



Sent via E-mail Only

Heidelberg Materials Northeast LLC

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August 17, 2023

Richard E. Tallman, P.E.
Pennsylvania Department of Environmental Protection
Pottsville District Mining Office
5 West Laurel Boulevard
Pottsville, PA 17901

**Re: Rockhill Environmental Preservation Alliance, Inc. Comment Letter dated July 5, 2023
Rock Hill Quarry
East Rockhill Township
Bucks County, Pennsylvania**

Dear Mr. Tallman,

Heidelberg Materials Northeast LLC (“Heidelberg”) provides this response to the July 5, 2023 comment letter submitted by the Rockhill Environmental Preservation Alliance, Inc. (“REPA”), which includes a technical memorandum prepared by Dr. Bradley Erskine of Erskine Environmental Consulting (“EEC”). Both REPA and EEC attempt to deflect from the reality of the data presented by Heidelberg for the Rock Hill Quarry (“Quarry”), which is that across two (2) years of air sampling at the Quarry perimeter, only three (3) total asbestos structures¹ were identified and none of those structures were determined to be “asbestiform” (i.e., those that are specifically regulated).

The data collected to date supports the following conclusions:

1. Background air concentrations of total asbestos (including non-asbestiform structures) at the Quarry, as monitored at the Quarry perimeter, are minimal and an order of magnitude below PADEP’s threshold of 0.01 fibers/cc. As to asbestiform structures, no structures have been identified;
2. Simulated Quarry operations through “Activity Based Sampling” events have generated minimal total asbestos detections at the Quarry Perimeter, with results an order of magnitude below PADEP’s threshold of 0.01 fibers/cc. As to asbestiform structures, no structures have been identified; and
3. Heidelberg’s dust control measures used during the simulated operations have proven to be effective.

¹ The term “Total Asbestos,” when used in this document, means both asbestiform and non-asbestiform structures.

Note that these activities have been performed according to the following rigorous PADEP requirements:

1. A counting requirement that is more stringent than required under federal asbestos regulations and Superfund guidance; and
2. Conservatively performed during dry, extended weather conditions that are more likely to generate dust.

Put simply, the data collected to-date, including five (5) background sampling events, four (4) activity based sampling events, and 79 total ambient air perimeter samples, demonstrates that Quarry operations can be performed safely and will not result in an unacceptable risk of off-site exposure to asbestos associated with quarrying activities.

Rather than squarely and honestly address this data, REPA and EEC manufacture issues with the supposed limitations of the ABS events and the laboratory reporting forms of Heidelberg's consultant the R.J. Lee Group ("R.J. Lee"). These complaints support their true goal, which they do not hide:

REPA remains committed to working with PA DEP to permanently cease operations at the Rockhill [sic] Quarry.

REPA has made it clear that its sole goal is to permanently close the Quarry, regardless of the data. Heidelberg reiterates its commitment to working with PADEP, as it has throughout this process, to address questions regarding the presence of asbestos at the Quarry and to allow for the removal of the Cessation Order so that quarrying activities can safely resume at the Quarry.

Regards,



Andrew J. Gutshall, P.G.
Mining Permit Manager



David A. Assalone, Esq.
Associate General Counsel

encl:

cc: John Stefanko, PADEP (e-mail only)
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Environmental File

RESPONSE TO ROCKHILL ENVIRONMENTAL PRESERVATION ALLIANCE AND ERSKINE ENVIRONMENTAL CONSULTING JULY 5, 2023 COMMENT LETTER AND TECHNICAL MEMORANDUM

Summary of Heidelberg's Investigations of Naturally Occurring Asbestos at the Rock Hill Quarry

The Rockhill Environmental Preservation Alliance's ("REPA") July 5, 2023 comment letter to the Pennsylvania Department of Environmental Protection ("PADEP") belies the extensive analysis performed by Heidelberg to determine the presence of asbestos at the Quarry since PADEP issued its cessation order on December 5, 2018.² Given the amount of analysis that has occurred, Heidelberg presents the following summary, which supports the conclusion that the Quarry can be operated safely:

1. On-site Bulk Materials – The bulk aggregate material presently at the Quarry does not constitute "Asbestos Containing Material" ("ACM") under OSHA rules.
2. Water Samples – Samples collected from seven (7) onsite locations show that the minimal asbestos identified is far below EPA's Maximum Contaminant Level of 7 million fibers per liter.
3. Perimeter Air Monitoring – Of 79 samples collected during five (5) background and four (4) "Activity Based Sampling" ("ABS") events, only three (3) non-asbestiform amphibole structures were identified. No asbestiform amphibole structures were identified. Even accounting for the non-asbestiform amphibole structures as total asbestos (i.e., without distinguishing between asbestiform and non-asbestiform amphibole structures), the resulting concentrations were an order of magnitude lower than DEP's threshold of 0.01 f/cc. None of these detections would have resulted in corrective actions.

The ABS events are:

- i. *Light Truck Movement* – light trucks driven around the site.
- ii. *Equipment Delivery* – Various quarry equipment delivered to the site.
- iii. *Stockpile Movement* – Movement of 500 tons of stockpiled aggregate material from one on-site location to another.
- iv. *(Pending) 500-ton Removal* – Removal of 500 tons of aggregate material from the site.
- v. *Site Maintenance* – Includes road maintenance and vegetation clearing.

As to the perimeter air monitoring especially, Heidelberg's analysis has been performed according to PADEP's rigorous requirements, the purpose of which is to determine the presence of any asbestos structure at the Quarry perimeter during weather conditions that are most likely to generate dust. These requirements include:

1. Heidelberg must count all asbestos structures, including elongate mineral particles, that are 0.5 um or greater. This is more stringent than EPA's revised Framework, which advises the counting of structures that are greater than 5 um (i.e., 10X longer than that required by PADEP). Further, this total asbestos counting requirement is more stringent than Federal OSHA, MSHA, and NESHAP regulations that define "asbestos" to be limited to the asbestiform varieties of the regulated minerals.

² All Heidelberg submittals, which includes all test data and reports, are publicly available for review on PADEP's webpage for the Quarry at: <https://www.dep.pa.gov/About/Regional/SoutheastRegion/Community%20Information/Pages/Rock-Hill-Quarry-.asp>

2. Heidelberg can only perform ABS after three (3) consecutive days of no precipitation to ensure that soils are adequately dry and are more likely to generate dust.

Heidelberg's analysis includes the following key documents submitted to PADEP:

1. August 14, 2020: R.J. Lee report and analysis of water and bulk aggregate stockpile samples.
 - i. For the water samples, this report concluded that only two (2) asbestos fibers were detected, resulting in a concentration that is far lower than EPA's "Maximum Contaminant Level" drinking water standard of 7 million fibers per liter ("MFL"); and
 - ii. For the bulk samples, this analysis included samples from existing stockpiles. Asbestos concentrations from within the stockpiles were observed in these samples at a concentration of $\leq 0.23\%$ (average 0.049%). Under OSHA's rules, these materials would not be considered "Asbestos Containing Material."³
2. July 6, 2021: Heidelberg (then Hanson) submits a response to a Department comment letter that includes the following:
 - i. Water Analysis – Samples were collected from seven (7) separate locations. Zero (0) asbestos structures were identified;
 - ii. Bulk Overburden Analysis – Analysis of eight (8) samples show that asbestos concentrations do not exceed OSHA's 1% ACM requirement, meaning the overburden materials do not constitute "Asbestos Containing Material."; and
 - iii. Asbestos Monitoring and Mitigation Plan ("AMMP") – Heidelberg submits an extensive plan to monitor the ambient air at the perimeter of the Quarry that includes the following:
 - a. Eight (8) Quarry perimeter air monitoring locations;
 - b. Field sample collection criteria;
 - c. Analytical methods for ambient air asbestos analysis;
 - d. Record keeping requirements;
 - e. Corrective action requirements; and
 - f. Vehicle traffic and other emissions mitigation requirements to limit and control dust generation.
3. October 29, 2021: Heidelberg submits the results of five (5) background perimeter sampling events. Among 40 total samples (eight [8] samples per event; one (1) from each perimeter monitoring station), only a single, non-asbestiform amphibole structure was identified.
4. June 24, 2022: Heidelberg submits the results of Activity Based Sampling Event 1 (Light Truck Movement). No asbestiform or non-asbestiform amphibole structures were identified.
5. November 4, 2022: Heidelberg submits the results of Activity Based Sampling Events 2 (Equipment Delivery) and 5 (Site Maintenance Activities). Of the 16 samples collected, only a

³ 29 CFR 1910.1001(b) – "Asbestos-containing material (ACM)" means any material containing more than 1% asbestos

single non-asbestiform amphibole structure was identified. No asbestiform amphibole structures were identified. Even accounting for total asbestos structures, the resulting concentration was an order of magnitude lower than DEP's threshold of 0.01 f/cc.

6. May 17, 2023: Heidelberg submits the results of Activity Based Sampling Event 3 (Stockpile Movement). Of the 15 samples collected, only a single non-asbestiform amphibole structure was identified. No asbestiform amphibole structures were identified. Even accounting for total asbestos structures, the resulting concentration was an order of magnitude lower than DEP's threshold of 0.01 f/cc.
7. Pending: Results from Activity Based Sampling Event 4 (500-ton Removal). Event to be planned contingent upon weather limitations.

Conclusion – The data collected to-date at the Quarry has demonstrated that no asbestiform structures have been identified in ambient air samples at the Quarry perimeter, that mitigation measures are effective, and that Quarry operations can be safely performed.

Response to REPA

- i. The Activity Based Sampling Events Have Effectively Simulated Anticipated Quarrying Activities

Heidelberg reiterates that its ABS events and data to-date demonstrate that operations at the Quarry will not result in unacceptable offsite exposure of naturally occurring asbestos associated with on-site quarrying activities. REPA tersely responds that “this statement is not factual” and that the recent ABS activities at the Quarry provide limited value because they only represent a snap-shot of certain Quarry activities performed under certain conditions.

The purpose of the ABS activities is to simulate actual, anticipated events during Quarry operations, such as vehicle and equipment movement, site maintenance activities, stockpile movement, and the upcoming 500-ton aggregate removal. This is consistent with applicable U.S. Environmental Protection Agency (“EPA”) guidance. Each subsequent event increases the intensity of the simulated operation so that Heidelberg can individually analyze each activity and determine which, if any, will generate asbestos emissions. Neither REPA nor EEC explain why the identified events are inadequate. Nor do REPA or EEC account for PADEP's requirement that Heidelberg only perform these activities during extended periods of dry weather that are mostly likely to result in dust generation.

The logical conclusion of REPA's assertion is that neither Heidelberg nor PADEP can know the effectiveness of emissions controls until PADEP lifts its Cessation Order and allows Heidelberg to resume full quarrying operations without limitation. Both REPA and EEC expressly state that the ABS results “cannot be projected into the future where the activity or volume is increased, different numbers or mixes of equipment operate, or on days where climatic conditions differ” and, further, that “the results of each sampling events [sic] can be interpreted only as a reflection of the activities that occurred on the specific days that were sampled.” Therefore, to satisfy REPA's complaint, Heidelberg should be allowed to fully operate the Quarry throughout the year under all weather conditions. Heidelberg supports this conclusion.

REPA would also seemingly have Heidelberg and PADEP ignore the EPA guidance on this issue. EPA regularly uses ABS to simulate site-related activities at federal Superfund sites to assess whether those

activities will generate asbestos and, if so, to measure the risk of any asbestos emissions to the public. As all parties are well aware, EPA has published guidance on this topic in the “Framework for Investigating Asbestos-Contaminated Comprehensive Environmental Response, Compensation and Liability Act Sites” (“Framework”), OLEM Directive No. 9200.0-90 (2021).⁴ Therein, EPA refers to its “Activity-Based Air Sampling for Asbestos Standard Operating Procedure (SOP:ERT-PROC-2084-24) (“SOP”), which provides further instruction on designing ABS:

7.6 Site-Specific Activity-Based Sampling Scenarios

If site-specific ABS is undertaken, the number and types of activities and the types of scenarios should be based on current and/or potential land use and potential impact to adjacent property.

See SOP, at 16.⁵

EEC has previously provided similar commentary on the usefulness of ABS, as advocated by EPA:

One method advocated by EPA to assess whether asbestos present in rock and soil results in adverse air concentrations is to conduct activity-based sampling (ABS). This form of sampling involves the collection of air samples during an activity designed to mirror an activity that will be performed at the site...

If significant concentrations of asbestos are reported in the air samples, it would imply that asbestos is present in rock and soil at the quarry site. If little or no asbestos is reported, it would support a conclusion that the quarry rocks are not NOA-bearing. It is recommended that ABS sampling be conducted to augment the rock testing.

See EEC “Review of Qualitative Geologic Survey Sampling Plan,” (June 6, 2019), at 5 (emphasis added).⁶

As noted above, Heidelberg proposed, and DEP approved, an ABS sampling plan that outlined operations that will occur at the Quarry, with each successive event representing more intensive operations. The purpose of these activities is to measure whether each will generate asbestos at the Quarry perimeter and necessitate corrective action. In other words, per Dr. Erskine, to “mirror” the individual activities to be performed at the site. Neither REPA nor EEC offered any comment when Heidelberg submitted its ABS plans on December 6, 2021, and February 1, 2022, or when PADEP approved Heidelberg’s ABS plan on February 8, 2022. Were Dr. Erskine to be consistent with his own past comments, he would acknowledge that since “little or no asbestos [has been] reported, it would support a conclusion that the quarry rocks are not NOA-bearing.”

ii. EEC Review of Laboratory Reports

It has been a common refrain of REPA and EEC to claim that Heidelberg and R.J. Lee “underreport” the asbestos data collected and analyzed at the Quarry. EEC also continues to state that the ISO 10312 Method does not allow for the discrimination between asbestiform and non-asbestos analogues.

⁴ Available at [Framework for Investigating Asbestos-Contaminated CERCLA Sites - OLEM Directive No. 9200.0-90 \(epa.gov\)](https://www.epa.gov/sites/default/files/2021-09/olem_directive_9200.0-90.pdf)

⁵ Available at <https://response.epa.gov/sites/2107/files/ERT-PROC-2084-21-R1.1%20SOP%20Manual.pdf>

⁶ [QGSSP Review 6-6-19 \(state.pa.us\)](https://www.padep.state.pa.us/press-releases/qgssp-review-6-6-19)

As to ISO 10312, Heidelberg does not dispute – and never has – that the method states that “[it] cannot discriminate between individual fibres of asbestos and elongate fragments (cleavage fragments and acicular particles) from non-asbestos analogues of the same amphibole mineral.” ISO 10312:2019(E), at 1. Rather, Heidelberg disputes EEC’s broad and inaccurate interpretation of that caveat as applied to R.J. Lee’s analysis, which is that Heidelberg and R.J. Lee are prohibited from differentiating among the structures identified in any given sample in its laboratory reports.

EEC’s interpretation is a plain misreading of ISO 10312, which also states that (and which EEC ignores):

Imposition of specific structure counting criteria generally requires that some interpretation, partially based on uncertain health effects information, be made of each asbestos structure found. It is not the intention of this document to make any interpretations based on health effects, and **it is intended that a clear separation shall be made between recording of structure counting data, and later interpretation of those data.**

See id., Annex C, C.1. at 34 (emphasis added).

This additional interpretation has a clear utility, as asbestiform structures are those that are regulated and have clear toxicological importance. EPA itself has recognized this in its own practice:

52) What are some of the methods for analyzing and measuring asbestos concentrations in air?

Since the toxicity of asbestos appears to be related to fiber size, analytical methods focus on providing information on these parameters, as well as total number of fibers and mineral type. The number and size distribution of fibers is determined via direct microscopic examination. **Measuring asbestos content in air samples and in bulk materials that could become airborne involves both quantification of fibers and determination of mineral content of the fibers to identify whether they are asbestiform.**

See BoRit Superfund Site Question and Answer (Mar. 21, 2018), at 120 (emphasis added).⁷

As to its evaluation, R.J. Lee counts all structures required by PADEP and then provides an additional data point, which is whether any of the counted structures possess characteristics of an asbestiform morphology as “asbestiform.” Each report also includes an explanatory footnote that expressly indicates this:

“Asbestiform Amphibole” section represents number and concentration of asbestiform amphibole structures included in “Total Structures” count and concentration.”

R.J. Lee also reports the concentration for “Total Structures” to compare against DEP’s threshold level of 0.01 f/cc. Thus, R.J. Lee is complying with ISO 10312 by counting “asbestos” structures and providing an additional interpretation of that data – i.e., whether any constitutes “asbestiform amphibole.” All of this data is clearly visually separated.

Regardless of whether EEC disagrees with R.J. Lee’s interpretation of “asbestiform amphibole” data, it is ultimately able to see the total asbestos count and concentration of all structures from the sampling

⁷ Available at <https://semspub.epa.gov/work/03/2230342.pdf>

event on the laboratory reports and present its conclusion. EEC does not acknowledge this but instead prefers to delve into the semantics of the report.

iii. The Data Collected To-date Demonstrates that the Quarry can be Operated Safely

REPA asserts, as it has on many occasions, that “neither the EPA nor the PA Department of Health have determined that any amount of airborne asbestos is acceptable.” This statement does not reflect the many federal asbestos regulations that do set exposure limits for asbestos. Given this, REPA and EEC’s claim can be interpreted as a proxy for their real argument, which is that where any naturally occurring asbestos has been detected – even limited levels like those seen at the Quarry – any related operation must cease completely. Simply put, this is not how the regulation of naturally occurring asbestos works. Rather than cease operations, many jurisdictions, including PADEP, require that monitoring and mitigation plans be put into place to minimize the generation of asbestos emissions and, should there be any, to detect them and identify and address the cause.

REPA and EEC ignore that regulatory exposure limits are in place to protect people who may be exposed to asbestos as a result of their employment. For instance, the United States Department of Labor’s Mine Safety and Health Administration (“MSHA”) has developed asbestos permissible exposure limits (“PEL”) of 0.1 fibers per cubic centimeter of air (f/cc) for miners during an 8-hour shift. See 30 CFR 71.702(b). The United States Department of Labor’s Occupational Safety and Health Administration (“OSHA”) has similarly developed a PEL for employee of 0.1 f/cc over an 8-hour time-weighted average shift. See 29 CFR 1910.1001(c)(1). EPA has developed National Emission Standards for Hazardous Air Pollutants (“NESHAP”) regulations for asbestos at 40 CFR Part 61, Subpart M, which PADEP regulations incorporate at 25 Pa. Code § 124.3.

Contrary to REPA and EEC’s comments, Heidelberg takes this obligation to identify and mitigate potential asbestos emissions seriously. As discussed above, it has developed an Asbestos Monitoring and Mitigation Plan that addresses both limited 500-ton removal actions and full scale operations. As part of its monitoring and mitigation strategy, Heidelberg established eight (8) air monitors at its Quarry perimeter to measure whether emissions migrate towards the perimeter during site operations.

Heidelberg applies, as directed by DEP, the modified ISO 10312 method to count all “asbestos” structures that are 0.5 um or greater. If any asbestos is detected that exceeds DEP’s threshold of 0.01 fibers/cc, Heidelberg will report analytical results to DEP, investigate the potential cause, and implement appropriate corrective action measures. As a general practice, Heidelberg will implement dust suppression measures and will mitigate dust generation by, among other things, adequately wetting stockpile materials and overburden when necessary. Heidelberg will also minimize emissions and dust generated by vehicle traffic with various measures, such as using a street sweeper, spraying roadways to minimize dust, washing trucks to remove material, and requiring that trucks transporting materials be properly covered. The data collected during the four (4) ABS activities to date, which have employed various dust control measures, show that Heidelberg’s plan is sufficient to address and minimize dust generated during Quarry operations, including dust that may include asbestos.

Conclusion

The extensive data collected to-date under criteria that are generally more rigorous than would be required to meet federal asbestos regulations and guidance shows that Quarry operations can be performed safely. Heidelberg remains committed to working with PADEP to collect, analyze, and report data at the Quarry to allow for the removal of the Cessation Order.



July 5, 2023

Richard E. Tallman, PE
Environmental Engineer, Bureau of District Mining Operations
Pennsylvania Department of Environmental Protection
5 West Laurel Boulevard
Pottsville, PA 17901

Re: Rock Hill Quarry, East Rockhill Township, Bucks County, PA

Dear Mr. Tallman:

Attached please find a Technical Memorandum of June 22, 2023 wherein Erskine Environmental Consulting, Inc. (EEC) provides its comments on Heidelberg Materials on Heidelberg Materials Limited Activity Based Sampling Event 3.

Once again, it appears that Heidelberg is applying procedures that effectively reduce reported asbestos concentrations, it is curious that Heidelberg avoids the term “asbestos.” There are contradictions in their report, as well as the report submitted by RJLG is subject to misinterpretation.

Heidelberg also provides an interpretation of the test data that is incorrect. The cover report states:

“The results of the air sampling over the last two years demonstrate that operations at the Quarry will not result in an unacceptable risk of exposure to asbestos associated with quarrying activities”.

This statement is not factual!

The activity-based sampling during each of the three events represent fugitive emissions from limited volumes of material transported a limited distance and disturbed by a single loader. The results cannot be projected into the future where the activity or volume is increased, different numbers or mixes of equipment operate, or on days where climatic conditions differ. **The results provide little, if any, opportunity to predict future exposures.** In addition, ABS sampling of other individual tasks (hauling, excavation, drilling, blasting) cannot predict the potential exposure when activity is increased and multiple tasks are conducted simultaneously. The results of each sampling events can be interpreted only as a reflection of the activities that occurred on the specific days that were sampled.

Neither the EPA nor the PA Department of Health have determined that any amount of airborne asbestos is acceptable. Heidelberg and their consultants have not produced any scientific studies that exposure to airborne asbestos is safe at any concentrations. Even while testing at these extremely limited activities have produced airborne asbestos. Heidelberg has not proposed any methods to encapsulate the airborne asbestos.

REPA remains committed to working with PA DEP to permanently cease operations at the Rockhill Quarry, as any citizen concerned with protecting the health of their family would. This is the only quarry in the state of Pennsylvania that has NOA that is in a **residential area** surrounded by thousands upon thousands of residents and students.

Respectfully yours,

Rockhill Environmental Preservation Alliance, Inc. (REPA)

cc: The Honorable Josh Shapiro, Governor of Pennsylvania
The Honorable Richard Negrin, Secretary, PA-DEP
The Honorable Brian Fitzpatrick, U.S. Representative PA-01
The Honorable Steven Santarsiero, 10th Senatorial District
The Honorable Jarrett Coleman, 16th Senatorial District
The Honorable Craig Staats, PA's 145th Legislative District
The Honorable Diane Ellis-Marseglia, Chair, Bucks County Board of Commissioners
The Honorable Robert Harvie, Jr., Vice Chair, Bucks County Board of Commissioners
The Honorable Gene DiGirolamo, Bucks County Board of Commissioners
Marianne Morano, East Rockhill Township Manager
Megan Banis-Clemens, Pennridge School District, School Board Member
Todd Hippauf, Quakertown Community School District, School Board Member
Amiee Bollinger PADEP
Virginia Cain, PADEP
Erika Furlong, PADEP
Craig Lambeth, PADEP
Shawn Mountain, PADEP
Patrick Patterson, PADEP
James Rebarchak, PADEP
Daniel Sammarco, PADEP
Sachin Shankar, PADEP
Doug White, PADEP
Michael Kutney, PADEP
John Stefanko, PADEP
Daniel Koury, PADEP

Erskine Environmental Consulting

Geologic Investigations Hazardous Materials Naturally Occurring Asbestos

Technical Memorandum

June 22, 2023

Subject: Comments on:
Heidelberg Materials
Limited Activity Based Sampling Event 3
Rock Hill Quarry
SMP No. 7974SM1
East Rockhill Township
Bucks County, Pennsylvania

Erskine Environmental Consulting, Inc. (EEC) provides its comments on Heidelberg Materials Limited Activity Based Sampling Event 3, referenced above.

The comments are broken into two subjects:

- Analytical test report submitted by R. J. Lee Group (RJLG),
- Interpretation of test data from the activity-based sampling (ABS) sampling event 3.

Each are discussed below.

Comments on Attachment 1: Laboratory Analysis

The cover page of the report states

“The samples were analyzed using ISO method 10312 modified per OSWER Directive #9200.0-68 to include fibers $\geq 0.5 \mu\text{m}$ long and $\geq 3:1$ aspect ratio”.

The referenced method is a test method to report asbestos particles, as indicated by its full title:

ISO 10312:2019: Ambient air- Determination of asbestos fibres- Direct transfer transmission electron microscopy method.

Within the body of the test method, the term asbestos is cited 155 times, 167 times if the references are included. For amphiboles, the definition of amphibole asbestos (section 3.6) includes a reference to amphiboles that “crystallized in the asbestiform habit”. The term “asbestiform” is a general descriptive term that cannot, and has not, been defined precisely. Definitions, including ISO 10312, usually provide a limited number of properties or observations of ideal asbestos that was mined for commercial use.

The ISO is well aware of this, as evidenced by the following:

- The definition of asbestiform (section 3.6) references an aged 1977 U.S. Bureau of Mines Information circular, which states: “Because of the complexity and variability of crystal morphology in different mineral groups, the descriptive terms are generally explained by illustration rather than by numerical values.”
- The scope of ISO 10312 (section 1) states: “The method cannot discriminate between individual fibres of asbestos and elongate fragments (cleavage fragments and acicular particles) from non-asbestos analogues of the same amphibole mineral.”

Therefore, any particle that meets the definition of a fiber and is a regulated composition (e.g. actinolite) must be reported as asbestos. There are no procedures to identify or report a fiber as being asbestiform.

RJLG previously stated that they have developed a proprietary test method to distinguish a single fiber as asbestiform. If RJLG wishes to analyze samples by an undisclosed method that has not been widely distributed for peer review and not tested for precision, accuracy and reproducibility, then the method should be cited rather than the ISO 10312 method. If RJLG wishes to modify the ISO 10312 method, then the modification should be reported, and the test methodology citation should be reported as such. In either case, the analysis should not be reported as ISO 10312.

There is a contradiction within the report regarding this issue. For sample M4H, RJLG reports amphibole (labeled “amph” in the header) at a concentration of 0.0011 s/cc. There is no indication in the title of the report or the table indicating that it reports asbestos concentrations. The report gives the appearance that asbestos was not detected. However, deep in the fine print of in the footer notes, note number 4 (abbreviations) defines “amph” as being amphibole asbestos. Therefore, the particle is reported as asbestos if the citation in the footer is extracted.

However, in the column titled asbestiform amphibole, the report indicates that no asbestiform amphibole was detected (reported as <0.0011 s/cc). This suggests, in this column, that the RJLG is reporting the 0.0011 s/cc concentration as not being asbestos.

Is RJLG reporting the particle in question as asbestos, or not?

For the reasons stated above, the asbestiform amphibole column should be ignored, and the concentration in this report, and all other reports, should be reported as asbestos, as required by ISO 10312. It would be correct and transparent to simply title the report as an asbestos report, and label the two reporting columns as chrysotile asbestos and amphibole asbestos.

In summary, the report submitted by RJLG is subject to misinterpretation. The end users of the report should not have to search through the fine print of the footer notes to ascertain that the reported concentrations are asbestos concentrations, nor should they be expected to comprehend the language in the ISO 10312 method.

Comments on Interpretation of test data from the activity-based sampling (ABS) sampling event 3.

Heidelberg Materials (Heidelberg) cover letter provides a summary of sampling event 3, and interpretation of the RJLG test data. The letter is misleading in that it implies that fibers reported in the RJLG reports are not asbestos.

Heidelberg refers to asbestos particles reported by the ISO 10312 method as:

"...only two total amphibole structures have been identified, neither of which were determined to be asbestiform structures".

Heidelberg interprets the data as follows:

"As Heidelberg has detailed, even if the identified structures were determined to be asbestiform, their detection would have resulted in concentrations that are significantly lower than PADEP's action limit of 0.01 fibers/cc".

It is curious that Heidelberg also seems to avoid the term "asbestos". As shown above, the ISO 10312 method cannot differentiate particles based on morphology. In fact, no analytical test methods for asbestos provides criteria for differentiation. The reference to asbestos particles as being not asbestiform gives the appearance that asbestos was not detected, when in fact, it was. The ISO 10312 method, which was used for the analyses, requires that these reported particles be reported as asbestos.

Heidelberg also provides an interpretation of the test data that is incorrect. The cover report states:

"The results of the air sampling over the last two years demonstrate that operations at the Quarry will not result in an unacceptable risk of exposure to asbestos associated with quarrying activities".

This statement is not factual. The activity-based sampling during each of the three events represent fugitive emissions from limited volumes of material transported a limited distance and disturbed by a single loader. The results cannot be projected into the future where the activity or volume is increased, different numbers or mixes of equipment operate, or on days where climatic conditions differ. The results provide little, if any, opportunity to predict future exposures. In addition, ABS sampling of other individual tasks (hauling, excavation, drilling, blasting) cannot predict the potential exposure when activity is increased and multiple tasks are conducted simultaneously. The results of each sampling events can be interpreted only as a reflection of the activities that occurred on the specific days that were sampled.

Please contact me if you have any questions.



Bradley G. Erskine, Ph.D., PG, CEG, CHG, CAC
Erskine Environmental Consulting