February 20, 2015

Clemson University
310 Klugh Avenue
Clemson, South Carolina 29634

Attn: Mr. W. Robert Newberry, IV
E: wnewber@clemson.edu

Re: Limited Qualitative Perchlorate Testing Report
Clemson University
Poole Agriculture Building
Clemson, South Carolina
Terracon Project No. 86127158

Dear Mr. Newberry:

Terracon Consultants, Inc. (Terracon) conducted limited qualitative perchlorate testing in select fume hoods scheduled for renovations in the Poole Agriculture Building located on Clemson University's main campus in Clemson, South Carolina. The testing was performed in general accordance with our IDC with Clemson University.

PROJECT DESCRIPTION

At the request of Clemson University Terracon conducted limited qualitative perchlorate testing in select fume hoods scheduled for renovations in the Poole Agriculture Building. Terracon representatives Jeffrey Gurrie and Stephen Ellis performed this investigation on June 11 and June 18, 2014. It is Terracon's understanding the fume hoods under study may have used dilute perchloric acid in low quantities, but cannot be confirmed. The fume hoods in the following rooms were evaluated; B113, B107, C122, C233, D131A, D131B, D134, D239-1, D239-2, and E251. These fume hoods are scheduled for replacement.

This investigation was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. Terracon did not attempt to identify every potential exposure or hazard present. The results, findings, conclusions, and recommendations expressed in this report are based on conditions observed during our investigation. The information contained in this report should not be relied upon to represent conditions that existed prior to or after this investigation. Terracon does not warrant the services of regulatory agencies, laboratories, or other third parties supplying information that may have been used in the preparation of this report. No warranty, express or implied is made.

INVESTIGATION CRITERIA AND METHODS

Field Assessment

Terracon was accompanied by Clemson University maintenance personnel to assist with locking out the electrical system and providing access to the fan assembly on the roof and the interior duct assembly at the attachment point of the fume hood. Terracon visually observed readily accessible duct areas at the duct/hood connection point and at the fan assembly on the roof for visual deposits of chemical salts. The duct between these two points was not accessible for observation.

Qualitative Perchlorate Testing

Perchloric acid is a colorless, fuming, unstable liquid that create a severe explosion hazard. Perchlorate(s) include salts of perchloric acid and are unstable materials, flammable by chemical reaction, powerful oxidizers and can constitute an explosion hazard when shocked, exposed to heat or chemical reaction. Perchlorates may be qualitatively detected using methylene blue to promote the formation of a violet precipitate with the perchlorate ion.

Terracon obtained samples at accessible points (duct/hood connection point and roof fan assembly) by rinsing the area with distilled water and capturing the rinsate. Additionally Terracon obtained wipe samples inside the fume hood at the duct/hood connection and at the fan assembly. Terracon attempted to collect a rinseate sample of the ductwork by spraying distilled water at the fan assembly and capturing the rinsate in the fume hood; however, the duct system contained several areas in which the rinsate leaked at flanges, welded seams, and other connections. Therefore a complete rinse of the duct could not be safely performed.

The rinseate samples and wipe samples were collected to conduct a field analysis for the presence of perchlorates or perchloric acid. Terracon tested the rinseate samples and wipe samples in the field for perchlorates using a 0.3% solution of methylene blue. The solution was then observed for the formation of a violet precipitate indicating the presence of perchlorates.

FINDINGS

Based on the results of the rinseate and wipe sampling of fume hoods located in rooms B113, B107, C122, C233, D131A, D131B, D134, D239-1, D239-2, and E251, no observation of violet precipitates were identified in samples indicating the presence of perchlorates. Terracon has attached a general selection of photographs from the qualitative testing. Terracon cannot make any determination of sections that were not accessible at the time of testing.

Terracon appreciates the opportunity to provide this service to Clemson University. If you have any questions regarding this limited asbestos sampling report, please contact the undersigned at 864-292-2901.

Sincerely,
Terracon Consultants, Inc.

Stephen N. Ellis
Project Professional

Jeffrey A. Gurrie
Senior Project Industrial Hygienist

Attachments: Photographs

Photographs



Photo #1 General rinseate/wipe sample



Photo #2 General rinseate/wipe sample



Photo #3 General rinseate/wipe sample



Photo #4 General rinseate/wipe sample



Photo #5 General rinseate/wipe sample

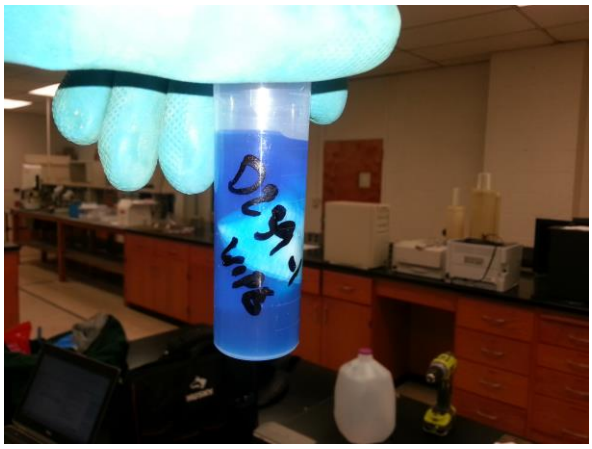


Photo #6 General rinseate/wipe sample

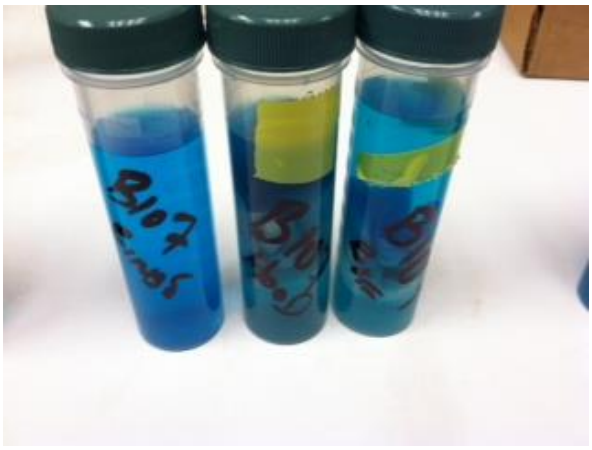


Photo #7 General rinseate/wipe sample

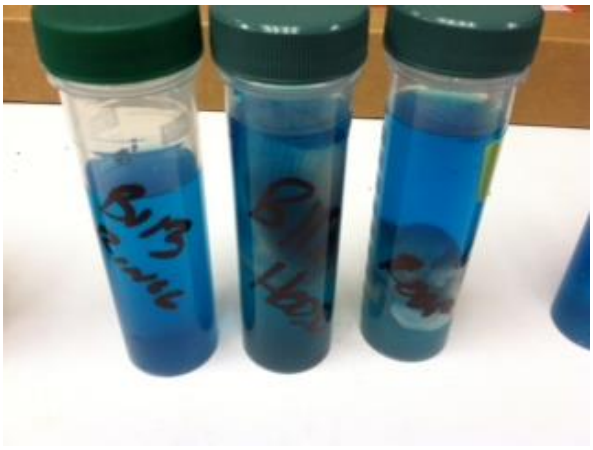


Photo #8 General rinseate/wipe sample

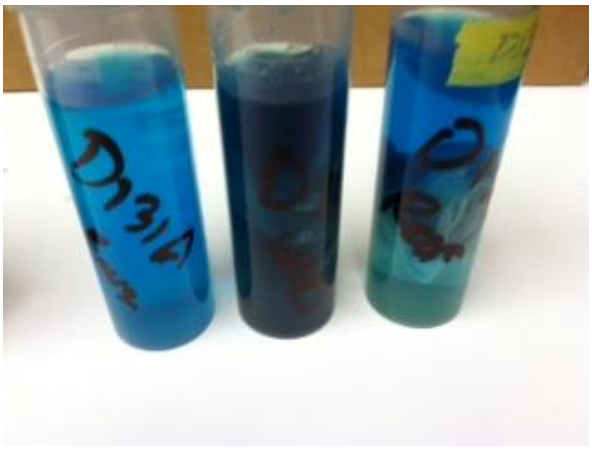


Photo #9 General rinseate/wipe sample



Photo #10 General rinseate/wipe sample



Photo #11 General rinseate/wipe sample