/19	A	nalyst:	WT	N	licroscope:	UZ3-UPF	-	
						Group Project			1997-9
Туре	Slide <u>9</u>	Slide <u>(</u> 0	Slide	Slide	Slide	_ Slide	Slide	Slide	Total
AS13	0	0							0
CLE	2 98	0							2
(vAs	98	100							198
Total	(00)	(00							200
<u></u>	<u></u>			L		L			
Туре	Slide	Slide	Slide	Slide	Slide	_ Slide	Slide	Slide	Total
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Total						· · ·			
10141					<u>798</u>			And the second sec	
Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	06/24/19	Analyst:	DF	Scope:	036-0PT		Sample Description:	Gray	Crushe	d Roc	K		
RJ Lee Gr Project N	umber: 315 oup umber: LLH						Commente (mit = 0.1	%
Analysis M Stereo- scope							# of Preps:	Homo Y	genous N	QC Y N	QC Analyst:		
9	6 %	Asbestos Type	Morphology	Color/Pie II	ochroism 上	Indices o II	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM%		
			wcs					LM	P N		Quartz	Carbonates	Vermiculite
			WCS					LM	P N		Tar	Binder	Copaques
			wcs					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pr	operties	Lavered Re	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
		Trem C	lev	R	Γ,			1			Clay	Organic Part.	Diatoms
		Actin. cl	ev	R. :	L						Misc Particles	Foam	Foil
						i .							

Type	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
NAS	100	100	100	100	100	100	100	100	800
clev.	0	0	G	C	С	0	o	0	0
Asb	0	U	C	0	0	0	0	0	0
Total	106	100	100	100	100	100	100	100	800

Effective Date: March 2019 Form F OPT.001

Total

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		<u>F</u>	PLM Point C	Count Addit	ional Slides	s Workshee	<u>t</u>		
Date:	6/24/19	Ar	nalyst:	DF	Mic	croscope:	036-0	PT	
RJ Lee Gr	oup Sample	Number:	3158035		RJ Lee Gro	oup Project	Number: _	LL H90190	97-9
Туре	Slide 9	Slide 10	Slide	Slide	Slide	Slide	Slide	Slide	Total
NAS	100	100							200
clev	0	0							
ASD	0	0							
Total	100	100							1000
			T T						
Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
				<u> </u>					

Туре	Slide	Slide	_ Slide		_ Slide	_ Slide	Slide	_ Slide	Total
Total				<u> </u>		<u> </u>			

.

						Tel	: 724-325-1776	Tel: 724-325-1776 Fax: 724-733-1799
			Laboratory Report	Report				
K & L Gates 17 North Second Street 18th Floor Harrisburg, PA 17101 United States Attention: Mr. David Raphael Telephone: 717-231-4504	eet 1 Raphael -4504				Report Date Sample Receipt Date RJ Lee Group Job No. Authorization/P.O. No. Client Job No./Name		06/27/2019 06/03/2019 LLH901997-10	
Analysis: Asbestos in Bulk S Method: EPA/600/R-93/116	Analysis: Asbestos in Bulk Samples by Point Count Method: EPA/600/R-93/116							
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158836.HPL	14 - RH #22	Yes	٢	DN	<0.1 OF	100.00	Q, AM, OP, M	WT-06/27/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. <0.1% OF= <0.1% Actinolite Cleavage.	<0.1% OF= <0.1%	Actinolite Cleava	ge.			E	
Weight Loss: 0.0%								
3158837.HPL	15 - RH #23	Yes	-	QN	<0.1 OF	100.00	Q, AM, OP, M	WT-06/27/2019
Description:	Beige Crushed Rock. 1000 Point Count. Detection Limit=0.1%. <0.1% OF= <0.1% Actinolite Cleavage.	<0.1% OF= <0.1%	Actinolite Cleava	ge				
Weight Loss: 0.0%								
3158838.HPL	16 - RH #24	Yes	-	QN		100.00	Q, OP, M	WT-06/25/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%.							
Weight Loss: 0.0%								

Page 1 of 4

RJ Lee Group, Inc.

The second has the second by the								
Client Job No./Name:	me:					RJ Lee (RJ Lee Group Job No:	LLH901997-10
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158839.HPL	17 - RH #25	Yes	÷	QN	<0.1 OF	100.00	Q, AM, OP, M	WT-06/25/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. <0.1% OF= <0.1		% Actinolite Cleavage	Ge.			Ξ	
Weight Loss: 0.0%				1				
3158840.HPL	18 - RH #26	Yes	-	<0.1 AC		100.00	Q, OP, M	WT-06/26/2019
Description:	Beige Crushed Rock. 1000 Point Count. Detection Limit=0.1%.							
Weight Loss: 0.0%								
3158841.HPL	19 - RH #27	Yes	-	QN		100.00	Q, CA, OP, M	WT-06/26/2019
Description:	Tan Crushed Rock. 1000 Point Count. Detection Limit=0.1%.							
Weight Loss: 0.0%								
3158842.HPL	20 - RH #28	Yes	-	QN		100.00	Q, CA, OP, M	WT-06/26/2019
Description:	Tan Crushed Rock. 1000 Point Count. Detection Limit=0.1%.							
Weight Loss: 0.0%								
3158843.HPL	21 - RH #29	Yes	٢	<0.1 AC	0.20 OF	<u>99.80</u>	Q, OP, M	WT-06/27/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. 0.2% OF= 0.2%		Actinolite Cleavage.					
Weight Loss: 0.0%								
3158844.HPL	22 - RH #30	Yes	-	QN	0.20 OF	<u>99.80</u>	Q, AM, OP, M	WT-06/27/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. 0.2% OF= 0.2%	0.2% OF= 0.2% Act	Actinolite Cleavage.					
Weight Loss: 0.0%								

RJC RJ LeeGroup, Inc.	eeGroup, Inc.						Laboratory	Laboratory Report (Cont)
Client Job No./Name:	me:					RJ Lee G	RJ Lee Group Job No:	LLH901997-10
RJLG Sample Number	Client Sample Number	Homogeneous	# of Layers	Asbestos Detected(%)	Non-Asbestos Fibers(%)	Non-Fibrous Materials(%)	Matrix Material	Analyst - Analysis Date
3158845.HPL	23 - RH #31	Yes	£	DN	0.20 OF	99.80	Q, CA, AM, OP, M	WT-06/27/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. 0.2% OF= 0.2%	2% OF= 0.2% Actin	Actinolite Cleavage.					
Weight Loss: 0.0%								
3158846.HPL	24 - RH #32	Yes	£	QN	0.30 OF	99.70	Q, AM, OP, M	WT-06/27/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. 0.3% OF= 0.3%	3% OF= 0.3% Actin	Actinolite Cleavage.					
Weight Loss: 0.0%								
3158847.HPL	25 - RH #33	Yes	~	QN	0.80 OF	99.20	Q, AM, OP, M	WT-06/27/2019
Description:	Gray Crushed Rock. 1000 Point Count. Detection Limit=0.1%. Total of Amphibole Cleavage=0.8%. 0.2% is Tremolite Cleavage, 0.8% is Actinolite Cleavage. 0.2% OF= 0.2% Tremolite Cleavage. 0.6% OF= 0.6% Actinolite Cleavage.	otal of Amphibole Cl olite Cleavage.	eavage=0.8%.	0.2% is Tremolite C	≿leavage, 0.8% is Acti	nolite Cleavage. 0.2	% OF= 0.2%	

Weight Loss: 0.0%

Client Job No./Name:					RJL	RJ Lee Group Job No:	up Job No: LLH901997-10
RJLG Sample Number	Client Sample Number	# of	# of Layers Asbestos	os Non-Asbestos 1(%) Eihers(%)	Non-F Mater	s Matrix	Analyst - Analysis Date
				11	The ly Poing		
				Multionized originature.	Wei Tseng, Microscopist	ist	
ASRESTOS	NON-ASBESTOS		Ž	NON-FIBROUS MATERIALS	RIALS		
AM = Amosite	CE = Cellulose	A	AM = Amphibole	HY = Hydromagnesite	esite Q = Quartz	artz	
	MW = Mineral Wool	Ш		M = Miscellaneous			
AN = Anthophyllite	FG = Fibrous Glass	U	CA = Carbonates	MI = Mica	V = Ver	= Vermiculite	
CH = Chrysotile				Ш			
		т (UK = Urganic			
TR = Tremolite		D	= Gypsum				
DISCLAIMER NOTES							
DISCLAIMER NOTES	(0)						
 "ND" indicates no asbestos was detected; the m. "Trace" or "<" indicates asbestos was identified i limit of 0.25% to 0.32 at high fiber concentrations. 	 "ND" indicates no asbestos was detected; the method detection limit is 0.1%. "Trace" or "<" indicates asbestos was identified in the sample, but the concentration is less than the method quantitation limit. PLM coefficients of variance range from approximately 1.8 at the quantitation limit of 0.25% to 0.32 at high fiber concentrations. 	t is 0.1%. e concentration is less	than the method qu	antitation limit. PLM coeffi	cients of variance ra	nge from approximately	1.8 at the quantitation
 Samples are archived for These results are submitt 	 Samples are archived for three months following analysis and are then properly discarded. These results are submitted pursuant to RJ Lee Group's current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is 	en properly discarded. Ins and conditions of sa	lle, including the corr	pany's standard warranty	and limitation of lial	oility provisions. No resp	onsibility or liability is
assumed for the manner in which these resi • This test report relates to the items tested.	assumed for the manner in which these results are used or interpreted. This test report relates to the items tested.	o					
 This report is not valid un Any reproduction of this d This report may not be us 	 This report is not valid unless it bears the name of a NVLAP Lab Code 101208-0 approved signatory. Any reproduction of this document must be in full in order for the report to be valid. This report may not be used to claim product endorsement by NVLAP Lab Code 101208-0, any agency of the U.S. Government or any other laboratory accrediting agency. 	de 101208-0 approved ort to be valid. P Lab Code 101208-0.	signatory. anv agencv of the L	.S. Government or any o	her laboratory accre	iditina agency.	
· Polarized-light microscop the only method that can b	Polarized-light microscopy is not consistently reliable in detecting asbestos in floor the only method that can be used to determine if this material can be considered or	bestos in floor covering considered or treated a	coverings and similar nonfriable orgar treated as "non-asbestos-containing."	coverings and similar nonfriable organically bound materials. Quantitative transmission electron microscopy is currently treated as "non-asbestos-containing."	terials. Quantitative	transmission electron m	icroscopy is currently
· Sample(s) for this project	· Sample(s) for this project were analyzed at our: Monroeville, PA (AIHA #100364, NY ELAP #10884) facility.	HA #100364, NY ELAP	' #10884) facility.				
 If RJ Lee Group, Inc. did 	If RJ Lee Group. Inc. did not collect the samples analyzed, the verifiability of the laboratorys results are limited to the reported values.	ability of the laboratory	s results are limited t	o the reported values.			

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C RJ LEE GROUP

Form C OPT.001.9

Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06/25/19	Analyst:	WT	Scope:	023-085	-	Sample Description:	Carring	Crushe	of Rock	5 a	······	
RJ Lee Gro Sample Nu	umber: 31	58836						000	Point Co	unt. Ne	tection 1	Limit = 0	1%
RJ Lee Gro Project Nu	imber:	11901997	-10				Comments / # of Layers:						······
Analysis M Stereo- scope	lethod:						# of Preps: (၁	Harris	genous N		QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple	ochroism 上		f Refraction	Birefrin~ gence	Sign of Elongation	Extinction Angle	NFM% (0	010	
	0%	ND	WCS					LM	PN		Quarty	Carbonates	Vermiculite
			WCS					LM	P N		Tar	Binder	(paques
			WCS					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	ults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0, (%	Actival:	e Cleanage	KJ.							Clay	Organic Part,	Diatoms
			0								MISC Rarticles	Foam	Foll
											\cup		

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Silde 6	Slide 7	Slide 8	Total
AS13	6	0	Э	0	0	0	Ô	0	0
(LE	ρ	О	б	0	0	0	0	0	υ
NAS	(00	(00	(20	(00)	(00	(00	100	(00)	foo
									9-8-144 (J. 19-19-19-19-19-19-19-19-19-19-19-19-19-1
Total	(00	100	100	100	100	100	(00	(00)	800

Detection limit = 1000 × 100% = 0, 1%

Constanting DE	J LEE GF	ESOLUTION							
Form F O									
			PLM Poir	nt Count Ad	ditional Slic	les Worksh	eet	<u></u>	
Date:	06/25/19	A	nalyst: _	WT	Ν	Aicroscope:	023-1997	-	
RJ Lee	Group Sampl	e Number:	315883	6	RJ Lee C	Group Proje	ct Number:	161990196	17-10
Туре	Slide 4	Slide (つ	Slide	Slide	Slide	Slide	Slide	Slide	Total
ASB	0	0							0
CLE	0	0							0
NAS	(00	(00							200
Total	[00]	(00							200
Туре	Slide	Slide	Slide	Slide	Slide	_ Slide	Slide	Slide	Total
Total									
Type	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total

Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
			· · · · · · · · · · · · · · · · · · ·					
	ilide		Slide Slide Slide	Slide		Slide	Slide Slide Slide Slide Slide Slide Slide Slide </td <td>Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Image: Slide Image: Slide Image: Slide Image: Slide Slide Image: Slide Image: Slide <t< td=""></t<></td>	Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Slide Image: Slide Image: Slide Image: Slide Image: Slide Slide Image: Slide Image: Slide <t< td=""></t<>

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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06/25/19	Analyst:	_WT	_ Scope:	023-01	<u>ا۲</u>	Sample Description:	Beig	e Crus	hed n	ock.		
RJ Lee Gro Sample Nu		158837	~					(000)	Point (count. J)-etection	Limit	=0,1%
RJ Lee Gro Project Nu	· · /	LH 901	997-10				Comments / # of Layers:						
Analysis N Stereo- scope	lethod:						# of Preps: (0	Home	ogenous N	QC Y N	QC Analyst:		
<u> </u>	%	Asbestos Type	Morphology	Color/Ple	ochroism L		f Refraction _L	Birefrin- gence	Sign of Elongation	Futination	1	0%	
	0%	ND	wcs					LM	PN		Quartz	Carbonates	Vermiculite
			WCS	<u> </u>				LM	P N		Tar	Binder	Opagues
			WCS					LM	<u>P N</u>	 	Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Lavered Res	ults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0.170	Activalite	<u>Clennaga</u>	k.E							Clay Misc Particles	Organic Part. Foam	Diatoms Foil
											IVIISOF AUTORS	Foath	FOII

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
ASIB	0	0	Э	Э	0	0	0	0	д
CLE	0	0	0	0	U	υ	0	υ	0
NAS	(00)	(00)	100	100	100	100	100	(00)	fuo
Total	[00	(00)	100	(00	100	(60	(00	[00	foo

Detection Limit = too × 100% =0,1%

		PLM Poin	t Count Ad	ditional Slic	les Workshe	et		
06/25/19	A	nalyst:	WT	N	licroscope:	023-015		
'								197-(0
Slide 9	Slide (0	Slide	Slide	Slide	Slide	Slide	Slide	Total
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J	Э							0
00]	(৩೦							200
(00	(00							200
Slide	Slide	Slide	Slide	_ Slide	Slide	Slide	Slide	Total
							-	_
	up Sample Slide <u> </u>	06/25/19 A up Sample Number: Slide <u>9</u> Slide <u>(0</u> 0 3 3 0 [00 (00 [00 (00	$\frac{26/25/(9)}{100}$ Analyst: up Sample Number: $3(5)$	$\frac{26/25/(9)}{100} Analyst: \underline{W}$ $\frac{3(58837)}{100} Slide \underline{(0)} Slide ($	$\frac{106/25/(9)}{100} Analyst: W_ W_ N_	$b6/25/(9)$ Analyst: W_{1} Microscope: up Sample Number: $3(5837)$ RJ Lee Group Projec Slide 9 Slide S	up Sample Number: $3(56837)$ RJ Lee Group Project Number: Slide 9 Slide Slide Slide Slide Slide 0 3 2 2 2 2 2 2 0 3 2 2 2 2 2 2 0 3 2 2 2 2 2 2 0 3 2 2 2 2 2 2 0 3 2 2 2 2 2 2 0 3 2 2 2 2 2 2 0 3 2 2 2 2 2 2 0 3 2 <td< td=""><td>06/25/i9 Analyst: W Microscope: $023-017$ up Sample Number: 315837 RJ Lee Group Project Number: $UU19019$ Slide 9 Slide Slide</td></td<>	06/25/i9 Analyst: W Microscope: $023-017$ up Sample Number: 315837 RJ Lee Group Project Number: $UU19019$ Slide 9 Slide Slide

Туре	Slide	Slide	Slide	Slide	_ Slide	Slide	Slide	Slide	Total
				ļ					
Total									

CO RJ LEE GROUP Effective Date: March 2019 Form C OPT.001.9

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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date: (16/25/19	Analyst:	WT	Scope:	023-01	PT	Sample Description:	Gray	Crushed	(Rock			
RI Lee Gro Sample Nu	up Imber: 3	158838									ection Li	mit = 0.1	0 /0
RJ Lee Gro	up ()	1-190199	7-10				Comments /						
Project Nu			1				# of Layers:						
Analysis M	lethod:						# of	Home	genous	QC	QC		
Stereo- scope							Preps:	Y	N		Analyst:		
		Asbestos		Color/Ple	ochroism	Indices of	f Refraction	Birefrin-	Sign of	Extinction	1	<u></u>	
%	%	Туре	Morphology			!!	L	gence	Elongation	Angle	<u>NFM% (U</u>	<u>0%</u>	
	0%.	NI)	wcs					LM	P N		Quartz Tar	Carbonates	Vermiculite
			WCS					LM	ΡN		Tar	Binder	Opaques
			WCS					LM	PN		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part.	Diatoms
											MiscParticles	Foam	Foil
	entre die												
										Ì			

Түре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
ASB	0	0	0	0	0	ð	ð	0	0
CLE	Э	0	Ø	Э	ð	Ĵ	0	U	0
NAS	(00	(ა0	(00	(00	(00	(୬୦	((00	800
Total	100	(00	[00	(00)	100	(00	luo	100	foo

Detection Limit = 1000 ×100% = 0,1%

	LEE GR		A 12/August						
Effective D Form F OP	ate: March 20 1.001)19							
			<u>PLM Point</u>	Count Ad	ditional Slic	les Workshe	et		
Date:	06/25/19	A	nalyst:	WT	N	/licroscope:	023-019		
	roup Sample			-		Group Projec			197-10
Туре	Slide 🤦	Slide (o	Slide	Slide	_ Slide	Slide	Slide	Slide	Total
ASB	0	Э					·····		0
CLE	0	0							<u>ی</u>
NAS	(00	(00)		_					200
Total	100	G0]					Proc		200
Туре	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Slide	Total
			·····						

Туре	Slide	_ Slide	_ Slide	_ Slide	Slide	Slide	_ Slide	Slide	Total
Total									

Total

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1000

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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	26/25/19	Analyst:	WT	Scope:	023-0	pt	Sample Description:		Crush				
RJ Lee Gro Sample Nu	imber: 31	58839					Commonte ((00)	POINT	Count.	Detecti	on Limi	= =0.1%
RJ Lee Gro Project Nu	moen	1901997	7-10				Comments / # of Layers:						
Analysis N Stereo- scope							# of Preps: (O	H	ogenous N	QC Y N	QC Analyst:	<u></u>	
%	%	Asbestos Type	Morphology	Color/Ple II	ochrolsm 上	Indices of	f Refraction 上	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% 00) /s	
	<i>ðŕ</i> ,	٧D	WCS					LM	P N		Quart	Carbonates	Vermiculite
			wcs					LM	P N		Far	Binder	Opaques
			WCS					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Flbers	Optical Pro	operties	Lavered Res	<u>sults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	<0.1%	Activolite	Cleanape	R.I.							Clay	Organic Part.	Diatoms
			ð								MiscParticles	Foam	Foll
							:						

туре АЅВ	Slide 1.	Slide 2 ひ	Slide 3 ဝ	Slide 4 O	Slide 5 Ø	Slide 6 Ø	Slide 7 ()	Slide 8 Ø	Total O
CLE	J	U	0	6	б	0	д	υ	0
NAS	(00	(00)	(00	(00	(მე	(00	· ()0	(00	800
Total	[00	100	100	100	100	(00	(00)	(00	Ro

Detection Limit = 1000 ×100% = 0.1%

Page _____ of _____

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Total

			<u>PLM Poin</u>	t Count Ad	ditional Slic	les Workshe	et			
Date:	06/25/19	A	nalyst:	WT	N	Aicroscope:	023-0p	T		
	'					Group Projec			197-10	_
Туре	Slide 9	Slide (0	Slide	Slide	Slide	Slide	Slide	Slide	Total	
ASB	0	G								0
CLE	0	0							J	6
NAS	100	(00							200	(0)
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Туре	Slide	Slide	Slide	Slide	_ Slide	Slide	Slide	Slide	Total	
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Total										
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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	06/25/19	Analyst:	M	Scope:	0>3-0	ρΓ	Sample Description:	Beige	Crushe	d Rod	<		
RJ Lee Gro Sample Nu	up umber: 37	58840 H90199									etection	Limit = D	1%
RJ Lee Gro Project Nu	imber:	190199	7-10				Comments / # of Layers:						
Analysis M Stereo-	lethod:						# of Preps: (O	Homo (y)	ogenous N	QC Y N	QC Analyst:	<u></u>	
scope %	%	Asbestos Type	Morphology	Color/Ple II	ochroism 上	Indices o	f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle		20 <i>%</i>	
	<0,1%	Actinolite	wc	GR	N	1.638	1.628	LØ	(P) N	PL	Quartz	Carbonates	Vermiculite
	1		wcs					LM	P N		Tar	Binder	Opaques
			WCS					L M	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part.	Diatoms
		-									Misq Panticles	Foam	Foil
<u>Laward (1997)</u>													

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Detection Limit = 100 ×100% = 0.1%



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RJ Lee Gi	roup Sample	e Number: _.	31588	>40	RJ Lee G	Group Proje	ct Number:	LLI-F901	997-10	
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date: 🕻	06/26/1	Analyst:	WT	Scope:	023-0	PT	Sample Description:	Tan	Grushed	1 Rode	>		
RJ Lee Gro Sample Nu		158841						(000	Point (bunt.l	Detectio	n Limit	=0,1%
RJ Lee Gro		1-1 90199	7-10				Comments /	·					
Project Nu	mber:		•				# of Layers:				· · · · · · · · · · · · · · · · · · ·		
Analysis M	lethod:									0.0			
Stereo- scope							# of Preps: しつ	Home	sgenous	QC Y N	QC Analyst:		
		Asbestos		Color/Ple	ochroism		f Refraction	Birefrin-	Sign of	Extinction		٥,	
%	%	Туре	Morphology	11	Т	11	<u> </u>	gence	Elongation	Angle	NFM%	00%	
	0%	ND	WCS					LM	P N		Quartz	Carbonates	Vermiculite
			wcs					LM	P N		Tar	Binder	Opaques
			wcs					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Lavered Res	ults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
											Clay	Organic Part.	Diatoms
											Misc Particles	Foam	Foil
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RJ Lee G	Group Sample	e Number:	315	f841	RJ Lee C	Group Proje	ct Number:	LLH90	1997-10
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date: 🕻	06/26/19	Analyst:		Scope:	023-0	PF	Sample Description:	Tan	Crushe	A Rock	с.		
RJ Lee Gro Sample Ni	up umber: 3(58842 1901997						(000	point C	ount. D	rection	n Limit=0), (%)
RJ Lee Gro	up LU-	1901997	f -(0				Comments /		•				
Project Nu	imber:	((,	•				# of Layers:						· · · · · · · · · · · · · · · · · · ·
Analysis M	1ethod:												
Stereo- scope							# of Preps: しり	Home	ogenous N	QC Y N	QC Analyst:	<u></u>	
		Asbestos		Color/Ple	ochroism	Indices of	f Refraction	Birefrin-	Sign of	Extinction	(20-21	
%	%	Туре	Morphology	11	L	11		gence	Elongation	Angle	NFM%	v0%	
	0%	ND	WCS					_ L М	P N		Quartz	Carbonates	Vermiculite
			wcs					LM	P N		Tar	Binder	Opaques
			wcs					LM	ΡN		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	<u>ults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
		7 A 34 A 17 7									Claγ	Organic Part.	Diatoms
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RJ Lee G	roup Sample	e Number:	31588	qr	RJ Lee G	roup Projec	t Number:	CU1-1901	497-10
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06(26/19	Analyst:	WT	Scope:	023-0	гГ	Sample Description:	Gray	Crush	ed Roc	.k.	· · · · · · · · · · · · · · · · · · ·	
RJ Lee Gro Sample Nu	imber: 31	58843					_	(000 P	wint Cou	nt. Det	ection Li	mit=0,	(70
		1-1-9019	197-10				Comments / # of Layers:						
Analysis M Stereo- scope	lethod: 						# of Preps: (ပ	Høm	ogenous N		QC Analyst:		
%	%	Asbestos Type	Morphology	Color/Ple	ochroism 上	in the second	f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle		1.8%	
	20.1%	Actinolite	w cs	GR	\mathbb{N}	1.638	1.62P	ιØ	ØN	PL	Quartz	Carbonates	Vermiculite
			wcs					LM	ΡN		Tar	Binder	Opaques
			wcs					LM	P N		Periite	Artiphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	ults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.2%	Actinolite	clempe	R,I	•						Clay	Organic Part.	Diatoms
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							ct Number:		797-10
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06/27/19	Analyst:	WT	Scope:	023-01	٢	Sample Description:	Gray	Crushe	d Roc	k,		
RJ Lee Gro Sample N	umber: 3(58844	,,, <u>, , , , , , , , , , , , , , , , , ,</u>								Detection	Limit=	.1%
RJ Lee Gro Project Nu	umber:	1-1901997	(0				Comments / # of Layers:				· · · · · · · · · · · · · · · · · · ·		
Analysis N Stereo-	1ethod:						# of Prens: (0		genous		QC		
scope %	%	Asbestos Type	Morphology	Color/Ple	ochroism L		Preps: V f Refraction	BirefrIn- gence	/ N Sign of Elongation		Analyst: NFM% 99	81,	
	02,	ND	W C S					LM	P N		Quartz	Carbonates	Vermiculite
			WCS					LM	PN		Tar	Binder	Qpaques
			WCS					LM	P N		Perlite	Amphilole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	ults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.2%	Actinuli	e Cleavage.	R.I.							Clay	Organic Part.	Dlatoms
			· · · · · · · · · · · · · · · · · · ·								MiscParticles	Foam	Foil

	Total Ø	Slide 8 Ø	Slide 7 O	Slide 6 Ø	Slide 5 Ə	Slide 4 Ô	Slide 3 ට	Slide 2 J	Slide 1	_{Туре} А́SB
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Detection Limit = too ×100% = 0,1%

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			PLM Point	t Count Add	litional Slid	les Worksho	eet			
Date:	06/27/19	A	nalyst:	WT	N	licroscope:	023-0195			
RJ Lee G	roup Sample	e Number:	315884	4	RJ Lee G	Group Projec	ct Number:	64190	1997-10	
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

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Date:	06/27/19	Analyst:	_WT	Scope:	023-019	r	Sample Description:	Gray	Crush	ed proc	.k.		
RJ Lee Gro Sample N	umber: }	158845 H90199	a (a					(000)	POMT C	ount - l	Detectlar	Limit.	-0.1%
RJ Lee Gro	oup Ll	H90199	+ -(0				Comments /						
Project Nu							# of Layers:					•	
Analysis N	1ethod: ា												
Stereo- scope							# of Preps: ()	Home Y	n N	QC Y N	QC Analyst:		
ir.		Asbestos		Color/Ple	ochroism	Indices of	f Refraction	Birefrin-	Sign of	Extinction	0	AAr.	
%	%	Түре	Morphology	1		11		gence	Elongation	Angle	NFM% 9	9.8%	
	0%	NO	WCS					LM	PN		Quartz	Carbonates	Vermiculite
			wcs					LM	P N		Tar	Binder	Opaques
			WCS					LM	P N		Perlite	Amphibole	Gypsum
	% Non-Asbestos Fibers				opertles	Lavered Res	<u>ults</u>	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.2%	Activolit	e Cleanage	12.3	÷						Clay	Organic Part.	Diatoms
		•	` 8								MiseParticles	Foam	Foli
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Defection Limit = 1 (000 ×100 %) = 0.1%

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		<u> </u>	PLM Poin	<u>t Count Ado</u>	ditional Slid	es Workshe	et		
Date:	06/27/17	A:	nalyst:	ht.	N	licroscope:	023-012	٢	
	J Lee Group Sample Number:			3158845		RJ Lee Group Project Number:			197-10
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	06/27/19	Analyst:	M	Scope:	023-01	Γ	Sample Description:	Girai	1 Crus	ned No	ck.		
RJ Lee Gro Sample Nu	up Imber: 3/9	58846						(000	Point	CONNT.	Detection	n Lini	f = 0.1%
RJ Lee Gro Project Nu	imber: LL	14 90199	7-10				Comments / # of Layers:						
Analysis N Stereo-	lethod:						# of 🛛 🔊		genous	QC V N	QC		
scope%	%	Asbestos Type	Morphology	Color/Ple	ochroism 上		Preps: L f Refraction L	Birefrin- gence) N Sign of Elongation	Extinction	Analyst: NFM% 99	1.7%	
	0%	NP ND	W C S					L M	P N	, , , , , , , , , , , , , , , , , , ,	quartz	Carbonates	Vermiculite
			wcs					LM	P N		Tar	Binder	paques
			wcs					LM	P N		Perlite	Amphibole	Gypsum
	%	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0:3%	Activoli	te Cleavage	R.	Ī.						Clay MiscParticles	Organic Part. Foam	Diatoms Foil

Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
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Total

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Date:	06/27/19	Aı	nalyst:	WT	Mi	croscope: _	023-012	Γ	
RJ Lee Gr	oup Sample	e Number: _.	315884	6	RJ Lee Gr	oup Project	Number:	661-1901	997-10
	N/ 1098						·		·
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Polarized Light Microscopy Point Count Worksheet for Asbestos Analysis of Bulk Samples

Date:	06/27/19	Analyst:		Scope:	025-071	بر	Sample Description:	Gray	Crushe	d Roc	k.		
RJ Lee Gro Sample Nu RJ Lee Gro	umber: 31	58847					Comments /	(000	point	Count.	<u>Actection</u>	(mit==).	1%
Project Nu		LH 901993	1-10				# of Layers:						
Analysis M	lethod:						# of	llomo			lac		
Stereo- scope							# of Preps: しつ	(Y)	ogenous N		Analyst:		
%	%	Asbestos Type	Morphology		eochroism 上	Indices of	f Refraction	Birefrin- gence	Sign of Elongation	Extinction Angle	NFM% 99.	2%	
	0%	ND	w c (s)					LM	P N		Quartz	Carbonates	Vermiculite
			wcs					LM	P N		Tar	Binder	@pagues
	(1940-ed)		wcs		L			LM	P N		Perlite	Amphibole	Gypsum
	Laure and the second se	Non-Asbestos	Fibers	Optical Pro	operties	Layered Res	sults	Asbestos	Non-Asb.	Matrix	Talc	Feldspar	Mica
	0.2%	Tremolit	e cleavage	RI	、						Clay	Organic Part.	Diatoms
	0.6%	Activolite	e cleavage	R.I	、						Mise Particles	Foam	Foll
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Туре	Slide 1	Slide 2	Slide 3	Slide 4	Slide 5	Slide 6	Slide 7	Slide 8	Total
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Date:	06/27/19	A	nalyst: _	WT	N	licroscope:	023-01	»۲—	
RJ Lee Gr	oup Sample	e Number:	31588	47	RJ Lee G	roup Projec	t Number:	LC1-1901	997-10
Туре	Slide 9	Slide (৩	Slide	Slide	Slide	_ Slide	Slide	Slide	Total
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NAS	100	(00							200
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Total									

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Total									

Appendix G - 2019 Site and Sampling Photographs





Photograph 1: Surface water collection at Sediment Trap #2 on 4/18/2019.



Photograph 2: 2B aggregate pile sampled on 4/18/2019.





Photograph 3: AASHTO sampling method of creating quadrants, take an increment from each to reduce.



Photograph 4: AASHTO method, mix the four increments (one from each quadrant).





Photograph 5: AASHTO reduction, cone and quarter the sample.



Photograph 6: One quarter retained, one quarter split with PA DEP, and two quarters discarded.





Photograph 7: Boulder #18 sampled on 5/7/2019



Photograph 8: Boulder #18 sample.





Photograph 9: Boulder #22 sampled on 5/7/2019



Photograph 10: Boulder #22 sample.





Photograph 11: Boulder #23 sampled on 5/7/2019



Photograph 12: Boulder #23 sample.





Photograph 13: Boulder #24 sampled on 5/7/2019



Photograph 14: Boulder #24 sample.





Photograph 15: Boulder #25 sampled on 5/7/2019



Photograph 16: Boulder #25 sample.





Photograph 17: Boulder #26 sampled on 5/7/2019



Photograph 18: Boulder #26 sample.





Photograph 19: Boulder #27 sampled on 5/7/2019



Photograph 20: Boulder #27 sample.





Photograph 21: Boulder #12 sampled on 5/8/2019



Photograph 22: Boulder #12 sample.





Photograph 23: Boulder #14 sampled on 5/8/2019

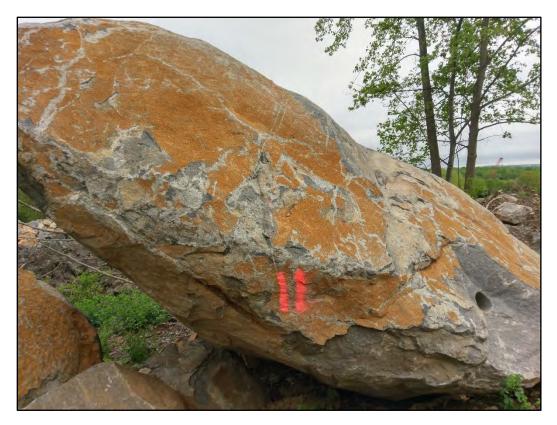


Photograph 24: Boulder #14 sample.





Photograph 25: Boulder #11 sampled on 5/8/2019



Photograph 26: Boulder #11 sample.





Photograph 27: Boulder #10 sampled on 5/8/2019



Photograph 28: Boulder #10 sample.





Photograph 29: Boulder #29 sampled on 5/8/2019



Photograph 30: Boulder #29 sample.





Photograph 31: Boulder #30 sampled on 5/8/2019



Photograph 32: Boulder #30 sample.





Photograph 33: Boulder #8 sampled on 5/8/2019



Photograph 34: Boulder #8 sample.





Photograph 35: Boulder #1 sampled on 5/8/2019



Photograph 36: Boulder #1 sample.





Photograph 37: Boulder #2 sampled on 5/8/2019



Photograph 38: Boulder #2 sample.





Photograph 39: Boulder #3 sampled on 5/8/2019



Photograph 40: Boulder #3 sample.





Photograph 41: Boulder #4 sampled on 5/8/2019



Photograph 42: Boulder #4 sample.





Photograph 43: Boulder #5 sampled on 5/8/2019



Photograph 44: Boulder #5 sample.





Photograph 45: Boulder #6 sampled on 5/8/2019



Photograph 46: Boulder #6 sample.





Photograph 47: Boulder #7 sampled on 5/8/2019



Photograph 48: Boulder #7 sample.





Photograph 49: Boulder #31 sampled on 5/7/2019



Photograph 50: Boulder #31 sample.





Photograph 51: Boulder #32 sampled on 5/7/2019



Photograph 52: Boulder #32 sample.





Photograph 53: Boulder #33 sampled on 5/13/2019



Photograph 54: Boulder #33 sample.





Photograph 55: Boulder #28 sampled on 5/8/2019



Photograph 56: Boulder #28 sample.





Photograph 57: Coring setup at CB-1 on 5/1/2019



Photograph 58: CB-1 4.0' to 20.9' B.G.





Photograph 59: Core sample CB-1 #1 at 19.9' B.G.



Photograph 60: CB-1 20.9' to 35.6' B.G.





Photograph 61: CB-1 35.6' to 50.3' B.G.



Photograph 62: CB-1 50.3' to 64.9' B.G.





Photograph 63: CB-1 64.9' to 79.4' B.G.



Photograph 64: CB-1 79.4' to 91.0' B.G.





Photograph 65: CB-1 vein near bottom of core, sample CB-1 #3 at 90.4' B.G.

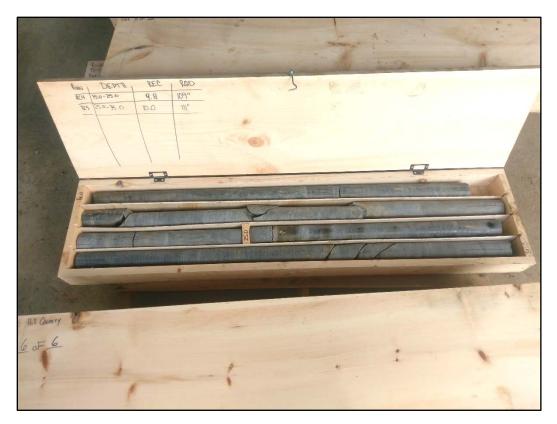


Photograph 66: CB-2 2.0' to 16.0' B.G.





Photograph 67: CB-2 16.0' to 31.0' B.G.



Photograph 68: CB-2 31.0' to 46.1' B.G.





Photograph 69: CB-2 46.1' to 60.5' B.G.



Photograph 70: CB-2 60.5' to 75.6' B.G.





Photograph 71: CB-2 75.6' to 90.0' B.G.



Photograph 72: CB-2 sample CB-2 #4 at 84.3' B.G.





Photograph 73: CB-2 sample CB-2 #5 at 85.2' B.G.

Site Photographs



Photograph 74: CB-2 sample CB-2 #6 at 86.0' B.G.





Photograph 75: CB-3 1.0' to 18.6' B.G.



Photograph 76: CB-3 sample CB-3 #7 at 17.8' B.G.





Photograph 77: CB-3 18.6' to 33.5' B.G.



Photograph 78: CB-3 33.5' to 48.7' B.G.





Photograph 79: CB-3 48.7' to 64.2' B.G.



Photograph 80: CB-3 64.2' to 79.4' B.G.





Photograph 81: CB-3 79.4' to 94.3' B.G.



Photograph 82: CB-3 94.3' to 109.1' B.G.





Photograph 83: CB-3 109.1' to 123.9' B.G.



Photograph 84: CB-3 123.9' to 139.0' B.G.





Photograph 85: CB-3 139.0' to 154.6' B.G.



Photograph 86: CB-3 sample CB-3 #8 at 146.2' B.G.





Photograph 87: CB-3 sample CB-3 #9 at 154.6' B.G.



Photograph 88: CB-3 154.6' to 160.5' B.G.





Photograph 89: CB-4 0.0' to 18.4' B.G.



Photograph 90: CB-4 18.4' to 35.6' B.G.





Photograph 91: CB-4 35.6' to 50.0' B.G.



Photograph 92: CB-4 50.0' to 64.2' B.G.





Photograph 93: CB-4 64.2' to 79.5' B.G.



Photograph 94: CB-4 79.5' to 94.9' B.G.





Photograph 95: CB-4 94.9' to 110.0' B.G.



Photograph 96: CB-4 110.0' to139.9' B.G.





Photograph 97: CB-4 139.2' to 155.4' B.G.



Photograph 98: CB-4 sample CB-4 #10 at 147.5' B.G.





Photograph 99: CB-4 155.4' to 160.0' B.G.



Photograph 100: Hand Sample #1.





Photograph 101: Hand Sample #2.



Photograph 102: Vein #7 sample (i.e. Hand Sample #3).





Photograph 103: Diabase sample DB-1 from CB-1 core at 78' B.G.



Photograph 104: Diabase sample DB-2 from CB-2 core at 72' B.G.





Photograph 105: Diabase sample DB-3 from CB-3 core at 30.5' B.G.

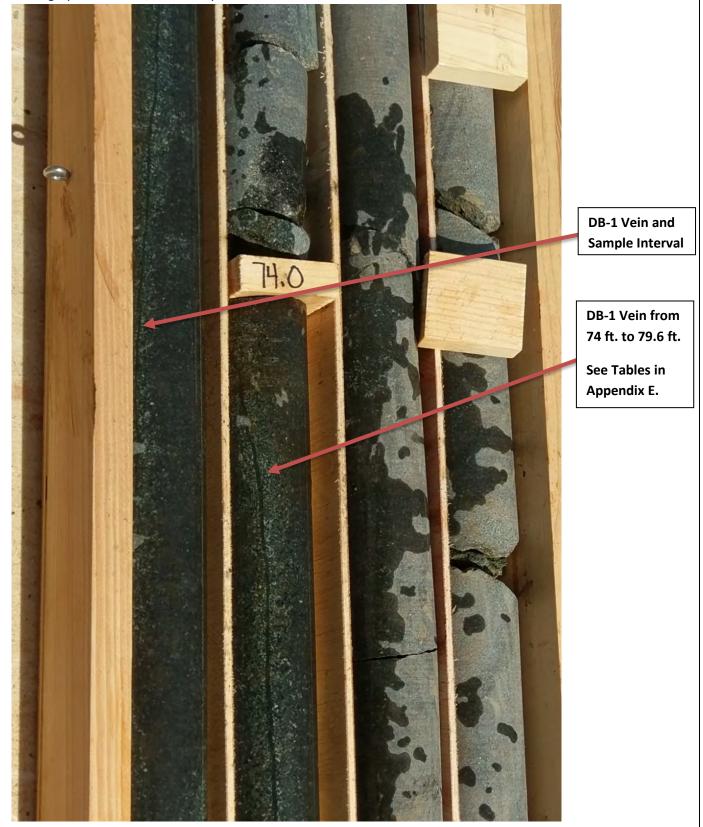


Photograph 106: Four diabase samples, one each from CB-1, CB-2, CB-3 and CB-4.





Photograph 107: CB-1, DB-1 Sample interval and identified mineral vein





Photograph 108: CB-1, DB-1 Sample interval (retained fraction) and identified mineral vein



Appendix H - 2019 Core Boring Logs



						C	B-1	0114.00			
					HEADQUARTERS Boring Number: PHILADELPHIA REGION Site Description: P.O. Box 468 Surface Elevation				QUARK	<u>.Y</u>	
					Pipersville, PA 18947 Lat./Long.:				0.73"		
		C /	١K		Pipersville PA 18947 Lat./Long.: Notal Depth:	+0 24 12	.20,	<u>w/51/4</u> 1.0'	9.73		
				-		FROM V		AL: HEAD	ING OF	315°	
		ENGIN	EERING	s fuk s	REGIONAL OFFICE Boring Angle: <u>30</u> R.G. Box 794 Munic.: <u>EAST ROCI</u>						
				es.com	8000 Coontins Farm Drive Dutilland Drive	FICHEI	BERGI	FRS	ute. <u> </u>	<u> </u>	
		www.	sarunru	es.com	Margantown, WV 26505 Drilled By: Logged By: LOUIS				A. YENC	нік	
					Date: <u>5/01/19</u> -	5/02/	19	Page <u>1</u>	of	2	
		(%)				- 5				Depth	
Depth	Number		8	e	Lithologic Description & Drilling Observation	Weathering [.] Classification	Hardness ²	Fracture ³ Spacing	Orientation	(Ft)	
(ft)		Recovery	D D D D D D D D D D D D D D D D D D D	Core	Lithologic Description & Drilling Observation	ssifi	ardr	Space	ient		
	Run	Rec				Š₿	⁻		Ō		
_											
-										-	
<u> </u>				$\overline{}$ 7	0.0'-4.0' FILL & BROKEN ROCK; NO RECOVERY. CASING SET TO 4'	T	†			0	
—				\times		NA	NA NA	NA	NA		
-											
_	RC-1 (4.0-6.5)	32	0	<,	4.0'-6.5' F-M GRAY DIABASE; VERY BROKEN	F	VH	vc	HIGH Z	_	
—	RC-2	70	0	<	6.5'-7.5' F-M GRAY DIABASE; VERY BROKEN	F		VC	JOINTING	-	
	(6.5–7.5)						"		JOINTING	_	
_	RC-3 (7.5-13.5)	100	67	Č×Č×.	7.5'-13.5' F-M GRAY DIABASE -WEATHERED GREEN PREHNITE/ALBITE AND MUSCOVITE MICA VEIN AT 13.5'	F/WS	∨н	cs	HIGH ∠ JOINTING	_	
10	— ́		├── -	Č Č Š		+ -	+ -			10-	
_				Č×Č×,						_	
-	RC-4	100	21	$\langle \rangle \rangle$	13.5'-17.0' F-M GRAY DIABASE; BROKEN	F/WS		cs	HIGH ∠	-	
—	(13.5–17.0)				-QUARTZ VEIN AT 14.0' -CLOSED JOINT AT 14.7'	F/W3			JOINTING		
				\sim \sim	-ORANGE-BROWN MUD SEAM AT 16.5'						
-	RC-5	100	34	$\sim \sim \sim$	17.0'-18.8' F-M GRAY DIABASE; BROKEN	F/WS	 н	cs	HIGH ∠	-	
	(17.0–22.2)			$\sim \sim \sim$	18.8'-19.5' M-C GRAY DIABASE; BROKEN 19.5'-20.9' M-C GRAY DIABASE	1/#3	*'''		JOINTING		
20					-GREEN PREHNITE/ALBITE, CHLORITE, WHITE ALBITE ON JOINT SURFACES; NEEDLE-LIKE ACTINULTE IN ROCK VOID AT 19.9' CORE SAMPLE #1 (CB-#1) AT 19.9'		\downarrow _			20	
-					20.9'-21.1' F-M GRAY DIABASE WITH GREEN PREHNITE/ALBITE 21.1'-22.2' F-M GRAY DIABASE					-	
-	RC-6 (22.2-26.0)	100	59	$\sim \sim \sim \sim$	22.2'-26.0' F-M GRAY DIABASE; BROKEN -GREEN CHLORITE ON JOINT SURFACE AT 23.2'	F/WS	∨н	cs	нісн∠		
—	22.2-20.0)			$\sim \sim \sim$					JOINTING	_	
-	RC-7	100	44	$\sim \sim \sim \sim$	26.0'-29.0' F-M GRAY DIABASE; BROKEN -GREEN PREHNITE/ALBITE ON JOINT SURFACES AT 27.8'-28.0'	F	VH	cs	нісн ∠	-	
_	(26.0–29.0)			$\sim \sim \sim \sim$					JOINTING	_	
—	RC-8	83	0	\sim	29.0'-29.7' M-C GRAY DIABASE; HIGH-ANGLED FRACTURE					_	
- 30	(29.0-30.8)			$\sim \sim$	29.7'-30.8 F-M GRAY DIABASE; BROKEN	WS/WM	Н	CS	HIGH ∠ J <u>OINTIN</u> G	30 —	
-				$\sim \sim \sim$						-	
	RC-9	100	73	$\sim \sim \sim$	30.8'-38.0' F-M GRAY DIABASE	. F	I VH	cs	HIGH ∠		
_	(30.8–38.0)			\sim \sim \sim	-GREEN PREHNITE/ALBITE VEINS AT 32.4' AND 33.4'; CORE SAMPLE #2 (CB-1 #2) AT 33.0	-			JOINTING	_	
-				/`\```						-	
_										_	
—		0.F	₇₄		38.0'-46.0' F-M GRAY DIABASE					-	
	RC-10 (38.0-46.0)	95	74		-GREEN PRENNITE/ALBITE AND QUARTZ VEINS WITH MUSCOVITE MICA AT 39.3' AND 43.0' -HIGH-ANGLED DIABASE FRACTURE AT 44.0'	F/WS	VH	cs	HIGH ∠ JOINTING	-	
<u> </u> ⁴⁰					-REEN PREINTE/ALBITE VEINS WITH MUSCOVITE MICA FROM 44.7'-46.0'	<u> </u>	Γ —			40	
—										-	
										_	
_				\sim \sim						_	
—	RC-11	99	85		46.0'-48.7' GREEN PREHNITE/ALBITE AND QUARTZ VEINS WITH MUSCOVITE MICA					-	
	(46.0–54.0)				48.7'-50.3' F-C GRAY DIABASE WITH GREEN PREHNITE/ALBITE AND WHITE ALBITE 50.3'-54.0 F-M GRAY DIABASE	F	VH	CS	HIGH ∠ JOINTING	_	
-				\times \times						-	
50						+	† —		—	50	
				$\sim \sim \sim$						_	
				$\langle \rangle \rangle \rangle \rangle$							
				or discoloratio				Very Widely Sp			
Weathered	Moderately	(WM) – Disc	oloration thr	oughout core,	pen fractures in rock. texture preserved. Strength scraped by knife. <u>Scraped by knife.</u> <u>Strength</u> <u>Scraped by knife.</u> <u>Scraped by Scraped </u>	blade		Widely Spaced Moderately Spa	<u>ced</u> (MS) -	2' to 3'	
Highly We	athered (WH)	 Minerals 	somewhat de	ecomposed, t	t core stones present in rock Moderately Hard (MH) – Requires one harmer blow to fra tock can be broken by hand or <u>Hard</u> (H) – Can be scratched with a knife with difficulty.	cture.		Closely Spaced Very Closely Sp	(CS) - 2" baced (VC) -	<2"	
shaved wi <u>Completel</u>	th knife. V Weathered	- (WC) — Mine	erals decomp	osed to soil,	but fabric and structure Very Hard (VH) - Cannot be scratched with a knife or ca	n barely be so	cratched 4	<u>Fine Grained</u> (F			
Residual S	served (saprolite). Material easily crumbled. idual Soil (RS) – Advanced state of decomposition resulting in plastic soils. Rock fabric is structure completely destroyed.										
and struc	τure complet	ely destroyed	l.								

					PH1	HEADQUARTERS	Boring Number: Site Description:					~
						P. O. Box 468 6912 Old Easton Road	Surface Elevation				QUARR	. I
		ΕA	A R	Tŀ	IRES	Pipersville, PA 18947	Lat./Long.: <u>N4</u>	0'24'12	.20 ", W	75 ° 17'4	9.73"	
						APPALACHIAN	Total Depth:		91.	.0'		7459
		ENGIN	EERING	g for s	UCCESS*	REGIONAL OFFICE	Boring Angle: <u>30</u> * Munic.: <u>EAST ROCK</u>					
			oorthu	es.com		P. O. Box 794 8000 Coombs Farm Drive	Drilled By:				ate:	<u>~</u>
		*****	CGI LIII (cə.cviii		Morgantown, WV 26505	Logged By: LOUIS	F. VITTO	DRIO /	JOHN /	A. YENC	HIK
							Date: <u>5/01/19 -</u>		<u>19</u> P	age <u>2</u>	of	2
Depth	Number	یک (%)	(%)	Core	Lithologia (Description & Drilling Ol	servation	Weathering [.] Classification	Hardness ²	Fracture ³ Spacing	Drientation	Depth (Ft)
(ft)	Run N	Recovery	RQD	ပိ	Littiologie	beschption & Drining of		Veath lassif	Hard	Spa	Orien	
	~	æ						-0				
_												_
50		·		\sim \sim				<u> </u>				50—
_												
_				\sim								
_	RC-12 (54.0-64.0)	100	80		54.0'-64.0' F-M GRAY DIABASE -GREEN PREHNITE/ALBITE AND	CHLORITE ON JOINT SURFACES	AT 54.2', 59.3', 63.0'	F/WS	∨н	cs	HIGH L	-
_	ĺ			\sim	-GREEN PREHNITE/ALBITE AND -CHLORITE OF JOINT SURFACE	QUARTZ VEIN AT 56.5' At 58.0'					JOINTING	
—				\sim								—
- 			L .					L	L			60 —
-												-
_												_
—	RC-13	98	80	$\sim \sim \sim$	64.0'-64.1' F-M GRAY DIABASE			F/WS	I vн	cs	нісн ∠	—
_	(64.0–74.0)			\sim \sim \sim	64.1'-64.6' M-C GREEN PREHN 64.6'-74.0' F-M GRAY DIABASE -CHLORITE ON JOINT SURFACE			^r /w3			JOINTING	
-					-GREEN PREHNITE/ALBITE ON J	DINT SURFACES AT 72.6'						_
_				\sim								-
- 70 -									⊦ —	·	—	70 —
—				$\sim \sim \sim \sim$								—
_				$\sim \sim \sim$								
-	RC-14 (74.0-84.0)	100	88	Ŭ XŬ ~ (74.0'-79.6' M-C GRAY DIABASE DIABASE CORE #1 (DB-1) SAMF 79.6'-84.0' F-M GRAY DIABASE	PLED AT 78	ORNBLENDE/PYROXENE VEINING;	F	∨н	cs	HIGH ∠ JOINTING	-
_				ŬĽ	-CLOSED JOINT AT 81.8' -GREEN CHLORITE ON JOINT SU							-
- 80												80 —
_												
-												-
_	RC-15	98	63		84.0'-90.0' F-M GRAY DIABASE 90.0'-90.4' M-C GRAY DIABASE			F/WS	VH	cs	HIGH ∠	
—	(84.0–91.0)			$\sim \sim \sim \sim$	90.4'-90.8' M-C GREEN/WHITE 90.8'-91.0' GREEN PREHNITE/A	ACTINOLITE VEIN; CORE SAMPL					JOINTING	—
_				$\sim \sim \sim \sim$								
- 90				(
												-
_					E	ND OF BORING AT 91'						
					CB-1 ROCK CORE REVIEWED BY	' EARTHRES AND PADEP. ALL	SELECTED CORE SAMPLE					—
_					INTERVALS FOR LABORATORY AND CORE SAMPLING AND ANALYSIS.	ALYSIS WERE AGREED TO BY E	ARTHRES AND PADEP PRIOR TO					
-												-
_												_
100				<u> </u>					├		—	100
—												_
1_						19 —						
Weathered	<u>l Slightly</u> (WS	i) – Slight d	discoloration	or discoloration inward from oughout core	on. open fractures in rock. , texture preserved. Strength	² <u>Extremely Soft</u> (ES) — Can <u>Very Soft</u> (VS) — Can be pr <u>Soft</u> (S) — Can be easily que <u>Soft</u> (S) — Can be easily que	be dented by thumb nail. weled with a knife. auged or carved with a knife.			<u>dely Spaced</u> derately Spa	<u>aced</u> (VW) – (WS) – 3' ta <u>ced</u> (MS) –	o 10' 2' to 3'
somewhat <u>Hiahly We</u>	less than fi athered (WH)	resh rock, co — Minerals	an't be brok somewhat d	en by hand a ecomposed, b	or scraped by knife. but core stones present in rock	<u>Medium Soft</u> (MS) — Can be <u>Moderately Hard</u> (MH) — Rea	readily scratched with a knife juires one hammer blow to fract	ure.		osely Spaced	<u>cea</u> (MS) — (CS) — 2" <u>paced</u> (VC) —	to 2'
shaved w	ith knife.	-			Rock can be broken by hand or but fabric and structure	required to detach hand spe <u>Verv Hard</u> (VH) — Cannot b	scratched with a knife or can	barely be so	blows ratched ⁴ Fin	ne Grained (F		
preserved Residual	(saprolite).	Material ea: Advanced sta	sily crumbled ate of decom	•	lting in plastic soils. Rock fabric	with a knife. Breaking spec	imens requires several hard blow	s of the pic	k. <u>Me</u>	dium Grained	1 (M) - 1-5 (C) - 5mm	imm I-3cm
1	and complet	.,				1						

				T 1	HEADQUARTERS PHILADELPHIA REGION P. O. Box 468 6912 Old Faston Road Pipersville, PA 18947	Boring Numbe Site Descriptio Surface Elevat Lat./Long.: _	on: HANS tion (Ft/MSL	ON ROO	660		<u>'Y</u>
					UCCESS" BALACHIAN REGIONAL OFFICE R.G. Box 794	Total Depth: Boring Angle: Munic.: EAST R	30° FROM V	90. ERTICAL	.0' _; HEAD	ING OF	
		www.	earthr	es.com	8000 Coonitis Farm Prive Morganitoves, WV 26505	Drilled By: Logged By: LO Date: _5/02/1	EICHEL UIS F. VITTO	. <u>BERGEI</u> DRIO /	RS	A. YENC	
Depth (ft)	Run Number	Recovery (%)	RQD (%)	Core	Lithologic Description [*] & Drilling Ot	oservation	Weathering ¹ Classification	Hardness²	Fracture ³ Spacing	Orientation	Depth (Ft)
- - -				\sim	0.0'-2.0' FILL & BROKEN ROCK; NO RECOVERY, CASING SET						
-	RC-1 (2.0-3.0)	100	75		2.0'-3.0' F-M GRAY DIABASE; BROKEN		F	∨н	cs	HIGH ∠ JOINTING	=
- -	RC-2 (3.0-6.0) RC-3	97 98	69 79		3.0'-6.0' F-M GRAY DIABASE 6.0'-15.0' F-M GRAY DIABASE		F	∨н	cs	HIGH ∠ JOINTING	
	(6.0–15.0)				-QUARTZ VEIN WITH M-C DIABASE AT 12.0'		F/WS	VH	CS	HIGH Z JOINTING	
	RC-4 (15.0-25.0)	98	91		15.0°—25.0° F—M GRAY DIABASE —QUARTZ VEIN AT 15.5° —GREEN PREHNITE/ALBITE, CHLORITE AND QUARTZ ON JOINT S						
20 	RC-5 (25.0-35.0)	100	93		25.0'-35.0' F-M GRAY DIABASE		F/WS	vh	cs	HIGH Z JOINTING	20
	RC6 (35.0-42.0)	96	77		35.0'-42.0' F-m gray diabase -green preinite/Albite and chlorite on joint surface -heavily jointed with minor chlorite on joint surfaces		F	VH	CS	HIGH Z JOINTING	
	RC-7 (42.0-50.0)	100	73		42.0'-50.0' F-m gray diabase -green preinite/albite and chlorite on joint surfaces -high-angled fractured diabase from 47.1'-48.7' -very broken diabase from 49.5'-49.8'	AT 42.6' AND 47.1'	F	VH	cs	HIGH Z JOINTING	
50 											50 <u> </u>
Weathered Weathered somewhat Highly We mass. To shaved wi	<u>1 Slightly</u> (WS <u>1 Moderately</u> : less than fr <u>athered</u> (WH) exture becom ith knife.	5) – Slight d (WM) – Disc resh rock, co – Minerals ning indistinct	liscoloration coloration thr an't be brok somewhat d t, but fabric	oughout core, en by hand o ecomposed, t preserved.	open fractures in rock. texture preserved. Strength or scroped by knife. Sut core stones present in rock Rock can be broken by hand or Hard (H) - Can be scratcher Hard (MH) - Rec Hard (MH) - Rec	seled with a knife. suged or carved with a k readily scratched with a juires one hammer blow ed with a knife with diffic icimens.	nife. 1 knife blade. to fracture. culty. Hard hammer	blows	dely Spaced oderately Spa osely Spaced ary Closely Sp	<u>aced</u> (VW) - (WS) - 3' ta iced (MS) - . (CS) - 2" t paced (VC) -	o 10' 2' to 3' to 2'
preserved Residual	(saprolite).	Material eas Advanced sta	ily crumbled	•	but fabric and structure ting in plastic soils. Rock fabric <u>Very Hard</u> (VH) - Cannot be with a knife. Breaking spec	e scratcned with a knife imens requires several ho	or can barely be sc ard blows of the picl	k. ∭a	ne Grained (F edium Grained oarse Grained	F) – <1mm d_(M) – 1–5 L_(C) – 5mm	imm 1−3cm

					₽HIL	HEADQUARTERS ADELPHIA REGION	Boring Number: _ Site Description:	HANS	CB ON ROC	<u>–2</u> CK HILL	QUARR	Y
				T L	IRES	P. O. Box 468 6912 Old Easton Road Pipersville, PA 18947	Surface Elevation	(Ft/MSI	_): 	660 75 ° 17'4	9 47"	
					IKES	APPALACHIAN	Total Depth:		90.	.0'		
		ENGIN	EERIN	g for s	UCCESS*	REGIONAL OFFICE	Boring Angle: 30° Munic.: EAST ROC					
			earthr	es.com		P. O. Box 794 8000 Coombs Farm Drive Morganitown, WV 26505	Drilled By:	EICHEL	BERGEF	RS		
							Logged By: <u>LOUIS</u> Date: <u>05/02/19</u>	F. VITTO)RIO /	JOHN /	A. YENC	HIK 2
	L	(%)					Date: <u>00/02/10</u>	_				Depth
Depth (ft)	Number	Recovery (RQD (%)	Core	Lithologic De	escription & Drilling Ot	oservation	Weathering ¹ Classification	Hardness ²	Fracture ³ Spacing	Drientation	(Ft)
	Run	Rec	Ľ.					Gĕ	ĽŤ.		ŏ	
-												_
50 	RC-8	98	75		50.0'-55.7' F-M GRAY DIABASE				ł —			50
<u> </u>	(50.0–55.7)		/5		-BROKEN DIABASE FROM 55.4"-5 -OPEN AND CLOSED JOINTS FROM			F/WS	VH	CS	HIGH Z JOINTING	_
<u> </u>	RC-9	100	27		55.7'-65.0' F-M GRAY DIABASE							_
<u> </u>	(55.7–65.0)				-HEAVILY JOINTED DIABASE FROM -GREEN CHLORITE ON JOINT SUR -VERY BROKEN DIABASE FROM 6	FACE AT 59.0	G CORE BARREL)	F/WS	VH	CS	HIGH ∠ JOINTING	_
<u> </u>												_
- 60		·						+ –		·		60 —
-												_
<u> </u>	RC-10	99	86		65.0'-75.0' F-M GRAY DIABASE			F	 VH	cs	нісн∠	_
<u> </u>	(65.0–75.0)				-green Chlorite on Joint Sur <u>Sampled at 72'</u>	FACES AT 73.0' AND 74.1';]	<u>DIABASE CORE #2 (DB-2)</u>	'			JOINTING	—
				$\langle \rangle								_
- 70		·							ł —			70 —
<u> </u>				$\sim \sim $								_
<u> </u>	RC-11	95	70		75.0'-85.0' F-M GRAY DIABASE							_
<u> </u>	(75.0-85.0)				-green Chlorite on Joint Sur -broken M-C gray diabase wi -green prehnite/albite, Musco	TH MUSCOVITE MICA AND QUA DVITE MICA AND GREEN NEED	RTZ VEINING FROM 83.7'-84.	รั 5'	VH	CS	HIGH ∠ JOINTING	
<u> </u>					84.3'-84.5'; <u>Core sample #4</u> -green prehnite/albite and Q	<u>(CB-2 #4) AT 84.3'</u> UARTZ VEINING AT 85.0'						
- 80									ł —			80 —
<u> </u>												
<u> </u>	RC-12	100	62		85.0'-86.3' GREEN PREHNITE/ALE	BITE, MUSCOVITE MICA, QUART	Z AND GREEN NEEDLE-LIKE	= 440				
<u> </u>	(85.0-90.0)				ACTINOLITE VEINING; <u>CORE SAMPL</u> (CB-2 #6) AT 86.0' 86.3'-90.0' F-M GRAY DIABASE	<u>E #5 (CB-2 #5) AT 85.2' A</u>		F/WS	VH	CS		
<u> </u>					-GREEN CHLORITE ON JOINT SUR -QUARTZ VEIN AT 89.1'	FACE AT 86.9'						
- 90		·				OF BORING AT 90'						90 —
					CB-2 ROCK CORE REVIEWED BY	EARTHRES AND PADEP. ALL	SELECTED CORE SAMPLE					_
					INTERVALS FOR LABORATORY ANAL CORE SAMPLING AND ANALYSIS.	YSIS WERE AGREED TO BY E	ARTHRES AND PADEP PRIOR	o				_
<u> </u>												_
<u> </u>												
- 												100
<u> </u>												
1					1.	F. J	L L L L		<u> </u>			
Weathered Weathered somewhat	<u>Slightly</u> (WS Moderately less than f	S) – Slight o (WM) – Disc resh rock, co	liscoloration coloration thr an't be broke	oughout core, en by hand o	on. open fractures in rock. , texture preserved. Strength or scraped by knife. out core stones present in rock	Medium Soft (MS) - Can be		e blade. acture	Wia Mo Cla	dely Spaced oderately Spa osely Spaced	<u>aced</u> (VW) – (WS) – 3' to iced (MS) – (CS) – 2" f	o 10' 2' to 3' to 2'
mass. Te shaved wi	exture becon ith knife.	ning indistinc	t, but fabric	preserved.	Rock can be broken by hand or	Hard (H) - Can be scratcher required to detach hand spe Very Hard (VH) - Cannot be	ed with a knife with difficulty. cimens. e scratched with a knife or c	Hard hammer an barely be so	r blows cratched ⁴ Fin		<u>paced</u> (VC) – F) – <1mm	• <2
preserved Residual	Delety Weathared (WC) — Minerals decomposed to soil, but fabric and structure structure (Saprolite). Material easily crumbled. <u>Structure completely</u> destroyed. Weathared (WH) — Cannot be scratched with a knife or can barely be scratched with a knife. Breaking specimens requires several hard blows of the pick. <u>Structure completely</u> destroyed. Medium Grained (M) — 1—5mm <u>Coarse Grained</u> (C) — 5mm-3cm											

					HEADQUARTERS	Boring Numbe	er:		3–3			
					PHILADELPHIA REGION R C Box 468	Site Description				QUARR	<u>Y</u>	
Δ						Surface Eleva				*		
		EA	٩K		IRES Pipersville, PA 18947				<u>75°17′4</u>	7.77″		
					APPALACHIAN	Total Depth: _	701 50014 14	160			7459	
		ENGIN	EERIN	g for s	UCCESS" REGIONAL OFFICE							
					P. C. Box 794 8000 Coomis Farm Drive					tate: <u>P</u>	<u>A</u>	
		www.	earthr	es.com	Morganitown, WV 26505	Drilled By:	EICHEL	BERGE				
						Logged By: <u>LO</u> Date: <u>5/06/1</u>	<u>0018 F. VILLO</u> 9 - 5/07/	<u>19</u>	JOHN . age <u>1</u>		<u>4</u>	
	1					Date: <u>370071</u>		<u>13</u> P	age <u>1</u>	of		
	Number	(%)	(%				Weathering [.] Classification	SS2	<u></u> . 900	ē	Depth (Ft)	
Depth (ft)		/ery		Core	Lithologic Description ⁴ & Drilling (Observation	ifico	Hardness ²	Fracture ³ Spacing	Orientation		
	Run	Secovery	RQD	0			Veat	Han	E &	Orie		
	~	<u>e</u>					-0			_	<u> </u>	
—												
<u> </u>												
_	RC-1	100	83		0.0'-1.0' FILL & BROKEN ROCK; NO RECOVERY. CASING SET 1.0'-3.0' F-M GRAY DIABASE	TO 1.0'					°	
—	(1.0-3.0)			$\langle \rangle \rangle \rangle \rangle$			F	VH	cs	HIGH ∠ JOINTING		
-	RC-2	65	29	$\langle \rangle \rangle \rangle \rangle$	3.0'-5.0' F-M GRAY DIABASE		F	∨н	vc	нісн∠	-	
_	(3.0-5.0)		50		5.0'-15.0' F-M GRAY DIABASE					JOINTING		
	RC-3 5.0-15.0)	77	50	$\langle \rangle \langle \rangle$	-CLOSED JOINTS WITH M-C WHITE ALBITE FROM 9.5'-9.9'		F	VH	cs	HIGH ∠ JOINTING	—	
-				$\sim \sim \sim$							-	
_				$\sim \sim \sim \sim$								
— — 10)										10 -	
											- 1	
—				$\langle \vee \rangle \vee \rangle$								
<u> </u>	RC-4 (15.0-19.0)	98	42	$\langle \rangle	15.0'-19.0' F-M GRAY DIABASE -GREEN PREHNITE/ALBITE AT JOINT SURFACES FROM 15.6'-	15.9' AND 18.0'-18.2';	F/WS	∨н	cs	нісн∠		
_	(13.0-19.0)			$\langle \rangle \rangle \rangle \rangle$	<u>CORE SAMPLE #7 (CB-3 #7) AT 17.8'</u>					JOINTING	<u> </u>	
—												
-				Č×Č×							-	
_	RC-5	100	58	$\sim \sim \sim$	19.0'-25.0' F-M GRAY DIABASE -M-C GREEN PREHNITE/ALBITE AND QUARTZ VEIN AT 20.0'		F/WS	∨н	cs	нісн ∠		
20	(19.0–25.0)	· .		$\sim \sim \sim$	-GREEN CHLORITE ON JOINT SURFACE AT 23.8					JOINTING	20 —	
-				$\sim \sim \sim \sim$							-	
—				$\sim \sim \sim$								
				\sim \sim								
-	RC-6 (25.0-35.0)	100	95	$\langle \vee \rangle \vee \rangle$	25.0'-35.0' F-M GRAY DIABASE; <u>DIABASE CORE #3 (DB-3)</u>	SAMPLED AT 30.5'	F	VH	ws	HIGH Z	-	
—				$\langle \rangle \rangle \rangle \rangle$						JOINTING		
_				$\langle \rangle \rangle \rangle \rangle \rangle \langle \rangle \langle \rangle \rangle \langle \rangle \langle \rangle \rangle \langle \rangle \langle \rangle \langle \rangle \rangle \langle \rangle $							_	
-				$\langle \rangle \rangle \rangle \rangle$							_	
30)	·		\leftarrow			·				30 —	
-				Č×Č×								
_				$\sim \sim \sim$							_	
			89	$\sim \sim \sim$	35.0'-45.0' F-M GRAY DIABASE							
-	RC-7 (35.0-45.0)	95	09	$\sim \sim \sim$	-QUARTZ VEINS AT 36.4', 36.7', 43.0', 43.1' -WEATHERED JOINT SURFACES WITH BROWN SANDY SILT AT	38 8' AND 39 1'	F/WS	VH	MS	HIGH Z	-	
_				\sim	A SAMENED VOIN SUNTALES WITH DRUWN SANUT SILL AL	J. J. J. J. I					_	
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40	<u> </u>	· · ·	i – –								40	
<u> </u>				$\langle \rangle \rangle \rangle$							_	
-				$\langle \vee \vee \rangle$							-	
											-	
	RC-8 (45.0-55.0)	85	68	$\sim \sim \sim$	45.0'-55.0' F-M GRAY DIABASE -WEATHERED WHITE ALBITE ON JOINT SURFACES AT 45.0', 4		F/WS	VH	cs	HIGH Z		
_	ſ			$\sim \sim \sim \sim$	-TRACE MUD SEAM AT 51.3' THAT REDUCED CORE RECOVER	r				JOINTING	_	
—				$\sim \sim \sim \sim$								
-				$\sim \sim$							-	
- 50 -											50	
—											_	
				$\sim \sim \sim$								
				or discoloratio		be dented by thumb nail.	. I	3 Ve	ary Widely Sp	<u>aced</u> (VW) –	>10'	
Weathered	sathered Slightly (WS) - Slight discoloration inward from open fractures in rock. Very Soft (VS) - Can be peeled with a knife. Widely Spaced (WS) - 3' to 10' sathered Moderately (WM) - Discoloration throughout core, texture preserved. Strength Sath (S) - Can be peeled with a knife. Widely Spaced (WS) - 2' to 3' method test than free. Moderately (MM) - Discoloration throughout core, texture preserved. Strength Sath (S) - Can be readily gauged or carved with a knife. Moderately Spaced (MS) - 2' to 3' method test than free. Medium Soft (MS) - Can be readily scretched with a knife blade. Closely Spaced (MS) - 2' to 3'											
Highly We	mewhat less than fresh rock, can't be broken by hand or scraped by knife. <u>shiy Weathered</u> (WH) - Minerals somewhat decomposed, but core stones present in rock <u>ss.</u> Texture becoming indistinct, but fabric preserved. Rock can be broken by hand or <u>Hard</u> (H) - Can be scratched with a knife with difficulty. Hard hammer blows											
shaved w	ith knife.	-		-	Acck can be broken by hand or Hard (H) — Can be scratc required to detach hand sy but fabric and structure <u>Very Hard</u> (VH) — Cannot	pecimens.	-		no ()!			
preserved	(saprolite).	Material eas	sily crumbled	•	ting in plastic soils. Rock fabric	ecimens requires several he	ard blows of the pick	ч. <mark>М</mark>	ne Grained (l edium Graine	<u>d</u> (M) – 1–5		
and struc	sture complet	ely destroyed	1						oarse Grained	(C) — 5mm	ocm	

					HEADQUARTERS BO	oring Number: ite Description: _	HANS		3–3 CK HILL	QUARR	Y
					P.O. Box 468	urface Elevation	(Ft/MSI	_):	720		
		E /	١K			at./Long.: <u>N4</u> otal Depth:			<u>75°17'4</u> 5'	7.77"	
		ENGIN	EERIN	G FOR S	UCCESS* REGIONAL OFFICE	oring Angle: <u>30°</u>	FROM V	ERTICAL	_; HEADI	NG OF	315°
					R C. Box 794 M 2000 Coontis Term Drive	unic.: EAST ROCK				ate: <u>P</u>	A
		www.	earthr	es.com	Morgantown, WV 26505	rilled By: <u></u> ogged By: <u>LOUIS</u>				YENC	нік
					D	ate: <u>5/06/19</u> -	5/07/	<u>19</u> P	age <u>2</u>		4
	Number	(%)	(%)				ing' ition	SS ²	ju op	ion	Depth (Ft)
Depth (ft)	NN	Recovery	RQD (Core	Lithologic Description ⁴ & Drilling Obser	rvation	Weathering [.] Classification	Hardness	Fracture ³ Spacing	Orientation	
	Run	Rec	Ě.				Clas	Ϋ́	E.0	Ö	
											—
- 50				~ ~ `			┣ ─				50—
<u> </u> _											
				$\langle \rangle							
-	RC-9 (55.0-60.0)	100	100		55.0'-60.0' F-M GRAY DIABASE QUARTZ VEINS AT 55.3' AND 56.9'		F	И ИН	MS	HIGH ∠	_
-	(55.0-80.0)									JOINTING	_
_											_
- 60	RC-10	100	100		60.0'-70.0' F-M GRAY DIABASE -WEATHERED DIABASE JOINT SURFACES AT 61.1' AND 61.8'		F/WS		- cs	l — — — — — — — — — — — — — — — — — — —	60 —
—	(60.0–70.0)			\sim	-GREEN PREHNTE/ALBITE AND QUARTZ VEINING AT 62.0' AND 69. -QUARTZ VEINS AT 63.4' AND 63.8'	.0'				JOINTING	—
_											
_											_
<u> -</u>											
-											-
- ⁷⁰	RC-11 (70.0-80.0)	99	83		70.0'-80.0' F-M GRAY DIABASE -GREEN PREHNITE/ALBITE, QUARTZ AND AUGITE VEINING AT 73.3'	AND 74.2'	F/WS	и и	cs	HIGH ∠	70 —
<u> </u> _	(70.0-00.0)				-SLIGHTLY WEATHÉRED JOINT SURFACE FROM 76.7'-77.1' -HIGH-ANGLED FRACTURE FROM 77.7'-78.1'					JOINTING	_
											—
											_
<u> </u> _				\sim							
- 80			L					ļ			80 —
_	RC-12 (80.0-90.0)	95	72		80.0'-90.0' F-M GRAY DIABASE -MODERATELY WEATHERED F-M DIABASE FROM 80.8'-81.8' -MIGH-ANGLED FRACTURES FROM 81.7-82.2' AND 84.1'-84.3'		F/WS	∣∨н	cs	HIGH ∠ JOINTING	_
_											_
-											_
_											_
<u> </u>											—
90	RC-13	100	74		90.0'-98.0' F-M GRAY DIABASE		╀_─	 			90 —
<u> </u>	(90.0–98.0)				-BROWN SILTY SAND ON JOINT SURFACES AT 91.0' AND 93.9' -QUARTZ VEINS AT 94.8', 96.0', 96.7'		F	VH	cs	HIGH ∠ JOINTING	_
_											_
-											-
-											_
_	RC-14 (98.0-105)	100	100		98.0'-105.0' F-M GRAY DIABASE -JOINT SURFACE WITH MINOR GREEN PREHNITE/ALBITE, QUARTZ A	ND PHLOGOPITE AT 102.9'	F	И ИН	MS	HIGH ∠	_
<u> </u>							+			J <u>OINTIN</u> G	100
											—
¹ Fresh (F)	- No vieible	sign of de	composition	or discoloration	on. ² <u>Extremely Soft</u> (ES) - Can be a	dented by thumb nail.		 3,,,	ary Widely Spo	Logd (AW)	>10'
Weathered Weathered	<u>i Slightly</u> (WS <u>i Moderately</u>	i) – Slight o (WM) – Disc	liscoloration coloration thr	inward from oughout core	open fractures in rock. , texture preserved. Strength r scraped by knife. <u>Very Soft</u> (VS) – Can be peeled <u>Soft</u> (S) – Can be reeled <u>Medium Soft</u> (MS) – Can be reeled	d with a knife. ad or carved with a knife.	blade	Wi Ma	dely Spaced oderately Spaced	(WS) – 3'te <u>sed</u> (MS) –	o 10' 2' to 3'
Highly We mass. To	<u>athered</u> (WH) exture becom	- Minerals	somewhat d	ecomposed, t	but core stones present in rock Rock can be broken by hand or <u>Hard</u> (H) – Can be scratched w	es one hammer blow to frac with a knife with difficulty.	ture.	l Ve	osely Spaced ary Closely Sp	(CS) - 2 ³ - aced (VC) -	<2*
preserved	<u>y Weathered</u> (saprolite).	Material eas	sily crumbled	L	but fabric and structure with a knife. Breaking speciment	cratched with a knife or can	barely be so ws of the pic	k. 1	<u>ne Grained</u> (F edium Grained	(M) — 1—5	mm
Residual Struc	<u>Soil</u> (RS) – / ture complet	Advanced sta ely destroyed	ite of decom	nposition resu	iting in plastic soils. Rock fabric				oarse Grained	(C) – 5mm	-3cm

					HEADQUARTES PHILADELPHIA REGIO	S Boring Number:			3–3			
					P. O. Box 4	Surface Elevatio				QUARR	Y	
				TL	IRES 6912 Old Easton No Pipersville, PA 189		N40°24'13	_): 64" W	/20 /75°17'4	7 77"		
					IRES	Total Depth:		160).5'			
		FNGIN	FERIN	G FOR S	UCCESS" REGIONAL OFFIC		• FROM V	ERTICAL	; HEAD	ING OF	315°	
			********		P. O. Box 7	Munic.: EAST ROO						
		www.	earthr	es.com	8000 Coombs Farm Dri Morgantown, WV 265	B Drilled By:						
						Logged By: <u>LOUI</u> Date: 5/06/19	<u>S F. VITTO</u> — 5/07/		<u>JOHN</u> age <u>3</u>		HIK	
						Date: 07 007 10			uge <u>- 5</u> T	<u>0'</u>	 Depth	
Depth	Number	(%)	8	a			Weathering [.] Classification	SS ²	ي ng	tion	(Ft)	
(ft)		Recovery	gg	Core	Lithologic Description & Drilling	Observation	athe	Hardness ²	Fracture ³ Spacing	Orientation		
	Run	Rec	<u>~</u>				Clas	Ĭ		ð		
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<u> </u>				\sim				i —			100	
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-	RC-15	98	88	~~~~	105.0'-115.0' F-M GRAY DIABASE		F/WS	I VH	cs	HIGH ∠	-	
_	(105–115)			\sim \sim \sim	-SLIGHTLY WEATHERED JOINT SURFACES AT 105.9', 106.1' -HIGH-ANGLED FRACTURE FROM 108.5'-109.1'	106.8, 109.1 - 109.5	.,			JOINTING		
—				\sim							_	
— —110				\sim							-	
				\sim								
—				\sim							—	
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-	RC-16 (115-125)	99	75	\sim	115.0'-125.0' F-M GRAY DIABASE -SLIGHTLY WEATHERED JOINT SURFACES AT 118.0', 119.2'	119.7', 120.2', 120.5', 120.6',	F/WS	∨н	cs	HIGH Z	_	
—				\sim	120.9', 121.3', 121.7', 124.4', 124.5'					JOINTING		
_				\sim								
-				\sim							-	
<u> </u>				$\sim \sim \sim$				i —			120	
—				\sim							—	
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-	RC-17 (125-135)	100	100	\sim	125.0'-135.0' F-M GRAY DIABASE		F	И ИН	vw	HIGH Z	-	
—	(120 100)			\sim						JOINTING		
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<u> </u>								i —			130	
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-	RC-18 (135-145)	100	86	\sim	135.0'-145.0' F-M GRAY DIABASE -GREEN CHLORITE ON JOINT SURFACES AT 141.7' AND 14		F/WS	И	cs	HIGH Z	_	
_	(~~~~~	-BROWN SILT ON JOINT SURFACES AT 142.6', 142.9', 143	.0', 144.2'				JOINTING		
_				\sim							_	
-				~~~~							-	
- ¹⁴⁰	RC-19	72	38		145.0'-145.3' MODERATELY WEATHERED GRAY DIABASE WIT QUARTZ AND WHITE ALBITE VEINING	H GREEN PREHNITE/ALBITE,	ws/wm	і ин	cs	HIGH ∠	- 40	
—	(145–150)				145.3'-146.2' F-M GRAY DIABASE WITH CHLORITE ON JOII 146.2'-146.8' SLIGHTLY TO MODERATELY WEATHERED QUAR					JOINTING	—	
_				$\sim \sim \sim$	ACTINOLITE, AUGITE VEINING; <u>CORE SAMPLE #8 (CB-3 #8)</u> 146.8'-150.0' F-M GRAY DIABASE	<u>AT 146.2'</u>					_	
-					-CLOSED JOINTS FROM 146.9'-147.2'						-	
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150 								Γ —	1		150	
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				Ĭ v Ĭ v Ĭ	l.							
Weathered	<u>Sliahtly</u> (WS	i) – Slight d	discoloration	or discoloration	open fractures in rock. <u>Very Soft</u> (VS) - Can b			l ₩	ery Widely Sp idely Spaced	(WS) - 3' t	o 10'	
somewhat	less than fr	esh rock, co	an't be brok	en by hand o	r scraped by knife. <u>Medium Soft</u> (MS) - Ca	y gauged or carved with a knife be readily scratched with a kn Requires one hammer blow to f	ife blade.		oderately Spa osely Spaced	<u>ced</u> (MS) – (CS) – 2"	2' to 3' to 2'	
mass. To shaved wi	hty Weathered (WH) - Minerals somewhat decomposed, but core stones present in rock ss. Texture becoming indistinct, but fabric preserved. Rock can be broken by hand or wed with knife. Moderately Hard (MH) - Requires one hammer blow to fracture. Hard (H) - Can be scratched with a knife with difficulty. Hard hammer blows required to detach hand specimens.											
Completel preserved	mpletely Weathered (WC) - Minerals decomposed to soil, but fabric and structure served (saprolite). Material easily crumbled.											
and struc	<u>Soil</u> (RS) – / ture complete	ely destroyed	ite of decom	position resul	ting in plastic soils. Rock fabric				oarse Grained			

							Boring Number:			-3		<u></u>
					187 H H	R CI BOX 468	Site Description:				QUARR	Y
						6912 Old Easton Road Pinerpyille PA 18947	Lat./Long.: <u>N4</u>				7 77"	
		EÆ	١K		IRES	ellinerature etc. 140-41	Total Depth:	0 24 13	. <u>04 , w</u> 160	<u>/31/4</u> 5'	/.//	
		-	FEBINIA		Heereen	APPALACHIAN	Boring Angle: <u>30</u>	FROM V			ING OF	315
		ENGIN	EEKING	s for s	UCCESS"	REGIONAL OFFICE R.O. Box 794	Munic.: EAST ROCK					
		han san bahar kan bahar san ing d				8000 Coombs Farm Drive	Drilled By:				ute. <u> </u>	
		www.	eartnr	es.com		Morgantown, WV 26505	Logged By: LOUIS				A. YENC	HIK
							Date: <u>5/06/19</u> -	5/07/	<u>19</u> P	age <u>4</u>		4
	5	(%)						5				Depth
Depth	Number		(%)	φ				Weathering [.] Classification	Hardness ²	Fracture ^s Spacing	Orientation	(Ft)
(ft)		Recovery	RoD	Core	Lithologic [escription ⁴ & Drilling O	bservation	athe	ardn	spac	ient	
	Run	Rec	<u>~</u>					Clas	Ť	E 07	ð	
_												
-												-
	RC-20	100	90	$\sim \times$	150.0'-160.5' F-M GRAY DIABA			F/WS	VH	CS		150—
	(150–160.5)			\sim	-green prehnite/albite veinit -slightly weathered joint su	IRFACE AT 150.3'		F/W3	VH	LS	HIGH ∠ JOINTING	
_				\sim	–PHLOGOPITE ON JOINT SURFAC (CB–3 #9) AT 154.6'	ES AT 152.2', 154.6', 155.2',	, AND 156.4'; <u>CORE SAMPLE #9</u>					-
—				\sim \sim \sim								
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—				~~~~								—
- 				<u>``````</u>								160-
					E	ID OF BORING AT 160.5'						- 100
—												—
-					CB-3 ROCK CORE REVIEWED BY INTERVALS FOR LABORATORY AN	EARTHRES AND PADEP. ALL	SELECTED CORE SAMPLE EARTHRES AND PADEP PRIOR TO					
_					CORE SAMPLING AND ANALYSIS.							
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170									ł —			170—
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200									t —			200
												_
¹ <u>Fresh</u> (F)	– No visible	sign of de	composition	or discoloratio	on.	² Extremely Soft (ES) - Can	be dented by thumb nail.		³ Ve	ry Widely Sp	aced (VW) -	>10'
Weathered Weathered	<u>Slightly</u> (WS <u>Moderately</u>	6) – Slight o (WM) – Disc	discoloration coloration thr	inward from o oughout core,	open fractures in rock. texture preserved. Strength		auged or carved with a knife.	blade	Wi Mc	dely Spaced Iderately Spa	(WS) – 3'te <u>ced</u> (MS) –	o 10' 2' to 3'
Highly We	mewhat less than fresh rock, can't be broken by hand or scraped by knife. <u>hty Weathered</u> (WH) - Minerals somewhat decomposed, but core stones present in rock <u>and Weathered</u> (WH) - Requires one harmer blow to fracture. <u>Hard</u> (WH) - Requires one harmer blow to fracture. <u>Hard</u> (WH) - Can be readily scratched with a knife blade. <u>Moderateky Hard</u> (WH) - Requires one harmer blow to fracture. <u>Hard</u> (WC) - <2"											
shaved wi	ss. lexture becoming indistinct, but tabric preserved. Kock can be broken by hand or required to detach hand specimens. wed with knife. required to detach hand specimens.											
preserved	(saprolite).	Material eas	sily crumbled		ting in plastic soils. Rock fabric	with a knife. Breaking spec	cimens requires several hard blow	rs of the pic	k. <u>Me</u>	ne Grained (f	<u>i (M) - 1-5</u>	mm
and struc	ture complet	ely destroyed	1.						<u>C</u>	arse Grained	(C) – 5mm	i-3cm

		ENGIN	EERING		HEADQUARTERS PHILADELPHIA REGION R.O. Box 468 5912 Old Easton Road Pipersville, PA 18947 UCCESS** Boring Number: Site Description: Surface Elevation Lat./Long.:A PAPALACHIAN REGIONAL OFFICE 8000 Coombs Term Drive Morgantown, WV 26505 Date:O8/19	HANS (Ft/MSI 0°24'14 FROM V (HILL Co EICHEL F. VITT(ON ROC _):	720 75°17'4 .0' ; HEAD JCKS_St	7.48" ING OF a ate: PA	315			
Depth (ft)	Run Number	Recovery (%)	RQD (%)	Core	Lithologic Description & Drilling Observation	Weathering ¹ Classification	Hardness²	Fracture [®] Spacing	Orientation	Depth (Ft)			
 	RC-1 (0.0-5.0)	32	0		0.0'-5.0' F-M GRAY DIABASE; BROKEN	F/WS	 Vн	vc		0 			
 	RC-2 (5.0-6.7) RC-3 (6.7-10.5)	59 100	0 29		5.0'-6.7' F-M GRAY DIABASE; VERY BROKEN 6.7'-10.5' F-M GRAY DIABASE; VERY BROKEN	F/WS F/WS	VH VH	vc cs	HIGH ∠ JOINTING HIGH ∠ JOINTING	- - -			
10 	RC-4 (10.5-15.5)	100			10.5'-15.5' F-M GRAY DIABASE	F/WS	 Vн	cs	HIGH ∠ JOINTING	10			
- - - - - 20	RC-5 (15.5-25.0)	89	62		15.5'-25.0' F-M GRAY DIABASE -WEATHERED JOINT SURFACES AT 19.1' AND 20.8' WITH GREEN CHLORITE AND WHITE ALBITE	F	∨н	cs	HIGH Ł Jointing	 20			
- - - - - -	RC-6 (25.0-35.0)	84	62		25.0'-35.0' F-M GRAY DIABASE -GREEN PREHNITE/ALBITE AND CHLORITE ON JOINT SURFACE AT 27.0' -BROWN SAND WITH GREEN PREHNITE/ALBITE ON JOINT SURFACE FROM 28.4-35.0'	F/WS	VH	cs	High Z Jointing	- - - - - - - - - -			
	RC-7 (35.0-42.0)	100	51		35.0'-42.0' F-M GRAY DIABASE -BROWN SAND WITH GREEN PREHNITE/ALBITE ON JOINT SURFACE AT 39.0'	F/WS	VH	cs	HIGH Z JOINTING	30 <u>-</u> 			
40 	RC8 (42.050.0)	94	70		F-M GRAY DIABASE -GREEN PREHNITE/ALBITE AND CHLORITE ON JOINT SURFACE AT 42.1' -BROWN SAND ON JOINT SURFACE AT 42.3' -BROWN SAND ON JOINT SURFACE AT 42.3' -SLIGHTLY WEATHERED HIGH-ANGLED FRACTURE FROM 46.3'-47.1'	F/WS	VH	cs	HIGH Z JOINTING	40 <mark></mark> 			
							 ³⊻e	ry Widely Sp	aced (VW) - 2	50 <u> </u>			
Weathered somewhat <u>Highly Wea</u> mass. Te shaved wit <u>Completely</u> preserved <u>Residual S</u>	$ \frac{r_{sab}(F) - No visible sign of decomposition or discoloration. \\ \frac{r_{eathered} Slight(WS) - Slight(WS)$												

					HEADQUARTERS PHILADELPHIA REGION	Boring Number: _ Site Description:			3-4 CK UUU		~
					P. O. Box 468	Surface Elevation	(Ft/MS	_):	720		<u> </u>
		ΕA	R	┱╞	IRES Pigersville, PA 18947	Lat./Long.: <u>N</u>	40'24'14	.25", W	'75 ' 17 ' 4	7.48"	
					APPALACHIAN	Total Depth:		160).0'		745
		ENGIN	EERIN	g for s	UCCESS* REGIONAL OFFICE	Boring Angle: 30°					
			thu	es.com	P. O. Box 794 8000 Coomins Farm Drive	Munic.: <u>EAST_ROC</u> Drilled_By:				:ate: <u> </u>	<u>A</u>
		www.	eartnr	es.com	Morgantown, WV 26505	Logged By: LOUIS	E. VITTO	DRIO /		A. YENC	HIK
						Date: <u>5/08/19</u>	- 5/15/	<u>19</u> P	age <u>2</u>	of	4
	ber	(%)	(%)				Weathering [!] Classification	S22	ືຍ ຫ	.e	Depth (Ft)
Depth (ft)	Number	Recovery	RQD (5	Core	Lithologic Description ⁴ & Drilling O	bservation	itheri	Hardness ²	Fracture ³ Spacing	Orientation	
	Run	Recc	l x				Clas		L F W	Ö	
										<u> </u>	_
											-
50 	RC-9	99	74		50.0'-58.0' F-M GRAY DIABASE			Ì			50
<u> </u>	(50.0-58)			$\sim \sim \sim \sim$	-GREEN CHLORITE AND PREHNITE/ALBITE ON JOINT SURFACE -HEAVILY JOINTED FROM 55.5-56.1	AT 50.0'	F/WS	VH	CS	HIGH ∠ JOINTING	
_				$\sim \sim \sim$	-QUARTZ VEIN AT 57.2'						_
_											
-											-
_	RC-10 (58-63.7)	95	60	$\langle \rangle	58.0'-63.7' F-M GRAY DIABASE -GREEN CHLORITE ON JOINT SURFACE AT 60.5'		F/WS	VH	CS	HIGH ∠ JOINTING	_
60	·				-BROKEN DIABASE FROM 63.0'-63.7' -QUARTZ VEIN WITH LOW-ANGLED HEALED JOINT AT 62.0'		+	ł —			60 —
				~~~~							_
<u> -</u>	RC-11 (63.7-70)	100	97		63.7'-70.0' F-M GRAY DIABASE; <u>DIABASE CORE #4 (DB-4) :</u> 	SAMPLED AT 69.0'	F	VH	MS	HIGH ∠ JOINTING	
-	(00.7-70)			$\sim \sim \sim$	-COARSE GRAIN QUARTZ & DIABASE AT 66.1'-66.6'						-
<u> </u>											
—											—
- 70								ļ			70 —
-	RC-12 (70-80)	100	100		70.0'-80.0' F-M GRAY DIABASE -QUARTZ VEINS AT 70.3', 70.6', 71.2', 71.9', 72.1'		F	И И	vw	HIGH ∠ JOINTING	-
-				$\sim \sim \sim$							_
_				$\left[ \right] $							_
—											—
_				$\sim$							
- 80				$\sim \sim \sim \sim$							80 -
_ **	RC-13 (80-90)	96	91		80.0'-90.0' F-M GRAY DIABASE -QUARTZ VEINS AT 85.0', 85.2', 86.3', 87.5'		F/WS	ИН	MS		_
<u> </u>					-M-C DIABASE AND QUARTZ AT 85.6'-85.8' -GREEN CHLORITE ON JOINT SUBRACE AT 89.5'	,					1 —
				$\sim \sim \sim$	-SLIGHTLY WEATHERED JOINT SURFACES AT 83.9', 84.4', 88.6						—
_											_
-				$\sim$ $\sim$							-
_											
90	RC-14	91	73	$\sim \sim \sim$	90.0'-100.0' F-M DIABASE		F/WS		cs	HIGH ∠	90 —
—	(90.0–100)				-GREEN PREHNITE/ALBITE AND CHLORITE ON JOINT SURFACES 96.7' -SLIGHTLY WEATHERED JOINT SURFACE AT 92.7'	6 AT 30.7, 30.9, 31.0, 94.9'				JOINTING	_
_				ŬĽ.	-M-C DIABASE WITH HIGH ANGLED FRACTURE FROM 93.7'-94	.2'					_
-											-
<u> </u> _				$\sim \sim \sim$							_
100								ł —			100—
<u> </u>											
Weathered	<u>  Slightly</u> (WS	) – Slight d	liscoloration		open fractures in rock. <u>Very Soft</u> (VS) — Can be p	eeled with a knife.		l ₩i	dely Spaced	<u>aced</u> (VW) – (WS) – 3' ta	o 10'
Weathered somewhat	Moderately less than fr	(WM) – Disc resh rock, co	oloration thr an't be broke	oughout core en by hand c	, texture preserved. Strength or scraped by knife. <u>Soft</u> (S) – Can be easily g <u>Medium Soft</u> (MS) – Can b	auged or carved with a knife. e readily scratched with a knif quires one hammer blow to fra	e blade. acture.	Ma	oderately Spa osely Spaced	i <u>ced</u> (MS) – (CS) – 2" + paced (VC) –	2'to 3' to 2'
mass. To shaved wi	exture becom th knife.	ing indistinct	t, but fabric	preserved.	Rock can be broken by hand or <u>Hard</u> (H) — Can be scratch required to detach hand sp	ed with a knife with difficulty. scimens.	Hard hamme	blows			~-
preserved	(saprolite).	Material eas	sily crumbled		but fabric and structure <u>Very Hard</u> (VH) - Cannot t with a knife. Breaking spe tting in plastic soils. Rock fabric	e scratched with a knife or co cimens requires several hard b	in barely be so lows of the pic	k. <u>M</u> e	ne Grained (f adium Grained	F) – <1mm d_(M) – 1–5 L_(C) – 5mm	imm J-3cm
	ture complete			,	·				wrae ordined	(0) – omm	

					PH1	HEADQUARTERS LADELPHIA REGION	Boring Number:	HANS		3—4 ^к нш	OLIARR	×
						P. O. Box 468 16912 Old Easton Road	Surface Elevation	(Ft/MSI	_):	720		<u> </u>
		ΕA	\ R	Τŀ	IRES	Pipersville, PA 18947	Lat./Long.: <u>N4</u>	0°24'14	.25", W	'75 <b>°</b> 17'4	7.48"	
						APPALACHIAN	Total Depth: Boring Angle: <u>30</u> *			).0'		715
	-	ENGIN	EERIN	g for s	UCCESS*	REGIONAL OFFICE R.O. Box 794	Munic.: EAST ROCK					
		APARTAR 4	aarthr	es.com		8000 Coombs Farm Drive Morgantown, WV 26505	Drilled By:				ute. <u> </u>	<u> </u>
		*****				Worganiowa, WY 20303	Logged By: <u>LOUIS</u> Date: <u>5/08/19</u> –	F. VITTO	DRIO /	JOHN A	A. YENC	HIK
			1				Date: <u>5/08/19</u> –	1	<u>19</u> P I	age <u>3</u>	of I	1
Depth	Number	(%)	8					Weathering [.] Classification	SS ²	je D	tion	Depth (Ft)
(ft)		Recovery	RQD (	Core	Lithologic I	Description & Drilling Ol	oservation	athe	Hardness ²	Fracture ³ Spacing	Orientation	
	Run	Rec	~					Cla:	Ť	E 07	- P	
—												
- 									ļ			100-
-	RC-15 (100-110)	100	97	$\sim$	100.0'-110.0' F-M GRAY DIAB -GREEN CHLORITE ON JOINT S	ASE URFACES AT 100.6' AND 108.9	y.	F	∨н	MS	HIGH Z	-
_				~~~`								_
_				~~~~								
_				~~~~~								_
_				~~~~~~								
<u> </u>	RC-16	100	97	$\sim$ $\sim$	110.0'-120.0' F-M GRAY DIAB	 Ase		F	і ин	w		110
_	(110–120)			$\sim$	-QUARTZ VEIN AT 115.4' -GREEN CHLORITE ON JOINT S	URFACE AT 118.3'						
_				$\langle \rangle \rangle \rangle \rangle \langle \rangle \langle \rangle \langle \rangle \rangle \langle \rangle $								_
_												
-				~~~~								-
_				~~~~								_
<u> </u>								F	I vh	cs	HIGH ∠	120
_	RC-17 (120-130)	100	84	$\overrightarrow{}$	120.0'-130.0' F-M GRAY DIAI -GREEN CHLORITE ON JOINT -GREEN PREHNITE/ALBITE ANI	BASE SURFACES AT 121.0', 121.4', D QUARTZ VEINS AT 126.9' AN	121.6', 126.1', 128.1' D 127.4'				JOINTING	_
_				$\sim$	-SLIGHTLY WEATHERED DIABAS	E JOINT SURFACES AT 120.6'	AND 129.2'					
-				~~~~								-
_												_
—												—
1 30				$\sim$ $\sim$				<u> </u>			<u> </u>	130—
_	RC-18 (130-140)	100	95	~``~```	130.0'-140.0' F-M GRAY DIAB -GREEN CHLORITE ON JOINT S		38.8', 139.8'	F	VH	CS	HIGH ∠ JOINTING	
-	(130-140)			$\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$ $\sim$								-
_												_
-												_
<u> </u>												_
- 			L					$\downarrow$ _	L			
- "	RC-19	80	42	$\sim$ $\sim$ $\sim$	140.0'-146.0' F-M GRAY DIAB			F	∨н	cs	HIGH Z	- 1
_	(140–146)			~~~~	-FRACTURED DIABASE WITH GR IN VEINS FROM 142.6'-143.4 -GREEN CHLORITE ON JOINT S	r	TE AND MINOR MUSCOVITE MICA				JOINTING	
—				$\sim$	-SLIGHTLY WEATHERED JOINT S		45.6'					—
_												_
_	RC-20	94	57	$\vee$ $\vee$ $\vee$	146.0'-153.0' F-M GRAY DIAB			F	∨н	cs	нісн∠	_
-	(146–153)				-green Chlorite on Joint S 153.0' -Slightly Weathered Jointed		49.2', 151.4', 151.5', 151.7',				JOINTING	-
<u> </u>					-M-C GREEN PREHNITE/ALBITE	, NEEDLE-LIKE ACTINOLITE AN #10 (CB-4 #10) AT 147.5	D CHLORITE VEINING FROM		t —			150
-												—
¹ Freeh /51	– No vieible	a sign of do		or discoloratio	pn.	² <u>Extremely Soft</u> (ES) - Can	be dented by thumb noil		<b>3</b> ,,	Widek S-	Logd (AMA)	>10'
Weathered Weathered	<u>Slightly</u> (WS <u>Moderately</u>	6) – Slight d (WM) – Disc	liscoloration oloration thr	inward from a oughout core,	open fractures in rock. texture preserved. Strength	<u>Very Soft</u> (VS) - Can be p <u>Soft</u> (S) - Can be easily g	eeled with a knife. auged or carved with a knife.	<b>L</b> 1_J_	Wi	ary Widely Spa idely Spaced oderately Spa	(WS) – 3'te <u>ced</u> (MS) –	o 10' 2' to 3'
Highly We	athered (WH)	– Minerals	somewhat d	ecomposed, b	r scraped by knife. ut core stones present in rock Rock can be broken by hand or	<u>Moderately Hard</u> (MH) - Red <u>Hard</u> (H) - Can be scratch	e readily scratched with a knife quires one hammer blow to fract ed with a knife with difficulty. I	ture.		osely Spaced ary Closely Sp	(CS) - 2"	to 2'
shaved wi Completely	th knife. Veathered	-	erais decomp	osed to soil,	but fabric and structure	required to detach hand spe <u>Very Hard</u> (VH) - Cannot b		barely be so	ratched + Fi	ne Grained (F	) - <1mm	
Residual S	Soil (RS) - /		te of decom		ting in plastic soils. Rock fabric		pic	1 400	edium Grained			

					Boring Number: _ Site Description:	НАИС	CB ON ROC		QUARR	Y		
						P.O. Box 468 6912 Old Easton Road	Surface Elevation	(Ft/MSI	_):	720		<u>.                                    </u>
		E /	١R	TH	IRES	Pipersville, PA 18947	Lat./Long.: <u>N</u>	40°24'14	.25", W	75°17'4	7.48"	
					UCCESS"	APPALACHIAN REGIONAL OFFICE	Total Depth: Boring Angle: <u>30</u> *	FROM V	160 ERTICAL	.U .; HEADI	NG OF	315
			CERIN	3 LAU 2	066633	P. C. Box 794	Munic.: EAST ROC	KHILL Co	unty: <u> BL</u>	JCKS_St		
		www.(	earthr	es.com		8000 Coomits Farm Drive Morgantown, WV 26505	Drilled By:	EICHEL	BERGER	RS		
							Logged By: <u>LOUIS</u> Date: <u>5/08/19</u>	<u>F. VITTO 5/</u> 15/	<u>ляю /</u> 19_ Р	<u>JOHN /</u> age <u>4</u>	<u>4. YENC</u> of	<u>HIK</u> 4
	ē	(%)	_									Depth
Depth (ft)	Run Number	Recovery (;	RQD (%)	Core	Lithologic [	Description & Drilling Ol	oservation	Weathering [.] Classification	Hardness	Fracture [®] Spacing	Orientation	(Ft)
	RL	Re						≤ö	-			
_												_
				~ ~					ł —			150—
_												_
_	RC-21 (153-160)	100	88		153.0'-160.0' F-M GRAY DIABA -GREEN CHLORITE ON JOINT SU	SE JRFACES AT 153.0', 153.7', 1	55.7', 156.5'	F	VH	CS	HIGH ∠ JOINTING	_
-												-
_												_
_				~``~``~								_
160			┣─ -	<u>~`</u> ~` <u>~</u>		D OF BORING AT 160'		+ $-$	┼ ──			160
<u> </u>												
_					CB-4 ROCK CORE REVIEWED BY INTERVALS FOR LABORATORY ANA CORE SAMPLING AND ANALYSIS.	LYSIS WERE AGREED TO BY E	SELECTED CORE SAMPLE ARTHRES AND PADEP PRIOR T	0				_
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—												
170												170—
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200 									[			200 -
-												
				or discoloratio	on. open fractures in rock.	² <u>Extremely Soft</u> (ES) - Can <u>Very Soft</u> (VS) - Can be p		1	3 <u>Ve</u>	ry Widely Spo	<u>aced</u> (VW) -	>10'
Weathered somewhat <u>Highly Wea</u> mass. Te	<u>Moderately</u> less than fr <u>athered</u> (WH) exture becom	(WM) – Disc resh rock, co – Minerals	oloration thr n't be broke somewhat d	oughout core, an by hand o ecomposed, b	open tractures in rock. texture preserved. Strength r scraped by knife. ut core stones present in rock Rock can be broken by hand or	<u>Soft</u> (S) — Can be easily gu <u>Medium Soft</u> (MS) — Can be <u>Moderately Hard</u> (MH) — Rea	auged or carved with a knife. e readily scratched with a knif quires one hammer blow to fro ed with a knife with difficulty.	icture.	Ma Cla Ve	derately Spaced	(WS) — 3' ta <u>ced</u> (MS) — (CS) — 2" f paced (VC) —	2'to 3' to 2'
shaved wi <u>Completely</u> preserved Residual		(WC) — Mine Material eas Advanced sta	n barely be so ows of the pic	cratched ⁴ <u>Fir</u> k. <u>Me</u>	<u>le Grained</u> (F Idium Grained Iarse Grained	) – <1mm [(M) – 1–5 (C) – 5mm	mm —3cm					