

Letter Health Consultation

METROPOLITAN METAL FINISHING
HAMDEN AND NEW HAVEN, CONNECTICUT

**Prepared by the
Connecticut Department of Public Health**

SEPTEMBER 2, 2009

Prepared under a Cooperative Agreement with the
U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation
Atlanta, Georgia 30333

Health Consultation: A Note of Explanation

A health consultation is a verbal or written response from ATSDR or ATSDR's Cooperative Agreement Partners to a specific request for information about health risks related to a specific site, a chemical release, or the presence of hazardous material. In order to prevent or mitigate exposures, a consultation may lead to specific actions, such as restricting use of or replacing water supplies; intensifying environmental sampling; restricting site access; or removing the contaminated material.

In addition, consultations may recommend additional public health actions, such as conducting health surveillance activities to evaluate exposure or trends in adverse health outcomes; conducting biological indicators of exposure studies to assess exposure; and providing health education for health care providers and community members. This concludes the health consultation process for this site, unless additional information is obtained by ATSDR or ATSDR's Cooperative Agreement Partner which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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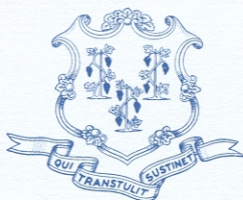
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LETTER HEALTH CONSULTATION

METROPOLITAN METAL FINISHING
HAMDEN AND NEW HAVEN, CONNECTICUT

Prepared By:

State of Connecticut
Department of Public Health
Under a cooperative agreement with the
Agency for Toxic Substances and Disease Registry



STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

August 25, 2009

Janis Tsang
On-Scene Coordinator (OSC)
EPA, New England Region
1 Congress St., Suite 1100 (HBR)
Boston, MA. 02114

Dear Ms. Tsang:

This Letter Health Consultation (LHC) has been completed for the property formerly known as Metropolitan Metal Finishing, which is located in the towns of Hamden and New Haven. Background information in this LHC was obtained through documents from the United States Environmental Protection Agency (US EPA).

Statement of Issues

This LHC is largely based on a letter, dated August 6, 2009 (Attachment A), that was prepared in response to a request by the US EPA that we evaluate environmental data and safety concerns regarding the Metropolitan Metal Finishing Site located in the cities of Hamden and New Haven, CT. The US EPA did a bulk chemical removal from inside the Metropolitan Metal Finishing building in the mid 1990s, but did not remove the residual contamination and some visible contamination on the metal plating equipment, which includes plating tanks and vats.

Background

The Metropolitan Metal Finishing site is an approximately 0.50 acre property located at 400 Goodrich Street in Hamden, CT with a portion of the property located in New Haven, CT. The property was originally developed as an automobile repair garage circa 1948. The property was subsequently developed as a metal plating facility circa 1955, remaining in operation until 1996 as Global Metal Finishing and later Metropolitan Metal Finishing. A one-story, cinderblock building, that once operated as a metal plating facility is located on the site. Metropolitan Metal Finishing was an electroplating shop that performed chromating, black oxide, copper flash (cyanide-based) plating, cyanide zinc plating, alkaline zinc plating, cyanide brass plating; and nickel plating. Metropolitan Metal Finishing went out of business in 1996 and the property has been vacant since then (Weston 2006).

The US EPA did a removal of hazardous substances from the site in the spring and summer of 1997. The US EPA reported that the main floor of the building had about 100 open top dip tank/baths ranging in size from 10 to 3,000 gallons containing solutions

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used in cyanide-based plating and other metal coating operations. In addition, approximately 100 containers of chemicals including cyanides, chromic acid, and other caustic materials were observed, along with 10 compressed gas cylinders and about 300 small containers of process lab reagents. The US EPA also stated that the basement contained several feet of contaminated standing water.

The town of Hamden hired a contractor to perform a Phase I Environmental Site Assessment in the summer of 2005. A site inspection performed in July 2005 indicated that a large amount of debris remained in the building as well as plating equipment. In addition, visible metal plating residue was also present. Inspectors noted that there was evidence that someone was living in the building at some point in time.

An onsite visit on June 19, 2009 by the Connecticut Department of Public Health (CTDPH), US EPA, and Quinnipiack Valley Health District staff indicated evidence of recent trespasser activity in the building on the property. Several windows are broken and only a board covers the back doorway. It is fairly easy to enter the building. In addition, the property is not fenced. Trespassers coming into contact with the residual contamination inside the building could be exposed to elevated levels of residual metal plating chemicals that could harm their health. Furthermore, there were obvious physical hazards such as unsecured machinery, broken windows, and debris on the floor observed in the inside of the building that needs to be addressed.

Environmental Contamination and Health Comparison Values

Residual Contamination Inside the Building

The CTDPH reviewed both liquid and solid residual chemical sample data collected throughout the inside of the Metropolitan Metal Finishing site building. Solid and liquid sample results indicated the presence of several contaminants, including cyanide and chromium found at maximum levels of 40 parts per million (ppm) and 12 ppm, respectively. CTDPH does not have appropriate cleanup standards to compare to this residual contamination, but they exceed Connecticut's Remediation Standard Regulations (CTRSR) residential direct exposure criteria (RDEC) for soil, which are 1.4 ppm and 3.9 (trivalent chromium) ppm, respectively.

Surface Soil

CT DPH has also reviewed surface soil data collected from the Metropolitan Metal Finishing Site. Heavy metals, including arsenic, cadmium, and lead are present in surface soil at levels above CTRSR RDEC. Table 1 shows that arsenic, cadmium, and lead exceed Connecticut residential soil cleanup standards.

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Table 1. Summary of Surface Soil Samples Results from the Metropolitan Metal Finishing Site, November 2005.

Contaminant	Sampling Depth (inches)	Concentration Range (ppm [#])	Number of Exceedances of Comparison Value/Number of Samples Taken	Average Concentration (ppm)	Comparison Value (ppm)
Arsenic	0-3	22-75	7/7	43	10 [^]
Cadmium	0-3	56-420	6/6	148	34
Lead	0-3	520-1,000	6/6	660	500

[#]ppm=parts per million

[^]Connecticut Remediation Standard Regulations Direct Exposure Criteria (CTRSRs). CTRSs are soil standards that were developed to be protective of children and adults who have contact with soils on a daily basis for many years (30 years).

Discussion

Exposure Pathway Analysis

To evaluate potential exposures to contaminants on the Metropolitan Metal Finishing Property, CT DPH evaluated the environmental data and considered how people might come into contact with contaminants in surface soil. Since residences are located only a few feet away from the property and there is no fence surrounding the property, access by trespassers is unrestricted and likely.

The possible pathways of exposure are dermal, inhalation, and incidental ingestion. In other words, in order to be exposed to contaminants in surface soil at Metropolitan Metal Finishing, one must come into contact with the surface soil by touching the soil, breathing airborne soil particles, or eating soil adhered to fingers or food items. Inhalation is not considered a complete pathway at this site because the presence of grass minimizes the creation of soil dust. Completed past and current dermal and ingestion exposures to onsite surface soil are evaluated in detail in this letter health consultation.

In the past and currently, teenage trespassers could be exposed to the contaminated onsite surface soil once a day. Exposure to the contaminated surface soil was estimated to be once a day, with a frequency of 5 days/week for a teenage trespasser, aged 13-18 years old for 6 years. Since the ground would mostly likely be covered with snow approximately 3 months out of the year, contact with the contaminated surface soil would be further limited, to only 9 months/year. This assumption is realistic, but conservative because the surface soil is covered mostly with grass thus minimizing direct contact with the contaminated surface soil. Because past and current exposure pathways are complete,

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they will be evaluated in further detail in the next section.

In addition, CT DPH also evaluated potential exposure to residual contamination found inside the building on the property. The possible past and current completed pathways of exposure are dermal and incidental ingestion and are discussed in the next section.

Public Health Implications

Dermal and ingestion exposure to surface soil is evaluated quantitatively in this health consultation. Because we do not have any appropriate values to compare visual residual contamination inside the building, we were unable to evaluate this exposure pathway quantitatively. However, since there is obvious residual contamination found inside the building and some chemical concentrations exceed the CTRSRs for soil, health effects from exposure to this contamination cannot be ruled out.

CTDPH evaluated risks to trespassers from ingestion and dermal exposure to arsenic and cadmium in soil using the maximum detected concentrations. This maximum daily dose represents a conservative estimate of what a teenager is exposed to who trespasses on the site. This dose from arsenic exposure from the site is much lower than ATSDR's Minimum Risk Level (MRL) [ATSDR 2000] for chronic oral exposure and the United States Environmental Protection Agency's (US EPA's) reference dose (IRIS 2004). All dose and risk calculations are provided in Attachment B. However, because the dose from cadmium exposure from the site exceeds ATSDR's MRL for chronic oral exposure¹, noncancer health effects from cadmium in surface soil Metropolitan Metal Plating site cannot be ruled out. This level is more than 3 times ATSDR's MRL for cadmium.

CTDPH also calculated theoretical cancer risks from exposure to arsenic (Attachment B) in the onsite surface soil using the maximum arsenic concentration. The theoretical cancer risk from arsenic exposure is nine excess cancers per 1,000,000 people, which represents a very small incremental risk above the background cancer rate of approximately 1 in 2 or 3 (NCI 2001). Therefore, cancer effects from arsenic exposure from arsenic are very unlikely.

CT DPH did not calculate theoretical cancer risks from exposure to cadmium in surface soil because there is insufficient toxicological evidence that long-term dermal or oral exposure to cadmium causes cancer.

CTDPH did not quantitatively evaluate not calculate risk from exposure to lead in surface soil. However, because maximum concentrations found in surface soil are twice the CTRSRs for lead, exposure to lead has the potential to harm health.

¹ ATSDR oral MRL for water. The oral MRL for food is 0.001 mg/kg/day [ATSDR 1999].



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Conclusion

CT DPH has concluded that ingestion and dermal exposure to the contaminated surface soil on the Metropolitan Metal Finishing Property site could harm people's health. In addition, ingestion and contact with the residual contamination in the building could harm people's health. Lastly, physical hazards in the building on the property could harm people's health.

CT DPH supports the US EPA's plan to remove all of the visual residual contamination left inside the building. This includes all tanks and vats left inside that could contain elevated levels of chemicals and are also a safety hazard. CT DPH also supports the US EPA plan to secure the building so that access is restricted.

CT DPH has concluded that performing these actions as well as the recommendations noted below will adequately address the risk of harm to public health. Once these actions are completed, the site should present no risk of harm.

Recommendations

As a temporary measure, CT DPH recommends that the US EPA erect a fence that restricts access to the entire property. CT DPH also recommends that this site will need to be re-evaluated if site conditions change (for example, if the property is developed in the future and the potential for exposure changes).

Please contact me at (860) 509-7583 if you have further questions or need further information.

Sincerely,

A handwritten signature in purple ink that reads "Sharee Rusnak".

Sharee M. Rusnak, MSPH, ScD
Epidemiologist, Site Assessment and
Chemical Risk Unit
Environmental and Occupational
Health Assessment Program

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References:

ATSDR 1999. Agency for Toxic Substances and Disease Registry. Toxicological Profile for Cadmium (Update), U.S. Department of Health and Human Services, July 1999.

ATSDR 2000. Toxicological Profile for Arsenic, US Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, September, 2000.

EPA 1993. Exposure Factors Handbook. EPA/6--/P-95/002Fa, August 1997.

EPA 2001. Risk Assessment Guidance for Superfund Volume I.: Human Health Evaluation Manual (Part E, Supplemental Guidance for Dermal Risk Assessment) Interim Review Draft for Public Comment, September 2001.

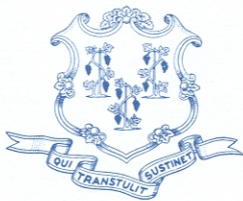
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Weston 2006. Removal Program Preliminary Assessment /Site Investigation Report for the Metropolitan Metal Finishing Site. Weston Solutions, Inc. Prepared for the United States Environmental Protection Agency, April 2006.

Attachment A

CTDPH Letter to US EPA Regarding Metropolitan Metal Finishing



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August 6, 2009

Janis Tsang
On-Scene Coordinator (OSC)
EPA, New England Region
1 Congress St., Suite 1100 (HBR)
Boston, MA. 02114

Dear Ms. Tsang,

This letter is in response to your request that the Connecticut Department of Public Health (CT DPH) evaluate environmental data and safety concerns regarding the Metropolitan Metal Finishing Site located in the cities of Hamden and New Haven, CT. The United States Environmental Protection Agency (US EPA) did a bulk chemical removal from inside the Metropolitan Metal Finishing building in the mid 1990's, but did not decontaminate the metal plating equipment including plating tanks and vats by removing the residual contamination, including some visible contamination.

CT DPH reviewed both liquid and solid residual chemical sample data collected throughout the inside of the Metropolitan Metal Finishing Site building. Sample results indicated the presence of several contaminants, including cyanide and chromium. CTDPH does not have appropriate cleanup standards to compare to this residual contamination, but they exceed Connecticut's Remediation Standard Regulations (CTRSR) residential direct exposure criteria (RDEC). Because of this, CT DPH supports the US EPA's plan to remove all of the residual contamination left inside the building. This includes all of tanks and vats left inside that could contain elevated levels of chemicals and are also a safety hazard.

In addition, a recent onsite visit by CTDPH, US EPA, and Quinnipiack Valley Health District staff indicated evidence of recent trespassers living inside the property. Several windows are broken and only a board covers the back doorway. It is fairly easy to enter the building. Trespassers coming into contact with the residual contamination inside the building could be exposed to elevated levels of residual metal plating chemicals. CT DPH also supports the US EPA plan to secure the building so that access is restricted.

CT DPH has also reviewed soil data collected from the Metropolitan Metal Finishing Site. Heavy metals, such as arsenic, cadmium, total chromium, zinc, and lead are present in soil at levels above CTRSR RDEC. Since residences are located only a few feet away from the property and there is no fence surrounding the property, access is unrestricted and likely. People coming into contact with the contaminated soil could be exposed to elevated levels of contaminants in the soil. Therefore, as a temporary measure, CT DPH recommends that the US EPA erects a fence that restricts access to the entire property.

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Lastly, the CT DPH recommends that this site will need to be re-evaluated if site conditions change (for example, if the parcel is developed in the future and the potential for exposure changes).

If you have any questions or need additional information, please contact me at (860) 509-7583.

Sincerely,

A handwritten signature in purple ink that reads "Sharee Rusnak".

Sharee M. Rusnak
Site Assessment and Chemical Risk Unit
Environmental and Occupational
Health Assessment Program

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Attachment B Metropolitan Metal Risk Calculations

Max Concentration Arsenic, Noncancer Risk, Trespasser, Aged 13-18 years

Ingestion Dose									
Ing Rate (mg/d)	Max Conc (mg/kg)	EF (d/yr)	ED (yr)	C1 (kg/mg)	C2 (y/365d)	1/BW (1/kg)	1/At _{nc}	ADD _i	HI
50	75	200	6	0.000001	0.002739726	0.02	0.17	0.000034247	0.276746

Dermal Dose

Max Conc (mg/kg)	AF (mg/cm ² -ev)	Absorption Fraction	Surface Area (cm ²)	EF (d/yr)	ED (yr)	F (ev/day)	C1 (kg/mg)	C2 (y/365d)	1/BW	1/AT _{nc}	ADD _d
75	0.2	0.03	9697	200	6	1	0.000001	0.002739726	0.02	0.17	4.87772E-05

Max Concentration Cadmium, Noncancer risk, Trespasser, Aged 13-18 years

Ingestion Dose									
Ing Rate (mg/d)	Max Conc (mg/kg)	EF (d/yr)	ED (yr)	C1 (kg/mg)	C2 (y/365d)	1/BW (1/kg)	1/At _{nc}	ADD _i	HI
50	420	200	6	0.000001	0.002739726	0.02	0.17	0.000733562	3.6769133

Dermal Dose

Max Conc (mg/kg)	AF (mg/cm ² -ev)	Absorption Fraction	Surface Area (cm ²)	EF (d/yr)	ED (yr)	F (ev/day)	C1 (kg/mg)	C2 (y/365d)	1/BW	1/AT _{nc}	ADD _d
420	0.04	0.001	9697	200	6	1	0.000001	0.002739726	0.02	0.17	1.82102E-06

Max Concentration, Cancer Risk, Trespasser, Aged 13-18 years

Ingestion Dose									
Ing Rate (mg/d)	Max Conc (mg/kg)	EF (d/yr)	ED (yr)	C1 (kg/mg)	C2 (y/365d)	1/BW (1/kg)	1/At _c	LADD _i	
50	75	200	6	0.000001	0.002739726	0.01666670	0.014	0.000002935	

Dermal Dose

Max Conc (mg/kg)	AF (mg/cm ² -ev)	Absorption Fraction	Surface Area (cm ²)	EF (d/yr)	ED (yr)	F (ev/day)	C1 (kg/mg)	C2 (y/365d)	1/BW	1/AT _c	LADD _d	ELCR
75	0.2	0.03	9697	200	6	1	0.000001	0.002739726	0.02	0.0143	1.70789E-07	9.527E-06

Where:

Absorption Fraction	= Soil dermal absorption fraction. Arsenic: 0.03 (EPA 2001), Cadmium: 0.001 (EPA 2001)
ADD _i	= Average daily dose from ingestion
ADD _d	= Average daily dose from dermal contact
AF	= Skin-soil adherence factor for default residential child; trespasser teenager; Arsenic: 0.01 mg/cm ² -ev, cadmium, 0.04 mg/cm ² -ev
AT _c	= Averaging time for cancer risk: 70 years
AT _{nc}	= Averaging time for noncancer risk: 6 years
BW	= Body weight teenager: 60 kg
C1	= Conversion factor: 0.000001 or 10 ⁻⁶ kg/mg
C2	= Conversion factor: 1yr/365 days
ED	= Exposure duration for a teenager trespasser: 6 years
EF	= 200 days/year
ELCR	= Estimated lifetime cancer risk
F	= Event frequency: 1 event/day
HI	= Hazard index
Ing Rate	= Ingestion rate: 50 mg/day (EPA, 1997)
LADD _i	= Lifetime average daily dose from ingestion for trespasser, Aged 13-18 years
LADD _d	= Lifetime average daily dose from dermal contact for trespasser, Aged 13-18 years
Max Conc	= Maximum concentration: Arsenic: 75mg/kg; Cadmium: 420 mg/kg
Surface Area	= Skin surface area for teenage trespasser: 50 th %ile for legs, feet, hands, and arms, teenager, 9697 cm ²

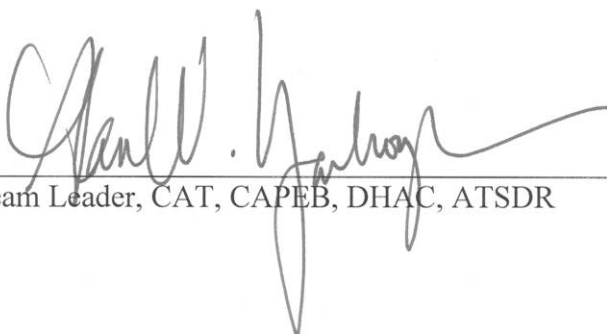
CERTIFICATION

The letter health consultation for the Metropolitan Metal Finishing site was prepared by the Connecticut Department of Public Health under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the letter health consultation was initiated. Editorial review was completed by the cooperative agreement partner.



Technical Project Officer, CAT, CAPEB, DHAC

The Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation, and concurs with its findings.



Team Leader, CAT, CAPEB, DHAC, ATSDR