



THE CITY OF NEW YORK

DEPARTMENT OF HEALTH AND MENTAL HYGIENE

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Report: Lead Hazard Risk Assessment of
Synthetic Turf Playing Fields, March 2008
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1.0 Introduction and Background

Recently, the New Jersey Department of Health and Senior Services (NJDHSS) reported findings of lead contamination in a synthetic turf playing field in Newark, NJ. In response to this report, the New York City Department of Health and Mental Hygiene (DOHMH) and the Department of Parks and Recreation (DPR) assessed similar fields operated by DPR for potential lead hazards. The NJDHSS identified lead in the carpet fibers of a synthetic turf field manufactured several years ago. The synthetic turf in question is composed of a flat nylon carpet and does not contain crumb rubber infill.

DPR only operates two synthetic turf fields similar in age and type, and purchased from the same manufacturer as the field in Newark. Both of these fields were assessed for lead hazards. In addition, two fields containing crumb rubber infill were also assessed for lead hazards. DPR hired an environmental consulting firm (Niche Analysis, Inc.) to collect bulk samples of synthetic turf carpet fibers, rubber infill and dust at the four fields. The NYC Department of Health and Mental Hygiene conducted lead hazard risk assessments at all four fields.

Using exceedance of federal regulatory standards as indicative of a lead hazard, the results of the risk assessments indicate that lead hazards are not present in any of the four fields assessed. No regulatory limits for lead in any samples were exceeded.

Synthetic turf fields at the following locations were assessed for lead hazards:

- Chelsea Park, West 27th Street and 10th Avenue (synthetic turf carpet)
- Riverside Park, West 103rd Street and Riverside Drive (synthetic turf carpet)
- Eugene McCabe Field, East 120th Street and Park Avenue (synthetic turf carpet with rubber infill)
- Riverside Park, West 107th Street and Riverside Drive (synthetic turf carpet with rubber infill)

2.0 DOHMH Lead Hazard Risk Assessment

Lead hazard risk assessments were conducted at four DPR synthetic turf fields from 3/11/08 to 3/12/08 by the DOHMH. The risk assessments were conducted in accordance with The United States Department of Housing and Urban Development (HUD) "*Guidelines for Evaluation and Control of Lead-Based Paint Hazards in Housing*" (HUD Guidelines) by a DOHMH Associate Public Health Sanitarian and EPA-certified Lead Risk Assessor. The risk assessments included a visual inspection of each site and collection of environmental samples for lead in dust, bare soil and deteriorated paint. A total of sixteen (16) dust samples, four (4) soil samples and one (1) paint chip sample were taken during the assessments.

3.0 DPR Bulk and Dust Sampling

The NYC Department of Parks and Recreation hired an environmental consulting firm (Niche Analysis, Inc.) to collect bulk samples of synthetic turf carpet fibers, rubber infill and dust at the selected synthetic turf fields. Niche Analysis conducted sampling on 3/4, 3/7 and 3/11/08. Niche Analysis, Inc. collected synthetic turf carpet fibers from all four fields and rubber infill from the two fields where it was present. Dust samples were collected from the two fields that are carpet fiber only.

3.0 Applicable Regulations and Guidelines

The following regulations and guidelines were referenced for all sampling performed at the four fields.

- *EPA 40 CFR-745.65(b)* defines a dust-lead hazard as surface dust in a residential dwelling or child-occupied facility that contains a mass-per-area concentration of lead equal to or exceeding 40 $\mu\text{g}/\text{ft}^2$ on floors or 250 $\mu\text{g}/\text{ft}^2$ on interior window sills based on wipe samples. **All dust wipe samples were compared with the EPA limit of 40 $\mu\text{g}/\text{ft}^2$ on floors.**
- *EPA 40 CFR-745.65(c)* defines a soil lead-hazard as bare soil on residential real property or on the property of a child occupied facility that contains total lead equal to or exceeding 400 parts per million (ppm) in a play area or average of 1,200 parts per million of bare soil in the rest of the yard based on soil samples. **All soil samples were compared with the EPA limit of 400 parts per million (ppm) in a play area.**
- *HUD 24 CFR-35* defines lead-based paint as paint or other surface coatings that contain lead equal to or exceeding 1.0 milligram per square centimeter or 0.5 percent by weight or 5,000 parts per million (ppm) by weight. **The paint chip sample was compared with the HUD limit of 5,000 ppm of lead in paint samples.**
- *The HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing, Chapter 5: Risk Assessment* indicates that during risk assessments of areas frequented by children, two floor dust samples should be collected from spaces up to 2,000 ft^2 and one additional sample should be collected for each increment of 2,000 ft^2 .

4.0 Conclusions and Recommendations

Based on existing HUD Guidelines and EPA standards, lead hazard risk assessments at these four DPR synthetic turf fields did not identify lead hazards. Some sample results indicated the presence of lead in the synthetic turf carpet fibers in the fields at West 27th Street and 10th Avenue, West 103rd Street and Riverside Drive, and East 120th Street and Park Avenue. Lead was also found in the rubber infill at East 120th Street and Park Avenue. Additionally, one micro vacuum sample of dust taken from the field at West 27th Street and 10th Avenue indicates that lead dust could be embedded in the field, however it is not known if the source of lead is from the carpet fibers or from other environmental sources. Micro vacuum dust samples can be used as an indicator of total dust available from a surface, but there are no applicable standards regarding lead levels in micro-vacuum dust samples.

Although there are currently no lead hazards at these synthetic turf fields, the sites may be reassessed at a later date to ensure that they remain lead hazard free. As part of routine maintenance activities, the DPR may address the areas of bare soil present near the Riverside Park Fields and the peeling paint on the retaining wall.

5.0 Field Data Summary

5.1. Chelsea Park, West 27th Street and 10th Avenue

The Chelsea Field located at West 27th Street and 10th Avenue consists of synthetic turf carpet only. Although lead was detected in some samples, no regulatory limits were exceeded indicating that lead hazards were not identified at this field.

The NYC Parks Department environmental consultant collected bulk fiber samples, micro vacuum dust samples and a dust wipe sample from this field. The NYC DOHMH collected dust wipe samples from this field.

Bulk carpet fiber sample results indicated the presence of lead. Four of five micro vacuum dust samples were below detection limits. One micro vacuum sample contained detectable levels of lead in dust. This may indicate that lead is present in sub-surface dust present at the field, however it is not known if the source of the lead is the carpet fibers or an environmental source. All dust wipe sample results for lead were below 40 µg/ft², the residential standard for lead in indoor dust.

Visual inspection of this field did not identify deteriorated areas, excessive amounts of dust, or turf carpet particles.

Lead Sample Results: Chelsea Park, West 27th Street and 10th Avenue

Bulk Carpet Fiber		Micro Vacuum Dust Sample		Dust Wipe Sample	
Location	Result (mg/kg)	Location	Result (µg/ft ²)	Location	Result (µg/ft ²)
Northeast	NA	Northeast	<77.1	Northeast	10.0
Northwest	3,692.2	Northwest	214.7	Northwest	18.1
Southwest	3,201.9	Southwest	<77.1	Southwest	16.0
Southeast	NA	Middle Area	<77.1	North	14.2
Middle Area	NA	Southeast	<77.1	East	12.1
Northeast	4,780.6				
Northwest	5,247.7				
Middle Area	5,284.1				

No regulatory standard exists for lead in synthetic turf fibers. Bulk sampling analysis establishes the presence of lead in synthetic turf fibers.

- There is no regulatory standard for lead in micro vacuum dust samples.
- All samples were analyzed by EPA method 3050B/7420

5.2. Riverside Park, West 103rd Street and Riverside Drive

The field in Riverside Park, at West 103rd Street and Riverside Drive, consists of synthetic turf carpet only. Although lead was detected in some samples, no regulatory limits were exceeded indicating that lead hazards were not identified at this field.

The DPR environmental consultant collected bulk carpet fiber samples and micro vacuum dust samples from this field. The DOHMH collected dust wipe samples from this field and samples from adjacent areas of bare soil.

Two of five bulk sampling results indicate the presence of lead. One bulk sample result was below detection limits and two samples could not be analyzed because not enough material was present. All four micro vacuum dust samples were below detection limits. All three dust wipe sample results were below detection limits and below 40 µg/ft², the residential standard for lead in indoor dust. Samples taken from bare soil adjacent to the field were below 400 ppm, the residential standard for lead in soil in play areas.

Visual inspection of this field did not identify deteriorated areas, excessive amounts of dust, or turf carpet particles. Approximately one third of the field was fenced-off for repairs and inaccessible at the time of inspection.

Lead Sample Results: Riverside Park, West 103rd Street and Riverside Drive

Bulk Carpet Fiber		Micro Vacuum Dust Sample		Dust Wipe Sample		Soil	
Location	Result (mg/kg)	Location	Result (µg/ft ²)	Location	Result (µg/ft ²)	Location	Result (ppm)
Northeast	82.4	East Side/ North Part	<77.1	Northwest	<8.3	Adjacent, northeast of field	70.0
North	<16.2	West Side/ North Part	<77.1	West	<8.3	Baseball infield	<15.2
West	NA	South Side/ Middle	<77.1	East	<8.3		
Southwest	NA	Middle area	<77.1				
Middle	159.7						

- No regulatory standard exists for lead in synthetic turf fibers. Bulk sampling establishes the presence of lead in synthetic turf fibers.
- There is no regulatory standard for lead in micro vacuum dust samples.
- All samples were analyzed by EPA method 3050B/7420

5.3. Eugene McCabe Field, East 120th Street and Park Avenue

Eugene McCabe Field, at East 120th Street and Park Avenue, consists of an synthetic turf carpet field with rubber infill. Although lead was detected in some samples, no regulatory limits were exceeded indicating that lead hazards were not identified at this field.

The DPR environmental consultant collected bulk carpet fiber and rubber infill samples from this field. The NYCDOHMH collected dust wipe samples from this field.

Bulk fiber and infill sample results indicated the presence of lead. All four dust wipe sample results were below detection limits and below 40 µg/ft², the residential standard for lead in indoor dust.

Visual inspection of the field indicated that it was in generally good condition, but there was some surface water accumulated in a small depression in the southeast area of the field.

Lead Sample Results: Eugene McCabe Field, East 120th Street and Park Avenue

Bulk Carpet Fiber		Bulk Rubber Infill		Dust Wipe Sample	
Location	Result (mg/kg)	Location	Result (mg/kg)	Location	Result (µg/ft ²)
Northeast	194.2	Northeast	56.3	Southwest	<8.3
Northwest	139.7	Northwest	49.3	East	<8.3
Southeast	84.9	Southeast	31.1	Center	<8.3
Southwest	293.7	Southwest	45.8	Northwest	<8.3
Middle	353.2	Middle	58.8		

- No regulatory standard exists for lead in synthetic turf fibers or rubber infill. Bulk sampling establishes the presence of lead in synthetic turf fibers and bulk rubber infill.
- All samples were analyzed by EPA method 3050B/7420

5.4. Riverside Park, West 107th Street and Riverside Drive

The field in Riverside Park, at West 107th Street and Riverside Drive, consists of synthetic turf carpet with rubber infill. Although lead was detected in some samples, no regulatory limits were exceeded indicating that lead hazards were not identified at this field.

The DPR environmental consultant collected bulk carpet fiber and rubber infill samples from this field. The DOHMH collected dust wipe samples from this field, samples from adjacent areas of bare soil and paint from an adjoining retaining wall.

None of the bulk sampling results for fiber or infill indicate the presence of lead. One bulk fiber sample result couldn't be analyzed because not enough material was present. Four of five dust wipe sample results were below detection limits. All five dust wipe samples were below 40 µg/ft², the residential standard for lead in indoor dust. Samples taken from bare soil adjacent to the field were below 400 ppm, the residential standard for lead in soil in play areas. The paint sample taken from the adjoining retaining wall is not considered to be lead-based paint.

Visual inspection of the field indicated that it was in good condition, but the paint on the adjoining retaining wall was in poor condition.

Lead Sample Results: Riverside Park, West 107th Street and Riverside Drive

Bulk Carpet Fiber		Bulk Rubber Infill		Dust Wipe Sample		Soil		Paint	
Location	Result (mg/kg)	Location	Result (mg/kg)	Location	Result (µg/ft ²)	Location	Result (mg/kg)	Location	Result (ppm)
West side/ South	<16.4	West side/ South	<16.1	North	12.6	Adjacent, northeast of field	119.4	Retaining wall east of field	0.007
South side/ Southwest	NA	South side/ Southwest	<16.1	Northwest	<8.3	Adjacent, southeast of field	35.2		
East side/ Southeast	<16.1	East side/ Southeast	<15.7	Center	<8.3				
East side/ Northeast	<15.3	East side/ Northeast	<15.4	Southeast	<8.3				
North side/ Middle	<16.3	North side/ Middle	<16.3	South	<8.3				

- No regulatory standard exists for lead in synthetic turf fibers or rubber infill. Bulk sampling establishes the presence of lead in synthetic turf fibers and bulk rubber infill.
- All samples were analyzed by EPA method 3050B/742