Ångstrom Analytical, Inc.

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Minnesota State Capitol Building

Additional Indoor Air Quality Testing – Phase 1

St. Paul, MN.

Contract # 59638. RECS # 02CB0015

2/17/15

Report Prepared For:

State of Minnesota
Department of Administration
C/O Steve Terman - CPMI
Real Estate & Construction Services
309 Administration Building
50 Sherburne Avenue
St. Paul, MN 55155

Presented By:

Ångstrom Analytical

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State of MN, Dept. of Admin, RECS
C/O Mr. Steve Terman, CPMI
3265 Northwood Circle, Suite 170
Eagan, MN 55121

February 17th, 2015

Re:- Additional Indoor Air Quality Testing – Phase1
Minnesota State Capitol Building

Dear Steve:

OBJECTIVE

The Department of Administration, Real Estate and Construction Services retained Angstrom Analytical, Inc. to conduct indoor air sampling and subsequent analysis, within the Minnesota State Capitol. Specifically Angstrom Analytical, Inc. tested for:

- Asbestos fibers via NIOSH 7400 and EPA 600/M4-82-020 or EPA 600/R-93/116
- Lead Dust via NIOSH 7082 and / or X-Ray Flourescence
- Respirable Nuisance Dust via NIOSH 0600
- Respirable Silica via NIOSH 7500 and X-Ray Diffraction
- Total Hydrocarbons (products of combustion) via Modified NIOSH 1550
- Volatile Organic Compounds via USEPA TO-15 using gas chromatography and mass spectroscopy.

All of the above contaminants could reasonably be expected to be produced as a result of the ongoing hazardous material abatement, demolition and construction related activities.

On January 6th, 2015, testing was performed in the following 5 locations:

In the Rathskeller café and third floor S.W. corridor testing was completed for Asbestos, Lead, Respirable Nuisance Dust, Respirable Silica, Total Hydrocarbons and Volatile Organic Compounds. Public areas of the ground, first and second floors were tested for Asbestos, Lead and Respirable Nuisance Dust. For precise sampling locations and the type of test performed, please refer to the floor plans referenced in Appendix 1.

RESULTS

All of the air samples collected throughout the Capitol Building during this "Background Scenario" (Phase 1) are below current OSHA and / or MN Dept. of Health PELs or Threshold Limit Values. However, samples taken in the basement Rathskeller café have elevated levels when compared to background of nuisance dust and vehicle exhaust (benzene compounds). Further, the First Floor Corridor was also elevated, again when compared to background, for respirable nuisance dust.

Asbestos: The Minnesota Department of Health's Indoor Clean Air Standard is set at 0.01 fibers per cubic centimeter of air (f/cc). All sampling locations within the Capitol Building rendered readings below 0.002 f/cc. Reference Appendix 2.

Lead Dust: OSHA's Permissible Exposure Level (PEL) for airborne lead dust is 50 micrograms per cubic meter of air ($\mu g/m^3$). All sampling locations within the Capitol Building rendered readings below 3.0 $\mu g/m^3$. Reference Appendix 2.

Respirable Nuisance Dust: OSHA's Permissible Exposure Level (PEL) for respirable nuisance dust (exclusive of silica) is 30 milligrams per cubic meter of air (mg/m^3). All sampling locations within the Capitol Building rendered readings below 0.2 mg/m^3. Although this is much less than the OSHA PEL, it is notable that the First Floor West Wing Corridor and Rathskeller sampling locations are well above background. Reference Appendix 3.

Respirable Crystalline Silica: OSHA's Permissible Exposure Level (PEL) for respirable nuisance dust is 15 milligrams per cubic meter of air (mg/m^3). Both sampling locations in the Rathskeller and in the S.W. corridor of the third floor, of the Capitol Building rendered readings below 0.25 mg/m^3. Reference Appendix 3.

Total Hydrocarbon Analyses: NIOSH's Reporting Limit for respirable nuisance dust (exclusive of silica) is 10 milligrams per cubic meter of air (mg/m^3). Both sampling locations in the Rathskeller and in the S.W. corridor of the third floor, of the Capitol Building rendered readings below 0.75 mg/m^3. Reference Appendix 4.

Volatile Organic Compound Scan: Of the 74 VOCs scanned, only the benzene value of the sample collected in the basement Rathskeller is of concern. Although not exceeding the OSHA PEL, the value was in excess of background levels. Benzene is the most common indicator of vehicle exhaust, especially internal combustion engines that are running "Rich", meaning that there is insufficient air vs. fuel to provide a lambda value indicative of correct stoichiometry. Reference Appendix 4.

CONCLUSIONS & RECOMMENDATIONS

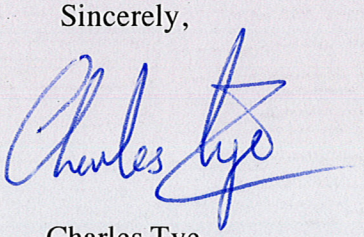
A slightly elevated level of nuisance dust, (absent of silica derivatives) and vehicle exhaust, both of which are to be expected given the considerable amount of construction taking place were determined. However, they can be controlled:

The vehicle exhaust may emanate from two sources, firstly the skid steer (Bobcat(s)) used in the S.E. corner of the basement and also from the fresh air intakes located in the S.W. quadrant of the N.W. parking lot. Further investigation should ensue to determine if any of the (three) fresh air intakes located in this area are still active and, whether one or more of these intakes provide make up air to the HVAC system that supplies the Rathskeller. Mechanical equipment is utilized on a daily basis in this former Parking Lot O. There exists a resident "Lull" front-end loader that appears to be in constant use during the working day, delivering construction materials to the localized job site. This machine should be frequently serviced with regards to it's injection system, air, particulate and exhaust scrubber filters and should be more gently driven without resorting to full throttle operation when using it's hydraulic and / or motive systems to limit excessive emissions. Idling of this machine in this parking lot should also be limited.

The nuisance dust issue can be partially mitigated by using a negative air pressure scenario in the various work areas or indeed positive pressure induced in the public spaces. Either would reduce the total dust burden in the occupied areas of the building.

It is our intent to repeat these tests on a two to four week schedule in order to monitor the contaminants for fluctuation. If you have any questions, please do not hesitate to call.

Sincerely,



Charles Tye
Angstrom Analytical, Inc.

CT/file.