

ATTACHMENT J

Response to Comments Submitted to CT DPH on the draft Public Health Assessment for Residential Soils in the Newhall Street Neighborhood, Hamden, Connecticut

Comment 1: Upon determining that soil has contaminants at levels greater than soil cleanup standards, residents want soil removed, if small children are living in the household. What plan does the DPH have to prevent children and pregnant women with PICA from ingesting chemical contaminants in their yards? Asking residents with small children not to dig in their yards below 4 inches of the top soil is unrealistic.

Response 1: Ultimately, residents who have landfill-related contamination in their yards at levels above cleanup standards will have that contamination addressed by CT DEP or Olin so that the soil meets state cleanup standards. Until that happens, CT DPH has provided residents with practical advice about how to reduce their exposure to soil. CT DPH recognizes that asking residents not to dig in their yards is not a practical permanent solution. CT DPH's recommendations about reducing soil exposure are only intended to be in place until a final cleanup action occurs in the neighborhood.

Comment 2: The residents want to be tested for the toxic effects of the known contaminants, understanding that chemicals may have opposing or even synergistic effects. For example, smoking coupled with asbestos exposure increases the risk of lung cancer by 25 fold.

Response 2: CT DPH has recommended blood lead screening for Newhall neighborhood residents because lead is the only contaminant found in soil at levels high enough that harmful health impacts could occur.

Comment 3: The community would like lead screening, for adults and children, to be offered at CT DEP's next quarterly meeting in July, not at QVHD. The community would also like CT DPH to develop a health program, to be held on a Saturday, to help residents better understand the adverse health effects of living on or near a hazardous waste landfill.

Response 3: In response to the community's request, CTDPH held an open house for addressing health concerns on Saturday, June 26, 2004. Blood lead screening was offered. An environmental medicine physician from the University of Connecticut Division of Occupational and Environmental Medicine was also present to answer residents' health questions.

Comment 4: The community would like radon testing for residential homes in the Newhall Street neighborhood. Radon is known to cause lung cancer.

Response 4: Testing for radon in your home is always a good idea. Radon tests are easy and inexpensive and are the only way to know for sure whether you and your family are at risk from radon exposure. The CT DPH is not able to provide radon test kits to the neighborhood but residents can purchase a radon test kit at any local hardware or home improvement store.

Comment 5: Why did CT DPH segment the community with two public health assessments, one for the Hamden Middle School and one for the residential neighborhood. Why not conduct a comprehensive evaluation? What is the difference between the contaminants at the Middle School versus contaminants found in residential areas? Poison is poison!

Response 5: CT DPH's intent was not to "segment" the community, or to imply that the effects of contaminants are different in different areas of the landfill. CT DPH prepared separate health consultation/health assessment documents for the Middle School, the Newhall Street School, Rochford Field, and the Residential Neighborhood. For each of these areas, CT DPH prepared a document at the time that sufficient environmental data was available for that area. CT DPH believes that this is more responsive than waiting for all environmental data from all the areas to be available.

Comment 6: New text was submitted to describe the methane screening performed by DEP in 2002.

Response 6: The suggested text was added to page 6 of the Public Health Assessment.

Comment 7: New text was suggested to state that in the CT DEP Right-of-Way soil sampling, depth samples were also analyzed for extractable total petroleum hydrocarbons (ETPH).

Response 7: The suggested text was added to page 8 of the Public Health Assessment.

Comment 8: New text was suggested to clarify that results summarized in Table 2 include samples collected by both DEP and EPA.

Response 8: The suggested text has been added to the Public Health Assessment.

Comment 9: New text was suggested to clarify footnote 5.

Response 9: The suggested changes were made to footnote 5.

Comment 10: The acronym CEL should be explained on the top of page 20.

Response 10: An explanation for CEL has been added.

Comment 11: In the Health Outcome Data section, the same two cancer incidence time periods are listed. This should be corrected.

Response 11: The correction has been made.

Comment 12: Recommendation 6 should be deleted because it is included in general recommendation 2.

Response 12: CT DPH agrees. Recommendation 6 has been deleted.

Comment 13: It would be helpful to see a map showing the rough distribution of chemical contaminants throughout the neighborhood. GIS methods allow the map to be created in ways that protect privacy of information.

Response 13: A significant level of effort would be needed to create a GIS map using all the soil data that have been collected thus far. CT DPH does not have the resources needed to create such a map. It is possible that a contaminant distribution map for the neighborhood may be created as part of the investigation work CT DEP, Olin, the Town of Hamden, and the Regional Water Authority are doing on the site.

Comment 14: The Newhall Street neighborhood is not the same as the study area. The neighborhood includes at least 25 blocks. Confusing the two may leave the impression that the current study area encompasses all the potentially contaminated areas. It should be made clear that large parts of Newhall and Newhallville (in New Haven) have not been tested.

Response 14: The text on page 1 now specifies that the focus of the Public Health Assessment is the "Newhall Street Neighborhood," as it is defined in the Public Health Assessment.

Comment 15: On page 1, there is no mention of ETPHs which have somewhat consistently been found at levels that exceed the RDEC (see Olin's proposed sampling plan). This omission is consistent throughout the document.

Response 15: The text referred to on page 1 is a summary statement which includes contaminants found at elevated levels in both surface and subsurface soils. ETPH was found at somewhat consistently elevated levels in subsurface soils, not surface soils. The Environmental Data section of the Public Health Statement already mentions exceedances of ETPHs.

Comment 16: Stating that the screening step excludes exposures for which there is no meaningful health effect (because they are below the RDEC) may not be true. For example, such screening methods exclude the potential health impacts of exposure to multiple chemicals at once. Indeed, the co-occurrence of lead and arsenic alone is so frequent in the US, a separate Toxicological Profile to consider the interaction effects was performed by the ATSDR. Frameworks for assessing risks of multiple exposures have been proposed by many, including ATSDR.

Response 16: The CT Residential Criteria for Direct Exposure (RDEC) that were used for screening are derived to be very conservative (health protective). Criteria for individual chemicals are set at very low risk levels to account for cumulative exposures from multiple contaminants at a site.

Comment 17: To say that any homes with the highest lead-related risk have been cleaned may be premature given (a) the ongoing and currently incomplete nature of soil testing and (b) the fact that some homes tested during the EPA's cleanup were over 400 mg/kg but less than 1200 mg/kg, meaning they were still hazardous but not cleaned up. It may also be misleading given that over half of all samples contained over 400 mg/kg of lead.

Response 17: CT DPH has stated in many places throughout the Public Health Assessment that its evaluations, conclusions and recommendations are based on the sampling results from 2001 and 2002. Therefore, based upon those results, homes with the highest lead levels have been cleaned up. CT DPH acknowledges that there are still many homes in the neighborhood with lead levels in surface soil that exceed cleanup standards and will be addressed as part of the neighborhood-wide cleanup plans. Likewise, there may be homes that have not yet been tested that have elevated lead in soil.

Comment 18: Discussion of QVHD's health survey should be accompanied by full disclosure of the weaknesses of the study, especially the low response rate which precludes the definitive statements about cancer rates and noncancer illnesses that are mentioned. With a response rate of less than 50% in a non-randomized sample, no statement about cancer rates can be made with confidence. In addition, the low response rate for noncancer effects renders the results unusable from an epidemiological standpoint. This should be made clear.

Response 18: In Section C4 of the Public Health Assessment (Health Outcome Data), additional language has been added to more clearly describe the weaknesses of the QVHD survey.

Comment 19: Cancer rates in the entire Town of Hamden cannot be expected to show any elevated rates of cancer in Newhall because the results will be diluted. Hamden cancer rates tell us only that the cancer rates in Newhall are not so profoundly astronomical that they would cause the rates of the entire town to increase. But they do not substantively contribute to a body of evidence which collectively says Newhall cancer rates are normal, as is implied here.

Response 19: In Section C4 of the Public Health Assessment (Health Outcome Data), additional language has been added to clarify this limitation.

Comment 20: The data in Tables 1 and 2 do not agree with the tables in Olin's revised work plan which, I believe summarizes the same bodies of data. If the data summarized is different, perhaps both data sets should be matched to include as much data as is currently available.

Response 20: The Tables in Olin's revised work plan do not include EPA surface soil data collected in 2001. Data Tables in the Public Health Assessment include the EPA data.

Comment 21: Though the EPA cleaned soil down to a depth of 18 inches, it is my understanding that a depth of 4 feet is the standard. Is that in a regulation somewhere and, if so, what are the risks posed to residents and how will those risks be managed? Will there be frequent soil retesting to track pollutant mobility? A possible recommendation would be to finish the cleanup job and/or to conduct permanent periodic testing to ensure there is no recontamination.

Response 21: CT Remediation Standard Regulations specify that the direct exposure soil cleanup standards must be met in soils as deep as 15 feet unless an environmental land use restriction is placed on the area so that contaminated soils less than 15 feet deep will not be exposed as a result of digging or other excavation activities.

Comment 22: My understanding is that somewhere in the process of testing for lead, a number of soil samples were composited which obscures any local hotspots and may even preclude some areas from protective action. If so, that should be disclosed. Also, there should be a discussion about the potential weaknesses of using one contaminant as a proxy for several others. In fact, the text acknowledges that high arsenic and PAH levels *almost* always occurred with high lead levels. How often was that not the case? Are residents therefore being fully warned that they will *almost* always be encountering safe soil in their yards? How many cases exist in which there were elevated levels of PAHs but not lead? How can the people in whose yards this is the case be informed?

Response 22: EPA performed extent-of-contamination surveys on properties identified for a removal action. For the extent-of-contamination surveys, a 10-foot grid was established at each property and EPA collected a composite sample consisting of soil from 5 points within each grid. If the composite sample exceeded 500 ppm lead (i.e., the average of the results of each 5 points), the grid was marked for excavation. It is possible that this procedure of using composite samples could have missed a moderately elevated lead result. However, if there was one point within the grid that was extremely elevated, the average within the grid would exceed 500 ppm and the grid would have been excavated.

Regarding the co-location of contaminants, lead was used as a proxy for arsenic and PAHs *only* during EPA's extent-of-contamination surveys on properties that had already been identified for cleanup.

Comment 23: I thought the XRF only looked at lead and arsenic in this case, not PAHs. Is that correct? Was a proxy for PAH used here? Also, I recall going through the QA/QC data and noticing that some of the soil samples tested for arsenic using the XRF and later confirmed by laboratory testing showed large discrepancies between the results from different methods. In other words, XRF results did not agree with lab results. If that is true, it could invalidate any conclusions that arsenic levels are safe according to the EPA-related testing. Furthermore, in footnote #1, the XRF limit is only 60 mg/kg, which is higher than the RDEC. So if the XRF results are invalid, and lab tests are

infrequent for arsenic, with what amount of confidence can we say that arsenic levels are not as high as they are for lead?

Response 23: As stated in the Environmental Data section of the Public Health Assessment, soil samples were field analyzed (using XRF) for lead, arsenic and mercury. Roughly 40% of the samples received confirmatory laboratory analysis. One sample from each property was analyzed for PAHs (as well as other semi-volatile chemicals). EPA investigated the correlation between XRF field results and laboratory results and concluded that XRF results for lead are in excellent agreement with laboratory results for lead concentrations less than 6000 ppm. At concentrations greater than 6000 ppm, XRF results do not agree as closely with laboratory results.

For arsenic, EPA concluded that XRF results are useable when lead levels are low (500 ppm or less). When lead levels are above 500 ppm but below 3000 ppm, arsenic XRF results are useable with a correction factor (which EPA applied to the data). When lead levels are greater than 3000 ppm, arsenic XRF results are not reliable.

The issue of XRF reliability is only a problem at high lead levels, well above the 1200 ppm concentration that would trigger EPA cleanup.

Comment 24: A disclosure about the limitations of the methods used to identify properties suitable for testing is needed. If the DEP only tested soil on properties where someone BOTH called and their yard contained bare spots or visual landfill clues, many potentially contaminated homes are unfairly excluded from analysis. Disclosure should include acknowledgement of populations whose properties will be excluded from this methodology. For example, renters and other short term residents are less likely to be informed or concerned about the contamination in the neighborhood and therefore are less likely to call in to request soil testing. Furthermore, they may be unwilling to risk alienating their landlords by calling to request soil testing which could drive the housing value down. It is also worth mentioning that children can be exposed to contaminated soil even when there are no bare spots.

Response 24: Only the supplemental soil testing done by CT DEP required that a property owner request sampling and have visual evidence of fill on the property. The soil testing done by EPA in 2001 identified properties for testing based on historical aerial photographs showing where fill was likely to be present. In addition, more extensive soil sampling was begun in the spring of 2004 by Olin and will continue until the summer of 2004.

Comment 25: Please specify how deep contamination must be in order to be excluded as a potential exposure pathway. If the critical depth is less than 4 feet, please explain how exposure can be managed among residents and contractors doing home improvements, how children can be warned to never dig that deeply, how kids with Pica will be identified and their risks managed, and how other incidental exposures can be managed. These are not unusual occurrences based on my experience in the area.

Response 25: When preparing a public health assessment, CT DPH and ATSDR typically consider accessible surface soils to be within the top 0-6 or 0-3 inches to be a complete exposure pathway (ongoing exposures). Deeper soils (no depth limit) are typically considered to be a potential exposure pathway. As stated in the response to a previous comment, Connecticut's soil cleanup standards apply to soils as deep as 15 feet unless an environmental land use restriction is placed on the area to warn against digging or other excavation activities.

Comment 26: The list of exposure factors on page 15 should include all exposure factors such as stage in development/pregnancy as well as other co-exposures such as other chemical contaminants or pharmaceuticals.

Response 26: The list was not intended to be a complete list of all factors that can affect whether a person becomes sick from exposure to environmental contamination. The text in Section C3 - Public Health Implications has been changed to clarify that it is not a comprehensive list of all factors.

Comment 27: All assumptions in the blood lead screening model and risk calculations for arsenic and PAHs should be listed.

Response 27: CT DPH believes that the Public Health Assessment does provide the relevant assumptions used in the blood lead screening model and the risk calculations for arsenic and PAHs. Some assumptions are provided in the text and some are provided in Attachment G.

Comment 28: It is impossible to say that “exposures at levels of public health concern are no longer occurring in the neighborhood” for many reasons, not the least of which is that lead exists in the soils at unsafe levels in over half the samples taken so far. Other reasons have already been articulated.

Response 28: CT DPH believes that its evaluation of the currently available data supports the conclusion that under current conditions, exposures at levels of public health concern are not occurring. The fact that lead is present in soils at elevated levels in over half the samples is not relevant because many, if not most, of those samples are from properties that EPA cleaned up in 2001.

Comment 29: I am not confident in the methodology to assess health risks associated with arsenic and PAHs (i.e., calculating an average concentration across properties rather than a property-specific average). Randomly selected lead data, which is more extensive, should be applied using this methodology and the results should be compared to lead findings as a whole. If spatial heterogeneity is on a small enough scale that local variation renders a one-sample-per-property methodology worthless, more samples would need to be gathered to get a true estimate of the distribution of arsenic and PAHs.



Response 29: CT DPH agrees that more arsenic and PAH data are needed on each property in order to get a more accurate estimate of the distribution of these contaminants. However, in this Public Health Assessment, CT DPH worked with the data it had available. Given the small number of arsenic and PAH samples on each property, CT DPH decided that an area-wide average was a reasonable way to evaluate the data.

Comment 30: A risk estimate of 5 in 10,000 is said to be “non-meaningful” when the EPA’s standard is 1 in 1 million. Using that well known risk standard, the public is actually at significant risk. Comparing the risk from living in Newhall to the “background” cancer rate is inappropriate. First, all cancers cannot be considered as the same disease. Secondly, there is no way to know what portion of these “background” rates are actually attributable to the contamination. Thirdly, it assumes a single baseline cancer rate for the entire population which we know is not true. The cancer rate for Newhall is probably significantly higher for most cancers than in Connecticut or the US because of demographics alone (with some exceptions like breast cancer). But it will be very difficult to detect with a relatively small sample size even if the entire neighborhood was included. Fourth, the assertion that the small increase in risk is negligible relative to the background risk assumes that all relatively low level risks are not worth addressing.

Response 30: EPA does not have a "standard" of one in one million risk. EPA uses a cancer risk range (one in ten thousand to one in one million) as a guide for making cleanup decisions. EPA almost never takes a cleanup action when risks are less than the "de minimus" risk of one in one million. EPA almost always takes a cleanup action when risks are greater than one in ten thousand. When cancer risks from a site fall within the risk range of one in ten thousand to one in one million, EPA makes cleanup decisions based on a variety of factors, including risk.

CT DPH estimated a cancer risk of five in one hundred thousand ( $5 \times 10^{-5}$ ) from exposure to arsenic in soil in the Morse Street group of properties (**not** five in ten thousand, as the commenter states). This is not considered by CT DPH to be a significant excess cancer risk, in terms of the likelihood of exposure causing disease. However, from a regulatory point of view, a risk of five in one hundred thousand falls within the risk range where EPA may take cleanup action but also may decide not to cleanup. From a health perspective, it represents a tiny increase above background cancer risks and such a tiny increase could never be observed among the small population of the Newhall neighborhood.

CT DPH argues that it is both appropriate and helpful to compare the theoretical excess cancer risks from the site with background rates. Background cancer rates provide some perspective on how many residents in the Newhall neighborhood might be expected to be diagnosed with cancer *even if there is no exposure to landfill contaminants*. With an understanding of background cancer rates, residents can better understand the magnitude of the theoretical increase that exposure to landfill contaminants could cause.

Comment 31: In the response to community concerns question #3, the expectations that a child will not touch the soil on a regular and continuing basis or that residents will vigilantly eliminate bare spots, wash toys and feet after every excursion into the backyard are unrealistic. Indeed the incidence of Pica in the US is highest among children (10-32%) (<http://www.nlm.nih.gov/medlineplus/ency/article/001538.htm>) and in people of color. There appears to be no statistical accommodation for that behavior in the model. Again, the burden of protection and behavior modification is on the residents. They need to know what they can do to protect themselves but this cannot be a long term strategy to deal with the contamination in this neighborhood.

Response 31: CT DPH agrees that residents need to be aware of actions they can take to reduce their contact with soil. CT DPH also agrees that placing the burden on residents to minimize their soil contact is not an acceptable long term solution. CT DEP will ensure that any permanent solution protects residents who use their yards to the fullest extent.

Comment 32: The response to community concerns question #8 should be more expansive and inclusive regarding lead exposure health effects that may persist beyond childhood. Is ADD/ADHD an expected outcome? What about research by Needleman and others that epidemiologically linked violent crime to blood lead levels in childhood?

Response 32: There are very limited data regarding attention deficit hyperactivity disorder and lead exposure. One study found a strong association between hair lead levels and the diagnosis of attention deficit hyperactivity disorder. However, this study has been criticized because hair is not considered a valid marker of lead exposure due to the extensive contamination possibilities (for example, hair care products) and the extent to which it relates to other usual markers of lead is not clear (ATSDR 1999).

With regard to links between lead exposure and violent crime, studies by Needleman et al. have suggested that lead levels in bone are related to various antisocial behaviors among children aged 7 to 11 years. However, there are questions regarding how confounding factors such as parental antisocial behavior were controlled for (ATSDR 1999). A recent study published in 2001 (Dietrich et al. 2001) reports that exposure to lead very early in life was associated with a small, but statistically significant increased frequency of self-reported and parent-reported delinquent and antisocial behaviors among 15-17 year olds. The authors conclude that while the effect of lead appears to be small, lead exposure may be one of many important variables in the development of antisocial behavior.

Comment 33: The final sentence in the answer to community concerns question #9 should be deleted. It is misleading and creates a false sense of security. Because a chemical is common does not mean it is harmless which is the implication here.

Response 33: CT DPH disagrees that the final sentence creates a false sense of security. It is important for residents to understand that there are sources of contaminants in soil other than the landfill.

Comment 34: In the conclusions section, ETPH has not been considered enough. In addition, the italicized statement regarding homes with the highest lead levels have been already cleaned up is misleading. First, even though the homes with the highest lead levels in the area have been remediated by the EPA, many more remain with unsafe lead levels as compared to the RDEC. Second, we cannot definitively say that exposure at levels of public health concern are not happening. We can say that the analysis, though limited in its application to individual circumstances, tells us that the average person will probably not be exposed at levels of concern according to the statistical model which requires certain assumptions. However we should also qualify the scientific guesses with statements about behaviors such as “playing in some yards or digging in the yards, could cause more exposure and put you at risk.” Another reason we cannot be definitive about the lack of risk is that testing is not yet complete inside the study area, let alone the properties outside the study area, where most indications point to a wider area of contamination.

Response 34: ETPH are discussed in the Public Health Implications Section (C3) but are not included in the Conclusions section for the following reasons. Average ETPH levels in surface soils were below health comparison values so they were not evaluated in detail. In deeper soils, ETPH were present at very elevated levels. However, contaminants in deep soils are considered a potential exposure pathway (because of the recommendation that digging not occur at the site) and therefore were not evaluated in this Public Health Assessment.

Comment 35: If the recommendations found in the fact sheets about gardening and digging in the soil are to be taken seriously, they must be accompanied by person-to-person outreach. Otherwise warnings will go largely unheeded and not respected. This might be a good opportunity to collaborate with Elizabeth Hayes on an outreach plan since she is working on the neighborhood issues full time.

Response 35: CT DPH agrees that its recommendations in the fact sheets are most effective when communicated on a one-on-one basis. CT DPH has spoken individually with many residents in the neighborhood at a variety of public meetings and Saturday open house events. CT DPH has also worked with the University of Connecticut Cooperative Extension Service Urban Gardening Program to provide practical information to the community regarding safe gardening. The suggestion to collaborate with Elizabeth Hayes, who is currently the Community Advocate, hired by CT DEP is a good one. CT DPH will work with the Community Advocate to improve outreach on CT DPH's fact sheets.

Comment 36: Biomonitoring should be offered for other contaminants of concern such as arsenic, PAHs, ETPHs and other frequently detected contaminants where biomarkers are available.

Response 36: Based on the environmental data currently available, levels of contaminants (other than lead) and resulting exposures are not high enough to warrant biomonitoring.

Comment 37: Attachment F should be more clear about the health implications of exposure to lead and smaller babies and premature births. For example, both are linked to higher rates of birth defects.

Response 37: Additional text has been added to Attachment F.