# **Health Consultation**

# SCHLAGE LOCK COMPANY SECURITY, COLORADO

ASSESSMENT OF DRINKING WATER QUALITY CITY OF FOUNTAIN MUNICIPAL WATER, 1996 - 2001

EPA FACILITY ID: COD082657420

APRIL 29, 2005

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**

# SCHLAGE LOCK COMPANY SECURITY, COLORADO

# ASSESSMENT OF DRINKING WATER QUALITY CITY OF FOUNTAIN MUNICIPAL WATER, 1996 - 2001

EPA FACILITY ID: COD082657420

#### Prepared by:

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

## **Health Consultation**

# Schlage Lock Company Security, Colorado Assessment of Drinking Water Quality City of Fountain Municipal Water, 1996 - 2001

EPA ID No. COD082657420





## Prepared by

The Colorado Department of Public Health and Environment under a cooperative agreement with the Agency for Toxic Substances and Disease Registry

## **Table of Contents**

Foreword	ii
Background and Statement of Issues	1
Discussion	2
Evaluation of Environmental Data	2
The City of Fountain Municipal Water Supply Data	3
Exposure Pathway Analysis	4
Child Health Considerations	4
Conclusions	4
Recommendations	5
Public Health Action Plan	5
Community Involvement/ Health Education	5
Author, Technical Advisors	6
Author	6
Designated Reviewer	6
ATSDR Technical Project Officer	6
References	
Appendix A. Map of Area Water Districts in Proximity to the Schlage Lock Company Plant	8
Appendix B. PCE Test Results for Distal Monitoring Wells and the City of Fountain Ground	
Water Wells	9
Appendix C. Map of Distal Extent and City of Fountain Wells	10
Appendix D. ATSDR's Public Health Hazard Categories	11
Certification	12

#### **Foreword**

The Colorado Department of Public Health and Environment (CDPHE) has prepared this health consultation in cooperation with the Agency for Toxic Substances and Disease Registry (ATSDR). ATSDR is part of the US Department of Health and Human Services and is the principal federal public health agency responsible for the health issues related to hazardous waste. This health consultation was prepared in accordance with the methodologies and guidelines developed by ATSDR.

The purpose of this health consultation is to identify and prevent harmful health effects resulting from exposure to hazardous substances in the environment. Health consultations focus on health issues associated with specific exposures so that the state or local department of public health can respond quickly to requests from concerned citizens or agencies regarding health information on hazardous substances. The state or local department of public health evaluates sampling data collected from a hazardous waste site, determines whether exposures have occurred or could occur, reports any potential harmful effects, and recommends actions to protect public health. The findings in this report are relevant to conditions at the site during the time of this health consultation and should not necessarily be relied upon if site conditions or land use changes in the future.

For additional information or questions regarding the CDPHE or the contents of this health consultation, please call the health advisor who prepared this document:

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#### **Background and Statement of Issues**

At the request of a concerned resident and CDPHE's Hazardous Material and Waste Management Division (HMWMD), CDPHE's Environmental Health Studies Program (EHS), under a Cooperative Agreement with ATSDR, is conducting an evaluation of cancer incidence and PCE concentration in municipal water in Security-Widefield, Colorado. Specifically, the request initiating this investigation included concerns about cancer and the quality of the drinking water in the Security Water District (SWD), Widefield Water and Sanitation District, City of Fountain, and private residential wells.

EHS contacted CDPHE's Water Quality Control Division and various area water departments in order to review and obtain available environmental sampling data for the affected municipal drinking water supplies. (See Figure in Appendix A for a map of the area water districts in proximity to the Schlage Lock site.) In addition, private residential well data were obtained from the annual and quarterly monitoring reports from the Schlage Lock PCE remediation site. However, due to the complexity of evaluating all water systems in one public health consultation, EHS has decided to evaluate each water system as a separate public health consultation. The following report is for the City of Fountain municipal water supply.

Community concern focused primarily on the incidence of multiple myeloma cancers in the Security-Widefield area. In response to these concerns, the EHS contacted the Colorado Central Cancer Registry (CCCR) to conduct an evaluation of the incidence of cancers of the esophagus, cervix, bladder, liver, kidney, lung, breast, non-Hodgkins lymphoma, and leukemia by a small geographic area where a PCE plume has been identified. These cancer types were selected in order to address community concern regarding suspected elevations in the incidence of these cancer types and because the scientific literature suggests environmental factors (e.g., exposure to chemicals) may be associated with the development of cancer. Results of the cancer evaluation will be described in a future document.

Schlage Lock, located at 3899 Hancock Expressway, Security, Colorado, began operations manufacturing door locks and related hardware in August 1977. From late 1977 until mid 1992, Schlage Lock used the solvent tetrachloroethylene (PCE) as a metal cleaner.

In mid July 1987, during plant expansion, Schlage Lock discovered PCE in their subsurface soils. Soil Vapor Extraction (SVE) systems were installed in two source areas in 1989 and in a third source area in 2000. Other remediation technologies that have been implemented include air sparging, NC<sub>2</sub> oxidation, and recirculating sparge wells.

Schlage discovered that groundwater beneath the site was contaminated with PCE after an initial investigation in 1987. The plume of PCE contaminated groundwater extends from the Schlage Lock facility, in a west-southwest direction below Little Johnson Reservoir, then turns and migrates south-southeast as it intersects with the Widefield aquifer south of Bradely Road. The contaminant plume travels within the Widefield aquifer toward the Willow Springs Ponds. The shape of the contaminant plume is constrained by paleo-channels in bedrock and by channel deposits in the Widefield aquifer. The length of the contaminant plume is approximately four and a half miles. The Widefield aquifer is used for drinking water in the Security-Widefiled

municipal water supply. The PCE concentration in the Widefield Aquifer varies greatly over time and space due to lithologic differences. For example, the range of PCE concentration detected at monitoring wells SW-37 in 1995 was 91-140 micrograms per liter ( $\mu$ g/l) and at SW-44 was 67-140  $\mu$ g/l. In comparison, the average concentration in 2004 (as of August 2004) was 15  $\mu$ g/l and 18  $\mu$ g/l respectively. At SW-43, a monitoring well located just 475 feet from SW-44, the PCE concentration in 1995 varied from 12-16  $\mu$ g/l (Accame, 2004).

Affected municipal wells were either shut down or water treatment systems were installed to remove PCE before concentrations became greater than drinking water standards. Affected residential wells were either offered municipal water hook-ups or individual water-treatment units. In 1990, Schlage Lock installed an on-site groundwater recovery and treatment system to treat PCE-contaminated groundwater, and in 1992, they began operation of an additional system between their property and the former Little Johnson Reservoir. Treated water was discharged under a permit to the Security Water and Sanitation District sanitary sewer.

By 1999, maximum concentrations of PCE within the plume were over 1,000  $\mu$ g/l in the vicinity of Little Johnson Reservoir, less than 100  $\mu$ g/l south of Bradley Road, and less than 50  $\mu$ g/l south of Fountaine Boulevard. Maximum PCE concentrations detected during the 2<sup>nd</sup> quarter of 2004 were below 800  $\mu$ g/l in the vicinity of Little Johnson Reservoir, less than 50  $\mu$ g/l south of Bradley Road, and less than 10  $\mu$ g/l south of Fountaine Boulevard. The width of the plume with PCE concentrations exceeding 5  $\mu$ g/l is usually less than 200 feet. An upgraded groundwater remediation system, described as the Bradley Road/Little Johnson Reservoir Groundwater Recovery, Treatment and Injection System, has been operating since 1999. The system is designed to halt further movement of PCE-affected groundwater into the Widefield aquifer.

In 2001, a series of sentry wells were installed to monitor groundwater in the vicinity of various municipal water supply wells. Additionally, an on-site boundary control system was installed. The boundary control system consists of 37 recovery wells for groundwater extraction, treatment, and infiltration. Water from the recovery wells is filtered and softened, then conveyed to the Bradley Road/Little Johnson Reservoir water treatment facility where PCE is removed prior to injecting the treated water into the ground. The system began operation in January 2002 with 19 wells. In November 2002, 14 recovery wells were added. In April 2003, a trench drain (including four recovery wells) became operational as part of the on-site boundary control system.

Some ponds in the area, Willow Springs Ponds, have also been found to be contaminated with PCE. In 1997, the El Paso County Parks Department closed the Willow Springs Ponds to all fishing pending further fish testing and analysis. Results of the fish analysis will be discussed in a future document.

#### **Discussion**

#### **Evaluation of Environmental Data**

Available sampling data for the City of Fountain water supply was reviewed, and a screening evaluation was conducted to identify PCE in the water supply and determine whether it may be

of potential health concern. The screening analysis identifies maximum concentrations of contaminants detected in the water supply and compares these concentrations with maximum contaminant levels and health-based comparison values established by the ATSDR (ATSDR 2003). The ATSDR comparison values are specific concentrations of a chemical for various environmental media (e.g., air, soil, or water) that are used by health assessors to identify environmental contaminants that require further evaluation. These comparison values are developed based on health guidelines and assumed exposure situations that represent high estimates of human exposure. Chemical concentrations detected in environmental media that are less than a comparison value are unlikely to pose a health threat. However, chemical concentrations detected in environmental media above a comparison value do not necessarily represent a health threat. To impact one's health, a chemical must not only be present in a certain environmental media but a person must also come in contact with the compound via the contaminated medium (e.g., drinking water).

Therefore, if the concentration of a chemical in an environmental medium (e.g., water) is greater than the appropriate comparison value (CV), the potential for exposure to the chemical should be further evaluated to determine whether health effects may be possible. Further evaluation is necessary because the CVs used in the screening analysis are derived based on high estimates of exposure that do not apply to all situations. Therefore, they are conservative in order to be health protective. Factors related to actual exposures that are unique to the specific situation under investigation need to be determined if an adverse health effect from this chemical could occur.

It is not unusual to detect some contaminants in a drinking water supply. For this reason, the CDPHE, Water Quality Control Division has adopted standards known as maximum contaminant levels (MCLs) for public drinking water supplies. These standards were developed by the US Environmental Protection Agency (EPA) and identify the maximum concentration at which a chemical can safely exist in drinking water. If a chemical is detected below the MCL, that chemical is considered to be at a level that is safe for drinking water.

#### The City of Fountain Municipal Water Supply Data

The City of Fountain municipal drinking water supply has been sampled and tested for PCE on three occasions. The results of drinking water samples were reported to CDPHE to ensure that the City's drinking water supply is in compliance with state drinking water standards. According to the latest sampling data reviewed, the municipal drinking water supply for the City of Fountain, based on results reviewed from September 20, 2001, is currently in compliance with state drinking water standards [see table in Appendix B].

The City of Fountain obtains approximately 22 percent of its municipal water from 4 groundwater wells (F-1, F-2, F-3, F-4). The remaining 78 percent of the water supply comes from the Fountain Valley Water authority, which draws surface water from the Pueblo Reservoir and is not impacted by the PCE plume in question (Woolsey 2004).

Municipal water obtained from 4 groundwater wells and the Fountain Valley Water authority is mixed within the distribution system. For example, water from groundwater well F-1 flows through a short water main toward a large water main. Here, water from well F-1 is diluted with

the flow of other water supply sources, (e.g., other groundwater wells and water from Pueblo Reservoir) which also enter the large water main at this junction (Woolsey 2004).

A series of 5 ground water monitoring wells (ESCMW-09, ESCMW-10, ESCMW-11, ESCMW-12, ESCMW-13) have been installed to detect movement of the PCE plume. These wells are located approximately 2000 feet south of the willow springs ponds and more than two miles north of the City of Fountain ground water wells. [See Figure Appendix C for a map of the monitoring wells in relation to the City of Fountain ground water wells.] Since 2001, the monitoring wells have been tested quarterly and all results were below the detection limit with the exception of one, which was slightly above the detection limit [see table in Appendix B]. Therefore, it is believed that the distal extent of the PCE plume has not moved beyond the monitoring wells and further testing for PCE in the City of Fountain groundwater wells is unnecessary.

For the City of Fountain groundwater wells, the level at which PCE was detected was below detection level for the test (less than 0.5 micrograms per liter ( $\mu g/l$ )). The state standard is 5  $\mu g/l$  for drinking water.

#### **Exposure Pathway Analysis**

Exposure to PCE in the municipal water supply in the City of Fountain is not occurring, and has not likely occurred in the past. Therefore, this represents an eliminated exposure pathway. According to the monitoring reports for the Schlage Lock Site, the municipal drinking water supply for the City of Fountain does not contain PCE.

#### **Child Health Considerations**

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

#### **Conclusions**

PCE, a metal cleaning solvent, has been detected in the Widefield aquifer, the same aquifer from which the City of Fountain draws its drinking water. However, it does not appear that customers of the City of Fountain municipal water system were exposed to PCE in their drinking water. Therefore, this is categorized as a **No Public Health Hazard**. [See Appendix D for a description of ATSDR's public health hazard categories.]

#### **Recommendations**

- CDPHE's Environmental Health Studies program will review any additional environmental sampling data for municipal water wells as data becomes available at the request of local officials and Security-Widefield residents.
- The CDPHE, Environmental Health Studies program recommends continued regulatory oversight of the PCE plume by the CDPHE Hazardous Materials Waste Management Division.

#### **Public Health Action Plan**

The public health action plan describes the actions designed to mitigate or prevent adverse human health effects that might result from exposure to hazardous substances associated with site contamination. CDPHE commits to do the following public health action related to the City of Fountain municipal water supply:

- Review any additional environmental sampling data for the City of Fountain municipal water supply as data becomes available at the request of local officials and Security-Widefield residents.
- Evaluate environmental sampling data for other municipal water supplies affected by the PCE groundwater plume and publish the evaluations in future health consultations.
- Evaluate environmental sampling data for private residential wells affected by the PCE groundwater plume and publish the evaluation in a future health consultation.
- Evaluate environmental sampling data and fish data for the Willow Springs ponds in a future health consultation.
- Evaluate cancer incidence data in a future health consultation.

#### **Community Involvement/ Health Education**

- A Community Involvement and Health Issues Communication Plan has been created to identify and document community concerns and to identify community-relations activities that encourage two-way communication of health issues, environmental concerns, and clean-up activities.
- Written responses to significant comments received through community in-home interviews were complied in a Responsiveness Summary.
- The has established an information repository in the Security Public Library, 715 Aspen Drive, Security, CO 80911.
- The Department of Public Health will provide community education activities for any group or individual who would like the findings of the health consultation explained.

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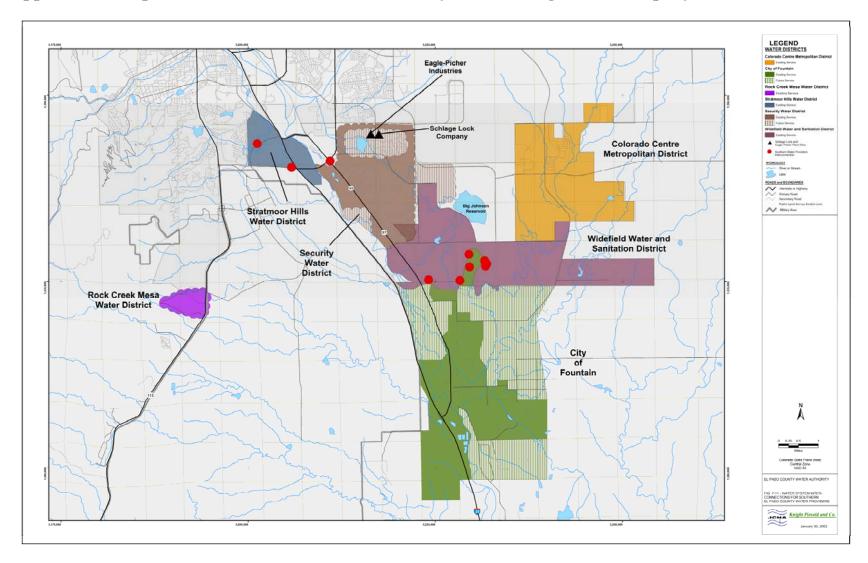
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R. Woolsey, general manager, City of Fountain Water and Sanitation, personal communication, July 2004.

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## Appendix A. Map of Area Water Districts in Proximity to the Schlage Lock Company Plant



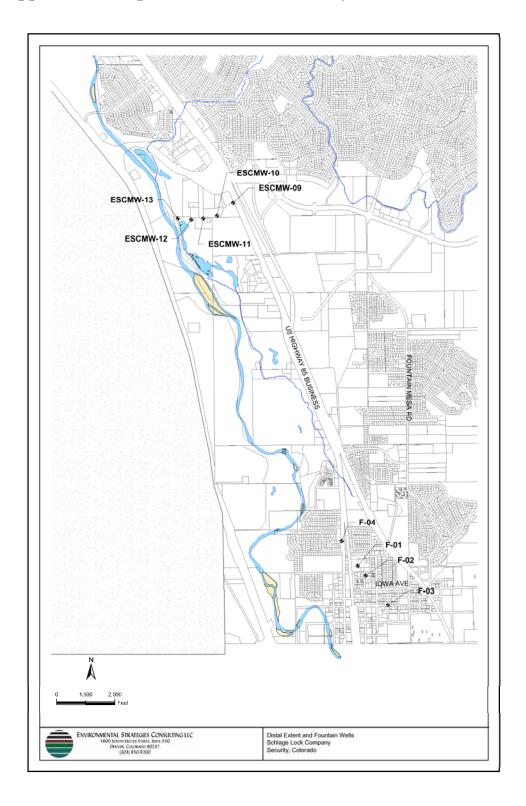
# Appendix B. PCE Test Results for Distal Monitoring Wells and the City of Fountain Ground Water Wells

Mapsite	Sample Date	Result	Units
ESCMW-09	4/6/2001	ND	μg/L
ESCMW-09	5/18/2001	ND	μg/L
ESCMW-09	8/27/2001	ND	μg/L
ESCMW-09	1/4/2002	ND	μg/L
ESCMW-09	3/11/2002	ND	μg/L
ESCMW-09	6/5/2002	ND	μg/L
ESCMW-09	8/15/2002	ND	μg/L
ESCMW-09	11/7/2002	ND	μg/L
ESCMW-09	2/5/2003	ND	μg/L
ESCMW-09	6/5/2003	ND	μg/L
ESCMW-09	10/13/2003	ND	μg/L
ESCMW-09	11/7/2003	ND	μg/L
ESCMW-09	3/19/2004	ND	μg/L
ESCMW-09	5/12/2004	ND	μg/L
ESCMW-09	8/10/2004	ND	μg/L
ESCMW-09	11/8/2004	ND	μg/L
ESCMW-10	4/6/2001	ND	μg/L
ESCMW-10	5/18/2001	ND	μg/L
ESCMW-10	1/4/2002	ND	μg/L
ESCMW-10	3/11/2002	0.51	μg/L
ESCMW-10	6/5/2002	ND	μg/L
ESCMW-10	8/15/2002	ND	μg/L
ESCMW-10	11/6/2002	ND	μg/L
ESCMW-10	2/5/2003	ND	μg/L
ESCMW-10	6/5/2003	ND	μg/L
ESCMW-10	10/13/2003	ND	μg/L
ESCMW-10	3/19/2004	ND	μg/L
ESCMW-10	5/12/2004	ND	μg/L
ESCMW-10	7/29/2004	ND	μg/L
ESCMW-10	11/8/2004	ND	μg/L
ESCMW-11	7/17/2001	ND	μg/L
ESCMW-11	8/27/2001	ND	μg/L
ESCMW-11	1/4/2002	ND	μg/L
ESCMW-11	3/11/2002	ND	μg/L
ESCMW-11	6/5/2002	ND	μg/L
ESCMW-11	8/15/2002	ND	μg/L
ESCMW-11	11/6/2002	ND	μg/L
ESCMW-11	2/5/2003	ND	μg/L
ESCMW-11	6/5/2003	ND	μg/L
ESCMW-11	10/13/2003	ND	μg/L
ESCMW-11	11/7/2003	ND	μg/L
ESCMW-11	3/19/2004	ND	μg/L
ESCMW-11	5/12/2004	ND	μg/L
ESCMW-11	7/29/2004	ND	μg/L
ESCMW-11	11/8/2004	ND	μg/L

Mapsite	Sample Date	Result	Units
ESCMM/ 12	7/17/2001	ND	ug/l
ESCMW-12	7/17/2001	ND ND	μg/L
ESCMW-12	8/27/2001		μg/L
ESCMW-12	1/4/2002	ND	μg/L
ESCMW-12	3/11/2002	ND	μg/L
ESCMW-12	6/5/2002	ND	μg/L
ESCMW-12	8/15/2002	ND	μg/L
ESCMW-12	11/6/2002	ND	μg/L
ESCMW-12	2/5/2003	ND	μg/L
ESCMW-12	6/5/2003	ND	μg/L
ESCMW-12	10/13/2003	ND	μg/L
ESCMW-12	11/11/2003	ND	μg/L
ESCMW-12	3/19/2004	ND	μg/L
ESCMW-12	5/12/2004	ND	μg/L
ESCMW-12	7/29/2004	ND	μg/L
ESCMW-12	11/8/2004	ND	μg/L
ESCMW-13	7/17/2001	ND	μg/L
ESCMW-13	8/27/2001	ND	μg/L
ESCMW-13	1/4/2002	ND	μg/L
ESCMW-13	3/11/2002	ND	μg/L
ESCMW-13	6/5/2002	ND	μg/L
ESCMW-13	8/15/2002	ND	μg/L
ESCMW-13	11/6/2002	ND	μg/L
ESCMW-13	2/5/2003	ND	μg/L
ESCMW-13	6/5/2003	ND	μg/L
ESCMW-13	10/13/2003	ND	μg/L
ESCMW-13	11/11/2003	ND	μg/L
ESCMW-13	3/19/2004	ND	μg/L
ESCMW-13	5/12/2004	ND	μg/L
ESCMW-13	7/29/2004	ND	μg/L
ESCMW-13	11/8/2004	ND ND	μg/L
F-01	7/18/1996	ND ND	μg/L
F-01		ND ND	
	6/6/2001		μg/L
F-01	9/20/2001	ND ND	μg/L
F-02	7/18/1996	ND	μg/L
F-02	6/6/2001	ND	μg/L "
F-02	9/20/2001	ND	μg/L "
F-03	7/18/1996	ND	μg/L 
F-03	6/6/2001	ND	μg/L
F-03	9/20/2001	ND	μg/L
F-04	7/18/1996	ND	μg/L
F-04	6/6/2001	ND	μg/L
F-04	9/20/2001	ND	μg/L

ND= Nondetect

## Appendix C. Map of Distal Extent and City of Fountain Wells



# **Appendix D. ATSDR's Public Health Hazard Categories**

Category / Definition	Data Sufficiency	Criteria
A. Urgent Public Health Hazard  This category is used for sites where short-term exposures (< 1 yr) to hazardous substances or conditions could result in adverse health effects that require rapid intervention.	This determination represents a professional judgment based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that site-specific conditions or likely exposures have had, are having, or are likely to have in the future, an adverse impact on human health that requires immediate action or intervention. Such site-specific conditions or exposures may include the presence of serious physical or safety hazards.
B. Public Health Hazard  This category is used for sites that pose a public health hazard due to the existence of long-term exposures (> 1 yr) to hazardous substance or conditions that could result in adverse health effects.	This determination represents a professional judgment based on critical data which ATSDR has judged sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* suggests that, under site-specific conditions of exposure, long-term exposures to site-specific contaminants (including radionuclides) have had, are having, or are likely to have in the future, an adverse impact on human health that requires one or more public health interventions. Such site-specific exposures may include the presence of serious physical or safety hazards.
C. Indeterminate Public Health Hazard  This category is used for sites in which "critical" data are insufficient with regard to extent of exposure and/or toxicologic properties at estimated exposure levels.	This determination represents a professional judgment that critical data are missing and ATSDR has judged the data are insufficient to support a decision. This does not necessarily imply all data are incomplete; but that some additional data are required to support a decision.	The health assessor must determine, using professional judgment, the "criticality" of such data and the likelihood that the data can be obtained and will be obtained in a timely manner. Where some data are available, even limited data, the health assessor is encouraged to the extent possible to select other hazard categories and to support their decision with clear narrative that explains the limits of the data and the rationale for the decision.
D. No Apparent Public Health Hazard This category is used for sites where human exposure to contaminated media may be occurring, may have occurred in the past, and/or may occur in the future, but the exposure is not expected to cause any adverse health effects.	This determination represents a professional judgment based on critical data which ATSDR considers sufficient to support a decision. This does not necessarily imply that the available data are complete; in some cases additional data may be required to confirm or further support the decision made.	Evaluation of available relevant information* indicates that, under site-specific conditions of exposure, exposures to site-specific contaminants in the past, present, or future are not likely to result in any adverse impact on human health.
E: No Public Health Hazard This category is used for sites that, because of the absence of exposure, do NOT pose a public health hazard.	Sufficient evidence indicates that no human exposures to contaminated media have occurred, none are now occurring, and none are likely to occur in the future	

<sup>\*</sup>Such as environmental and demographic data; health outcome data; exposure data; community health concerns information; toxicologic, medical, and epidemiologic data; monitoring and management plans.

#### Certification

This health consultation was prepared by the Colorado Department of Public Health and Environment under a cooperative agreement with the Agency for Toxic Substances and Disease Registry (ATSDR). It is in accordance with approved methodology and procedures existing at the time the health assessment was begun. Editorial review was completed by the Cooperative Agreement partner.

Jennifer A. Freed
Technical Project Officer
Division of Health Assessment and Consultation (DHAC)
ATSDR

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

Roberta Erlwein Team Leader, SPAB, DHAC, ATSDR



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Date April 29, 2005

From Division of Health Assessment and Consultation, ATSDR

Subject Health Consultation

Schlage Lock Company

To Glenn Tucker

Senior Regional Representative, ATSDR, Region VIII

Enclosed please find five copies of the April 29, 2005, Health Consultation on the following site prepared by the Colorado Department of Public Health and Environment under Cooperative Agreement with the Agency for Toxic Substances and Disease Registry.

SCHLAGE LOCK COMPANY SECURITY, COLORADO EPA FACILITY ID: COD082657420

ASSESSMENT OF DRINKING WATER QUALITY CITY OF FOUNTAIN MUNICIPAL WATER, 1996 - 2001

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Aaron Borrelli Manager, Records Center

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