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April 27, 2023

Mr. Brian Croyle, Environmental Specialist
Montgomery County Public Schools
Division of Sustainability and Compliance
8301 Turkey Thicket Drive
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Ref: **Monitoring for Total Volatile Organic Compounds – 4/26/2023**
Poolesville High School
KCI Job No. 122302497

KCI Technologies Inc. (KCI) is submitting the following letter report detailing the findings of Total Volatile Organic Compounds (TVOCs) screening at Poolesville High School located at 17501 W. Willard Rd. Poolesville, MD 20837 (subject site). Testing was performed by KCI's Industrial Hygienist, Ms. Brittany Maas, under the oversight of KCI's Certified Industrial Hygienist (CIH), Mr. Jonathan Coale.

Background:

At Poolesville High School, the current renovations and construction has raised concerns from student's parents regarding air quality within the facility. Students and faculty have voiced concerns related to an odor present in the school while construction activities are occurring on the roof of the existing structure. The parents are concerned the students are being exposed to potentially hazardous conditions related to the asphalt fumes being produced during the roofing installation. MCPS retained KCI to assist in collecting data on the school's occupants' potential exposure to emissions from roofing work being conducted.

In addition to the current scope that includes testing for asphalt fumes and hydrogen sulfide, MCPS requested KCI utilize a Photoionization Detector (PID) with a 10.6 eV lamp to perform real-time TVOC screening in various locations throughout the interior and exterior of the school up to 3 days a week, for 7 weeks (April 26th through June 16th). Utilizing a PID will allow KCI to detect real-time TVOC concentrations (measured in part per million - ppm) in areas of concern and report back to MCPS quickly. The PID will capture TVOCs concentrations but won't provide selective information on individual VOCs.

The purpose of this screening is to determine if concentrations of TVOCs are present, and to what degree, in real-time. The data obtained from the screening may suggest if specific VOCs should be screened for at the facility.

It is important to note that VOCs can be produced from many sources including but not limited too; paints/solvents, building materials, cleaning agents and other chemicals, perfumes, cosmetics, carpet, smoking, etc. This may produce background VOC levels unrelated to the roofing.

There are currently no standards set for TVOCs but they are a reliable indicator of potential Indoor Air Quality (IAQ) concerns. Occupational exposure standards vary depending on specific VOCs and their

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impact on human health. The EPA has found that the levels of VOCs average 2 to 5 times higher indoors than outdoors and up to 1,000 times higher several hours after activities such as painting or cleaning. For the purpose of this project, the initial site visit performed on 4/26/2023 may provide insight on areas that have higher TVOC concentrations than others. This should indicate where KCI should focus additional sampling efforts.

Description of the Work Performed:

On April 26, 2023, KCI utilized a RAE Systems MiniRAE 3000 Photoionization Detector (PID) with a 10.6 eV lamp to perform real-time TVOC monitoring in various locations throughout the interior and exterior of the school. KCI's IH collected data in areas where complaints were received from students and in areas where the IH smelled asphalt fumes.

To record data, each hour KCI walked to different locations throughout the school and the school's perimeter. Specific areas that were screened included: near all established air sampling locations associated with the ongoing air quality monitoring, throughout the 1st and 2nd floor of the science building, throughout the main building, downwind of the roofing work, the student parking lot near the gate entrance to the construction site, inside the construction site next to the asphalt roofing material tank, and the west end of the portable units. KCI stood in each location for approximately five (5) minutes to allow for the PID to stabilize and obtain accurate readings of each area.

In addition, KCI collected VOC readings during roofing activities. During the screening, roofers observed activities included: filling mini barrels with tar, transferring tar to wagons, applying tar to the roof with mops, and placing underlayment fabric to the tar. KCI took readings from each of these activities as well as perimeter readings at each edge of the roof during these activities.

KCI conducted the screening from approximately 08:00 until 14:30. Conditions during the sampling period were clear skies and 50°F - 68°F. Winds were between 0 and 9 mph with gusts from the SSW, SSE to SE directions.

Results:

Table 1 summarizes the locations readings were taken from and concentrations detected.

| Table 1 – TVOC Monitoring Summary | | |
|--|---------------------|----------------------------|
| Location | Sample Time | Concentration (ppm) |
| Media Center Hallway – Outside Room 37 | 8:30 – 9:00 am | 0.0 – 0.3 |
| | 9:30 – 10:00 am | 0.0 |
| | 10:30 – 11:00 am | 0.0 |
| | 11:30 am – 12:00 pm | 0.0 |
| | 12:30 – 1:00 pm | 0.0 |
| | 2:00 – 2:30 pm | 0.0 |
| Arts Hallway – Outside Room 44 | 8:30 – 9:00 am | 0.0 – 0.1 |
| | 9:30 – 10:00 am | 0.0 |
| | 10:30 – 11:00 am | 0.0 |
| | 11:30 am – 12:00 pm | 0.0 |
| | 12:30 – 1:00 pm | 0.0 |
| | 2:00 – 2:30 pm | 0.0 |

| Table 1 – TVOC Monitoring Summary | | |
|---|---------------------|----------------------------|
| Location | Sample Time | Concentration (ppm) |
| Auditorium Lobby | 8:30 – 9:00 am | 0.0 |
| | 9:30 – 10:00 am | 0.0 |
| | 10:30 – 11:00 am | 0.0 |
| | 11:30 am – 12:00 pm | 0.0 |
| | 12:30 – 1:00 pm | 0.0 |
| | 2:00 – 2:30 pm | 0.0 |
| Science Building – Throughout 1 st and 2 nd Floor | 8:30 – 9:00 am | 0.1 – 0.3 |
| | 9:30 – 10:00 am | 0.1 – 0.2 |
| | 10:30 – 11:00 am | 0.0 |
| | 11:30 am – 12:00 pm | 0.0 – 0.1 |
| | 12:30 – 1:00 pm | 0.0 – 0.1 |
| | 2:00 – 2:30 pm | 0.4 – 0.7 |
| Downwind of Roofing Work (Exterior) | 8:30 – 9:00 am | 0.0 – 0.1 |
| | 9:30 – 10:00 am | 0.0 |
| | 10:30 – 11:00 am | 0.0 |
| | 11:30 am – 12:00 pm | 0.0 |
| | 12:30 – 1:00 pm | 0.0 |
| | 2:00 – 2:30 pm | 0.0 |
| Construction Entrance in Student Parking Lot (Exterior) | 8:30 – 9:00 am | 0.0 – 0.1 |
| | 9:30 – 10:00 am | 0.0 |
| | 10:30 – 11:00 am | 0.0 |
| | 11:30 am – 12:00 pm | 0.0 |
| | 12:30 – 1:00 pm | 0.0 |
| | 2:00 – 2:30 pm | 0.0 |
| In Construction Area next to Asphalt Roof Material Tank (Exterior) | 8:30 – 9:00 am | 0.0 – 0.1 |
| | 9:30 – 10:00 am | 0.0 |
| | 10:30 – 11:00 am | 0.0 |
| | 11:30 am – 12:00 pm | 0.0 |
| | 12:30 – 1:00 pm | 0.0 |
| | 2:00 – 2:30 pm | 0.0 |
| West End of Portables (Exterior) | 8:30 – 9:00 am | 0.0 |
| | 9:30 – 10:00 am | 0.0 |
| | 10:30 – 11:00 am | 0.0 |
| | 11:30 am – 12:00 pm | 0.0 |
| | 12:30 – 1:00 pm | 0.0 |
| | 2:00 – 2:30 pm | 0.0 |
| Roof – Pouring Tar Into Mini Barrel | 1:30 pm | 1.0-3.1 |
| Roof – Pouring Tar From Mini Barrel to Wagon | 1:35 pm | 0.0-2.2 |
| Roof – Stirring Tar in Wagon With Mop | 1:36 pm | 0.9-1.3 |
| Roof – Applying Tar To Roof | 1:38 pm | 0.2-0.6 |
| Roof – East Edge | 1:40 pm | 0.6-0.9 |
| Roof – North Edge | 1:41 pm | 0.3-0.6 |
| Roof – West Edge | 1:42 pm | 0.1-0.4 |
| Roof – South Edge | 1:43 pm | 0.0-0.3 |
| Notes: ppm – Parts Per Million | | |

Conclusion:

The initial screening showed nondetectable to low TVOC concentrations throughout the exterior of the building at ground levels which includes the construction area and roofing tar tanker truck. The highest level of TVOCs detected in the interior of the school was in the Science Building on the 1st floor Lobby. KCI collected an asphalt fume air sampling in that area and will report the findings in the 4/26/2023 sampling report when analytical results are available.

During roofing activities there were detectable levels of TVOCs most notably during the pouring of tar from the mini barrels into the wagons. At the edge of the roofing area the levels were below 1ppm. KCI also took readings during no roofing activity when roofers were on break, readings were 0.0 – 0.1ppm.

In conclusion, the roofing activities do generate VOC emissions which is expected. Depending on the wind direction, VOCs may be incidentally introduced into the indoor air, but at levels less than what was detected during the monitoring, which is considered the source. TVOC concentrations identified in the interior were nondetectable or considerably low. Focusing on the science building entrance lobby, the asphalt fume analytical result should provide more insight for the relatively higher VOC concentration (compared to the rest of the data) and if it may have been caused by the roofing activities or another potential source.

KCI will continue to actively monitor for VOCs every Monday, Wednesday, and Friday that school is in session and will report findings daily to MCPS.

If you have questions or comments regarding this report, please contact me.

Sincerely,
KCI Technologies, Inc



Jonathan S. Coale, CIH, CIEC
Certified Industrial Hygienist
KCI Technologies, Inc.