



Significant Environmental Issues/Common Contaminants of Concern
REGULATORY LEVELS in the P.A.L.M.S.* of YOUR HANDS

PCB's
Asbestos
Lead
Mold
Silica



*P.A.L.M.S. - PCB, Asbestos, Lead/Legionella, Mold/Metals, Silica/Safety & Health

Compilation of Significant Environmental Issues/Common Contaminants of Concern – Regulatory Levels in the PALMS* of your hands

P POLYCHLORINATED BIPHENYLS (PCB)

Air		Water	
0.5 mg/m3	ACGIH Threshold Limit Value (TLV), OSHA PEL for chlorodiphenyl (54% chlorine) (8hrs TWA)	0.5 ppb	EPA Drinking Water Standard, Maximum Contaminant Level (MCL)
1 mg/m3	ACGIH Threshold Limit Value (TLV) / OSHA PEL for chlorodiphenyl (42% chlorine) (8hrs TWA)	0 mg/L	EPA Maximum Contaminant Level Goal (MCLG)
0.001 mg/m3	NIOSH Recommended Exposure Limit (REL) for 10-hour TWA	Waste	
		≥ 50 ppm	EPA PCB-Contaminated, TSCA/RCRA Landfill
		Wipe	
		10 µg/100cm2	EPA PCB Action Level

A ASBESTOS

Air		Asbestos -Containing Material (ACM)	
0.1 f/cc (fibers > 5 µm long);	OSHA Permissible Exposure Limit (PEL) (8hr TWA)	✓ EPA: Bulk more than 1% of regulated asbestiforms is ACM	
1 f/cc (fibers > 5 µm long);	OSHA Excursion Limit (EL) (30 min.)	✓ OSHA: "products containing asbestos" of trace ≤1%...must inform employees about the presence of material containing <1% asbestos..." and institute specific OSHA requirements.	
0.2 f/cc crocidolite; 0.5 f/cc	ACGIH Threshold Limit Value - TLV/TWA	VERMICULITE	✓ If the vermiculite content of the sample is <10%, analysis may be conducted by the New York State PLM Method (198.1) as usual to determine the asbestos content.
0.1 f/cc (fibers > 5 µm long);	NIOSH at CDC Recommended Exposure Limit (REL)	NYS DOH ELAP POLICY	✓ If the vermiculite content of the sample is >0% for SOF-V, material must be analyzed by method NYS ELAP 055.1 or 198.8
0.01 f/cc	EPA/AHERA, NYC DEP clearance standard by PCM		✓ Loose Vermiculite is to be considered asbestos containing materials (ACM) and no analysis is permitted.
Less than 0.01 f/cc	NYS DOL clearance standard by PCM		
Less than 70 s/mm2	EPA/AHERA clearance standard by TEM		
Dust			
"Industrial hygienists and other health professionals recommend professional asbestos abatement procedures when a wipe sample is over the detection limit, or background, of 260 s/cm2 for wipe samples, or over 1000 s/cm2 for a microvacuum sample."			
Microvacuum Sampling and Indirect Analysis of Dust by TEM - ASTM D-5755-03			
Less than 1000 s/cm2	considered low		
Greater than 10,000 s/cm2	considered above background		
Greater than 10,000 s/cm2	considered high		
		Wipe Sampling of Dust by TEM - ASTM D-6480	
		Less than 260 s/cm2	considered low

L LEAD

Air-Lead		Lead Hazard Risk Screening	
0.15 µg/m3	EPA/NAAQS (PM-10) Ambient Air Quality Standard (rolling 3-month average) - revision from 1.5 µg/m3	<20 µg/ft2	HUD/EPA Lead Hazard Screen for Floors (Hard or Carpeted)
30 µg/m3	OSHA Action Level (AL) (8hr TWA)	<125 µg/ft2	HUD/ EPA Lead Hazard Screen for Window Sills (Interior)
50 µg/m3	OSHA Permissible Exposure Limit (PEL) (8hr TWA)	Blood-Lead	
50 µg/m3	ACGIH Threshold Limit Value for a Time Weighted Average (TLV/TWA)	5 µg/dl	CDC reference level (children ages 1-5) at which CDC recommends public health actions be initiated
50 µg/m3	NIOSH at CDC Recommended Exposure Limit (REL)	5 µg/dl	NYC DOH "means you have been exposed to lead"
> 200 µg/m3	OSHA Lead in Construction (29 CFR 1926.62) Employer Requirement to provide daily clean work clothing weekly	10 µg/dl	NYC DOH "blood lead levels of 10 mcg/dl or greater for all NYC residents must be reported within 24 hours"
> PEL (50 µg/m3) ≤ 200 µg/m3		20 µg/dl	HUD/EPA, NYC DOH Definition of Lead-Poisoned Child (single test)
Dust-Lead		15 - 19 µg/dl	HUD/EPA, NYC DOH Definition of Lead-Poisoned Child under age of 6 (2 blood results, 3 months apart)
<40 µg/ft2	HUD/EPA Lead Clearance Level for Horizontal Surfaces (i.e. floors hard or carpeted)	30 µg/dl	ACGIH Biological Exposure Index
<250 µg/ft2	HUD/EPA Lead Clearance Level for Interior Window Sills	25 µg/dl	NYC DOH, CDC Level of Concern for Adults
<400 µg/ft2	HUD/EPA Lead Clearance Level for Interior Window Wells (Troughs)	30 µg/dl	OSHA Recommended Level to Prevent Reproductive Problems
Paint-Lead		40 µg/dl	OSHA Blood Lead Level to Return To Work From Medical (two consecutive tests)
≥1mg/ cm2	EPA Definition of Lead-Based Paint (LBP) by X-RAY Florescence (XRF)	50 µg/dl	OSHA Requires Lead Worker to be Removed from Lead exposure above the AL
≥0.7 mg/cm2	MD Definition of Lead-Based Paint (LBP) by X-Ray Florescence (XRF)	Urine-Lead	
≥0.5 mg/cm2	RI, Philadelphia Definition of Lead-Based Paint (LBP) by X-Ray Florescence (XRF)	80 ppb	NI DOH
≥0.5% or 5,000 ppm	HUD/EPA Definition of Lead-Based Paint (LBP) by Atomic Absorption Spectrometry (AAS)	Water-Lead	
<0.009% or 90 ppm	Consumer Product Safety Commission (CPSC) by Atomic Absorption Spectrometry (AAS). Revision from 0.06% or 600ppm	15 ppb	Allowed Level for Public Water Systems (tap water); EPA
		Soil-Lead	
		400 ppm	HUD/EPA Guidance for High-Contact Play Areas bare soil
		1,200 ppm	HUD/EPA Guidance for Other Residential Bare Soil Areas of the Yard
		Hazardous Waste-Lead	
		5 mg/l or 5 ppm	EPA/RCRA - Toxicity Characteristic Leaching Procedure (TCLP)

M MOLD

✓ Mold is ubiquitous in our environment	✓ Mold is a known allergen
✓ Prevalent on water damaged surfaces	✓ Plays a role in the development of Sick Building Syndrome
✓ Water damage may result in mold contaminated surfaces	

S SILICA











Air			
25 µg/m3	OSHA Action Limit (AL)	150 µg/m3	EPA National Ambient Air Quality Standard
50 µg/m3	OSHA Permissible Exposure Limit (PEL)	0.05 mg/m3	NIOSH Recommended Exposure Limit (REL) for 10-hour TWA
		0.05 mg/m3	ACGIH TLV (8-hr TWA)

L LEGIONELLA

Cooling Towers			
<10 CFU/ml	Level 1 - NYC Health Dept.	20 CFU/mL	NYSDOH Detection Level
≥ 10 CFU/ml to <100 CFU/ml	Level 2 - NYC Health Dept.	≥ 20 CFU/mL but < 100	NYSDOH Response Directive
≥ 100,000 CFU/ml to	Level 3 - NYC Health Dept.	≥100 CFU/mL but < 1000	NYSDOH Response Directive
≥ 1,000,000 CFU/ml	Level 4 - NYC Health Dept.	≥ 1000 CFU/mL	NYSDOH Response Directive

M

METALS (HEAVY/TOXIC)

 <h3>CADMIUM</h3> <p>29 CFR 1926.1127</p> <p>2.5 µg/m³ 5 µg/m³</p> <p>Hazardous Waste – Cadmium 1 mg/L</p> <p>OSHA Action Level (AL) 8-hrs TWA OSHA Permissible Exposure Limit (PEL) 8-hrs TWA</p> <p>EPA/RCRA - Toxicity Characteristic Leaching Procedure (TCLP)</p>	 <h3>INORGANIC ARSENIC</h3> <p>29 CFR 1926.1118</p> <p>5 µg/m³ 10 µg/m³</p> <p>Hazardous Waste-Arsenic 5 mg/L</p> <p>OSHA Action Level (AL) 8-hrs TWA OSHA Permissible Exposure Limit (PEL) 8-hrs TWA</p> <p>EPA/RCRA - Toxicity Characteristic Leaching Procedure (TCLP)</p>
 <h3>BERYLLIUM</h3> <p>Air</p> <p>0.5 µg/m³ 2 µg/m³ 2 µg/m³ 5 µg/m³ 25 µg/m³</p> <p>Water 68 ng/L</p> <p>NIOSH Recommended Exposure Limits (REL) for 10-hour TWA ACGIH Advisory; Threshold Limit Value (TLV), (8hrs TWA) OSHA Permissible Exposure Limit (PEL) (8hr TWA) OSHA Short-Term Exposure Limit OSHA Excursion Limit (EL) (30 min.)</p> <p>EPA Maximum Contaminant Level Goal (MCLG)</p>	 <h3>HEXAVALENT CHROMIUM</h3> <p>29 CFR 1926.1126</p> <p>2.5 µg/m³ 5 µg/m³</p> <p>Hazardous Waste– Chromium 5 ppm or 5 mg/L</p> <p>OSHA Action Level (AL) 8-hrs TWA OSHA Permissible Exposure Limit (PEL) 8-hrs TWA</p> <p>If the employer can demonstrate that any activities, processes, operations, etc. involving chromium does not release dusts, fumes or mists of chromium (VI) in concentrations at or above 0.5 µg/m³ as an 8-hr TWA, the standard does not apply.</p> <p>EPA/RCRA - Toxicity Characteristic Leaching Procedure (TCLP)</p>
 <h3>TITANIUM</h3> <p>Air</p> <p>1.00 mg/m³ 0.001 mg/m³</p> <p>EPA OAOPS Levels of Concern (LOC) NIOSH Extremely Hazardous Substances and Data for Hazards Analysis Level Analysis Level of Concern</p>	 <h3>SILVER</h3> <p>Water 100 µg/L</p> <p>Hazardous Waste – Silver 5 mg/L</p> <p>EPA Secondary Maximum Contaminant Level Goal (SCLG) EPA/RCRA - Toxicity Characteristic Leaching Procedure (TCLP)</p>
 <h3>NICKEL</h3> <p>Air</p> <p>1.5 mg/m³ 0.1 mg/m³ 0.2 mg/m³ 0.1 mg/m³ 0.05 ppm 0.015 mg/m³ 10 mg/m³</p> <p>0.001 ppm 2 ppm</p> <p>1.0 mg/m³ 0.007 mg/m³</p> <p>Water 1.0 mg/L 1.0 mg/L 0.7 mg/L 0.1 mg/L</p> <p>ACGIH Threshold Limit Value (TLV) (8-hour TWA) Elemental Nickel ACGIH Threshold Limit Value (TLV) (8-hour TWA) Soluble Inorganic ACGIH Threshold Limit Value (TLV) (8-hour TWA) Insoluble Inorganic ACGIH Threshold Limit Value (TLV) (8-hour TWA) Nickel Subulfide ACGIH Threshold Limit Value (TLV) (8-hour TWA) Nickel Carbonyl NIOSH Recommended Exposure Limit (REL) (10-hour TWA) Nickel NIOSH Recommended Exposure Limit (REL) (10-hour TWA) Immediately Dangerous to Life or Health (IDLH) NIOSH Recommended Exposure Limit (REL) (10-hour TWA) Nickel Carbonyl NIOSH Recommended Exposure Limit (REL) (10-hour TWA) Immediately Dangerous to Life or Health (IDLH) Nickel Carbonyl OSHA Permissible Exposure Limit (PEL) (8-hour TWA) OSHA Permissible Exposure Limit (PEL) (8-hour TWA) Nickel Carbonyl</p> <p>EPA Maximum Contaminant Level Goal (MCLG) EPA Drinking Water Standard, Maximum Contaminant Level (MCL) EPA Drinking Water Equivalent Level (DWEL) EPA Lifetime Minimum Level</p>	 <h3>ZINC</h3> <p>Air</p> <p>1.0 mg/m³ 5.0 mg/m³ 2.0 mg/m³ 10.0 mg/m³ 15.0 mg/m³ 50.0 mg/m³</p> <p>50.0 mg/m³</p> <p>1.0 mg/m³ 5.0 mg/m³</p> <p>15 mg/m³</p> <p>Water 0.1 mg/L 5.0 mg/L</p> <p>10 mg/L</p> <p>NIOSH Recommended Exposure Limit (REL) (10-hour TWA) Zinc Chloride NIOSH Recommended Exposure Limit (REL) (10-hour TWA) Zinc Oxide NIOSH Short Term Exposure Limit (STEL) (10-hour TWA) Zinc Chloride NIOSH Short Term Exposure Limit (STEL) (10-hour TWA) Zinc Oxide NIOSH Ceiling Zinc Oxide NIOSH Recommended Exposure Limit (REL) (10-hour TWA) Immediately Dangerous to Life or Health (IDLH) Zinc Chloride NIOSH Recommended Exposure Limit (REL) (10-hour TWA) Immediately Dangerous to Life or Health (IDLH) Zinc Oxide OSHA Permissible Exposure Limit (PEL) (8-hour TWA) Zinc Chloride (Fume) OSHA Permissible Exposure Limit (PEL) (8-hour TWA) Zinc Oxide (Fume and Respirable Fraction of Dust) OSHA Permissible Exposure Limit (PEL) (8-hour TWA) Zinc Oxide (Total)</p> <p>EPA Lifetime Minimum Level EPA Drinking Water Standard, Secondary Maximum Contaminant Level (MCL) Level (MCL) EPA Drinking Water Equivalent Level (DWEL)</p>
 <h3>MERCURY</h3> <p>Air</p> <p>0.1 mg/m³</p> <p>0.025 mg/m³</p> <p>0.05 mg/m³</p> <p>10 mg/m³</p> <p>2 mg/m³</p> <p>0.01 mg/m³</p> <p>Hazardous Waste – Mercury 0.2 mg/L</p> <p>OSHA Permissible Exposure Limit (PEL) 8-hour TWA, NIOSH Recommended Exposure Limit (REL) and ACGIH Threshold Limit Value (TLV) 10-hour TWA/40-hour workweek (except for organo-alkyl Mercury) ACGIH Threshold Limit Value (TLV) 10-hour TWA/40-hour workweek for inorganic Mercury NIOSH Recommended Exposure Limit (REL) 10-hour TWA/40-hour workweek (except for organo-alkyl Mercury) NIOSH Immediately Dangerous to Life or Health Concentration (IDLH) (except for organo-alkyl Mercury) NIOSH Immediately Dangerous to Life or Health Concentration (IDLH) for organo-alkyl Mercury OSHA PEL 8-hour TWA, NIOSH REL and ACGIH TLV 10-hour TWA/40-hour workweek for organo-alkyl Mercury</p> <p>EPA/RCRA - Toxicity Characteristic Leaching Procedure (TCLP)</p>	 <h3>SELENIUM</h3> <p>Air</p> <p>0.2 mg/m³ 0.16 mg/m³ 3.0 mg/m³ 0.2 mg/m³ 1.0 mg/m³</p> <p>0.2 mg/m³ 0.16 mg/m³</p> <p>Water 0.05 mg/L 0.05 mg/L 0.2 mg/L</p> <p>Hazardous Waste – Selenium 1.0 mg/L</p> <p>ACGIH Threshold Limit Value (TLV) (8-hour TWA) Selenium and Compounds ACGIH Threshold Limit Value (TLV) (8-hour TWA) Selenium Hexafluoride EPA Reference Air Concentration NIOSH Recommended Exposure Limit (REL) (10-hour TWA) NIOSH Recommended Exposure Limit (REL) (10-hour TWA) Immediately Dangerous to Life or Health (IDLH) OSHA Permissible Exposure Limit (PEL) (8-hour TWA) Seliium and OSHA Permissible Exposure Limit (PEL) (8-hour TWA) Selium Hexafluoride</p> <p>EPA Maximum Contaminant Level Goal (MCLG) EPA Drinking Water Standard, Maximum Contaminant Level (MCL) EPA Drinking Water Equivalent Level (DWEL) EPA/RCRA - Toxicity Characteristic Leaching Procedure (TCLP)</p>
 <h3>ANTIMONY</h3> <p>Air</p> <p>0.5 mg/m³ 0.5 mg/m³ 0.5 mg/m³</p> <p>Water 6 ppb 6 ppb</p> <p>NIOSH Recommended Exposure Limit (REL) (10-hour TWA) OSHA Permissible Exposure Limit (PEL) (8-hour TWA) ACGIH Threshold Limit Value (TLV) (8-hour TWA)</p> <p>EPA Maximum Contaminant Level Goal (MCLG) EPA Drinking Water Standard, Maximum Contaminant Level (MCL)</p>	 <h3>COPPER</h3> <p>Air - Fume</p> <p>0.1 mg/m³ 0.1 mg/m³ 0.2 mg/m³</p> <p>Air - Dust</p> <p>1 mg/m³ 1 mg/m³ 1 mg/m³ 100 mg/m³</p> <p>Water 1.3 mg/L 1.3 mg/L</p> <p>NIOSH Recommended Exposure Limit (REL) (10-hour TWA) OSHA Permissible Exposure Limit (PEL) (8-hour TWA) ACGIH Threshold Limit Value (TLV) (8-hour TWA)</p> <p>ACGIH Threshold Limit Value (TLV) (8-hour TWA) OSHA Permissible Exposure Limit (PEL) (8-hour TWA) NIOSH Recommended Exposure Limit (REL) (10-hour TWA) NIOSH Immediately Dangerous to Life or Health (IDLH)</p> <p>OSHA Action Level (AL) (8hr TWA) EPA Maximum Contaminant Level Goal (MCLG)</p>

*Due to ever Changing Regulations / Requirements always check the Current Limits with the Appropriate Regulatory Agencies

