Liberty Mutual.

Industrial Hygiene Air Sample Results

Summary for Week of 1/25/02 to 2/1/02

Attached is a summary of the laboratory results completed during the week of January 25, 2002 to February 1, 2002. The air samples were collected by ATC associates at the World Trade Center site.

The majority of the samples collected by ATC are "personal samples", meaning that the worker wore the sampling device. In addition, the most of results have shown exposure levels to be below shift adjusted occupational exposure limits. The exceptions were;

- A **lead** concentration of **242% of the shift adjusted OEL** on a Torch Cutter in depression on the spot of tower 2,
- An **arsenic** concentration of **214% of the shift adjusted OEL** on a Torch Cutter in depression at tower 2,
- **Diesel exhaust particulate** concentrations at **214% and 104% of the shift adjusted OEL** on a Torch Cutter in depression at tower 2 and Grappler Operator in depression at tower 1, respectively,
- An asbestos concentration at **198 % of the shift adjusted OEL**[1] on a spotter on surface at 4 WTC, and
- A **quartz** concentration of **104% of the shift adjusted OEL** on a Laborer in a pit at Liberty and Washington Streets.

In addition, the following results are at or above 50% of the shift adjusted OEL (but below 100% of the shift adjusted OEL). The operations associated with these results should receive attention to ensure that these results are an accurate reflection of actual exposures and that feasible steps are taken in an attempt to ensure that exposures do not elevate over time;

- **Diesel exhaust particulate** concentrations of **96 %, 68%, 59%, and 54% of the shift adjusted OEL** on a Truck Washer at pier 25, a Truck Washer at West St., a Loader Operator in the depression, and a Spotter on the surface at pier 25, respectively, and
- **Asbestos** concentrations of **70 % and 60% of the shift adjusted OEL** on a Spotter in depression at tower 1 and Grappler Operator in tower 1.

Some of the columns in the attached summary may require explanation:

Analyte Class - This column includes general category of the agents (substances) which were sampled.

# of Samples - This indicates how many individual samples were collected for the agent class listed.

# of Analysis - This is the number of individual analyses performed. If only one analysis is performed on each sample, then the number of analytes will equal the number of samples. However, most samples are analyzed for more than one agent as follows:

[1] The fibers present may or may not be asbestos. This sample is being analyzed further to confirm the presence of asbestos. That result is pending.

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Metals: Aluminum, antimony, arsenic, barium, beryllium, cadmium, calcium, chromium, cobalt, copper, iron, lead, magnesium, manganese, nickel, selenium, silver, thallium, tin, titanium, vanadium, and zinc. Metal samples are sometimes also analyzed for total particulate.

Silica: Respirable dust, quartz, and cristobalite.

Acids: Hydrobromic acid, hydrochloric acid, hydrofluoric acid, nitric acid, phosphoric acid and sulfuric acid

Sulfides: Hydrogen sulfide and sulfur dioxide

OEL - Occupational Exposure Limit is the lower of the OSHA PEL or ACGIH TLV. PELs are established by an OSHA rule-making process and are the legal occupational exposure standards. TLVs are voluntary guidelines for occupational exposure which are established by the American Conference of Governmental Industrial Hygienists, a private professional organization.

Highest % OEL - This is the percentage of the occupational exposure limit (OEL) that the highest result represents. This is the value in the "Highest Result" column divided by OEL and converted to a percentage.

Shift Adjusted OEL - The OEL reduced to compensate for the reduced recovery time and longer exposure time posed by a 7 day per week , 12 hour shift work schedule.

Highest % of Shift Adjusted OEL - This is the percentage of shift adjusted OEL that the highest result represents.

#of NQs - This is the number of analyses that reported that concentration as "not quantifiable" (NQ).

% of NQ - This is the percent of the total analyses which were reported as "not quantifiable".

If you have any questions concerning this information or would like further details about these results, feel free to contact the Liberty Mutual Industrial Hygienist on duty @ 917-566-2576.

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