April 23, 2024

Dr. Samir Elmir
Environmental Public Health Director
Florida Department of Health in Miami-Dade County
Email: Samir.Elmir@flhealth.gov
Phone: 305-623-3595

Re: Letter Health Consultation: Ferguson Park, Miami, Miami-Dade County, Florida

Dear Dr. Elmir,

The Florida Department of Health (Department), Bureau of Environmental Public Health, is committed to assuring that people, who may be exposed to site-related contamination, have the best information available about the chemical contaminants and potential associated health risk.

We understand that the Department of Health in Miami-Dade (DOH-Miami) is concerned that exposure to arsenic levels found in soil at the Ferguson Park in Miami, Florida may cause a potential health risk for visitors (recreational users) and workers of the park. The Letter Health Consultation focuses on this concern to ensure the health and safety of the public.

Based on the review of available environmental data (soil), the Department concludes that the arsenic soil concentration at the Park does not pose an apparent non-cancer health risk and results in an estimated excess cancer risk over a period of 33 years of approximately 3 or 5 in a million—for workers (landscaper/maintenance) or children and adolescents, respectively.

With arsenic, the greatest concern is always incidental ingestion, which can occur by hand to mouth transfer of soil and soil dust and bringing the soil into the household via soil and soil dust on the shoes, clothes, skin, and pets. It is always good practice to limit soil and soil dust in the household, to limit hand to mouth exposure, and clean pets after they have been outdoors.

The enclosed information describes the site (Ferguson Park) background, methodology, results and discussion, conclusions and recommendations.

If you have any questions or comments concerning this letter, please contact Dr. Gladys A. Liehr at 850-245-4249 or at gladys.liehr@flhealth.gov.

Dr. Gladys A. Liehr, FCCM, CMP, PMP
Bureau Chief, Environmental Public Health

GAL/cdh
Enclosure
cc: Yesina Villalta, Health Officer, DOH-Miami-Dade

LETTER HEALTH CONSULTATION: FERGUSON PARK

Site Background

Ferguson Park is located at SW 146 Street, Miami, Florida 33176. The six-acre park features a multipurpose field, picnic tables and a walkway and is open from sunrise to sunset. Ferguson Park was developed approximately late 1990s and is surrounded by a single-family property zone/neighborhood to the west, north and east; and by a school (Dorothy M. Wallace C.O.P.E. Center) the south (Figure A-1)

Based on aerial images, it seems the park location was formerly used for agricultural purposes till the late 1950s.

Environmental Data Collection

In 2023, the Department of Regulatory and Economic Resources (RER) in Miami-Dade conducted a Phase II Environmental Site Assessment. The purpose of the assessment was to investigate the subsurface soil conditions to identify if any contaminants are present.

Ferguson Park was divided into six sampling sections (Figure A-2) with each section approximately an acre in size. At each section, eight soil borings were conducted collecting a total of 48 soil samples from each sampling interval—surface to 0.5 feet (ft) below surface, 0.5 ft to 2.0 ft, and 2.0 ft to 4.0 ft intervals. Soil samples were analyzed for arsenic, lead, and manganese. A subset of composite samples was also analyzed that included arsenic, chromium, copper, and organochlorine pesticides. Though, the Department only evaluates chemicals and its concentrations from discrete sample events following requirements set by the DEP chapter 62-780, Florida Administrative Code (F.A.C.).

Health Risk Evaluation Methodology

The Department completed this health risk evaluation under the cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR) following ATSDR's public health assessment guidance.

Exposure Pathway Evaluation

The exposure pathway evaluation determines the specific ways people could be exposed to harmful chemicals (another term is contamination). Contamination in the environment can only harm people's health if they have contact with those chemicals (exposure). Without contact or exposure, there is no harm to health from this contamination. If there is contact or exposure, risk of harm to people's health depends on how much of the chemical a person was in contact (concentration) with, how often (frequency), and for how long (duration) they were in contact with it, as well as how toxic the contamination is. Table 1 defines the five elements considered by the Department using ATSDR's exposure pathway analysis as well as the site (Ferguson Park)-specific elements for this evaluation.

ATSDR defines exposure pathways as completed, potential, or eliminated. Exposure pathways are "completed" when all five elements of a pathway are present. Exposure pathways are "potential" when one or more elements of a pathway is missing, but information is not sufficient to eliminate or exclude the element. Exposure pathways are "eliminated" when one or more elements of a pathway is not present (i.e., exposure is not possible).

Completed and potential exposure pathways warrant further evaluation, but their identification does not necessarily mean the exposure will result in harmful health effects.

Table 1: ATSDR's 5 Elements of the Exposure Pathway Analysis.

ATSDR's 5 Elements of the Exposure Pathway Analysis	Site-Specific Elements of the Exposure Pathway Analysis
Contaminant source	Potentially past agricultural use of the land
Environmental fate and transport	Soil
Exposure point	Soil
Exposure route	Dermal contact Incidental ingestion
Potentially exposed population	Visitors Workers

The Department cannot evaluate exposure, when no data exist and therefore, cannot evaluate the likelihood of harmful health effects to the exposed population.

Screening Analysis

To evaluate the risk of harm to people's health from site-related chemicals, the Department evaluates the chemical and its concentrations. The screening analysis involves comparing the maximum detected, site-specific chemical concentrations to environmental media-specific screening levels. These screening levels are specific environmental medium chemical concentrations that are not likely to cause harmful health effects to those exposed. Site-specific chemical concentrations at or below the screening level are not considered for additional health risk evaluation. If a chemical concentration exceeds the screening level, it warrants additional health risk evaluation (see next section on exposure calculations), but it does not mean adverse health effects will necessarily occur.

ATSDR develops different screening levels for noncancer and cancer health effects. When developing noncancer screening levels, ATSDR assumes that only noncancer health effects will occur. When developing cancer screening levels, ATSDR assumes that only cancer health effects will occur. When a contaminant has both a cancer and noncancer screening level, health assessors typically use the lowest of the two levels for screening (except for arsenic because the screening level for cancer is below background[1]).

For this evaluation, the Department used the ATSDR, and non-ASTDR* screening levels outlined in Table 2. [***Note***: If an ATSDR screening level is not available, a non-ATSDR level can be used for the screening analysis.]

The Department only screened and evaluated chemicals and its concentrations from discrete sample events following requirements set by the DEP chapter 62-780, Florida Administrative Code (F.A.C.).

[1] **Background**—refers to the levels of chemicals and radiological elements that exist in the environment prior to the contamination.

Table 2: Screening Levels and Types used to screen chemical concentrations found in soil at Ferguson Park, Miami, Miami-Dade, Florida**.**

Chemical Contaminant	Screening Level (mg/kg)	Screening Level Type
Arsenic	16	ATSDR chronic Environmental Media Evaluation Guides (EMEG)[2] and Reference dose Media Evaluation Guides (RMEGs)[3] for children
Lead	100	U.S. Environmental Protection Agency (EPA) residential soil screening level
Manganese	3,500	DEP residential SCTL

Exposure Calculations

When exposure pathways and chemicals of potential concern have been selected for further evaluation, chemical specific daily exposure doses are estimated to assess the potential risk of human health effects. A daily exposure dose is the amount of a chemical a person is exposed to in their surrounding environment in a day (in milligrams of chemical per kilogram body weight per day [mg/kg/day]). This evaluation calculated daily exposure doses for specific age groups using ATSDR's pre-defined body weights and intake rates, and the chemical concentrations found in the soil.

Non-Cancer evaluation—This evaluation assesses non-cancer health risk from estimated daily exposure doses using health guidelines called minimal risk levels (MRLs) and reference doses (RfDs). MRLs represent estimates of the daily human exposure to a specific chemical that, based on ATSDR evaluations, are not expected to cause non-cancer health effects during a specified exposure duration. RfDs represent estimates of daily oral exposures to a chemical not likely to have a noticeable risk of harmful effects to the general human population, including sensitive subgroups, during a lifetime[4] of exposure.

For arsenic, the MRL was derived for chronic (365 days or longer) exposure durations.

We evaluate the potential for non-cancer health risk from exposure to a chemical by calculating a hazard quotient (HQ) (Equation 1). The HQ is calculated by dividing the maximum site- and media-specific chemical concentration by its respective MRL:

- A HQ less than 1 indicates that a non-cancer health risk is unlikely.
- A HQ greater than 1 means there is an exceedance of the non-cancer health guideline, and a further in-depth toxicological effects analysis shall be conducted.

$$\mathbf{HQ = D/MRL}$$

HQ = Hazard Quotient

D = Exposure Dose (mg/kg/day)

MRL = Minimal Risk Level (mg/kg/day)

Equation 1: Hazard Quotient calculation

[2] **EMEG** - Represent estimated contaminant concentrations below which humans exposed during a specific timeframe (acute, intermediate, or chronic) are not expected to experience noncarcinogenic health effects.
[3] **RMEG** - Represent the concentration in a specific medium (e.g., water, soil) at which daily human exposure for a chronic duration is unlikely to result in noncarcinogenic effects.
[4] The Department used an average life expectancy of 78 years for adults (both, males and females).

Cancer evaluation—ATSDR calculates a population's excessed cancer risk estimate for cancer-causing chemicals using available cancer risk values published by EPA. EPA cancer risk values include oral cancer slope factors (CSFs) and inhalation unit risks (IURs). In general, the Departments health risk evaluation uses EPA's approach for estimating a theoretical excessed risk of developing cancer in the exposed population by multiplying a chemical-specific CSF by the estimated daily exposure dose (Equation 2).

$$\mathbf{CR = CFS \times D}$$

CFS = Cancer Slope Factor

CR = Cancer Risk

D = Exposure Dose (mg/kg/day)

Equation 2: Cancer Risk calculation

Results and Discussion

Exposure Pathways

Ferguson Park is used for recreational activities. Visitors of the park could be exposed to chemicals in the surface soil. Planned park improvements could have workers being exposed to chemicals in surface (0.5 ft to 2.0 ft) and subsurface soil (2.0 ft and deeper). Both, visitors and workers may be exposed to the chemicals in soil through dermal contact and/or incidental ingestions of soil particles.

The Department cannot evaluate past exposure as no environmental data exist. Therefore, the Department cannot evaluate the likelihood of harmful health effects to visitors and workers from arsenic in soil at Ferguson Park from the past.

Screening Analysis

Induvial soil samples were analyzed for arsenic, lead, and manganese. Testing results for these chemicals, as well as their respective screening levels (ATSDR, DEP, and EPA) are shown in Tables B-1A through B-1F.

Arsenic—Based on the environmental information provided, it seems that the available soil data for arsenic contain a few very high arsenic concentrations corresponding to local hot spots of contamination (Tables B-1A through B-1F). The Department assessed that the 95th Upper Confidence Level (UCL) rather than the maximum individual concentration is providing a reasonable estimate of the arsenic concentration likely to be contacted over time. Therefore, the 95th UCL was used for screening and further health risk evaluations of arsenic levels founds in soil at the Park. The estimated 95th UCL for each sampling section and soil interval are summarized in Table B-2.

The highest 95th UCL of 13.31 mg/kg arsenic was estimated in the first 0 – 0.5 ft soil in sampling section 5 and is below the recommended screening levels set by ATSDR of 16 mg/kg[5] for children (Table B-2). If a person is exposed to a concentration below or at the ATSDR respective screening level, it is not likely to result in adverse non-cancer health effects.

Arsenic is classified as a carcinogen (cancer causing) and therefore considered as a chemical of potential concern for soil exposure for further health risks evaluation.

[5] mg/kg – milligram per kilogram

Arsenic Background Levels in Florida—Environmental data provided included an evaluation of background arsenic levels concluding that the arsenic levels in Ferguson Park are not background. It is the Department's understanding that the park area was former agricultural land which may could also cause some higher arsenic background levels.

Measurable levels of arsenic can be found in soil and sand throughout the world. Some areas of the United States contain high natural arsenic levels in rock which can lead to high levels in soil or water. The naturally occurring background levels of arsenic in Florida soil varies between 0.01 and 50.6 mg/kg, depending on location (Chen at all, 1999[6]).

Chen et al. (1999) found correlations between the soil texture and the background levels. Most of Florida has sandy soils and will have a lower amount of arsenic present, such as found in the areas of the discussed background samples. However, the soil at Ferguson Park consists mainly of clay and organic texture [USDA, 2024[7]] and could contain higher arsenic background levels than the levels identified with the environmental data provided.

A Miami-Dade County, Department of Regulatory and Economic Resources, Environmental Monitoring and Restoration Division background study for Miami-Dade county determined that arsenic concentration of 10.6 mg/kg (95th UCL) analyzed in soil sampled south of SW 88th Street, are the arsenic background levels for the area [RER, 2014[8]].

Lead—The highest lead concentration of 57.6 mg/kg in soil at Ferguson Park is below the EPAs residential screening level of 100 mg/kg (Table B1-C).

Therefore, lead is not considered a chemical of potential concern and further evaluated.

Manganese—The highest concentration of manganese of 183 mg/kg in soil at Ferguson Park is below the DEPs residential SCTL of 3,500 mg/kg (Table B1-A).

Therefore, manganese is not considered a chemical of potential concern and further evaluated.

Estimated Exposures and Health Risk

Health risk evaluations were conducted for visitors and workers potentially exposed to arsenic in soil at Ferguson Park. Both, visitors and workers may be exposed to the chemicals in soil through dermal contact and/or incidental ingestions of soil particles.

Arsenic—The highest 95th UCL of 13.31 mg/kg arsenic in soil at the Park is below its respective screening levels. Though, arsenic is classified as a carcinogen (cancer causing) and therefore considered as a chemical of potential concern for soil exposure for further health risks evaluation:

> The Department used health risk assessment input parameters and exposure factors identified in Tables B-3 and B-4 to evaluate potential health impacts.
>
> As the bioavailability of arsenic in soil is dependent on the physical and chemical characteristics of the soil, we also used a Florida specific arsenic bioavailability factor of 33% [FDEP 2005[9]].
>
> The 95th UCL of 13.31 mg/kg for arsenic was used to calculate a daily dose for children, adolescences and adults including workers who are exposed to arsenic in soil when

[6] Chen, Ming, Ma, Lena Q., Harris, Willie G. (1999). Baseline concentration of 15 trace elements in Florida surface soil. Journal of Environmental Quality. Volume 28, No 4. 1173-1181.

[7] [USDA] United States Department of Agriculture (2024). https://websoilsurvey.nrcs.usda.gov/ [Accessed March 2024].

[8] [RER] Miami-Dade County Department of Regulatory and Economic Resources. 2014. Memorandum from Wilbur Mayorga: Miami-Dade County Anthropogenic Background Study

[9] [FDEP] Florida Department of Environmental Protection. 2005. Technical Report: Development of Cleanup Target Levels (CTLs) For Chapter 62-777, F.A.C.

visiting Ferguson Park 3 days a week, 50 weeks a year, for 14 years (25 years for workers).

The calculated daily exposure doses for visitors and workers exposed to arsenic in soil at Ferguson Park are below the minimal risk level (MRL) set by ATSDR of 0.0003 mg/kg/day[10] (Tables B-5 and B-6). A daily exposure dose is the average amount of the chemical concentration a person is exposed to daily. Per ATSDR, if exposure is below a MRL, it is not expected to result in adverse health effects.

Daily exposure to 13.31 mg/kg of arsenic results in an estimated excess cancer risk over a period of 33 years of approximately 3 or 5 in a million—for workers (landscaper / maintenance), or children and adolescents, respectively (Tables B-5 and B-6). To put this into context, the American Cancer Society estimates that one out of every two men (or 500,000 in a million men) and one out every three women (or 333,333 in a million women) will develop some type of cancer in their lifetime. Adding the excess cancer risk from exposure to the highest 95th UCL level of arsenic (13.31 mg/kg) in the soil at the Park would increase the cancer incidences for men from 500,000 in a million to 500,001 in a million and for women from 333,333 in a million to 333,334 in a million.

Lead and manganese—Lead and manganese concentrations found in soil at Ferguson Park were below their respective screening levels and not considered for further health risk evaluations. If a person is exposed to a concentration below or at the respective screening level, it is not likely to result in adverse non-cancer health effects.

Conclusions and Recommendations

The Department concludes that arsenic levels at Ferguson Park could potentially be background levels due to agricultural application in the past.

Using ATSDRs health evaluation guidance, the Department further concludes that the arsenic soil concentration at Ferguson Park do not pose an apparent non-cancer health risk and results in an estimated excess cancer risk over a period of 33 years of approximately 3 or 5 in a million—for workers (landscaper/maintenance) or children and adolescents, respectively.

With arsenic, the greatest concern is always incidental ingestion, which can occur by hand to mouth transfer of soil and soil dust and bringing the soil into the household via soil and soil dust on the shoes, clothes, skin, and pets. It is always good practice to limit soil and soil dust in the household, to limit hand to mouth exposure, and clean pets after they have been outdoors. Please see attached (Attachment C) further guidance by ATSDR on “How to reduce exposure to chemicals at home, work, and play.”[11]

It was discussed that the available soil data seem to contain a few very high arsenic concentrations corresponding to local hot spots of contamination and therefore, the 95th UCL rather than the maximum concentration was used for this health evaluation. It was further discussed that using the maximum 95th UCL of 13.31 mg/kg for the entire park rather than evaluating each sampling section and soil depth individually, is a protective approach and may overestimate the potential risk. However, remediation of the few hotspots of contamination that exceed ATSDRs screening value of 16 mg/kg (surface soil samples 0 – 2.0 feet identified as: SB01-08, SB02-08, SB04-02, SB05-05) and are accessible to the public and workers should be considered.

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[10] mg/kg/day - milligram per kilogram per day

[11] [ATSDR] Agency for Toxic Substances and Disease Registry (Unknown). How to reduce your exposure to chemicals at home, work, and play. [Accessed March 2024] https://www.atsdr.cdc.gov/emes/public/docs/How%20to%20Reduce%20Your%20Exposure%20to%20chemicals%20at%20home%20work%20and%20play%20fs.pdf

ATTACHMENT A

Figure A-1: Location of Ferguson Park (Miami, Miami-Dade County, Florida) and surroundings.

Figure A-2: Sampling sections and soil boring locations, Ferguson Park, Miami-Dade County, Florida.

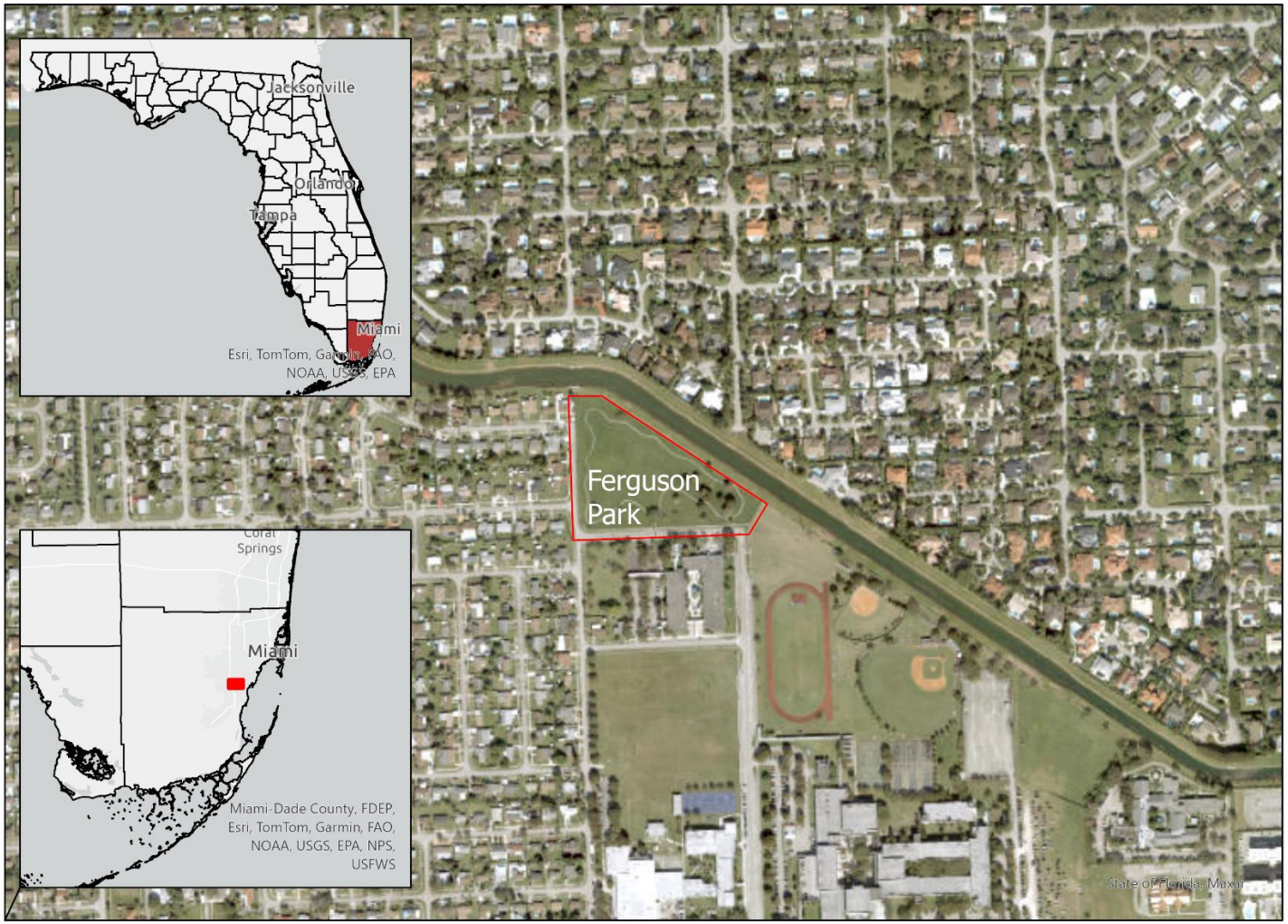


Figure A-1: Location of Ferguson Park (Miami, Miami-Dade County, Florida) and surroundings.

Figure A-2: Sampling sections and soil boring locations, Ferguson Park, Miami-Dade County, Florida.

ATTACHMENT B

Table B-1A: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 1 Ferguson Park, Miami, Miami-Dade County, Florida.

Table B-1B: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 2 Ferguson Park, Miami, Miami-Dade County, Florida.

Table B-1C: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 3 Ferguson Park, Miami, Miami-Dade County, Florida.

Table B-1D: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 4 Ferguson Park, Miami, Miami-Dade County, Florida.

Table B-1E: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 5 Ferguson Park, Miami, Miami-Dade County, Florida.

Table B-1F: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 6 Ferguson Park, Miami, Miami-Dade County, Florida.

Table B-2: Arsenic concentration in soil at Ferguson Park. Minimum and maximum concentration, as well as 95th Upper Confidence Level (UCL).

Table B-3: Contaminant information used to calculate soil (dermal and incidental ingestion) exposure estimates for visitors and workers.

Table B-4A: Input parameters and exposure factors used to calculate soil (dermal and incidental ingestion) exposure estimates for visitors.

Table B-4B: Input parameters and exposure factors used to calculate soil (dermal and incidental ingestion) exposure estimates for workers.

Table B-5: Estimated chronic duration exposure doses, non-cancer health risk (hazard quotients), and excess cancer risk for visitors exposed to highest 95th UCL ***ARSENIC*** concentration (13.31 mg/kg) in soil at Ferguson Park, Miami-Dade County, Florida, via a combined exposure (dermal and incidental ingestion).

Table B-6: Estimated chronic duration exposure doses, non-cancer health risk (hazard quotients), and excess cancer risk for workers exposed to highest 95th UCL ***ARSENIC*** concentration (13.31 mg/kg) in soil at Ferguson Park, Miami-Dade County, Florida, via a combined exposure (dermal and incidental ingestion).

Table B-1A: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 1 Ferguson Park, Miami, Miami-Dade County, Florida.

Sampling Section	Boring Number	Soil Interval (feet)	Arsenic (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)
1	SB01-1	0 - 0.5	3.7	NS	NS
		0.5 - 2.0	6.2	NS	NS
		2.0 - 4.0	0.99	NS	NS
	SB01-2	0 - 0.5	5	NS	NS
		0.5 - 2.0	1.2	NS	NS
		2.0 - 4.0	1.3	NS	NS
	SB01-3	0 - 0.5	3.5	NS	NS
		0.5 - 2.0	9.3	NS	NS
		2.0 - 4.0	1.2	NS	NS
	SB01-4	0 - 0.5	7.8	NS	NS
		0.5 - 2.0	2.2	NS	NS
		2.0 - 4.0	1.5	NS	NS
	SB01-5	0 - 0.5	4.5	28.7	90.6
		0.5 - 2.0	8.1	42.3	163
		2.0 - 4.0	6.3	43.3	183
	SB01-6	0 - 0.5	8.5	NS	NS
		0.5 - 2.0	9.9	NS	NS
		2.0 - 4.0	1.2	NS	NS
	SB01-7	0 - 0.5	6.4	NS	NS
		0.5 - 2.0	5.2	NS	NS
		2.0 - 4.0	7.7	NS	NS
	SB01-8	0 - 0.5	14.7	NS	NS
		0.5 - 2.0	22.7	NS	NS
		2.0 - 4.0	1.6	NS	NS
Screening Level			**16** ***ATSDR****	**100** ***EPA****	**3,500** ***DEP****

NS – Not sampled
U – Below laboratory detection limit

***Note:**

ATSDR Chronic Environmental Media Evaluation Guides (EMEG)[1] and Reference dose Media Evaluation Guides (RMEGs)[2] for children

DEP Residential soil cleanup target level (SCTL)

EPA Residential soil screening level

[1] **EMEG** - Represent estimated contaminant concentrations below which humans exposed during a specific timeframe (acute, intermediate, or chronic) are not expected to experience noncarcinogenic health effects.
[2] **RMEG** - Represent the concentration in a specific medium (e.g., water, soil) at which daily human exposure for a chronic duration is unlikely to result in noncarcinogenic effects.

Table B-1B: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 2 Ferguson Park, Miami, Miami-Dade County, Florida.

Sampling Section	Boring Number	Soil Interval (feet)	Arsenic (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)
2	SB02-1	0 - 0.5	4.6	NS	NS
		0.5 - 2.0	8.1	NS	NS
		2.0 - 4.0	1.1	NS	NS
	SB02-2	0 - 0.5	9.5	NS	NS
		0.5 - 2.0	11.8	NS	NS
		2.0 - 4.0	3.1	NS	NS
	SB02-3	0 - 0.5	3.7	NS	NS
		0.5 - 2.0	6.4	NS	NS
		2.0 - 4.0	1.2	NS	NS
	SB02-4	0 - 0.5	5.1	NS	NS
		0.5 - 2.0	10.3	NS	NS
		2.0 - 4.0	2.5	NS	NS
	SB02-5	0 - 0.5	5.3	NS	NS
		0.5 - 2.0	1	NS	NS
		2.0 - 4.0	1.6	NS	NS
	SB02-6	0 - 0.5	7.6	NS	NS
		0.5 - 2.0	1.1	NS	NS
		2.0 - 4.0	1.3	NS	NS
	SB02-7	0 - 0.5	0.31 U	NS	NS
		0.5 - 2.0	4.6	NS	NS
		2.0 - 4.0	9.4	NS	NS
	SB02-8	0 - 0.5	5.4	NS	NS
		0.5 - 2.0	17.7	NS	NS
		2.0 - 4.0	1.4	NS	NS
Screening Level			**16** ***ATSDR****	**100** ***EPA****	**3,500** ***DEP****

NS – Not sampled
U – Below laboratory detection limit

***Note:**

ATSDR Chronic Environmental Media Evaluation Guides (EMEG) and Reference dose Media Evaluation Guides (RMEGs) for children

DEP Residential soil cleanup target level (SCTL)

EPA Residential soil screening level

Table B-1C: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 3 Ferguson Park, Miami, Miami-Dade County, Florida.

Sampling Section	Boring Number	Soil Interval (feet)	Arsenic (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)
3	SB02-1	0 - 0.5	11.9	NS	NS
		0.5 - 2.0	1.4	NS	NS
		2.0 - 4.0	0.36 U	NS	NS
	SB02-2	0 - 0.5	5	NS	NS
		0.5 - 2.0	6.1	NS	NS
		2.0 - 4.0	1.1	NS	NS
	SB02-3	0 - 0.5	6.6	NS	NS
		0.5 - 2.0	7.7	NS	NS
		2.0 - 4.0	0.37 U	NS	NS
	SB02-4	0 - 0.5	5.6	NS	NS
		0.5 - 2.0	3.3	NS	NS
		2.0 - 4.0	6.2	NS	NS
	SB02-5	0 - 0.5	6.9	57.6	115
		0.5 - 2.0	0.37 U	0.37 U	29.4
		2.0 - 4.0	0.35 U	1.1	3.8
	SB02-6	0 - 0.5	9.5	NS	NS
		0.5 - 2.0	8.9	NS	NS
		2.0 - 4.0	0.8	NS	NS
	SB02-7	0 - 0.5	4.2	NS	NS
		0.5 - 2.0	7.8	NS	NS
		2.0 - 4.0	2.9	NS	NS
	SB02-8	0 - 0.5	15.9	NS	NS
		0.5 - 2.0	0.94	NS	NS
		2.0 - 4.0	11.9	NS	NS
Screening Level			**16** ***ATSDR****	**100** ***EPA****	**3,500** ***DEP****

NS – Not sampled
U – Below laboratory detection limit

***Note:**

ATSDR Chronic Environmental Media Evaluation Guides (EMEG) and Reference dose Media Evaluation Guides (RMEGs) for children

DEP Residential soil cleanup target level (SCTL)

EPA Residential soil screening level

Table B-1D: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 4 Ferguson Park, Miami, Miami-Dade County, Florida.

Sampling Section	Boring Number	Soil Interval (feet)	Arsenic (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)
4	SB02-1	0 - 0.5	3.3	NS	NS
		0.5 - 2.0	14.1	NS	NS
		2.0 - 4.0	1.3	NS	NS
	SB02-2	0 - 0.5	2.3	NS	NS
		0.5 - 2.0	17.2	NS	NS
		2.0 - 4.0	1.1	NS	NS
	SB02-3	0 - 0.5	6.5	NS	NS
		0.5 - 2.0	9.4	NS	NS
		2.0 - 4.0	1.1	NS	NS
	SB02-4	0 - 0.5	4.9	NS	NS
		0.5 - 2.0	3.7	NS	NS
		2.0 - 4.0	3.2	NS	NS
	SB02-5	0 - 0.5	3.4	NS	NS
		0.5 - 2.0	3.6	NS	NS
		2.0 - 4.0	5.7	NS	NS
	SB02-6	0 - 0.5	5.4	NS	NS
		0.5 - 2.0	9.5	NS	NS
		2.0 - 4.0	29.3	NS	NS
	SB02-7	0 - 0.5	8.7	NS	NS
		0.5 - 2.0	2.2	NS	NS
		2.0 - 4.0	1.7	NS	NS
	SB02-8	0 - 0.5	5.2	NS	NS
		0.5 - 2.0	12.6	NS	NS
		2.0 - 4.0	10.1	NS	NS
Screening Level			**16** ***ATSDR****	**100** ***EPA****	**3,500** ***DEP****

NS – Not sampled
U – Below laboratory detection limit

***Note:**

ATSDR Chronic Environmental Media Evaluation Guides (EMEG) and Reference dose Media Evaluation Guides (RMEGs) for children

DEP Residential soil cleanup target level (SCTL)

EPA Residential soil screening level

Table B-1E: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 5 Ferguson Park, Miami, Miami-Dade County, Florida.

Sampling Section	Boring Number	Soil Interval (feet)	Arsenic (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)
5	SB02-1	0 - 0.5	7	NS	NS
		0.5 - 2.0	15.4	NS	NS
		2.0 - 4.0	1.8	NS	NS
	SB02-2	0 - 0.5	6.2	NS	NS
		0.5 - 2.0	6.6	NS	NS
		2.0 - 4.0	9.7	NS	NS
	SB02-3	0 - 0.5	6.2	NS	NS
		0.5 - 2.0	5.5	NS	NS
		2.0 - 4.0	6	NS	NS
	SB02-4	0 - 0.5	13	NS	NS
		0.5 - 2.0	6.4	NS	NS
		2.0 - 4.0	4	NS	NS
	SB02-5	0 - 0.5	20.9	NS	NS
		0.5 - 2.0	7.9	NS	NS
		2.0 - 4.0	2.6	NS	NS
	SB02-6	0 - 0.5	7.2	NS	NS
		0.5 - 2.0	4.9	NS	NS
		2.0 - 4.0	1.7	NS	NS
	SB02-7	0 - 0.5	11	NS	NS
		0.5 - 2.0	2.8	NS	NS
		2.0 - 4.0	2.5	NS	NS
	SB02-8	0 - 0.5	7.9	NS	NS
		0.5 - 2.0	9.7	NS	NS
		2.0 - 4.0	0.94	NS	NS
Screening Level			**16** ***ATSDR****	**100** ***EPA****	**3,500** ***DEP****

NS – Not sampled
U – Below laboratory detection limit

***Note:**

ATSDR Chronic Environmental Media Evaluation Guides (EMEG) and Reference dose Media Evaluation Guides (RMEGs) for children

DEP Residential soil cleanup target level (SCTL)

EPA Residential soil screening level

Table B-1F: Concentrations of arsenic, lead and manganese in surface (0 – 0.5 feet and 0.5 – 2.0 feet) and subsurface (2.0 – 4.0 feet) soil collected at sampling section 6 Ferguson Park, Miami, Miami-Dade County, Florida.

Sampling Section	Boring Number	Soil Interval (feet)	Arsenic (mg/kg)	Lead (mg/kg)	Manganese (mg/kg)
6	SB02-1	0 - 0.5	6.5	NS	NS
		0.5 - 2.0	8	NS	NS
		2.0 - 4.0	13.7	NS	NS
	SB02-2	0 - 0.5	9.1	NS	NS
		0.5 - 2.0	2.6	NS	NS
		2.0 - 4.0	2	NS	NS
	SB02-3	0 - 0.5	5.2	NS	NS
		0.5 - 2.0	6.9	NS	NS
		2.0 - 4.0	4.7	NS	NS
	SB02-4	0 - 0.5	6.6	NS	NS
		0.5 - 2.0	6.9	NS	NS
		2.0 - 4.0	12	NS	NS
	SB02-5	0 - 0.5	7	NS	NS
		0.5 - 2.0	5.9	NS	NS
		2.0 - 4.0	6.3	NS	NS
	SB02-6	0 - 0.5	9.1	NS	NS
		0.5 - 2.0	4.5	NS	NS
		2.0 - 4.0	2.5	NS	NS
	SB02-7	0 - 0.5	5	NS	NS
		0.5 - 2.0	10.1	NS	NS
		2.0 - 4.0	4.7	NS	NS
	SB02-8	0 - 0.5	5.5	NS	NS
		0.5 - 2.0	9.9	NS	NS
		2.0 - 4.0	3.1	NS	NS
Screening Level			**16** ***ATSDR****	**100** ***EPA****	**3,500** ***DEP****

NS – Not sampled
U – Below laboratory detection limit

***Note:**

ATSDR Chronic Environmental Media Evaluation Guides (EMEG) and Reference dose Media Evaluation Guides (RMEGs) for children

DEP Residential soil cleanup target level (SCTL)

EPA Residential soil screening level

Table B-2: Arsenic concentration in soil at Ferguson Park. Minimum and maximum concentration, as well as 95th Upper Confidence Level (UCL).

Soil Interval (feet)	**0 – 0.5**			**0.5 – 2.0**			**2.0 – 4.0**		
Sampling Section	**Min**	**Max**	**95th UCL***	**Min**	**Max**	**95th UCL***	**Min**	**Max**	**95th UCL***
1	3.50	14.70	**9.25**	1.20	22.70	**12.57**	0.99	7.70	**7.70*** **
2	3.70	9.50	**7.03**	1.00	17.70	**11.41**	1.10	9.40	**4.57**
3	4.20	15.90	**10.88**	0.94	8.90	**7.56**	0.80	6.20	**2.96**
4	2.30	8.70	**6.32**	2.20	17.20	**12.71**	1.10	29.30	**13.15**
5	6.20	20.90	**13.31**	2.80	15.40	**9.96**	0.94	9.70	**5.6**
6	5.00	9.10	**7.83**	2.60	10.10	**8.53**	2.00	13.70	**9.07**
ATSDR Screening Level (mg/kg)**	**16**								

* UCL calculation conducted using ProUCL 5.2 by the U.S. Environmental Protection Agency

** Chronic Environmental Media Evaluation Guides (EMEG)[3] and Reference dose Media Evaluation Guides (RMEGs)[4] for children

*** No recommended 95th UCL could be calculated. Use maximum concentration.

Maximum 95th UCL concentration used for this health evaluation.

[3] **EMEG** - Represent estimated contaminant concentrations below which humans exposed during a specific timeframe (acute, intermediate, or chronic) are not expected to experience noncarcinogenic health effects.

[4] **RMEG** - Represent the concentration in a specific medium (e.g., water, soil) at which daily human exposure for a chronic duration is unlikely to result in noncarcinogenic effects.

Table B-3: Contaminant information used to calculate soil (dermal and incidental ingestion) exposure estimates for visitors and workers.

Contaminant Information

Contaminant Name	Entered Concentration	EPC Type	Converted Concentration*	Dermal Absorption Fraction	ABS_{GI}	Bioavailability Factor
Arsenic	13.31 mg/kg	95% UCL of the mean	13.31 mg/kg	0.03	1	0.33

Abbreviations: ABS_{GI} = gastrointestinal absorption factor; EPC = exposure point concentration; mg/kg = milligram chemical per kilogram soil; mg/kg = milligrams per kilogram; UCL = upper confidence limit

* Contaminant concentration converted to standard unit for calculating exposure.

Table B-4A: Input parameters and exposure factors used to calculate soil (dermal and incidental ingestion) exposure estimates for visitors.

Site-specific Exposure Factors

Duration Category	Days per Week	Weeks per Year	Years	Exposure Group Specific $EF_{noncancer}$	Exposure Group Specific* EF_{cancer}
Acute	-	-	-	1	-
Intermediate	3	50	-	0.43	-
Chronic	3	50	14	0.41	= $EF_{noncancer}$ x Exposure Duration for $Cancer_{Exposure\ Group}$ (years) ÷ 78 years
Pica	3	-	-	0.43	-

Abbreviations: EF = exposure factor; NC = not calculated
Note: The dermal absorbed dose equation includes 1 event/day EF parameter.
* Cancer risk is averaged over a lifetime of exposure (78 years).

Site-specific Exposure Parameters

Exposure Group	Body Weight (kg)	Exposure Duration (years)	Intake Rate (mg/day)	Soil-pica Intake Rate (mg/day)	Adherence Factor to Skin (mg/cm^2/event)	Combined Skin Surface Area (cm^2)
Birth to < 1 year	7.8	1	150	-	0.2	1,772
1 to < 2 years	11.4	1	200	5,000	0.2	2,299
2 to < 6 years	17.4	4	200	5,000	0.2	2,592
6 to < 11 years	31.8	5	200	-	0.2	3,824
11 to < 16 years	56.8	3	100	-	0.2	5,454
16 to < 21 years	71.6	0	100	-	0.2	6,083
Total Child (all age groups)	-	14	-	-	-	-
Adult	80	14	100	-	0.07	6,030

Abbreviations: cm^2 = centimeters square skin; kg = kilograms; mg/cm^2/event = milligram chemical per centimeter square of skin per event; mg/day = milligram soil per day

Table B-4B: Input parameters and exposure factors used to calculate soil (dermal and incidental ingestion) exposure estimates for workers.

Site-specific Exposure Factors

Duration Category	Days per Week	Weeks per Year	Years	Exposure Group Specific $EF_{noncancer}$	Exposure Group Specific* EF_{cancer}
Acute	-	-	-	1	-
Intermediate	3	50	-	0.43	-
Chronic	3	50	25	0.41	= $EF_{noncancer}$ x Exposure Duration for $Cancer_{Exposure\ Group}$ (years) ÷ 78 years

Abbreviations: EF = exposure factor; NC = not calculated

Note: The dermal absorbed dose equation includes 1 event/day EF parameter.

* Cancer risk is averaged over a lifetime of exposure (78 years).

Site-specific Exposure Parameters

Exposure Group	Body Weight (kg)	Exposure Duration (years)	Intake Rate (mg/day)	Adherence Factor to Skin (mg/cm^2/event)	Combined Skin Surface Area (cm^2)	Notes
Workers - outdoor (low intensity soil contact)	80.6	25	100	0.07	3,470	-

Abbreviations: cm^2 = centimeters square skin; kg = kilograms; mg/cm^2/event = milligram chemical per centimeter square of skin per event; mg/day = milligram soil per day

Table B-5: Estimated chronic duration exposure doses, non-cancer health risk (hazard quotients), and excess cancer risk for visitors exposed to highest 95th UCL ***ARSENIC*** concentration (13.31 mg/kg) in soil at Ferguson Park, Miami-Dade County, Florida, via a combined exposure (dermal and incidental ingestion).

PHAST PUBLIC HEALTH ASSESSMENT SITE TOOL **Exposure Group**	**Dose (mg/kg/day)**	**Hazard Quotient (Noncancer)**	**Excess Cancer Risk**	**Exposure Duration (Years)**
Birth to < 1 year	4.2E-05	0.14	-	1
1 to < 2 years	3.8E-05	0.13	-	1
2 to < 6 years	2.6E-05	0.085	-	4
6 to < 11 years	1.5E-05	0.051	-	5
11 to < 16 years	6.3E-06	0.021	-	3
16 to < 21 years	5.3E-06	0.018	-	0
Total Child	-	-	5.4E-6 ‡	14
Adult	3.1E-06	0.010	8.4E-7	14

Source: Department of Regulatory and Economic Resources (RER). 2023. Phase II Environmental Site Assessment Report

Abbreviations: mg/kg/day = milligram chemical per kilogram body weight per day; mg/kg = milligram chemical per kilogram soil;

* The calculations in this table were generated using ATSDR's PHAST v2.4.1.0. The noncancer hazard quotients were calculated using the EPC: 13.3 mg/kg and chronic (greater than 1 year) minimal risk level of 0.0003 mg/kg/day and the cancer risks were calculated using the cancer slope factor of 1.5 $(mg/kg/day)^{-1}$.

‡ Indicates that the cancer risk exceeds one extra case in a million people similarly exposed, which ATSDR evaluates further.

Table B-6: Estimated chronic duration exposure doses, non-cancer health risk (hazard quotients), and excess cancer risk for workers exposed to highest 95th UCL ***ARSENIC*** concentration (13.31 mg/kg) in soil at Ferguson Park, Miami-Dade County, Florida, via a combined exposure (dermal and incidental ingestion).

PHAST PUBLIC HEALTH ASSESSMENT SITE TOOL **Exposure Group**	**Dose (mg/kg/day)**	**Hazard Quotient (Noncancer)**	**Excess Cancer Risk**	**Exposure Duration (Years)**
Workers - outdoor (low intensity soil contact)	2.7E-06	0.0091	1.3E-6 ‡	25

Source: Department of Regulatory and Economic Resources (RER). 2023. Phase II Environmental Site Assessment Report

Abbreviations: mg/kg/day = milligram chemical per kilogram body weight per day; mg/kg = milligram chemical per kilogram soil; yrs = years

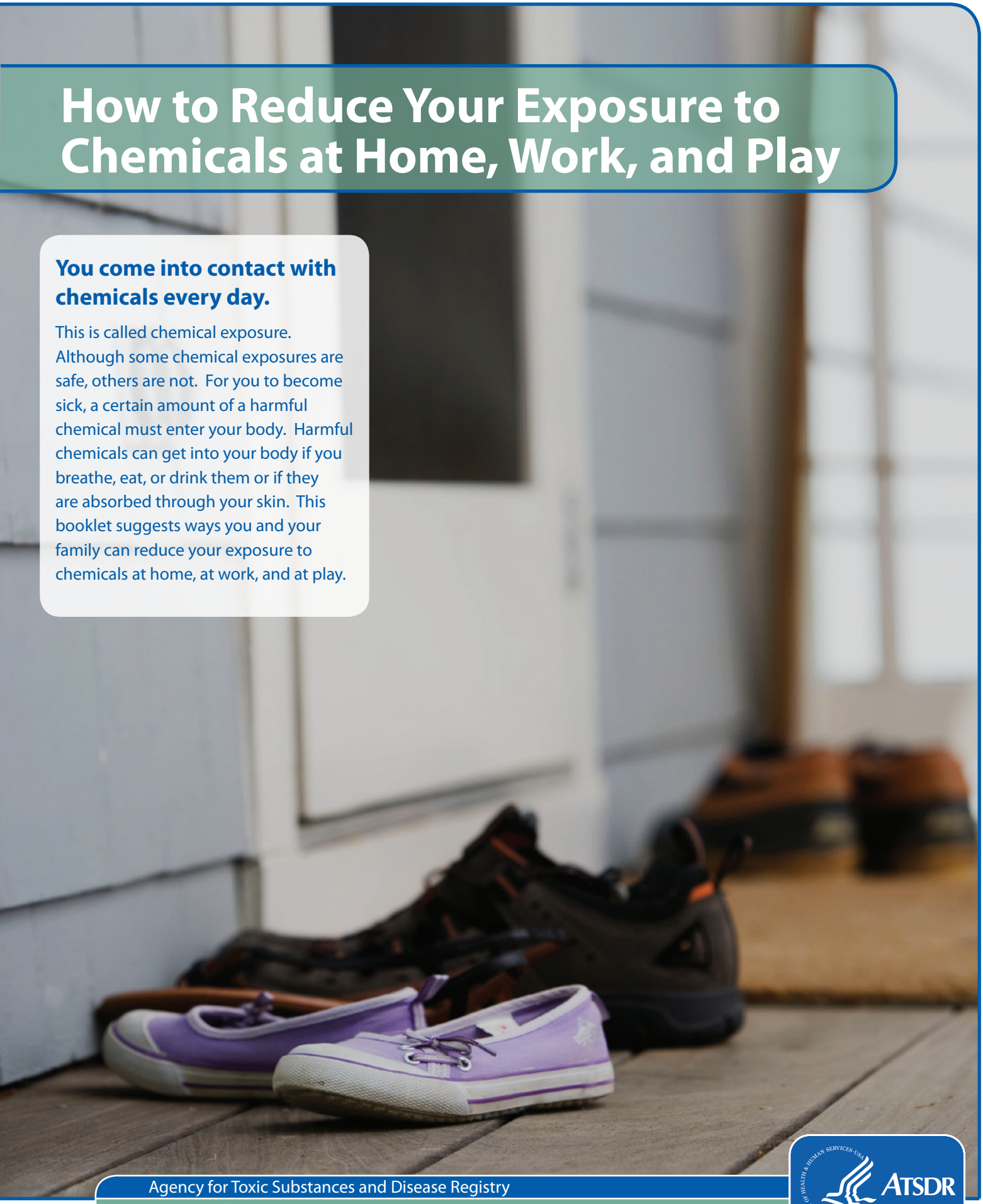
* The calculations in this table were generated using ATSDR's PHAST v2.3.0.0. The noncancer hazard quotients were calculated using the EPC: 13.3 mg/kg and chronic (greater than 1 year) minimal risk level of 0.0003 mg/kg/day and the cancer risks were calculated using the cancer slope factor of 1.5 $(mg/kg/day)^{-1}$.

‡ Indicates that the cancer risk exceeds one extra case in a million people similarly exposed, which ATSDR evaluates further.

ATTACHMENT C

ATSDR—How to Reduce Your Exposure to Chemicals at Home, Work, and Play

How to Reduce Your Exposure to Chemicals at Home, Work, and Play



You come into contact with chemicals every day.

This is called chemical exposure. Although some chemical exposures are safe, others are not. For you to become sick, a certain amount of a harmful chemical must enter your body. Harmful chemicals can get into your body if you breathe, eat, or drink them or if they are absorbed through your skin. This booklet suggests ways you and your family can reduce your exposure to chemicals at home, at work, and at play.

Agency for Toxic Substances and Disease Registry
Division of Health Assessment and Consultation

ATSDR

CS214865-C

At Home

You should be aware of possible dangers in your house, including possible exposure to chemicals. You can do many things around your house to reduce or prevent exposures to hazardous substances.

Be Aware of Possible Dangers Around the House

If your house was built before 1970, it may have been built with materials that contain asbestos, mercury, or lead. Asbestos can be found in insulation, wiring, and roof or siding shingles. Mercury is frequently found in old thermostats and old light switches. Lead is sometimes found in old plumbing and paint.

If you are remodeling your home, do so safely. Find out if you have asbestos, mercury, or lead in your home before you start. Many counties require permits for remodeling. The permit office should offer help on how to safely remodel your home. Your health department may test water or dust for lead. An inspection may also tell you if your house has hazardous materials.

Removing hazardous materials requires special care and often special training and equipment. Learn how to handle, remove, and dispose of these materials safely, or hire professionals. Professionals have the right equipment, personal protective gear, and training to do the job safely.

- For asbestos, hire a professional contractor who specializes in asbestos removal.
- For mercury thermostats, hire a heating, ventilation, and air conditioning (HVAC) specialist.

Use Cleaning Products Safely

Many cleaning products give off fumes that you should not breathe in. Some can burn or irritate your skin and eyes. Most are poisonous if swallowed. To protect you and your family from harm,

- Make sure the room you are cleaning is well ventilated with a fan or an open window;
- Store your cleaning products in a safe place where your children cannot reach them;
- Keep cleaning products in their original containers;
- Do not mix cleaning products with one another;
- Follow the directions on the containers; and
- Clearly mark hazardous cleaners.

To reduce your exposure, use natural cleaning products, such as vinegar (removes mildew and grease), lemon juice (stain remover, glass cleaner, and deodorizer), baking soda mixed with water (all-purpose cleaner), and olive oil (furniture polish).

If you are concerned about any products you bring into the home, look up potential health hazards at http://householdproducts.nlm.nih.gov/.

At Home

Heating Your Home

If you use space heaters or wood burners in your home, you should be aware of these safety concerns.

Kerosene Heaters

If you use a kerosene heater, ensure that your home has lots of circulating air, especially if your home is well insulated. If your kerosene heater is poorly maintained or not adjusted properly, it can release pollutants into your home. Some of these pollutants are

- Carbon dioxide,
- Carbon monoxide, and
- Soot.

Protect your family by taking the following steps.

- Follow the instructions for your kerosene heater carefully. Use only water-clear 1-K grade kerosene.
- Leave a window cracked open and open the doors between rooms.
- Place heaters at least 16 inches from the walls, curtains, and furniture. Hot surfaces on the heater pose a fire and burn risk.
- Never refuel indoors.

Wood-burning Fireplaces

If you use a wood-burning fireplace,

- Have your chimney checked for problems and cleaned regularly, and
- Do not burn treated lumber in your fireplace. This lumber can release toxic smoke when it burns.

Other Heating Concerns

Never use gas ovens or burners to heat your home. Never use barbecues or grills in the house, carport, or garage.

Install carbon monoxide detectors inside your home. Carbon monoxide is an odorless, colorless, and toxic gas. Gas from kerosene heaters or worn boilers and furnaces may cause high levels of carbon monoxide inside your home. Exposure to carbon monoxide can lead to health problems or even death.

Working in the Garage

- If you work on cars, lawn mowers, snow blowers, or other types of small engines, you should find an auto shop or waste disposal location that will help you discard old oil.
- Use kerosene, gas, and paint thinners with care. Keep these liquids in well-marked (preferably original) or DOT-approved containers and follow directions.
- Store chemicals out of reach of children.
- When working with chemicals, wear protective equipment such as a mask, gloves, or other appropriate clothing such as goggles and long pants.
- Do not idle your car in a closed garage or a garage attached to your house. Keep the garage doors open for a couple of minutes after you park your car. This step will help clear out the fumes (carbon monoxide) before you open the door to your house.

At Home

Working in the Garden or Yard

Chemicals, like pesticides, can pollute the soil. Polluted soil can affect the food you grow and eat. Polluted soil can also spread through the air as dust particles. When it rains, these dust particles may settle back into the soil.

If you live in an area that has contaminated soil and you want to garden, a raised-bed garden is one way to avoid exposing you and your family to chemicals. In raised-bed gardening, you build boxes on top of the ground. These boxes separate your gardening soil from the contaminated soil. Use bagged soil or soil from a contaminant-free area to ensure your safety.

Gardening can involve the use of herbicides, pesticides, and fertilizers. Below are some ways to help protect your health if you use these chemicals.

- Have your soil tested before you fertilize. This service is offered for free from many Cooperative Extension Service offices.
- Calculate the correct amount of fertilizer, and do not apply right before or after heavy rainfall.
- Dampen the soil with water before you garden. This step will limit the amount of dust you inhale.
- Take your shoes off at the door to avoid tracking soil into your home.
- Wash your hands after gardening.
- Wash fruits, vegetables, and herbs before you eat them.

Many jobs might expose employees to hazardous materials, causing various health effects. Examples of workplace exposure can be found in factories, chemical plants, manufacturing, and automotive shops.

Reducing Your Exposure to Chemicals at Work

If you may come into contact with hazardous chemicals and materials at work, you can do things to reduce your exposure.

- Read and follow instructions provided by your employer.
- If you come into contact with dust, fibers, chemical fumes, radiation, or biologic agents on your job, ask for and wear all required personal protective equipment (such as gloves, masks, coveralls, and respirators).
- Shower or change clothes before leaving work. Otherwise, you can carry contaminants home from work on your clothing.
- If your clothing is contaminated, wash your work clothes separately from the rest of your family's clothing.

At Play

Many hobbies involve using chemicals. For example, woodworking and painting use solvents, thinners, and finishes. Pottery can use a mix of chemicals to create glazes, and some stained glass materials can contain lead.

Reducing Your Exposure to Chemicals at Play

If your hobby involves the use of chemicals, you can reduce your chances of exposure in several ways.

- Read the instructions for how to use the chemical properly.
- Keep the work area well ventilated.
- Wear gloves, masks, or other protective devices to reduce contact with the chemicals.
- Make sure you wash your hands with soap and warm water after using chemicals.
- Investigate alternatives. If you like to do woodworking or refinishing, look into using the nontoxic wood strippers found in most hardware stores.

At home, work, or play, you can reduce your chances of chemical exposure by being aware of your surroundings, reading labels and following instructions, and washing your hands often.

If you are concerned about any products you bring into the home, look up potential health hazards at http://householdproducts.nlm.nih.gov/.

If you have questions or want more information about exposure to chemicals or other environmental health topics, please visit the Agency for Toxic Substances and Disease Registry's Web site at http://www.atsdr.cdc.gov.

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The Agency for Toxic Substances and Disease Registry (ATSDR), based in Atlanta, Georgia, is a federal public health agency of the U.S. Department of Health and Human Services. ATSDR partners with communities across the nation to increase knowledge about toxic substances, reduce the health effects of toxic exposures, and protect the public health.