STATE OF NEW YORK
DEPARTMENT OF HEALTH

Flanigan Square, 547 River Street, Troy, New York 12180 –2216

Antonia Novella, M.D., M.P.H.
Commissioner

Dennis P. Whalen
Executive Deputy Commissioner

July 6, 2001

Dear Interested Party:

Enclosed is a copy of the health consultation for the **Colesville Landfill** site in Broome County, New York. This document was developed by the New York State Department of Health (NYS DOH), in cooperation with the U. S. Agency for Toxic Substances and Disease Registry (ATSDR). The purpose of this health consultation is to update the community about events that have taken place at the Colesville Landfill since the release of the 1993 Public Health Assessment and to evaluate the status of off-site contamination in private drinking water wells and leachate.

For any additional questions or to obtain additional copies of the health consultation, please contact me (toll free) at 1-800-458-1158, extension 27530. I can also be reached via e-mail at **ceheduc@health.state.ny.us**.

Sincerely,

Mark A. VanDeusen
Outreach Coordinator
Center for Environmental Health
New York State Department of Health

Enclosure

New York State Department of Health
Center for Environmental Health

Health Consultation

Colesville Landfill

Broome County, New York

November 13, 2000 Cerclis No. NYD980768691

Prepared under a Cooperative Agreement with
U.S. Department of Health & Human Services
Public Health Service
Agency for Toxic Substances and Disease Registry

In an effort to reduce the costs of printing and postage, please notify us if you wish your name to be deleted from our mailing list or if your address has changed.

New York State Department of Health
Center for Environmental Health
Outreach Unit
Flanigan Square, Room 316
547 River Street
Troy, NY 12180-2218
1-800-458-1158, Ext. 2-7530
(518) 402-7530

BACKGROUND AND STATEMENT OF ISSUES

The New York State Department of Health, under a Cooperative Agreement with the Agency for Toxic Substance and Disease Registry, completed a public health assessment for the Colesville Landfill in March of 1993. That document contains additional detail regarding background, history of the site, past investigations and remedial actions, community concerns, completed and potential exposure pathways and public health implications for past exposures. The purpose of this health consultation is to update the community about events that have taken place at the Colesville Landfill since the 1993 health assessment (NYS DOH 1993), and to evaluate the status of off-site contamination in private drinking water wells and leachate.

A. Site Description and History

The site is in an undeveloped, rural region of Broome County (Figure 1). The area surrounding the landfill includes large tracts of rolling woodlands, cultivated agricultural fields, livestock pasture and scattered single-family residences. The nearest homes are to the west and southwest along East Windsor Road, with the closest about 300 feet from the landfill perimeter. The nearest and largest residential development is the Hamlet of Doraville, about ½ mile south of the landfill. A Delaware-Hudson railway service line runs north-south, generally along the Susquehanna River, west of the landfill property. The Susquehanna River near the Colesville Landfill may be used for recreation (e.g., fishing and swimming) and fish propagation. The unnamed tributaries to the north and south of the landfill could also be used for fishing and recreation.

The Town of Colesville operated the Colesville Landfill from 1965 to 1971. The Broome County Department of Public Works took ownership of the site in 1969 and operated the landfill from 1971 to 1984. The site was primarily used for disposal of municipal waste; however, between 1973 and 1975 an estimated 68,500 gallons of drummed industrial waste was disposed at the site (Wehran Engineering, 1988). The site is just north of the Hamlet of Doraville at the intersection of county routes 541 and 29 (East Windsor Rd.) in the Town of Colesville. Of the 113-acre parcel owned by Broome County, 35 acres were used for waste disposal. The landfill has been inactive since 1984 and was capped in 1995, in accordance with a 1991 Record of Decision (ROD) (US EPA 1991).

A focused feasibility study (FFS) (Geraghty and Miller, 1996) was conducted in 1995 to determine the appropriateness of the groundwater management plan that was originally proposed. That study shows that the approach to groundwater management needs to be modified, and the ROD may need to be amended. A pilot study is being conducted to evaluate the effectiveness of adding oxygen-releasing compounds to the contaminated plume. The purpose of the study is to determine if this *in situ* bio-remediation technique will attain groundwater remediation goals faster than a conventional groundwater extraction system. Initial results from that study are reported in a groundwater remediation system report (Geraghty and Miller, 2000).

Several private wells between the site and the Hamlet of Doraville are contaminated with volatile organic compounds (VOCs) from the site. The county bought three of these properties; however,

some have wells which are or could be used. There are carbon filtration systems on the water supplies that are still being used. These wells are shallow overburden wells. The major contaminants of concern include benzene, chlorobenzene, chloroethane, chloroform, 1,1-dichloroethane, *trans*-1,2-dichloroethene, toluene, 1,1,1-trichloroethane, trichloroethene; and methylene chloride. The public health implications of these past exposures are discussed in the 1993 public health assessment (NYS DOH 1993).

B. Current Site Conditions

The Colesville Landfill is currently closed, capped and access to the landfill is restricted. A leachate recovery system, which was required by the ROD to handle contaminated run-off from the site, was not installed during site closure. In the past, leachate production was evident on both the north and the south side of the site. This leachate flowed into two small drainage streams that discharged to the Susquehanna River. Post closure inspections found that discharge of leachate to these streams still continues. Although surface water infiltration is somewhat controlled by the cap, some leachate is still being produced. Samples of the leachate and the stream water were taken in February 2000. Results showed that the leachate contained several volatile organic compounds; however, the stream immediately downgradient did not have detectable levels of contamination. The leachate seep is in a brushy part of the landfill, where potential contact with contaminants in leachate by trespassers is limited.

The ROD also provided for a groundwater management system. During the design of site closure, the consultant for the Broome County Solid Waste Authority determined that the pumping system, as it was presented in the ROD, would not effectively clean up the groundwater contaminant plume. A model was used to calculate the operational time needed to restore the groundwater to New York State groundwater standards. The original prediction was four years. The more appropriate time needed for aquifer recovery was later determined to be 65 years. The FFS indicated that this was about the same amount of time needed for natural attenuation to accomplish the same goal. Negotiations are currently ongoing between the county and US EPA to choose a reasonable and cost-effective remedy for the groundwater contaminant plume. A pilot study is ongoing to test the effectiveness of adding oxygen-releasing compounds to the groundwater in an attempt to hasten biodegradation.

Seven homes downgradient of the landfill have wells taking water from the shallow overburden aquifer, which became contaminated from the site. Broome County purchased three of these properties and the houses were demolished. Three other homes are still using contaminated wells with treatment systems and one well is no longer contaminated.

DISCUSSION: ADULT AND CHILDREN HEALTH ISSUES

Because of the controversy over the appropriateness of the groundwater management system, the conditions of the ROD have not been implemented. The two components that are related to public health are long-term monitoring of the early warning wells and the replacement of the contaminated

water supply wells. Replacement wells would be drilled into the bedrock with double casing to seal out contaminated water from the overburden aquifer.

A series of monitoring wells are outside the contaminant plume, and were identified in the post closure operation and maintenance (O&M) plan as sampling points to detect any contaminant migration toward the private water supply wells in Doraville. Since this type of a monitoring program is typically not implemented until after the remedy is complete, sampling has not been done in accordance with the O&M Plan.

In lieu of providing alternate water supplies to affected homes, the county chose to purchase properties to eliminate human exposure. Although some properties have been vacated, three homes within the plume remain occupied. The county is maintaining carbon filter treatment systems on the water supplies of these homes to reduce exposures to contaminants in the water by children and adults.

For an undetermined period of time, leachate from the Colesville Landfill site has been contaminated with chlorinated VOCs. Exposure of trespassers to contaminants in leachate from the Colesville Landfill site could occur by incidental ingestion and by dermal contact. The highest levels of chlorobenzene (16 mcg/L), chloroethane (21 mcg/L), 1,1-dichloroethane (58 mcg/L), and trichloroethene (4 mcg/L) measured in leachate that was sampled in February 2000 at the site exceed New York State public drinking water or surface water standards (Table 1). No volatiles were detected in the stream water when sampled in February 2000. The location of the site and current knowledge of site conditions (e.g., location of the leachate seeps in the brushy portion of the landfill) suggest that long-term exposure to contaminants in the leachate is unlikely. Given the fairly low contaminant levels and the minimal contact expected, no adverse health effects are likely to children or adults following exposure to the leachate.

CONCLUSIONS

In the Public Health Assessment (NYS DOH 1993), the Colesville Landfill was classified as a public health hazard because of past and possible future exposures to hazardous substances. Several private wells between the site and the Hamlet of Doraville are contaminated with VOCs from the site. The county bought three of these properties; however, some have wells which are or could be used. There are carbon filtration systems on the water supplies that are still being used. Also, landfill leachate on-site contained VOCs; however, the stream immediately downgradient did not have detectable levels of contamination. The levels detected in the leachate are unlikely to cause adverse health effects. Therefore, the site currently presents no apparent public health hazard as long as the filters provided are maintained and the leachate does not increase significantly in volume or contaminant concentration.

- Although steps were taken to reduce exposure to contaminated drinking water, environmental contamination and potential for exposure remains. The cap has eliminated most exposures to contaminants on-site. However, recent sampling and observation of leachate seeps show that the landfill cap has not eliminated leachate discharge from the site. Although surface water

infiltration is somewhat controlled by the cap, some leachate is still being produced.

- The remaining homes within the contaminated groundwater area continue to show low levels of VOC contamination and residents continue to rely on filters to provide a potable water supply. Based on modeling information, both active remediation (pump and treat) and intrinsic remediation will require a long time (several decades) to return the groundwater to drinking water standards.

RECOMMENDATIONS

- The off-site groundwater continues to show levels of contamination in areas where residential wells are still being used. These shallow wells should be replaced with double cased bedrock wells as indicated in the ROD. Meanwhile, the filtration units should be maintained to prevent exposure to volatile organic compounds in drinking water.

- Implementation of the operation and maintenance plan should begin immediately, regardless of the status of other provisions in the ROD. This should include routine sampling of the leachate seeps and the monitoring wells that were installed to detect any migration of the groundwater contaminants.

PUBLIC HEALTH ACTION PLAN

The Public Health Action Plan (PHAP) for the Colesville Landfill contains a description of actions to be taken by ATSDR and/or the NYS DOH following completion of this health consultation. For those actions already taken at the landfill, please refer to the background section of this health consultation. The purpose of the PHAP is to ensure that this health consultation identifies public health hazards and provides a plan of action designed to mitigate and prevent adverse human health effects resulting from past, present and/or future exposures to hazardous substances at or near the landfill. Included is a commitment on the part of ATSDR and the NYS DOH to follow-up on this plan to ensure that it is implemented. The public health actions to be implemented by ATSDR and/or the NYS DOH are as follows:

- The ATSDR and NYS DOH will work with NYS DEC and US EPA to make sure that filtration systems on contaminated private wells are maintained and will work toward a more permanent remedy, such as replacing these shallow wells with double cased bedrock wells.

- The ATSDR and NYS DOH will work with NYS DEC and US EPA to make sure that the groundwater contaminant plume will be monitored to detect whether contamination is moving toward private wells in Doraville.

REFERENCES

NYS DOH. 1993. Public Health Assessment, Colesville Landfill, Colesville, Broome County, New York.

Geraghty and Miller. 1996. Focused Feasibility Study, Colesville Landfill, Broome County, New York.

Geraghty and Miller. 2000. Groundwater remediation system report, 95% design. Colesville Landfill, Broome County, New York.

US EPA. 1991. Record of Decision - Colesville Landfill Site - Town of Colesville, Broome County, New York.

Wehran Engineering, P.C. 1988. Colesville Landfill Remedial Investigation Report, Volume 1. WE Project No. 07522ER.

PREPARERS OF REPORT

New York State Department of Health Authors

John G. Sheehan
Public Health Specialist
Bureau of Environmental Exposure Investigation

Donald W.R. Miles
ATSDR Coordinator
Bureau of Environmental Exposure Investigation

Sharlin Liu
Assistant Research Scientist
Bureau of Toxic Substance Assessment

Thomas B. Johnson
Research Scientist
Bureau of Toxic Substance Assessment

Agency for Toxic Substances and Disease Registry

Arthur Block
Senior Regional Representative
Region 2
Office of Regional Operations

Gregory V. Ulirsch
Technical Project Officer
Environmental Health Engineer
Superfund Site Assessment Branch
Division of Health Assessment and Consultation

Certification

The Health Consultation for the Colesville Landfill site was prepared by the New York Department of Health 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 consultation was initiated.

Technical Project Officer, SPS, SSAB, DHAC

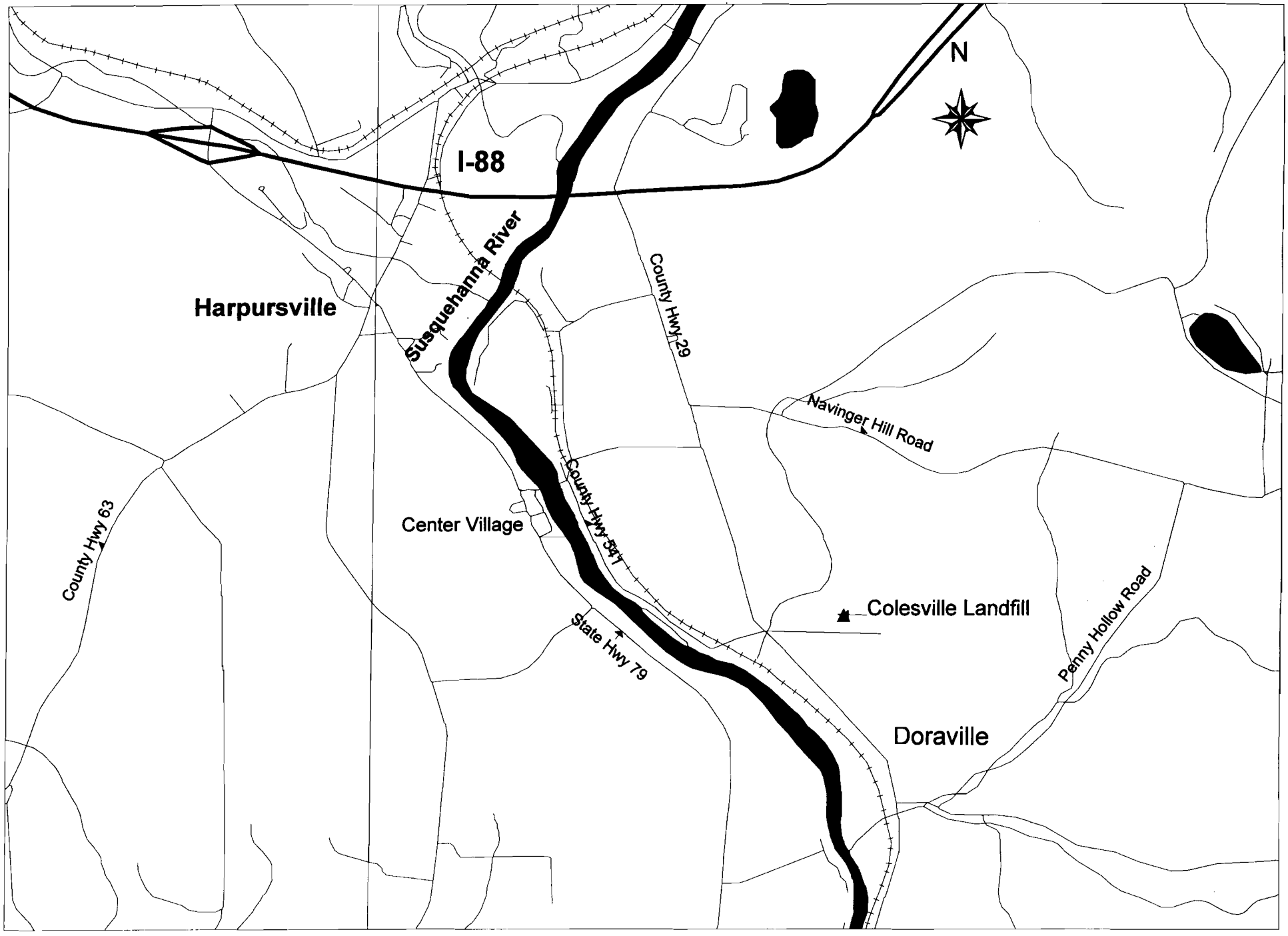
The Superfund Site Assessment Branch (SSAB), Division of Health Assessment and Consultation (DHAC), ATSDR, has reviewed this health consultation and concurs with its findings.

Chief, SSAB, DHAC, ATSDR

APPENDIX A

FIGURE 1

Figure 1 - Colesville Landfill - Colesville, Broome County



APPENDIX B

TABLE 1

Table 1
Water Quality Standards/Guidelines
Exceeded by Contaminants Found in Leachate Samples at the Colesville Landfill Site
[All values in micrograms per liter (mcg/L)]

Contaminant	Maximum Detected	Water Quality Standards/Guidelines			
		New York State			US EPA
		Ground	Surface	Drinking	Drinking
chlorobenzene	16	5	20	5	100
chloroethane	21	5	5 (g)	5	--
1,1-dichloroethane	58	5	5 (g)	5	--
trichloroethene	4	5	3	5	5

g : Guidance value.

APPENDIX C

PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS FOR CONTAMINANTS OF CONCERN

NYS DOH PROCEDURE FOR EVALUATING POTENTIAL HEALTH RISKS FOR CONTAMINANTS OF CONCERN

To evaluate the potential health risks from contaminants of concern associated with the Colesville Landfill site, the New York State Department of Health assessed the risks for cancer and noncancer health effects.

Increased cancer risks were estimated by using site-specific information on exposure levels for the contaminant of concern and interpreting them using cancer potency estimates derived for that contaminant by the US EPA or, in some cases, by the NYS DOH. The following qualitative ranking of cancer risk estimates, developed by the NYS DOH, was then used to rank the risk from very low to very high. For example, if the qualitative descriptor was "low", then the excess lifetime cancer risk from that exposure is in the range of greater than one per million to less than one per ten thousand. Other qualitative descriptors are listed below:

Excess Lifetime Cancer Risk

Risk Ratio	Qualitative Descriptor
equal to or less than one per million	very low
greater than one per million to less than one per ten thousand	low
one per ten thousand to less than one per thousand	moderate
one per thousand to less than one per ten	high
equal to or greater than one per ten	very high

An estimated increased excess lifetime cancer risk is not a specific estimate of expected cancers. Rather, it is a plausible upper bound estimate of the probability that a person may develop cancer sometime in his or her lifetime following exposure to that contaminant.

There is insufficient knowledge of cancer mechanisms to decide if there exists a level of exposure to a cancer-causing agent below which there is no risk of getting cancer, namely, a threshold level. Therefore, every exposure, no matter how low, to a cancer-causing compound is assumed to be associated with some increased risk. As the dose of a carcinogen decreases, the chance of developing cancer decreases, but each exposure is accompanied by some increased risk.

There is general consensus among the scientific and regulatory communities on what level of estimated excess cancer risk is acceptable. An increased lifetime cancer risk of one in one million or less is generally not considered a significant public health concern.

For noncarcinogenic health risks, the contaminant intake was estimated using exposure assumptions for the site conditions. This dose was then compared to a risk reference dose (estimated daily intake of a chemical that is likely to be without an appreciable risk of health effects) developed by the US EPA, ATSDR and/or NYS DOH. The resulting ratio was then compared to the following qualitative scale of health risk:

Qualitative Descriptions for
Noncarcinogenic Health Risks

Ratio of Estimated Contaminant Intake to Risk Reference Dose	Qualitative Descriptor
equal to or less than the risk reference dose	minimal
greater than one to five times the risk reference dose	low
greater than five to ten times the risk reference dose	moderate
greater than ten times the risk reference dose	high

Noncarcinogenic effects unlike carcinogenic effects are believed to have a threshold, that is, a dose below which adverse effects will not occur. As a result, the current practice is to identify, usually from animal toxicology experiments, a no-observed-effect-level (NOEL). This is the experimental exposure level in animals at which no adverse toxic effect is observed. The NOEL is then divided by an uncertainty factor to yield the risk reference dose. The uncertainty factor is a number which reflects the degree of uncertainty that exists when experimental animal data are extrapolated to the general human population. The magnitude of the uncertainty factor takes into consideration various factors such as sensitive subpopulations (for example, children or the elderly), extrapolation from animals to humans, and the incompleteness of available data. Thus, the risk reference dose is not expected to cause health effects because it is selected to be much lower than dosages that do not cause adverse health effects in laboratory animals.

The measure used to describe the potential for noncancer health effects to occur in an individual is expressed as a ratio of estimated contaminant intake to the risk reference dose. A ratio equal to or less than one is generally not considered a significant public health concern. If exposure to the contaminant exceeds the risk reference dose, there may be concern for potential noncancer health effects because the margin of protection is less than that afforded by the reference dose. As a rule, the greater the ratio of the estimated contaminant intake to the risk reference dose, the greater the level of concern. This level of concern depends upon an evaluation of a number of factors such as the actual potential for exposure, background exposure, and the strength of the toxicologic data.

APPENDIX D

ATSDR PUBLIC HEALTH HAZARD CATEGORIES

INTERIM 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 judgement 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 judgement 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 judgement 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 judgement, 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 judgement 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	

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