

# Health Consultation

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MILLER BOTTOM ROAD MUNICIPAL SOLID WASTE LANDFILL  
CONYERS, ROCKDALE COUNTY, GEORGIA

MARCH 28, 2007

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
Public Health Service  
Agency for Toxic Substances and Disease Registry  
Division of Health Assessment and Consultation  
Atlanta, Georgia 30333

## **Health Consultation: A Note of Explanation**

An ATSDR health consultation is a verbal or written response from ATSDR 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 which, in the Agency's opinion, indicates a need to revise or append the conclusions previously issued.

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HEALTH CONSULTATION

MILLER BOTTOM ROAD MUNICIPAL SOLID WASTE LANDFILL  
CONYERS, ROCKDALE COUNTY, GEORGIA

Prepared By:

Georgia Department of Human Resources  
Division of Public Health  
under a cooperative agreement with the  
Agency for Toxic Substances and Disease Registry

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**GLOSSARY OF ACRONYMS**

**GEPD** – Georgia Environmental Protection Division

**GDPH** – Georgia Division of Public Health

**ATSDR** – Agency for Toxic Substance and Disease Registry

**VOC** – volatile organic compound

**PCE** – tetrachloroethylene

**TCE** – trichloroethylene

**EPA** – U.S. Environmental Protection Agency

**LTHA** – Lifetime Health Advisory

**ppb** – parts per billion

**CV** – comparison value

**mg/kg/day** – milligrams per kilogram per day

## SUMMARY

Miller Bottom Road Municipal Solid Waste Landfill is a closed landfill located near Conyers in Rockdale County, Georgia. The area within one mile of the landfill is primarily residential including approximately 30 homes to the south and west of the landfill. Additionally, a large municipal reservoir is located west of the landfill. The majority of residents in the area use domestic wells.

A contamination plume of chemicals from the landfill is migrating off-site. The residences and the drinking water reservoir are in the migration path of the contaminant plume. There is concern that the regulated chemicals, including tetrachloroethylene, trichloroethylene, and vinyl chloride, could potentially contaminate the domestic wells at levels of health concern.

In 2006, the Georgia Environmental Protection Division asked the Georgia Division of Public Health to investigate the potential for exposures of residents using domestic wells in the path of the contamination plume.

This document contains information about the environmental transport and extent of human exposure to hazardous chemicals, conclusions about the health risks posed to residents, and recommendations intended to protect public health. A health consultation is designed to provide the community with information about the public health implications from exposure to hazardous substances at a specific site, and to identify populations for which further health actions are needed.

GDPH has determined that this site poses **No Apparent Public Health Hazard** because human exposure to contaminated groundwater is occurring, but exposures are below levels of health concern. There is a potential for a completed exposure pathway to groundwater contamination in the future, because although the plume is currently delineated, fractured bedrock can provide a conduit for further contaminant migration. However, exposure is considered unlikely because connection to the public water supply is available to all residents within a half mile of the landfill, and site remediation is expected to be sufficient to protect public health from future exposure.

GDPH recommends that all wells that remain unused for more than three years be properly abandoned and that GEPD oversee site remediation.

GDPH will respond to all requests for public health information about this site. GDPH will review additional data if it becomes available and provide documents, including a follow-up health consultation, if appropriate.

## STATEMENT OF ISSUES AND BACKGROUND

Regulated contaminants were detected in groundwater at the boundary of the Miller Bottom Road Municipal Solid Waste Landfill (Miller Bottom Road Landfill) site. The landfill is adjacent to residential properties with domestic water wells. In response, the Georgia Environmental Protection Division (GEPD) requested that the Georgia Division of Public Health (GDPH) conduct an investigation to assess whether residents using wells near the landfill may be exposed to contaminants in groundwater at levels of health concern.

### Site Description

The Miller Bottom Landfill is located along Miller Bottom Road and Haynes Bridge Road in Rockdale County, near the Walton and Newton County borders (Figures 1 and 2). The site has gated access and limited fencing; a fence surrounds the landfill except in a marshy area at the southeastern boundary. The site is buffered by trees and surrounded by residential community on the west and south sides, and by county property to the east and north. An established residential community was observed immediately adjacent to the landfill's southern boundary. Summerhills Baptist Church and several homes are located across Miller Bottom Road between the landfill and Randy Poynter Lake at the western boundary. A more recently developed subdivision was observed to the south, within 600 feet of the landfill boundary. Undeveloped county property borders the landfill to the east and immediately to the north, and further to the north are residential properties.

Contaminated groundwater from the landfill is migrating toward residences at the southern and western boundary of the landfill. Groundwater beneath the landfill predominantly flows to the southeast, however there is limited evidence that a groundwater divide exists near the western landfill boundary and that groundwater is also flowing toward the west [1]. The nearest domestic wells are approximately 100 feet south of the landfill down gradient of the contaminated groundwater plume (Figure 5). Construction records are not available for this or other older domestic wells in the area; however, sampling logs, which include well depth and construction type, are available [1].

During site visits made by GDPH in summer 2006, the community within one mile south of the landfill were observed to be single-family homes with domestic wells. However homes immediately adjacent to the landfill at the west and south boundaries are connected to the public water supply as the primary drinking water source. Domestic well construction was logged as either shallow, bored wells; or deep, drilled wells [1]. Some homes were observed to maintain vegetable gardens or livestock, and some were observed to have outdoor pools and children's play equipment. During the site visit, GDPH noted that one home connected to the public water supply still uses its domestic well for gardening, and non-potable uses.

Randy Poynter Lake, a public drinking water reservoir, supplies water to homes and is approximately 1000 feet down gradient to the west of the landfill [1]. Two small creeks, Sandy Creek and Little Haynes Creek are located to the southeast (Figure 2). Sandy Creek flows

southwest onto the site, and Little Haynes Creek flows southwest approximately 400 feet east of Sandy Creek.

### **Demographics**

Using 2000 Census data, 292 people live within one mile of the Miller Bottom Road Landfill. The Agency for Toxic Substances and Disease Registry (ATSDR) calculated population information for individuals residing within a 1-mile radius of the site using an area-proportion special analysis technique (Figure 1). For more information about ATSDR, visit [www.atsdr.cdc.gov](http://www.atsdr.cdc.gov) or see Appendix A.

### **Hydrogeology**

Topography, soils, and hydrogeology of an area play a key role in groundwater flow. The topography of the site slopes to the west and to the east toward the lake and the two creeks (Figure 5) [1]. Groundwater in the community is shallow, ranging from an estimated 0-40 feet below ground surface, and 10 feet or more under surface structures; and predominantly flows from the northwest to the southeast, however sampling shows additional flow to the west [1]. The groundwater system is an unconfined aquifer made up of two water bearing zones, a shallow zone of soil and weathered rock, and a deeper zone of fractured bedrock<sup>1</sup> (Figure 3) [1, 2]. These fractures contribute to the complexities of groundwater flow in the area. In addition to migration to the west and southeast, the contamination plume is showing trends of downward movement through fractured bedrock, roughly 60-100 feet below ground surface (bgs) (Figure 3) [1].

### **Site History**

The Miller Bottom Road Landfill began operations in the 1970s for the disposal of municipal solid waste. Waste was disposed at various depths, including at land surface.

Prior to 1989, monitoring well sampling results showed volatile organic compounds (VOCs) in on-site groundwater, and further evaluation was required by EPD [1]. The City of Conyers then conducted a hydrogeological assessment in 1989 to characterize the site and the extent of shallow contamination in the area. Six additional on-site monitoring wells were installed to supplement the two already in existence [1].

In mid 1993, on-site monitoring well sampling results revealed that VOCs were detected above regulatory levels in two monitoring wells at the western boundary [2, 3]. By 1993, seventeen groundwater monitoring wells had been installed along the boundaries of the landfill and were sampled semi-annually. Results indicated that contamination had migrated to the site's southern and southeastern boundaries, (in the marshy area near the creeks) [3]. Since then, several additional groundwater and methane monitoring wells were installed around the perimeter of the

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<sup>1</sup> Groundwater in Rockdale County moves through porous weathered rock (saprolite) and fractured bedrock, and is found in both saprolite and fractured bedrock [2].



site. In 1994, the landfill was closed in accordance with the Georgia Rules for solid waste management. The landfill is currently in post-closure care [2].

Delineation of the vertical and horizontal extent of contamination began in 1994 [2]. Since then, a total of eight additional monitoring wells have been installed and sampled semi-annually (five by early 1996, and three in summer 1999) [2, 3]. Results of continuous on-site monitoring well groundwater sampling reveal various VOCs including tetrachloroethylene (PCE), trichloroethylene (TCE), and vinyl chloride in on-site groundwater [2, 3].

Approximately 34 sampling events occurred from 1993 through 2006 for on-site monitoring wells. Six off-site monitoring wells were constructed on private properties along the southern and northwestern boundaries of the landfill in August 2004, and then sampled in October [2]. Contaminants were not detected in these wells.

Sampling was conducted for off-site domestic wells in 1993 and 2004. Homes immediately adjacent to the western and southern boundaries of the landfill were connected to the public water supply for drinking and other household uses when contaminants were detected in one domestic well in 1993 [4]. However, several homes further south and within one mile of the landfill still use domestic wells as their primary drinking water source. Groundwater in 28 domestic wells was sampled in 2004 and analyzed for VOCs. At that time, PCE was detected in two domestic wells adjacent to the southern boundary [2]. One of these wells is currently used for non-potable purposes.

In late summer 2006, GDPH was asked by GEPD to conduct an investigation to determine whether exposure to site contaminants is occurring and may pose a health hazard to nearby residents. GDPH met with the GEPD, the Rockdale County Board of Health, and City of Conyers officials, and issued a Notice of Involvement to the public. GDPH also visited the site and surrounding areas, distributed the brochure, *Well Water Quality*, and distributed three copies of the University of Georgia in Athens Cooperative Extension Services video on the same topic, *Well... What Do You Know?*, to Board of Health officials for distribution to the public.

### **Physical and Other Hazards**

There are no observed physical hazards on site. The site is enclosed by a locked fence, but there is site access through the fence at a few locations at the southeast. However, there are no reports of concerns that the site is trespassed.

Physical hazards exist off site from unused domestic wells in the community. Some wells are as large as a few feet in diameter and observed to be uncovered, or covered at ground surface level with wood. These wells are especially dangerous to children and animals. Additionally, during site visits, GDPH observed improper storage of household chemicals near or on top of wells in the community (see Figure 6).

## **Community Involvement**

The City of Conyers and GEPD have worked with individual community members regarding concerns and safety since the early 1990s [4, 5]. GEPD addressed community concerns raised in 1993 at a public hearing and public information meetings, which were reported through local newspapers [6, 7]. GEPD sampled groundwater from domestic wells and analyzed these samples for chemicals in the early 1990s [1, 4]. Homes adjacent to the landfill located along the western and southern boundaries down-gradient from the contamination plume were connected to the public water supply for drinking and other household uses as a precautionary measure in the early 1990s [1].

On March 9, 2007, GDPH and the City of Conyers visited homes in the community to gather community concerns about the landfill, and to provide information about the health consultation and domestic wells. GDPH distributed approximately 22 copies of a one page summary of the health consultation, a one page questionnaire, the site-specific fact sheet *Well Abandonment* (see Appendix B), and *Well Water Quality* brochure (see Figure 6).

## **DISCUSSION**

### **Environmental Sampling Data**

Available data include analysis of groundwater samples collected from on- and off-site monitoring wells and off-site domestic wells [1]. Samples were taken from 23 on-site monitoring wells, 11 off-site monitoring wells, and 25 domestic wells during 1994-2006 [2]. Monitoring well depths range between approximately 10 and 90 feet bgs [1]. Domestic well depths vary from an estimated 40 feet to over 150 feet bgs [1].

Since 1993, 29 sampling events have occurred, with the last being conducted in June 2006. Results show several VOCs present in on-site groundwater above levels of health concern [1, 2]. Landfill-related contaminants have been detected in two domestic wells located immediately adjacent to the southwest corner of the landfill [2]. Surface water collected from Randy Poynter Lake and Sandy Creek was also analyzed, and no contaminants were detected [1, 2].

### **Pathways Analysis**

GDPH determines exposure to environmental contamination by identifying exposure pathways. An exposure pathway is generally classified by environmental medium (e.g., water, soil, air, food). A completed exposure pathway consists of five elements: a source of contamination; transport through an environmental medium; a point of exposure; a route of exposure; and a receptor population. A completed exposure pathway exists when people are actually exposed through ingestion or inhalation of, or by skin contact with a contaminated medium.

In completed exposure pathways, all five elements exist, and exposure to a contaminant has occurred in the past, is occurring, or will occur in the future. In potential exposure pathways, at

least one of the five elements is not clearly defined, but could exist. Therefore, exposure is possible. Potential pathways indicate that exposure to a contaminant could have occurred in the past, could be occurring, or could occur in the future. However, key information regarding a potential pathway may not be available. It should be noted that the identification of a completed or potential exposure pathway does not necessarily result in human health effects. An exposure pathway can be eliminated if at least one of the five elements is missing and will never be present.

GDPH reviewed the site’s history, community concerns, and available environmental sampling data. Based on this review, GDPH has determined that a completed exposure pathway does not exist for ingestion of contaminated drinking water because residents immediately adjacent to the landfill have been connected to the public water supply since the early 1990s, and other domestic wells used by homes in the community were sampled and no chemicals were detected. There is no past or current completed exposure pathway for drinking domestic well water.

A completed exposure pathway does exist for homes near the landfill, however, for skin contact, incidental swallowing, or inhalation of PCE in groundwater because one contaminated well is used for non-potable uses, such as vehicle care, gardening, and lawn maintenance.

There is potential for future exposure from drinking water because the contaminated groundwater plume could migrate to domestic wells still in use. However, future exposure is considered unlikely because connection to the public water supply is available to all residents within a half mile of the landfill, and site remediation is expected to be sufficient to protect public health from future exposure.

There is also a potential for exposure to VOCs through vapor intrusion for homes located above the contamination plume. Completed and potential exposure pathways are shown in Table 1.

**Table 1. Exposure Pathways**

Pathway	Exposure Pathway Elements					Time
	Sources	Transport	Point of Exposure	Route of Exposure	Exposed Population	
Groundwater	Migration of Contamination Plume in Groundwater	Groundwater	Domestic Well Water	Ingestion, Inhalation, and Dermal Absorption	Residents downgradient of landfill	Present and Future
Vapor Intrusion	Migration of Contamination Plume in Groundwater	Groundwater	Indoor Air	Inhalation	Residents downgradient of landfill	Present and Future

**Evaluation Process**

For each environmental pathway, GDPH examines the contaminant types and levels of concern. GDPH uses ATSDR comparison values and other established agencies’ reference values to

screen contaminant levels that may warrant further evaluation. Comparison values (CVs) are concentrations of chemicals that can reasonably (and conservatively) be regarded as harmless, assuming the most likely conditions of exposure. The CVs include ample safety factors to ensure protection of sensitive human populations. Because CVs do not represent thresholds of toxicity, exposure to contaminant concentrations above CVs will not necessarily lead to adverse health effects. CVs and the evaluation process used in this document are described in more detail in Appendix C. GDPH then considers how people may come into contact with the contaminants.

Exposure to site related contaminants at the Miller Bottom Road Landfill site could occur through three routes: ingestion, inhalation, and dermal absorption of contaminated groundwater. Ingestion is defined as *direct ingestion* or actively and passively drinking water; and, *indirect ingestion*, such as inhalation of shower steam that is expelled from the respiratory tract and swallowed (ingested). The other route of exposure, direct skin contact (dermal absorption), may contribute additional exposure to specific contaminants.

## **Groundwater**

Domestic well samples were analyzed in 1993 and 2004 for chemicals listed under the Safe Drinking Water Act [2]. Samples were obtained using U.S. Environmental Protection Agency (EPA) approved methods, and analyzed at state certified laboratories.

### On-site Groundwater

Tetrachloroethylene (PCE), trichloroethylene (TCE), methylene chloride, and vinyl chloride have been detected above CVs in on-site groundwater. PCE and TCE have been detected consistently since 1995 in several wells along the southern and northwestern boundaries of the site. From 1993 until 2001, levels of PCE and TCE detected have fluctuated, showing no definitive trends [8]. Since 2001, however, sampling results show a general trend of increasing concentrations [2].

The highest concentration of PCE was detected in monitoring well GWB-103 (Figures 3, 4, 5) in 2004 at 90 parts PCE per billion parts water (ppb) at the southern boundary [2]. TCE has been detected consistently in a few wells on the northwestern boundaries. Historically, the highest level of TCE detected was 39 ppb in 1994, and currently TCE has been detected at 18 ppb. Although trends could not be identified in the past for on-site levels of TCE because of fluctuation, the levels have shown a trend of increasing concentrations, with the highest levels detected in the interior of the site.

The highest level of methylene chloride detected was 30 ppb in 2005 at the south boundary. The highest level of vinyl chloride detected was at 94 ppb in 2005. Table 2 summarizes the current levels of contaminants detected.

An on-site well for potable (drinking, bathing, etc.) use does not exist at the landfill; therefore, a groundwater exposure pathway for workers, visitors, or trespassers does not exist.

**Table 2. Highest Concentrations Above CVs in On-Site Groundwater**

Contaminant	Year Sampled	Level (ppb)	CV* (ppb)	CV Type
Tetrachloroethylene	2004	90	5.0	MCL
Trichloroethylene	2006	21	5.0	MCL
Methylene Chloride	2006	100	5.0	CREG
			5.0	MCL
Vinyl Chloride	2006	95	0.03	CREG
			5.0	MCL

ppb: parts per billion

MCL: Maximum Contaminant Level

CREG: Cancer Risk Evaluation Guide

\* Source: ATSDR, *Water Comparison Values*, 2/17/06

### Off-site Groundwater

Off site groundwater monitoring well data are available from 2005 for three wells GWA-104, GWA-105, GWA-106. These wells are located along Miller Bottom Road across from the landfill. PCE was detected in these wells above regulatory levels. Additional wells installed in October 2004 showed no contaminants detected.

The most recent off-site domestic well sampling data available are from 2004. Off-site domestic wells were sampled in February 2004, and monitoring wells were sampled in August 2004. Landfill contaminants were not detected in most domestic wells, however PCE was detected below CVs in two domestic wells south of the landfill. Sampling from additional off-site monitoring wells installed did not detect any contaminants.

Currently, the highest level of PCE found was 3.5 ppb in one domestic well currently used for non-potable uses. This is below the MCL and below the CV for children of 100 ppb for intermediate exposure (more than two weeks but less than one year). Although, direct skin contact (dermal absorption) may contribute additional exposure to this contaminant, exposure through the skin is minimal [10]. Because the levels detected were below screening values (CVs), GDPH will not further evaluate exposure to these contaminants.

### Vapor Intrusion from Off-site Groundwater

Available data was used to derive a model of the extent of the contamination plume. Recent sampling data and derived modeling shows that total VOCs in shallow groundwater from non-detected levels up to 350 ppb are migrating under homes along the southern landfill boundary (see figures 3 and 5) at a depth of 10 feet to 40 feet below the ground's surface. However, based on the modeling, the plume does not extend underneath homes located on properties along Haynes Ridge Road [2].

Three homes along the southern landfill boundary are located 10 to 40 feet above contaminated groundwater. Based on overlying soil properties, the likelihood of vapor intrusion decreases with increasing depth to groundwater. The U.S. EPA makes qualitative assumptions by using an attenuation factor 1/1000 for soil gas migration when groundwater depths are greater than 5 feet [11]. Therefore, based on modeled results, VOC soil gas levels underneath homes would be less than health-based screening values (CVs) of 40 ppb for air [12]. Although the potential for exposure exists, exposure is not likely to occur at levels of health concern based on contaminant levels found in groundwater and because home foundations in this area are 10 feet or greater above groundwater, and currently can be considered negligible. For site-specific calculations, see Appendix D. The potential for future exposure does exist; however, it is unlikely because site remediation is expected to be sufficient to protect these residents from future exposure.

### CHILD HEALTH CONSIDERATIONS

ATSDR recognizes the unique vulnerabilities of young children exposed to chemicals in the environment. Because of their size, body weight, frequent hand to mouth activity, and developing systems, children require special emphasis in communities faced with contamination. Also, they receive higher doses of exposure because children's growing bodies absorb more contamination and can sustain permanent damage if exposures occur during critical growth stages.

There is no evidence that children are being exposed to contaminants from the landfill at levels that could cause adverse health effects. However, residents with young children should exercise caution that children avoid the physical hazards and injury associated with unused domestic wells. As an additional precaution, residents should ensure that children do not trespass onto the Miller Bottom Road Landfill through open fencing to avoid physical hazards.

### CONCLUSIONS

GDPH has determined that this site poses **No Apparent Public Health Hazard**. Although human exposure to contaminated groundwater is occurring, the exposure is below a level of health concern.

There is a potential for exposure to groundwater contamination in the future, because although the plume is currently delineated, fractured bedrock can provide a conduit for further contaminant migration. However, future exposure is considered unlikely because connection to the public water supply is available to all residents within a half mile of the landfill, and future remediation is expected to be sufficient to protect public health from future exposure.

Residents are responsible for the care and safety of their water wells. Residents using domestic wells as their primary water source are encouraged to properly maintain their wells. For more information about proper well maintenance, residents can contact GDPH or the University of Georgia Cooperative Extension Service, or visit their website at [www.caes.uga.edu](http://www.caes.uga.edu).

## **RECOMMENDATIONS**

1. GDPH and GEPD recommend that unused, shallow, bored wells down-gradient from the landfill be properly abandoned (see Appendix D) to help prevent groundwater contamination and injury.
2. GDPH recommends that the City of Conyers oversees the proper abandonment of unused, shallow, bored wells down-gradient of the landfill at no cost to residents.
3. GDPH recommends that GEPD continue to oversee site remediation actions plans, and once remediation begins; oversees site remediation.

## **PUBLIC HEALTH ACTION PLAN**

### **Actions Completed**

- The City of Conyers has provided connection to the public water supply to residents immediately adjacent to the landfill, and has made connection to the public water supply available to all residents in the community.
- In summer 2006, GDPH was asked to conduct an investigation to determine whether exposure to site contaminants is occurring and may pose a health hazard to nearby residents.
- GDPH issued a Notice of Involvement to the public, and met with GEPD, the Rockdale County Board of Health, and City of Conyers officials.
- GDPH distributed the brochure, *Water Well Quality*, to the Rockdale Board of Health for distribution to the public.
- GDPH also distributed three copies of the University of Georgia in Athens Cooperative Extension Services video, *Well... What Do You Know?* to Rockdale County Board of Health officials for distribution to the public.
- GDPH visited the site and surrounding areas, and reviewed environmental sampling data to determine the extent of contamination and potential threats to public health.
- GDPH, in coordination with city officials, provided information to homeowners about maintaining their domestic wells and about proper well abandonment.

### **Actions Planned**

- GDPH will review additional data and other information as it becomes available to ensure that remediation measures are successful and protective of public health and safety.

## REFERENCES

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13. Agency for Toxic Substance and Disease Registry, *Air Comparison Values*, February 17, 2006.



## **PREPARERS AND REVIEWERS OF REPORT**

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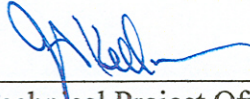
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**CERTIFICATION**

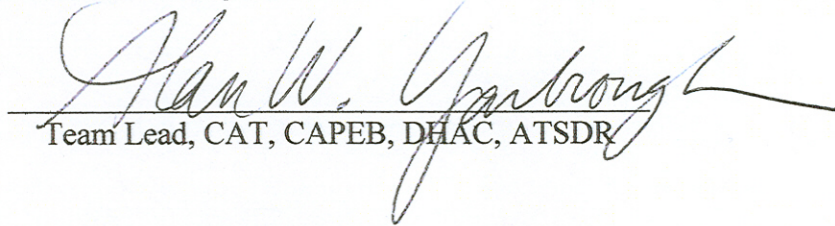
The Georgia Division of Public Health prepared this Miller Bottom Road MSWL, Rockdale County, Georgia, health consultation under a cooperative agreement with the Agency for Toxic Substances and Disease Registry. It is in accordance with approved methodology and procedures existing at the time that the health consultation was begun. Editorial review was completed by the Cooperative Agreement partner.



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Technical Project Officer, CAPEB, DHAC

The Division of Health Assessment and Consultation, ATSDR, has reviewed this health consultation and concurs with the findings.



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Team Lead, CAT, CAPEB, DHAC, ATSDR

## **FIGURES**

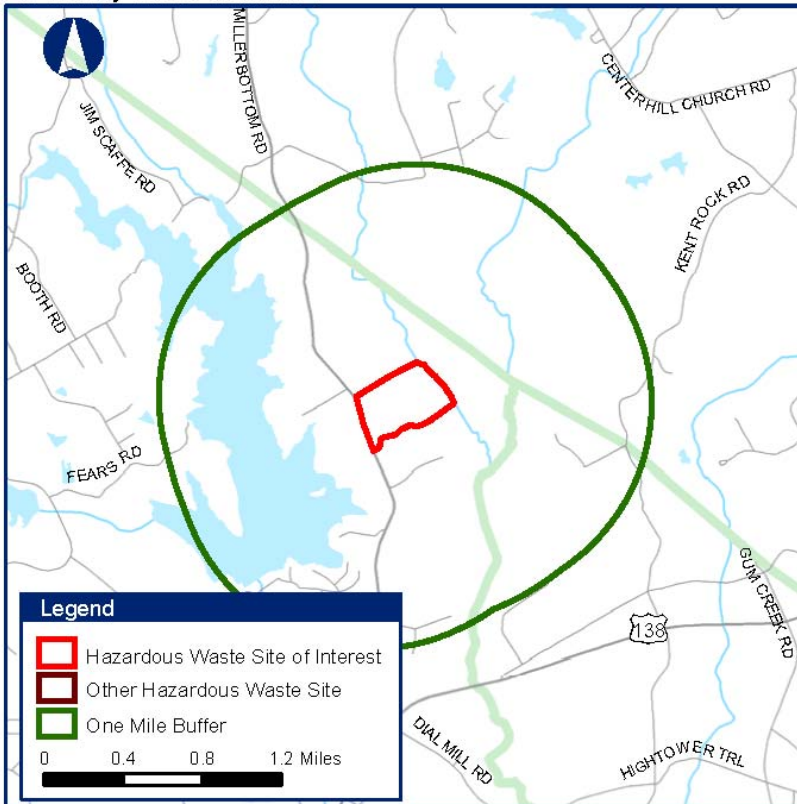


**Figure 1: Site Map and Demographic Characteristics**

**Miller Bottom Road Landfill**  
Conyers, GA



EPA Facility ID: UNAVAILABLE

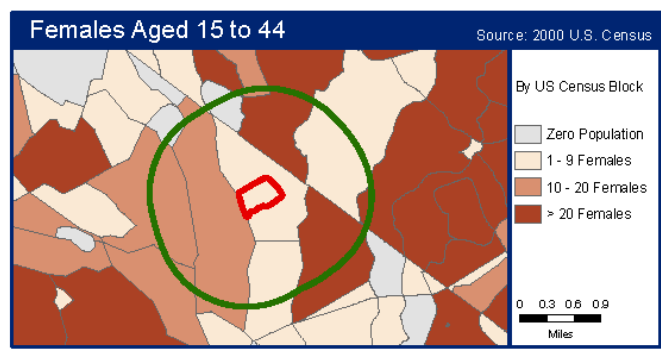
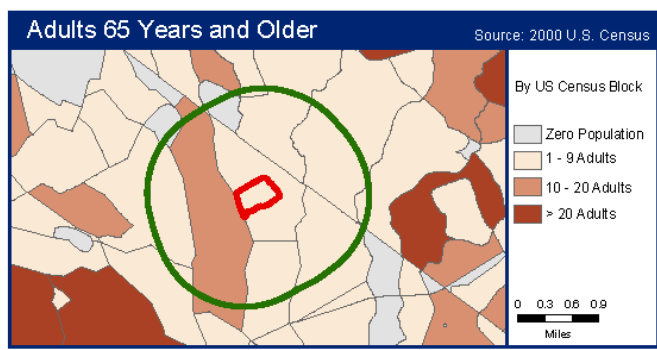
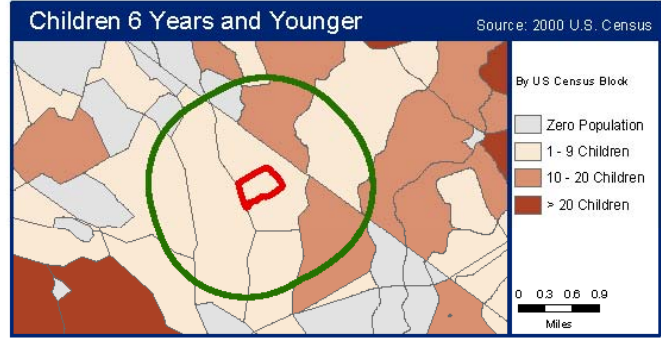
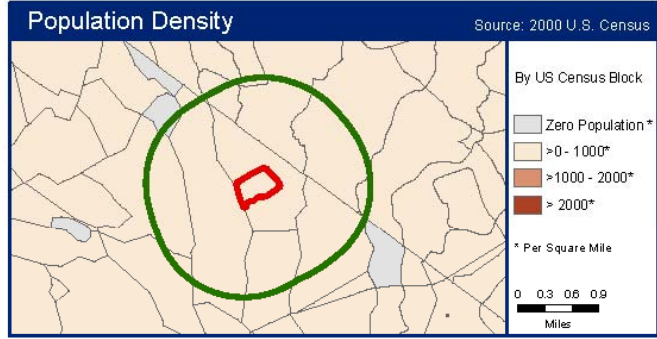


**Demographic Statistics**  
Within One Mile of Site\*

Total Population	292
White Alone	270
Black Alone	21
Am. Indian & Alaska Native Alone	0
Asian Alone	0
Native Hawaiian & Other Pacific Islander Alone	0
Some Other Race Alone	0
Two or More Races	0
Hispanic or Latino**	2
Children Aged 6 and Younger	34
Adults Aged 65 and Older	29
Females Aged 15 to 44	55
Total Housing Units	107

Base Map Source: Geographic Data Technology, May 2005.  
Site Boundary Data Source: ATSDR Geospatial Research, Analysis, and Services Program, Current as of Generate Date (bottom left-hand corner).  
Coordinate System (All Panels): NAD 1983 StatePlane Georgia West FIPS 1002 Feet

Demographics Statistics Source: 2000 U.S. Census  
\* Calculated using an area-proportion spatial analysis technique  
\*\* People who identify their origin as Hispanic or Latino may be of any race.



GRASPMASER 1.3 - GENERATED: 07-14-2006

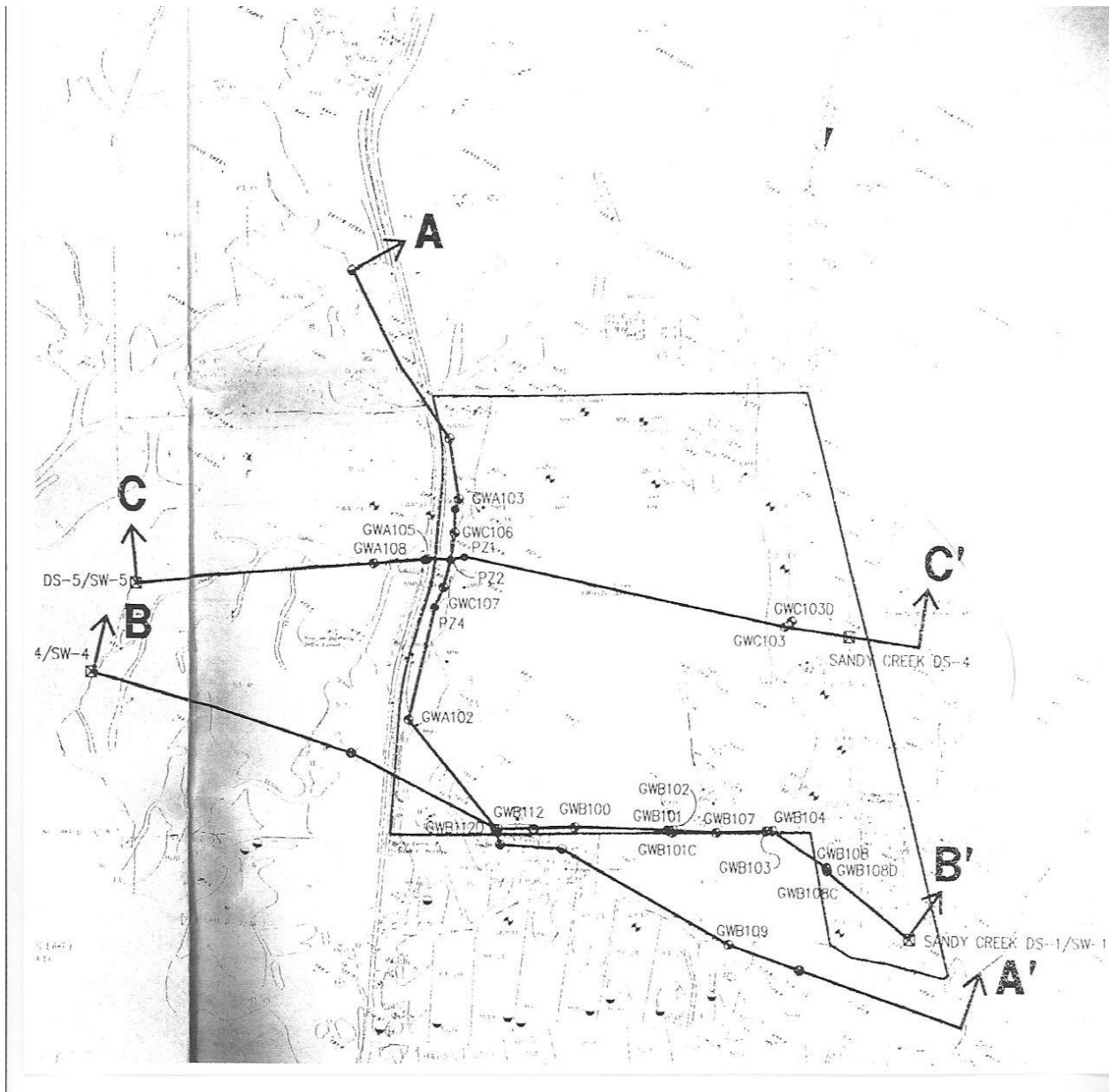
**Figure 2: Aerial Photograph**







**Figure 4: Cross Section Map**



**Source:** Bunnell-Lammons, Inc., *Report of Groundwater Contamination Assessment for the ACM, May 13, 2005*





## Figure 6: Site Photographs



**At the western boundary, there are homes less than one-half mile from the landfill.**



**Domestic well located near the landfill. A chainsaw and household chemicals are stored near the well.**



**An unused shallow well near the landfill. Unused wells that are not properly abandoned can introduce safety hazards to children, pets, and other animals.**



**An unused domestic well down gradient of the landfill. In addition to safety hazards, unused wells can serve as conduits for contamination.**

**Figure 6: Site Photographs (Cont.)**



**Some homes care for livestock or have gardens using groundwater.**



**Several homes maintain pools using groundwater.**

## **APPENDICES**



## **APPENDIX A: THE AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY**



### **What is the Agency for Toxic Substances and Disease Registry (ATSDR)?**

ATSDR is the principal federal public health agency involved with hazardous waste issues. The agency helps prevent or reduce the harmful effects of exposure to hazardous substances on human health. The Superfund Law created ATSDR, an agency of the U.S. Department of Health and Human Services, in 1980.

### **Where is ATSDR located? How big is it?**

ATSDR's headquarters are in Atlanta, Georgia. The agency has 10 regional offices and an office in Washington D.C. The multi-disciplinary staff of approximately 400 includes epidemiologists, physicians, toxicologists, engineers, public health educators, health communication specialists, and support staff.

### **What does ATSDR do?**

ATSDR conducts a number of activities to help prevent or reduce the harmful effects of exposure to hazardous substances, including:

- Advises federal and state agencies, community members, and other interested parties on the health impacts of Superfund sites and other petitioned sites.
- Identifies communities where people might be exposed to hazardous substances in the environment.
- Determines the level of public health hazard posed by a site.
- Recommends actions that need to be taken to safeguard people's health.
- Conducts health studies in some communities that are located near Superfund sites or in locations where people have been exposed to toxic materials.
- Funds research conducted by colleges, state agencies, and others who study the relationship between hazardous waste exposure and illnesses.
- Educates physicians, other health care professionals, and community members about the health effects of--and how to lessen exposure to--hazardous substances.
- Provides technical support and advice to other federal agencies and state and local governments.
- Maintains registries of people who are exposed to the most dangerous substances.

### **What can ATSDR do to help a community that may be exposed to hazardous substances?**

ATSDR helps communities in a variety of ways, including:

- Helps communities by working with them to resolve their health concerns.
- Determines whether the community is or was exposed to hazardous substances.
- Visits the community to hear residents voice their health concerns.

- Educates residents about any health hazards posed by environmental contaminants.
- Works with local health care providers to ensure they have the information needed to evaluate possible exposures to hazardous substances in their community.
- Visits a community to draw blood or to collect urine to determine if people have been or are being exposed to a hazardous substance when such actions are required.
- Provides medical monitoring in communities exposed to hazardous substances if such action is needed.

#### **What can't ATSDR do to help a community?**

- ATSDR does not have the legal authority to conduct certain activities, such as the following:
- Cannot provide medical care or treatment to people who have been exposed to hazardous substances, even if the exposure has made them ill.
- Cannot provide funds to relocate affected residents or to clean up a site.
- Cannot close down a plant or other business, but can make recommendations to the U.S. Environmental Protection Agency (EPA).

#### **How is ATSDR's role in helping communities different from EPA's role?**

Unlike EPA, ATSDR is not a regulatory agency. ATSDR is a public health agency that advises EPA on the health aspects of hazardous waste sites or spills. ATSDR makes recommendations to EPA when specific actions are needed to protect the public's health. For example, ATSDR might recommend providing an alternative water supply, removing contaminated material, or restricting access to a site. EPA usually follows these recommendations. However, ATSDR cannot require EPA to follow its recommendations.

#### **How does ATSDR become involved with a site? How can I get ATSDR involved with a site?**

ATSDR is required by the Superfund law to become involved with all sites that are on or proposed for the National Priorities List (NPL). Specifically, ATSDR conducts public health assessments of NPL sites, as well as of all sites proposed for the NPL. EPA, states, local governments, or other federal agencies may request ATSDR's help with a site, such as in cases of accidental spills or releases. Anyone may request or "petition" that ATSDR to do a health consultation. Most requests for health consultations come from EPA and state and local agencies. Anyone may also petition ATSDR to conduct a public health assessment of a site. For more information about how to petition ATSDR to conduct a public health assessment, call ATSDR's toll-free information line, 1-888-42-ATSDR (1-888-422-8737), or send an e-mail request to [ATSDRIC@cdc.gov](mailto:ATSDRIC@cdc.gov)

#### **How does ATSDR work with states and local health departments?**

ATSDR has cooperative agreements (partnerships) with 23 states to conduct site-related public health assessments or health consultations, health studies, and health education. In states that have cooperative agreements, ATSDR provides technical assistance and oversees site evaluations and related activities done by state staff. ATSDR also assists local health departments.

#### **Does ATSDR assist communities located near hazardous waste sites that are not on the NPL?**

Yes. More than half of the sites ATSDR has worked at are not on the NPL.

## **What information does ATSDR provide through its Internet web site?**

Information that can be accessed through ATSDR's web site includes these items: information about ATSDR; a database containing information on all sites where ATSDR has worked; short, easy-to-read fact sheets on 60 of the most common contaminants at Superfund sites; and links to related sites.

## **ATSDR PUBLIC HEALTH HAZARD CATEGORIES**

### **ATSDR Public Health Hazard Categories**

Depending on the specific properties of the contaminant, the exposure situations, and the health status of individuals, a public health hazard may occur. Using data from public health assessments and consultations, sites are classified using one of the following public health hazard categories:

#### **Category 1: Urgent Public Health Hazard**

Sites that pose a serious risk to public health as the result of short-term exposures to hazardous substances.

#### **Category 2: Public Health Hazard**

Sites that pose a public health hazard as the result of long-term exposures to hazardous substances.

#### **Category 3: Potential/Indeterminate Public Health Hazard**

Sites for which no conclusions about public health hazard can be made because data are lacking.

#### **Category 4: No Apparent Public Health Hazard**

Sites where human exposure to contaminated media is occurring or has occurred in the past, but the exposure is below a level of health hazard.

#### **Category 5: No Public Health Hazard**

Sites for which data indicate no current or past exposure or no potential for exposure and therefore no health hazard.

## APPENDIX B: SITE SPECIFIC FACT SHEET

# FACT SHEET

MILLER BOTTOM ROAD LANDFILL  
ROCKDALE COUNTY, GA

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## Well Abandonment

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This fact sheet provides general information about proper well abandonment near the Miller Bottom Road Landfill.

### **What is an abandoned well?**

An “abandoned well” is a well or borehole that is not used anymore, is unable to produce useable water, or is unable to be used because of poor maintenance or significant wear and tear.

Wells are “temporarily abandoned” if they remain unused for a minimum 365 days, or “permanently abandoned” if use is interrupted for more than three years.



### **What does “proper abandonment” mean?**

A “properly abandoned” water well is a well that has been cleared, plugged, and sealed by a licensed well driller. The sealed plug must be constructed to fill the well hole for the length and diameter of the well.

For the work to be legal, it must be done by a licensed well driller, or by a county or municipal government. Water well owners are required to properly abandon a well if it has not been used for at least three years.

### **Why should I properly abandon my well?**

Wells that are left unused but not properly abandoned create opportunities for injury to people and animals. These wells leave open holes in the ground where adults, children, pets, and wild animals can get hurt or get trapped. These holes also serve as direct channels into Georgia’s groundwater. They allow contamination to pass straight through to a drinking water source used by many people. Contamination, such as chemicals or bacteria, may come from the environment or from aging of the well construction materials. The only way to reduce safety hazards and groundwater contamination caused by unused wells is to properly abandon them.

## **Are There Laws About Abandoning Water Wells?**

The State of Georgia Water Well Standards Act 1985, OCGA 12-5-120 through 12-5-137 provides laws to govern the proper abandonment of water wells. To abandon a well, the owner must hire a licensed well driller. For a list of licensed well drillers, contact the Georgia Environmental Protection Division, Watershed Protection Branch at 404-657-6126, or visit the website at [www.gaepd.org](http://www.gaepd.org).

## **Who Pays for Proper Abandonment of Water Wells?**

The owner of a water well is responsible for properly abandoning it.

However, in some cases the city government may arrange to pay to have a water well abandoned. Near the Miller Bottom Road Landfill, the City of Conyers is offering to properly abandon all shallow, bored wells that have remained unused for more than three years. For more information, contact Brad Sutton at 770-785-5043.



## **How did the Georgia Division of Public Health get involved in investigating my neighborhood?**

The Georgia Division of Public Health (GDPH) was asked by the Georgia Environmental Protection Division (GEPD) to review groundwater data collected from domestic wells near the Miller Bottom Road Landfill in Rockdale County. GDPH is conducting a health consultation to investigate the potential for exposure to chemicals in groundwater from the landfill. During the investigation, GDPH observed unused water wells that pose a health and safety hazard in the community.

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### **For More Information, Contact:**

**Department of Planning and City Services  
City of Conyers  
1174 Scott Street  
P.O. Box 1259  
Conyers, Georgia 30012  
(770) 785-5043  
[www.conyersga.com](http://www.conyersga.com)**



## APPENDIX C: EXPLANATION OF TOXICOLOGICAL EVALUATION

### Step 1--The Screening Process

In order to evaluate the available data, GDPH used comparison values (CVs) to determine which chemicals to examine more closely. CVs are contaminant concentrations found in a specific environmental media (for example: air, soil, or water) and are used to select contaminants for further evaluation. CVs incorporate assumptions of daily exposure to the chemical and a standard amount of air, soil, or water that someone may inhale or ingest each day. CVs are generated to be conservative and non-site specific. The CV is used as a screening level during the public health assessment process where substances found in amounts greater than their CVs might be selected for further evaluation. CVs are not intended to be environmental clean-up levels or to indicate that health effects occur at concentrations that exceed these values.

CVs can be based on either carcinogenic (cancer-causing) or non-carcinogenic effects. Cancer-based CVs are calculated from the U.S. Environmental Protection Agency's (EPA) oral cancer slope factors for ingestion exposure, or inhalation risk units for inhalation exposure. Non-cancer CVs are calculated from ATSDR's minimal risk levels, EPA's reference doses, or EPA's reference concentrations for ingestion and inhalation exposure. When a cancer and non-cancer CV exist for the same chemical, the lower of these values is used as a conservative measure. The chemical and media-specific CVs used in the preparation of this public health assessment are:

An **Environmental Media Evaluation Guide (EMEG)** is an estimated comparison concentration for exposure that is unlikely to cause adverse health effects, as determined by ATSDR from its toxicological profiles for a specific chemical.

A **Cancer Risk Evaluation Guide (CREG)** is an estimated comparison concentration that is based on an excess cancer rate of one in a million persons exposed over a lifetime (70 years), and is calculated using EPA's cancer slope factor.

### Step 2--Evaluation of Public Health Implications

The next step in the evaluation process is to take those contaminants that are above their respective CVs and further identify which chemicals and exposure situations are likely to be a health hazard. Separate child and adult exposure doses (or the amount of a contaminant that gets into a person's body) are calculated for site-specific scenarios, using assumptions regarding an individual's likelihood of accessing the site and contacting contamination. Usually little or no information is available for a site to know exactly how much exposure is actually occurring, so assessors assume that maximum exposure is taking place. That assumption would include any worse case scenarios where someone received a maximum dose. Actual exposure is likely much less than the assumed exposure.

### **Non-cancer Health Risks**

The doses calculated for exposure to individual chemicals are then compared to an established health guideline, such as an ATSDR minimal risk level (MRL) or an EPA reference dose (RfD), in order to assess whether adverse health impacts from exposure are expected. Health guidelines are chemical-specific values that are based on available scientific literature and are considered protective of human health. Non-carcinogenic effects, unlike carcinogenic effects, are believed to have a threshold, that is, a dose below which adverse health effects will not occur. As a result, the current practice to derive health guidelines is to identify, usually from animal toxicology experiments, a no observed adverse effect level (NOAEL), which indicates that no effects are observed at a particular exposure level. This is the experimental exposure level in animals (and sometimes humans) at which no adverse toxic effect is observed. The known toxicological values are doses derived from human and animal studies that are summarized in ATSDR's *Toxicological Profiles* ([www.atsdr.cdc.gov/toxpro2.html](http://www.atsdr.cdc.gov/toxpro2.html)). The NOAEL is modified with an uncertainty (or safety) factor, which reflects the degree of uncertainty that exists when experimental animal data are

extrapolated to the human population. The magnitude of the uncertainty factor considers various factors such as sensitive subpopulations (e.g., children, pregnant women, the elderly), extrapolation from animals to humans, and the completeness of the available data. Thus, exposure doses at or below the established health guideline are not expected to cause adverse health effects because these values are much lower (and more human health protective) than doses, which do not cause adverse health effects in laboratory animal studies.

For non-cancer health effects, the following health guidelines were used in this public health assessment:

A **minimal risk level (MRL)** is an estimate of the daily human exposure to a chemical that is likely to be without a significant risk of harmful effects over a specified period of time. MRLs are developed for ingestion and inhalation exposure, and for lengths of exposures; acute (less than 14 days), intermediate (between 15-364 days), and chronic (365 days or greater). ATSDR has not developed MRLs for dermal exposure (absorption through skin).

If the estimated exposure dose to an individual is less than the health guideline value, the exposure is unlikely to result in non-cancer health effects. If the calculated exposure dose is greater than the health guideline, the exposure dose is compared to known toxicological values for the particular chemical and is discussed in more detail in the text of the public health assessment. A direct comparison of site-specific exposure and doses to study-derived exposures and doses found to cause adverse health effects is the basis for deciding whether health effects are likely to occur.

It is important to consider that the methodology used to develop health guidelines does not provide any information on the presence, absence, or level of cancer risk. Therefore, a separate cancer risk evaluation is necessary for potentially cancer-causing contaminants detected at this site.

### **Cancer Risks**

Exposure to a cancer-causing chemical, even at low concentrations, is assumed to be associated with some increased risk for evaluation purposes. The estimated risk for developing cancer from exposure to contaminants associated with the site was calculated by multiplying the site-specific doses by EPA's chemical-specific cancer slope factors (CSFs) available at [www.epa.gov/iris](http://www.epa.gov/iris). This calculation estimates a theoretical excess cancer risk expressed as a proportion of the population that may be affected by a carcinogen during a lifetime of exposure. For example, an estimated risk of  $1 \times 10^{-6}$  predicts the probability of one additional cancer over background in a population of 1 million. An increased lifetime cancer risk is not a specified estimate of expected cancers. Rather, it is an estimate of the increase in the probability that a person may develop cancer sometime in his or her lifetime following exposure to a particular contaminant under specific exposure scenarios. For children, the theoretical excess cancer risk is not calculated for a lifetime of exposure, but from a fraction of lifetime; based on known or suspected length of exposure, or years of childhood.

Because of conservative models used to derive CSFs, using this approach provides a theoretical estimate of risk; the true or actual risk is unknown and could be as low as zero. Numerical risk estimates are generated using mathematical models applied to epidemiologic or experimental data for carcinogenic effects. The mathematical models extrapolate from higher experimental doses to lower experimental doses. Often, the experimental data represent exposures to chemicals at concentrations orders of magnitude higher than concentrations found in the environment. In addition, these models often assume that there are no thresholds to carcinogenic effects--a single molecule of a carcinogen is assumed to be able to cause cancer. The doses associated with these estimated hypothetical risks might be orders of magnitude lower than doses reported in toxicology literature to cause carcinogenic effects. As such, a low cancer risk estimate of  $1 \times 10^{-6}$  and below may indicate that the toxicology literature supports a finding that no excess cancer risk is likely. A cancer risk estimate greater than  $1 \times 10^{-6}$ , however, indicates that a careful review of toxicology literature before making conclusions about cancer risks is in order.

## APPENDIX D: SITE SPECIFIC VAPOR INTRUSION CALCULATIONS

Groundwater contamination models based on monitoring well sampling results at the Miller Bottom Road Landfill were used to describe the extent of the contamination plume beneath the landfill. The modeling shows the contamination plume at its highest concentration approximately 50 feet below ground surface, however gradient concentrations radiate and diffuse out toward the water table and beneath homes. Although the models show trends of deep contamination migrating in a downward and southeasterly pattern, on-site sampling along the south border of the landfill detected VOCs at the water table depth. Therefore, VOCs are diffusing into shallower depths, creating another potential exposure pathway through vapor intrusion into homes, although the highest concentrations are not spreading upwards.

Home elevations in the community vary from 10 feet to 40 feet above the water table. Homes with foundations approximately 10 feet above the water table were located to the south and southeast of the landfill. All but one of those homes located 10 feet above the water table were outside the delineation gradient of the modeled plume, and therefore there is no completed exposure pathway for vapor intrusion into these homes. One home directly south of the landfill is located within the lateral boundaries of the VOC plume, and therefore has a potential for exposure from vapor intrusion.

The US EPA Conceptual Site Model calculation for target concentration in indoor air was used to calculate the hypothetical concentration of site-related chemicals that could be found in indoor air. The attenuation factor, which was obtained from the EPA's OSWER Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils – (Subsurface Vapor Intrusion Guidance) attenuation factor graphs, was estimated based on site specific conditions. The modeled total VOC concentration found in the water table beneath the foundation of the home was used to determine the hypothetical indoor air concentration. Although the levels of PCE are less than one-third of total VOCs, a “worst case scenario” assumption using the most toxic and volatile chemical, – PCE- was used to determine the potential risk to homeowners whose home foundations are 10 feet above the groundwater contamination plume. Calculations are typically based on the most toxic and most volatile VOC. The model used to calculate the attenuation factor can be found at [www.epa.gov/correctiveaction/eis/vapor.htm](http://www.epa.gov/correctiveaction/eis/vapor.htm).

### Calculations

GDPH used the U.S. EPA's Subsurface Vapor Intrusion Guidance accessed at the above mentioned website to determine the hypothetical concentration of indoor PCE contributed by vapor intrusion into the residence.

For target and total concentrations in groundwater the calculations are as follows.

If the target concentration is calculated as:

$$C_{gw} [\mu\text{g}/\text{L}] = C(\text{target,ia}) [\mu\text{g}/\text{m}^3] * 10^{-3} \text{ m}^3/\text{L} * 1/\text{H} * 1/\alpha \quad \text{then therefore,}$$

The site-specific concentrations are:

$$C(\text{ia}) [\mu\text{g}/\text{m}^3] = C(\text{gw}) [\mu\text{g}/\text{L}] * 1/10^{-3} \text{ L}/\text{m}^3 * \alpha * H \quad \text{where}$$

$C_{\text{gw}}$  = target groundwater concentration,

$\alpha$  = attenuation factor (ratio of indoor air concentration to source vapor concentration).

$H$  = dimensionless Henry's Law Constant at 25C [(mg/L – vapor)/(mg/L – H<sub>2</sub>O)].

**Site Specific Concentration:**

$C_{\text{gw}}$  = 350 ppb or 350  $\mu\text{g}/\text{L}$

$\alpha$  = Graph based =  $2 \times 10^{-4}$

$H$  = 0.532

Therefore, the hypothetical indoor air concentration based on site-specific data is:

$C(\text{ia}) = 37 \mu\text{g}/\text{m}^3$ , which is below the ATSDR chronic exposure CV for air (300  $\mu\text{g}/\text{m}^3$ ) and the US EPA target indoor air concentration = 81  $\mu\text{g}/\text{m}^3$  for PCE. There are no ATSDR CVs for cancer evaluation; however, U.S. EPA considers PCE to be a probable human carcinogen.

## APPENDIX E: GLOSSARY OF TERMS

### ATSDR/GDPH Glossary of Environmental Health Terms

#### **Absorption**

The process of taking in. For a person or animal, absorption is the process of a substance getting into the body through the eyes, skin, stomach, intestines, or lungs.

#### **Adverse health effect**

A change in body function or cell structure that might lead to disease or health problems.

#### **Background level**

An average or expected amount of a substance or radioactive material in a specific environment, or typical amounts of substances that occur naturally in an environment.

#### **Biota**

Plants and animals in an environment. Some of these plants and animals might be sources of food, clothing, or medicines for people.

#### **Cancer**

Any one of a group of diseases that occurs when cells in the body become abnormal and grow or multiply out of control.

#### **Cancer risk**

A theoretical risk of for getting cancer if exposed to a substance every day for 70 years (a lifetime exposure). The true risk might be lower.

#### **Carcinogen**

A substance that causes cancer.

**CERCLA** [see **Comprehensive Environmental Response, Compensation, and Liability Act of 1980**]

#### **Chronic**

Occurring over a long time (more than 1 year) [compare with **acute**].

#### **Chronic exposure**

Contact with a substance that occurs over a long time (more than 1 year) [compare with **acute exposure** and **intermediate duration exposure**].

#### **Comparison value (CV)**

Calculated concentration of a substance in air, water, food, or soil that is unlikely to cause harmful (adverse) health effects in exposed people. The CV is used as a screening level during

the public health assessment process. Substances found in amounts greater than their CVs might be selected for further evaluation in the public health assessment process.

**Completed exposure pathway** [see **exposure pathway**].

**Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)**

CERCLA, also known as **Superfund**, is the federal law that concerns the removal or cleanup of hazardous substances in the environment and at hazardous waste sites. ATSDR, which was created by CERCLA, is responsible for assessing health issues and supporting public health activities related to hazardous waste sites or other environmental releases of hazardous substances.

**Concentration**

The amount of a substance present in a certain amount of soil, water, air, food, blood, hair, urine, breath, or any other media.

**Contaminant**

A substance that is either present in an environment where it does not belong or is present at levels that might cause harmful (adverse) health effects.

**Dermal**

Referring to the skin. For example, dermal absorption means passing through the skin.

**Dermal contact**

Contact with (touching) the skin [see **route of exposure**].

**Detection limit**

The lowest concentration of a chemical that can reliably be distinguished from a zero concentration.

**Disease prevention**

Measures used to prevent a disease or reduce its severity.

**Disease registry**

A system of ongoing registration of all cases of a particular disease or health condition in a defined population.

**Environmental media**

Soil, water, air, **biota** (plants and animals), or any other parts of the environment that can contain contaminants.

### **Environmental media and transport mechanism**

Environmental media include water, air, soil, and **biota** (plants and animals). Transport mechanisms move contaminants from the source to points where human exposure can occur. The **environmental media and transport mechanism** is the second part of an **exposure pathway**.

### **EPA**

United States Environmental Protection Agency.

### **Exposure**

Contact with a substance by swallowing, breathing, or touching the skin or eyes. Exposure may be short-term [**acute exposure**], of intermediate duration, or long-term [**chronic exposure**].

### **Exposure assessment**

The process of finding out how people come into contact with a hazardous substance, how often and for how long they are in contact with the substance, and how much of the substance they are in contact with.

### **Exposure pathway**

The route a substance takes from its source (where it began) to its end point (where it ends), and how people can come into contact with (or get exposed to) it. An exposure pathway has five parts: a **source of contamination** (such as an abandoned business); an **environmental media and transport mechanism** (such as movement through groundwater); a **point of exposure** (such as a private well); a **route of exposure** (eating, drinking, breathing, or touching), and a **receptor population** (people potentially or actually exposed). When all five parts are present, the exposure pathway is termed a **completed exposure pathway**.

### **Groundwater**

Water beneath the earth's surface in the spaces between soil particles and between rock surfaces [compare with **surface water**].

### **Hazard**

A source of potential harm from past, current, or future exposures.

### **Hazardous waste**

Potentially harmful substances that have been released or discarded into the environment.

### **Health consultation**

A review of available information or collection of new data to respond to a specific health question or request for information about a potential environmental hazard. Health consultations are focused on a specific exposure issue. Health consultations are therefore more limited than a public health assessment, which reviews the exposure potential of each pathway and chemical [compare with **public health assessment**].

**Health education**

Programs designed with a community to help it know about health risks and how to reduce these risks.

**Health investigation**

The collection and evaluation of information about the health of community residents. This information is used to describe or count the occurrence of a disease, symptom, or clinical measure and to estimate the possible association between the occurrence and exposure to hazardous substances.

**Health promotion**

The process of enabling people to increase control over, and to improve, their health.

**Indeterminate public health hazard**

The category used in ATSDR's public health assessment documents when a professional judgment about the level of health hazard cannot be made because information critical to such a decision is lacking.

**Ingestion**

The act of swallowing something through eating, drinking, or mouthing objects. A hazardous substance can enter the body this way [see **route of exposure**].

**Inhalation**

The act of breathing. A hazardous substance can enter the body this way [see **route of exposure**].

**mg/kg**

Milligram per kilogram.

**mg/cm<sup>2</sup>**

Milligram per square centimeter (of a surface).

**mg/m<sup>3</sup>**

Milligram per cubic meter; a measure of the concentration of a chemical in a known volume (a cubic meter) of air, soil, or water.

**Migration**

Moving from one location to another.

**Minimal risk level (MRL)**

An ATSDR estimate of daily human exposure to a hazardous substance at or below which that substance is unlikely to pose a measurable risk of harmful (adverse), noncancerous effects.



MRLs are calculated for a route of exposure (inhalation or oral) over a specified time period (acute, intermediate, or chronic). MRLs should not be used as predictors of harmful (adverse) health effects [see **reference dose**].

**No apparent public health hazard**

A category used in ATSDR's public health assessments for sites where human exposure to contaminated media might be occurring, might have occurred in the past, or might occur in the future, but where the exposure is not expected to cause any harmful health effects.

**No-observed-adverse-effect level (NOAEL)**

The highest tested dose of a substance that has been reported to have no harmful (adverse) health effects on people or animals.

**No public health hazard**

A category used in ATSDR's public health assessment documents for sites where people have never and will never come into contact with harmful amounts of site-related substances.

**Plume**

A volume of a substance that moves from its source to places farther away from the source. Plumes can be described by the volume of air or water they occupy and the direction they move. For example, a plume can be a column of smoke from a chimney or a substance moving with groundwater.

**Point of exposure**

The place where someone can come into contact with a substance present in the environment [see **exposure pathway**].

**Population**

A group or number of people living within a specified area or sharing similar characteristics (such as occupation or age).

**Potentially responsible party (PRP)**

A company, government, or person legally responsible for cleaning up the pollution at a hazardous waste site under Superfund. There may be more than one PRP for a particular site.

**ppb**

Parts per billion.

**ppm**

Parts per million.

**Prevention**

Actions that reduce exposure or other risks, keep people from getting sick, or keep disease from getting worse.

**Public comment period**

An opportunity for the public to comment on agency findings or proposed activities contained in draft reports or documents. The public comment period is a limited time period during which comments will be accepted.

**Public availability session**

An informal, drop-by meeting at which community members can meet one-on-one with ATSDR staff members to discuss health and site-related concerns.

**Public health action**

A list of steps to protect public health.

**Public health hazard**

A category used in ATSDR's public health assessments for sites that pose a public health hazard because of long-term exposures (greater than 1 year) to sufficiently high levels of hazardous substances or **radionuclides** that could result in harmful health effects.

**Public health hazard categories**

Public health hazard categories are statements about whether people could be harmed by conditions present at the site in the past, present, or future. One or more hazard categories might be appropriate for each site. The five public health hazard categories are **no public health hazard, no apparent public health hazard, indeterminate public health hazard, public health hazard, and urgent public health hazard.**

**Public meeting**

A public forum with community members for communication about a site.

**RCRA [See Resource Conservation and Recovery Act (1976, 1984)]****Receptor population**

People who could come into contact with hazardous substances [see **exposure pathway**].

**Remedial Investigation**

The CERCLA process of determining the type and extent of hazardous material contamination at a site.

**Resource Conservation and Recovery Act (1976, 1984) (RCRA)**

This Act regulates management and disposal of hazardous wastes currently generated, treated, stored, disposed of, or distributed.

**Risk**

The probability that something will cause injury or harm.

**Risk reduction**

Actions that can decrease the likelihood that individuals, groups, or communities will experience disease or other health conditions.

**Risk communication**

The exchange of information to increase understanding of health risks.

**Route of exposure**

The way people come into contact with a hazardous substance. Three routes of exposure are breathing [**inhalation**], eating or drinking [**ingestion**], or contact with the skin [**dermal contact**].

**Safety factor [see uncertainty factor]****SARA [see Superfund Amendments and Reauthorization Act]****Sample**

A portion or piece of a whole. A selected subset of a population or subset of whatever is being studied. For example, in a study of people the sample is a number of people chosen from a larger population [see **population**]. An environmental sample (for example, a small amount of soil or water) might be collected to measure contamination in the environment at a specific location.

**Sample size**

The number of units chosen from a population or environment.

**Solvent**

A liquid capable of dissolving or dispersing another substance (for example, acetone or mineral spirits).

**Source of contamination**

The place where a hazardous substance comes from, such as a landfill, waste pond, incinerator, storage tank, or drum. A source of contamination is the first part of an **exposure pathway**.

**Special populations**

People who might be more sensitive or susceptible to exposure to hazardous substances because of factors such as age, occupation, sex, or behaviors (for example, cigarette smoking). Children, pregnant women, and older people are often considered special populations.

**Stakeholder**

A person, group, or community who has an interest in activities at a hazardous waste site.

**Statistics**

A branch of mathematics that deals with collecting, reviewing, summarizing, and interpreting data or information. Statistics are used to determine whether differences between study groups are meaningful.

**Substance** A chemical.

**Substance-specific applied research**

A program of research designed to fill important data needs for specific hazardous substances identified in ATSDR's **toxicological profiles**. Filling these data needs would allow more accurate assessment of human risks from specific substances contaminating the environment. This research might include human studies or laboratory experiments to determine health effects resulting from exposure to a given hazardous substance.

**Superfund Amendments and Reauthorization Act (SARA)**

In 1986, SARA amended CERCLA and expanded the health-related responsibilities of ATSDR. CERCLA and SARA direct ATSDR to look into the health effects from substance exposures at hazardous waste sites and to perform activities including health education, health studies, surveillance, health consultations, and toxicological profiles.

**Surface water**

Water on the surface of the earth, such as in lakes, rivers, streams, ponds, and springs [compare with **groundwater**].

**Survey**

A systematic collection of information or data. A survey can be conducted to collect information from a group of people or from the environment. Surveys of a group of people can be conducted by telephone, by mail, or in person. Some surveys are done by interviewing a group of people [see **prevalence survey**].

**Toxic agent**

Chemical or physical (for example, radiation, heat, cold, microwaves) agents which, under certain circumstances of exposure, can cause harmful effects to living organisms.

**Toxicological profile**

An ATSDR document that examines, summarizes, and interprets information about a hazardous substance to determine harmful levels of exposure and associated health effects. A toxicological profile also identifies significant gaps in knowledge on the substance and describes areas where further research is needed.

**Toxicology**

The study of the harmful effects of substances on humans or animals.

**Urgent public health hazard**

A category used in ATSDR's public health assessments for sites where short-term exposures (less than 1 year) to hazardous substances or conditions could result in harmful health effects that require rapid intervention.

**Volatile organic compounds (VOCs)**

Organic compounds that evaporate readily into the air. VOCs include substances such as benzene, toluene, methylene chloride, and methyl chloroform.

**Other glossaries and dictionaries:**

Environmental Protection Agency <http://www.epa.gov/OCEPATERMS/>

National Center for Environmental Health (CDC)

<http://www.cdc.gov/nceh/dls/report/glossary.htm>

National Library of Medicine <http://www.nlm.nih.gov/medlineplus/dictionaries.html>