Health Consultation

Health Risks from Polychlorinated Biphenyls in
Fertilizer Applied to Soil in Recreation Areas

MILWAUKEE, MILWAUKEE COUNTY, WISCONSIN

Prepared by the
Wisconsin Department of Health Services

JUNE 23, 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.

You May Contact ATSDR Toll Free at
1-800-CDC-INFO
or
Visit our Home Page at: http://www.atsdr.cdc.gov

HEALTH CONSULTATION

Health Risks from Polychlorinated Biphenyls in Fertilizer Applied to Soil in Recreation Areas

MILWAUKEE, MILWAUKEE COUNTY, WISCONSIN

Prepared By:

Wisconsin Department of Health Services
Division of Public Health
Under a Cooperative Agreement with the
U.S. Department of Health and Human Services
Agency for Toxic Substances and Disease Registry

Summary and Statement of Issues

The Wisconsin Division of Public Health (DPH), Department of Health Services, was asked by the City of Milwaukee Health Department (MHD) and the United States Environmental Protection Agency (EPA) for assistance in assessing public health hazards associated with the application of fertilizer having low concentrations of polychlorinated biphenyls (PCB). The fertilizer was applied to 35 athletic fields and recreation areas in Milwaukee County. When the city learned of the possible PCB problem, the fields were immediately closed, after which the Milwaukee Metropolitan Sewage District (MMSD), the Wisconsin Department of Natural Resources, and the EPA coordinated a rapid environmental assessment of PCBs in the fields. Based on the PCB levels detected during the assessment, DPH and MHD determined that there was *no apparent public health hazard* for recreational park users from the low concentrations of PCBs found in these parks. Nonetheless, limited areas in 12 parks and athletic fields were found to exceed EPA target goals for environmental quality. These areas received limited soil removal to ensure PCBs were not further dispersed into the environment.

Background

Purpose. Concerns from health and environmental agencies as well as school and park officials were raised when it was learned that a batch of Milorganite™ fertilizer containing PCBs at concentrations above that allowed by federal regulation had been spread on 35 athletic fields and recreational parks in the Milwaukee County area. Milorganite (www.Milorganite.com) is a commercially-distributed fertilizer manufactured from municipal sewage biosolids from the Milwaukee area.

On July 19, 2007, the MMSD contacted WDNR and U.S. EPA to inform them that routine quality testing of Milorganite had detected PCBs in product that had already been placed in a storage silo for distribution to county parks. Test results from May 2007 reported by MMSD, showed no detections of PCBs, but subsequent testing on June 26, June 29, July 1, and July 3, 2007 revealed total PCB concentrations in Milorganite silos of 79.1, 52.6, 32.4, and 35.8 mg/kg, respectively. Further analysis (MMSD 2007) indicated that the PCB-contaminated Milorganite was approximately 86% Aroclor 1248, with the remainder being Aroclor 1260. MMSD concluded that the source of the PCB was a storm sewer near 30th St. and Auer Ave. in Milwuakee that had been cleaned about June 10, 2007, and is also investigating an additional industrial source of PCB dumping. By the time PCBs were detected in the silos, approximately 11 tons of the PCB-contaminated Milorganite had been applied to parks and school athletic fields throughout Milwuakee County. All areas where PCB-contaminated Milorganite was believed to have been spread were immediately closed pending sampling and analysis of surface soils for PCBs. An interagency committee, consisting of federal, state, and local health, environmental, park, and school officials was quickly assembled to assess the situation, arrange an environmental investigation, and provide information to the public.

This report reviews the environmental investigation performed at 35 Milwaukee County parks and school recreation fields, with emphasis on the following public health issues and exposure pathways:

- Potential for exposure to PCBs, by users of parks and athletic fields, through incidental hand-to-mouth contact with contaminated soils.

- Potential for exposure to PCBs through inhalation of Milorganite dust by school ground workers handling the material.

Based on prior experience with PCB issues, several types of questions from the public were anticipated. State and local health officials collaborated in preparing exposure risk estimates and risk communication to address questions about present and past exposure to the public from PCBs in public parks and recreation areas, exposures to pets, cleanup of the PCBs in the parks, and expected effects to the environment.

Investigation of PCBs in applied material. The silo that was the source of PCB-impacted fertilizer contained about 400 tons of Milorganite. The lower 200 tons in the silo had lower concentrations than the upper level. There is some mixing of Milorganite as the silos are emptied so the concentration of the PCBs in the hauled Milorganite is not known.

The silo containing PCB-contaminated milorganite was used to load 29 tons of fertilizer destined for Milwaukee Public School (MPS) athletic fields, and 11 tons for the City of Milwaukee parks. At a normal recommend loading of 40 lbs per 2,500 square feet, 3 times per year, the City of Milwaukee calculated this would cover 230 acres but suspect it was used at for a one-time application over a lesser area.

At the request of WDNR, the EPA sampled soil for PCBs at "priority" locations that included ten school parks and two county parks. By the completion of the investigation, twenty-seven school field and county park locations were tested and evaluated.

Results of investigation. PCBs above the screening level agreed upon by the inter-agency workgroup, 0.3 ppm (see below), were found in 12 of the 27 fields and parks tested (Table 1). These fields remained closed pending their remediation. Four grids were identified as needing to be remediated (EPA 2007b; Appendix I):

- Wick Field, Grid JJ3 (10,000 ft^2); 2.7 ppm total PCBs
- Dyer Field, Grid B1 (10,000 ft^2); 1.2 ppm total PCBs
- Dyer Field, Grid C1 northeast quadrant (2,500 ft^2); 1.8 ppm total PCBs
- Custer High School, Grid 1 southeast quadrant (2,500 ft^2); 1.1 ppm total PCBs

Discussion

Environmental data. Allowable amounts of PCBs in land-applied sludge follow from EPA rules created under the Toxic Substances Control Act (TSCA), and are laid out in Wisconsin Administrative Code ch NR 204.07(3)(k). These state that "Sludge which has a PCB concentration greater than 50 mg/kg (dry weight) may not be applied unless a management plan is approved by the U.S. EPA region V…. Sludge with a PCB concentration greater than 10 mg/kg (dry weight) shall be injected or incorporated into the soil." In other words, sludge with PCB levels below 10 ppm is acceptable for surface application. This assumes that the relatively thin application of PCB-contaminated sludge becomes diluted into the top 6 inches of soil. The final concentration in surface soil is calculated as an application rate, just as one would for an herbicide application. PCBs in sludge below 10ppm become diluted in soil to background

concentrations.

Cleanup goals. After much discussion, the interagency group working on this case agreed on a screening level goal of 0.3 ppm PCBs in surface soils. Locations where total PCBs were found to be greater or equal to 0.3 ppm (Table 1) were tested in more detail by EPA, and were evaluated for possible remediation. Discussions among the stakeholder group concerned the screening value to be used in evaluating the PCB analyses. The Agency for Toxic Substances and Disease Registry (ATSDR 2008) Cancer Risk Evaluation Guide (CREG) for PCBs in soil, at an one-in-one million excess cancer risk, is 0.4 parts per million (ppm). The U.S. EPA cancer risk-based concentration (RBC) for lifetime exposure to PCBs is 3.2 ppm, although when exposure factors are considered in risk assessment, 1.0 ppm is commonly found acceptable as a cleanup goal at remediation sites, and was used as the cleanup goal at the four sites listed above that needed remediation.

The 0.3 ppm screening value is comparable to the EPA Region III residential Risk-based concentration of 0.32 ppm total PCB in surface soil (U.S. EPA 2007a), which has been used previously by DPH. For a park exposure scenario, DPH starts with 0.32 ppm, and can make adjustments as needed to account for less frequent exposure to those soils than at one's home.

Toxicology of PCBs. The polychlorinated biphenyls are a group of structurally related molecules that are chemically stable, highly soluble in oil, and are insoluble in water. PCBs last for decades in the environment, tend to accumulate in body fats, and accumulate in the food chain. In the environment, PCBs are found mostly adsorbed to sediments and soil rather than in water. PCBs have various effects on the body that are related to physiological development, regulation of the cell cycle, and tumorogenesis. Several population-level studies have linked prenatal and perinatal exposure to PCBs to lower birth weights and learning problems (Guo *et al.* 1999; and reviewed in ATSDR 2000). Some forms of PCBs are suspected human carcinogens. Due to the widespread dispersion and chemical stability of PCBs in the environment, some exposure (mostly through food) is unavoidable.

Exposure assessment for park and recreational users: The expected maximum exposures to Aroclors 1248 and 1260 for adult and child users of recreation areas from incidental ingestion of PCBs in soil at recreation fields are calculated below.

Worst case concentration: Wick Field, Grid JJ3 (10,000 square foot area): 2.7 ppm total PCBs in surface soil.

Assumed incidental ingestion of soil: 200×10^{-6} kg/day

$(200 \times 10^{-6}$ kg soil/day) x $(2.7 \times 10^{-6}$ kg PCB/kg soil) = 5.4×10^{-10} kg PCB/day
= 5.4×10^{-4} mg PCB/day

Dose, 70 kg adult = $(5.4 \times 10^{-4}$ mg PCB/day)/70kg = **7.7×10^{-6} mg PCB/kg body wt/day**

Dose, 20 kg child = $(5.4 \times 10^{-4}$ mg PCB/day)/20kg = **2.7×10^{-5} mg PCB/kg body wt/day**

Comparison of exposure estimate to health-based guidelines for PCBs. Based on a comparison of calculated exposures to health-based comparison values, there is *no apparent health hazard* from incidental hand to mouth ingestion of park soils containing PCBs from contaminated Milorganite. The U.S. EPA (2008) has classified PCBs a class B2 (probable, but with inadequate human or animal data) carcinogen. The PCB congener analysis for the fields treated with Milorganite indicated that the primary PCB mixtures present were Aroclor 1248 and Aroclor 1260. A screening value of 0.22 mg PCB/kg soil (or parts per million) has been published by the EPA (2008b) for both Aroclor 1248 and Aroclor 1260.

For the estimated maximum exposures to PCBs calculated above, the EPA has no published reference dose (RfD) for Aroclor 1248 and 1260. References reviewed by EPA (U.S. EPA 2008) *suggest*, for Aroclor 1248, a fetal exposure limit of 0.03 mg/kg/day for developmental defects. The worst-case exposure estimate calculated above does not exceed this 0.03 mg/kg/day exposure limit for Aroclor 1248. The EPA (2008) does not provide a corresponding literature review or suggested RfD for Aroclor 1260. RfD estimates (U.S. EPA) are available for Aroclor 1016 ($7x10^{-5}$ mg/kg/d) and for Aroclor 1254 ($2x10^{-5}$ mg/kg/d). However, these Aroclors were not reported from these recreation sites.

Exposure assessment of school groundskeepers. Park workers and school groundskeepers that had handled PCB-contaminated Milorganite voiced concern about their exposure. DPH was asked, in cooperation with MHD with workplace contacts from MPS, to speak to an assembly of these workers to discuss their exposure and risk. An exposure assessment was prepared based on assumptions of the workers inhalation of airborne Milorganite particles and prior measurements of PCBs in the Milorganite. All of the workers were males, aged 35-55. Because this was a one-time exposure, these calculations were compared, as a point of context, to allowable levels of PCBs in milk and meat (Table 2) instead of making comparisons to reference concentrations as would be appropriate for chronic exposure.

Worst-case exposure calculations were based on the knowledge that most of the material handled by the workers contained 2.2 ppm total PCB and that some of the material contained 85 ppm total PCB (Pace 2007). Calculations were made using both of these concentrations, and with the following assumptions:

- Worst-case concentration of suspended soil = 10 milligram suspended Milorganite per cubic meter of air
- Maximum exposure duration: 4 hours on 1 day.
- Concentration of PCB in soil is either 2.2 ppm PCBs in soil (=22 nanograms PCBs in 10 milligrams soil), or 85 ppm PCB (= 850 ng in 10 mg soil).
- Assume workers breathe 1 cubic meter air per hour
- Assume all soil particles are trapped in upper respiratory tract and swallowed, such that inhalation exposure becomes ingestion exposure.

The calculated exposures are shown in Table 2. The calculations suggest an exposure of 3.4 µg PCB from four hours breathing concentrated Milorganite dust containing 85 ppm total PCB. The corresponding exposure for dust containing 2.2 ppm PCB is 0.09 µg. By comparison, the ATSDR minimum risk level for intermediate-duration PCB exposure is 0.03 µg/kg/day (ATSDR

2000). For a 70 kg adult, an acceptable minimum-risk exposure of intermediate duration would be 2.1 µg/day. The calculated worst-case exposure from a single day of exposure is somewhat higher than that acceptable for daily exposure of intermediate duration. In contrast, the estimated exposure from Milorganite dust is at least 100-fold less than FDA tolerance limits for PCB residues in milk, fish, and meat. This difference in acceptable exposure limits is due to the unavoidability of PCB residues in many foods. Based on this assessment, the worst-case exposure experienced by MSD workers represented *no apparent health hazard.*

Child Health Considerations

In communities faced with air, water, or food contamination, the many physical differences between children and adults demand special emphasis. Children could be at greater risk than are adults from certain kinds of exposure to hazardous substances. Children play outdoors and sometimes engage in hand-to-mouth behaviors that increase their exposure potential. Children are shorter than are adults; this means they breathe dust, soil, and vapors close to the ground. A child's lower body weight and higher intake rate results in a greater dose of hazardous substance per unit of body weight. If toxic exposure levels are high enough during critical growth stages, the developing body systems of children can sustain permanent damage. Finally, children are dependent on adults for access to housing, for access to medical care, and for risk identification. Thus adults need as much information as possible to make informed decisions regarding their children's health.

Eating contaminated fish either by small children or by their pregnant mothers is considered to be the most important exposure pathway for the child development related health effects. Direct contact with PCB-contaminated sludge in parks, while constituting a much lower level of exposure, is another route of exposure to these chemicals. Public education directed at parents, along with access restrictions and posted warnings, should be considered to help prevent exposure.

Conclusions

Total PCBs in park soils exceeded the 0.3 ppm screening value in 26 samples that were distributed over 12 of the 27 fields tested. Ultimately, soil was removed from 4 areas where total PCBs exceeded 1 ppm. No health effects, including cancer, are expected that would be attributable to exposure to these soils or to contaminated Milorganite. In general, our most significant exposures occur pre- and peri-natally through placenta and milk. The environmental cleanup of PCBs performed here will help to minimize the lifetime buildup in women that results in transfers to infants. The estimates discussed here indicate that any exposure to either workers or recreational users was small enough to be indistinguishable from other sources of daily exposure.

- Direct exposure to PCBs in soils by park and athletic field users constitutes *no apparent health hazard* due to its low concentration, but may still directly or indirectly contribute to lifetime exposure.

- A one-time worst-case exposure to park workers breathing Milorganite dust is low compared to FDA tolerance limits for food exposure, and represents *no apparent health hazard*.

Recommendations

- DPH supports plans by the Milwaukee Metropolitan Sewage District to more closely monitor sewage sludge for PCBs and other persistent contaminants, particularly in the case of sludge source areas where contaminants are a possibility.

Public Health Action Plan

- Affected areas in Milwaukee County Parks and school fields were closed, using signs and fences, pending an environmental assessment of those areas for PCB content in surface soils.
- The City Milwaukee Health Department, in consultation with DPH, established a web site and phone hotline to answer frequently asked questions about the case. This included an automated phone information and message system which answered over 500 calls.
- Medical advice for workers concerned about their PCB exposure was made available from the DPH Bureau of Environmental and Occupational Health Chief Medical Officer.
- Park areas with identified PCB problems were cleaned up by EPA contractors as described in Appendix I.

Consultation Author

Robert Thiboldeaux, Ph.D.
Toxicologist
Health Hazard Evaluation Unit
Bureau of Environmental and Occupational Health
Division of Public Health
Wisconsin Department of Health Services

Technical Team

Mary Ellen Bruesch, MS, RS
Environmental and Disease Control Specialist
Division of Disease Control and Prevention
City of Milwaukee Health Department

Paul Biedrzycki, Director
Division of Disease Control and Prevention
City of Milwaukee Health Department

Chuck Warzecha, Director
Bureau of Environmental and Occupational Health
Division of Public Health
Wisconsin Department of Health Services

References

ATSDR. 2000. *Toxicological Profile for Polychlorinated Biphenyls*. Agency for Toxic Substances and Disease Registry. http://www.atsdr.cdc.gov/toxprofiles/tp17.html

ATSDR. 2008. *Soil Comparison Values*. Agency for Toxic Substances and Disease Registry.

Guo YL, Yu M-L, Jsu C-C, Rogan WJ. 1999. Chloracne, goiter, arthritis, and anemia after polychlorinated biphenyl poisoning: 14 year follow-up of the Taiwan Yucheng cohort. *Env. Health Persp. 107:*715-719.

MMSD. 2007. Analytical Report 886210. Prepared by Pace Analytical, Green Bay, Wisconsin, for the Milwaukee Metropolitan Sewage District. July 20, 2007.

Pace. 2007. Pace Analytical, Green Bay WI. Report 886210, proj. PACiw_07113. July 3, 2007.

U.S. EPA. 2007a. *Human Health Risk Assessment, Region III Risk-Based Concentration Table.* U.S. Environmental Protection Agency. http://www.epa.gov/reg3hwmd/risk/human/index.htm

U.S. EPA. 2007b. United States Environmental Protection Agency, Region V. Pollution report, Milwaukee Fertilizer Sites, 5225 W. Vliet St., Milwaukee, WI Tom Cook, OSC, November 07, 2007.

U.S. EPA. 2008. Integrated Risk Information System: Polychlorinated biphenyls (PCBs) (CASRN 1336-36-3). http://www.epa.gov/ncea/iris/subst/0294.htm

U.S. EPA. 2008b. Regional Screening Levels for Chemical Contaminants at Superfund Sites. United States Environmental Protection Agency. http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm

Wisconsin Department of Natural Resources Fish Contaminant Database (1970-2003). Available by request to WDNR

Tables

Table 1. Polychlorinated biphenyl (PCB) concentration of soil from Milwaukee County Parks. Data from the U.S. EPA.

Field, collection date	# samples	# detects ≥0.3 mg/kg	Maximum detected* mg/kg-dry
Burnham, 7/26/2007	26	1	0.32
Carmen, 7/26/2007	9	1	0.52
Custer High School, 7/30/2007	37	1	0.30
Custer, Aug 7-9, 2007**	44	2	1.14
Dyer field, 7/26/2007	31	3	1.80
Division, 7/26/2007	8	1	0.64
Grant, 7/25/2007	28	1	0.31
Hamilton High School, 8/1/2007	28	1	0.45
Hamilton High School, 8/6/2007	24	0	na
Lewis, 7/26/2007	12	1	0.60
Pulaski High School, 8/8/2007	88	1	0.30
Pulaski High School, 7/30/2007	19	5	0.88
Root River Parkway,7/31/2007	10	2	0.59
Sheridan Park, 7/31/2007	11	4	0.60
Sheridan Park, 8/7/2007	88	0	na
Wick, 7/25/2007	77	2	2.72

***27 fields and parks tested; listed only if detection ≥ 0.3mg/kg**
****Several parks were sampled on more than one date.**

Table 2. Calculated worst-case exposure to polychlorinated biphenyl (PCB) among workers handling Milorganite

Calculated PCB exposure from Milorganite dust or from meals at FDA tolerance for PCB residue in food. [1]	Total exposure to PCB from each source	Amount that PCBs in source exceeds worst-case Milorganite exposure.
4 hr breathing 85 ppm PCB in 10mg/m^3 Milorganite dust[2]	3.4 µg	1x
4 hr breathing 2.2 ppm PCB[2] in 10mg/m^3 Milorganite dust	0.09 µg	0.03x
1 cu milk at 1.5 ppm FDA limit	350 µg	103x
6 oz fish at 2 ppm FDA limit	340 µg	100x
6 oz red meat at 3 ppm FDA limit	510 µg	150x

[1]ATSDR. 2000. *Toxicological Profile for Polychlorinated Biphenyls*.
[2]Pace Analytical, Green Bay WI. Report 886210, proj. PACiw_07113. July 3, 2007.
ppm: parts per million
FDA: U.S. Food and Drug Administration

Appendix I.

United States Environmental Protection Agency
Region V
POLLUTION REPORT

Date:Wednesday, November 07, 2007
From:Tom Cook, OSC

To:John Maritote, U.S. EPA ERBMick Hans, U.S. EPA
David Chung, EPARick Karl, U.S.EPA
Linda Nachowicz, U.S. EPAWilliam Messenger, EPA
Afif Marouf, EPAMike Harris, U.S. EPA
Ann Coyle, U.S. EPAPeter Topczewski, MMSD
Laura Schloesser, Milwaukee County ParksAnton Martig, U.S. EPA
John Melby, WDNRMargaret Barrett, MPS
Paul Biedrycki, MPHKendall Moore, U.S. EPA
Brad Benning, U.S. EPAMichelle Watters, ATSDR

Subject: FINAL POLREP
Milwaukee Fertilizer Sites
5225 W. Vliet St., Milwaukee, WI

POLREP No.: 3Site #:B5LB
Reporting Period:08/11/2007 to 10/01/2007D.O. #:
Start Date: 7/24/2007Response Authority:CERCLA
Mob Date: 7/24/2007Response Type:Emergency
Completion Date: 10/1/2007NPL Status:Non NPL
CERCLIS ID #:Incident Category:Removal Assessment
RCRIS ID #:Contract #

Site Description
The Milwaukee Fertilizer Sites are located throughout the City of Milwaukee, Wisconsin. The Sites are located at approximately twenty-five Milwaukee Public School (MPS) Parks and five Milwaukee County Parks (approximately 200 acres total).

The Milwaukee Metropolitan Sewage District (MMSD) produces fertilizer from sewage sludge. MMSD donated fertilizer to the Milwaukee County Parks and MPS. The donated fertilizer was applied at twenty five schools and five county parks located throughout Milwaukee. After the fertilizer had been applied, MMSD discovered that 11 tons of the fertilizer/sludge produced contained polychlorinated biphenyls (PCB) ranging from of 2.2 parts per million (ppm) to as high as 87 ppm. The potentially affected areas

of concern at the schools are football fields, baseball fields, soccer fields, and general lawn areas. The areas of concern at the Milwaukee County parks include multiple-use fields, tot lots, golf courses, and soccer fields.

At the request of Wisconsin Department of Natural Resources (WDNR). The United States Environmental Protection Agency (U.S.EPA) initiated sampling activities at identified "priority" locations that included ten school parks and two county parks. The purpose of the sampling activities is to identify the extent of PCB contamination on the properties. MMSD was to complete sampling at the sites where the fertilizer was spread and conduct any necessary removal actions.

Current Activities

From August 11 to August 14, 2007, MMSD's contractor, URS, completed the sampling protocol at the Milwaukee Fertilizer Sites. In summary, the sampling protocol consisted of the following steps. Initially, all of the sites were divided into 100-foot by 100-foot grids. A 5-point composite sample was collected from each grid and each 5-point composite sample was analyzed for PCBs. Each 100-foot by 100-foot grid that had a total PCB result of greater than or equal to 0.3 ppm was further divided into four 50-foot by 50-foot grids. Five grab samples were then collected from each 50-foot by 50-foot grid (25 grab samples total) and analyzed for total PCBs. All soil samples were collected from a depth of 0 to 3 inches below ground surface. If the removal action level of 1 ppm total PCBs was exceeded, then that grid needed to be remediated. A total of four grids were identified as needing to be remediated as follows:

- Wick Field, Grid JJ3 (10,000 square foot area); 2.7 ppm total PCBs
- Dyer Field, Grid B1 (10,000 square foot area); 1.2 ppm total PCBs
- Dyer Field, Grid C1 northeast quadrant (2,500 square foot area); 1.8 ppm total PCBs
- Custer High School, Grid 1 southeast quadrant (2,500 square foot area); 1.1 ppm total PCBs

Remediation activities at the above four grids occurred from September 10 to 19, 2007. These areas were remediated by excavating the top six inches of soil, stockpiling the soil, and then loading dump trucks from the stockpiled soil pile. All soil was transported to Emerald Park Landfill, Franklin, Wisconsin, for disposal as non-hazardous special waste.

Cleanup was confirmed by collecting a five-point composite sample from the floor of each excavation area. In addition, 4 grab samples (one from each excavated area) were collected at a later date to further confirm cleanup results. All samples contained no detections of PCBs.

Following the excavation activities, each of the four areas remediated was restored to its original condition by restoring the grade with soil backfill and then placing sod over the soil. All backfill soil was sampled and analyzed for PCBs. There were no detections of PCBs in the soil backfill samples.

Planned Removal Actions
None. Removal action is completed.

Next Steps
None.

Key Issues
None.

Estimated Costs *

	Budgeted	Total To Date	Remaining	% Remaining
Extramural Costs				
Intramural Costs				
Total Site Costs	$0.00	$0.00	$0.00	0.00%

* The above accounting of expenditures is an estimate based on figures known to the OSC at the time this report was written. The OSC does not necessarily receive specific figures on final payments made to any contractor(s). Other financial data which the OSC must rely upon may not be entirely up-to-date. The cost accounting provided in this report does not necessarily represent an exact monetary figure which the government may include in any claim for cost recovery.

Disposition of Wastes

Waste Stream	Quantity	Manifest #	Disposal Facility
Non-hazardous Special Waste	650.19 tons	NA	Emerald Park Landfill, Franklin, Wisconsin

www.epaosc.net/MilwaukeeFertilizerSites

CERTIFICATION

This Health Consultation for the PCBs in Milorganite was prepared by the Wisconsin Department of Health Services under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with the approved methodology and procedures existing at the time the Health Consultation was begun. Editorial review was completed by the Cooperative Agreement partner.

Jennifer Freed
Technical Project Officer
CAT, CAPEB, DHAC, ATSDR

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

Alan Yarbrough
Team Leader
CAT, CAPEB, DHAC, ATSDR