



Central Valley School District Todd Lane Elementary School Renovation

**Indoor Air Quality (IAQ),
Surface Dust and Water
Quality Assessment**

November 29-30, 2017

Scope

Performance Environmental Services, Inc. (*Performance*) conducted an Indoor Air Quality (IAQ) and Surface Dust Assessment, with Water Quality Testing, during renovation and construction activities in the Todd Lane Elementary School facility.

The testing was conducted on November 29 & 30, 2017, to document airborne and surface dust concentrations, and water quality, related to potential construction contaminants from the on-going renovation activities.

The study included:

- a visual inspection of the facility,
- the collection of representative air, surface dust, and water samples.

The Sampling was conducted 'side-by-side' with Allegheny Mountain Research & observed by Parent Representative, Michele Buford, Education Program Specialist for *Women for a Healthy Environment*



Scope

Air Samples

- Each defined parameter was sampled in each designated location with laboratory analysis.
- respirable dust (particulates) and crystalline silica – 16 areas.
- total dust – 8 areas
- airborne mold (fungal spores) – 5 areas
- airborne fibers – 4 areas
- airborne metals (lead) – 4 areas



Scope

Surface Dust Samples

- Construction-related contaminants
 - surface metals (RCRA 8) – 5 areas
 - surface mold/fungi – 5 areas
 - surface polychlorinated biphenyls (PCBs) – 5 areas
 - full particle ID - of common indoor/outdoor contaminants – worst case location



Scope

Drinking Water Screening

- Lead – 5 potable water outlets, ‘first draw’ sampling

Air Monitoring

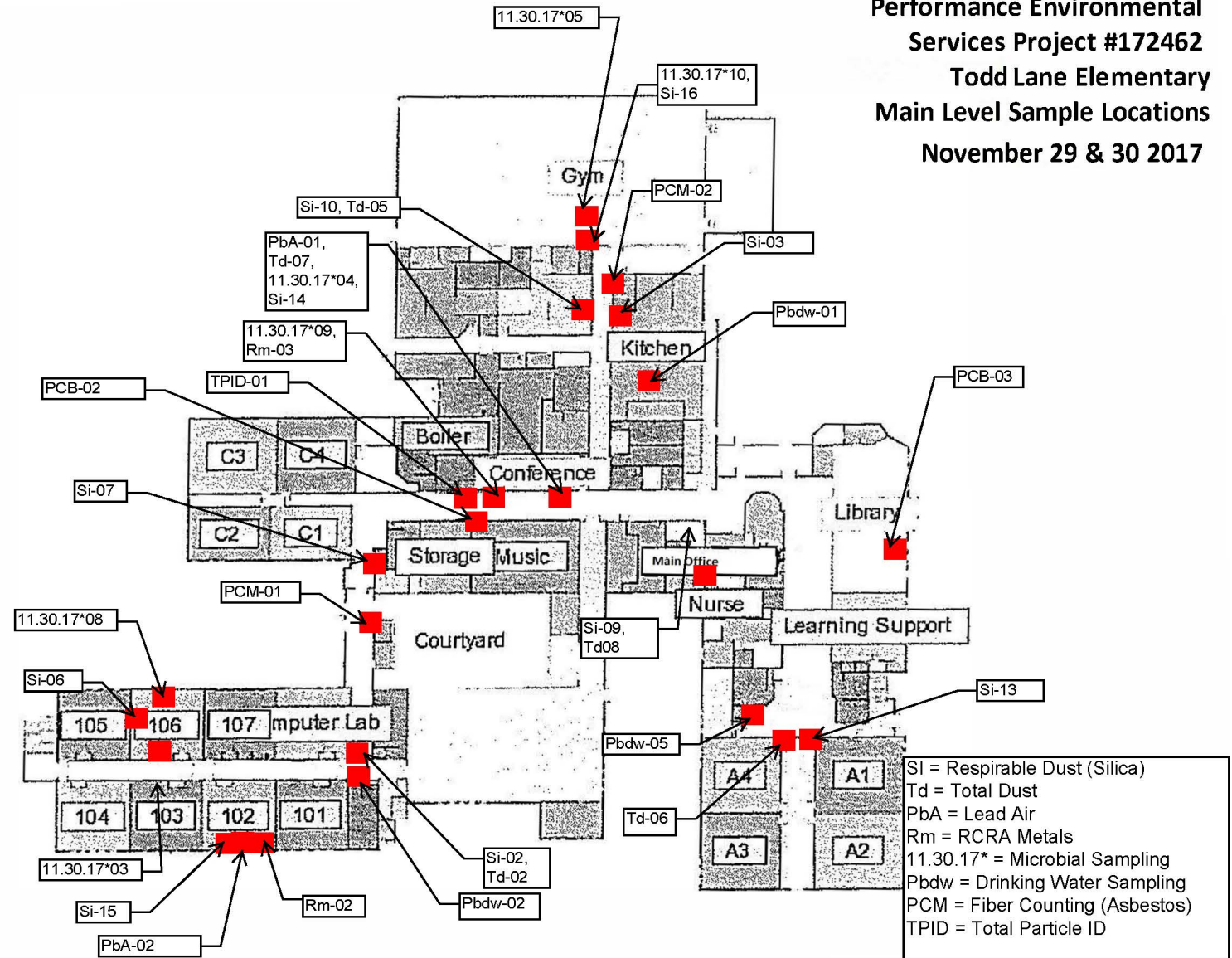
Airborne contaminants monitored in **54 areas** throughout the facility.
These were ‘grab samples’ collected in each designated location each day.

- respirable airborne particulates (dust), <10 microns (PM10), <2.5 (PM2.5)
- total volatile organic compounds (TVOCs)
- ‘comfort parameters’ – carbon dioxide (CO₂), temperature and relative humidity (RH%)
- carbon monoxide (CO)



Sample Locations – Main Level

Performance Environmental
Services Project #172462
Todd Lane Elementary
Main Level Sample Locations
November 29 & 30 2017



Sample Locations – Lower Level

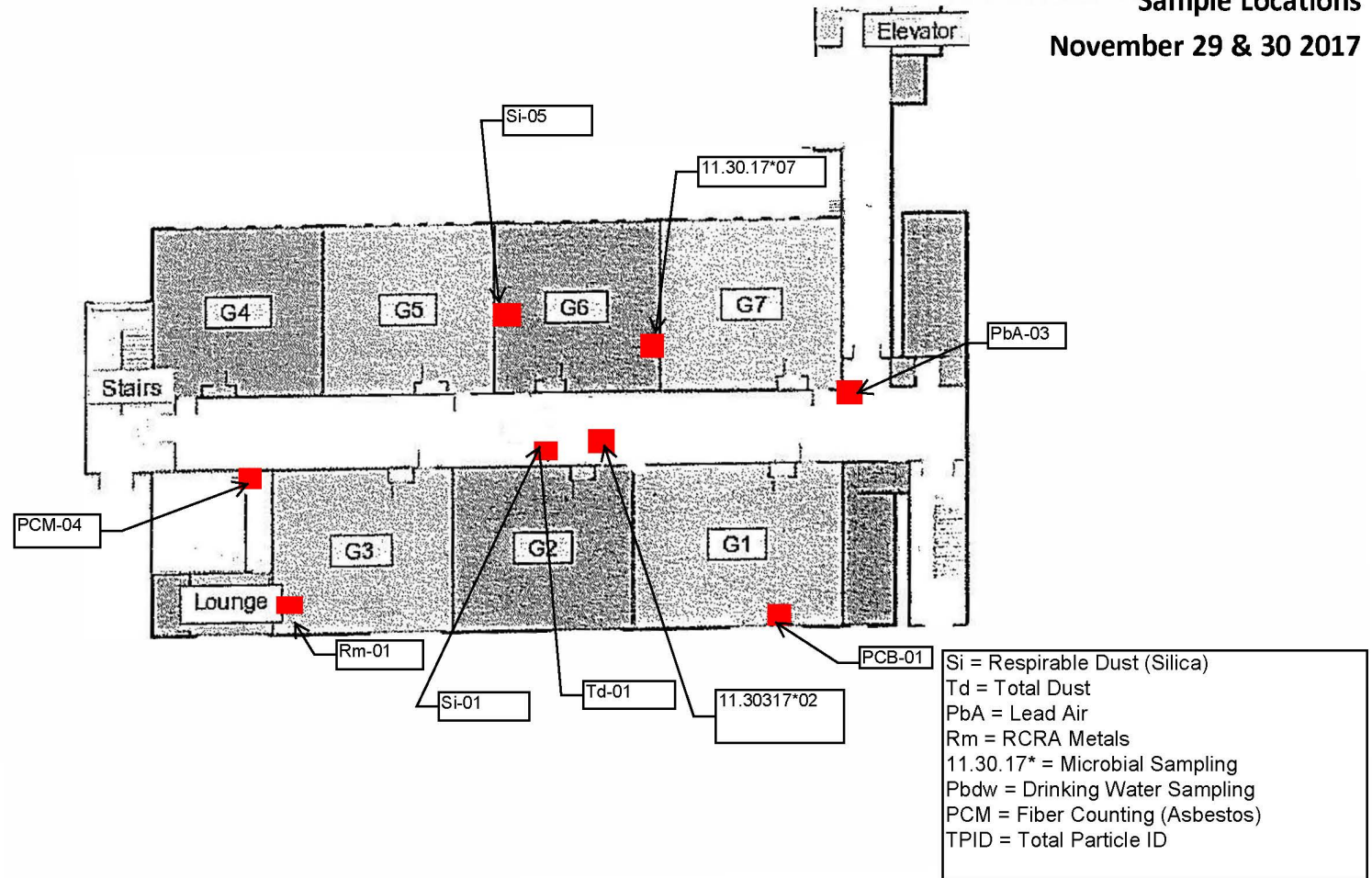
Performance Environmental Services

Project #172462

Todd Lane Elementary
Lower Level (Basement)

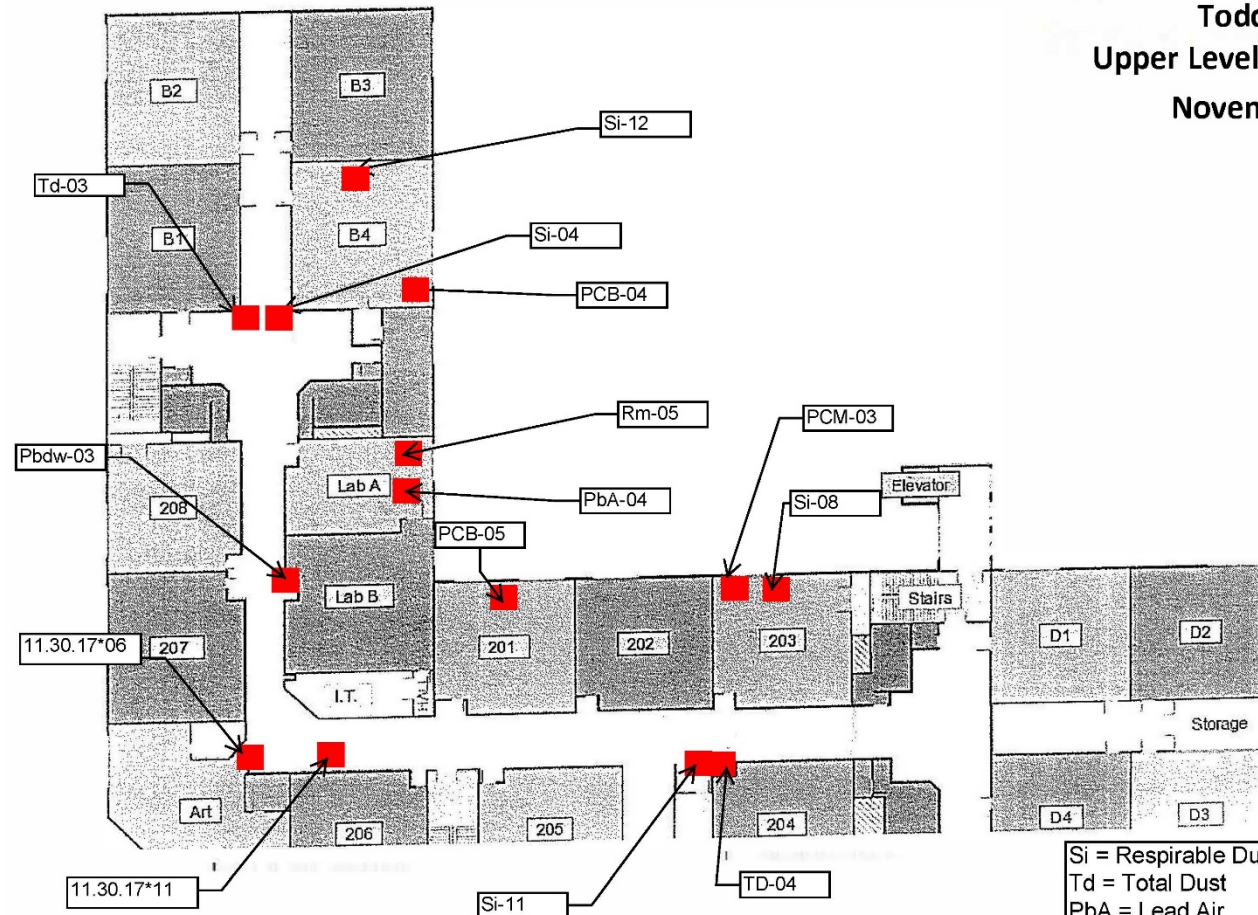
Sample Locations

November 29 & 30 2017



Sample Locations – Upper Level

Performance Environmental
Services Project #172462
Todd Lane Elementary
Upper Level Sample Locations
November 29 & 30 2017



Si = Respirable Dust (Silica)
Td = Total Dust
PbA = Lead Air
Rm = RCRA Metals
11.30.17* = Microbial Sampling
Pbdw = Drinking Water Sampling
PCM = Fiber Counting (Asbestos)
TPID = Total Particle ID

12/7/2017

Findings

Respirable Airborne Dust (Particulates) & Crystalline Silica

Sampled 16 interior locations

- Respirable Dust
 - Results in occupied areas –
 - ranged from $<0.03 \text{ mg/m}^3$ to 0.16 mg/m^3
 - 11 of 15 were 'none-detected' ($<0.04 \text{ mg/m}^3$)
 - Construction area sample - 0.67 mg/m^3
- Crystalline Silica
 - None Detected ($<11 \text{ } \mu\text{g/m}^3$)
- OSHA PEL:
 - Respirable Dust Limit $<5 \text{ mg/m}^3$, (all occupied area samples $<1/10^{\text{th}}$ the exposure level)
 - Crystalline Silica Limit $<50 \text{ } \mu\text{g/m}^3$, Action Level $25 \text{ } \mu\text{g/m}^3$
- EPA NAAQS (Outdoor Air) PM₁₀ = 0.150 mg/m^3 (24 hr avg) – all classrooms, 14 of 15 occupied area samples
- LEED 'Green Building' PM₁₀ - 0.050 mg/m^3 - all classrooms, 11 of 15 occupied areas

Findings

Total Airborne Dust (Particulates)

Sampled same 8 locations tested 3 previous times by Allegheny Mountain

- Results in occupied areas ranged from <0.025 to 0.35 mg/m^3
- Construction area sample = 0.99 mg/m^3
- OSHA PEL = 15 mg/m^3
- ACGIH TLV = 10 mg/m^3
- Recommended non-industrial areas, $1/10 \text{ TLV} = 1.0 \text{ mg/m}^3$

Findings

Airborne Lead

Sampled 5 locations

- Results were all 'none detected' ($<0.06 \mu\text{g}/\text{m}^3$)
- OSHA PEL = $50 \mu\text{g}/\text{m}^3$
- OSHA 'Action Level' = $30 \mu\text{g}/\text{m}^3$

Findings

Airborne Mold (Fungal Spores)

Sampled 5 interior locations and outdoors

- Interior areas ranged from 53 to 266 spores per cubic meter (s/m^3)
- Outdoor level was 2,240 (s/m^3)
- No regulatory mold limits – compare indoors to outdoors
- Indoor levels well below outdoor levels (about 1/10th) and no 'target' molds identified

Findings

Airborne Fibers (All fibers including Asbestos)

Sampled 4 interior locations

- Results in occupied areas ranged from <0.002 to 0.005 fibers/cc
- OSHA PEL = 0.1 f/cc
- US EPA and Allegheny County 'Clearance Level' = 0.010 f/cc
- Highest level indoors was $\frac{1}{2}$ the abatement clearance limit

Findings

Surface Dust

Sampled 5 locations: floors, window sills, bookshelves, ventilators



- **RCRA Metals**

- Lead detected in 4 of 5 samples. Highest was $1.4 \mu\text{g}/\text{ft}^2$ (all below HUD limit of 40 & OLHCHH limit of $10 \mu\text{g}/\text{ft}^2$)
- Barium detected in 1 sample, $7.5 \mu\text{g}/\text{ft}^2$ – no reg level
- Cadmium detected in 1 sample, $47 \mu\text{g}/\text{ft}^2$ – no reg level
- Chromium detected 4 of 5 samples – highest was $1.9 \mu\text{g}/\text{ft}^2$ – no reg level
- No mercury, arsenic, selenium or silver detected

- **Mold / Fungal Spores** – interior surfaces very low levels (no spores detected to 'present on <5% of sample area')

- **Polychlorinated biphenyls (PCBs)** - None Detected

- No regulatory levels for surface dust except for lead ($10 \mu\text{g}/\text{ft}^2$ floors, $100 \mu\text{g}/\text{ft}^2$ sills OLHCHH) and PCBs ($<10 \mu\text{g}/100\text{cm}^2$ EPA spills)



Findings

Surface Dust – Full Particle ID

Sampled main level floor in corridor near boiler room / music room.

Dustiest 'worst case' occupied area identified

- Sample is predominantly composed of building dust (including quartz, calcite, gypsum wallboards and joint compounds).
- Lesser amounts of insulation fibers (fiber glass and mineral wool) were observed along with particles consistent with outdoors environmental contaminants (natural plant matter and starch grains).
- No hazardous components detected.
- Construction Barriers and Housekeeping to keep levels low

Findings

Air Monitoring – Direct Reading Instruments

- Sampled 54 interior locations – sampled each day
- **Airborne Particulates (PM 10)**
 - Results in occupied areas ranged from 0.002 to 0.025 mg/m³
 - US EPA NAAQS = 0.150 mg/m³ (24 hr Avg)
 - LEED 'Green Building' Level is 0.050 mg/m³
- **Total Volatile Organic Compounds (TVOCs)**
 - 0 to 0.2 ppm (occupied Areas), 0.3 ppm (construction zone)
 - 0.2 ppm = ±500 µg/m³ = green building limit (prior to occupancy)
- **Carbon Monoxide (CO)** – None Detected (0 ppm), (<9 ppm EPA NAAQS)
- **'Comfort Parameters' (CO₂ temperature, relative humidity)**
 - – CO₂: 530 – 950 ppm (<1000 recommended), Temp (70s), RH% <35%
- **Airborne Particulates (PM 2.5) - (fine particles)**
 - 0.008 to 0.031 mg/m³ (occupied areas) most rooms 0.012 to 0.017,
 - 0.084+ in room with air freshener!
 - EPA (24 hr) = 0.035 mg/m³

Findings

Lead in Drinking Water Screening

Sampled 5 interior potable water outlets

'First Draw' prior to start of school day

- Lead in water concentrations ranged from 'none detected' ($<1.0 \mu\text{g/L}$) to $4.24 \mu\text{g/L}$.
- EPA 'Action Level' for Schools = $<20 \text{ ppb}$ ($\mu\text{g/L}$)

Conclusions

No problems were identified

All findings were well below regulatory levels,
and were within generally recommended limits.

No restrictions or limitations for occupancy

Recommendations

Housekeeping

- Occupied areas –
 - clean regularly, including shelves, window sills, etc.
 - Keep surface dust levels to a minimum
- Construction Zones –
 - maintain clean, debris free work areas.
 - Regularly clean to keep surface dust levels down

Engineering Controls

- Maintain barriers – doors, walls and poly ‘penetrations’, windows adjacent to construction. Inspect daily
- When needed, provide air flow away from occupied areas &/or filtration to reduce dust levels – especially during dust or odor producing activities

Air Monitoring

- Conduct periodically during remainder of renovations/construction - particulates



Environmental Services, Inc.

Thank you!

- **WWW.PERFORM-ENV.COM**

- *Contact Information:*

- **Curtis V. Wagner**
- Senior Project Manager
- Cell: 412.616.1173
- curtis.wagner@perform-env.com

Joseph Kuchnicki, CIE, CHMM

Project Manager

Cell: 412.874.3439

joseph.kuchnicki@perform-env.com