

May 7, 2015  
EE&G Project No.: 2012-2335

Mr. Steven Kulick C.P.M.  
6130 Sunset Drive  
South Miami, Florida 33143

**Subject:        Formaldehyde Testing Results  
                  City of South Miami Municipal Complex  
                  6130 Sunset Drive  
                  South Miami, Florida 33143**

Dear Mr. Kulick:

Pursuant to your request, EE&G Environmental Services, LLC (EE&G) has prepared this letter to provide formaldehyde sampling results and interpretation for a limited assessment that was performed at the above referenced address as part of an overall indoor air quality assessment requested by the City of South Miami.

#### **LIMITATIONS**

EE&G has prepared this letter report in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions. No other warranty, expressed or implied, is made. EE&G's interpretations and recommendations are based upon the findings of investigative work. Other conditions elsewhere in the subject building(s) may differ from those in the inspected/surveyed locations and such conditions are unknown, may change over time and have not been considered. EE&G will not be responsible for the interpretation or use by others of data developed pursuant to the compilation of this report.

Changes or modifications to the site made after the site inspection are not covered. The parameters tested are limited by the sampling methodologies employed for this investigation. These limitations include, but are not restricted to, the sample locations chosen, number of samples collected, and the statistical validity of sampling and analytical methods.

EE&G will not be responsible for the interpretation or use by others of data developed pursuant to the compilation of this report. This report reflects conditions, operations, and practices as observed on the date and time of the site inspection only. The interpretations and recommendations, stated in this report, are based on previous environmental studies and research conclusions. EE&G does not warrant the use of segregated portions of this report. A qualified occupational physician should interpret the information in this report before clinical conclusions are drawn.

## **METHODS**

The formaldehyde assessment was performed at the subject site on March 13, 2015. Samples were collected using passive diffusion technology with the FM-801 formaldehyde meter, manufactured by Greywolf Sensing Solutions. Colorimetric sensor cartridges were set in the area of concern for one (1) hour. The cartridges were then inserted into the meter for a reading. The sensor element uses a chemical reaction between formaldehyde and  $\beta$ -diketone. The concentration of the derivatives yellows the sensor in proportion to the formaldehyde concentration and the duration of exposure. The difference of absorbance between samples was then measured by radiating a constant wavelength light (absorptiometric method) and then an algorithm converts to parts per billion (ppb) or micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) HCHO. Results were provided as ppb of formaldehyde (note 1 part per million or ppm equals 1000 ppb).

According to OSHA 1910.1048(c)(1), the 8-hour time-weighted average (TWA) for formaldehyde is 0.75 ppm or 750 ppb. According to OSHA 1910.1048(c)(2), the 15-minute short term exposure limit (STEL) for formaldehyde is 2 ppm or 200 ppb.

Additional guidelines or reference points are available below:

- Reported outside ambient – 11-20 ppb.
- Reported level to notice eye or skin irritation – 100 ppb.
- NIOSH Recommended Exposure Limit (REL) – 16 ppb.
- World Health Organization – 80 ppb.
- Reported average new house – 300 ppb.
- US Consumer Product Safety Commission – less than 30 ppb.
- Housing Urban Development (HUD) – 400 ppb.
- The Federal Emergency Management Agency (FEMA) – 16 ppb.
- California Environmental Protection Agency Air Resources Board (CARB) – 50 ppb.

## **FINDINGS**

### **Background**

Formaldehyde is a naturally-occurring organic compound also known as a volatile organic compound (VOC). VOC's are chemicals that become a gas at room temperature. As a result, products made with formaldehyde will release the gas into the air. Formaldehyde is colorless and at higher concentrations (typically above 100 ppb), has a characteristic strong, pungent, irritating odor. Formaldehyde can be found from; combustion emissions from natural gas appliances, new carpet, new furniture or cabinets, as a resin or glue, fiber board, plywood, and kerosene space heaters. Exposure to elevated concentrations of formaldehyde can lead to health issues including; respiratory irritation (asthma attacks and breathing difficulty), nausea, eye irritation and headaches. Additionally, formaldehyde is listed as a known carcinogen and as such, low concentrations can be a concern.

### **Formaldehyde Sample Results**

Samples collected April 22, 2015.

<b>Location</b>	<b>Results</b>
City Hall Cashier 1 <sup>st</sup> Floor	151 ppb
City Hall Human Resources 1 <sup>st</sup> Floor	15 ppb
Police Department Copy Area 2 <sup>nd</sup> Floor	90 ppb
Police Department Copy Area 1 <sup>st</sup> Floor	31 ppb
Service Front Desk	181 ppb

### **CONCLUSIONS and RECOMMENDATIONS**

The data collected showed an average concentration of formaldehyde below the OSHA regulated workplace PEL of 750 ppb. Based on this it is the conclusion of EE&G that employees in the subject area were not exposed to formaldehyde at or above OSHA regulated concentrations. However, the readings were above several of the non-regulated criteria and most notably the concentration of 100 ppb which has been listed as the point where some people may experience irritations. Based on this, it is the opinion of EE&G that although not in violation of the OSHA PEL, the employees may have been exposed to formaldehyde at a concentration greater than the general public or workers in a similar classification

Formaldehyde in an office environment is typically the result of new carpet, new furniture or cabinets, as a resin or glue, fiber board and plywood. The history of renovations at the site were not known but based on the results there is likely a source of formaldehyde in the subject area. In addition to formaldehyde off gassing from building materials, it is possible that activities related to occupants can result in airborne emissions. Specifically, the burning of candles has been reported to result in the generation of a variety of potential irritants including formaldehyde (*Candles and Incense as Potential Sources of Indoor Air Pollution: Market Analysis and Literature Review*, prepared for the USEPA, January 2001). Beyond the burning of candles it is possible that the use of some insect repellents may contribute to airborne formaldehyde concentrations.

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Based on the findings and conclusions, EE&G recommends:

- The client should remove candles and other deodorant materials from the work area.
- An inventory of insect repellents should be made and reviewed for possible content of formaldehyde.
- Following removal of potential sources as described above, the air test should be repeated.

EE&G appreciates the opportunity to perform this limited assessment. If you have questions or require clarifications on this report, please do not hesitate to contact us at (305) 374-8300.

Sincerely,



Laura Jones, CIEC  
Senior Project Manager  
EE&G



Jay W. Sall, CIH  
Project Director  
EE&G