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Vasquez Boulevard/ Interstate 70 Superfund Site
Denver, Colorado

Information Package for the
EPA National Remedy Review Board

prepared by:

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Site Description

The Vasquez Boulevard and I-70 (VB/I-70) Superfund site is an area of approximately 4.5 square miles located in the north-central section of the city and county of Denver, Colorado. The CERCLIS identification number for the VB/I-70 site is CO0002259588.

Operable Unit 1 (OU1) of the VB/I-70 site encompasses four neighborhoods in north-central Denver that are largely residential: Swansea, Elyria, Clayton, and Cole. OU1 also includes the southwest portion of the Globeville neighborhood. Figure 1 is a map of the area.

There are approximately 4,000 residential properties, 10 schools, and 7 parks within OU1. Most residences are single family dwellings. There are also some multi-family homes and apartment buildings.

OU1 is narrowly defined as only those residential yards with levels of lead or arsenic in soil that present an unacceptable risk to human health. While numerous commercial and industrial properties are also located within OU1, these properties are not considered to be part of the VB/I-70 site. The levels of arsenic and lead in soils of OU1 do not pose an unacceptable risk to workers in a commercial/industrial scenario.

Environmental Justice Considerations

According to the 2000 census, the total population living within OU1 is 17,545. Also according to the 2000 census, there are approximately 2400 children 6 years old or younger who live there (ATSDR, 2002).

A higher percentage of ethnic minorities reside in VB/I-70 OU1 compared to Denver city-wide and average household incomes are lower there when compared to Denver city-wide. Table 1 summarizes key demographic data by neighborhood (Piton Foundation, 2002).

The VB/I-70 site is an Environmental Justice Site.....

EPA determined that the VB/I-70 site is an Environmental Justice (EJ) site because the community is predominantly low income and minority and is disproportionately affected by environmental impacts from many sources including industry, other Superfund sites, and major transportation corridors. Figure 2 shows the locations of regulated industries in the vicinity of the VB/I-70 site, illustrating the large number of such facilities in the area.

Table 1. Demographic and Economic Indicators for the Neighborhoods of VB/I70					
	Clayton	Cole	Swansea-Elyria	Globeville	Denver
Total Population	5,172	5,662	6,708	3,454	560,663
# Children under 18	1,901	1,936	2,491	1,162	129,457
# Elderly 65+	432	406	437	227	59,262
% African American	38.9%	21.3%	5.3%	2.6%	10.8%
% Native American	0.6%	0.6%	0.7%	1%	0.7%
% Asian/Pacific Islander	2.1%	0.3%	0.3%	0.8%	2.8%
% Latino	50.2%	71.0%	83.0%	77.5%	31.7%
% Non-Latino White	6.0%	6.0%	9.9%	17%	51.9%
% Persons on Public Assistance	12.2%	12.3%	7.9%	3.8%	4.6%
% Persons in Poverty	28.5%	26.3%	27.9%	23.2%	14.3%
Ave Household Income	$44,122	$38,990	$38,435	$33,148	$55,087

Site History

The story of VB/I-70 site begins at another Superfund site, the Asarco Globe Plant....

The Asarco Globe Plant is located at 51st Avenue and Washington Street in north Denver. For more than 100 years, the plant has been part of the Globeville neighborhood. The plant began operations as the Holden Smelter in 1886. That name was later changed to the Globe Smelting and Refining Company to reflect the multi-ethnic population that made up the workforce. The Globe Smelting and Refining Company was one of several plants consolidated in 1899 into the American Smelting and Refining Company, now known as Asarco, Inc. The Globe Plant was operated as a lead smelter from 1901 through 1919. Lead smelting was replaced by the production of arsenic trioxide, a compound used in alloys, insecticides, medicines, and glass. Arsenic trioxide production continued from 1919 to 1926. In 1926, the Globe Plant ceased

production of arsenic trioxide and began producing cadmium, a metallic by-product of zinc and lead. Large scale cadmium metal production ceased in 1991; however, cadmium oxide and cadmium powder production continued until 1993.

Current operations at the Globe Plant focus on the production of small quantities of high-purity metals and speciality chemicals used in a variety of industries. The Globe Plant produces litharge (lead oxide); cadmium sulfide and cadmium telluride, specialty chemicals used in the manufacture of photovoltaic cells; and refines the metals bismuth, tellurium, antimony, and selenium. (Asarco 1998a; Asarco 1998b).

Years of operations at the Globe Plant resulted in releases of hazardous substances into the environment both on the plant site and in the surrounding residential neighborhood of Globeville. In December, 1983, the State of Colorado sued Asarco for natural resource damages related to releases caused by their operations at the Globe Plant. Asarco subsequently conducted extensive environmental investigations under the State's oversight. EPA proposed that the Asarco Globe Plant be included on the National Priorities List (NPL) in May, 1993. At about the same time, in July, 1993, the State and Asarco entered into a consent decree. As part of that settlement agreement, Asarco is required to remediate soils in residential properties surrounding the Globe Plant where levels of cadmium, lead, and/or arsenic exceed acceptable limits established by the State in a Record of Decision (State of Colorado, 1993). These "action levels" for residential soils in Globeville were 70 parts per million (ppm) cadmium, 500 ppm lead, and 70 ppm arsenic. Appendix A contains information EPA has obtained from the State of Colorado to explain the basis for the arsenic and lead action levels. The State of Colorado has been the lead agency for overseeing the cleanup activities on the plant site and in the Globeville neighborhood.

The consent decree requires Asarco to collect soil samples from residential yards in the Globeville neighborhood and continue remediation until the extent of contamination from the Globe Plant is established. This was defined in the consent decree as a entire city block, " not to exceed 660 feet" with no properties containing unacceptable levels of cadmium, lead, or arsenic.

The arsenic anomaly which caused a dispute between Asarco and the State of Colorado.....

By 1997, Asarco had established the extent of lead and cadmium contamination in Globeville but continued to find random occurrences of elevated levels of arsenic in residential yards at greater distances from the Globe plant site. These unexpected arsenic levels came to be referred to as the "arsenic anomaly".

In June, 1998, Asarco invoked the dispute resolution provisions of the consent decree to modify the requirement to establish the extent of impacts from the Globe Plant using a "block -by -block" approach. Asarco's position was that "remediating community soils based on the block-by- block approach causes Asarco to address areas that exceed the action levels for arsenic and lead that are not due to the Globe Plant".

While the dispute resolution process was underway, further sampling and remediation of yard soils by Asarco was suspended. As of October, 2002, the dispute has not yet been formally resolved. The Colorado Department of Public Health and Environment (CDPHE) continued to be concerned about the possible health risks to area residents potentially exposed to arsenic in yard soils and about the extent of the problem in the north Denver area . In 1997, CDPHE began a limited soil sampling program in the Elyria and Swansea neighborhoods, located just east of Globeville, across the South Platte River. Figure 1, taken from the Remedial Investigation Report for VB/I-70, shows the relative locations of Globeville, Swansea, and Elyria. CDPHE collected soil samples from 25 homes. The results are summarized in Table 2.

Table 2. Yard Average Concentrations Measured in Elyria and Swansea Properties CDPHE, 1997

	# homes sampled	minimum	maximum
arsenic	25	below detection	1800 ppm
lead	25	39 ppm	754 ppm

These results indicated that the "arsenic anomaly" extended far beyond the Globeville neighborhood. It was unclear how long the dispute resolution process with Asarco could take, therefore, CDPHE requested EPA's assistance in immediately responding to the elevated levels of arsenic and lead in soil found in the Elyria and Swansea neighborhoods.

EPA began VB/I-70 site activities with an Emergency Response...

In response to the 1997 request from CDPHE, EPA mobilized an Emergency Response team and assigned an On Scene Coordinator to direct an extensive soil sampling effort and time critical removal actions in the area.

The Emergency Response consisted of two phases. Phase I was an extensive screening level soil sampling effort. The objective was to collect soil samples from as many residential properties as possible to identify properties which were potential time critical removal candidates (remove and replace soil).

The boundaries of the Phase I sampling program were established as East 38th Avenue on the south, East 56th Avenue on the north, Colorado and Vasquez Boulevards on the east and the South Platte River on the west, and included the southwest portion of Globeville, the only area of Globeville not yet characterized by Asarco. The boundaries were arbitrary since little was known about a possible source of the arsenic and lead being investigated. They encompassed all of the Elyria and Swansea neighborhoods but only a small northern portion of the adjacent Cole and Clayton neighborhoods. Based on input from CDPHE, the City of Denver, and community representatives, EPA named the site "Vasquez Boulevard /Interstate 70" because these two major transportation routes easily locate the area being sampled.

Phase I sampling occurred during March and April 1998. A minimum of three grab samples were collected from each property where EPA obtained access, two samples from the surface and one from the subsurface. Soil samples were also collected from all schools and parks located within the initial study area. Samples were collected from locations judged to present a high potential for exposure relative to other areas of the property (for example, at bare spots within the yard) and were analyzed for arsenic, lead, cadmium and zinc in a field laboratory using an x-ray fluorescence spectrometer (XRF). A percentage of soil samples were sent to an off-site commercial laboratory for analysis by EPA method 6010. During Phase I, 1152 properties, including 4 schools and 7 parks, were sampled by EPA.

Time Critical Removal Action was initiated to address short term risks to children....

In September, 1998, EPA issued an Action Memorandum which established the basis for conducting a time critical removal action (EPA, 1998a). The Action Memorandum required that soil be removed and replaced at any property with yard average arsenic soil levels greater than 450 ppm and/or lead soil levels greater than 2000 ppm. These removal "action levels" were chosen to protect young children from adverse health effects related to short term (sub-chronic) exposure. EPA Region 8's toxicologist identified a range of risk-based exposure levels of concern from 412 ppm to 900 ppm for arsenic in soil. The range is based on a risk analysis in which the relative bioavailability of arsenic in soil at the site was assumed to be in the range of 50% - 80% and the body weight of a child was assumed to be 11-15 kilograms (kg) to characterize children between 2 years and 6 years old. The recommendation for lead in soil was based on an analysis using EPA's Integrated Exposure/Uptake Biokinetic (IEUBK) Model and represents a soil concentration that is predicted to result in an approximately 50% probability of children having blood leads greater than the EPA recommended limit of 10 micrograms per deciliter (ug/dL). The Region 8 toxicologist recommended that steps be taken to stop exposure to children where soils contain these or higher levels of arsenic or lead. The toxicologist also recommended that, due to the carcinogenic potential of arsenic, steps be taken to assess the risks associated with longer-term exposure. The memorandum which provides the basis for the removal action levels is included in Appendix B.

From the Phase I data, 37 properties were identified as potentially requiring time critical removal action. Since Phase I was a screening level assessment, EPA began another sampling effort, Phase II, to collect more soil samples to better characterize the yard average arsenic and lead concentrations in the 37 properties. A second objective of Phase II was to perform screening level sampling at properties within the site which had not yet been sampled.

The Phase II sampling occurred in July and August, 1998. Additional soil samples were collected from any residential property which had a maximum surface soil concentration equal to or greater than 450 ppm for arsenic or 2000 ppm for lead, i.e., removal action candidates. These residential properties were revisited and a 5-point composite sample was collected from the front yard and a second 5-point composite sample was collected from the back yard of each. Arsenic and lead levels in these samples were measured. Any property with one or more composite samples exceeding the removal action levels for either arsenic or lead was identified for soil removal.

In Phase II, the On Scene Coordinator extended the site boundaries south to East 35th Avenue, encompassing a greater portion of the Cole and Clayton neighborhoods. Properties not sampled during Phase I were targeted for screening level sampling using the Phase I protocols.

In all, 1,393 properties were sampled as part of the Phase I and II programs. The distribution of maximum lead and arsenic concentrations at the residential properties may be found in Figure 3. Arsenic and lead concentrations in subsurface soil samples were lower than the concentrations in surface soil with an average ratio of 0.8 for arsenic and 0.7 for lead. 21 properties were identified for time critical removal actions. Removals were completed at 18 properties where EPA obtained access. The schools and parks sampled had very low levels of arsenic and lead and have apparently not been impacted by arsenic or lead contamination.

One of the striking findings that emerged from the Phase I and Phase II programs was that properties with elevated levels of arsenic occur at widely scattered locations across the site with no clear spatial pattern. Properties with elevated levels of arsenic were located immediately adjacent to one or more properties that were apparently not affected. A gradient of arsenic concentrations, not random concentrations, would be expected if the source of arsenic contamination was emissions from a point source such as a smelter.

While emergency response was undertaken, an effort to list the VB/I-70 site began...

Based on the results of the Phase I and Phase II sampling programs, EPA determined that residential properties within the VB/I-70 site contained concentrations of arsenic or lead at levels that could present unacceptable health risks to residents with long term exposures. On this basis, the EPA proposed the VB/I-70 site for inclusion on the Superfund NPL in January, 1999.

At the time of the NPL listing proposal, EPA had little information about the possible source or sources of lead and arsenic in soil. Besides the Asarco Globe Plant, EPA was aware of two historic smelters in the area either or both of which could have contributed to the contamination. The two smelters are:

1. The former Omaha & Grant Smelter was located at approximately at 42nd Avenue and St. Vincent Street, bordering the South Platte River south of I-70 and the existing Denver Coliseum. The smelter was built in 1882 on approximately 67 acres and operated by Asarco from 1899 until 1902 using a lead smelting process to produce gold, silver, copper, and lead (Asarco, 2001).

2. The former Argo Smelter was located at approximately 47th Avenue and Fox Street, west of I-25. The smelter was built in 1878 and operated until 1906. The smelter utilized the "Swansea" method which recovered gold and silver from ores by means of a copper matte. The method was developed in Wales and had never been used in the United States before. The smelter produced gold, silver, and copper. The Argo never operated as a lead smelter. (Klodt, 1952).

Since the arsenic and lead in the residential soils of the VB/I-70 site could not be readily explained by emissions from the Asarco Globe Plant and no extensive investigations had been conducted at the former locations of Omaha & Grant or Argo, EPA considered the VB/I-70 site to be a separate site from the Asarco Globe site and considered the Omaha & Grant and Argo smelters to be part of the VB/I-70 site.

During the public comment period on the proposed NPL listing of the VB/I-70 site, Asarco submitted information indicating that the source of the arsenic in residential soil may be lawn care products that were readily available for residential use in the past and were formulated with arsenic trioxide and lead arsenate to be effective in controlling crabgrass. The specific product identified by Asarco was "PAX 3- year Crabgrass Control", available from the 1950's until the early 1970's and formulated with 27% arsenic trioxide and 8% lead arsenic oxide. The product is no longer available commercially.

EPA added the VB/I-70 site to the NPL on July 22, 1999 (FR 1999).

Concurrent with emergency response and NPL listing, a remedial investigation was started.....

Anticipating the need for long term response, EPA assigned a remedial project manager to the VB/I-70 site in August, 1998 and remedial investigation activities began as removal activities were underway. In order to manage the site effectively, the remedial program organized the VB/I-70 site into 3 operable units (OUs). Separate investigations will be conducted and separate remedies will be selected for each. The OUs are:

Operable Unit 1 (OU1) is defined as residential yards within the study area with levels of lead or arsenic in soil that present an unacceptable risk to human health. EPA's highest priority in VB/I-70 is OU1 because there is the highest potential for human exposure in the residential yards.

Operable Unit 2 (OU2) is defined as the location of the former Omaha & Grant Smelter and includes all environmental media impacted by releases of hazardous substances which resulted from the operation of that smelter. EPA's second priority in VB/I70 is OU2 since it presents a lower level of risk. The majority of the OU2 area is paved and has been extensively redeveloped since the smelter stopped operating. Contamination is likely limited to subsurface and groundwater impacts. On September 25, 2001, EPA, the State of Colorado, and Asarco entered into an Administrative Order on Consent in which Asarco agreed to perform a remedial investigation and feasibility study for OU2. As the previous owner and operator of the Omaha & Grant Smelter, Asarco is a potentially responsible party (PRP) for OU2.

Operable Unit 3 (OU3) is defined as the location of the former Argo Smelter and includes all environmental media impacted by releases of hazardous substances which resulted from the operation of that smelter. OU3 is EPA's third priority in VB/I-70. EPA will be the lead agency for remedial response activities at OU3 and it is expected that response activities will be financed by the Superfund. There are no viable PRPs for OU3.

The remedial investigation activities for OU1 were focused on collecting all the information necessary to accurately characterize exposure and risk to residents at the VB/I-70 site to support a quantitative baseline human health risk assessment. Secondly, efforts began to investigate the source of the arsenic and lead in residential soils. Toward that effort, EPA used its 104(e) enforcement authority to acquire a 6 ounce sample of the "PAX 3-year Crabgrass Control" product from Martin Resources, a company that acquired the PAX company.

Site Characteristics

Using removal program data to support the OU1 remedial investigation....

One of the first objectives of the remedial program was to determine the physical and chemical attributes of the arsenic and lead in the residential soil since this information is pertinent to understanding exposure and the risks posed by elevated metals concentrations in soil . It was not necessary to collect additional soil samples since the samples collected during the Phase I and Phase II removal assessment programs were available in storage. In August, 1998, EPA designed and implemented the "Physico-Chemical Characterization Study".

The Physico-Chemical Characterization Study conducted analyses on existing Phase I and Phase II soil samples to generate supplementary data on the relationship between:

- concentrations of metals in the bulk and fine soil fractions,
- the chemical forms of arsenic and lead (speciation),
- particle sizes, and
- the *in vitro* bioaccessibility of arsenic and lead in site soils

Secondly, the properties undergoing time critical removal action offered an opportunity to collect detailed information on the distribution of metals concentrations within each individual yard and to investigate whether the contamination has impacted adjacent yards. So, also in August, 1998, EPA designed and implemented a "Risk-Based Sampling Program" at the removal properties.

In the Risk-Based Sampling Program, before soil was excavated from properties undergoing removal action, selected removal properties were intensively sampled by collecting 150 - 200 individual samples the yards. Yards adjacent to the selected properties were also sampled to determine if there is a limit to the contamination at the property boundary. The program also included:

- collection of indoor household dust,
- collection of attic dust,
- collection of tap water,
- analysis of exterior and interior paint,
- collection of garden vegetables, and garden soils.

Also as part of this program EPA established a voluntary biomonitoring service for all families whose yards were undergoing the removal actions. Any family member could have hair or urine tested for arsenic levels and/or blood lead levels tested.

Findings of the Physico-Chemical Characterization Study and the Risk Based Sampling Program...

The Physico-chemical Characterization Study and the Risk Based Sampling Program generated these important findings:

- Nearly all the arsenic mass in soils is present as arsenic trioxide with a contribution from lead arsenic oxide

- Lead occurs in several phases, including lead arsenic oxide, lead phosphate, and lead manganese oxide, an indication that the source of lead is different from the source of arsenic

- Concentrations of metals are about 10%-20% higher in the fine fraction of soil compared to the bulk fraction

- Arsenic bearing particles are predominantly small-sized, between <5 and 49 um

- The majority of lead bearing particles are also small, between <5 um and 49 um, although lead is consistently found in particles between 50 um and 149 um in size

- The relative percent bioaccessibility ranges between 3% and 26% for arsenic and 64% and 83% for lead

- There does not appear to be a significant contribution from outdoor soils to the levels of arsenic and lead in indoor dust

- Lead was detected in paint at most locations where paint was sampled, with 130 out of 144 samples having values above 1 mg/cm^2. These data suggest that interior and/or exterior leaded paint might be a source of lead exposure in area children, either directly (by paint chip ingestion), or indirectly (by ingestion of dust or soil containing paint chips)

- 15 residents participated in the voluntary biomonitoring service. The resulting data indicated that exposure levels to lead and arsenic in these individuals were within normal levels

- The intensive soil sampling revealed that at properties with the highest concentrations of arsenic and lead, the contamination is distributed across the yard area, with a fairly clear boundary between the affected property and the adjacent property. This finding is illustrated in the figures included as Appendix C

- Generally, metals concentrations are highest in the first two inches of soil and decrease with depth

The Remedial Investigation known as the "Phase III Program"...

Ideally, EPA would use the data collected by the Removal Program in Phase I and Phase II to support a baseline risk assessment and remedial risk management decisions. However, at VB/I-70 OU1, the size of the site (4.5 square miles) dictates that remedial risk management decisions need to be based on data that is as accurate as possible, within the constraints of available resources. The data from Phase I and Phase II were judged to be too limited to be the basis of remedial decisions. More specifically, many samples had elevated detection limits for arsenic, the sampling density at each property was too low, and/or sampling locations were not clear. Additionally, the findings from the Physico-Chemical Characterization Study and the Risk - Based Sampling Program proved to be extremely influential in EPA's decision to undertake a new, large scale remedial investigation because the supplementary data provided by those two studies indicated that the following additional data was needed to improve remedial decisions at OU1:

- The invitro bioaccessibility results indicated that animal studies to investigate the relative bioavailability of lead and arsenic in soils at VB/I-70 were warranted.

- The lack of spatial pattern to the arsenic contamination indicated that essentially every property within the study area should be sampled since it would not be possible to predict levels in an individual yard by considering levels in yards within the vicinity.

- The results of the intensive sampling indicated that relying on the limited sampling performed to support removal action decisions would result in an unacceptably high rate of false positives in remedial action decisions. This would mean if EPA relied on the removal data, remedial action would likely be taken at many properties where it actually is not required.

- The accuracy of risk estimates would be improved by collecting more extensive data on the concentrations in the fine fraction of soil, concentrations in house dust, concentrations in garden soil and concentrations in garden vegetables.

Therefore, EPA decided to invest the resources to conduct a new, large-scale field investigation as part of the Remedial Investigation and Feasibility Study. The new field investigation was called "Phase III". The overall objectives of the Phase III program were to:

1. collect sufficient data to support a quantitative baseline human health risk assessment which would provide the basis for risk management decisions, and

2. collect sufficient data to define the nature and extent of contamination.

Since the VB/I-70 site is an Environmental Justice (EJ) site, EPA approached the remedial activities with careful consideration to EJ issues...

EPA convened a Working Group to provide a discussion forum for community members, State and local governmental agencies, the PRP, and any other interested parties to provide input to EPA on all aspects of the remedial investigation and feasibility study for the VB/I-70 site.

Since 1998, EPA has supported and worked in cooperation with the VB/I-70 Working Group, currently comprised of representatives of the local community; the City and County of Denver; CDPHE; the Agency for Toxic Substances and Disease Registry (ATSDR); Asarco; and the Clayton, Elyria, and Swansea Environmental Coalition (CEASE), the recipient of a Technical Assistance Grant from EPA.

The Working Group is EPA's response to the EJ concern of providing community members open and equal access to decision makers in EPA Region 8's Superfund Program. All aspects of EPA's remedial activities at the VB/I-70 site have been discussed in the Working Group forum to address the community's desire to have a voice in decisions which directly affect them.

The Working Group provided essential input to EPA in the design of the Phase III Program....

EPA relied on input from community members of the Working Group to develop the site conceptual model and the Sampling and Analysis Plan for the new field investigation known as Phase III.

As a direct result of the discussions in the Working Group, EPA expanded the site boundaries once again. The site boundaries established for removal activities included the entire Swansea neighborhood and the entire Elyria neighborhood but only the northern half of the Cole and Clayton neighborhoods. The Cole and Clayton residents who lived outside these boundaries perceived it to be unfair that soil sampling and potentially remedial action were not available to them. The residents explained that it was an EJ concern that EPA did not recognize the importance of maintaining the integrity of neighborhoods in its environmental activities. EPA responded by expanding the site boundaries to include all of Cole and Clayton for the Phase III investigation and subsequent remedial activities.

Since the Phase III investigation was specifically to support quantitative risk calculations, the design of the Phase III investigation began with the development of the site conceptual model, identification of important exposure pathways, and selection of contaminants of concern, all done with input from the Working Group.

Selection of Chemicals of Concern.....

Data collected during Phase I and Phase II clearly indicated that arsenic and lead were both chemicals of potential concern at the VB/I-70 site. However, no systematic evaluation had been performed to determine whether or not any other chemicals might also be of potential

concern. A careful review of available data was undertaken to determine if other chemicals should be added to the list. The review followed EPA guidance contained in "Risk Assessment Guidance for Superfund: Human Health Evaluation Manual (Part A)" (EPA, 1989). Based on the review, the chemicals of concern selected for quantitative evaluation at OU1 are arsenic and lead. All other chemicals detected in soils in OU1 are either not of concern or are present at levels which contribute minimal risk compared to arsenic and lead.

Development of the Site Conceptual Model....

Figure 4 presents the conceptual model for OU1 showing the potential sources, release mechanisms, and main pathways by which chemicals in surface soil may come into contact with area residents. This conceptual model was developed in consultation with the Working Group. Exposure pathways considered most likely to be of concern are shown by boxes containing a solid circle, and greatest attention is focused on these pathways. Pathways which are judged to contribute only occasional and minor exposures are shown by boxes with an open circle. Incomplete pathways (i.e., those which are not thought to occur) are shown by open boxes.

Identification of Exposure Pathways....

The conceptual model for OU1 is a tool for organizing the available information about arsenic and lead in soils as well as a tool for identifying information needs to allow quantitative analysis of the exposure and health risk associated with the important exposure pathways. EPA used the conceptual model to identify exposure pathways judged to be of sufficient potential concern to warrant quantitative exposure and risk analysis. The Phase III field investigation was then designed to collect sufficient data to quantify the risks associated with each significant exposure pathway.

Data required to characterize exposure pathways...

The Phase III investigation consisted of six primary activities:

1. Sampling surface soils (0"-2") in residential yards throughout the study area
2. Sampling indoor dust in homes
3. Sampling vegetables and surface soils (0"-6") from residential vegetable gardens
4. Sampling school and park surface soils (0"-2")
5. Analyzing the concentration of arsenic and lead in the fine fraction of soil
6. An investigation of alleys to determine if they are a source of exposure

In the Phase III field investigation, the properties targeted for soil sampling included all residential properties within the expanded study area boundaries that <u>had</u> <u>not</u> been sampled as part of the Phase I and Phase II programs as well as <u>re-sampling</u> of all the properties that <u>had</u> been sampled in Phase I and Phase II.

*A total of **4000 residential properties** were targeted for sampling in the 4.5 square mile expanded study area. A Soil Sampling Strategy was developed using a rigorous statistical approach....*

EPA recommends the following performance measures for data collection to support baseline risk assessments in the Superfund program (EPA 1992a):

1. There should be no greater than a 20% probability of requiring remedial action when no action is required (false positive rate $\leq$ 20%); and

2. There should be no greater than a 10% probability of not requiring remedial action when action is required (false negative rate $\leq$ 10%).

EPA designed the Phase III residential soil sampling program to meet or exceed these performance measures. At OU1, a residential property is assumed to require remedial action unless there is at least 95% confidence that no action is required.

For arsenic, this performance measure is met by using the 95% Upper Confidence Limit (UCL) of the arithmetic mean concentration of arsenic in soil at the property as the exposure point concentration (EPC) in the baseline risk assessment and as the basis for remedial decision making. That is, if the health risks associated with exposure to the 95% UCL are acceptable, there is at least 95% confidence that the true arithmetic mean of arsenic for the property is below this level and that risks are within acceptable limits.

The use of 95% UCL as the EPC for arsenic means that some properties where true risks are actually acceptable may be identified as requiring action. The recommended performance measure is to limit the frequency of this type of error to no more than 20%. Because of the large number of residential properties in OU1, even a relatively small false positive rate could result in a large number of properties potentially undergoing remedial action when it is not necessary. At large sites such as OU1, it is cost effective to invest resources to collect enough data to increase the accuracy of risk estimates in order to lower the false positive rate. At smaller sites, the investment in sampling may not be economical. EPA's goal was to ensure that the frequency of false positive decision errors at OU1 was as low as could be achieved with the available sampling and analysis budget.

For lead, the established performance measures are met by using the EPA Integrated Exposure Uptake Biokinetic (IEUBK) model or other appropriate mathematical model that describes the probability that an individual exposed to a specified set of environmental lead levels will have a blood lead value that is above a level of health concern. An acceptable level of lead in soil is defined as the arithmetic mean soil concentration within a yard such that a typical child or group of similarly exposed children would have a predicted risk of no more than 5% of exceeding a blood lead level of 10 micrograms per deciliter (μg/dL). This provides 95% confidence that children exposed to lead in soil will be protected.

The key design elements of the soil sampling component of the Phase III project are as summarized below. Additional detail is provided in Appendix D.

Sampling Depth

Available data on lead and arsenic levels in residential soils were sufficient to establish that concentrations of contaminants in subsurface soil are lower than in the surface soil. Thus, Phase III was designed to characterize only surficial soil (0"-2" interval) in residential yards.

Calculation of the 95% UCL

Currently, USEPA has established default methods for calculating the 95% UCL for distributions that are either normal or lognormal (EPA, 1992b). Equations for calculating the 95% UCL of the mean for distributions other than the normal and the lognormal are not readily available.

Data from residential properties that were intensively sampled suggest the distribution of arsenic values within a residential property is not well characterized as either normal or lognormal. Therefore, use of EPA's default equations as the basis for calculating the 95% UCL based on a series of grab samples might yield results that are not accurate.

One way to minimize problems associated with calculating the 95% UCL of the mean for non-standard distributions is by combining individual samples into composite samples. This is because, regardless of the shape of the parent distribution, the distribution of the values of composite samples will approach a normal distribution if the number of sub-samples is sufficiently large and the sub-samples are thoroughly mixed, allowing use of EPA's recommended equation for calculation of the 95% UCL of the mean at a property. In addition, the variability between composite samples is less than between grab samples, so uncertainty in the mean of composite samples is usually less than for an equal number of grab samples. For these reasons, the Phase III soil sampling program utilized compositing of grab samples collected within a property.

Number of Grab Samples per Composite

In order to estimate the number of grab samples per composite needed to reduce intra-composite variability and to ensure that distribution of composites is approximately normal, Monte Carlo simulations were performed using site-specific data from properties that had been intensively sampled. In these simulations, grab samples of size j (j = 5, 10, 15, 25, 30, 50 grabs per composite) were repeatedly drawn, and the composite mean was calculated as the mean of the grab samples. Then the distribution of the composite values was tested for normality. Based on these tests, a set of 10 sub-samples was found to be adequate to ensure that the distribution of the composites will be approximately normal.

Number of Composites per Property

The number of composites per yard depends on the acceptable false positive rate. This is the case when a property is incorrectly identified as being above a level of concern when it is actually below a level of concern. In general, as the number of composites increases, the chances of making this type of error decreases. . As noted above, the goal of the Phase III program was to reduce the false positive error rate to the maximum extent that available resources will permit.

In order to investigate the relationship between the false positive error rate and the number of composites at this site, another Monte Carlo simulation was performed based on an assumed distribution of arsenic levels in un-impacted properties. This distribution was based on available data on background arsenic levels in residential surface soil samples collected in the vicinity of the Asarco Globe plant. The false positive error rate was assessed by counting the

number of properties where the "true mean" indicated risks were acceptable but the 95% UCL indicated risks were unacceptable.

Because a site-specific acceptable level of arsenic in soil had not been derived, EPA assumed a value for the purposes of planning the design of Phase III. Employing an assumed acceptable level of 70 ppm (the arsenic "action level" for Globeville) and the estimated background distribution, and employing a grab sample size of 10, the simulated false positive error rates are as shown below:

Number of Composites	Estimated False Positive Error Rate
2	15%
3	4.1%
4	2.6%
6	1.5%

The results indicate that if only 2 composite samples were collected from a property, there would be a relatively high probability (about 15%) of declaring that the property has arsenic levels above an acceptable limit when the levels are actually acceptable. Collecting 3 composites reduces the rate to about 4%, and this error rate can be reduced further by collecting 4 or 6 composites. Although an error rate of 4% is very good by most standards, because of the large number of properties to be evaluated at this site, even a rate this low results in a large number of errors (up to 160 residences). EPA included a provision for re-sampling a percentage of properties in Phase III by collecting 30 individual grab samples. The candidate properties were to be those whose arithmetic mean is close to or below the concentration identified in the baseline risk assessment as being associated with unacceptable risk. The re-sampling effort would further reduce the possibility of false positives.

Based on these findings, the design of the Phase III program required the collection of 3 composite soil samples of 10 sub-samples at each property. This design achieved an appropriate balance of cost and minimization of the false positive rate, even considering the cost of re-sampling. Figure 5 summarizes the evaluation of cost effectiveness for various optional Phase III designs.

The community had concerns that by collecting composite samples, EPA might miss "hot spots" of concern to children's health.....

The proposed composite soil sampling approach was optimal for characterizing the yard wide average concentrations of arsenic and lead. However, the community representatives and other members of the Working Group were concerned that the composite samples might dilute hot spots within a yard. So EPA devised a way to predict hot spots using the composite results. In order to be protective, EPA had to ensure that the predicted value was more likely to overestimate than underestimate the true value of a potential hot spot.

EPA decided to calculate the "maximum theoretical hot spot concentration (MTHC)" at each property by assuming that the maximum composite sample from each yard was composed of 9 sub-samples collected from locations at background concentrations and the 10th sub-sample from a hot spot. EPA would then use the MTHC in a screening level assessment of short term risk. At yards where unacceptable short term risk was indicated, 30 individual grab samples would be collected to characterize hot spots and determine if they are as significant as the MTHC value suggested.

This final requirement satisfied the concerns of the Working Group. The Phase III Project Plan specified that 30 sub-samples be located approximately equidistant throughout each property. The locations were flagged following measurements of all yard soil areas, excluding paved sidewalks, driveways, large trees and bushes, and garden areas. Locations were flagged sequentially using three colors of flags representing each of the three composite samples. In this manner, each composite contained 10 sub-samples representing an independent estimate of the yard-wide mean.

All surface soil locations were collected from the top 0-2" interval using a 2"-diameter hand corer. In areas of dense sod, the sod layer was carefully lifted and the soil immediately beneath the sod was sampled. All sample holes were filled with top soil and sod was replaced.

Each composite sample was thoroughly homogenized following collection, and rocks, vegetation and other non-soil matter were removed prior to containing the sample in a labeled sample bag. The composite soil samples were brought to a field laboratory, dried and sieved to the bulk fraction, and analyzed in the field laboratory by energy dispersive x-ray fluorescence (EDXRF). A subset of samples were sieved through the 250 um screen to isolate the "fine" fraction of soil. The fine fraction was analyzed for lead and arsenic.

Dust sampling was also necessary to increase the accuracy of risk estimates.....

As part of Phase III, EPA collected house dust samples to define the relationship between arsenic and lead levels in soil and dust at this site. 75 properties were selected for this study. These properties were chosen by stratifying the soil concentrations and randomly selecting an equal number of properties with low, medium, and high concentrations in soil and also equal spatial representativeness across the site. Samples were collected in October and November, 1999.

A composite dust sample was collected from the interior of selected residential homes using a high volume vacuum sampler (HVS3 model). A template was used to collect dust from a standard area within living areas, including kitchens, family rooms, bedrooms, hallways and entryways. In most cases, two template areas were collected per living space in order to collect sufficient mass for chemical analysis. Thus, the total number of sub-samples collected within a residence was dependent upon the number of living spaces. In the case where a resident had more than ten living spaces, only one template per living space was collected. Sub-sample locations within a living space (living space sample points) were focused on areas with the greatest potential for exposure.

Garden soil and vegetables were collected to characterize risks related to home gardening...

Another pathway by which residents might be exposed to soil-related contaminants is ingestion of vegetables grown in home gardens that contain contaminated soil. In order to obtain site-specific data on this potential exposure route, garden vegetable and garden soil samples were collected from residential gardens. At each location where a vegetable sample was collected, a co-located sample of garden soil also was collected.

Candidate gardens were identified from property sketches generated during soil sampling, and residents were contacted by phone to determine whether vegetables remained available. Sampling began on October 7, 1999 and was completed in two weeks. At each vegetable sample location, a corresponding 0-6" grab soil sample was collected using a hand corer. Soil samples were collected next to the plant being sampled, at a maximum of 6 inches from the plant.

Animal studies to investigate the relative bioavailability of lead and arsenic in site soils were undertaken...

In order to investigate the relative bioavailability (RBA) of arsenic and lead in site soils, EPA performed two separate studies in which samples of soil were fed to young swine. Swine were selected as the test species because the gastrointestinal system (and hence the behavior of ingested lead and arsenic) in swine is similar to that in humans.

As part of the study on the RBA of arsenic in site soils, EPA tested a sample composed of site soil at background levels mixed with a sample of the PAX 3-year Crabgrass Control product. The soils used in the studies on RBA are subjected to extensive characterization including chemical analysis, mineral speciation, particle size distribution, and in-vitro bioaccessibility testing. The arsenic RBA study offered an opportunity to compare site soils impacted by arsenic with a background soil mixed with the PAX 3-year Crabgrass Control product to aid in EPA's effort to identify a source of the arsenic contamination.

The results of the Phase III field investigation.....

The Phase III program was implemented in August, 1999. The field investigation was completed in September, 2000.

Results for each property

EPA obtained access to and sampled approximately 3000 of the 4000 targeted properties. Summary statistics for the bulk soil samples, based on the average values at each property and stratified by neighborhood, are summarized in Table 3. The frequency distributions of arsenic and lead concentrations for every property sampled are shown graphically in Figures 6 and 7.

Time Critical Removal Action Candidiates

From the Phase III data, 30 more properties were identified for time critical removal action based on yard average arsenic concentrations above 400 ppm. The Action Memorandum was amended and continuation of the time critical removal action was undertaken in October, 2000. The arsenic level which triggered a removal action was lowered from 450 ppm in the first

removal action to 400 ppm. Just as in Phase I and Phase II programs, the 30 properties that required removal action were randomly located throughout the entire study area. Upon completion of this work, a total of 48 residential properties have been cleaned up by EPA using time critical removal authority.

Geostatistical Analysis

EPA performed geostatistical analyses on the arsenic and lead soil data. Geostatistical analyses, including the techniques of variograms and kriging, are commonly-used approaches when sample data exist in a large spatial area, such as the OU1 study area.

An analysis of the Phase III surface soil samples reveals that arsenic concentrations range from non-detect to over 750 ppm. Arsenic concentrations are below 36 ppm over most of the site, but extreme values, i.e. greater than 300 ppm, occur at a few scattered locations. Lead concentrations range from non-detect to over 1,100 ppm but tend to follow a different spatial distribution than arsenic.

Standard statistical analyses on the composite arsenic and lead data are summarized in Table 4. The mode of the arsenic data, the most frequently occurring value, is in the concentration range of non-detect - 50 ppm. Arsenic data indicate that 34% of the properties are at or below the method detection limit of 11 ppm. Almost 80% of the properties are below the practical quantitation limit of 36 ppm for arsenic. This leaves only 34 properties, approximately 1%, above 300 ppm.

In contrast, the mode of the lead data is in the 100–150 ppm range, which contains only about 1% of the properties. The vast majority of the properties (approximately 90%) fall between 50 and 400 ppm lead. Only 8.4% of the properties fall above 400 ppm, with 3.4% exceeding 500 ppm.

Table 3. Phase III Investigation
Summary Statistics of the Average Concentrations in Residential Yards

Neighborhood	Total Properties Sampled	Percentile Distribution of Average Arsenic Concentrations (ppm)					
		5th	25th	50th	75th	95th	maximum
Clayton	902	5.5 ppm	5.5 ppm	8.7 ppm	38.3 ppm	168 ppm	758 ppm
Cole	796	5.5 ppm	7.7 ppm	11.8 ppm	24.8 ppm	142.1 ppm	660 ppm
Elyria	59	5.5 ppm	8.5 ppm	12.3 ppm	22.3 ppm	97.2 ppm	431 ppm
Globeville	63	5.5 ppm	8.5 ppm	13.8 ppm	22.3 ppm	123.3 ppm	297 ppm
Swansea	1166	5.5 ppm	5.5 ppm	9.7 ppm	30.6 ppm	128.3 ppm	604 ppm
ALL	2986	5.5 ppm	5.5 ppm	10.5 ppm	30.3 ppm	144.9 ppm	758 ppm

Neighborhood	Total Properties Sampled	Percentile Distribution of Average Lead Concentrations (ppm)					
		5th	25th	50th	75th	95th	maximum
Clayton	902	76 ppm	106 ppm	140 ppm	193 ppm	337 ppm	1131 ppm
Cole	796	135 ppm	221 ppm	288 ppm	371 ppm	538 ppm	1130 ppm
Elyria	59	181 ppm	299 ppm	372 ppm	438 ppm	601 ppm	922 ppm
Globeville	63	171 ppm	257 ppm	332 ppm	482 ppm	633 ppm	835 ppm
Swansea	1166	76 ppm	119 ppm	164 ppm	250 ppm	410 ppm	776 ppm
ALL	2986	81 ppm	127 ppm	188 ppm	292 ppm	465 ppm	1131 ppm

Table 4 Summary Statistics

STATISTIC	CONTAMINANT	
	Arsenic	Lead
Minimum (ppm)	<11	<52
Maximum (ppm)	759	1,131
Mean (ppm)	34	216
Variance $(ppm)^2$	3,531	16,577
Standard Deviation (ppm)	59	129
Median (ppm)	12	181
Number of Samples	3293	3293
Coefficient of Variation	1.7	0.59

A scatterplot of the lead and arsenic data indicates a wide pattern of dispersion between individual arsenic/lead pairs, indicating that knowing the concentration of either arsenic or lead provides very little information regarding the concentration of the other.

Kriging is a spatial estimation technique that produces regionalized views of contaminant concentrations and other variables. Kriging is a type of contouring method that can be effectively used in recognizing and detecting trends over relatively large areas.

The kriging performed for both arsenic and lead at the VB/I-70 site OU1 was done using ordinary kriging of block areas. Block kriging integrates the estimate of the metal concentration over the area of the block. Blocks used for kriging measured 5 x 5 meters in all areas of the site for both arsenic and lead. Each block represents 25 square meters in area, or approximately 30 square yards.

The block maps shown in Figures 8 and 9 show several distinct features. On the arsenic map, Figure 8, numerous, small areas of soils concentrations greater than 300 ppm are displayed. These areas are widely distributed and fairly randomly scattered. Distinct lineations are not present, nor are features resembling concentric bands of decreasing concentrations as one moves away from the former smelter areas. Such concentric banding is common around former smelters (Myers, 1985; EnviroGroup, 1997). This suggests that the emplacement mechanism for arsenic did not occur on a regional scale, but rather took place in random, isolated pockets of the site.

Figure 9 shows the lead concentrations at the site. In contrast to the arsenic map, the lead map shows a more spatially structured nature to the contamination. Soil lead concentrations in

the western area of the VB/I-70 site, the area where smelters operated historically, are generally the highest concentrations, with a relatively systematic decrease in soil lead values as one moves away radially from the area of the former smelters. Areas of high local variability are also present in numerous areas.

Due to the distinctly different spatial patterns exhibited by arsenic and lead in the surface soils, it appears that the two contaminants may have been emplaced by means of different mechanisms, one largely random, the other a more continuous spatial pattern.

Relation to Year of Construction

EPA compared the yard mean arsenic and lead concentrations to the year of construction for each property where the construction date was available. Figure 10 illustrates that elevated concentrations of arsenic occur more frequently although randomly in yards of homes built before 1960. Yards of homes built after 1960 appear to be unimpacted by arsenic. Figure 11 illustrates the comparison of lead concentrations to the year of construction. The figure indicates a trend of decreasing levels of lead in soil at homes constructed in more recent years. A steep decrease can be seen in homes constructed in the 1980-1985 time frame.

Results of Fine Fraction Analysis

The results from the analysis of the fine fraction of soil in Phase III were combined with the results of the fine fraction from the Physico-Chemical Characterization Study . The combined results indicate that the concentration of arsenic in the fine fraction of soil is 21% higher than the bulk fraction and the concentration of lead in the fine fraction is 9% higher than the bulk fraction.

Results of House Dust Sampling

The results from house dust sampling show that concentrations of arsenic and lead in indoor dust are relatively consistent over a wide range of yard soil concentrations, and are poorly correlated to yard soil concentrations. Figure 12 illustrates these results.

Results of Garden Sampling

The results for garden vegetables, garden soils and corresponding yard soils show that arsenic and lead in garden soils is generally lower than levels found in the yard soils. This may be because residents add soil amendments and/or fertilizers to garden soils. Figure 13 illustrates these results. Garden vegetable concentrations are compared to the co-located garden soils in Figure 14 . In general, arsenic and lead concentrations in vegetables remained consistently low throughout the range of garden soil concentrations.

Investigation of Alleys

No alleys in the study area were suitable candidates for sampling since all are concrete or asphalt. The only areas available for collecting soil samples are where the pavement is cracked or missing. There is limited potential for exposure to such soils and therefore, no samples were collected.

Additional grab sampling

As discussed previously, EPA calculated the "maximum theoretical hot spot concentration (MTHC)" at each property sampled. EPA re-visited properties where the MTHC indicated a possible hot spot which might be of concern for short term exposures and collected 30 individual

grab samples. 119 properties were sampled in this manner. The standard deviation of the grab samples tends to increase in proportion to the yard wide mean. EPA estimated the coefficient of variation (CV) from the slope of the best fit regression line through the data. This is illustrated in Figure 15. The CV is estimated to be 1.02.

At any yard where the mean concentration is known, Figure 15 can be used to estimate the standard deviation for a set of grab samples from within that yard.

Relative Bioavailability of Arsenic and Lead in VB/I-70 Site Soils

The studies on relative bioavailability (RBA) of arsenic and lead in site soils found that:

- Arsenic in site soils is less well absorbed than a readily soluble form of arsenic. The study recommended a site specific arsenic RBA of 42% , the 95% upper confidence limit of the mean arsenic RBA of the five site soils tested.

- Lead in site soils is less well absorbed than a readily soluble form of lead. The study recommended a site specific RBA of 84% , the mean of the lead RBA of the two site soils tested. This lead RBA is higher than the EPA default value of 60%, suggesting that the lead in site soils is in a form that can be readily absorbed.

As discussed previously, the soils tested in the RBA studies were extensively characterized. Appendix E contains the results for the soils tested in the arsenic RBA study. Test material 6 was composed of a background site soil mixed with PAX 3-year Crabgrass Control. As shown by the figures in Appendix E, test material 6 is similar in mineral form, particle size and arsenic RBA to the other test materials which were soils collected from yards within the site.

Determination of Background

The frequency distribution of yard average arsenic concentrations from the Phase III data set is well characterized as the sum of two different lognormal distributions. It is EPA's interpretation that the first distribution characterizes local background. Using this lognormal distribution, the best estimate of the background level of arsenic in OU1 is 8 ppm. The 95th percentile value is 15 ppm.

In contrast, analysis of the frequency distribution of yard average lead concentrations does not indicate two distinct distributions so the boundary between background lead levels and those that are elevated due to site specific sources is difficult to judge. EPA calculated the mean of all samples less than 400 ppm as a rough estimate of the mean background concentration in OU1. This value is 195 ppm.

Cost

The cost of the Phase III field investigation was $2.5 million.

Summary of Site Risks

An individual risk assessment was completed for each property sampled. That means there are 3000 separate risk assessments for OU1....

Using the extensive data from the Phase III program, EPA completed a quantitative baseline human health risk assessment (EPA, 2001a) which evaluated current and anticipated future exposure of residents within OU1 to concentrations of arsenic and lead measured in soil collected from their yards. Both the average and reasonable maximum exposure scenarios were evaluated. . The reasonably anticipated future land use of the residential area of OU1 is residential. It is not expected that the current residential land use will change.

The exposure unit in the baseline human health risk assessment is the individual residential yard (or a sub-location of the yard for short term exposures). Baseline risks were calculated for each individual residential yard where sampling data was available. There are 3000 individual risk calculations for OU1. EPA used the results of the baseline risk assessment to establish the basis for taking a remedial action at specific properties using CERCLA Section 104 authority.

Further, EPA relied on guidance contained in the Office of Solid Waste and Emergency Response (OSWER) Directive 9355.0-30 (EPA, 1991) to determine the level of risk that is unacceptable, warranting remedial action. Individual yards where the cancer risk based on reasonable maximum exposure is predicted to be greater than 10^{-4} and/or the non-cancer hazard quotient (HQ) is predicted to be greater than 1 were identified as remedial action candidates. This is consistent with EPA regulations in the National Contingency Plan (NCP), (40 CFR Part 300) that establish a range of acceptable risk as 10^{-6}- 10^{-4}.

The approach to arsenic risk assessment is different from the approach to lead risk assessment...

Human Health Risks Associated with Potential Exposure to Arsenic

The exposure pathways of concern to residents are incidental ingestion of soil and dust which could cause chronic or sub-chronic effects, ingestion of home grown garden vegetables which could cause chronic effects, and intentional ingestion of large amounts of soil by children with soil pica behavior which could cause acute effects. Table 5 summarizes the potentially exposed populations, exposure pathways, and potential health effects assessed by EPA.

Table 5: Potentially Exposed Populations and Exposure Pathways for Current and Reasonably Anticipated Future Scenarios

Arsenic Risk Assessment, VB/I70 OU1

Exposure Pathway	Potentially Exposed Population			Potential Health Effects			
	child	adult resident	adult worker	acute	sub-chronic	chronic non-cancer	chronic cancer
pica soil ingestion	●			✓			
soil ingestion	●				✓		
soil and dust ingestion	●	●	○			✓	✓
vegetable ingestion	●	●				✓	✓
particulate inhalation	○	○	○				
dermal contact	○	○	○				

○ - complete but insignificant pathway, screening evaluation

●- complete and potentially significant pathway, quantitative evaluation

Arsenic may cause different health effects depending on the time and intensity of exposure....

The potential health effects of concern associated with arsenic exposure that were considered by EPA are:

- **Acute non-cancer effects:** irritation of the gastrointestinal tract leading to nausea and vomiting. EPA has not previously considered arsenic to be an acute toxicant in soil. This health effect was evaluated at VB/I-70 OU1 based on at the recommendation of ATSDR. This required that EPA develop a new reference dose protective of acute effects.

  EPA evaluated the risk that these effects could potentially result from a one-time exposure to arsenic by a child with soil pica behavior who happens to ingest a lot of soil from a small area of a yard that contains arsenic levels higher than the average concentration in the yard.

- **Subchronic non-cancer effects:** diarrhea, vomiting, anemia, injury to blood vessels, damage to kidney and liver, and impaired nerve function

  EPA evaluated the risk that these effects could potentially result from lower level exposure for periods of a few months to several years by a child who plays preferentially in a small area of a yard during the summer months and happens to incidentally ingest soil at a high rate (characteristic of the upper percentile of the general population).

- **Chronic non-cancer effects:** similar to subchronic effects but also include skin abnormalities

  EPA evaluated the risk that these effects could potentially result from lower level exposure over a long period of time such as that associated with long term incidental ingestion of soil and dust and ingestion of home grown garden vegetables by long time area residents who have spent their childhood and adult years living at the same residence.

- **Cancer effects:** skin cancer, internal cancer including cancer of the bladder and lung

  EPA evaluated the risk that these effects could potentially result from lower level exposure over a long period of time such as that associated with long term incidental ingestion of soil and dust and ingestion of home grown garden vegetables by long time area residents who have spent their childhood and adult years living at the same residence.

The baseline human health risk assessment quantified potential risks to residents with average levels of exposure and to residents with "reasonable maximum" levels of exposure. Consideration of the reasonable maximum exposure scenario is required by EPA regulations in the NCP (40 CFR Part 300). The intent of the reasonable maximum exposure scenario is to estimate an exposure case that is conservative, yet still within the range of possible exposures. Reasonable maximum is generally intended to characterize the 90th-95th percentile of the exposed population.

Consideration of both **average** exposures and **reasonable maximum** exposures gives the risk manager a range of risk estimates to provide an indication of the variability, uncertainty, and inherent protectiveness in the assumptions used to quantify potential risks.

The Phase III program generated arsenic data primarily to support assessments of chronic exposure and risk. For each property sampled, a conservative estimate of the yard-wide average concentration of arsenic, the 95% UCL, was used as the EPC in the chronic cancer and non-cancer risk assessments in accordance with EPA guidance (EPA, 1992b).

Cancer and Non-cancer Risks from Chronic Exposure

Long term exposure is estimated using the following general equation:

$$\text{Dose} = \frac{(\text{EPC}) \times (\text{intake}) \times (\text{exposure frequency}) \times (\text{exposure duration})}{(\text{body weight}) \times (\text{averaging time})}$$

Table 6 summarizes the assumptions used for each of the parameters in the equation. Most values are default assumptions recommended by EPA. However, site specific data collected during the Phase III program was used to increase the accuracy of the risk assessment. The Phase III data used to better characterize exposure are:

- relationship between arsenic concentrations in the fine and bulk fractions of soil
- relationship between arsenic concentrations in yard soil and indoor dust,
- relationship between arsenic concentrations in yard soil, garden soil, and garden vegetables
- measurements of RBA of arsenic in VB/I-70 site soils

Table 6. Exposure Parameters for Chronic Exposure to Soil, Dust, and Vegetables				
	AVERAGE		REASONABLE MAXIMUM EXPOSURE	
	child	adult	child	adult
concentration of arsenic in soil (ppm)	EPC[1]	EPC[1]	EPC[1]	EPC[1]
adjustment for fine fraction	1.21	1.21	1.21	1.21
concentration of arsenic in dust (ppm)	estimated from site specific relationship of soil to dust dust = .06soil	estimated from site specific relationship of soil to dust dust = .06soil	estimated from site specific relationship of soil to dust dust = .06soil	estimated from site specific relationship of soil to dust dust = .06soil
daily intake rate of soil and dust (milligrams /day)	100	50	200	100
fraction of total intake that is soil	45%	45%	45%	45%
exposure frequency (days/year)	234	234	350	350
exposure duration (years)	2	7	6	24
body weight (kilograms)	15	70	15	70
concentration of arsenic in vegetables	estimated from site specific relationship of soil to garden vegetables (Fig 13 &14)	estimated from site specific relationship of soil to garden vegetables (Fig 13 &14)	estimated from site specific relationship of soil to garden vegetables (Fig 13 &14)	estimated from site specific relationship of soil to garden vegetables (Fig 13 &14)
daily ingestion rate of home grown vegetables (kilograms/day)	0.007	0.35	0.007	.35
Arsenic RBA	0.42	0.42	0.42	0.42
Averaging time for cancer effects (years)	70	70	70	70
Averaging time for non-cancer effects (years)	9	9	30	30

1. EPC is the exposure point concentration. Over the long term, residents will be exposed to the average arsenic levels in their yards. EPA recommends that the 95% UCL of the average or the maximum concentration (whichever is lower) be used as the EPC (EPA 1989). At VB/I-70, the EPC is the lower of the 95% UCL of the 3 composite samples or the maximum composite sample.

Risk is quantified by multiplying the dose by the slope factor for cancer risk, and dividing the dose by the reference dose to determine the non-cancer Hazard Quotient (HQ). Table 7 summarizes the toxicity factors used in the chronic arsenic risk assessment.

Table 7. Arsenic Toxicity Values

Toxicity Factor	Value	Source
Chronic Reference Dose	0.0003 mg/kg/day	IRIS, 2000
Oral Slope Factor	1.5 /(mg.kg/day)	IRIS, 2000

The baseline human health risk assessment indicates:

- Cancer risks to area residents with **average levels of exposure** range from **2×10^{-6} to 9×10^{-5}**. There are no properties where cancer risks are predicted to exceed 1×10^{-4} for average levels of exposure.

- Cancer risks to area residents with **reasonable maximum levels of exposure** range from **1×10^{-5} to 8×10^{-4}**. Cancer risks exceed 1×10^{-4} for reasonable maximum levels of exposure where the arsenic EPC is 240 ppm or greater. There are 99 such properties.

- Chronic non-cancer risks to area residents with **average levels of exposure** range from less than or equal to the chronic reference dose (hazard quotient ≤ 1) to 2 times the chronic reference dose (hazard quotient = 2). The ratio of site dose to a reference dose is the "hazard quotient (HQ)". The HQ exceeds 1 for average levels of exposure where the arsenic EPC is1300 ppm or greater. There are only 2 such properties.

- Chronic non-cancer risks to area residents with **reasonable maximum levels of exposure** range from less than or equal to the chronic reference dose (HQ ≤ 1) to 5 times the chronic reference dose (HQ = 5). The HQ exceeds 1 for reasonable maximum levels of exposure where the arsenic EPC is 450 ppm or greater. There are 26 such properties.

Risk of Subchronic Non-Cancer Effects

Sub-chronic exposure is estimated using the same general equation. Exposure parameters are chosen to characterize short term exposures:

$$\text{Dose} = \frac{(\text{concentration}) \times (\text{intake}) \times (\text{exposure frequency}) \times (\text{exposure duration})}{(\text{body weight}) \times (\text{averaging time})}$$

Table 8 summarizes the assumptions used for each of the exposure parameters in the equation for sub-chronic exposure. In this scenario, during a 1 -3 month period such in the summer months, a child is assumed to play in a particular sub-location of a yard where the arsenic concentrations are higher than the yard average. EPA chose the 90th percentile concentration in each yard as the concentration for sub-chronic exposure. The 90th percentile concentration was estimated at each yard from the mean and the CV from Figure 15, 1.02. For the risk assessment, the EPC was used as a conservative estimate of the mean at each property. The 90th percentile is 2.07 times the EPC.

Table 8. Exposure Parameters for Sub-Chronic Exposure to Soil		
	AVERAGE	**REASONABLE MAXIMUM EXPOSURE**
	child	**child**
concentration of arsenic in soil (ppm)	90th percentile concentration in yard (2.07) x (EPC)	90th percentile concentration in yard (2.07) x (EPC)
adjustment for fine fraction	1.21	1.21
daily intake rate of soil (milligrams /day)	200	400
fraction of total intake that is soil	100%	100%
exposure frequency (days/month)	15	25
body weight (kilograms)	12.3	12.3
Relative bioavailability	0.42	0.42
Averaging time (days)	30	30

To calculate the sub-chronic HQ, EPA used a sub-chronic reference dose of 0.015 mg/kg/day developed by an EPA/ATSDR interagency workgroup (EPA, 2001b).

The baseline human health risk assessment indicates:

- Sub-chronic risks to children with **average levels of exposure** are predicted to be less than or equal to the sub-chronic reference dose (HQ $\leq$ 1). There are no properties with arsenic concentrations that are predicted to result in a sub-chronic hazard quotient greater than 1 for average levels of exposure.

- Sub-chronic risks to children with **reasonable maximum levels of exposure** range from less than or equal to the sub-chronic reference dose (HQ $\leq$ 1) to 3 times the sub-chronic reference dose (HQ = 3). The HQ exceeds 1 where the arsenic EPC is 800 ppm or greater. There are 7 properties such properties.

Risk of Acute Effects

EPA's evaluation of the risk of acute effects from exposures to arsenic associated with soil pica behavior in children is considered to be a screening level evaluation because of the substantial uncertainty which exists in most of the exposure assumptions. The evaluation is complicated by the fact that EPA and ATSDR employ different values for the reference dose and the assumptions about soil ingestion rates for a child with soil pica behavior.

To account for the differences between ATSDR and EPA concerning the appropriate acute reference dose and exposure assumptions to characterize pica behavior, EPA evaluated 2 "cases" of the soil pica exposure scenario to reflect the 2 agencies' recommendations. Table 9 summarizes the assumptions used for each of the exposure parameters in the equation for acute exposure.

EPA chose the 95th percentile concentration in each yard as the concentration for acute exposure. The 95th percentile concentration was estimated at each yard from the mean and the CV from Figure 15, 1.02. For the risk assessment, the EPC was used as a conservative estimate of the mean at each property. The 95th percentile is 2.81 times the EPC.

Table 9. Exposure Parameters for Soil Pica Exposure to Soil

	AVERAGE	**REASONABLE MAXIMUM EXPOSURE**
	child	**child**
concentration of arsenic in soil (ppm)	95th percentile concentration in yard (2.81) x (EPC)	95th percentile concentration in yard (2.81) x (EPC)
adjustment for fine fraction	N/A	N/A
daily intake rate of soil (milligrams /day)	5,000 (case 1) 2,000 (case 2)	10,000 (case 1) 5,000 (case 2)
fraction of total intake that is soil	100%	100%
body weight (kilograms)	12.3	12.3
Relative bioavailability	0.42	0.42

To calculate the acute HQ, EPA used the ATSDR Minimum Risk Level of 0.005 mg/kg/day as the reference dose for "Case 1". EPA used an acute reference dose of 0.015 mg/kg/day developed by an EPA/ATSDR interagency workgroup (EPA, 2001b) for "Case 2".

The screening level calculations of acute risk indicate:

- Acute risks to children with **average soil pica exposures** range from less than or equal to the reference dose (HQ $\leq$ 1) to 100 times the reference dose (HQ = 100). The HQ exceeds 1 for average soil pica exposures where the arsenic EPC is greater than 16 ppm (case 1) or 118 ppm (case 2). There are between 294 and 1511 such properties.

- Acute risks to children with **reasonable maximum soil pica exposures** range from less than or equal to the reference dose (hazard quotient $\leq$ 1) to 300 times the reference dose (hazard quotient =300). The HQ exceeds 1 for reasonable maximum soil pica exposures where the arsenic EPC is greater than 8 ppm (case 1) or 47 ppm (case 2). There are between 662 and 1841 such properties.

Table 10 summarizes the results of the baseline human health risk assessment for arsenic.

The risk calculations for every property were reviewed by EPA. EPA Guidance was used to identify individual properties where remedial action is needed to address unacceptable risks....

Unacceptable Risks that Warrant Remedial Action

EPA relied on the baseline risk assessment results to determine which properties in OU1 require remedial action. As a first step, EPA considered the cancer risks, the chronic non-cancer risks, and the sub-chronic non-cancer risks. This is because EPA has more confidence in these risk calculations than those for the acute risks which are considered screening level only.

Table 11 summarizes the arsenic EPCs associated with various cancer risk estimates for the reasonable maximum exposure scenario. Figure 16 also summarizes the cancer risk estimates for the reasonable maximum exposure scenario. Considering both of these, it is clear that cancer risks exceed the acceptable risk range at properties where the arsenic EPC is 240 ppm or greater. In accordance with EPA guidance, remedial action is warranted at these properties. At properties where the arsenic EPC is less than 240 ppm, the RME cancer risks are within the acceptable range.

There are 99 properties where the arsenic EPC is 240 ppm or greater. Of these 99 properties, there are 26 properties where the predicted RME hazard quotient exceeds 1 for chronic non-cancer effects, and 7 properties where the predicted RME hazard quotient exceeds 1 for both subchronic and chronic non-cancer effects. Remedial action at the 99 properties where RME cancer risks are unacceptable will also address unacceptable RME non-cancer risks (both chronic and sub-chronic).

Table 10. Summary of Cumulative Risks to Residents

Arsenic Risk Assessment, VB/I70 Residential Soils

Exposure Pathways and Health Effect	Average or Central Tendency Exposure		Reasonable Maximum Exposure	
	Range of Calculated Risks	# properties where risks are predicted to be unacceptable	Range of Calculated Risks	# properties where risks are predicted to be unacceptable
acute non-cancer effects • soil ingestion / pica	$0.07 \leq HQ^{1} \leq 100$	294-1511[2]	$0.2 \leq HQ \leq 300$	662- 1841[2]
subchronic non-cancer effects • incidental soil ingestion	$0.003 \leq HQ \leq 0.8$	0	$0.01 \leq HQ \leq 3$	7
chronic non-cancer effects • incidental soil and dust ingestion, and • vegetable ingestion	$0.04 \leq HQ \leq 2$	2	$0.1 \leq HQ \leq 5$	26
cancer effects • incidental soil and dust ingestion, and • vegetable ingestion	**$2 \times 10^{-6} \leq$ Cancer Risk $\leq 9 \times 10^{-5}$**	**0**	**$1 \times 10^{-5} \leq$ Cancer Risk $\leq 8 \times 10^{-4}$**	**99**

1. HQ = hazard quotient, defined as ratio of predicted site dose to EPA reference dose
2. There is a range of properties instead of a discrete number because EPA calculated risks using the EPA acute reference dose for one case and the ATSDR provisional acute MRL for the second case.

Table 11. Summary of RME Cancer Risks and Associated Arsenic EPCs

Cancer Risk based on Reasonable Maximum Exposure Assumptions	Arsenic EPC	# properties in VB/I-70 at this risk level
8×10^{-4}	1356 ppm - 1418 ppm	2
6×10^{-4}	927 ppm	1
5×10^{-4}	839 ppm - 898 ppm	4
4×10^{-4}	595 ppm - 688 ppm	11
3×10^{-4}	413 ppm - 522 ppm	12
2×10^{-4}	240 ppm - 410 ppm	69
1×10^{-4}	146 ppm - 238 ppm	131
9×10^{-5}	129 ppm - 145 ppm	38
8×10^{-5}	113 ppm - 127 ppm	47
7×10^{-5}	94 ppm - 111 ppm	58
6×10^{-5}	77 ppm - 93 ppm	78
5×10^{-5}	60 ppm - 76 ppm	100
4×10^{-5}	43 ppm - 59 ppm	159
3×10^{-5}	26 ppm - 42 ppm	275
2×10^{-5}	11 ppm - 25 ppm	1068
1×10^{-5}	5.5 ppm	933

The cancer risks are estimates. Region 8 carefully considered the uncertainty in the cancer risk estimates to determine if remedial action should be taken at properties where risks are within the acceptable range....

As the second step in determining where remedial action should be undertaken, EPA next considered whether there is reason to require remedial action at properties where risks are within the acceptable risk range. Again, EPA considered the guidance in OSWER Directive 9355.0-30 (EPA, 1991) which states that:

- EPA should clearly explain why remedial action is warranted if baseline risks are within the acceptable risk range of 10^{-6} to 10^{-4}

- A risk manager may decide that a level of risk lower than 10^{-4} warrants remedial action where, for example, there are uncertainties in the risk assessment results

EPA carefully evaluated the uncertainty in the OU1 risk assessment.

Uncertainty in the Risk Estimates

The Phase III program included several studies specifically to increase the accuracy (reduce uncertainty) of the risk estimates for OU1. The first was a study to investigate the RBA of arsenic in soil at the VB/I-70 site (EPA, 2001c).

In the absence of site specific information on RBA, it is common practice to use a default assumption as the value for this parameter or to ignore RBA altogether in risk estimates. However, where accuracy of risk estimates is important to risk managers, measurements of RBA based on site specific soils significantly reduce the uncertainty in estimates of this parameter.

In the study on OU1 soils, the RBA of arsenic was measured in 5 different soils collected from residential yards in the 4 main neighborhoods of the site. As expected, the RBA of arsenic varied between the five different site soils. EPA used the 95% UCL of the mean of the five values in the baseline risk assessment. This approach is expected to overestimate the true value of this parameter for any given soil in the residential yards in the Site. Thus the accuracy of the risk estimate was increased by using a VB/I-70 site-specific value and protectiveness was achieved by using a conservative estimate of the mean of all values measured.

The second study was Phase III which provided site-specific relationships between:

- arsenic in yard soil and arsenic in house dust;
- arsenic in yard soil and arsenic in garden soils;
- arsenic in garden soils and arsenic in garden vegetables;
- arsenic in the bulk fraction and the arsenic in the fine fraction of soil.

Establishing these site-specific relationships reduces the uncertainty in quantifying exposure and risk associated with incidental ingestion of soil and dust and ingestion of garden vegetables.

Quantitative Uncertainty Analysis

When risks are described as point estimates, it is difficult to evaluate the level of protectiveness inherent in the exposure assumptions used to calculate the risks. A point estimate of risk also does not provide any information about the uncertainties in the risk assessment.

One way to analyze uncertainty in risk estimates is by using Monte Carlo modeling, a computer based mathematical technique in which exposure parameters are characterized as probability density functions (PDF) rather than as point estimates. The premise of Monte Carlo modeling is that many assumptions about exposure (e.g., the frequency of contact, soil ingestion rate) are can be modeled as PDFs. In a Monte Carlo analysis, a risk calculation is repeated thousands of times using statistical techniques to select exposure values from the PDFs that characterize them. The thousands of combinations of exposure assumptions results in a range of risk estimates expressed as a probability distribution of risks for the site population being considered. The point estimate of risk can be located on the risk distribution to evaluate its likelihood. The likelihood is expressed as a percentile for the exposed population.

In theory, a Monte Carlo analysis can be performed for every property within OU1. To simplify the analysis, EPA performed screening level Monte Carlo modeling of exposure and risk associated with selected concentrations of arsenic in soil at the VB/I70 Site. The results are included in the final Human Health Baseline Risk Assessment and in Appendix F.

The results indicate that the point estimate of cancer risk using RME assumptions from Table 6 is located at the 99th percentile of the risk distribution. This means that there is a 99% chance that the true risk of cancer is less than the point estimate. The combination of assumptions used by EPA to characterize exposure risks has only a 1% chance of actually occurring in any individual living in OU1. The combination of exposure assumptions used by EPA for the chronic arsenic exposure assessment at this site may be at the upper bound of or even beyond the reasonable maximum exposure scenario.

The Monte Carlo analysis also showed that at properties where point estimate of risk is $1x\ 10^{-4}$ (i.e., where the arsenic EPC is below 240 ppm), risks in the 90th percentile - 95th percentile range (the RME range) are 2×10^{-5} to 7×10^{-5}. Thus, if remedial action is taken where arsenic equals or exceeds 240 ppm, the highest residual RME risks (at remaining un-remediated properties) will be well within the acceptable risk range.

The uncertainty analysis indicates that actual risks are much more likely to be lower than the calculated point estimates of risks. It is more likely that EPA overestimated the risk than underestimated the risk in the combination of assumptions used to quantify the the point estimate. EPA Region 8 concluded that remedial action is only warranted at those properties where baseline risks are outside of the acceptable risk range of 10^{-6} to 10^{-4}, i.e., where the arsenic EPC is 240 ppm or greater, in order to be protective of human health.

EPA also considered the available information on the incidence of cancer in the Northeast Denver area where VB/I-70 is located.....

Community representatives who participated in the VB/I-70 Working Group often expressed concern about the potential health effects of exposure to multiple chemicals in their

immediate environment. This concern is related to the EJ nature of the site, i.e., the community is disproportionately affected by environmental impacts from many sources other than the lead and arsenic in residential soils which Superfund is addressing.

EPA is fortunate to have information from studies conducted by CDPHE on the incidence of cancer in the population living in VB/I-70. EPA considered this important information in its determination of whether remedial action of soils is necessary at properties where reasonable maximum cancer risks are in the acceptable range (i.e., where the arsenic EPC is below 240 ppm) to help address the potential for cumulative risk from exposure to multiple sources. The information is briefly summarized here.

Two studies of cancer incidence in the Northeast Denver area are currently underway:

1. "Cancer in North Denver, 1998 - 2000": This is a study of the incidence and mortality statistics for cancers in the broad north and west Denver area compared to the entire Denver metropolitan area. This study, performed by CDPHE, was released in September, 2002. Cancer data was combined with survey results to contribute to the understanding of local behavioral risk factors. The findings are:

    - Among Whites, there is a greater incidence of lung cancer in the study area compared to the Denver metropolitan area
    - The incidence rate for all cancers combined for White males and females is significantly higher in north Denver compared to the remainder of the Denver metropolitan area
    - 30% of the residents in the study area smoke compared to 20% of residents in the rest of the State
    - Within the study area, the cancer incidence rate for Hispanic and Black women is lower than for White women
    - The prostate cancer mortality rate is higher in the study area than in the Denver metropolitan area and the rate is higher among Black men than White men
    - The cervical cancer mortality rate is higher in the study area than in the Denver metropolitan area and Hispanic women have a higher incidence rate than White women
    - The colorectal cancer mortality rate for males and Hispanic females is significantly higher than the other metropolitan area rates
    - Melanoma incidence rates in north Denver are significantly lower than the rates in the remainder of the metropolitan area for both males and females

According to the study, lifestyle, lack of access to preventive health care, and decreased likelihood of cancer screening tests may be factors in higher cancer incidences among some population groups in North Denver.

2. "Analysis of Diagnosed vs. Expected Cancer Cases in Residents of the Vasquez Boulevard/I-70 (VB/I-70) Superfund Site Study Area": This study was conducted by CDPHE in response to a request from representatives of the VB/I-70 community and the advisor to the Technical Assistance Grant (TAG) Group. Specifically, they requested that CDPHE compile data on the incidence of lung, bladder, and skin cancer based on the association of high exposure to arsenic in drinking water and these specific cancers. The study compares the incidence of these types of cancers and all cancers combined in residents of VB/I-70 to the incidence in the Denver metropolitan area. The study has NOT been publicly released yet. CDPHE expects to release the final study in early 2003. CDPHE provided a review draft to EPA in November, 2001. Preliminary findings include:

-THESE FINDINGS ARE CONFIDENTIAL AND SHOULD NOT BE RELEASED UNDER THE FREEDOM OF INFORMATION ACT-

- The incidence of lung cancer is statistically higher than expected in VB/I-70 mostly due to a statistically high ratio for white males in the Cole neighborhood. Over 75% of all the diagnosed lung cancer cases in the study area had a reported history of smoking. All of the males diagnosed with lung cancer in Cole for whom smoking status could be determined, were smokers.

- The ratio of the diagnosed to expected incidence of cancer for all cancers combined was statistically high for males and females combined for the VB/I-70 area. Cancers among males were within expected statistical limits. The higher than expected incidence of cancers in females was due to higher ratios of cervical and colorectal cancer in the study area overall and elevations of pancreatic and breast cancers in the Swansea/Elyria neighborhoods.

Information from these two studies suggests that health education and greater access to preventive health care is likely to be more effective in reducing the risk of cancer than requiring remediation of soils at properties where predicted cancer risks associated with arsenic in soil are within an acceptable risk range. Neither study is able to show an association between higher incidence of cancer and exposure to soil.

EPA also considered the screening level calculations of acute risks associated with soil pica behavior...

Uncertainties in the Estimates of Acute Risks

As the third step in determining which properties require remedial action, EPA considered the screening level assessment of acute risks associated with soil pica behavior. The RME acute HQ exceeds 1 at yards where arsenic levels are 8 ppm or higher (case 1) or 47 ppm or higher

(case 2). In evaluating the uncertainty in these calculations, two important facts were considered: (1) the distribution of soil ingestion rates for children with soil pica behavior is not known and (2) the frequency with which such children exhibit the behavior is also not known. Therefore, the application of Monte Carlo techniques to analyze the uncertainty in the calculations of acute risk is difficult and was not performed by EPA for the VB/I-70 Site.

However, these screening level estimates suggest that there are between 294 and 1511 individual properties with soil arsenic concentrations that are predicted to result in acute HQ greater than 1 for the average soil pica scenario and between 662 and 1841 for the RME soil pica scenario. The wide range of potentially affected properties, 294-1841, reflects the substantial uncertainty in quantifying these risks.

EPA also considered the following:

- EPA is not aware of any reported cases of acute arsenic toxicity attributable to ingestion of arsenic in soil.

- Limited data on urinary arsenic levels in residents of the nearby Globeville neighborhood do not reveal the occurrence of high soil intakes by children.

- Inquiries by CDPHE into reports of known or suspected cases of arsenic poisoning in the community surrounding the VB/I70 site resulted in their conclusion, stated in a July 25, 2001 letter, that "....it appears that there is no obvious or identifiable problem of arsenic exposure from environmental sources in the area of concern." (CDPHE, 2001).

- Extensive data on urinary arsenic levels in children who live in VB/I-70 OU-1 were collected during the "Kids at Play" Health Survey conducted by CDPHE and the University of Colorado Health Sciences Center during the summer of 2002. These important data indicate there is no evidence of exposures to arsenic at levels indicative of acute exposures. The data are summarized in Appendix G.

The above facts suggest that risk of acute arsenic exposure from soil pica behavior may not be as significant as the theoretical calculations for OU1 suggest. However, because of the high uncertainty regarding the magnitude and frequency of soil pica behavior, more reliable risk estimates for this scenario will not be possible until better data are collected on soil intake rates characteristic of soil pica behavior along with direct measurements of soil related exposures to arsenic.

Weighing the substantial uncertainty in the acute risk assessment, and recognizing that the calculations are theoretical, EPA determined that in order to be protective, remedial alternatives would be developed and evaluated for effectiveness in addressing the theoretical acute risks to children with soil pica at all properties where the arsenic EPC is 47 ppm or greater, based on the "case 2" scenario. In choosing 47 ppm as the level triggering response, EPA is recognizing that existing exposure data provides no evidence of the widespread acute exposures suggested by the "case 1" scenario.

In summary, EPA determined that remedial action at properties where the arsenic EPC is 240 ppm or greater will protect residents from unacceptable RME cancer, chronic non-cancer, and subchronic non-cancer risks. Remedial action at properties where the arsenic EPC is 47 ppm or greater will be evaluated for effectiveness in protecting soil pica children from theoretical unacceptable acute risk.

EPA also evaluated the risks associated with potential exposure to lead....

EPA's quantitative baseline human health risk assessment for OU1 also considered the health risks to young children associated with exposure to lead in soil. Table 12 summarizes the potentially exposed populations, exposure pathways, and potential health effects assessed by EPA.

EPA evaluates risks associated with exposure to lead by considering total exposure via all sources and pathways in the environment rather than to site related exposures only. This requires assumptions about the level of lead in food, air, water, and paint as well as the level of lead measured in yard soils. The Integrated Exposure/Uptake Biokinetic Model (IEUBK) is the recommended tool for assessing lead risks.

In order to increase the accuracy of the model results, EPA used VB/I70 site-specific data on the relationship between lead in the fine and bulk fractions of soil, the relationship between lead in yard soil and lead in house dust (EPA, 2001d), and the RBA of lead in soils (EPA, 2001e) as inputs to the model. Tables 13 and 14 summarize the values used for the IEUBK model parameters.

The adverse health effect associated with lead exposure that was considered by EPA is lead-induced neurobehavioral effects in children. EPA's OSWER determined that, in Superfund Site cleanups, EPA will attempt to limit exposure to soil lead levels such that a typical (or hypothetical) child or group of similarly exposed children would have an estimated risk of no more than 5% of exceeding a blood lead level of 10 micrograms per deciliter (ug/dL) (EPA 1994).

Using the values summarized in Tables 13 and 14, the IEUBK model predicts that there is a greater than 5% chance that a child will have a blood level of 10 ug/dL as a result of exposure to lead in soil at 1331 properties. The concentration of lead in soil at these properties is 208 ppm or greater.

Table 12: Potentially Exposed Populations and Exposure Pathways for Current and Reasonably Anticipated Future Scenarios

Lead Risk Assessment, VB/170 Residential Soils

Exposure Pathway	Potentially Exposed Population			Potential Health Effects			
	child	adult resident	adult worker	acute	sub-chronic	chronic non-cancer	chronic cancer
pica soil ingestion							
soil ingestion							
soil and dust ingestion	●		○		✓		
vegetable ingestion	○						
particulate inhalation	○		○				
dermal contact	○		○				

○ - complete but insignificant pathway, screening level evaluation

● - complete and potentially significant pathway, quantitative evaluation

Table 13. IEUBK Model Inputs

IEUBK Model Input	Value
concentration of lead in soil	EPC[1]
adjustment for fine fraction	1.09
concentration of lead in dust	estimated from site specific relationship of soil to dust dust = 0.34 soil + 150
concentration of lead in outdoor air	0.10 micrograms per cubic meter
concentration of lead in indoor air	30% of concentration in outdoor air
concentration of lead in drinking water	4 micrograms per liter
absorption fractions: air diet water soil and dust	 32% 50% 50% 84% of 50% = 42% (from lead RBA study)
fraction of daily intake that is soil	45%
geometric standard deviation of blood lead values	1.6

1. The EPC is the average of 3 composite samples collected from the property

Table 14. Age Dependent IEUBK Model Inputs

Age	AIR		DIET	WATER	SOIL
(Years)	time outdoors (hours)	breathing rate (m^3/day)	dietary intake (micrograms/day)	intake (liters/day)	intake (milligrams /day)
0-1	1.0	2.0	3.87	0.20	85
1-2	2.0	3.0	4.05	0.50	135
2-3	3.0	5.0	4.54	0.52	135
3-4	4.0	5.0	4.37	0.53	135
4-5	4.0	5.0	4.21	0.55	100
5-6	4.0	7.0	4.44	0.58	90
6-7	4.0	7.0	4.90	0.59	85

Consideration of Uncertainties in the Baseline Human Health Risk Assessment for Lead

In order to investigate uncertainty in the IEUBK model predictions for OU1, EPA ran the model again varying soil intake rate to reflect recently published data on soil intake rates measured in children in Anaconda, Montana (Stanek and Calabrese, 2000). The results of the alternative model run indicate there are only 2 properties where lead risks due to soil are predicted to exceed EPA's health goals. The concentration of lead in soil at these properties is 1100 ppm or greater. The results are presented in the final Baseline Human Health Risk Assessment document.

The range of results indicate that there is a greater than 5% chance that a child will have a blood level of 10 ug/dL as a result of exposure to lead in soil at between 2 and 1331 properties. This wide range indicates substantial uncertainty in predictions of blood lead levels using the IEUBK model at the VB/I-70 site.

EPA also predicted blood lead levels in children in VB/I70 using a different model than the IEUBK. The results of this modeling effort, also presented in the final Baseline Human Health Risk Assessment, indicate that there are no properties where lead levels in soil are predicted to result in a greater than 5% chance that a child will have a blood level of 10 ug/dL, suggesting that remedial action to address lead in soil may not be warranted.

Consideration of Observed Blood Lead Values in Children Who Reside in VB/I70

EPA reviewed the available information on measured blood lead levels in the population of children in VB/I-70 to better understand how well the IEUBK model was predicting blood lead levels at OU1. The CDPHE offered three separate blood lead testing programs to children living in the VB/I-70 site during the period 1995 through 2000 and provided the results of this testing to EPA. Although the blood lead testing was not designed or intended to support risk assessment, the data support the following conclusions:

- elevated blood lead levels do occur in children residing within the site
- soil is not likely to be the main source of elevated blood lead levels in children
- the elevated blood lead levels that were observed in children within VB/I-70 are not clearly different from the elevated levels observed in children who live outside of VB/I-70

In addition, recently available data from the Kids at Play Health Survey indicates that EPA's health goals for children exposed to lead may currently be met. The study data indicates that less than 3.2% of the approximately 1340 children tested have elevated blood lead levels. A summary of the data is provided in Appendix G.

In order to investigate some of the sources of uncertainty in the IEUBK model predictions for OU1, EPA ran the model a number of times, varying the values for dietary lead intake, geometric standard deviation of blood lead levels, and soil intake rate to reflect recently published data. The results of the alternative model runs are presented in the final Baseline Human Health Risk Assessment document.

Each alternative IEUBK model run predicts that EPA's health goal for lead in soil will be met at a specific average soil lead concentration or lead EPC in an individual yard. The

alternative model runs performed by EPA resulted in a range of such EPCs presented in Table 15. Remedial action may be warranted at properties where the lead EPC is greater than a value within this range to achieve EPA's health goal.

EPA considered the following factors in determining what concentration in the range warrants remedial action:

- Available blood lead data indicates that soil is not likely to be the main source of elevated blood lead levels in children in VB/I70.
- Predictions using an alternative model suggest that remedial action of soil may not be required to achieve EPA's health goal for lead in soil.

These factors led EPA to determine that, in order to be protective, remedial action is warranted at yards where the lead EPC is greater than 540 ppm , a value in the middle of the range of values in Table 15. Remedial action at properties where the lead EPC is greater than 208 ppm, the low end of the range, will be evaluated for effectiveness in achieving EPA's health goal for lead in soil. This recognizes that soil is not likely to be main source of elevated blood lead levels.

Table 15
Range of EPCs predicted to meet EPA's Health Goal for Lead in Soil at OU1 of the VB/I70 Site

IEUBK Model Run	soil intake rates	Dietary Lead Intake Values	Geometric Standard Deviation of Blood Lead Values	Predicted Lead Soil Level at P10 < 5% [1] (ppm)
1	default	default	1.6 (default)	208
2	default	revised	1.6 (default)	246
3	default	default	1.4	326
4	default	revised	1.4	362
5	default	revised	1.3	443
6	default	default	1.2	542
7	default	revised	1.2	581
8	Stanek and Calabrese, 2000	default	1.6 (default)	1100

1. P10 < 5% = less than 5% probability that blood lead levels exceed 10 ug/dL

In November 2001, EPA developed a Feasibility Study (FS) for OU1 to develop and evaluate a range of remedial alternatives to address the predicted unacceptable risks associated with potential exposure to contaminated soils and homegrown vegetables in residential yards. The FS was prepared in accordance with EPA Office of Solid Waste and Emergency Response (OSWER) Directive 9355.3-01, "Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA", and consistent with EPA regulations in the NCP (40 CFR Part 300).

The Feasibility Study began with the development of Remedial Action Objectives...

The overall Remedial Action Objective (RAO) is to protect human health. EPA developed the following specific RAOs for arsenic and lead in soil at OU1:

RAOs for Arsenic in Soil

A. For residents of the VB/I70 site, prevent exposure to soil containing arsenic in levels predicted to result in an excess lifetime cancer risk associated with ingestion of soil and ingestion of home grown garden vegetables which exceeds 1×10^{-4} using reasonable maximum exposure assumptions.

B. For residents of the VB/I70 site, prevent exposure to soil containing arsenic in levels predicted to result in a chronic or sub-chronic hazard quotient associated with ingestion of soil and ingestion of home grown garden vegetables which exceeds 1 using reasonable maximum exposure assumptions.

C. For children with pica behavior who reside in the VB/I70 site, reduce the potential for exposures to arsenic in soil that result in acute effects.

RAO for Lead in Soil

D. Limit exposure to lead in soil such that no more than 5 percent of young children (72 months or younger) who live within the VB/I70 site are at risk for blood lead levels higher than 10 ug/dL from such exposure.

This objective is consistent with EPA's guidance in OSWER Directive 9355.4-12 that EPA should, ". limit exposure to soil lead levels such that a typical child or group of similarly exposed children would have an estimated risk of no more than 5 percent of exceeding the 10 ug/dL blood lead level (EPA, 1994)."

Preliminary Remediation Goals (PRGs) for arsenic and lead in soil were established based on the evaluation and findings of the Baseline Human Health Risk Assessment. In accordance with the NCP (40 CFR Part 300) PRGs are the desired endpoint concentrations of lead and arsenic in soils that are protective of human health for the various exposure scenarios. The PRGs help to focus the development of remedial alternatives on technologies that can achieve the goals. At OU1, PRGs were set at background concentrations for both lead and

arsenic. Remedial alternatives were evaluated for how effective they are in achieving the PRGs at those properties where remedial action is warranted.

It is estimated that background levels of arsenic are characterized as a lognormal distribution with a mean of 8 mg/Kg and a standard deviation of 3.6 mg/Kg. Based on this, background levels may range up to about 15 mg/Kg or slightly higher. Lifetime cancer risk associated with exposure to background concentrations of arsenic in soil is approximately $1x10^{-5}$, a level within EPA's acceptable risk range. However, the screening level calculations of acute risk associated with soil pica behavior indicate that the acute HQ exceeds 1 (indicating an unacceptable risk) under some scenarios even where arsenic is at background levels.

Lead levels in bulk soil range below the detection limit (about 52 mg/Kg) up to a maximum of more than 1,000 mg/Kg. If it is assumed that the upper range of lead concentrations resulting from natural and area-wide anthropogenic sources is about 400 mg/Kg, then the mean of all samples that are less than 400 mg/Kg is about 195 mg/Kg. This value is considered by EPA to be a rough estimate of the average background concentration of lead in soil at OU1.

In order to identify the specific properties for which remedial alternatives will be developed and evaluated, EPA established Preliminary Action Levels in the FS. These are exposure point concentrations (EPCs) above which some remedial action is warranted. An EPC is a conservative estimate of the mean concentration within an individual yard. These preliminary action levels are:

(1) an EPC of 47 mg/Kg arsenic, which is the level at which the Baseline Human Health Risk Assessment predicts the RME acute non-cancer HQ is greater than 1 for the Case 2 pica scenario;
(2) an EPC of 240 mg/Kg arsenic, which is the level at which the Baseline Human Health Risk Assessment predicts RME lifetime cancer risks exceed 10^{-4};
(3) an EPC of 208 mg/Kg lead, which equates to a less than 5% chance that any child will have a blood lead value above 10 ug/dL based on the IEUBK model adjusted by using site-specific data on the levels of lead in house dust and the relative bioavailability of lead in site soils; and
(4) an EPC of 540 mg/Kg lead, which also equates to a less than 5% chance that any child will have a blood lead value above 10 ug/dl based on an alternate IEUBK model run.

These concentrations equate to the EPCs used in the Baseline Human Health Risk Assessment and any evaluation of concentrations of lead or arsenic in residential yard soils must use the same sampling methodology as the RI and same evaluation methodology as the risk assessment to provide comparable results.

EPA developed 5 remedial alternatives...

Based on site conditions and RAOs, a range of General Response Actions (GRAs) were identified. GRAs are general categories of remedial activities (e.g. no action, institutional controls, containment, etc.) that may be undertaken, either singly or in combination, to satisfy the requirements of the RAOs. Remedial technologies and process options are more specific applications of the GRAs. Remedial technologies and process options were identified for each GRA and screened in accordance with procedures described in RI/FS guidance. In the first screening step, remedial technologies that have limited or no potential for implementation at the site were eliminated. Remedial technologies and process options that passed the initial screening test were then subjected to a second, more rigorous, screening evaluation of their anticipated effectiveness, potential implementability and relative cost. The remedial technologies and process options that survived the screening were carried forward for consideration in the development of remedial alternatives.

Based on this process, five remedial alternatives were identified as follows:

- Alternative 1 - No Action
- Alternative 2 – Community Health Program, Tilling/Treatment (Lead), Targeted Removal and Disposal (Arsenic)
- Alternative 3 – Community Health Program, Targeted Removal and Disposal
- Alternative 4 – Community Health Program, Expanded Removal and Disposal
- Alternative 5 – Removal and Disposal

Detailed descriptions of the alternatives are provided below.

Alternative 1 - No Action

The no action alternative provides a baseline for the evaluation of other alternatives in accordance with the NCP. No additional protective or remediation measures would be taken for the no-action option. Soils have already been removed from 48 residential properties at the site in Time Critical Removal Actions conducted by EPA in 1998 and 2000.

In general, the no-action alternative may be viable if arsenic and lead concentrations are below preliminary action levels. This alternative may also be appropriate for materials or soils that do not pose unacceptable risks to human health or the environment, if implementation of remedial actions would create a greater risk, or if the cost of remediation is excessive when compared to the risk reduction.

Alternative 2 – Community Health Program, Tilling/Treatment (Lead), Targeted Removal and Disposal (Arsenic)

Alternative 2 contains the following principal components:

- Implementation of a community health program.

The community health program alternative for the VBI70 site would be composed of two separate (but partially overlapping) elements. The first element would be designed to address risks to area children from non-soil sources of lead, and to the extent that they exist, risks from lead in un-remediated soils above the preliminary action level of 208 mg/Kg. The second element would be designed to address risks to area children from pica ingestion of arsenic in soil above the preliminary action level of 47 mg/Kg. Each of these two main elements of the program is described below. Participation in one or both elements of the program would be strictly voluntary, and there would be no charge to eligible residents and property owners for any of the services offered by the community health program.

PUBLIC HEALTH PROGRAM TO REDUCE RISKS FROM LEAD

The program for reduction of lead risks is intended to be general. That is, it is intended to assess risks from lead from any and all potential sources of exposure, with response actions tailored to address the different types of exposure source that may be identified. The lead program will consist of three main elements:

1) Community and individual education about potential pathways of exposure to lead, and the potential health consequences of excessive lead exposure.

2) A biomonitoring program by which any child (up to 72 months old) may be tested to evaluate actual exposure.

3) A program to respond to any observed lead exposure that is outside the normal range. This will include any necessary follow-up sampling, analysis, and investigation at a child's home to help identify the likely source of exposure, and to implement an appropriate response that will help reduce the exposure.

A key component of the response program is that all potential sources of lead at a property would be sampled, including soil and interior/exterior paint. If soil is judged to be the most likely source of exposure, a series of alternative actions will be evaluated to identify the most effective way to reduce that exposure. These will include a wide range of potential alternatives, including such things as education, sodding or capping of contaminated soil, tilling/treatment, etc. If exterior paint is the source of lead contamination in soil, remediation of the paint may be considered. If the main source is judged to be non-soil related, responses may include things such as education and counseling, or referral to environmental sampling/response programs offered by other agencies, as appropriate.

PUBLIC HEALTH PROGRAM TO REDUCE RISKS FROM PICA INGESTION OF ARSENIC

Chronic cancer and non-cancer risks from incidental ingestion of arsenic in soil will be addressed by the soil removal/disposal component of this remedial alternative. The public health program for arsenic is designed to focus specifically on the potential risks to young children from pica behavior. The program for arsenic will consist of three main elements:

1) Community and individual education about identification and potential hazards of pica behavior and the potential health consequences of excessive acute oral exposure to arsenic.

2) A biomonitoring program by which any child may be tested to evaluate actual soil pica exposure to arsenic.

3) A program that provides a response to any observed inorganic arsenic exposures that are outside the normal range. This will include any necessary follow-up sampling, analysis, and investigation at a child's home to help identify the likely source of exposure, and to implement an appropriate response that will help reduce the exposure.

- In yards with arsenic EPCs of 240 mg/Kg or greater, accessible soils would be removed to a depth of 12 inches and transported offsite for disposal at an appropriate facility. The excavation areas would be backfilled with clean soil containing arsenic and lead concentrations at or below PRGs, and pre-remediation yard features restored. Based on RI data, it is estimated that this would occur at a total of 113 residential properties within the entire site.

- In yards with lead EPCs greater than 540 mg/Kg, surface soils would be tilled to a depth of 6 inches and treated with phosphate. Pre-remediation yard features would then be restored. Based on RI data, it is estimated that this would occur at a total of 89 residential properties at the site (8 of the properties with lead EPCs above 540 mg/Kg also have arsenic EPCs above 240 mg/Kg and would therefore be remediated by soil removal).

- To date, EPA has sampled the soil at approximately 75% of the residential properties within the VBI70 site boundary. Because the spatial pattern of lead and arsenic contamination is variable between properties, it is not possible to assess potential risks at a specific property without data from that property. Therefore, upon request from the owner or current resident (if access is granted by the owner), EPA will provide a program of on-going testing for lead and arsenic in soil at any residential property within the site boundaries that has not already been adequately tested. If the lead EPC exceeds 540 mg/Kg and the arsenic EPC is below 240 mg/Kg, soil at the property would be tilled and treated with phosphate. If the arsenic EPC equals or exceeds 240 mg/Kg, soil would be removed and disposed offsite. This sampling program will operate for as long as on-site construction of the remedy is occurring.

Alternative 3 – Community Health Program, Targeted Removal and Disposal

Alternative 3 contains the following principal components:

- Implementation of a community health program, identical to the one described for Alternative 2, except that future response actions on soils would entail removal and offsite disposal.

- In yards with arsenic EPCs of 240 mg/Kg or greater or with lead EPCs above 540 mg/Kg accessible soils would be removed to a depth of 12 inches and transported offsite for disposal at an appropriate facility. The excavation areas would be backfilled with clean soil containing arsenic and lead concentrations at or below PRGs, and pre-remediation yard features restored. Based on RI data, it is estimated that this would occur at a total of 202 residential properties (105 properties for arsenic only, 8 for both arsenic and lead, and 89 for lead only).

- Implementation of a sampling program identical to the one described under Alternative 2. Under this alternative, at properties with lead EPCs greater than 540 mg/Kg or with arsenic EPCs equal to or greater than 240 mg/Kg, soil would be removed and disposed offsite.

Alternative 4 – Community Health Program, Expanded Removal and Disposal

Alternative 4 contains the following principal components:

- Implementation of a community health program, identical to the one described for Alternative 3.

- In yards with arsenic EPCs greater than 128 mg/Kg or with lead EPCs above 540 mg/Kg accessible soils would be removed to a depth of 12 inches and transported offsite for disposal at an appropriate facility. The excavation areas would be backfilled with clean soil containing arsenic and lead concentrations at or below PRGs, and pre-remediation yard features restored. Based on RI data, it is estimated that this would occur at a total of 403 residential properties (306 properties for arsenic only, 31 for both arsenic and lead, and 66 for lead only).

- Implementation of a sampling program identical to the one described under Alternative 2. Under this alternative, at properties with lead EPCs greater than 540 mg/Kg or with arsenic EPCs greater than 128 mg/Kg, soil would be removed and disposed offsite.

Alternative 4 was developed and evaluated at the request of CDPHE . Specifically, CDPHE requested that EPA develop alternatives that would protect residents from cancer risks greater than a range of 3×10^{-5} to 8×10^{-5} to be consistent with cleanup objectives at the adjacent Asarco Globe site. Information from the Public Health Evaluation for the Asarco Globe site (CDPHE, 1989) and the Record of Decision for the Asarco Globe Site (CDPHE, 1993) indicates that the arsenic action level of 70 mg/Kg established for residential properties at the Globe site was associated with a cancer risk 8×10^{-5} using less protective exposure assumptions than those used at VB/I-70 OU1 (e.g., 250 days/year of exposure versus 350 days /year assumed at VB/I-70 and lower soil ingestion rates for children). When exposure assumptions consistent with those used at the VB/I-70 site are used, the cancer risk associated with 70 ppm at the Globe site is 2×10^{-4} . Nevertheless, EPA complied with CDPHE's request and developed Alternative 4 which requires soil removal at an arsenic EPC of 128 mg/Kg or higher. Based on the findings of the Baseline Human Health Risk Assessment for OU1, an arsenic EPC of 128 mg/Kg corresponds to a point estimate risk level of 8×10^{-5} . This is a more protective risk level than provided at the Globe site.

Alternative 5 – Removal and Disposal

Alternative 5 contains the following principal components:

- In yards with arsenic EPCs of 47 mg/Kg or greater or with lead EPCs above 208 mg/Kg accessible soils would be removed to a depth of 12 inches and transported offsite for disposal at an appropriate facility. The excavation areas would be backfilled with clean soil containing arsenic and lead concentrations at or below PRGs, and pre-remediation yard features restored.

This alternative would also include sampling of properties that were not sampled during the RI with soil removal at properties where lead or arsenic exceeds 208 mg/Kg or 47 mg/Kg respectively. It is estimated that soil removal would be required at a total of 2,122 residential properties.

Alternative 4 was EPA's initial preferred alternative...

The 5 remedial alternatives were evaluated against the nine criteria in the NCP. Based on this analysis, EPA and CDPHE identified Alternative 4 as the preferred alternative, giving substantial consideration to the criterion, State Acceptance. In May, 2002, EPA issued a proposed plan that summarized the evaluation of alternatives, identified Alternative 4 as the preferred alternative, and requested public comment. A copy of the May 2002 proposed plan is included in Appendix H.

The pubic provided extensive comments on EPA's preferred alternative...

A 60-day public comment period followed the release of the proposed plan. The public provided extensive comments on EPA's and CDPHE's preferred alternative. Many who provided comments expressed concern that under Alternative 4, soil with lead levels above EPA OSWER's screening level for lead in soil of 400 mg/Kg (EPA, 1994) would not be removed and

replaced. Some were concerned that the EPA regulations under the Toxic Substances and Control Act establish the following lead-based paint hazards (40 CFR Part 745.65): "bare soil on residential real property or on the property of a child-occupied facility that contains total lead equal to or exceeding 400 parts per million in a play area or average of 1,200 parts per million of bare soil in the rest of the yard based on soil samples". The commenters suggested that EPA would not be following its own regulations unless soil was removed from properties where lead levels exceed 400 mg/Kg. Some who provided comments expressed concern that soil with arsenic levels above the 70 mg/Kg action level established in 1993 at the Globe site would not be removed and replaced and asked EPA for an explanation of the differences in the levels established for Globe and VB/I-70 as well as other sites.

EPA responded to the public comments on the May 2002 proposed plan by developing and evaluating a new alternative, Alternative 6...

A remedial alternative that requires soil removal and replacement at yards where the arsenic EPC is greater than 70 mg/Kg or the lead EPC is greater than 400 mg/Kg was not evaluated in the November, 2001 FS Report. Consequently, EPA, the State, and the community did not have the information about how effectively such an alternative meets the nine criteria in the National Contingency Plan (40 CFR Part 300).

EPA responded to public comments on the May 2002 proposed plan by developing and evaluating a new alternative, Alternative 6, that would require soil removal and replacement at yards where the arsenic EPC is greater than 70 mg/Kg or the lead EPC is greater than 400 mg/Kg. These arsenic and lead levels are consistent with the arsenic action level at the Globe site and EPA's screening level for lead in soil (EPA, 1994).

EPA prepared an addendum to the FS to develop and evaluate the new alternative, Alternative 6.

The FS Addendum includes a new alternative...

<u>Alternative 6 – Community Health Program, Further Expanded Removal and Disposal</u>

Alternative 6 contains the following principal components:

- Implementation of a community health program, identical to the one described for Alternatives 3 and 4.

- In yards with arsenic EPCs greater than 70 mg/Kg or with lead EPCs above 400 mg/Kg accessible soils would be removed to a depth of 12 inches and transported offsite for disposal at an appropriate facility. The excavation areas would be backfilled with clean soil containing arsenic and lead concentrations at or below PRGs, and pre-remediation yard features restored. Based on RI data, it is estimated that this would occur at a total of 853 residential properties (508 properties for arsenic only, 108 for both arsenic and lead, and 237 for lead only).

- Implementation of a sampling program identical to the one described under Alternative 2. Under this alternative, at properties with lead EPCs greater than 400 mg/Kg or with arsenic EPCs greater than 70 mg/Kg, soil would be removed and disposed offsite.

All 6 remedial alternatives were then evaluated and compared in the COMPARATIVE ANALYSIS OF ALTERNATIVES...

The 6 remedial alternatives were evaluated against the threshold and balancing criteria specified in the NCP and FS Guidance.

The nine evaluation criteria specified in the National Contingency Plan (NCP) are:

- Threshold Criteria
  - Overall Protection of Human Health and the Environment
  - Compliance with ARARs

- Primary Balancing Criteria
  - Short-Term Effectiveness
  - Long-Term Effectiveness and Permanence
  - Reduction of Toxicity, Mobility and Volume Through Treatment
  - Implementability
  - Cost

- Modifying Criteria
  - State Acceptance
  - Community Acceptance

Detailed analyses were performed for each alternative, applying each of the threshold and primary balancing criteria. The remedial alternatives were also evaluated comparatively, relative to one another, within each criterion.

The No Action Alternative is not evaluated in the comparative analysis, but is considered as the baseline condition. The Baseline Human Health Risk Assessment indicates that no further action would be effective in preventing exposures to arsenic in soil above a $1x10^{-4}$ lifetime cancer risk, a chronic hazard greater than 1, or a sub-chronic hazard quotient greater than 1 for residents who have average or central tendency exposures. However, if no further action is taken at the site, screening level calculations suggest that high rates of soil intake associated with soil pica behavior in children might result in doses of arsenic that exceed an acute hazard quotient of 1, even for the central tendency pica exposure scenario. Also, the No Action Alternative would not meet the RAOs for arsenic since they are established to be protective of RME exposures.

For lead, the probability of elevated blood lead levels predicted by the IEUBK Model provides the basis for EPA's evaluation of the No Action Alternative. When the IEUBK model is run using recently published data on soil ingestion rates for children (Stanek & Calabrese, 2000), the site-specific relative bioavailability and site-specific soil/dust ratio adjustments, it

predicts that no further action is necessary to achieve the RAO for lead. When the IEUBK model is run using default assumptions for all parameters except the site-specific relative bioavailability and soil/dust ratio, it predicts that the No Action Alternative would not be effective in achieving the RAO for lead in soil. The range of results reflects the uncertainty in using the IEUBK Model to predict whether further action is required to achieve the RAO for lead at the site.

In order to help determine whether the IEUBK model is yielding reliable predictions at the VB/I70 site, USEPA compared the IEUBK model predictions to actual observations of blood lead levels in the population of children currently living at the site. Even though the available data are from studies that were not designed to support risk assessment, they do support the following:

A. Elevated blood lead levels occur in children residing within the site.
B. Soil is not likely to be the main source of elevated blood lead levels.
C. Elevations are not clearly different from areas outside VB/I70.

Recently available preliminary results from the KAP Survey indicate that of the approximately 1340 children that have participated in the KAP survey, less than 3.2% of children tested have blood lead levels greater than 10 ug/dL. The data on blood lead levels in children residing in OU1 suggest that the No Action Alternative may be effective in meeting the RAO for lead in soil as predicted by the IEUBK Model run with recently published data on soil ingestion rates for children, the site-specific relative bioavailability, and the site-specific soil/dust ratio.

A summary of the comparative analysis is presented below.

Overall Protection of Human Health

There is not a large difference between each of the 6 alternatives in overall protection of human health. However, the highest level of overall protection of human health (as measured by how well the RAOS will be met and short-term effectiveness) would be achieved by Alternative 3.

In Alternative 3, removal and offsite disposal of yard soils with arsenic EPCs at or above 240 mg/Kg or lead EPCs greater than 540 mg/Kg would be effective in preventing exposure to these soils, which are of the greatest concern with respect to human health risk. This would effectively achieve the first 2 RAOs for arsenic in soil and the RAO for lead in soil. Implementation of a community health program would be effective in achieving the third RAO for arsenic in soil and the RAO for lead in soil by addressing the risks of exposure to non-soil sources of lead and the risks from soil pica behavior through the components of education, biomonitoring, source sampling and analysis, and response actions as necessary. The community health program would provide additional protection for the community, because it would provide the mechanism for evaluating other sources of lead (such as lead paint) that may cause exposures in the future, and for addressing soil pica behavior that may be associated with other risks in addition to the risk of acute arsenic exposure. Even if there were no detectable arsenic or lead in soil, soil pica behavior may lead to development of significant gastrointestinal

disturbances and/or blockages, abdominal pain, parasitic infection, and iron deficiency. The community health program would include strategies to reduce soil pica behavior within the population of children living in VB/I70. Reduction in soil pica behavior would reduce the risk of these other health effects. Alternative 3 would also minimize short-term risks.

Alternative 2 may provide a similar level of protection compared to Alternative 3, but there is some uncertainty associated with the tilling/treatment component to address soils with lead EPCs above 540 mg/Kg. Uncertainties are associated with the effect of tilling on surface soil concentrations. This is because concentration profiles were not generated with depth or in different yard locations for the target properties, and therefore the resultant lead concentrations in surface soil after tilling are difficult to predict. Also, the effectiveness of phosphate treatment is uncertain. This is because site-specific testing would be required to determine the chemical form and application rate necessary to achieve the preliminary remediation goals for lead in soil; this would lead to a delay of at least a year in implementing this portion of the remedy.

Alternative 4 differs from Alternative 3 by adding soil removal from properties with arsenic concentrations greater than 128 mg/Kg. This alternative was developed and evaluated at the request of CDPHE . Specifically, CDPHE requested that EPA develop alternatives that would protect residents from cancer risks greater than a range of 3×10^{-5} to 8×10^{-5} to be consistent with cleanup objectives at the adjacent Asarco Globe site. Based on the findings of the Baseline Human Health Risk Assessment, an arsenic EPC of 128 mg/Kg corresponds to a point estimate risk level of 8×10^{-5}.

Under Alternative 4, remedial action would be taken at approximately 200 properties where predicted RME cancer risks are within EPA's acceptable risk range and where the first 2 RAOs for arsenic in soil are currently being met. In addition, the predicted point estimate risks is at the 99th percentile of the risk distribution for the exposed population, indicating that there is a 99% probability that the true risks are lower than the estimated risks and the combination of exposure assumptions for OU1 characterizes exposures that are very likely not occurring at the VB/I70 site. Thus, it is not necessary to take remedial action at properties where risks within EPA's acceptable risk range (as in Alternative 4) in order to be protective at the VB/I-70 site OU1.

The first and second RAOs for arsenic in soil are consistent with guidance set out in the OSWER Directive 9355.0-30 "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions". In part, this guidance states, "Where the cumulative carcinogenic site risk to an individual based on reasonable maximum exposure for both current and future land use is less that 10^{-4}, and the non-carcinogenic hazard quotient is less than 1, action is not warranted unless there are adverse environmental impacts." The directive further states that consideration of uncertainties in the baseline risk assessment may lead a risk manager to decide that risks lower than 10^{-4} are unacceptable, triggering the need for remedial action. EPA considered the uncertainty in the arsenic risk calculations for VB/I70 to determine whether remedial action is needed at properties where risks are predicted to be less than or equal to 10^{-4}. The uncertainty analysis in the Baseline Human Health Risk Assessment indicates that actual risks are much more likely to be lower than the calculated point estimates of risks. Providing protection at the 1×10^{-4} risk level based on the point estimates of risk (the first RAO for arsenic in soil) is likely to

provide a level of protectiveness for the RME scenario in the range of 2×10^{-5} to 7×10^{-5}. Therefore, it is not necessary to perform soil removals where arsenic EPCs are lower than 240 mg/Kg in order to achieve protectiveness in the range requested by CDPHE for the RME scenario.

To the extent that there may be unacceptable health risks associated with exposure to soil with arsenic EPCs below 240 mg/Kg and lead EPCs below 540 mg/Kg, Alternative 5 would provide the highest level of long-term protection because soils with arsenic and lead levels above 47 mg/Kg and 208 mg/kg respectively would be removed. However, the following information from the baseline risk assessment and other EPA studies indicates that below 240 mg/Kg arsenic and 540 mg/Kg lead, soil is <u>not</u> a major source of exposure and risk in OU1.

For arsenic, potential unacceptable health risk where arsenic EPCs are below 240 mg/Kg is associated with soil pica behavior. Screening level calculations suggest that removing and replacing soil below 240 mg/Kg will not effectively protect children from the risk of acute effects since under at least one set of assumptions, the acute HQ is greater than 1 at background levels of arsenic. Also, children with soil pica behavior are at risk of experiencing other health risks unrelated to arsenic that will not be addressed by removing and replacing soil.

In the case of lead, it is likely that other, non-soil sources of lead exist in VB/I-70 that would not be identified under Alternative 5. Evidence from other studies indicates that unless the non-soil sources are addressed, removing more soil will not be more protective. The USEPA sponsored a study in urban areas of Baltimore, Boston and Cincinnati to investigate the efficacy of soil and dust abatement techniques in reducing blood lead values in children (USEPA 1995). Because of the study design, this investigation is usually referred to as the "three cities study". Among the key findings of this study was the conclusion that:

"... soil abatement alone will have little or no effect on reducing exposure to lead unless there is a substantial amount of lead in soil and unless this lead is the primary source of lead in house dust"

The report did not rigorously define "substantial", but it was only when soil lead levels were higher than 1,000 to 2,000 mg/Kg that a benefit from soil remediation was detectible. Conversely, in two cities where soil lead levels were mainly less than 1,000 mg/Kg, no substantial decrease in blood leads could be detected following soil remediation. As noted earlier, 99% of all properties tested in Phase III at the VB/I70 site have soil lead concentrations below 700 mg/Kg, with only three properties being above 1,000 mg/Kg. Also recall that, at the VB/I70 site, available data indicate that only about 34% of the mass of interior dust appears to be derived from yard soil. Thus, it appears that neither of the two conditions needed for soil removal to be effective is likely to apply at most properties at the VB/I70 site.

Evaluation of overall protection must also consider that the extensive removals under Alternative 5 would entail the greatest amount of short-term risks to the community compared to all the other alternatives due to the presence and operation of heavy equipment and the greater number of truck trips required to dispose excavated soil offsite and to transport clean fill to the site. Another short-term impact to the community is the impact of the additional water use

required to establish grass at remediated properties. Colorado is experiencing drought conditions and water use is restricted in the City of Denver. EPA estimates that Alternative 5 will require 10 times more water to implement than Alternatives 2 or 3, and 5 times more water than Alternative 4.

Alternative 6 differs from Alternatives 2, 3, and 4 by adding soil removal from properties with arsenic EPCs greater than 70 mg/kg and/or lead EPCs greater than 400 mg/kg. This alternative was developed and evaluated in response to comments received on the May 2002 Proposed Plan. Those comments requested an explanation of why EPA was not considering removing soil from properties where arsenic exceeds 70 mg/Kg as was done at the Asarco Globe site and where lead exceeds 400 mg/Kg to be consistent with EPA's screening level for lead in soil.

Based on the findings of the Baseline Human Health Risk Assessment, an arsenic EPC of 70 mg/Kg corresponds to a point estimate risk level of 5×10^{-5}. However, there is a range of soil EPCs associated with this same point estimate of RME cancer risk. That range of soil EPCs is 60 mg/Kg to 76 mg/kg. Therefore, some properties with the same estimated risk levels (i.e. with arsenic EPCs above 60 mg/kg, but below 70 mg/kg) would not undergo soil removal under this alternative.

To the extent that there may be unacceptable health risks associated with exposure to soil with arsenic EPCs below 240 mg/Kg and lead EPCs below 540 mg/Kg, Alternative 6 would provide a higher level of long-term protection when compared to Alternatives 2,3 and 4 because soils with arsenic and lead levels above 70 mg/Kg and 400 mg/kg respectively would be removed. However, as discussed in the evaluation of Alternative 5, available information from the baseline risk assessment and other EPA studies indicates that below 240 mg/Kg arsenic and 540 mg/Kg lead, soil is <u>not</u> a major source of exposure and risk in OU1.

Under Alternative 6, remedial action would be taken at 400 properties where predicted RME cancer risks are within EPA's acceptable risk range. In addition, the predicted point estimate is at the 99th percentile of the risk distribution for the exposed population indicating that there is a 99% probability that the true risks are lower than the estimated risks and the combination of exposure assumptions used for OU1 characterizes exposures that are very likely not occurring at the site.

The first and second RAOs for arsenic in soil are consistent with the guidance set out in the OSWER Directive 9355.0-30 "Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions". In part, this guidance states that "Where the cumulative carcinogenic site risk to an individual based on reasonable maximum exposure for both current and future land use is less that 10^{-4}, and the non-carcinogenic hazard quotient is less than 1, action is not warranted unless there are adverse environmental impacts." The directive further states that consideration of uncertainties in the baseline risk assessment may lead a risk manager to decide that risks lower than 10^{-4} are unacceptable, triggering the need for remedial action. EPA considered the uncertainty in the arsenic risk calculations for VB/I70 to determine whether remedial action is needed at properties where risks are predicted to be less than or equal to 10^{-4}. The uncertainty

analysis in the Baseline Human Health Risk Assessment indicates that actual risks are much more likely to be lower than the calculated point estimates of risks.

Providing protection at the 1×10^{-4} risk level based on the point estimates of risk (as in Alternatives 2 and 3) is likely to provide a level of protectiveness for the RME scenario in the range of 2×10^{-5} to 7×10^{-5}. Therefore, it is not necessary to perform soil removals where arsenic EPCs exceed 70 mg/Kg but are lower than 240 mg/Kg in order to achieve protectiveness for the RME scenario.

EPA performed additional quantitative uncertainty analysis for Alternative 6 using Monte Carlo techniques consistent with those in the Baseline Human Health Risk Assessment. The analysis indicates that, at an arsenic EPC of 70 mg/kg, the point estimate of cancer risk is 5×10^{-5} and the 90th – 95th percentile cancer risk (the range of RME risks) is 1×10^{-5} to 4×10^{-5}, not a significant reduction in RME cancer risks when compared to Alternative 3 (where the range is 2×10^{-5} to 7×10^{-5}), yet the short-term risks associated with Alternative 6 are higher.

For lead, Alternative 6 would require soil removal from properties with lead EPCs lower than Alternatives 3 and 4 (400 mg/kg, compared to 540 mg/kg). As described above, alternatives with soil removal actions at 540 mg/kg lead are expected to be effective in achieving the RAO for lead in soil. Therefore removal of additional soil with lead EPCs between 400 mg/kg and 540 mg/kg would not contribute significantly to meeting the RAO. Since the FS was prepared, the community health study known as the KAP survey has been performed within the VB/I70 site. CDPHE and the University of Colorado Health Sciences Center have been awarded a grant from ATSDR to conduct the study. The door-to-door survey includes (1) a census to count resident children less than 6 years old, (2) a questionnaire about child behaviors related to soil contact and (3) collection of samples for blood lead analysis and urine arsenic analysis. EPA is performing the chemical analyses of these biological samples. Approximately 1340 children participated in the survey. Preliminary results of the survey indicate that RAO for lead in soil is currently being met within the site. This provides further evidence that reducing the action level for soil removal for lead from 540 mg/kg to 400 mg/kg is not necessary to achieve the RAO for lead in soil.

Evaluation of overall protection must also consider that the additional removals under Alternative 6 would entail greater short-term risks to the community compared to Alternatives 2,3, and 4 due to the presence and operation of heavy equipment and the greater number of truck trips required to dispose excavated soil offsite and to transport clean fill to the site. Another short-term impact to the community is the impact of the additional water use required to establish grass at remediated properties. Colorado is experiencing drought conditions and water use is restricted in the City of Denver. EPA estimates that Alternative 6 will require 4 times more water to implement than Alternatives 2 or 3 and twice as much water as Alternative 4.

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

All of the remedial alternatives evaluated in the comparative analysis would be expected to comply with ARARs identified in Tables 16,17, and 18. ARARs relating to the generation of fugitive dust and lead concentrations in ambient air would be applicable to the range of

engineering actions under evaluation. Although the potential exists for dust generation during soil tilling and excavation, and transport and backfilling activities, engineering controls would be readily implementable and effective to achieving compliance with the applicable regulations. ARARs relating to the characterization, transport and disposal of solid wastes would be applicable for excavated soils and would be met by standard construction and transportation practices.

In response to the public comments concerning lead based paint hazards established by EPA under the Toxic Substances and Control Act (TSCA) (40 CFR Part 745.65), EPA concluded that these regulations are not ARARs for OU1. However, Alternatives 2,3,4,5,and 6 are consistent with the TSCA regulations. The preamble to the regulations includes an explanation of the relationship of the TSCA soil standards to Superfund soil cleanup standards. The preamble states in part that the Superfund program "relies on the IEUBK model for relating environmental levels to blood lead levels in children. The OSWER soil lead guidance (EPA, 1994) recommends that the IEUBK Model be applied to utilize site-specific information that can be very important in evaluating the risks at Superfund sites". The preamble also states, "Site-specific information at Superfund sites would provide a basis to identify a soil lead level different from the level identified in the TSCA rule that would be protective of health". Therefore, establishing that Superfund remedial action is required at properties in VB/I70 where the lead EPC is different from the 400 mg/Kg or 1200 mg/Kg identified in the TSCA rule (as in Alternatives 2, 3, 4, and 5) is consistent with the rule.

Short-Term Effectiveness

Alternative 3 provides the highest level of short-term effectiveness. Soil removal actions could be quickly and effectively implemented with less risk to workers or the community than Alternatives 4, 5, and 6. Implementation of the community health program would be effective in the short term due to the components of education, biomonitoring, soil sampling and analysis, and response actions when warranted.

Consistent with the NCP (40 CFR Part 300), the evaluation of short-term effectiveness also considered the environmental impacts of soil removal actions, specifically water use required to establish grass cover in remediated yards. Since the publication of the FS Report in November 2001, the State of Colorado has experienced a drought. The severity of the drought is illustrated by the fact that the City of Denver has placed a complete ban on lawn watering beginning October 1, 2002.

Watering of replacement lawns and plants is a critical component of soil removal actions. Soil removal actions within the adjacent Globeville neighborhood required an estimated 9.35 gallons of water to establish one square foot of replacement sod (Asarco, 1997). An average yard in VB/I70 has an estimated 5,200 square foot area of soil (EPA, 2001d). Assuming that 70% of the soil area is sod, approximately 50,000 gallons of water would be required to establish sod at a typical property. Based on these assumptions, Alternative 3 would require 10 million gallons of water to implement.

TABLE 16
POTENTIAL ACTION-SPECIFIC ARARS

STATE ARARS					
Action	**Potentially Applicable**	**Potentially Relevant and Appropriate**	**Citation**	**Description**	**Comments**
Hazardous and Solid Waste: 1. Solid waste determination	Yes	--	6 CCR 1007-3 Part 260 6 CCR 1007-3 Sect. 260.30-31 6 CCR 1007-3 Sect. 261.2 6 CCR 1007-3 Sect. 261.4	A solid waste is any discarded material that is not excluded by a variance granted under 40 CFR 260.30 and 260.31. Discarded material includes abandoned, recycled, and waste-like materials.	Applicable to alternatives where contaminated soil is excavated and disposed.
2. Solid waste classification.	Yes	--	6 CCR 1007-2, Section 1	If a generator of wastes has determined that the wastes do not meet the criteria for hazardous wastes, they are classified as solid wastes.	Applicable to alternatives where contaminated soil is excavated and disposed.
3. Determination of hazardous waste.	Yes	--	6 CCR 1007-3 Sect. 262.11 6 CCR 1007-3 Part 261	Wastes generated during soil excavation activities must be characterized and evaluated according to the following method to determine whether the waste is hazardous. Excavated soil would be classified as D004 hazardous waste if the arsenic concentration from the TCLP test was greater than 5.0 milligrams per liter. Excavated soil would be classified as D008 hazardous waste if the lead concentration from the TCLP test was greater than 5.0 milligrams per liter.	Applicable to alternatives where contaminated soil is excavated and disposed.

TABLE 16
POTENTIAL ACTION-SPECIFIC ARARS (continued)

STATE ARARS					
Action	**Potentially Applicable**	**Potentially Relevant and Appropriate**	**Citation**	**Description**	**Comments**
Air Emission Control 4. Particulate emissions during excavation and backfill.	Yes	--	5 CCR 1001-3, Regulation 1, Section III (D) 5 CCR 1001-5, Regulation 3 5 CCR 1001-2, Section II	Colorado air pollution regulations require owners or operators of sources that emit fugitive particulates to minimize emissions through use of all available practical methods to reduce, prevent, and control emissions. In addition, no off-site transport of particulate matter is allowed. A fugitive dust control measure will be written into the workplan in consultation with the state for the remedial activity.	Applicable to alternatives where soil is excavated, moved, stored, transported or redistributed.
5. Emission of hazardous air pollutants.	No	Yes	5 CCR 1001-10, Regulation 8	Emission of certain hazardous air pollutants is controlled by NESHAPs. Excavation and backfill of soils could potentially cause emission of hazardous air pollutants. Regulation No. 8 sets emission limits for lead from stationary sources at 1.5 micrograms per standard cubic meter averaged over a one-month period.	Regulation is for stationary sources and is therefore not applicable. However, it is relevant and appropriate. Applicants are required to evaluate whether the proposed activities would result in an exceedance of this standard. The potential remedial actions at the site are not expected to exceed the emission levels for lead, although some lead emissions may occur. Compliance with the requirements of Regulation No. 8 would be achieved by adhering to a fugitive emissions dust control plan prepared in accordance with Regulation No. 1. This plan will discuss monitoring requirements, if any, necessary to achieve these standards.

TABLE 16
POTENTIAL ACTION-SPECIFIC ARARS (continued)

STATE ARARS					
Action	**Potentially Applicable**	**Potentially Relevant and Appropriate**	**Citation**	**Description**	**Comments**
6. Air emissions from diesel-powered vehicles associated with excavation and backfill operations.	Yes	--	5 CCR 1001-15, Regulation 12	Colorado Diesel-Powered Vehicle Emissions Standards for Visible Pollutants apply to motor vehicles intended, designed, and manufactured primarily for use in carrying passengers or cargo on roads, streets, and highways, and state as follows: 1) No person shall emit or cause to be emitted into the atmosphere from any diesel-powered motor vehicle weighting 7,500 pounds and less, empty weight, any air contaminant, for a period greater than five (5) consecutive seconds, which is of such a shade or density as to obscure an observer's vision to a degree in excess of 40% opacity. 2) No person shall emit or cause to be emitted into the atmosphere from any diesel-powered motor vehicle weighing more than 7,500 pounds, empty weight, any air contaminant, for a period greater than five (5) consecutive seconds, which is of such a shade or density as to obscure an observer's vision to a degree in excess of 35% opacity, with the exception of subpart "C". 3) Any diesel-powered motor vehicle exceeding these requirements shall be exempt for a period of 10 minutes if the emissions are a direct result of a cold engine startup and provided the vehicle is in a stationary position. 4) These standards shall apply to motor vehicles intended, designed, and manufactured primarily for travel or use in transporting persons, property, auxiliary equipment, and/or cargo over roads, streets, and highways.	Applicable to alternatives that include transportation of soil.

TABLE 16
POTENTIAL ACTION-SPECIFIC ARARS (continued)

STATE ARARS					
Action	**Potentially Applicable**	**Potentially Relevant and Appropriate**	**Citation**	**Description**	**Comments**
7. Odor emissions.	Yes	--	5 CCR 1001-4, Regulation 2	Colorado odor emission regulations require that no person shall allow emission of odorous air contaminants that result in detectable odors that are measured in excess of the following limits: For residential and commercial areas – odors detected after the odorous air has been diluted with seven more volumes of odor-free air.	Applicable to alternatives that include construction activities in residential areas.
8. Smoke and opacity.	No	Yes	5 CCR 1001-3, Regulation 1, Sect. II.A	Excavation and backfilling of soils must be conducted in a manner that will not allow or cause the emission into the atmosphere of any air pollutant that is in excess of 20% opacity.	Regulation specifically exempts fugitive emissions generated by excavation/backfilling activities. Relevant and appropriate to alternatives that include excavation and backfilling of soils.
9. Ambient Air Standard for Total Suspended Particulate Matter.	Yes	--	5 CCR 1001-14	Air quality standards for particulates (as PM10) are 50 $\mu g/m^3$; annual geometric mean, 150 $\mu g/m^3$ 24 hour.	Applicable to alternatives that include actions that generate fugitive dust.
10. Ambient Air Standard for Lead.	Yes	--	5CCR 1001-10, Regulation 8	Monthly air concentration must be less than 1.5 $\mu g/m^3$.	Applicable to alternatives that include actions on contaminated soil that generate fugitive dust.

TABLE 16
POTENTIAL ACTION-SPECIFIC ARARS (continued)

STATE ARARS					
Action	**Potentially Applicable**	**Potentially Relevant and Appropriate**	**Citation**	**Description**	**Comments**
11. Noise abatement.	Yes	--	C.R.S., Section 25-12-103	The Colorado Noise Abatement Statute provides that: a. "Applicable activities shall be conducted in a manner so any noise produced is not objectionable due to intermittence, beat frequency, or shrillness. Noise is defined to be a public nuisance if sound levels radiating from a property line at a distance of twenty-five feet or more exceed the sound levels established for the following time periods and zones: Zone / 7:00 a.m. to next 7:00 p.m. / 7:00 p.m. to next 7:00 a.m. Residential / 55 db(A) / 50 db(A) Commercial / 60 db(A) / 55 db(A) Light Industrial / 70 db(A) / 65 db(A) Industrial / 80 db(A) / 75 db(A) b. In the hours between 7:00 a.m. and the next 7:00 p.m., the noise levels permitted in Requirement a (above) may be increased by ten decibels for a period of not to exceed fifteen minutes in any one-hour period. c. Periodic, impulsive, or shrill noises shall be considered a public nuisance when such noises are at a sound level of five decibels less than those listed in Requirement a (above). d. Construction projects shall be subject to the maximum permissible noise levels specified for industrial zones for the period within which construction is to be completed pursuant to any applicable construction permit issued by proper authority or, if no time limitation is imposed, for a reasonable period of time for completion of the project. e. For the purpose of this article, measurements with sound level meters shall be made when the wind velocity at the time and place of such measurement is not more than five miles per hour.	Applicable to alternatives that include construction activities.

TABLE 16
POTENTIAL ACTION-SPECIFIC ARARS (continued)

STATE ARARS					
Action	**Potentially Applicable**	**Potentially Relevant and Appropriate**	**Citation**	**Description**	**Comments**
12. Transportation of Hazardous Waste.	Yes	--	8 CCR 1507	Rules regarding Transportation of Hazardous Substances.	Applicable to alternatives that include transportation of contaminated soil.

TABLE 16
POTENTIAL ACTION-SPECIFIC ARARS (continued)

FEDERAL ARARs					
Standard, Requirement or Criteria	**Potentially Applicable**	**Potentially Relevant and Appropriate**	**Citation**	**Description**	**Comments**
Criteria for Classification of Solid Waste and Disposal Facilities and Practices	Yes	--	40 CFR Part 257	Establishes criteria for use in determining solid wastes and disposal requirements.	Would be applicable if solid wastes are generated (such as excavated soil).
Criteria for Classification of Hazardous Waste and Disposal Facilities and Practices	Yes	--	40 CFR 264	Establishes criteria for use in determining hazardous wastes and disposal requirements. Excavated soil would be classified as D004 hazardous waste if the arsenic concentration from the TCLP test was greater than 5.0 mg/l. Excavated soil would be classified as D008 hazardous waste if the lead concentration from the TCLP test was greater than 5.0 mg/l.	Would be applicable if hazardous wastes are generated. It is noted that previous soil removed had higher concentrations of lead and arsenic and were not hazardous wastes. However, these regulations are potentially applicable.
National Ambient Air Quality Standards	No	Yes	40 CFR Part 50	Establishes ambient air quality standards for certain "criteria pollutants" to protect public health and welfare. Standards are: 150 micrograms per cubic meter for particulate matter for a 24 hour period; 50 micrograms per cubic meter for particulate matter-annual arithmetic mean; 1.5 micrograms lead per cubic meter maximum - arithmetic mean averaged over a calendar quarter	National ambient air quality standards (NAAQS) are implemented through the New Source Review Program and State Implementation Plans (SIPs). The federal New Source Review Program addresses only major sources. Emissions associated with proposed remedial action at VB/I70 OU1 would be limited to fugitive dust emissions associated with earth moving activities during construction. These activities will not constitute a major source. Therefore, attainment and maintenance of NAAQS pursuant to the New Source Review Program are not applicable. However, the standards relating to particulates and to lead are relevant and appropriate.
Hazardous Materials Transportation Regulations	Yes	--	49 CFR Parts 107, 171-177	Regulates transportation of hazardous materials.	Applicable only if the remedial action involves off-site transportation of hazardous materials. The regulations affecting packaging, labeling, marking, placarding, using proper containers, and reporting discharges of hazardous materials would be potential ARARs.

TABLE 17

SUMMARY OF POTENTIAL CHEMCIAL-SPECIFIC ARARs
VB/I-70 OU1

Standard, Requirement or Criteria	Potentially Applicable	Potentially Relevant and Appropriate	Citation	Description	Comment
FEDERAL					
National Ambient Air Quality Standards	No	Yes	40 CFR Part 50	Establishes ambient air quality standards for certain "criteria pollutants" to protect public health and welfare. Standard is: 1.5 micrograms lead per cubic meter maximum - arithmetic mean averaged over a calendar quarter	National ambient air quality standards (NAAQS) are implemented through the New Source Review Program and State Implementation Plans (SIPs). The federal New Source Review Program addresses only major sources. Emissions associated with proposed remedial action at VB/I70 OU1 would be limited to fugitive dust emissions associated with earth moving activities during construction. These activities will not constitute a major source. Therefore, attainment and maintenance of NAAQS pursuant to the New Source Review Program are not applicable. However, the standards relating to lead are relevant and appropriate.
STATE					
Colorado Air Pollution Prevention and Control Act	Yes	--	5 CCR 1001-14;	Applicants for construction permits are required to evaluate whether the proposed source will exceed NAAQS.	Construction activities associated with potential remedial actions at the site would be limited to generation of fugitive dust emissions. Colorado regulates fugitive emissions through Regulation No. 1. Compliance with applicable provisions of the Colorado air quality requirements would be achieved by adhering to a fugitive emissions dust control plan prepared in accordance with Regulation No. 1. This plan will discuss monitoring requirements, if any, necessary to achieve these standards.
	No	Yes	5 CCR 1001-10 Part C (1) Regulation 8	Regulation No. 8 sets emission limits for lead from stationary sources at 1.5 micrograms per standard cubic meter averaged over a one-month period.	Regulation is for stationary sources and is therefore not applicable. However, it is relevant and appropriate. Applicants are required to evaluate whether the proposed activities would result in an exceedance of this standard. The potential remedial actions at the site are not expected to exceed the emission levels for lead, although some lead emissions may occur. Compliance with the requirements of Regulation No. 8 would be achieved by adhering to a fugitive emissions dust control plan prepared in accordance with Regulation No. 1. This plan will discuss monitoring requirements, if any, necessary to achieve these standards.

TABLE 18

SUMMARY OF POTENTIAL LOCATION-SPECIFIC ARARs

Standard, Requirement or Criteria	Potentially Applicable	Potentially Relevant and Appropriate	Citation	Description	Comment
SUMMARY OF POTENTIAL LOCATION-SPECIFIC ARARs					
Resource Conservation and Recovery Act (RCRA), Subtitle D	No	No	40 CFR 257	Facilities where treatment, storage, or disposal of solid waste will be conducted must meet certain location standards. These include location restrictions on proximity of airports, floodplains, wetlands, fault areas, seismic impact zones, and unstable areas.	Applicable only if interim disposal is conducted or if an onsite repository is necessary. However, because onsite disposal is not a component of any alternative under consideration, this regulation is not an ARAR.
Executive Order No. 11990 Protection of Wetlands	No	No	40 CFR § 6.302(a) and Appendix A	Minimizes adverse impacts on areas designated as wetlands.	Not ARARs as remedial actions will occur on individual yards where there are no wetlands. Also onsite disposal is not a component of any alternative under consideration.
Executive Order No. 11988 Floodplain Management	No	No	40 CFR § 6.302 & Appendix A	Pertains to floodplain management and construction of impoundments in such areas.	Not ARARs because the remedial actions do not require the occupation or modification of flood plains.
Section 404, Clean Water Act (CWA)	No	No	33 USC 1251 et seq. 33 CFR Part 330	Regulates discharge of dredged or fill materials into waters of the United States.	The Act is not an ARAR. Onsite disposal which affects waters of the US is not a component of any alternative under consideration.
Endangered Species Act	Yes	No	16 USC § 1531 et seq.; 50 CFR 200 and 402	Provides protection for threatened and endangered species and their habitats.	Due to the urban nature of the site, threatened or endangered species are highly unlikely to be present. However, the Act would be applicable if endangered species were identified and affected by the selected remedial alternative.
Wilderness Act	No	No	16 USC 1311; 16 USC 668; 50 CFR 53; 50 CFR 27	Limits activities within areas designated as wilderness areas or National Wildlife Refuge Systems.	These types of areas are not present at the site and therefore the Act is not an ARAR.

Alternative 2 could be implemented with less risk to workers and the community than Alternatives 3,4,5, and 6. However, Alternative 2 provides a slightly lower level of short-term effectiveness than Alternative 3, primarily because tilling/treatment actions would be delayed while treatability testing was performed and because there would be some uncertainties with the immediate effectiveness of the tilling/treatment activities due to lack of data on lead concentrations with depth and at different locations in the targeted yards. Alternative 2 would require an amount of water equal to that required under Alternative 3.

Alternative 4 provides a slightly lower level of short-term effectives than Alternative 3, primarily because additional removals at properties with arsenic EPCs greater than 128 mg/Kg would entail greater risks to the community due to the operation of heavy equipment in residential areas over a longer period of time and to truck traffic associated with transportation of excavated soil offsite and import of clean backfill through neighborhood streets. Alternative 4 would require an estimated 20 million gallons of water to implement. This is twice as much water as estimated would be required by Alternatives 2 and 3. Yet the additional removals would not contribute to additional long-term protection of human health as set out by the requirements of the RAOs.

Alternative 6 provides a lower level of short-term effectiveness than Alternative 4, primarily because additional removals at properties with arsenic EPCs greater than 70 mg/Kg and with lead EPCs greater than 400 mg/Kg would entail greater risks to the community. Increased short term risks are due to the larger scope of removal actions, which would require transportation of a larger volume of excavated soil and clean backfill through neighborhood streets by truck. Alternative 6 would require an estimated 43 million gallons of water to implement. This is 4 times as much water as estimated would be required by Alternatives 2 and 3. However, additional long-term protection of human health as set out by the requirements of the RAOs would not be enjoyed since the requirements of the RAOs would be met by Alternative 2or 3.

Alternative 5 would provide the lowest level of short-term effectiveness because of increased risks to workers and the community due to the prolonged operation of heavy equipment in the residential areas. There would also be increased risk to the community from truck traffic associated with transportation of the largest volume of excavated soil offsite and import of clean backfill (approximately 43,000 truck trips would be required). Alternative 5 would require an estimated 106 million gallons of water to implement. This is 10 times as much water as estimated would be required by Alternatives 2 and 3. However, additional long term protection of human health as set out by the requirements of the RAOs would not be enjoyed since the requirements of the RAOS would be met by Alternatives 2,3 and 4. An additional consideration is that Alternative 5 does not include a Community Health Program component and so it is highly uncertain that it would be effective in achieving the third RAO for arsenic in soil.

Table 19 summarizes the short term risks associated with each alternative.

Long-Term Effectiveness and Permanence

Table 19. Summary of Short Term Effectiveness

ALT.	# PROPERTIES			PRELIMINARY ACTION LEVELS (engineering actions)		COST (millions)	SHORT TERM RISKS	
	community health program	soil tilling W/phosphate amendment	soil removal	arsenic	lead		injury	fatality
1	-	-	-			$0	-	-
2	1920	89	113	240 ppm	540 ppm	$10.6	3.3%	0.2%
3	1920	-	202	240 ppm	540 ppm	$11.1	6%	0.3%
4	1920	-	403	128 ppm	540 ppm	$17.5	12%	0.6%
5	-	-	2,122	47 ppm	208 ppm	$61	65%	3.2%
6	1920	-	853	70 ppm	400 ppm	$31	25%	1.3%

To the extent that unacceptable health risks are associated with exposure to soil with arsenic EPCs below 240 mg/Kg and lead EPCs below 540 mg/Kg, Alternative 5 would provide the highest level of long-term protection and permanence because soils would be removed where arsenic or lead levels are above 47 mg/Kg or 208 mg/kg respectively. However, the following information from the baseline risk assessment indicates that below 240 mg/Kg arsenic and 540 mg/Kg lead, soil is not a major source of exposure and risk at OU1.

For arsenic, potential health risk where arsenic EPCs are below 240 mg/kg is associated with soil pica behavior. Screening level calculations suggest that removing and replacing soil below 240 mg/Kg will not effectively protect children from the risk of acute effects since under at least one set of assumptions, the acute HQ is greater than 1 at background levels of arsenic. Also, children with soil pica behavior are at risk of experiencing other health risks unrelated to arsenic that will not be addressed by removing and replacing soil.

In the case of lead, Alternative 5 may not provide the highest overall protection since, in OU1, it is likely that there are other, non-soil sources of lead (such as lead-based paint), which would not be evaluated and addressed. Alternatives 2,3, 4, and 6 would provide an equal level of long-term effectiveness by addressing soils with lead or arsenic EPCs above preliminary action levels of 240 mg/Kg arsenic and 540 mg/kg lead by tilling and treatment and/or removal. The benefit of Alternatives 2,3,4, and 6 are that risks associated with non-soil sources of lead and with soil pica behavior would be effectively addressed by implementation of a community health program under these alternatives. The additional benefit of the community health program is it would provide the community a mechanism to identify sources of lead exposure other than soils, and a means of addressing them (e.g., through lead paint abatement). Abatement of exterior lead-paint would be performed under this program if soils at a property are remediated and paint abatement is required to protect the remedy. Abatement of exterior paint may be accomplished by referral to another program if soils do not require remediation. The Community Health Program would also provide a program to reduce the likelihood of soil pica behavior in children within VB/I70. Every lead paint abatement, whether accomplished directly or indirectly under the Community Health Program, is a permanent solution to a non-soil source of lead exposures. Alternative 2 would provide slightly less long-term effectiveness when compared to Alternative 3 since the effectiveness of tilling and treatment is less certain than soil removal.

Reduction of Toxicity, Mobility or Volume Through Treatment

Alternatives 3, 4, 5 and 6 do not contain a treatment component and therefore Alternative 2 would result in the highest reduction of toxicity and mobility due to treatment. However, there are uncertainties with the treatment process and site-specific testing would have to be performed to evaluate the chemical form and application rate of phosphate and to evaluate the overall treatment effectiveness once implemented.

Implementability

Alternatives 3, 4, 5 and 6 would be readily implementable with standard equipment and services, and adequate personnel would be readily available for this type of work. The construction technologies required to implement these alternatives are commonly used and

widely accepted. For Alternative 2, tilling of residential soils may be difficult to implement. Areas of accessible soils within yards are relatively small and typically have features such as trees or large shrubs, which would make access and implementation of deep tilling difficult unless the features were removed and replaced. It is likely that due to access constraints tilling would have to be performed using rototillers, which typically have a working depth of about 6 inches. Lead concentrations with depth have not been generated for the target properties and if deeper tilling were found to be necessary to meet the RAOs it would be difficult to implement.

Cost

Estimated costs for each alternative considered in the comparative analysis are shown below. These costs include direct and indirect capital costs and review costs for 30 years (there are no operation and maintenance costs associated with any of the alternatives).

Remedial Alternative	Net Present Worth Cost (Millions)
Alternative 2	10.6
Alternative 3	11.1
Alternative 4	17.5
Alternative 5	61.0 (1)
Alternative 6	31.1

Note: (1) Of this amount, approximately $15.6 million is associated with remediation of properties with arsenic EPCs above 47 mg/Kg but below 128 mg/Kg.

All alternatives meet the threshold requirements of protection of human health and compliance with ARARs. Alternative 3 provides a greater level of overall certainty for protecting human health compared to Alternative 2 and entails lower costs and lower short-term risks than Alternatives 4, 5, and 6.

Table 20 contains a summary of the comparative analysis of the 6 Alternatives.

TABLE 20 SUMMARY OF THE COMPARATIVE ANALYSIS

Evaluation Criterion	Alternative 2 – Community Health Program, Tilling/Treatment (Lead), Targeted Removal and Disposal (Arsenic)	Alternative 3 – Community Health Program, Targeted Removal and Disposal	Alternative 4 – Community Health Program, Expanded Removal and Disposal	Alternative 5 – Removal And Disposal	Alternative 6 – Community Health Program, Further Expanded Removal and Disposal
Threshold Criteria					
Overall Protection of Human Health	Meets the requirements of the RAOs – however, there is some uncertainty with respect to treatment/tilling component	Meets the requirements of the RAOs	Meets the requirements of the RAOs	Meets the requirements of the RAOs-however there is uncertainty with respect to preventing acute exposures associated with soil pica behavior	Meets the requirements of the RAOs
Compliance with ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs	Complies with ARARs
Balancing Criteria					
Short-Term Effectiveness	Reduction in short-term effectiveness compared to Alternative 3, because implementation would be delayed to allow for treatability testing of tilling/phosphate treatment component and because of uncertainties associated with effectiveness of tilling/treatment 3.3% probability of accident involving injury 0.16% probability of accident involving fatality estimated 10 million gallons of water required	High level of short-term effectiveness 6% probability of accident involving injury 0.29% probability of accident involving fatality estimated 10 million gallons of water required	Reduction in short-term effectiveness compared to Alternative 3, because of risks associated with soil removal for properties with arsenic concentrations below RAO risk levels 12% probability of accident involving injury 0.6% probability of accident involving fatality estimated 20 million gallons of water required	Lowest level of short-term effectiveness because of risks to workers and the community during implementation – particularly associated with operation of heavy equipment and truck transportation in residential areas 65% probability of accident involving injury 3.2% probability of accident involving fatality estimated 106 million gallons of water required	Reduction in short-term effectiveness compared to Alternative 3, because of risks associated with soil removal for properties with arsenic concentrations below RAO risk levels 25% probability of accident involving injury 1.3% probability of accident involving fatality estimated 43 million gallons of water required

Evaluation Criterion	Alternative 2 – Community Health Program, Tilling/Treatment (Lead), Targeted Removal and Disposal (Arsenic)	Alternative 3 – Community Health Program, Targeted Removal and Disposal	Alternative 4 – Community Health Program, Expanded Removal and Disposal	Alternative 5 – Removal And Disposal	Alternative 6 – Community Health Program, Further Expanded Removal and Disposal
Long-Term Effectiveness and Permanence	Would be effective over the long-term. Community Health Program provides additional benefit in providing a mechanism for evaluating other sources of lead	Would be effective over the long-term. Community Health Program provides additional benefit in providing a mechanism for evaluating other sources of lead	Would be effective over the long-term. Community Health Program provides additional benefit in providing a mechanism for evaluating other sources of lead	Highest possible level of long-term effectiveness for risks associated with soil because all soils with arsenic or lead above levels of concern would be removed. Would not provide information on other sources of lead. Would not reduce or prevent soil pica behavior.	Would be effective over the long-term. Community Health Program provides additional benefit in providing a mechanism for evaluating other sources of lead
Reduction of Toxicity, Mobility or Volume Through Treatment	Effectiveness of treatment with tilling expected to be effective, but there are uncertainties and site-specific testing would be required to support design	Does not contain a treatment component	Does not contain a treatment component	Does not contain a treatment component	Does not contain a treatment component
Implementability	Expected to be readily implementable. However, tilling may be difficult to implement if deep tilling is required to meet RAOs. This would be evaluated during design	Readily implementable	Readily implementable	Readily implementable	Readily implementable
Cost	$10.6 million	$11.1 million	$17.5 million	$61.0 million	$31.8 million

Based on the evaluation of all 6 alternatives, EPA identified a new preferred alternative, Alternative 6...

EPA selected Alternative 6 as the new preferred alternative. Alternative 6 consists of the following components:

- Implementation of a community health program.

The community health program alternative for the VBI70 site would be composed of two separate (but partially overlapping) elements. The first element would be designed to address risks to area children from non-soil sources of lead, and to the extent that they exist, risks from lead in soils above the preliminary action level of 208 mg/Kg. The second element would be designed to address risks to area children from pica ingestion of arsenic in soil above the preliminary action level of 47 mg/Kg. Each of these two main elements of the program is described below. Participation in one or both elements of the program would be strictly voluntary, and there would be no charge to eligible residents and property owners for any of the services offered by the community health program.

PUBLIC HEALTH PROGRAM TO REDUCE RISKS FROM LEAD

The program for reduction of lead risks is intended to be general. That is, it is intended to assess risks from lead from any and all potential sources of exposure, with response actions tailored to address the different types of exposure source that may be identified. The lead program will consist of three main elements:

1. Community and individual education about potential pathways of exposure to lead, and the potential health consequences of excessive lead exposure.

2. A biomonitoring program by which any child (up to 72 months old) may be tested to evaluate actual exposure.

3. A program that provides a response to any observed lead exposure that is outside the normal range. This will include any necessary follow-up sampling, analysis, and investigation at a child's home to help identify the likely source of exposure, and to implement an appropriate response that will help reduce the exposure.

A key component of the response program is that all potential sources of lead at a property would be sampled, including soil and interior/exterior paint. If soil is judged to be the most likely source of exposure, a series of alternative actions will be evaluated to identify the most effective way to reduce that exposure. These will include a wide range of potential alternatives, including such things as education, sodding or capping of contaminated soil, tilling/treatment, etc. If exterior paint is the source of lead contamination in soil, remediation of the paint may be considered. If the main source is judged to be non-soil related, responses may include things such as education and counseling, or referral to environmental sampling/response programs offered by other agencies, as appropriate.

PUBLIC HEALTH PROGRAM TO REDUCE RISKS FROM PICA INGESTION OF ARSENIC

The public health alternative for arsenic is designed to focus specifically on the potential risks to young children from pica behavior. The program for arsenic will consist of three main elements:

1. Community and individual education about identification and potential hazards of pica behavior and the potential health consequences of excessive acute oral exposure to arsenic.

2. A biomonitoring program by which any child may be tested to evaluate actual soil pica exposure to arsenic.

3. A program that provides a response to any observed inorganic arsenic exposures that are outside the normal range. This will include any necessary follow-up sampling, analysis, and investigation at a child's home to help identify the likely source of exposure, and to implement an appropriate response that will help reduce the exposure.

    - In yards with arsenic EPCs greater than 70 mg/Kg or lead EPCs greater than 400 mg/Kg, accessible soils would be removed to a depth of 12 inches and transported offsite for disposal at an appropriate facility. The excavation areas would be backfilled with clean soil containing arsenic and lead concentrations at or below PRGs, and pre-remediation yard features restored. Based on RI data, it is estimated that this would occur at a total of 853 residential properties within the entire site (508 properties for arsenic only, 108 properties for both lead and arsenic and 237 for lead only).

    - To date, EPA has sampled the soil at approximately 75% of the residential properties within the VBI70 site boundary. Because the spatial pattern of lead and arsenic contamination is variable between properties, it is not possible to assess potential risks at a specific property without data from that property. Therefore, upon request from the owner or current resident (if access is granted by the owner), EPA will provide a program of on-going testing for lead and arsenic in soil at any residential property within the site boundaries that has not already been adequately tested. If the lead EPC exceeds 400 mg/Kg and the arsenic EPC exceeds 70 mg/Kg, soil would be removed and disposed offsite. This sampling program will operate for as long as on-site construction of the remedy is occurring.

The estimated net present worth cost of Alternative is $31.1 million at a discount rate of 5%. Of the $31.1 million, approximately $27.2 million is required to accomplish the soil removals and to set up the Community Health Program.

Figure 17 is a map that shows the location of all properties that would undergo soil removal under Alternative 6.

The Technical Issue that is consistently raised in discussions about EPA's preferred alternative for VB/I-70 is how the arsenic action level compares to other Superfund sites.....

Arsenic action levels at other sites:

EPA has not established standard action levels for soil which trigger Superfund cleanup action for any chemicals. This is because the specific soil action levels developed for one Superfund site may not be appropriate for another site because of the nature of the site, the waste, and the potential exposures to the current and future site population (40 CFR Part 300, Fed Reg Vol 55 No. 46 March 8, 1990, 8709). However, in order to ensure consistency and operate a unified Superfund program, EPA has established a consistent methodology for assessing risks at all Superfund sties (EPA, 1989) and for making risk management decisions (EPA, 1991).

The standard EPA method for evaluating exposure to soil is to calculate a daily intake (DI) using the equation:

$$DI = \frac{\text{(concentration in soil and dust) x (intake rate) x (exposure frequency) x (exposure duration)}}{\text{(body weight) x (averaging time)}}$$

For convenience, the general equation is often written as:

DI = (concentration) x (Human Intake Factor); or
DI = C x HIF

At sites where sufficient information has been collected, the basic equation for DI is adjusted to reflect site specific conditions. To calculate the cancer risk associated with exposure, DI is multiplied by the cancer slope factor for the specific chemical of concern.

The site specific decision of what level of risk warrants cleanup action is guided by EPA policy as stated in OSWER Directive 9355.0-30 (EPA, 1991). EPA generally requires that action be taken to reduce exposure to a cancer causing substance if the cancer risk associated with reasonable maximum exposure (RME) is greater than 1×10^{-4}. Sometimes EPA will require action where RME cancer risk is less than 1×10^{-4} if there is reason to believe that EPA underestimated the risk..

At the VB/I70 Site, EPA undertook several studies specifically to collect information on the characteristics of arsenic in soil that most effect exposure. This work was done to increase the accuracy of the risk estimates. This was part of an overall effort to address EJ concerns at the Site. One of the EJ concerns communicated to EPA in meetings of the VB/I70 working group was to ensure that Superfund decisions are based on sound science. The first of these studies was an investigation to determine the relative bioavailability of arsenic in the soil found in the VB/I70 Site. The second was the Phase 3 Investigation in which data were collected to

establish VB/I70 Site-specific relationships between:

1. Arsenic in yard soil and arsenic in house dust;
2. Arsenic in yard soil and arsenic in garden soils;
3. Arsenic in garden soils and arsenic in garden vegetables; and
4. Arsenic in the fine fraction of soil and arsenic in the bulk fraction of soil.

The studies served to reduce the uncertainty in the risk estimates by more accurately reflecting site-specific conditions that affect exposure to arsenic. The results were used to adjust the basic equation for DI.

At sites where such site-specific studies are not undertaken, the basic equation is not adjusted and default values are used. The following table summarizes the site specific studies of arsenic in soil done at VB/I-70, Eureka Mills, and the Asarco Globe Plant and other factors that account for the differences in the action levels established for these sites. The Eureka Mills and Asarco Globe sites were chosen because they were mentioned in comments from the community and ATSDR on the May 2002 VB/I-70 Proposed Plan.

Table 21: Summary of Site Specific Studies at Three Region 8 Superfund Sites

	Eureka Mills	**Asarco Globe Plant**	**VB/I-70**
site specific soil/dust ratio determined?	no	no	yes
site specific relationship between fine soil and bulk soil concentrations determined?	yes	no	yes
site specific relative bioavailability of arsenic in soil?	yes, 55%	no	yes, 42%
garden soil and vegetables added to soil ingestion risk?	no	no	yes
probabilistic risk assessment?	no	no	yes
estimated cancer risk at action level	1×10^{-4} at 77 ppm	2×10^{-4} at 70 ppm	5×10^{-5} at 70 ppm

Discussion of VB/I-70 compared to the Globe Plant Site: Since site-specific data are not available for the soil/dust ratio, relative bioavailability of arsenic in soil, nor the fine/ bulk ratio at the Asarco Globe site, the RME cancer risk associated with exposure to 70 ppm arsenic in soil (the action level for arsenic in residential soil at the Asarco Globe site) is determined by multiplying 70 ppm by the unadjusted Human Intake Factor (HIF) developed using standard exposure assumptions for the residential reasonable maximum exposure scenario and the unadjusted cancer slope factor for arsenic. The unadjusted HIF for chronic exposure to soil is developed in Section 4 of the final Baseline Human Health Risk Assessment and can also be found in Appendix E of that document (EPA, 2001a).

RME cancer risks for 70 ppm soil in Globeville:

[70ppm] x [HIF (unadj.)] x [unadjusted slope factor] = 2×10^{-4} .

This risk level only considers exposure to soil. The addition of exposure to garden vegetables would result in a cancer risk greater than 2×10^{-4} at 70 ppm.

Discussion of VB/I-70 compared to the Eureka Mills Site: At the Eureka Mills site, although a study of dust was undertaken, no suitable correlation between paired arsenic in dust and arsenic in soil data could be established. Thus, a soil/dust ratio was not used in developing the action level for arsenic at the site. The relative bioavailability of arsenic in soil was estimated to be 55% compared to the estimate of 42% for soil at VB/I-70.

RME cancer risks for 77 ppm soil in Eureka:

[77ppm] x [HIF (unadj.)] x [slope factor][0.55] = 1×10^{-4} .

As an added step at VB/I-70, EPA performed a probabilistic risk assessment using Monte Carlo modeling as part of the uncertainty analysis in the Baseline Human Health Risk Assessment (EPA, 2001a). The results indicate that the point estimate of risk for the RME scenario is located at the 99th percentile of the risk distribution. This means that it is highly unlikely that the chronic arsenic exposures EPA has characterized for the VB/I-70 site are actually occurring in the people who reside there. The combination of exposure assumptions used by EPA for the chronic arsenic exposure assessment at this site may be at the upper bound of or even beyond the reasonable maximum exposure scenario.

The preferred alternative at VB/I-70 provides a greater level of protection against cancer risks compared to the two other sites. At the VB/I-70 site, a cancer risk level of 5×10^{-5} was selected as the trigger for action compared to 2×10^{-4} selected at the Globe site and 1×10^{-4} selected at the Eureka Mills site.

In their comments on the May 2002 proposed Plan for VB/I-70 OU1, ATSDR performed a duplicate quantitative arsenic risk assessment for children with soil pica behavior using a different methodology than used in EPA's Baseline Risk Assessment. ATSDR's duplication of EPA's effort is very helpful because it provides an independent evaluation of the effectiveness of soil removal in addressing the potential risk of acute effects to soil pica children.

Based on their independent quantitative risk assessment for children with soil pica behavior, ATSDR recommended that EPA remove and replace soil from all yards where the level of arsenic in soil is "somewhere between 47 ppm and 127 ppm" specifically to address risks to soil pica children.

Following ATSDR's recommendation, EPA evaluated the effectiveness of establishing an arsenic soil action level for VB/I-70 of 47 ppm in protecting children with soil pica behavior. EPA also evaluated the effectiveness of establishing an action level at 128 ppm and 70 ppm.

In evaluating the effectiveness of taking action as recommended by ATSDR, EPA used the same methodology used by ATSDR in their independent quantitative risk assessment. Table 22 summarizes the results. The results support EPA's independent conclusion that soil removal will not be effective in addressing the potential risk of acute effects associated with soil pica behavior.

Also in comments on the May 2002 proposed plan for VB/I-70 OU1, ATSDR provided a table displaying soil arsenic action levels established at a number of EPA Region 8 sites. However, this table did not reflect the complete range of action levels. Once the complete range is considered as summarized in Table 23, it is evident that the action level for VB/I-70 is within the range of action levels at residential sites in Region 8.

Table 22: Evaluation of ATSDR's Recommendation for Arsenic Soil Action Level to Protect Soil Pica Children VB/I-70 OU1

arsenic level remaining after soil is removed at recommended arsenic action level	Estimated dose to a pica child using ATSDR's methodology	estimated dose above ATSDR's effect level, 0.05 mg/kg/day ?	estimated dose above ATSDR's acute MRL for arsenic, 0.005 mg/kg/day?	estimated dose above EPA's acute reference dose for arsenic, 0.015 mg/kg/day?	Notes
127 ppm	0.17 mg/kg/day	yes	yes	yes	calculation from ATSDR's comments on EPA's Proposed Plan for VBI70. One time dose to a pica child estimated using ATSDR methodology is above ATSDR's effect level.
69 ppm	0.09 mg/kg/day	yes	yes	yes	One time dose to a pica child estimated using ATSDR methodology is above ATSDR's effect level.
46 ppm	0.06 mg/kg/day	yes	yes	yes	One time dose to a pica child estimated using ATSDR methodology is above ATSDR's effect level.

Table 23: Range of Arsenic Action Levels at Region 8 Sites			
Site	arsenic action level for residential soil	ATSDR Public Health Assessment Completed?	Did ATSDR consider risks to soil pica children?
Asarco Globe	70 ppm	yes	no
Eureka Mills	77 ppm	no	NA
California Gulch	340 ppm	yes	no
Butte	250 ppm	yes	no
Anaconda	250 ppm	?	?
Murray Smelter	no action at levels 230ppm and below	yes	no
Portland Cement	70 ppm	no	NA
Jacobs Smelter	100 ppm	yes	no

EPA performs site specific studies similar to those performed at VB/I-70 at all Superfund sites. The results of this site specific work are reflected in the range of action levels EPA has chosen for various sites even though the level of protection provided is consistent and in accordance with EPA policy (EPA, 1991).

Statements from the VB/I-70 EJ community and other interested parties for the board's consideration.....

EPA received a statement from the community group that received a TAG grant for VB/I-70. It is included for the Board's consideration as Appendix J. EPA also received a statement from Asarco, included as Appendix K. A summary of all public comments received on the May 2002 proposed plan is included as Appendix L.

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Butte	250 ppm	yes	no
Anaconda	250 ppm	?	?
Murray Smelter	no action at levels 230ppm and below	yes	no
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The State of Colorado supports EPA's preferred Alternative.....

The State of Colorado provided EPA Region VIII with a statement of support for the preferred alternative and requested that it be provided to the board for consideration. It is included as Appendix M.

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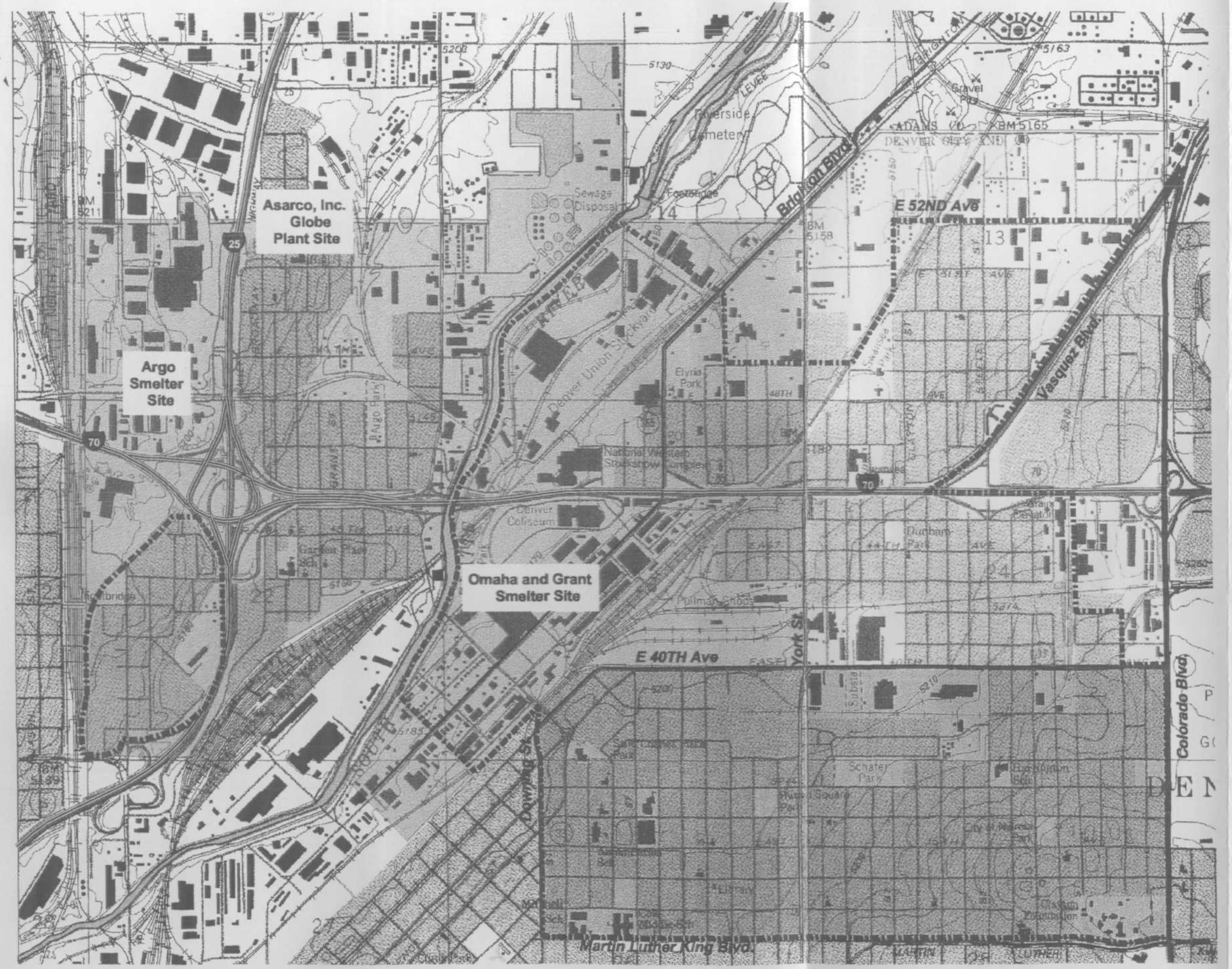
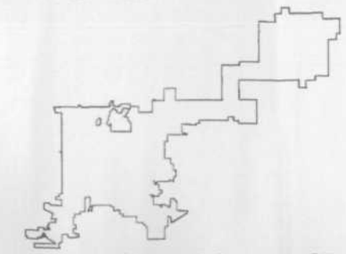
TABBED PAGE

FIGURES



Location of VB/I-70 Site



City and County of Denver

Washington

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

Legend

- Study Area Boundary
- Stream or River

Neighborhood

- CLAYTON
- COLE
- ELYRIA
- GLOBEVILLE
- SWANSEA

Map Base:

USGS 7.5' Quadrangle
Commerce City

1,000 500 0 1,000 2,000
Feet

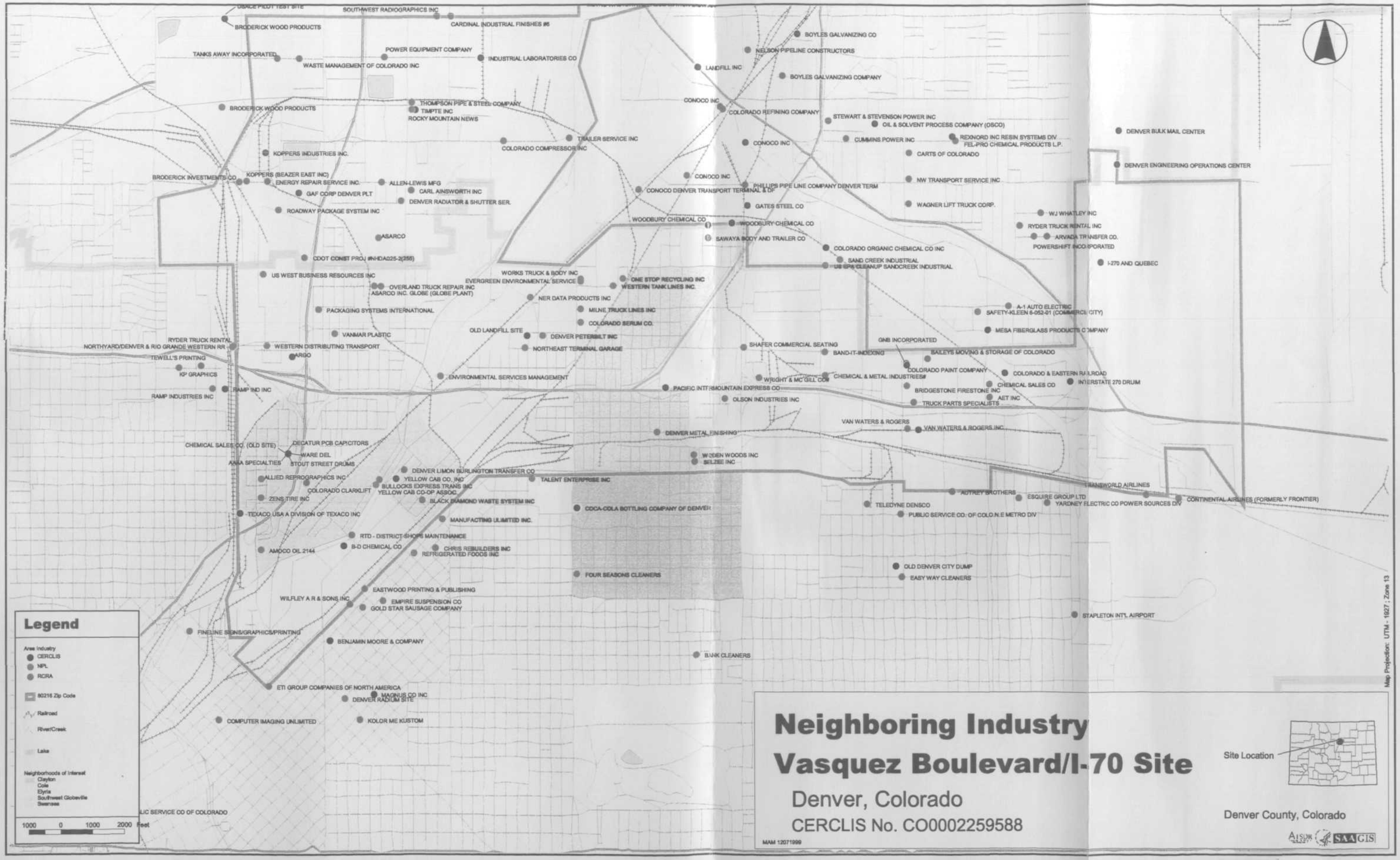
200 100 0 200 400 600
Meters

Vasquez Boulevard / I-70
Operable Unit 1
Remedial Investigation Report

Figure 1

Site Location

Project No: RAC 68-W7-0039 WA 004-RICO-089R
File: Q:\4994\1004\RI-FS\vbi70_site.eps



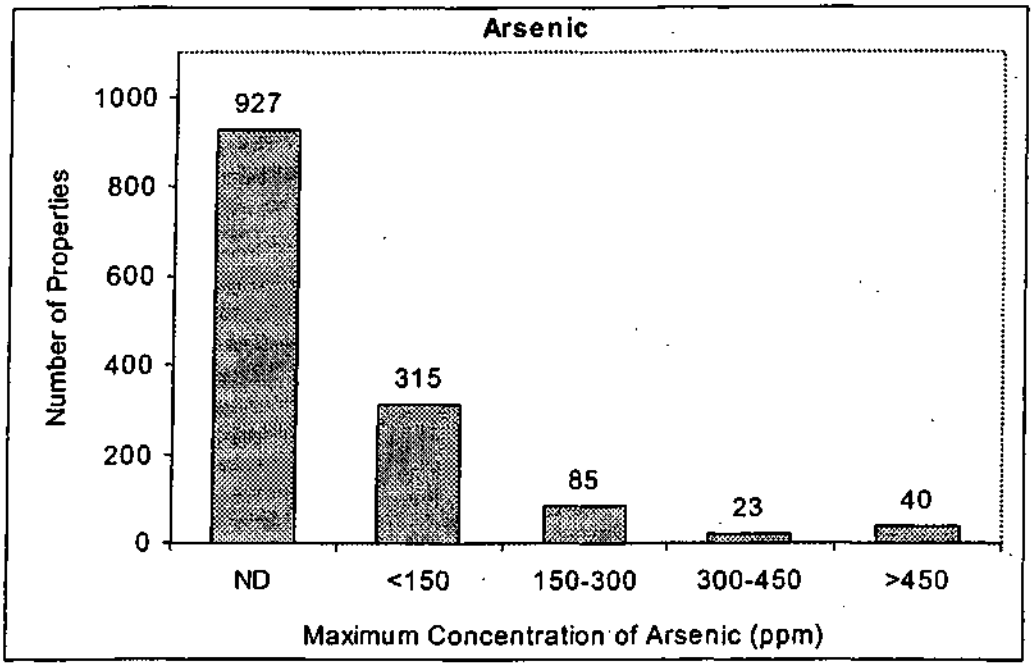
Neighboring Industry
Vasquez Boulevard/I-70 Site

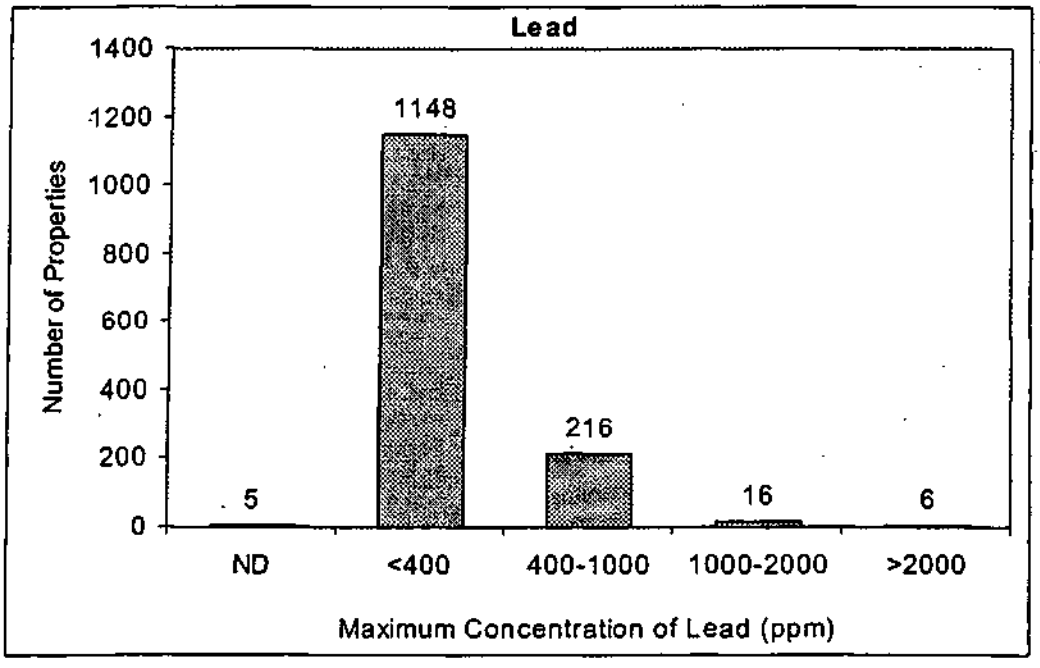
Denver, Colorado

CERCLIS No. CO0002259588

Figure 2

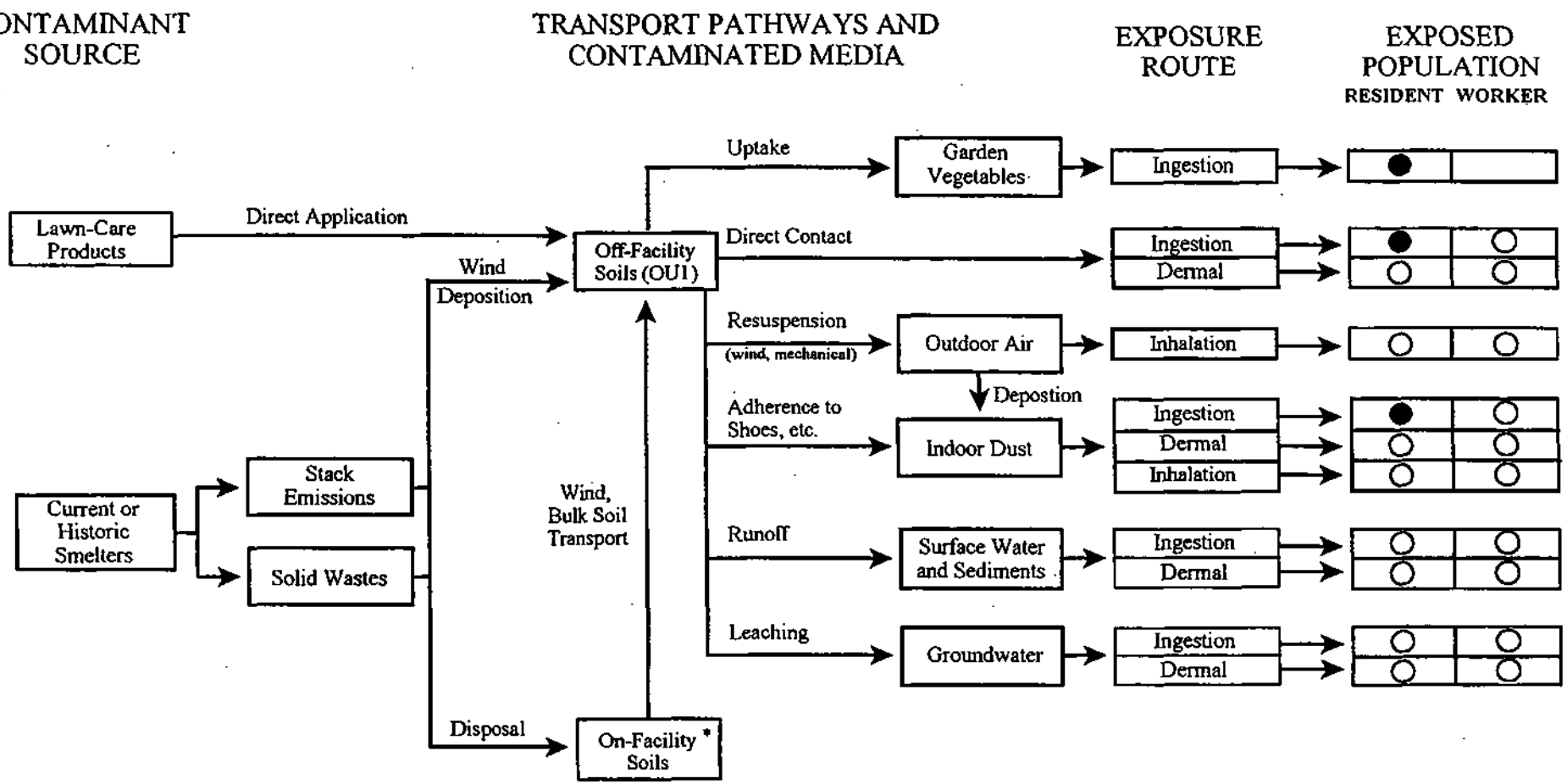
Figure 3 **Phase I/Phase II Soil Grab Sample Data**





Notes:
ND = Not Detected
Average detection limit for arsenic = 51 ppm (range = 44 to 800)
Average detection limit for lead = 32 ppm (range = 28 to 38)

FIGURE 4 CONCEPTUAL SITE MODEL FOR OPERABLE UNIT 1
EXPOSURES TO OFF-FACILITY SOILS



= Pathway is not complete

= Pathway is or might be complete, but is judged to be minor; qualitative evaluation

= Pathway is or might be complete and could be significant; quantitative evaluation

* To be evaluated as a separate operable unit.

FIGURE 5
COST ESTIMATION FOR VBI70 PHASE 3

Total properties	3000

Cost Elements

per subsample	6
per composite	19
per type II error	29995

As RBC = 70 ppm

Phase 3 Design		Phase 3 Cost (thousands)			Raw Type II Errors		Saves by Resampling		Cost of	Final Type II Errors		Total Costs (thousands)				No
Comp.	Grabs	Sampling	Analytical	Total	Rate	N	Rate	N	Resampling	N	Cost	Phase 3	Resample	Type II	Total	Resample
2	5	$180	$114	$294	0.293	878	0.968	851	$538	27	$801	$294	$538	$801	$1,633	$26,624
2	10	$360	$114	$474	0.211	632	0.958	606	$383	26	$765	$474	$383	$765	$1,622	$19,425
2	15	$540	$114	$654	0.164	491	0.938	464	$293	27	$810	$654	$293	$810	$1,757	$15,385
3	5	$270	$171	$441	0.092	275	0.911	251	$159	24	$720	$441	$159	$720	$1,319	$8,684
3	10	$540	$171	$711	0.049	147	0.804	121	$76	26	$774	$711	$76	$774	$1,561	$5,111
3	15	$810	$171	$981	0.034	101	0.697	73	$46	28	$837	$981	$46	$837	$1,864	$4,013
4	5	$360	$228	$588	0.055	164	0.860	142	$89	22	$657	$588	$89	$657	$1,334	$5,492
4	10	$720	$228	$948	0.026	78	0.634	52	$33	26	$774	$948	$33	$774	$1,755	$3,279
4	15	$1,080	$228	$1,308	0.017	50	0.464	25	$16	25	$756	$1,308	$16	$756	$2,080	$2,820
6	5	$540	$342	$882	0.029	86	0.708	63	$40	23	$675	$882	$40	$675	$1,597	$3,456
6	10	$1,080	$342	$1,422	0.014	42	0.340	16	$10	26	$792	$1,422	$10	$792	$2,224	$2,682
6	15	$1,620	$342	$1,962	0.010	29	0.139	5	$3	24	$720	$1,962	$3	$720	$2,685	$2,817
20	1	$360	$1,140	$1,500	0.072	215	0.799	182	$115	33	$990	$1,500	$115	$990	$2,605	$7,934
25	1	$450	$1,425	$1,875	0.049	146	0.718	114	$72	32	$963	$1,875	$72	$963	$2,910	$6,266
30	1	$540	$1,710	$2,250	0.041	122	0.662	90	$57	32	$972	$2,250	$57	$972	$3,279	$5,912

As RBC = 150 ppm

Phase 3 Design		Phase 3 Cost (thousands)			Raw Type II Errors		Saves by Resampling		Cost of	Final Type II Errors		Total Costs (thousands)				No
Comp.	Grabs	Sampling	Analytical	Total	Rate	N	Rate	N	Resampling	N	Cost	Phase 3	Resample	Type II	Total	Resample
2	5	$180	$114	$294	0.0531	159	1.000	159	$101	0	$0	$294	$101	$0	$395	$5,072
2	10	$360	$114	$474	0.0202	61	1.000	61	$38	0	$0	$474	$38	$0	$512	$2,292
2	15	$540	$114	$654	0.0117	35	1.000	35	$22	0	$0	$654	$22	$0	$676	$1,707
3	5	$270	$171	$441	0.0044	13	1.000	13	$8	0	$0	$441	$8	$0	$449	$837
3	10	$540	$171	$711	0.0008	2	1.000	2	$2	0	$0	$711	$2	$0	$713	$783
3	15	$810	$171	$981	0.0003	1	1.000	1	$1	0	$0	$981	$1	$0	$982	$1,008
4	5	$360	$228	$588	0.0013	4	1.000	4	$2	0	$0	$588	$2	$0	$590	$705
4	10	$720	$228	$948	0.0001	0	1.000	0	$0	0	$0	$948	$0	$0	$948	$957
4	15	$1,080	$228	$1,308	0.0000	0	0.000	0	$0	0	$0	$1,308	$0	$0	$1,308	$1,308
6	5	$540	$342	$882	0.0003	1	1.000	1	$1	0	$0	$882	$1	$0	$883	$909
6	10	$1,080	$342	$1,422	0.0000	0	0.000	0	$0	0	$0	$1,422	$0	$0	$1,422	$1,422
6	15	$1,620	$342	$1,962	0.0000	0	0.000	0	$0	0	$0	$1,962	$0	$0	$1,962	$1,962
20	1	$360	$1,140	$1,500	0.0053	16	1.000	16	$10	0	$0	$1,500	$10	$0	$1,510	$1,977
25	1	$450	$1,425	$1,875	0.0023	7	1.000	7	$4	0	$0	$1,875	$4	$0	$1,879	$2,082
30	1	$540	$1,710	$2,250	0.0014	4	1.000	4	$3	0	$0	$2,250	$3	$0	$2,253	$2,376

Figure 6. YARD AVERAGE SOIL ARSENIC LEVELS IN VB/I-70

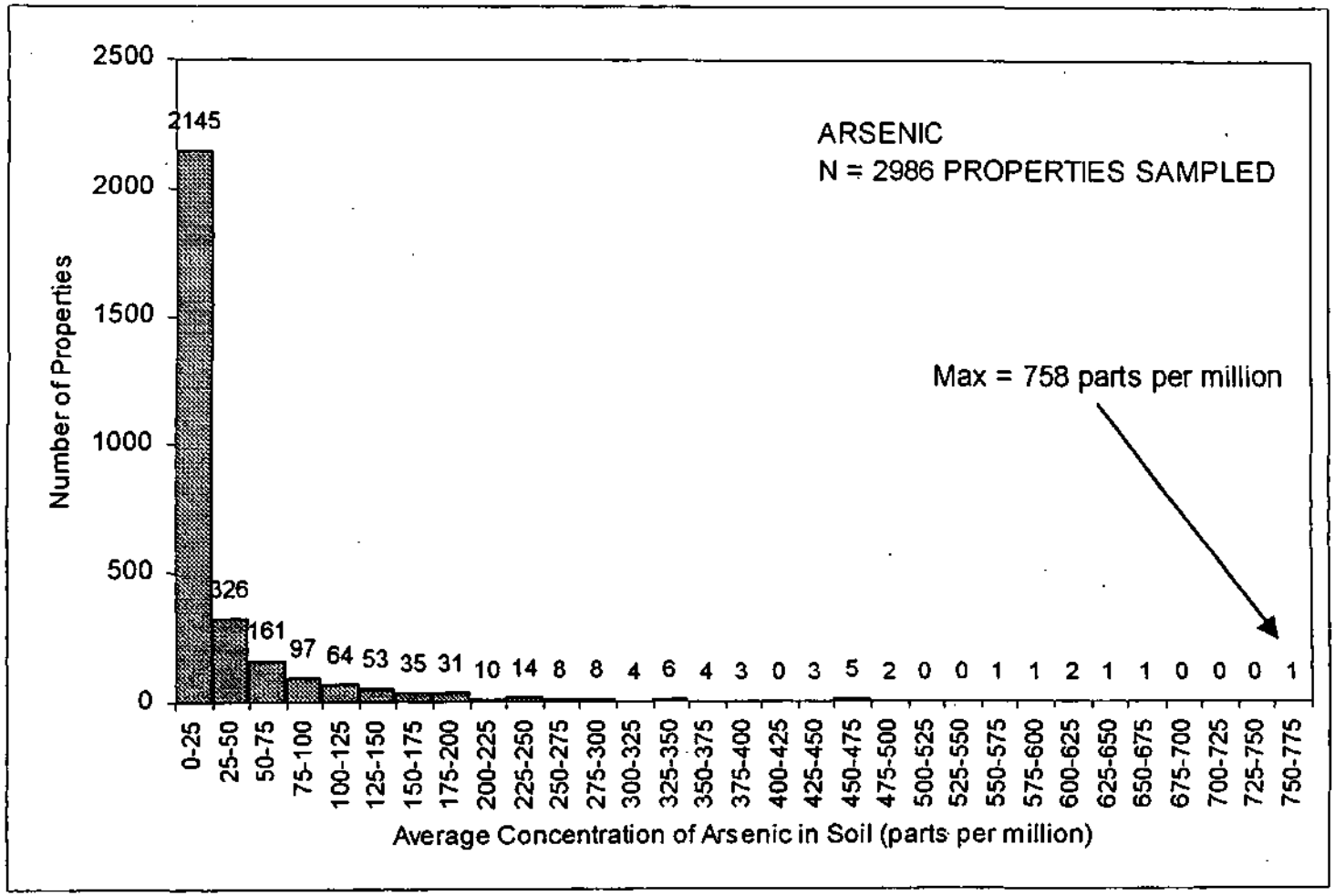
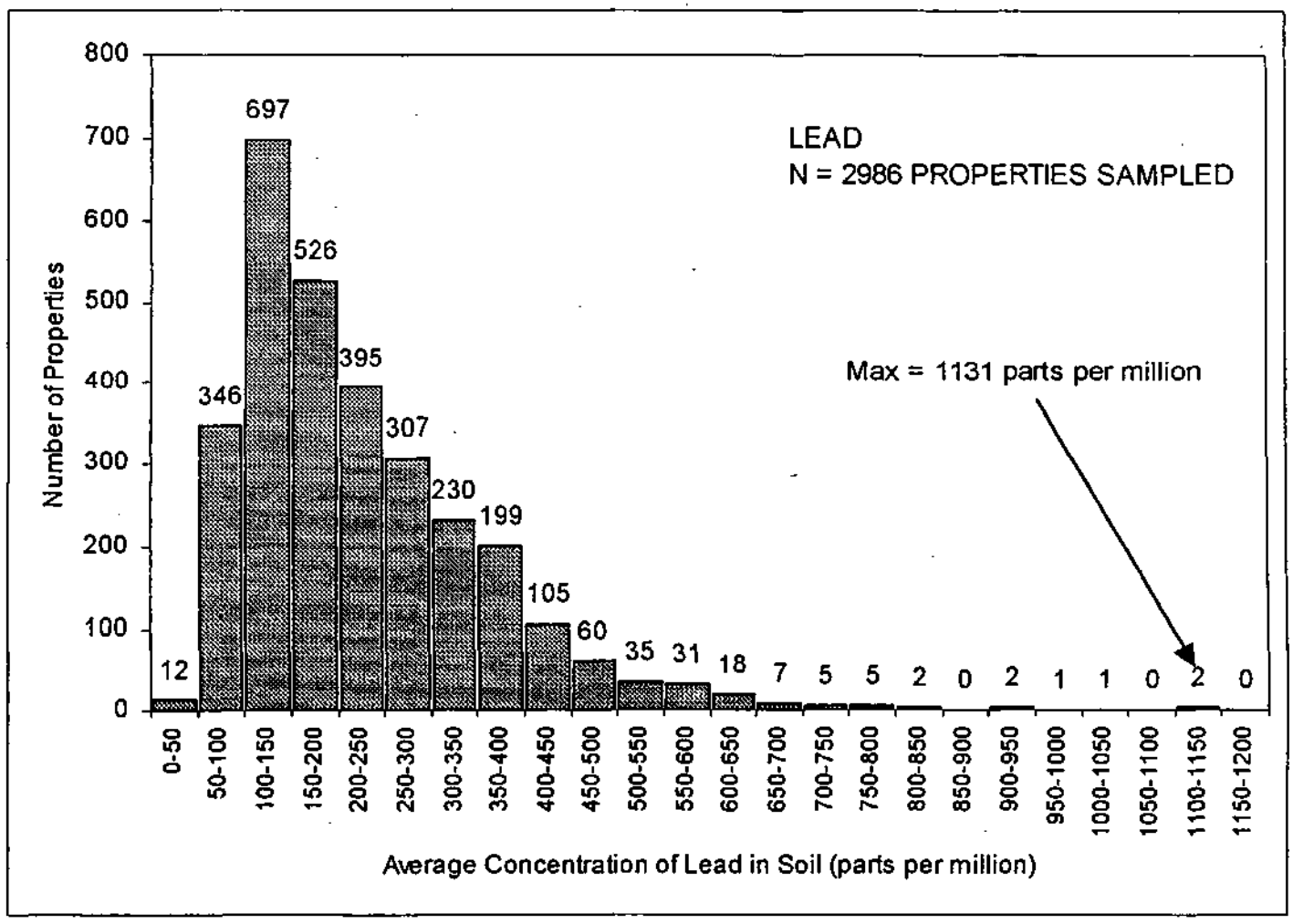


Figure 7. YARD AVERAGE SOIL LEAD LEVELS IN VB/I-70



N

0 250 500 1000 1500 2000 FEET

0.1 .05 0 0.1 MILE

0.5 .25 0 KM

Transverse Mercator Projection

UTM Coordinate System – Zone 13

NAD27/NGVD29 Datum – Units Meters

LEGEND

- Study Area Boundary
- Neighborhood Boundary

- 11 –36 mg/Kg
- 36 –100 mg/Kg
- 100 –200 mg/Kg
- 200 –300 mg/Kg
- >300 mg/Kg

5 Meter Grid

Washington

VASQUEZ BLVD / I-70 SITE
Operable Unit 1
Remedial Investigation Report

Figure 8

Kriged Spatial Distribution of Arsenic in Residential Surface Soils

Project No.: RAC 68-W7-0039 WA 004-RICO-089R
File: Q\4994\1004\RIFS\as17x11.ps

June 27, 2001

N

0 250 500 1000 1500 2000 FEET

0.1 .05 0 0.1 MILE

0.5 .25 0 KM

Transverse Mercator Projection

UTM Coordinate System – Zone 13

NAD27/NGVD29 Datum – Units Meters

LEGEND

- Study Area Boundary
- Neighborhood Boundary

- 52 –173 mg/Kg
- 173 –300 mg/Kg
- 300 –400 mg/Kg
- 400 –500 mg/Kg
- >500 mg/Kg

5 Meter Grid

Washington

VASQUEZ BLVD / I-70 SITE
Operable Unit 1
Remedial Investigation Report

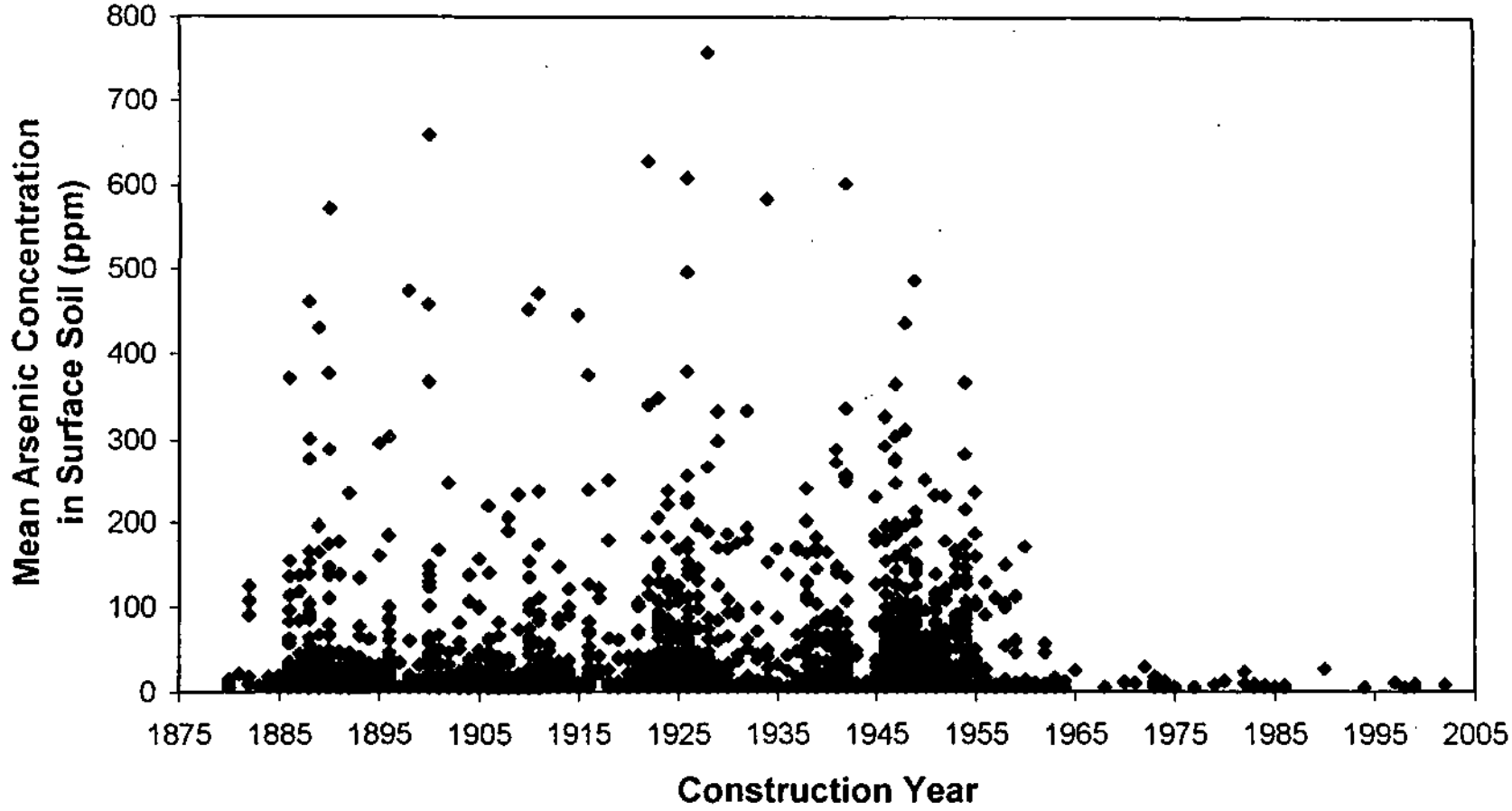
Figure 9

Kriged Spatial Distribution of Lead in Residential Surface Soils

Project No.: RAC 68-W7-0039 WA 004-RICO-089R
File: Q\4994\1004\RIFS\pb17x11.ps

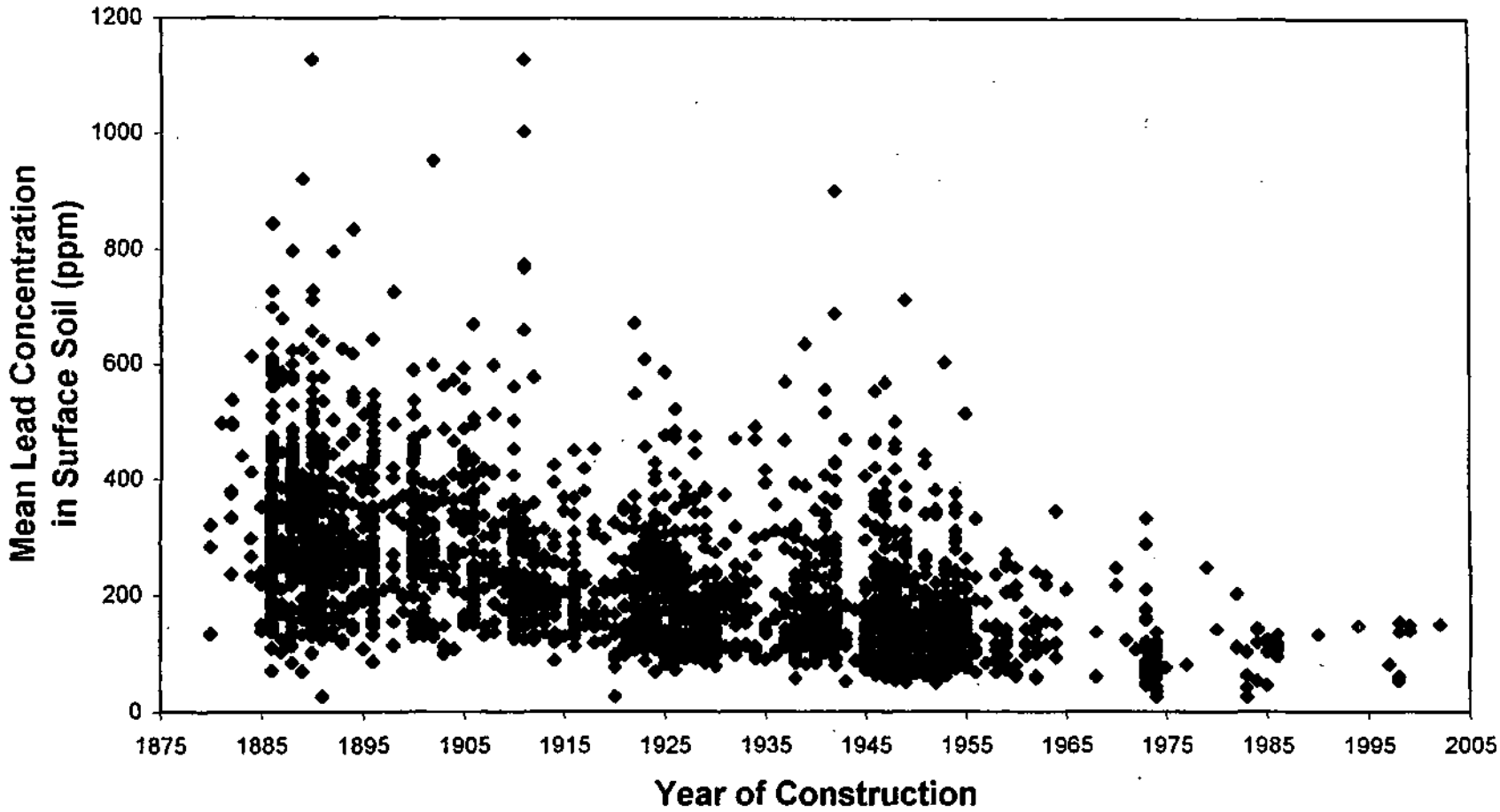
June 27, 2001

Figure 10. Distribution of Soil Arsenic Concentrations by Construction Year



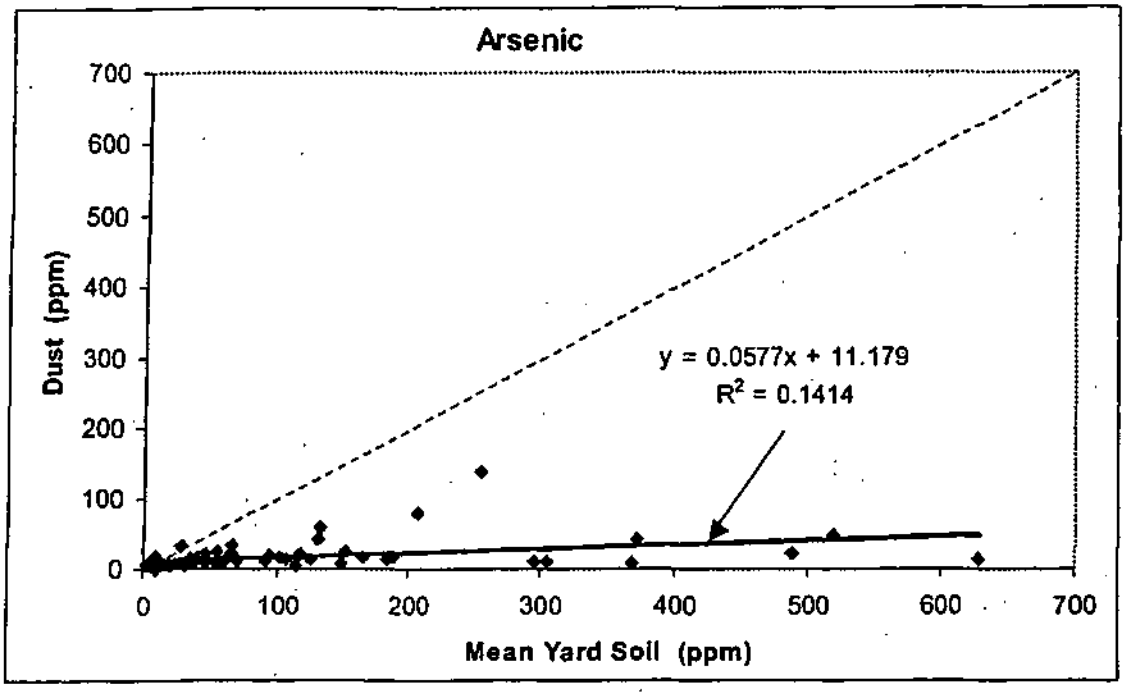
Soil As by Year Constructed.xls

Figure 11. Distribution of Soil Lead Concentrations by Year of Construction



Soil Pb by Year Constructed.xls

Figure 12 **Relation between Concentration in Indoor Dust and Bulk Yard Soil**



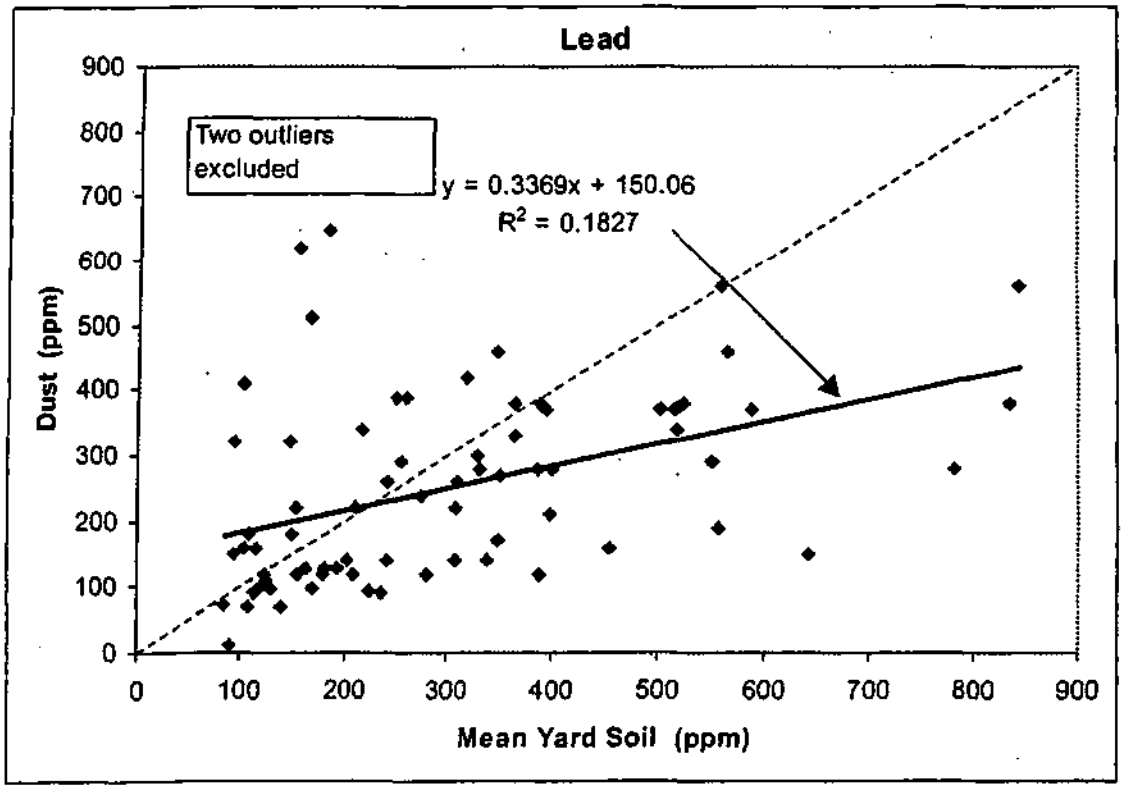
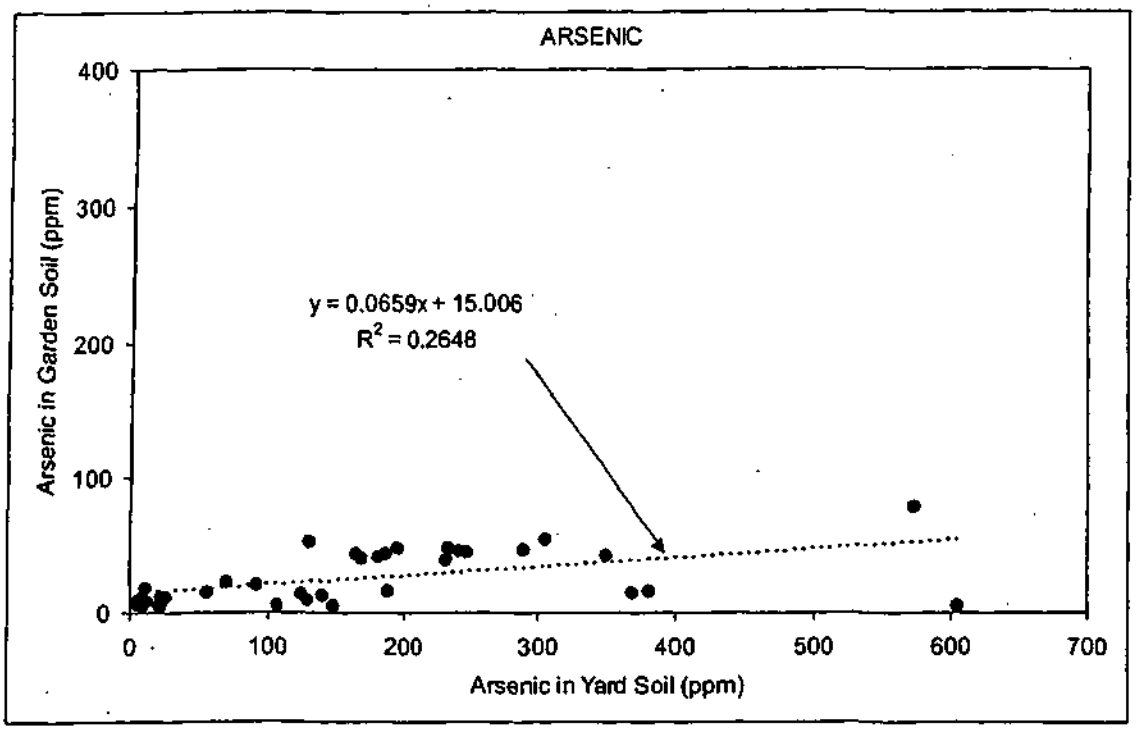


Figure 13 **Relation between Contaminants in Garden Soil and Yard Soil**



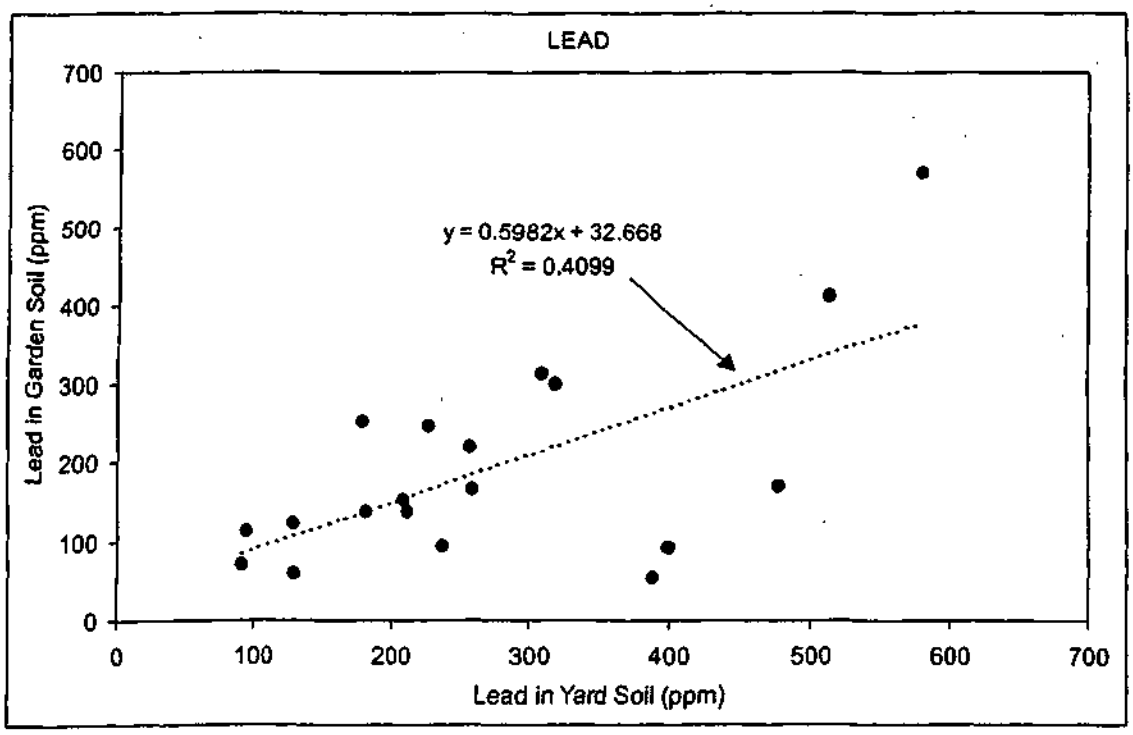
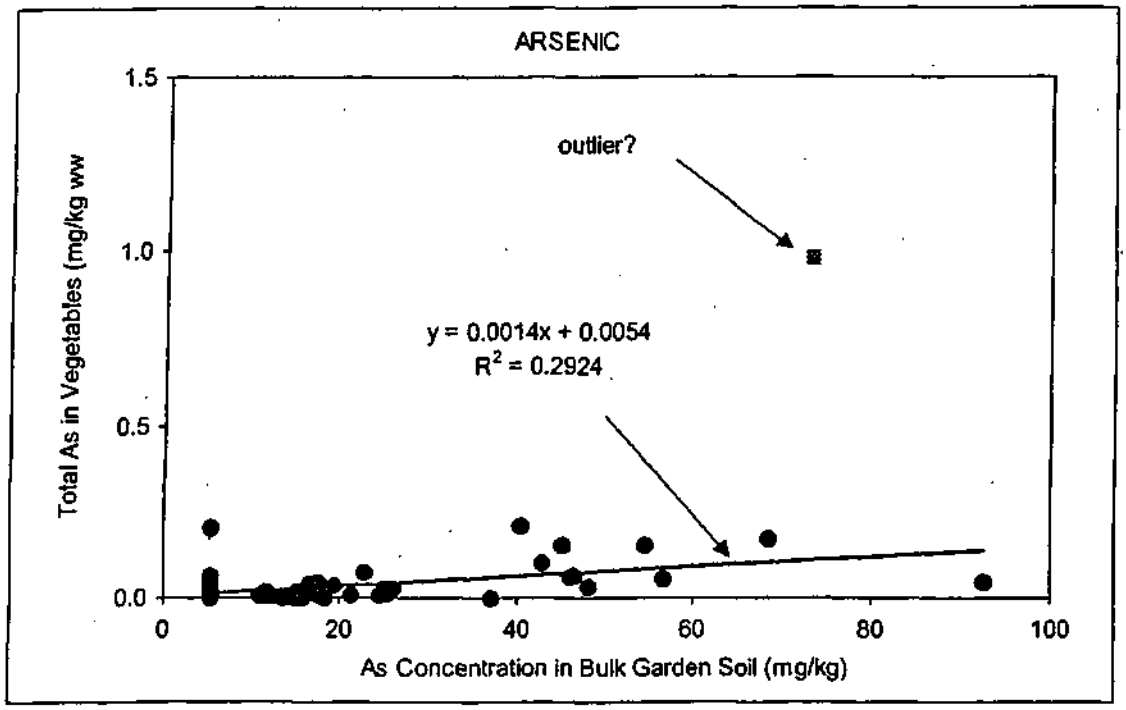


Figure 14 **Relation between Total Arsenic in Garden Vegetables and Garden Soil**



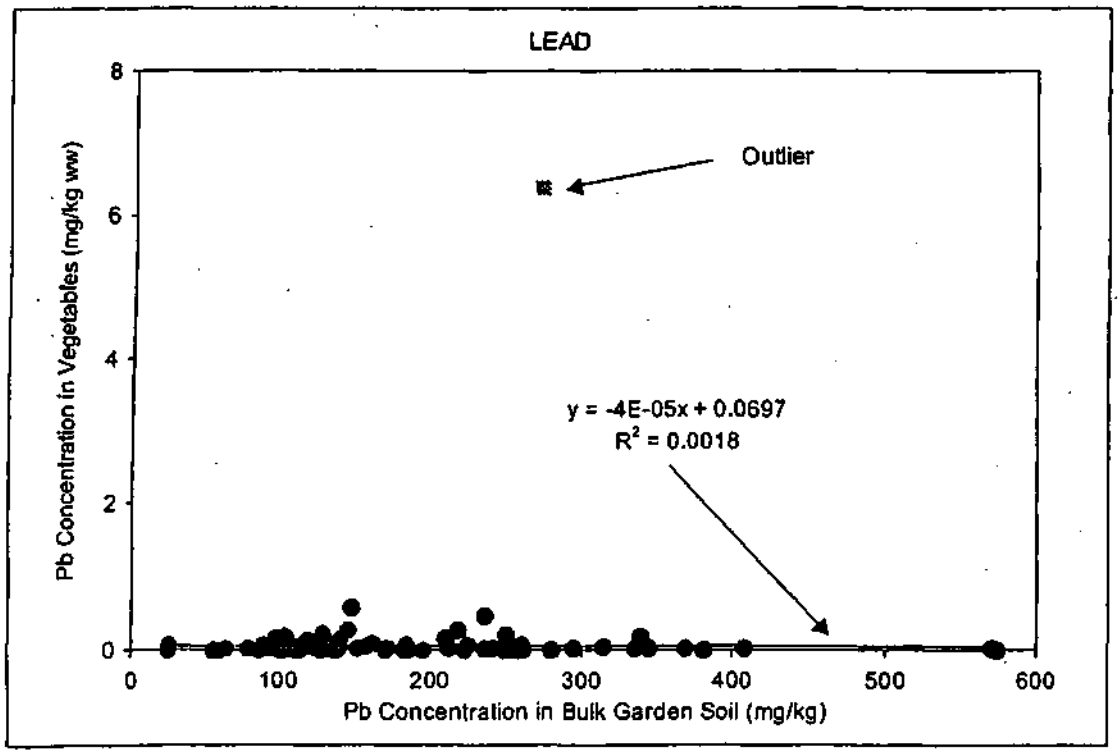


Figure 15 **Coefficient of Variation in Yard Soil Grab Samples**

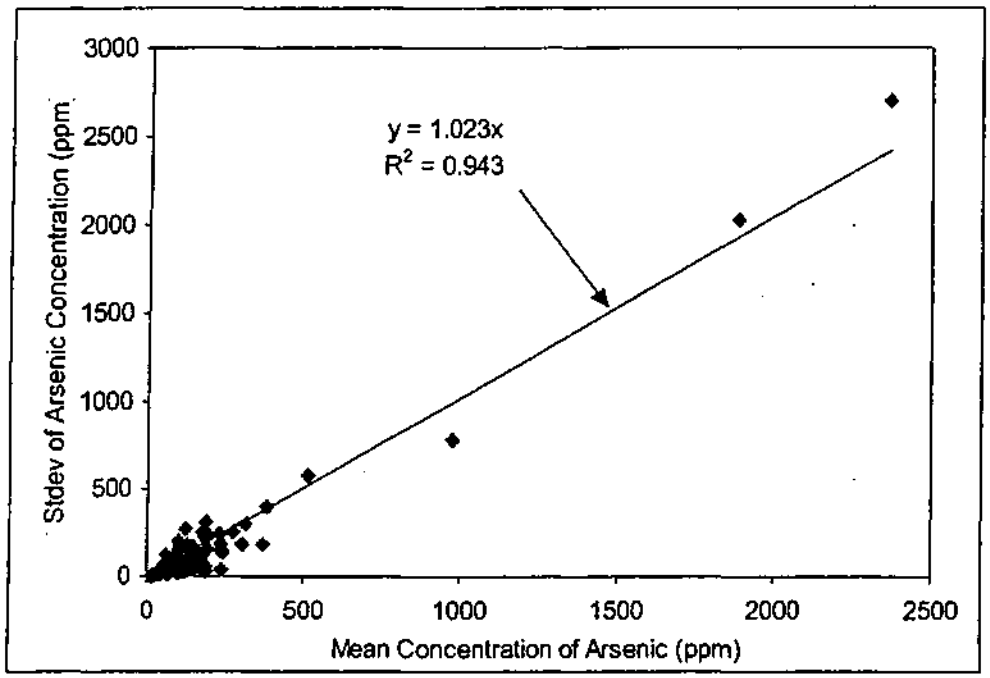
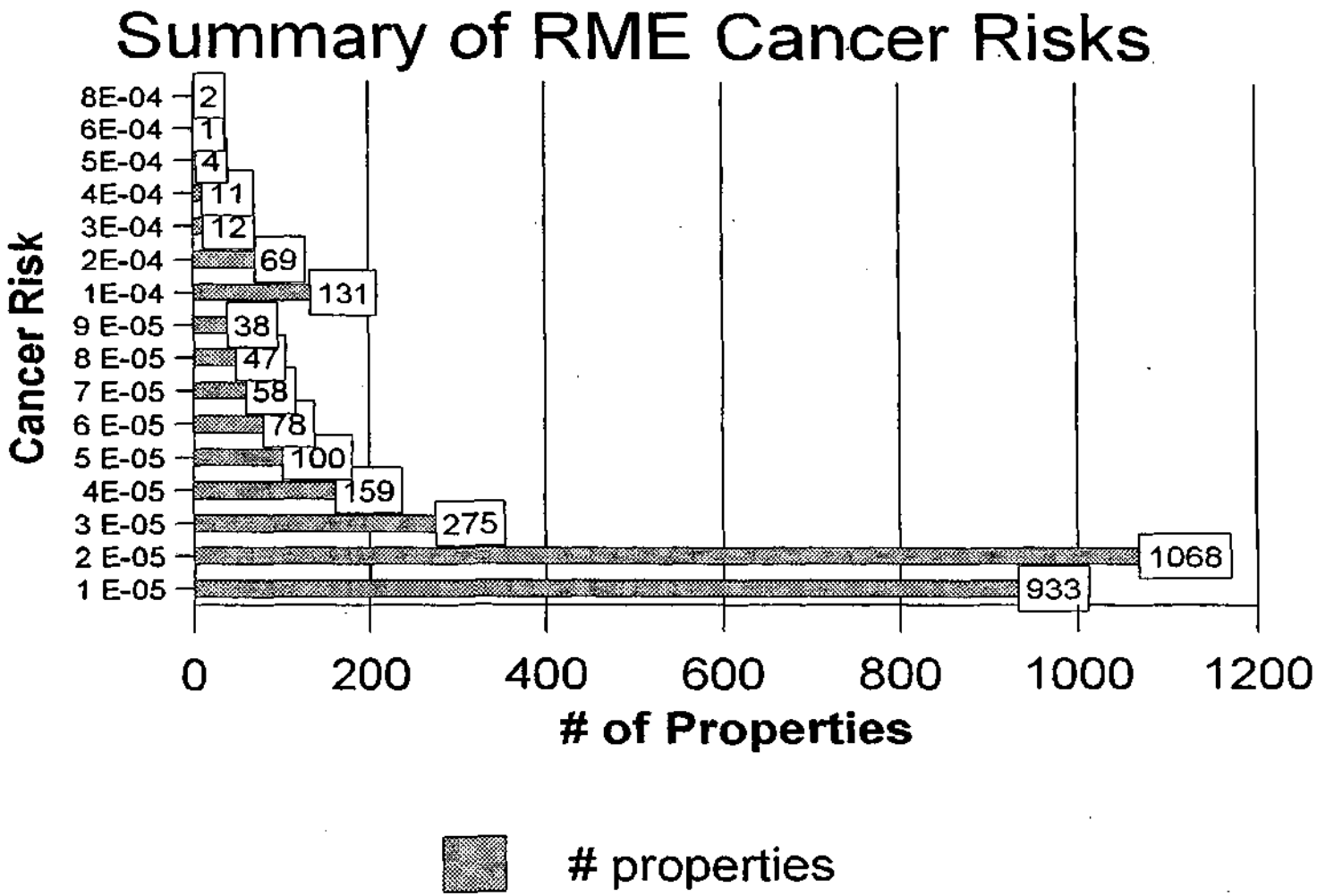


Figure 16


Summary of RME Cancer Risks
Cancer Risk
8E-04
6E-04
5E-04
4E-04
3E-04
2E-04
1E-04
9 E-05
8 E-05
7 E-05
6 E-05
5 E-05
4E-05
3 E-05
2 E-05
1 E-05
2
1
4
11
12
69
131
38
47
58
78
100
159
275
1068
933
0
200
400
600
800
1000
1200
# of Properties
properties

TABBED PAGE

APPENDIX A

Jane Mitchell
<Jane.Mitchell@state.co.us>
11/30/01 07:36 AM

To: cvanderl@ci.denver.co.us, Bonita Lavelle/EPR/R8/USEPA/US@EPA, barbara.ogrady@state.co.us, jane.mitchell@state.co.us
cc:
Subject: Re: looking for some information....

Bonnie - I know Barb is out until Monday, so I'll respond from my perspective. I took a quick look at the FS this morning. 120 ppm was the action level associated with a 10-4 risk level under the guidance available in 1990 when the FS was done. When the proposed plan /ROD were finalized, we reassessed the action levels using more current guidance, resulting in a slightly lower action level. The primary difference seems to be that the FS assumed 250 days of exposure (vs. current default of 350 days) and a daily soil ingestion rate for children of 85 to 135 mg/d (vs. current default of 200 mg/d). However, as I recall, the arsenic action level was also tied to co-location with cadmium soil concentrations, since cadmium was the driver at Globe (i.e., the cadmium footprint covered a larger area than arsenic). Previous analysis showed that cleanup of cadmium in soil to about 70 ppm would also result in residual arsenic concentrations in soil of about 70 ppm or lower. We used RAGS guidance available in about 1993 to calculate a risk level associated with 70 ppm in soil to determine if this exceeded a 10-4 risk level; hence the 8X10-5 risk level. It's been a long time since we worked on that, so no doubt it would be best to get input from other folks also. Regards, Jane

>>> <Lavelle.Bonita@epamail.epa.gov> 11/29/01 06:14PM >>>
EPA is hosting a community forum for VB/I70 this Monday night, December
3 at Swansea Rec. The Community Involvement Coordinators at EPA who are
helping me on VB/I70 have advised me that I need to clearly explain the
differences between the action level for arsenic at Globeville and the preliminary action levels for arsenic at VB/I70. They feeI strongly that this is a big source of confusion and tension for community members. I agree with them.

So, I plan to address this topic directly Monday night.

I've been reviewing the Globe Plant ROD and have a question which is the reason for this message. The FS included an arsenic action level of
120 ppm for the community soils which represented a 1 E-4 risk level. This was changed in the ROD to 70 ppm. The State obviously worked very
hard to document the rationale for almost everything (it must have been
exhausting!!) but I can't follow why you went from 120 ppm (1 E-4) in
the FS to 70 pm (8 E-5) in he ROD. I can't find the reason....can you tell me what happened between the FS and ROD?

Believe me, I don't intend to cover this at all on Monday, I'm just trying to figure out what happened. Any insight you can provide would be
appreciated. sorry to dredge up a painful subject ....

"Vanderloop, Celia - Environmental Health" <celia.vanderloop@ci.denver.co.us>

11/29/01 06:41 PM

To: Bonita Lavelle/EPR/R8/USEPA/US@EPA
cc:
Subject: RE: looking for some information....

Maybe we used similar rationale to the current lead approach. (Real answer, I don't remember, and I bet it was sort of a negotiated level co-located with cadmium - we were trying to get as low as we could. We tried for a long time to get them to go straight 28 across the board, but it was definitely a negotiated remedy. At the time of the RI, people thought that cadmium would be the driver, so didn't pay that much attention to arsenic. It became problematic at the FS and PHE. We tried to explain everything, so if we didn't explain it, there's probably a reason we didn't explain it, because we couldn't.) My alternative approach is to ask Dave Folkes what he remembers.

-----Original Message-----
From: Lavelle.Bonita@epamail.epa.gov
[mailto:Lavelle.Bonita@epamail.epa.gov]
Sent: Thursday, November 29, 2001 6:15 PM
To: barbara.ogrady@state.co.us; cvanderl@ci.denver.co.us; jane.mitchell@state.co.us
Subject: looking for some information....

EPA is hosting a community forum for VB/I70 this Monday night, December 3 at Swansea Rec. The Community Involvement Coordinators at EPA who are helping me on VB/I70 have advised me that I need to clearly explain the differences between the action level for arsenic at Globeville and the preliminary action levels for arsenic at VB/I70. They feeI strongly that this is a big source of confusion and tension for community members. I agree with them.

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I've been reviewing the Globe Plant ROD and have a question which is the reason for this message. The FS included an arsenic action level of 120 ppm for the community soils which represented a 1 E-4 risk level. This was changed in the ROD to 70 ppm. The State obviously worked very hard to document the rationale for almost everything (it must have been exhausting!!) but I can't follow why you went from 120 ppm (1 E-4) in the FS to 70 pm (8 E-5) in he ROD. I can't find the reason....can you tell me what happened between the FS and ROD?

Believe me, I don't intend to cover this at all on Monday, I'm just trying to figure out what happened. Any insight you can provide would be appreciated. sorry to dredge up a painful subject ....

Bonita Lavelle

08/29/01 01:12 PM

To: jane.mitchell@state.co.us, barbara.ogrady@state.co.us
cc: Barry Levene/EPR/R8/USEPA/US, Dale Vodehnal/EPR/R8/USEPA/US,
cc:
Subject: VB/I70

Barb and Jane:

You have mentioned a few times the State's concern about ensuring that the VB/I70 action levels are similar to those established by the State for residential properties in Globeville.

As you are reviewing the FS, here is some information for you to consider:

The VB/I70 Phase III investigation collected information that allows us to make the risk estimates more accurate. There are three key pieces of data that most influence the soil levels at various risk levels. They are:

1. We now know that the **fine fraction of soil is enriched in arsenic by 21%.**

This means that for example, the 70ppm level at Globe may result in actual exposure to (70) (1.21) or 85 ppm arsenic.

2. The **Relative Bioavailability** of arsenic in VB/I70 soils was measured at **42%.**

This means that if a non-adjusted dose associated with exposure to 85 ppm is considered to be OK, considering RBA, the absorbed dose is that associated with (85) / (0.42) or 202 ppm.

3. We now know that the level of arsenic in dust is only 6% of the level of arsenic in soil. This was not considered at Globe. Since we assume 55% of intake is from dust, an increased amount of arsenic in yard soils will **not** result in a **proportional** increase in exposure. A lot of Superfund investigations do not collect dust information so it is assumed that soil levels equal dust levels. We now know this is not the case at VB/I70.

In other ways, we have used more protective assumptions at VB/I70. For example, we assumed exposure to the 95% upper confidence limit of the yard mean. This resulted, on average, in assuming people are exposed to 1.4 times the amount we measured. Also, we added the risk associated with eating garden vegetables,which turned out to be not insignificant.
As you know, it's difficult to compare the results of the risk assessments for the two sites since they were done at different points in time using the available science. Simply comparing "action levels" doesn't tell the whole story as you know. If it's a matter of explaining the differences, I'm confident we can do it.

5.0 STATEMENT OF WORK - COMMUNITY SOILS AND VEGETABLE GARDENS OPERABLE UNIT

5.1 DESCRIPTION AND STATUS OF COMMUNITY SOILS AND VEGETABLE GARDENS

Cadmium, arsenic, lead, and zinc concentrations in the soils of certain properties in the community surrounding the Globe Plant exceed urban background levels. In general, metals concentrations in these soils decrease significantly with distance from the Globe Plant, with the greatest decreases occurring closest to the Globe Plant boundary. The general area where shallow soils contain more than the community soils action levels of 73 parts per million (ppm) cadmium, 500 ppm lead, or 70 ppm arsenic and the general area where shallow soils contain more than the upper limit of background for arsenic of 28 ppm are shown on Figure 5.1.

Remedial Investigation results show that elevated metals concentrations also generally decrease with depth. Metals concentrations above community soils action levels are generally confined to the upper one foot of undisturbed soil.

Concentrations of cadmium, lead, arsenic, and zinc are typically elevated above urban background levels in vegetable garden soils within one mile of the Globe Plant, compared to the range of normal values reported in the literature and compared to concentrations in vegetable gardens located beyond one mile but within two miles of the Plant. More than 75% of the vegetable garden soil samples collected within one mile of the Plant had cadmium concentrations that could potentially affect plant growth (e.g., may result in reduced yield), compared to 30% of the vegetable garden soil samples collected within the one to two mile zone and none of the vegetable garden soil samples beyond a distance of two miles. The distributions of elevated lead and zinc concentrations in vegetable garden soils are similar to that of cadmium. An action level of 500 ppm for zinc in vegetable garden soils, in addition to the action levels for cadmium, lead, and arsenic listed above, is based on potential impacts to garden and crop yields.

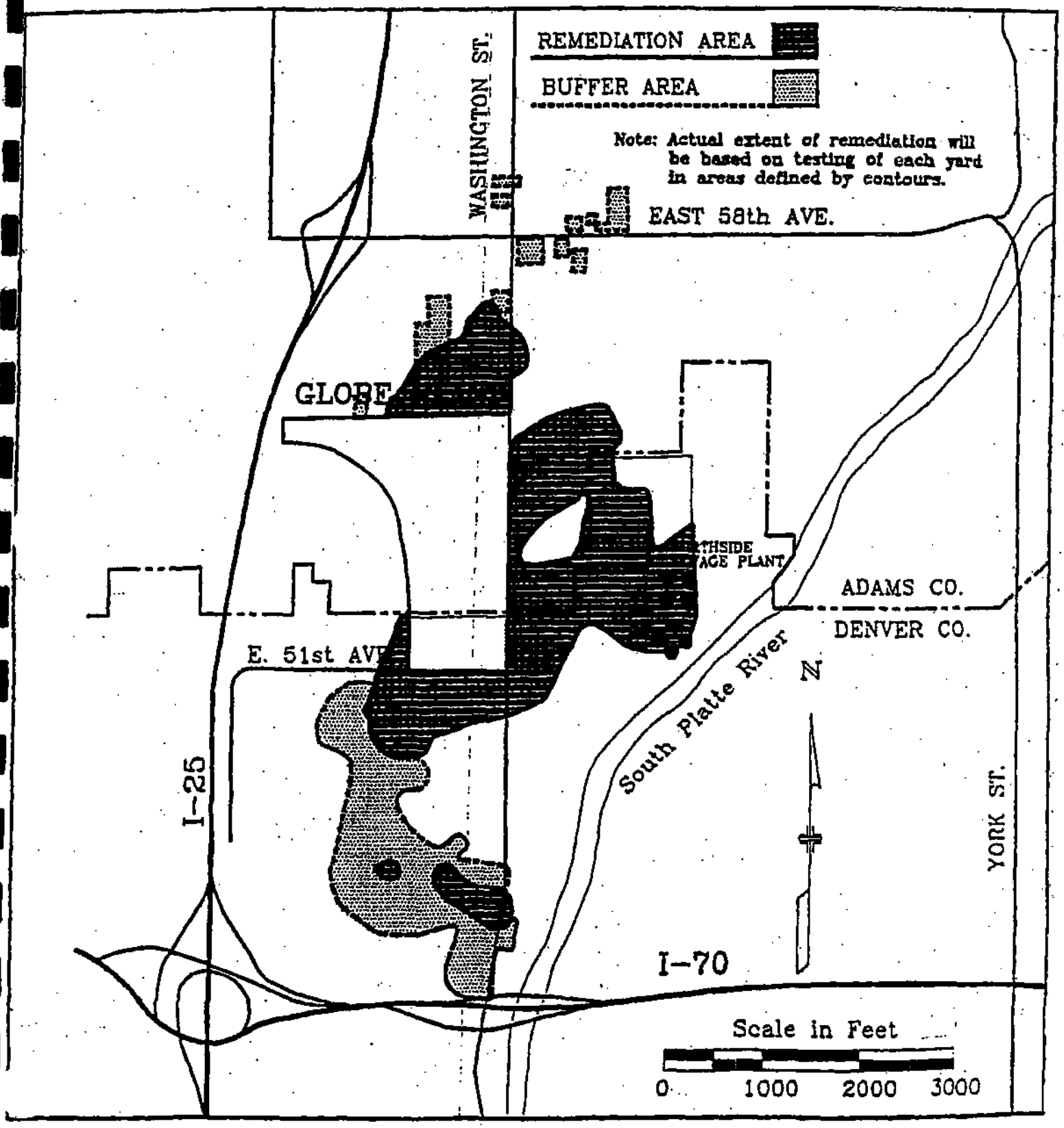


Figure 5.1 Community Soils Cleanup

5.2 REMEDIAL ACTION

5.2.1 Overview of Remedial Action

The goal of the Community Soils and Vegetable Gardens Remedial Action is to prevent or minimize exposure to soils and vegetables grown in soils with concentrations of metals exceeding the health-based action levels presented in Section 5.1. An explanation of how this objective will be accomplished is presented in this section.

The community soils remedy will require remediation of any property within or generally adjacent to the geographic area shown on Figure 5.1 where metals concentrations in soils exceed any of the community soils action levels described in Section 5.1.

Residential properties with soil metals concentrations less than the action levels listed above, but with arsenic concentrations exceeding the upper limit of background as defined in Section 6.2.3 of the RI Report, comprise the buffer cleanup area. In the buffer area, property owners will be afforded the opportunity to have their properties remediated. Residential properties within the buffer area will be identified through a property use survey. For open fields or unimproved parcels, current zoning will be used to identify which properties are residential. Properties that exceed action levels and that are eligible buffer area properties will be identified through a property-by-property sampling and testing program as defined in Section 5.2.3.

Whether or not action levels are exceeded will be determined by sampling and testing the top six inches of soil. Eligible properties will be remediated by capping, excavation, deep tilling, or exposure controls unless existing surface conditions such as asphalt, concrete, buildings, shrubs and bushes, permanent stockpiles, fixed heavy equipment, and other structures or barriers are already in place and minimize the potential for long-term ingestion exposure to soils with concentrations above the action levels.

Appropriate caps or barriers include 12 inches of soil suitable for revegetation or two inches of asphalt pavement. Caps may be placed without excavation of soils exceeding action levels where the finished grade elevations are not constrained by physical features such as buildings, sidewalks, or existing drainage patterns, and this remedy is acceptable to the property owner. Alternatively, where capping without excavation, is not practicable or acceptable to the homeowner, soils will be excavated to a depth of 12 inches and removed, prior to placement of the cap.

Excavated soils with metals concentrations below on-site worker/trespasser action levels (Section 6.3.2), that meet on-site placement requirements, and that do not exceed the Toxicity Characteristic under RCRA will be placed on the Globe Plant property. On-site worker/trespasser action levels, identified in the ROD, are 9125 ppm for cadmium, 426 ppm for arsenic, and 3000 ppm for lead. Excavated community soils with metals concentrations greater than on-site worker/trespasser levels or exhibiting Toxicity Characteristics will be managed in compliance with applicable off-site regulations and applicable or relevant and appropriate requirements if managed on-site. Soils, when placed on the Plant surface, will meet the technical requirements of a Solid Waste Certificate of Designation (no degradation of groundwater, surface water, or air quality).

The community soils action level for lead of 500 ppm has been established based on EPA OSWER Directive Number 9355.4-02, dated September 9, 1989. In an August 29, 1991 memorandum, EPA discusses the use of the UBK model as a risk management decision-making aid when setting soil lead cleanup levels in residential areas. If, prior to completion of the Remedial Action for the Community Soils and Vegetable Gardens Operable Unit, EPA guidance is changed to formally advise the use of the UBK model to establish action levels for lead in soils for CERCLA remedies, CDH and Asarco will evaluate this guidance to determine its appropriateness for this Site. If determined appropriate, Asarco will either include in the remediation area properties with lead concentrations in surface soils in excess of the upper limit of background (413 ppm) or obtain the samples necessary to correctly model impacts to individuals under the UBK model. CDH may use the UBK model to evaluate remedy protectiveness under the reopener provisions of the Consent Decree.

TABBED PAGE

APPENDIX B

Attachment 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION VIII (8EPR-PS)
999 18th STREET - SUITE 500
DENVER, COLORADO 80202-2466

Region VIII

JUL 27 1998

MEMORANDUM

SUBJECT: Exposure to elevated levels of arsenic and lead in residential soils in the vicinity of Vasquez Blvd. and I-70 may pose an imminent and substantial endangerment to public health.

FROM: Christopher P. Weis, Ph.D., DABT.
Regional Toxicologist

TO: Peter Stevenson
On Scene Coordinator

This memorandum addresses recently characterized metal contamination from lead and arsenic in residential surface soils in specific neighborhoods in the vicinity of Vasquez Boulevard and I-70 in Denver, CO. Elevated cadmium concentrations were also detected during recent sampling events. Due to analytical difficulty the results of the cadmium analysis are unreliable and will not be discussed further in this memorandum. The area of interest is bounded by the 56th Avenue on the North, 38th Avenue on the south, the South Platte River to the west, and Colorado Boulevard on the east. This screening level surface soil characterization effort conducted by EPA contractor URS Operating Services, Inc. under your oversight, included the collection of 3,550 surface (0-2") and depth (6-10") samples in approximately 1200 yards and measurement of these samples using X-ray fluorescence spectroscopy (XRF), inductively coupled plasma emission spectroscopy (ICP), and standard EPA quality assurance and quality control procedures. This memo will address only the surface (0-2") set of samples as this soil horizon is most likely to be contacted by children or adults presently living in the area. The results of this sampling effort and risk assessment are screening level and are subject to some variability and uncertainty. Variability in sample results may occur due to: 1) variation in sample location throughout the individual yard; 2) variation in particle size of the metals of concern in the soil; or 3) variation in the depth at which samples were collected. Uncertainty and variability in the risk assessment arises from several sources including: 1) uncertainty and variability regarding specific exposure situations of children and adults on the site (e.g. behavior, body weight, etc.); 2) uncertainty and variability regarding the absorption of metals from the soil matrix; and 3) a less than complete understanding of the mechanisms by which these metals cause disease. However, as explained in this memorandum, a subfraction of the soil measurements of lead and arsenic are very high and indicate the possibility of an imminent and substantial endangerment to public health. I, therefore, recommend that steps be taken to minimize direct exposure to individuals (especially children) who may come in contact with site-specific concentrations of surficial arsenic greater than approximately 400 parts per million (ppm). Additionally, steps should be taken to minimize risk to children by reducing exposure to soil concentrations of lead greater than approximately 2,000 ppm within the area of interest.

Data Evaluation:

A total of 3,550 soil samples were collected in the target area at a frequency of approximately 3 samples per residence during the months of March and April, 1998. The summary surface soil results of the sampling effort are presented below.

Arsenic concentration range (mg/kg or ppm)	Number of samples within range	Lead concentration range (mg/kg or ppm)	Number of samples within range
<70	2,162	<500	2,368
70-250	207	500-1,000	77
251-399	22	1,001-1,199	2
400-1000	38	1,200-1,500	2
>1000	7	>1,500	5

Samples were collected according to the EPA sampling plan for the site (UOS, 1998). Surface soils were collected into lead-free containers and sieved through a 10 mesh screen (approximately 2mm particle size) prior to analytical measurement by XRF or ICP. Sample locations were tracked using global positioning system (GPS) and entered into an interactive geographic database. Under the conditions of the sampling and analysis, a total of 46 properties had arsenic concentrations greater than or equal to 400 mg/kg and/or lead concentrations greater than or equal to 2,000 mg/kg. A total of 248 properties had arsenic concentrations ranging from 70 mg/kg to 399 mg/kg and/or lead concentrations ranging from 500 mg/kg 1,900 mg/kg. Four properties had lead concentrations greater than 2,000 ppm and no properties had lead concentrations greater than 4,000 mg/kg.

Complete physico-chemical characterization of the material which was collected is pertinent to understanding exposure and the risks posed by elevated metal concentrations in soil. For example, metals may be bound in a multitude of chemically and physically different matrices which might influence their solubility and bioavailability (fractional absorption across the gut). The particle size of the metal-bearing fraction of soil may also greatly influence the bioavailability and internal exposure to children or adults. Work is presently underway to fully characterize the samples collected as to particle size, organic carbon content, pH, chemical speciation, and matrix. In the absence of this information, EPA has reviewed recent studies conducted by the University of Colorado Department of Geology (CU) on soils in the vicinity of the present sampling effort (Drexler, 1998). For the protection of childhood health, and in the absence of direct characterization of the subject samples, it is plausible to assume that the physico-chemical characterization of soils in the immediate vicinity of the present sampling effort is likely to be representative of the samples collected by UOS.

The results of the CU study indicate that the frequency of occurrence of arsenic trioxide (As_2O_3) is on the order of 30% while the mass fraction of As_2O_3 in the vicinity soils is approximately 80%. There is a strong correlation (0.66) between As_2O_3 and arsenic antimony oxide (AsSbO) indicating the possibility that arsenic contamination in the area may be due to pyrometalurgical sources. As_2O_3 is highly oxidized. Because of this, arsenic is likely to be soluble and highly bioavailable to humans via the ingestion route of exposure. This bioavailability is enhanced by the relatively small particle size range characterized by CU scientists. The mean particle size for all arsenic species identified was 8 micrometers (μm). The mean particle size for the As_2O_3 phase was 9 μm with a range from 1-200 μm. This information is highly relevant to the risk evaluation of soils in the vicinity of Vasquez Blvd. And I-70 as it indicates that the arsenic is likely to be readily absorbed across the gastrointestinal tract and within a particle size (<250μm) expected to stick readily to hands, clothes, pet fur, and children's toys.

<u>Exposure of Residents to Metals in Soil:</u>

In order for exposure and risk to occur under current conditions, a complete exposure pathway must exist. Pathways of exposure to soil metals may be complex and multifaceted. For a complete exposure pathway to exist, there must be; 1) a source of contamination (metals in soil), 2) a release mechanism (e.g. bare soil areas or other possibility for release), 3) a transport of the soil

contamination to a receptor (child or adult resident), and 4) an exposure route (ingestion, inhalation, or dermal absorption). Due to their atomic charge, metals are typically not well absorbed by the skin and this dermal route of exposure is usually insignificant in areas of soil contamination. Therefore, this route will not be discussed further in this memorandum. While exposure to metals in soil by inhalation can pose a significant threat in areas which are extremely dusty and human activity levels are high (such as in areas of active earth moving), this route of exposure is also far less significant in most residential exposure settings where there are not active smelter emissions. This is presently the case in the Vasquez and I-70 area and so this route of exposure will not be fully quantified in this memorandum.

In most cases where residential soil is contaminated with metals, the significant exposure route is through incidental ingestion of soil and dust. Soil and dust ingestion may be influenced by a variety of other environmental factors such as; 1) time spent outdoors, 2) amount of exposed bare soil, 3) proximity and condition of lead-based paints, 4) frequency of hand-to-mouth activity, 5) parental care, etc. Children and adults are typically exposed to soil and dust particle sizes less than approximately 250 micrometers in size as this particle size more readily adheres to hands, toys, and clothing. Sieving to this smaller particle size using a 60 mesh sieve may also reduce sample heterogeneity and slightly increase the measured metal concentration of the samples. EPA estimates that children may ingest an average of approximately 100 milligrams of soil and house dust per day (mg/day). This is due to common hand-to-mouth activity coupled with a tendency of children to be active at outdoor and indoor play. A reasonable upper bound estimate for childhood soil and dust ingestion used for this assessment is 200 mg/day. EPA assumes that adults may ingest 50 mg/day of soil and dust (EPA Exposure Factors Handbook).

Due to the chemical form of arsenic found in the neighboring community soils it is reasonable to assume that solubility of the material is relatively high and, as a consequence, fractional absorption of this material is correspondingly elevated. For the purpose of this assessment a range of absorption efficiencies of arsenic from soils of 50% to 80% relative to freely soluble arsenic in water will be used.

Toxicity of Arsenic and Lead:

Subchronic Arsenic Toxicity:

Most of the available peer reviewed literature which supports a scientific understanding of arsenic toxicity in humans is derived from cases of human exposure and resulting health effects following ingestion of arsenic contaminated water. Due to the likelihood of high bioavailability of the predominant arsenic species (As_2O_3), it is technically plausible (in the absence of data to the contrary) and protective of public health to assume that arsenic in these particular soils may be as toxiologically active as arsenic in several key toxicity studies.

Several studies address the question of short-term (from a few months up to five to seven years) exposure to arsenic. These studies were reviewed and discussed in detail by Region VIII toxicologists during September, 1995 (Benson, 1995). The nature of those discussions is reproduced herein.

The studies presented in this section represent those which describe non-cancer health effects related to arsenic exposure lasting from six months to 15 years. Assessment of short-term exposure to arsenic should only be undertaken in cases where chronic exposure is not likely or where steps to address chronic exposure to arsenic are expected. Health risk assessment which fully addresses the chronic aspects of arsenic exposure (carcinogenic effects) for these residential soils should be considered.

Tay and Seah (1975) provide a summary of 74 case histories from Singapore of arsenic poisoning attributed to the consumption of herbal preparations which contained arsenic sulfide or arsenic trioxide. Clinical findings in the individuals are consistent with symptoms known to be

associated with arsenic intoxication. Ninety-two percent of the patients showed some form of cutaneous lesions (generalized hyperpigmentation, hyperkeratosis of palms and soles, "raindrop" depigmentation, palmar and plantar hyperhidrosis, multiple arsenical keratoses on trunk and limbs, mucous membrane lesions, diffuse alopecia, and Mee's lines in nails). The length of time the patients had ingested the herbal preparations varied from less than six months to approximately 15 years. 53% of the patients had ingested the preparations for one year or less and 84% of the patients had ingested the preparation for five years or less. The authors of this report estimated the dose of arsenic to be 3.1 milligrams per day (mg/day) in patients ingesting pills containing arsenic sulfide. The subchronic dose of arsenic necessary to cause an adverse effect is 0.06 - .2 mg/kg-day.

A series of papers in the peer reviewed literature discuss incidence of arsenic poisoning occurring in Antofagasta, Chile (Zaldivar, 1974; Zaldivar, 1977; Zaldivar and Guillier, 1977). The population was exposed to arsenic in drinking water and food. Of particular interest for derivation of a subchronic reference dose are the reports of skin lesions (leuko-melanoderma and/or hyperkeratosis of palms and soles, sometimes accompanied by scaling of the skin) in children. The children examined ranged in age from birth to 10 with a mean age of 1.7 years. Exposure time is assumed to be equal to the age of the child. Details of the examination of the children and the data used to derive the prevalence of disease in the population are not reported in the papers. The incidence of arsenic poisoning in the age group is reported to be 726.6 per 100,000. The calculated mean dose of arsenic for this age group is reported to be 0.063 mg/kg-day. This value was determined using the average measured concentration of arsenic in drinking water, the measured content of arsenic in a variety of foods, and the average body weight of the children. This publication documents adverse effects of arsenic observed following a subchronic dose of 0.06 mg/kg-day.

Borgono et al., (1980) describe the evaluation of 1277 school children (ten to 15 years of age) from different cities in the Antofagasta province of Chile. The study was conducted in 1977. The children were exposed to arsenic from the public water supply in the various communities and from food. The exposure time is not directly mentioned by the authors but is presumed to be equal to the age of the child. The results of the investigation are shown in the table below. The skin lesions observed included melanoderma, melanoleukoderma, hyperkeratosis of palms and soles, and peripheral vascular alterations (transient patches of cyanosis or white patches on the tongue, fingers, toes, and back of the hands and feet).

Location	Concentration of arsenic in drinking water (mg/l)	Incidence of Skin Lesions
Chuquicamata	0.08	4
Tocopilla	0.30	49
Maria Elena	0.30	54
Calama	0.30	19
Pedro De Valdivia	0.40	50

The authors of this study did not determine the amount of water or food-borne arsenic consumed by these individuals. Because the study was conducted in the same location as that reported by Zaldivar (1974 and 1977) and Zaldivar and Guillier (1977), it is reasonable to assume that the amount of arsenic ingested from drinking water and food are comparable. This study provides support for the conclusion that a subchronic dose of arsenic of 0.06 mg/kg-day is an effect level.

Huang et al., (1985) report an investigation of endemic arsenism in a plant in Kuitun area Xinjiang, China. The water supplying the plant came from a deep artesian well and contained 0.6 mg/l of arsenic. The well was first used in 1969. In 1982 the authors examined 336 individuals. One hundred and fifty people (44.6%) showed skin lesions characteristic of chronic arsenism. There was no control group. The lesions observed included dyspigmentation (diffuse brownish pigmented

macules and spots mixed with depigmented areas) and keratosischiefly on the palms and soles. The exposure time in effected individuals ranged from six months to 12 years, but because no other symptoms presented with the cutaneous lesions, most patients failed to remember the exact time of onset of symptoms. Water consumption was not measured directly, but the authors stated that individuals drank more than two liters of water daily. The highest intake reported was eight liters daily. No information is provided on the arsenic content of the diet or on the body weight. Assuming an average consumption of water of five liters per day and a body weight of 50 kg, the dose of arsenic from drinking water is 0.06 mg/kg-day.

Two reports by Tseng (Tseng, 1968 and Tseng et al., 1977) were used to establish EPA's chronic reference dose. The lowest observed-effect level for skin lesions (hyperpigmentation and hyperkeratosis) was established at 0.014 mg/kg-day. Although not clearly reported, the data show a very strong increase in incidence of skin lesions with increasing time of exposure. See Tseng et al. (1968) Figures 5 and 6 and Tseng (1977) figure 6 and Tables 2, 4, and 6. These data strongly imply that an exposure duration of ten years or less at a dose of 0.014 mg/kg-day is a no-effect level for non-cancer endpoints. Taken together, these studies establish that adverse effects occur when people ingest for six months to 15 years a dose of 0.06 mg arsenic/kg-day. None of these studies adequately quantifies a no-observed-adverse-effect-level following subchronic exposure in people. Therefore, a subchronic lowest-adverse-effect-level of 0.06 mg/kg-day is coupled with and uncertainty factor of 10 for extrapolation to a subchronic no-observed-adverse-effect-level in humans.

$$\text{Subchronic RfD} = \frac{0.06\ \frac{mg}{kg\text{-}day}\ \text{(effect level)}}{10\ \text{(uncertainty factor)}} = 0.006\frac{mg}{kg\text{-}day}$$

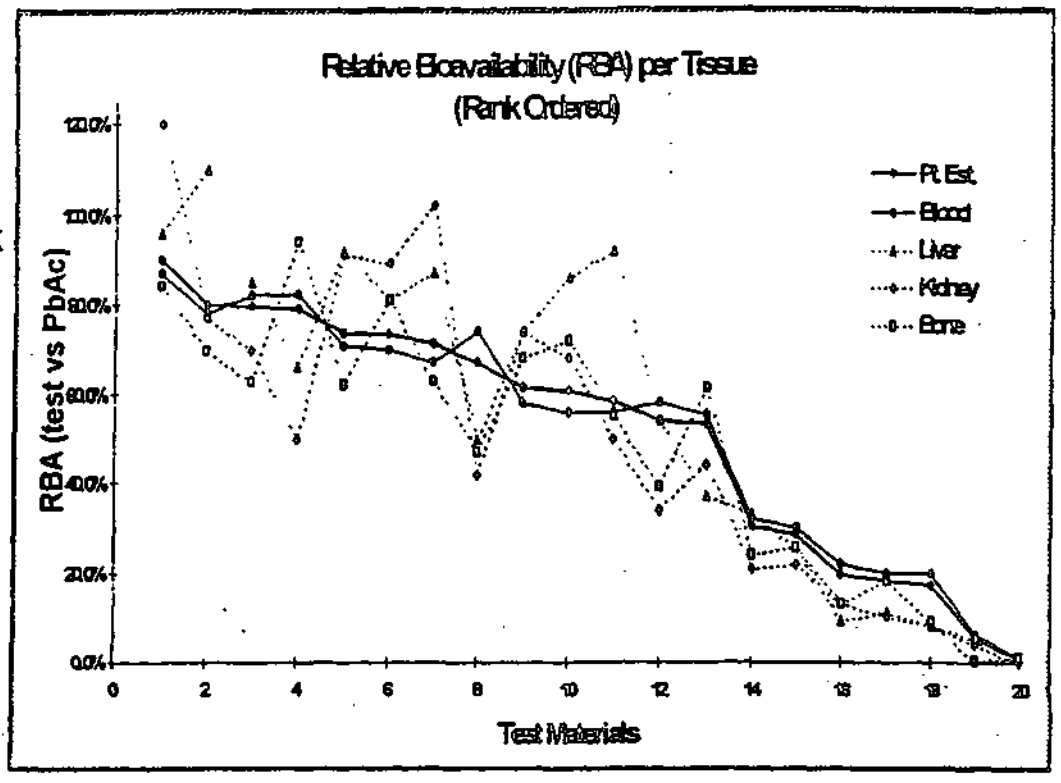
Lead:

Lead exposure in children is known to cause central nervous system effects resulting in learning disabilities, hearing impairment, and behavioral difficulties (Needleman, 1990). Children are particularly susceptable to the effects of lead due to: 1) the tendency for children less than the age of 7 to absorb lead much more efficiently than adults; 2) the particular susceptibility of the developing brain to the toxicological effects of lead, and 3) the tendency for children to be more highly exposed to possible sources of lead such as dust, soil and paint due to exploratory behavior. These effects have been demonstrated in large epidemiological studies to occur at blood lead levels of 10 micrograms per deciliter of blood (10 µg/dL). Needleman (1990) demonstrated the tendency for lead toxicity in children to persist long after exposure ends. It is not known how long exposure must occur for persistent effects to appear. However, seasonal exposure to environmental lead is sufficient to bring blood lead concentrations to semi-steady state as determined by pharmacokinetic studies in animals.

Adults in a residential setting are generally less exposed to the effects of lead due to lower absorption rates and generally less exposure. However, lead is known to redily cross the placenta with a transfer efficiency to the developing fetus of approximately 90%. Thus, pregnant women and women of child-bearing age are of concern in an environment conducive to excessive lead exposure. Typically, steps which are taken to reduce exposure of children to lead are also effective for reducing or eliminating adult exposure.

The absorption of lead from soils associated with the metal extraction industries is highly variable. Region VIII has tested the gastrointestinal absorption of several lead contaminated soils using an immature swine model as a surrogate for young children. The results of that investigation are summarized in the figure below. This study measured the relative bioavailability of lead in soils compared to the bioavailability of freely soluble lead acetate in water. The preliminary results indicate that lead in mine waste is highly variable relative to highly soluble lead acetate (Casteel et al, 1998). The range of relative bioavailabilities (RBA) measured in the study is from approximately 6% to approximately 86% compared with absorption of soluble lead. Most of the soil lead identified in communities adjacent to the Vasquez Blvd. and I-70 area is in the form of a relatively soluble arsenic lead oxide (AsPbO) with a mean particle size diameter of 4µm (range 1-100µm). AsPbO of this small

particle size would be expected to have relatively high bioavailability. It is also likely that some fraction of the lead in North Denver soils derives from lead-based paint.



EPA employs an Integrated Uptake Biokinetic Model (IEUBK model) for assessing exposure to children in residential settings. This computer model employs estimation of the absorption, distribution, and excretion of lead in children to predict blood lead concentrations following exposure to environmental lead. When available, appropriately collected human biomonitoring information (blood lead measurements) is useful for determination of recent environmental exposure. Information regarding multiple sources of exposure such as lead in water or paint aid in the understanding of risk related to lead absorption by children. Using standard default exposure assumptions, the IEUBK model predicts an approximate 50% probability of children having blood leads greater than the Agency recommended limit of 10 µg/dL when soil lead concentrations exceed 2,000 ppm.

Risk Characterization:

Arsenic:

A range of risk-based exposure levels for short term exposure (6 months to 15 years) of children (2-3 years old) to arsenic can be established using the subchonic (non-cancer) toxicity information presented above coupled with site-specific and Agency default assumptions about the dose which might be ingested following exposure to soil and housedust in the neighborhoods of interest. Using a range of childhood body weights for children between the ages of 2 years and 6 years (11-16 kg) and a range of plausible absorption fractions for oxidized arsenic compounds (50 to 80%[1]), a corresponding range of risk-based soil levels can be established. Equation 2 and 3 were used to estimate risk-based exposure levels of concern for short term (6 months to 10 years) exposure to arsenic in residential soils.

[1] Absorption (bioavailability) of soil arsenic has been measured in experimental animals. USEPA Region 8 toxicologists have recently released the results of a series of studies on the absorption of soil arsenic (Henningsen et al, 1998). The available data indicates that soil arsenic is less bioavailable than arsenic in water. However, estimates of soil arsenic absorption range from approximately 20% to as high as 100% relative to freely soluble arsenic.

Where:

$$Exposure\ Level = \frac{subchronic\ RfD\ (\frac{mg}{kg\text{-}day}) \times Body\ Weight\ (kg)}{Soil\ Ingestion\ Rate\ (\frac{gms}{day}) \times Absorbed\ Fraction} \times \frac{1000\ ug}{1\ mg} \quad (2)$$

Subchronic RfD	= 0.006 mg/kg-day
Body Weight	= 11-15 kg (child)
Soil Ingestion Rate	= 0.2 grams/day
Absorbed fraction	= 0.5 - 0.8 demensionless

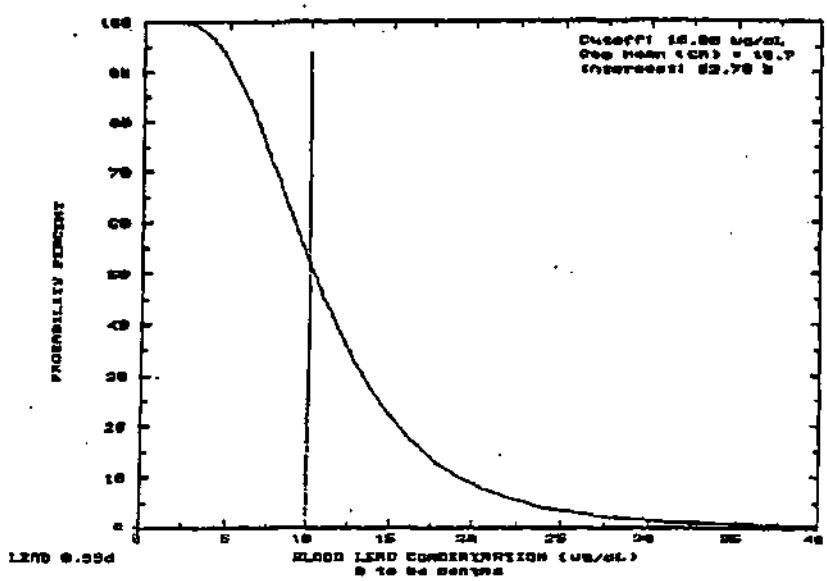
$$Exposure\ Level = (412\text{-}900)\ \frac{mg}{kg} = \frac{0.006\ (\frac{mg}{kg\text{-}day}) \times (11 - 16)\ (kg)}{0.2\ (\frac{gms}{day}) \times (0.5 - 0.8)} \times \frac{1000\ ug}{1\ mg} \quad (3)$$

The range of risk-based exposure levels of concern is from 412 mg/kg (ppm) to 900 mg/kg arsenic in soil. This range of risk-based exposures is applicable only for short-term, interim actions which might be taken to reduce or eliminate exposure to arsenic in soil. Due to the carcinogenic potential of arsenic, steps should be taken to assess the possibility of longer-term exposures above risk-based levels of concern.

To assure adequate protection of public health, it is recommended that any actions taken to reduce exposure to soil arsenic in this neighborhood focus on the lower end of this soil range. The rationale for providing a significant margin of protection is three fold: 1) As discussed previously, recently collected evidence available from near-by the site indicates that the arsenic bearing material may be of fine particle size and is likely to be very soluble and bioavailable. Efforts to improve our understanding of arsenic absorption on this site would be both expensive, technically complex, and would require significant time; 2) while the State of Colorado is presently conducting protective biomonitoring in neighboring communities, there is no similar program in place to monitor actual exposure in the vicinity of Vasquez Blvd. and I-70; and 3) while there is an interest in pursuing longer-term clean-up options for the site, there is presently no established activity underway to implement longer-term options.

Lead:

Using standard default exposure assumptions, EPA's IEUBK model predicts an approximate 50% probability that children's (0-84 months) blood lead will exceed 10 µg/dL when soil lead concentrations exceed 2000 ppm. This predicted blood lead probability is considerably greater than the EPA goal of not more than a 5% probability of a childhood blood level greater than 10 µg/dL. Medical monitoring for childhood blood



lead has proceeded in the general vicinity of the Globeville smelter which is north and east of the neighborhoods of interest for this memorandum. A baseline study conducted in 1994 prior to soil remediation or community education. The results indicate relatively low blood lead concentration in children between the ages of 0-6 years. A summary of human biomonitoring conducted in the baseline monitoring program by the State of Colorado Department of Public Health and Environment in cooperation with the Agency for Toxic Substances and Disease Registry is presented in the table below. The data do not indicate that childhood lead exposure was excessive during the time that the samples were taken. This discrepancy between modeled and measured blood lead cannot be resolved with available data but is often noted in areas contaminated by mining and smelting wastes. In order to assure protection of childhood health steps should be taken to minimize exposures to soil lead concentrations greater than 2000 ppm. Additional exposure-based sampling would better define the nature of human exposure on the site and may better define the discrepancy between measured and modeled blood lead concentrations.

	number of individuals	average blood lead (ug/dL)	number of children >10ug/dL
Blood lead (0-6 years)	127	3.4	7 (5.5%)
Blood lead (>6 years)	799	2.9	0

Summary:

Recently collected surface soil data in the vicinity of Vasquez Blvd. and I-70 indicate the presence of elevated levels of arsenic and, to a lesser extent, lead. Levels of these levels exceed concentrations which may pose an imminent and substantial endangerment to human health following short term (6 months to 10 years) exposure. The primary exposure pathway is incidental ingestion of soil and dust by children in areas with poor ground cover or stressed vegetation where children may play. Steps should be taken to minimize exposure of children to arsenic in surface soils where levels are approximately 400 parts per million or greater. Lead exposure to surface soils greater than 2000 ppm are also of concern for children. Steps should be taken to minimize exposure of children to lead in surface soils where levels are approximately 2000ppm or greater.

cc: D. Skie
B. Murray
M. Dodson
B. LaVelle

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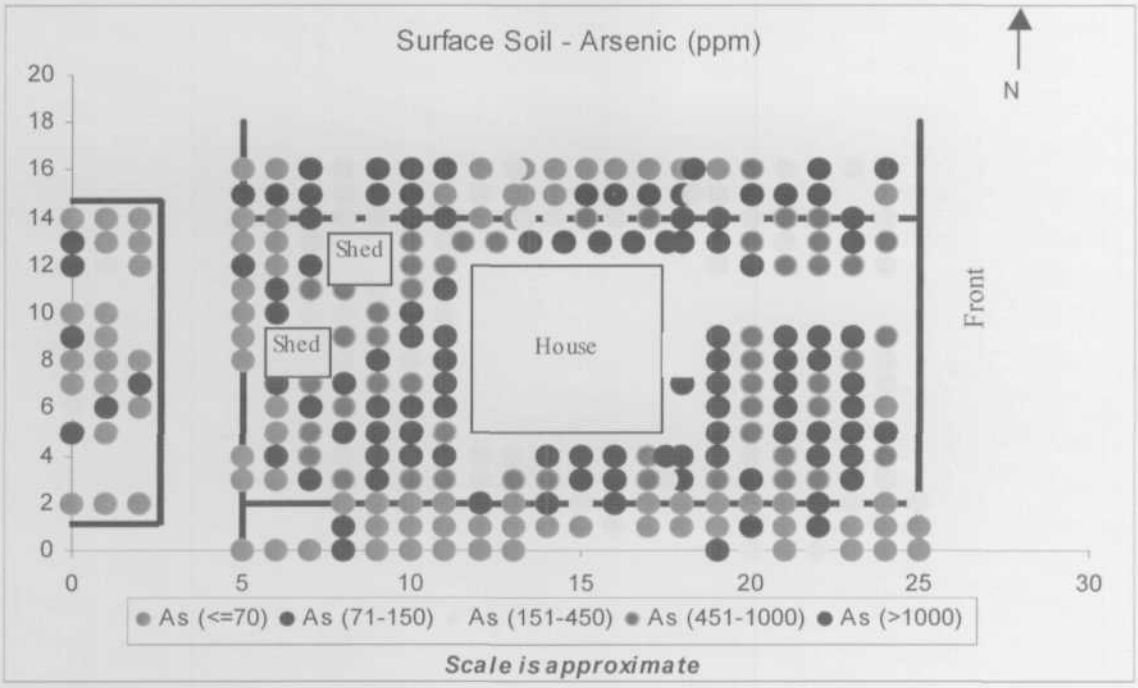
APPENDIX C

Figure 2-2 Spatial Distribution of Contaminants – Property 1



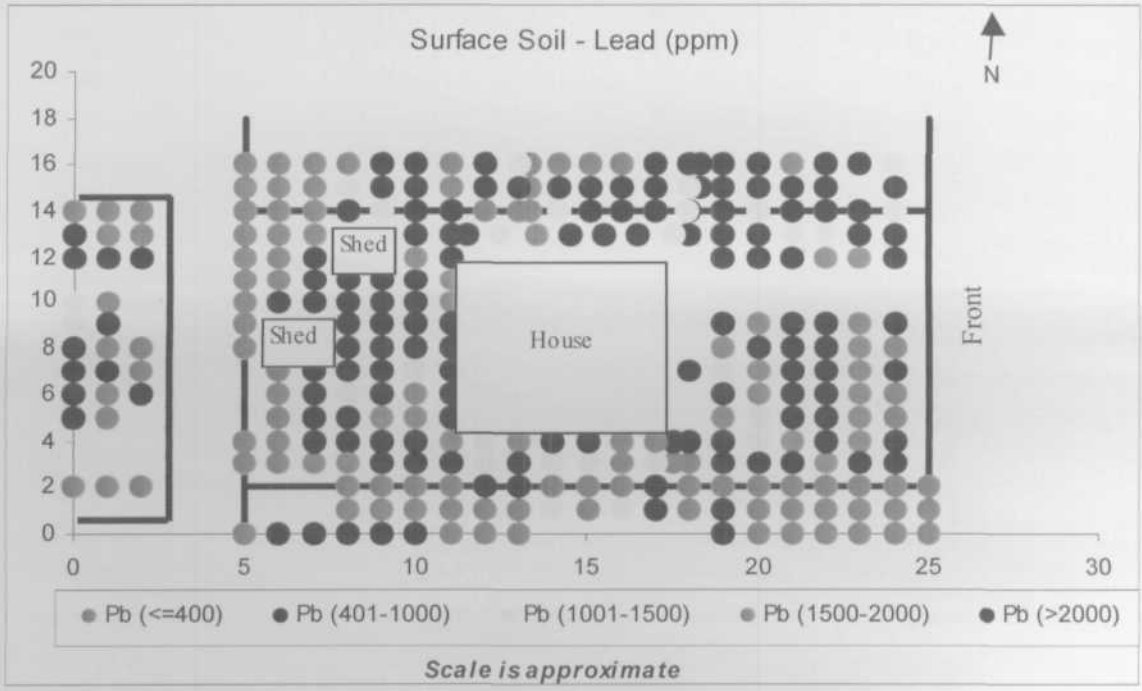
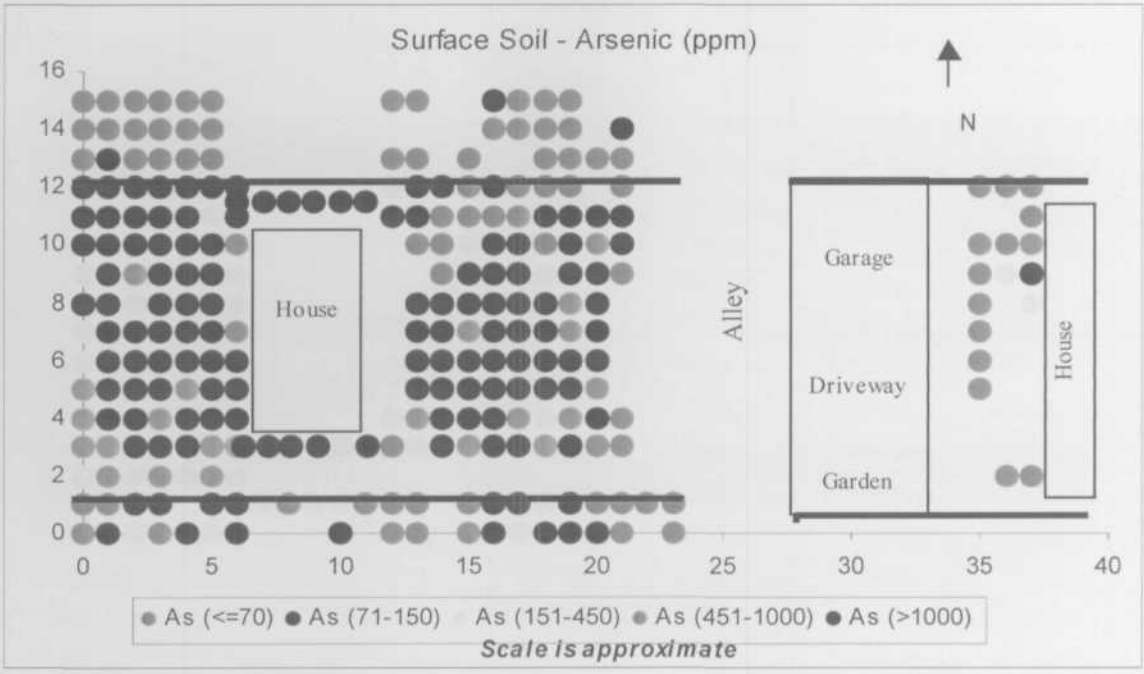
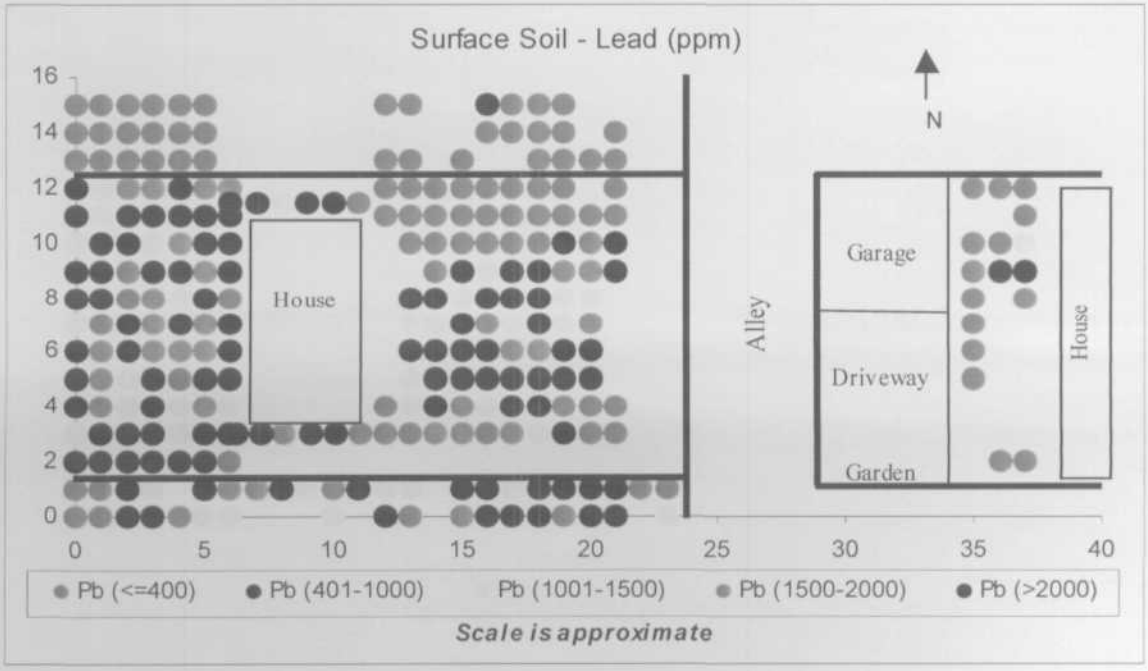


Figure 2-3 Spatial Distribution of Contaminants – Property 2





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APPENDIX D

Calculation of the 95% UCL

Currently, USEPA has established default methods for calculating the 95% UCL for distributions that are either normal or lognormal (see Supplemental Guidance to RAGS, OSWER Pub 9285.7-08):

Normal:

$$UCL = m + t_{1-\alpha,n-1} * \frac{s}{\sqrt{n}} \qquad (1)$$

where:

m	=	arithmetic mean of the data
s	=	standard deviation of the data
n	=	number of samples
$t_{1-\alpha,n-1}$	=	t-statistic for the (1-α) percentile of the t distribution with n-1 degrees of freedom

Lognormal:

$$UCL = \exp\left(m_t + 0.5s_t^2 + \frac{s_t H}{\sqrt{n-1}}\right) \qquad (2)$$

where:
m_t = mean of the log-transformed data
s_t = standard deviation of the log-transformed data
n = number of samples
H = H-statistic from table in OSWER Publication 9285.7-08

Equations for calculating the 95% UCL of the mean for distributions other than the normal and the lognormal are not readily available.

At this site, data from eight residential properties that were intensively sampled suggest the distribution of arsenic values within a residential property tends to be right-skewed, at least for properties where concentration values are substantially higher than average (see Figure D-1). This indicates that a log-normal distribution might be appropriate for characterizing the distributions at such locations. However, tests of the distribution at these impacted properties reveal that the data are not well characterized by a lognormal (or a normal) distribution (Figure D-2). The distribution of values at properties that are not impacted or minimally impacted (mean concentration = 40-70 mg/kg) appears to be more nearly normal (Figure D-3), but are still skewed at the low end by the presence of multiple values below the detection limit. Because the distributions are not well characterized as either normal or lognormal, use of either equation 1 or equation 2 as the basis for calculating the 95% UCL based on a series of grab samples might yield results that are not accurate.

One way to minimize problems associated with calculating the 95% UCL of the mean for nonstandard distributions is by compositing. This is because, regardless of the shape of the parent distribution, the distribution of the values of composite samples will approach a normal distribution if the number

of sub-samples is sufficiently large and the sub-samples are thoroughly mixed, allowing use of equation 1 for calculation of the UCL of the mean at a property. In addition, the variability between composite samples is less than between grab samples, so uncertainty in the mean of composite samples is usually less than for an equal number of grab samples. For these reasons, the Phase III soil sampling study utilized compositing of grab samples collected within a property.

Number of Grab Samples per Composite

In order to estimate the number of grab samples per composite needed to reduce intra-composite variability and to ensure that distribution of composites is approximately normal, Monte Carlo simulations were performed using site-specific data from properties that had been intensively sampled (140-160 data points per property). In these simulations, grab samples of size j (j = 5, 10, 15, 25, 30, 50 grabs per composite) were repeatedly drawn, and the composite mean was calculated as the mean of the grab samples. Then the distribution of the composite values was tested for normality. The results are presented in Appendix E of the Final Phase III Field Investigation Plan. Based on these tests, a set of 10 sub-samples was found to be adequate to ensure that the distribution of the composites drawn from minimally impacted properties (sample mean = 40-70 mg/kg) will be approximately normal.

At the intensively sampled properties that were clearly impacted (sample mean = 390-2370 mg/kg), the number of grab samples per composite needed to ensure that the distribution of composites is approximately normal is about 15-25. Thus, the distribution of the 10-point composite samples from such a property is likely to be somewhat right-skewed. For right skewed distributions, the median is less than the mean and therefore a single 10-point composite sample is more likely to be below the true mean than above the true mean. However, some 10-point composite sample values may be raised by very high although infrequent values and the mean of the three 10-point composite samples should, therefore, approach the true mean and use of equation 1 to calculate the 95% UCL could underestimate the true UCL. At such a location, it is expected that the identification of the property as potentially unacceptable can readily be made based on the sample mean. That is, if the sample mean indicates unacceptable risks, the property may be classified as potentially unacceptable without regard to the value of the UCL. Therefore, the possibility of incorrectly identifying the property as acceptable when it is really not acceptable is very small.

Number of Composites per Property

The number of composites per yard depends on the acceptable probability of requiring remedial action when no action is required (false positive). This is the case when a property is incorrectly identified as being above a level of concern when it is actually below a level of concern. In general, as the number of composites increases, the chances of making this type of error decreases. However, the exact number depends on the expected difference between the level associated with unacceptable risk and the typical level in unimpacted properties. That is, the wider the difference between the mean value at unimpacted properties and the level associated with unacceptable risks, the fewer samples that are needed. As noted above, EPA guidance recommends that the value be no more than 20%, and the goal of the study is to reduce the false positive error rate to the maximum extent that available resources will permit.

In order to investigate the relationship between the false positive error rate and the number of composites at this site, a Monte Carlo simulation was performed based on an assumed distribution of arsenic levels in unimpacted properties. This distribution was based on available data on arsenic levels in residential surface soil samples collected in the vicinity of the Globe plant (see Figure D-4). Each data point represents the measured arsenic value in a four-point composite from a residential property. Values higher than 70 mg/kg were assumed to represent potentially impacted properties, and were not considered in the approximation of the background distribution. Even though these data are from outside the VB/I-70 study area, the distribution of values is judged to be reasonably predictive for those that are expected to occur within the study area. Based on these data, the distribution of true property means at an unimpacted property was modeled as:

$$\text{Background} = LN(21,13)$$

where:

LN(21, 13) = lognormal distribution with parameters 21 and 13
21 = mean of the (untransformed) data
13 = standard deviation of the (untransformed) data

From this distribution, a series of random "true means" were selected, each representing a randomly selected background property. The inter-grab sample variability at each property with "true mean" m was simulated based on the observed range of inter-grab-sample variability at the eight properties that had been intensively sampled. At these properties, the coefficient of variation (CV = standard deviation/mean) ranged from about 0.8 to 1.2. Because this range was based on only 8 properties, a slightly wider range of variability (CV = 0.7 to 1.3) was assumed. Based on this, the standard deviation at a simulated property was simulated as:

$$s = m*CV$$
$$CV = TRI(0.7,1.0,1.3)$$

where:

TRI(0.7,1.0,1.3) = triangular distribution with parameters 0.7, 1.0, 1.3
0.7 = minimum value
1.0 = mode (most likely value)
1.3 = maximum value

For each simulated "true mean" and "true standard deviation," a series of grab samples was selected at random, and combined into n composites of j grab samples per composite. From these, the inter-composite means and standard deviation were calculated and used to calculate the 95% UCL using equation 1 (above). The false positive error rate was assessed by counting the number of properties where the "true mean" indicated risks were acceptable but the 95% UCL indicated risks were unacceptable.

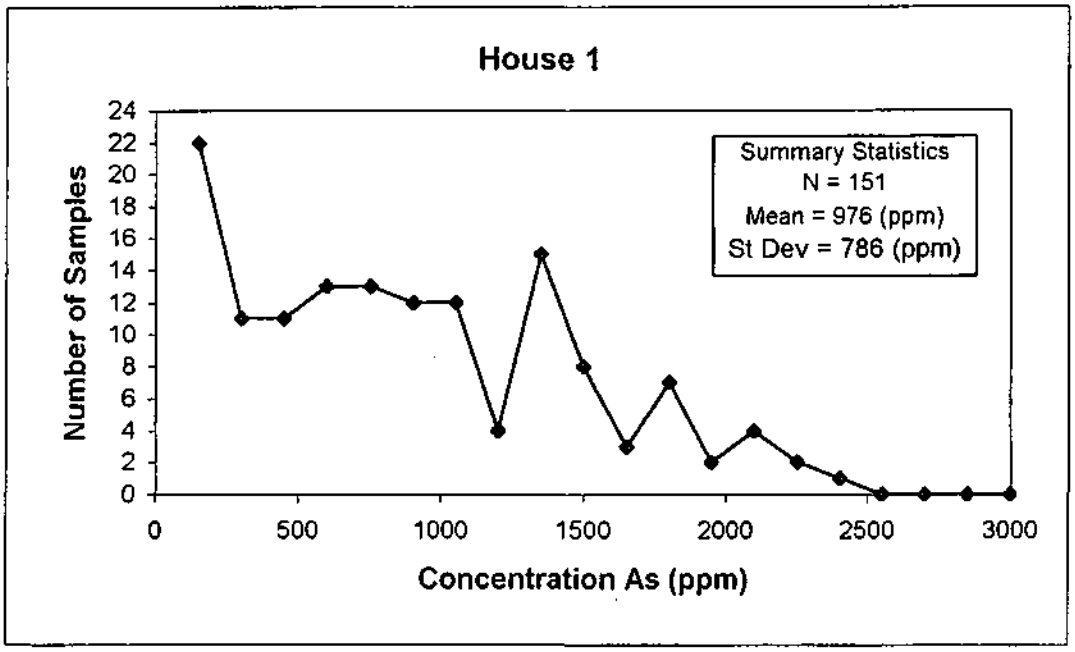
Because a site-specific acceptable level of arsenic in soil had not been derived, it was necessary to assume a value for the purposes of planning the design of Phase III. For arsenic, a value of 70 mg/kg was adopted. Employing an assumed acceptable level of 70 mg/kg and the estimated background distribution described above, and employing a grab sample size of 10, the simulated false positive error rates are as shown below:

Number of Composites	Estimated False Positive Error Rate
2	15%
3	4.1%
4	2.6%
6	1.5%

As seen, if only 2 composites were used, there would be a relatively high probability (about 15%) of declaring a property to be potentially unacceptable when it was actually acceptable. Use of three composites reduces the rate to about 4%, and this error rate can be reduced further by going to 4 or 6 composites. Although an error rate of 4% is very good by most standards, because of the large number of properties which must be evaluated at this site, even a rate this low results in a large number of errors (up to 120 residences).

Based on these findings, a phased approach to sampling and reducing false positive errors was developed. That is, samples collected at each property tested in Phase III included three composites of 10 grab samples each. All properties whose 95% UCL indicates unacceptable risks will be considered potentially unacceptable. However, because of the possibility of a false positive error, EPA may consider performing further sampling activities at such locations (especially those where the sample mean is close to or below the risk-based concentration) in order to determine whether the property actually does exceed an acceptable level. Further sampling may be done as part of remedial design.

Figure D-1: Distribution of Arsenic Values at Impacted Properties



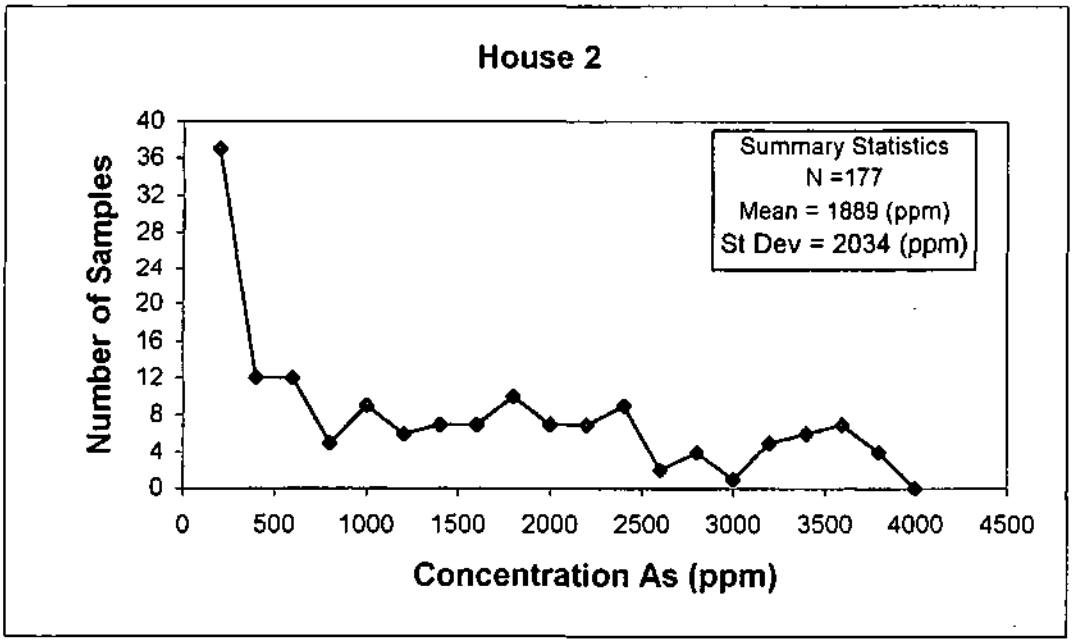
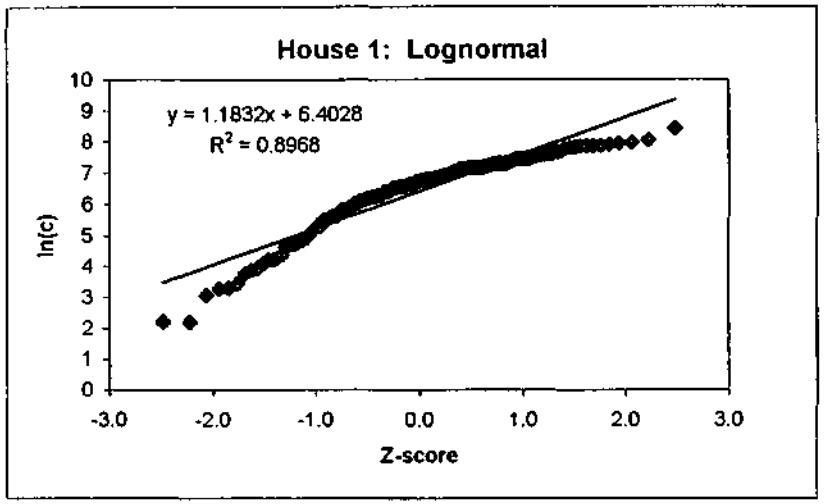
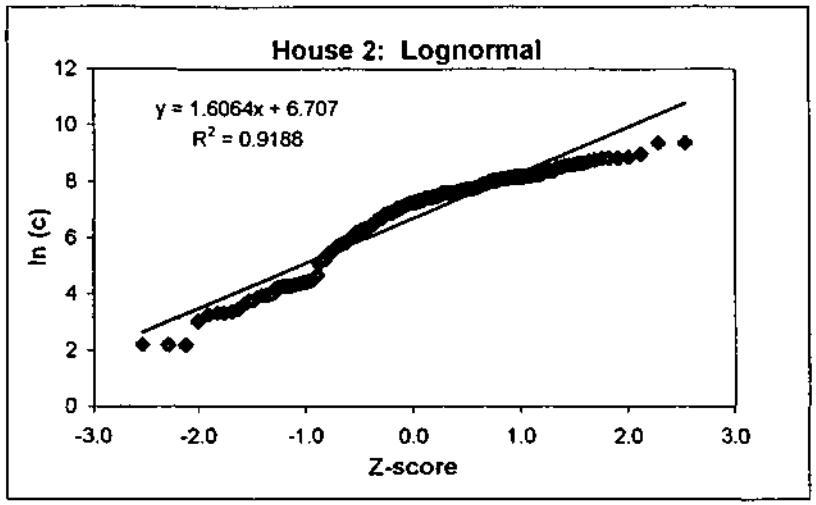
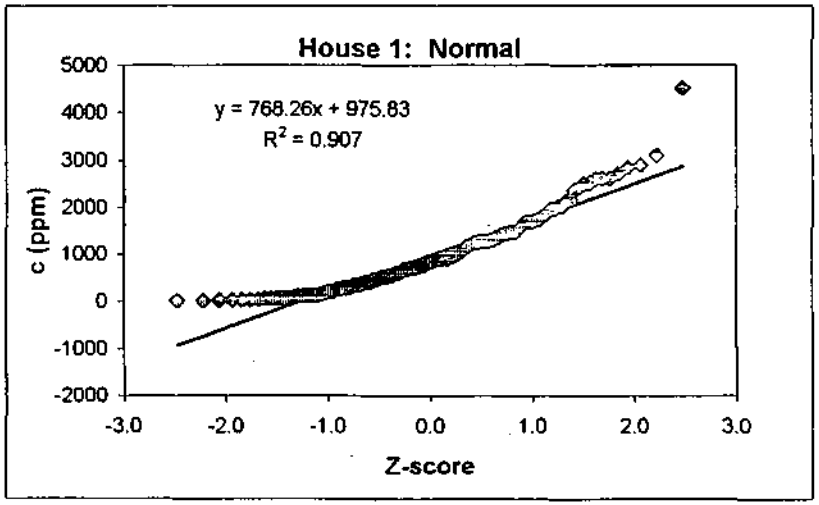


Figure D-2: Probability Plots of Arsenic Distribution at Impacted Properties







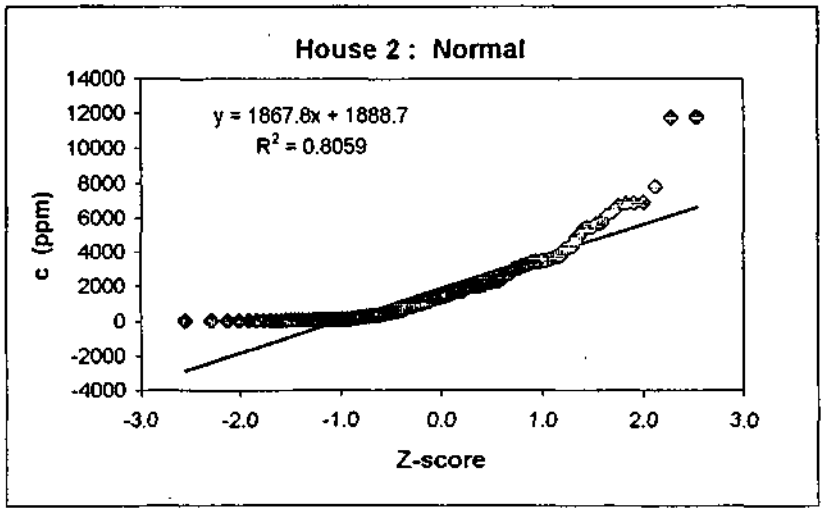
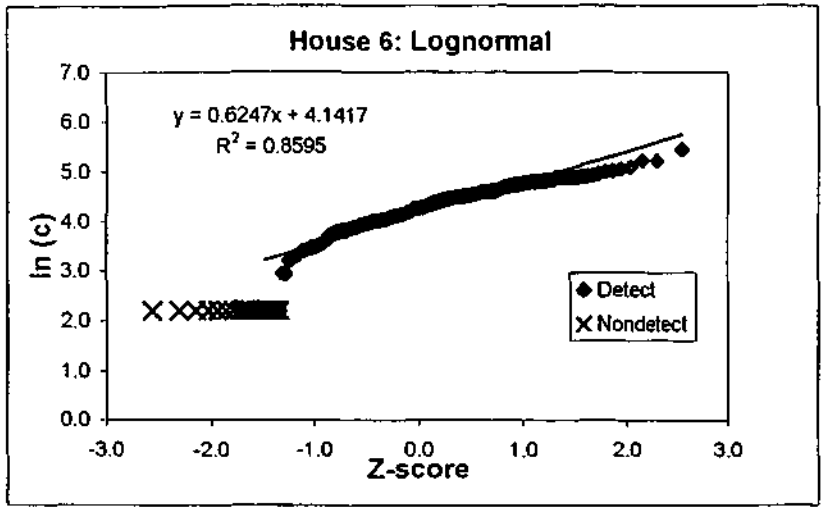
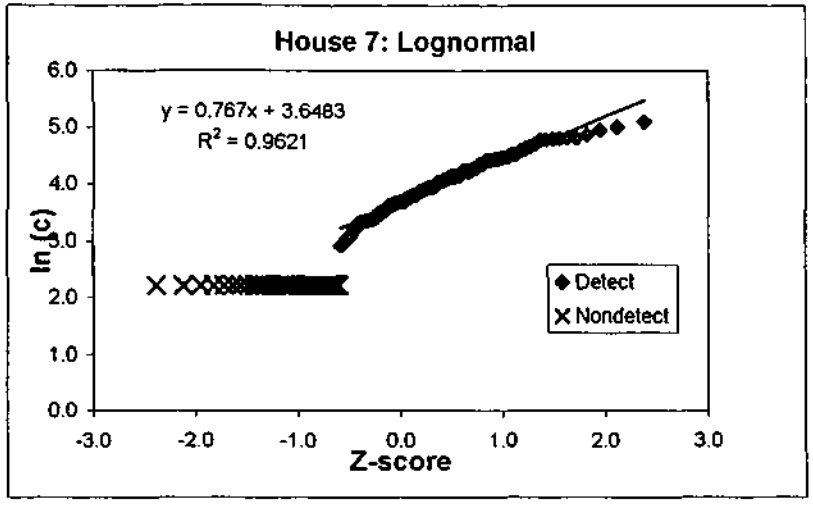
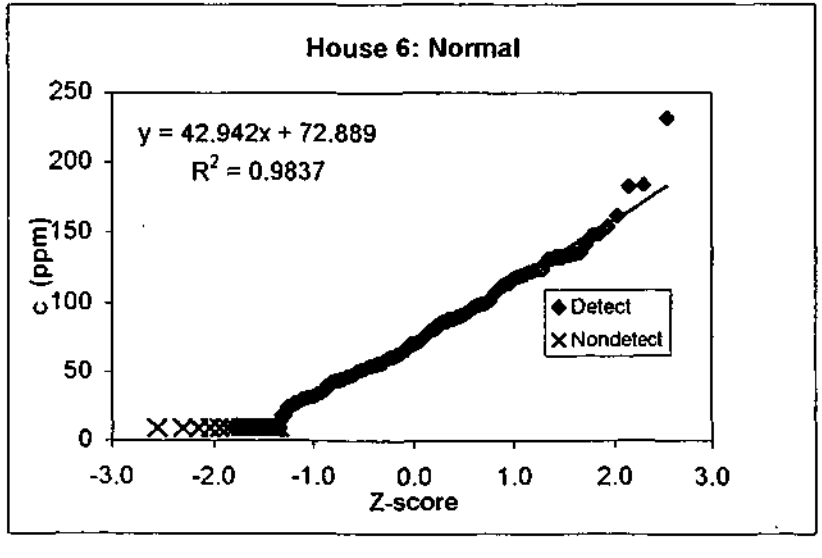


Figure D-3: Probability Plots of Arsenic Distribution for Minimally Impacted Properties







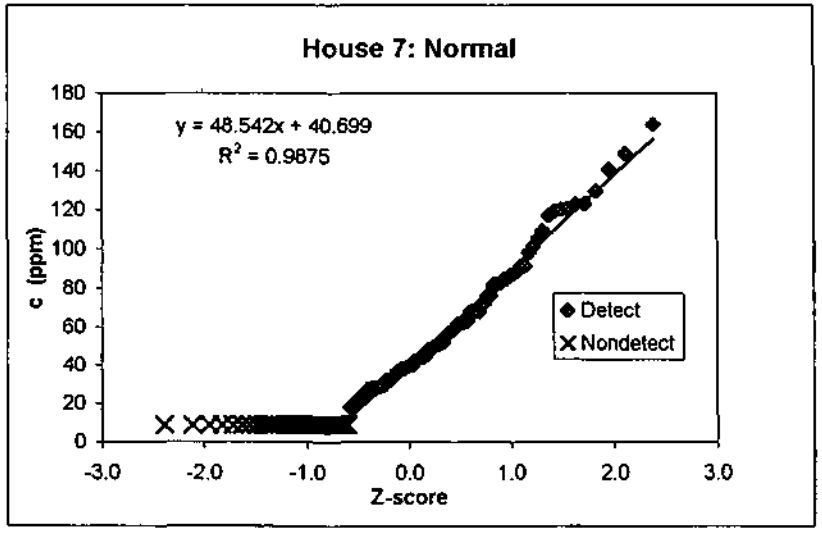
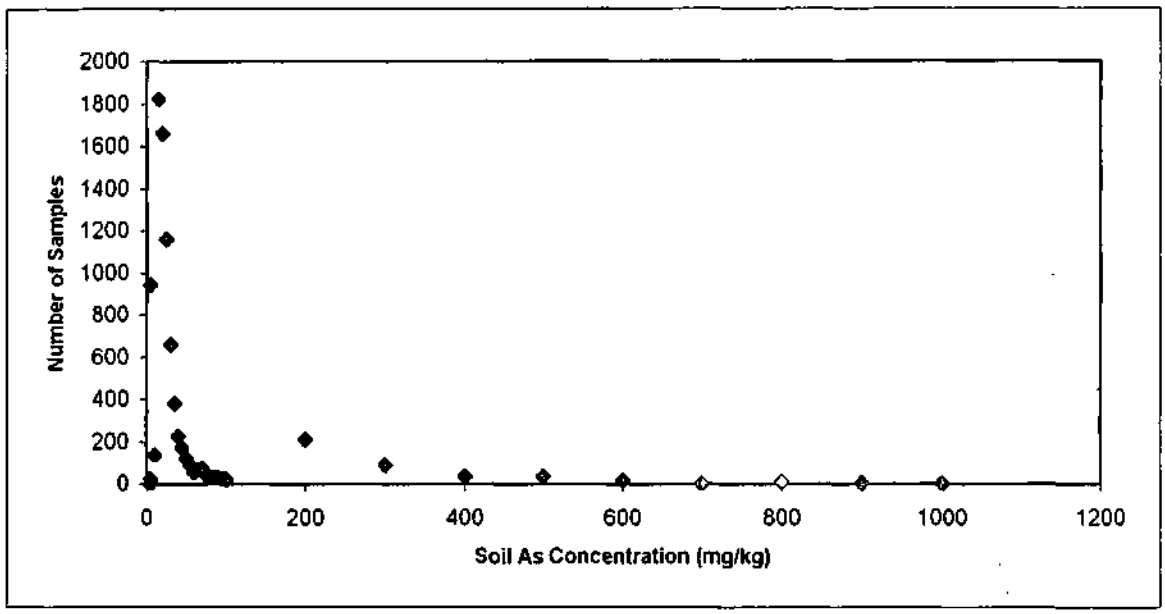
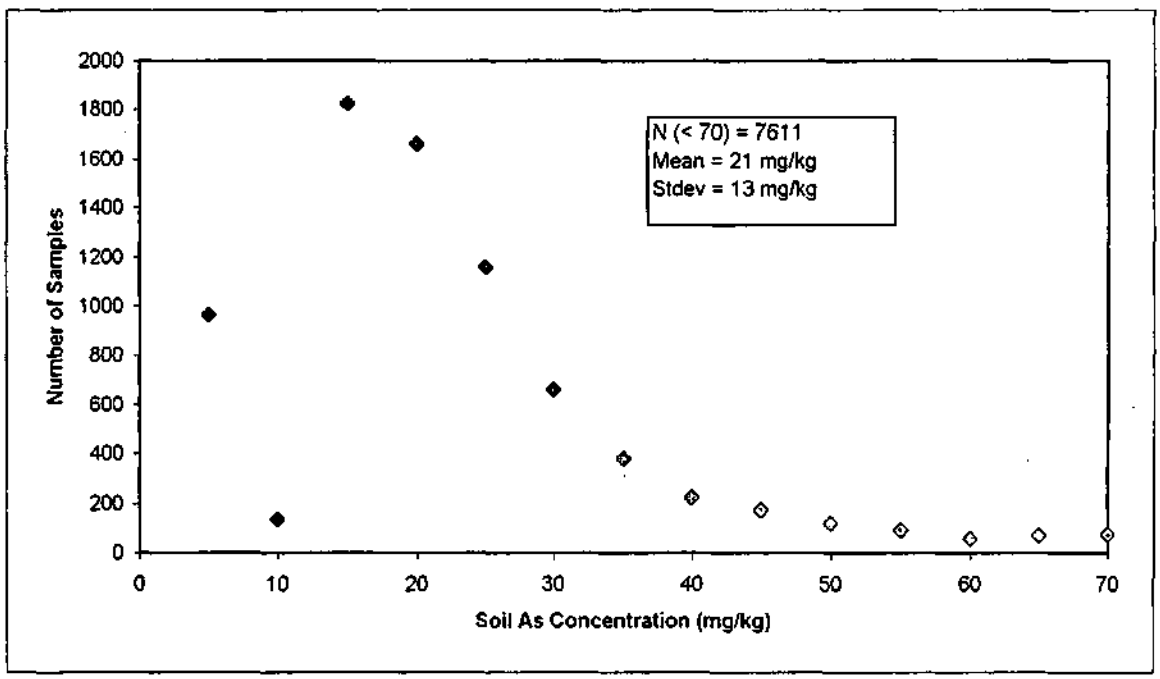


Figure D-4. Arsenic Levels in Surface Soil at Unimpacted Residences in the Globeville Area





Note: All samples below the detection limit (10 ppm) were assigned a value of 5 mg/kg

Data Source: ASARCO

TABBED PAGE

APPENDIX E

APPENDIX E

Characterization Data from the
Study on
Relative Bioavailability of Arsenic
in VB/I-70 Site Soils

EXECUTIVE SUMMARY

The gastrointestinal absorption of arsenic from soil samples collected from residential properties at the Vasquez Boulevard and I-70 (VBI70) Superfund site was measured using young swine. Test materials include composite soil samples from five different residences with arsenic levels ranging from 290 to 860 ppm. In addition, one sample was prepared by mixing clean site soil (arsenic < 10 ppm) with an arsenical herbicide (PAX) to yield a concentration of about 460 ppm. Groups of animals (four animals per dose group) were given oral doses of reference material (sodium arsenate) or test material twice a day for 12 days. Urine excreted by each animal was collected on days 6-7, 8-9 and 10-11. The urinary excretion fraction (UEF) (the ratio of the amount excreted per 48 hours divided by the dose given per 48 hours) was calculated for each test material using linear regression analysis. The relative bioavailability (RBA) of arsenic in test material compared to that in sodium arsenate (abbreviated NaAs) was calculated as:

$$RBA = \frac{UEF(test\ material)}{UEF(NaAs)}$$

The results are summarized below:

Test Material	Description	Neighborhood	Arsenic Conc. (ppm)	Relative Bioavailability	
				Best Est.	90% CI
TM1	Soil composite from impacted residential property	Eastern Swansea/Elyria	312	0.35	0.26 – 0.45
TM2	Soil composite from impacted residential property	Western Swansea/Elyria	983	0.45	0.38 – 0.52
TM3	Soil composite from impacted residential property	Eastern Cole	390	0.36	0.31 – 0.42
TM4	Soil composite from impacted residential property	Western Cole	813	0.21	0.17 – 0.25
TM5	Soil composite from impacted residential property	Clayton	368	0.18	0.15 – 0.21
TM6	Clean site soil plus added PAX	Swansea/Elyria	516	0.23	0.19 – 0.28

An estimate of the site-wide mean RBA value may be derived by combining the values across all five site samples (TM1–TM5). Because of the inherent variability and uncertainty in the data, the 95% UCL of the site-wide mean RBA value is recommended for use in calculation of human risk from ingestion of arsenic in site soils. The results are shown below:

Statistic	Value
Mean	0.31
95% UCL	0.42

Based on a consideration of all available data, a final RBA value of 0.42 is recommended.

Sample Speciation

An aliquot of each test material was analyzed by electron microprobe in order to identify the different mineral forms of arsenic that were present in the sample and to estimate approximately how much of the total arsenic was present in each form. The detailed results are presented in Appendix A, and the results are summarized below:

Arsenic Speciation Data

Test Material	Number of Grains Counted	Relative Arsenic Mass			Particle Size (um)		
		As_2O_3	PbAsO	All Other	<10	10-50	>50
TM1	262	54.3%	31.9%	13.8%	88.5%	10.7%	0.4%
TM2	128	22.1%	70.0%	7.9%	78.1%	19.5%	0.0%
TM3	104	81.0%	5.6%	13.4%	72.1%	26.9%	0.0%
TM4	144	87.1%	10.0%	3.0%	73.6%	24.3%	1.4%
TM5	134	96.8%	--	3.2%	72.4%	27.6%	0.0%
TM6	133	80.1%	18.2%	1.7%	86.5%	12.0%	0.0%

Inspection of these data reveals the following main observations:

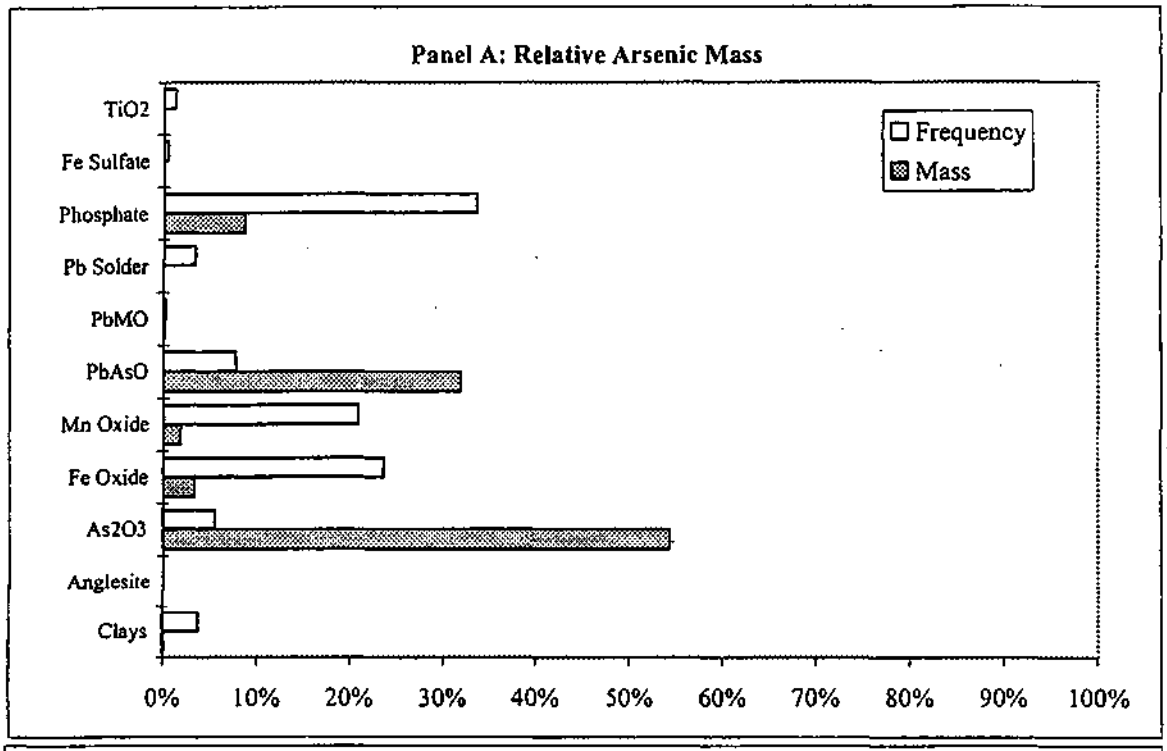
- Arsenic in most site soils consists mainly as arsenic trioxide (As_2O_3) and lead arsenic oxide (PbAsO).
- Most arsenic (72% to 88%) occurs in particles that are smaller than 10 um in diameter.
- Essentially all arsenic-bearing grains are "liberated" (i.e., they are not contained within any other matrix).

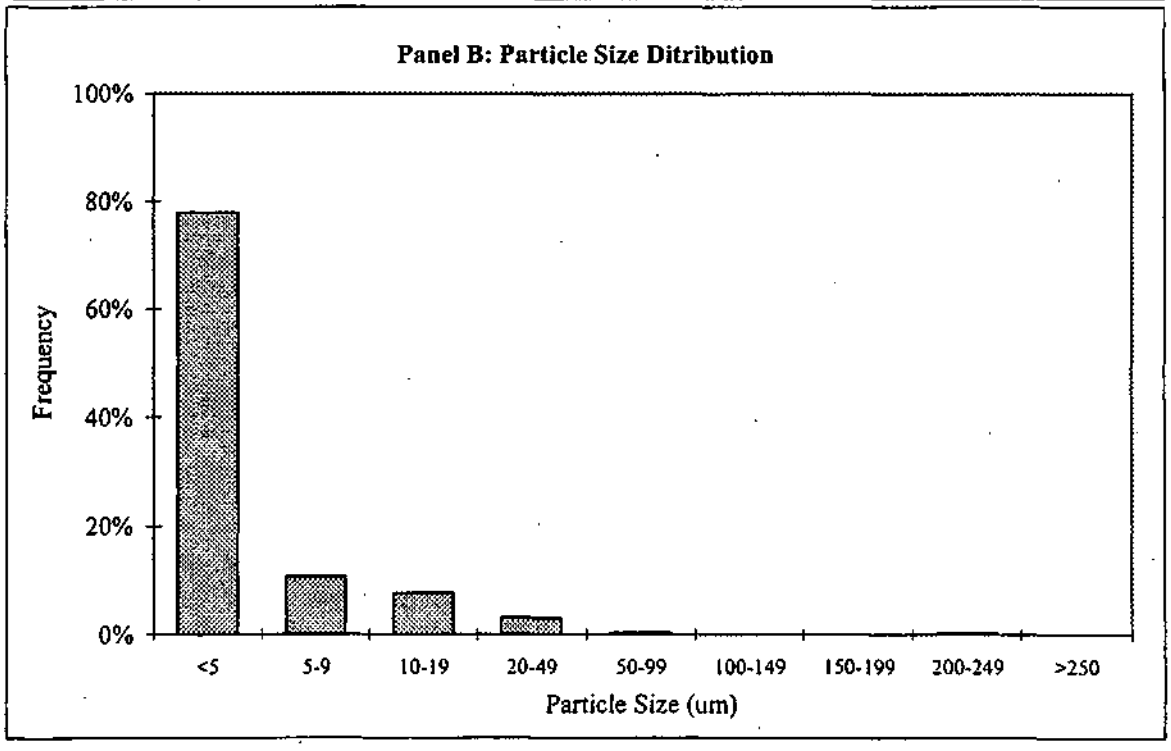
It is important to note that these quantitative estimates of particle frequency and relative arsenic mass are based on examination of a relatively small number of arsenic-bearing particles (N = 104 to 262) in each sample. Consequently, the quantitative values reported should not be considered to be highly precise, and apparent differences between samples may be due to random variation in the analysis rather than authentic differences in composition.

Test Material 1 - Arsenic
Speciation Summary Statistics

	COUNTS		SIZE			Count Freq (%)		LW Freq (%)		Rel. Arsenic Mass (%)	
Mineral	Total	Lib	Avg	Min	Max	Total	Liberated	Total	Liberated	Total	Liberated
Clays	5	5	9	2	30	1.9%	1.9%	3.7%	3.7%	0.2%	0.2%
Anglesite	1	1	1	1	1	0.4%	0.4%	0.1%	0.1%	0.0%	0.0%
As2O3	7	7	10	7	11	2.7%	2.7%	5.4%	5.4%	54.3%	54.3%
Fe Oxide	25	25	12	2	42	9.5%	9.5%	23.6%	23.6%	3.2%	3.2%
Mn Oxide	39	39	7	1	50	14.9%	14.9%	20.8%	20.8%	1.8%	1.8%
PbAsO	52	52	2	1	11	19.8%	19.8%	7.6%	7.6%	31.9%	31.9%
PbMO	1	1	3	3	3	0.4%	0.4%	0.2%	0.2%	0.1%	0.1%
Pb Solder	2	2	21	1	40	0.8%	0.8%	3.3%	3.3%	0.0%	0.0%
Phosphate	128	128	3	1	200	48.9%	48.9%	33.5%	33.5%	8.5%	8.5%
Fe Sulfate	1	1	6	6	6	0.4%	0.4%	0.5%	0.5%	0.1%	0.1%
TiO2	1	1	15	15	15	0.4%	0.4%	1.2%	1.2%	0.0%	0.0%
TOTAL	262	262	5			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Test Material 1 - Speciation and Particle Size Data

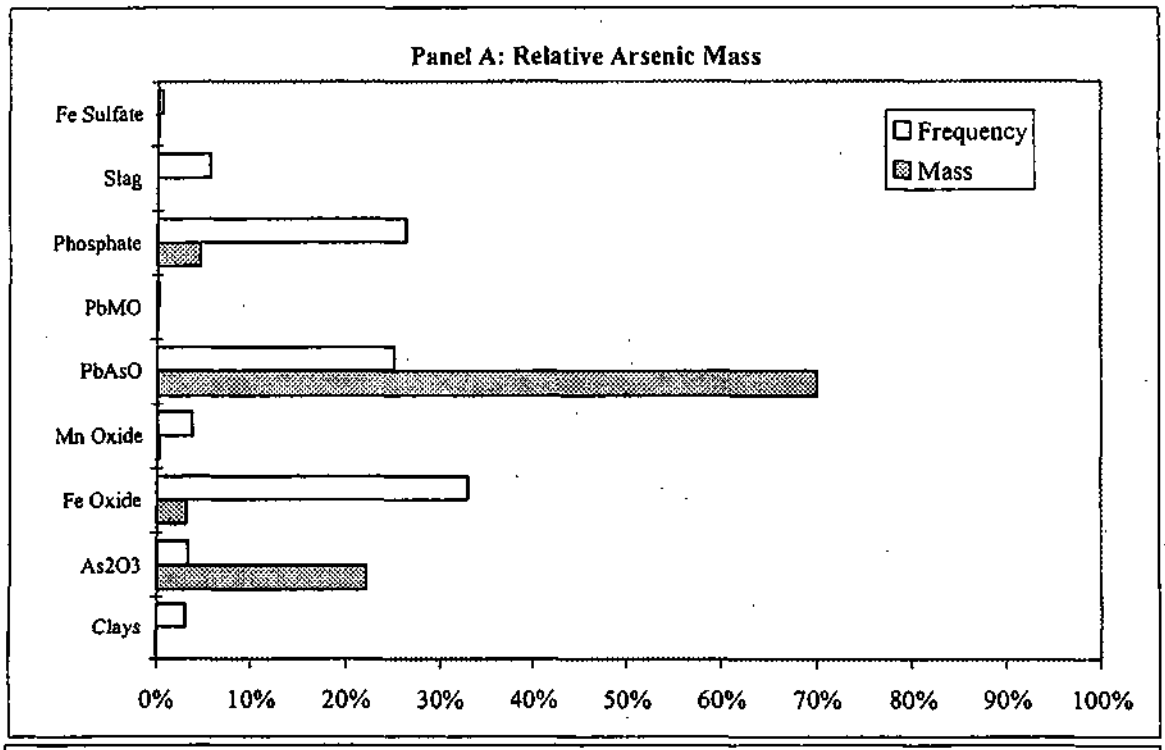


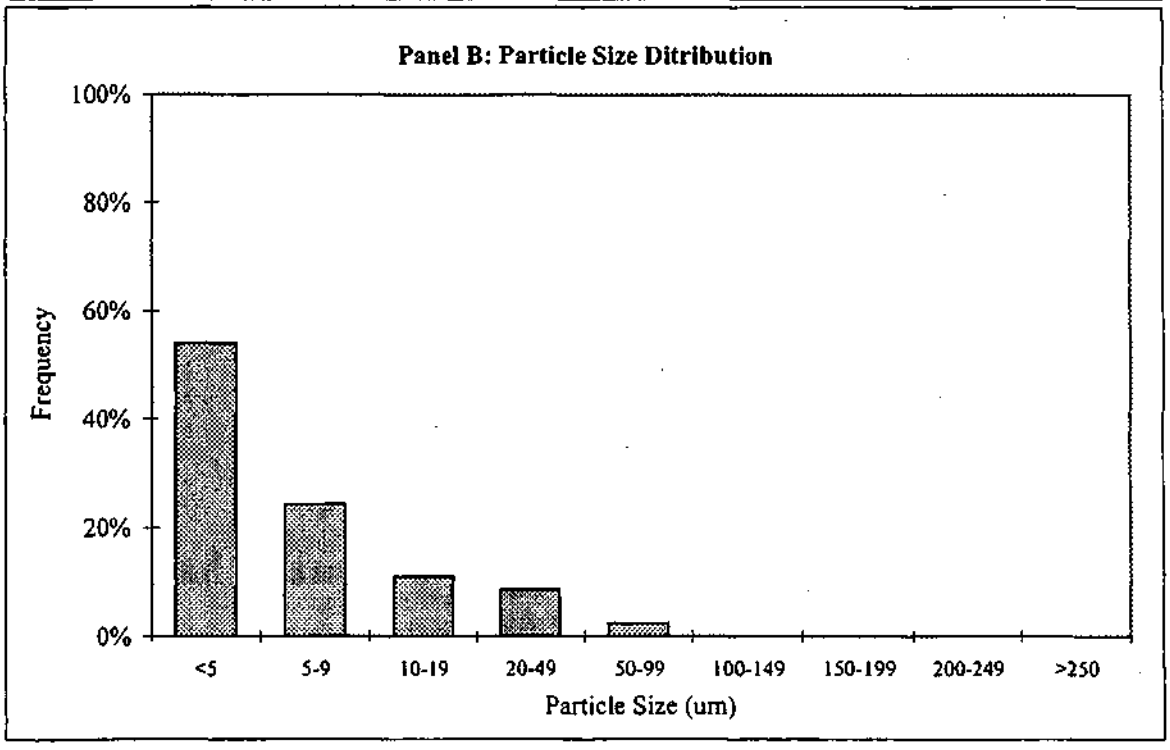


Test Material 2 - Arsenic
Speciation Summary Statistics

	COUNTS		SIZE			Count Freq (%)		LW Freq (%)		Rel. As Mass (%)	
Mineral	Total	Lib	Avg	Min	Max	Total	Liberated	Total	Liberated	Total	Liberated
Clays	5	5	7	2	25	3.9%	3.9%	3.0%	3.0%	0.1%	0.1%
As2O3	7	7	5	1	12	5.5%	5.5%	3.3%	3.3%	22.1%	22.1%
Fe Oxide	24	24	15	3	88	18.8%	18.8%	32.9%	32.9%	3.0%	3.0%
Mn Oxide	5	5	8	3	12	3.9%	3.9%	3.6%	3.6%	0.2%	0.2%
PbAsO	54	54	5	1	80	42.2%	42.2%	25.0%	25.0%	70.0%	70.0%
PbMO	2	2	1	1	1	1.6%	1.6%	0.2%	0.2%	0.1%	0.1%
Phosphate	28	28	10	1	45	21.9%	21.9%	26.1%	26.1%	4.4%	4.4%
Slag	2	2	30	28	32	1.6%	1.6%	5.4%	5.4%	0.0%	0.0%
Fe Sulfate	1	1	5	5	5	0.8%	0.8%	0.5%	0.5%	0.0%	0.0%
TOTAL	128	128	9			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Test Material 2 - Speciation and Particle Size Data

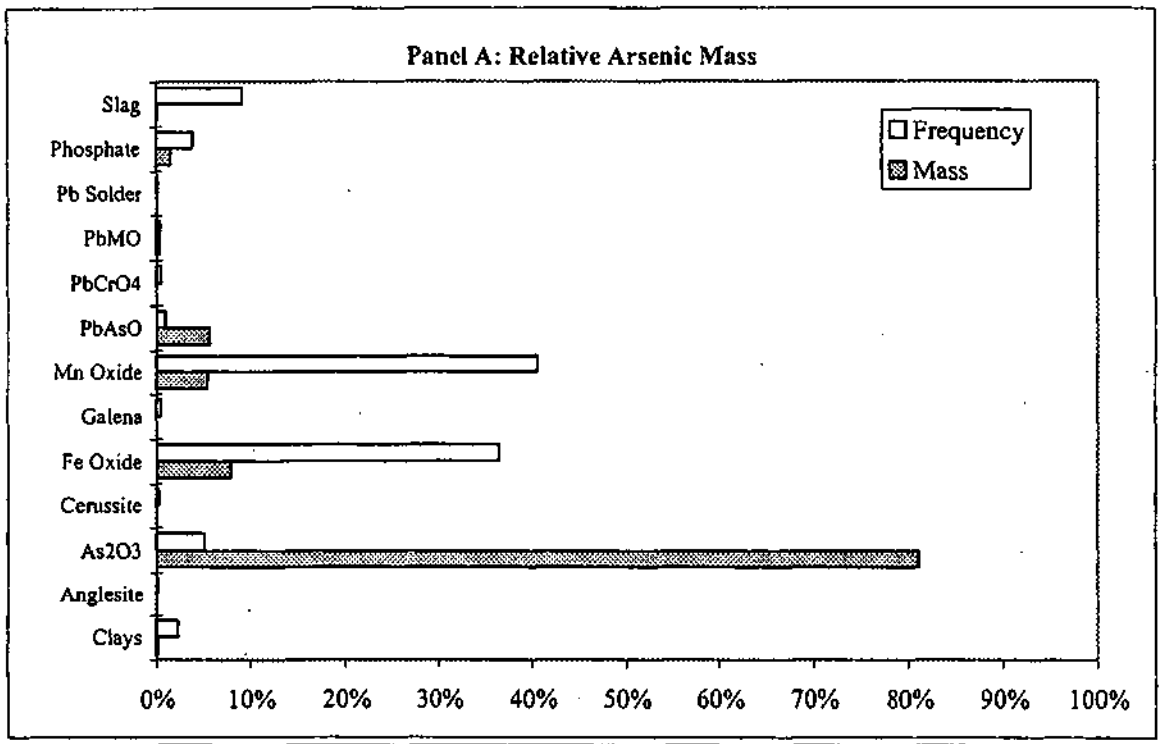


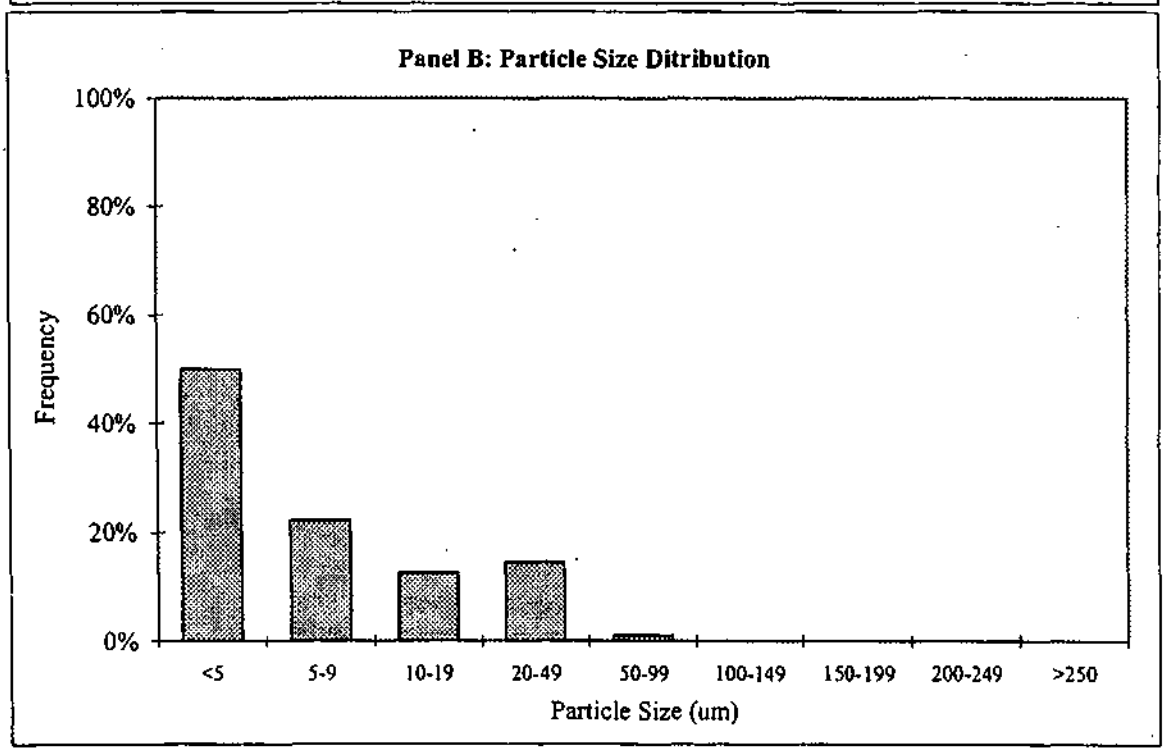


Test Material 3 - Arsenic
Speciation Summary Statistics

	COUNTS		SIZE			Count Freq (%)		LW Freq (%)		Rel. As Mass (%)	
Mineral	Total	Lib	Avg	Min	Max	Total	Liberated	Total	Liberated	Total	Liberated
Clays	7	7	3	1	8	6.7%	6.7%	2.3%	2.3%	0.1%	0.1%
Anglesite	1	1	1	1	1	1.0%	1.0%	0.1%	0.1%	0.0%	0.0%
As2O3	8	8	6	2	9	7.7%	7.7%	5.2%	5.2%	81.0%	81.0%
Cerussite	2	2	1	1	1	1.9%	1.9%	0.2%	0.2%	0.0%	0.0%
Fe Oxide	28	28	12	1	45	26.9%	26.9%	36.4%	36.4%	7.8%	7.8%
Galena	4	4	1	1	2	3.8%	3.8%	0.5%	0.5%	0.0%	0.0%
Mn Oxide	22	22	17	2	38	21.2%	21.2%	40.6%	40.6%	5.4%	5.4%
PbAsO	6	6	1	1	3	5.8%	5.8%	0.9%	0.9%	5.6%	5.6%
PbCrO4	1	1	5	5	5	1.0%	1.0%	0.5%	0.5%	0.0%	0.0%
PbMO	3	3	1	1	1	2.9%	2.9%	0.3%	0.3%	0.3%	0.3%
Pb Solder	1	1	1	1	1	1.0%	1.0%	0.1%	0.1%	0.0%	0.0%
Phosphate	20	20	2	1	8	19.2%	19.2%	3.9%	3.9%	1.5%	1.5%
Slag	1	1	85	85	85	1.0%	1.0%	9.1%	9.1%	0.0%	0.0%
TOTAL	104	104	9			76.0%	76.0%	100.0%	100.0%	100.0%	100.0%

Test Material 3 - Speciation and Particle Size Data

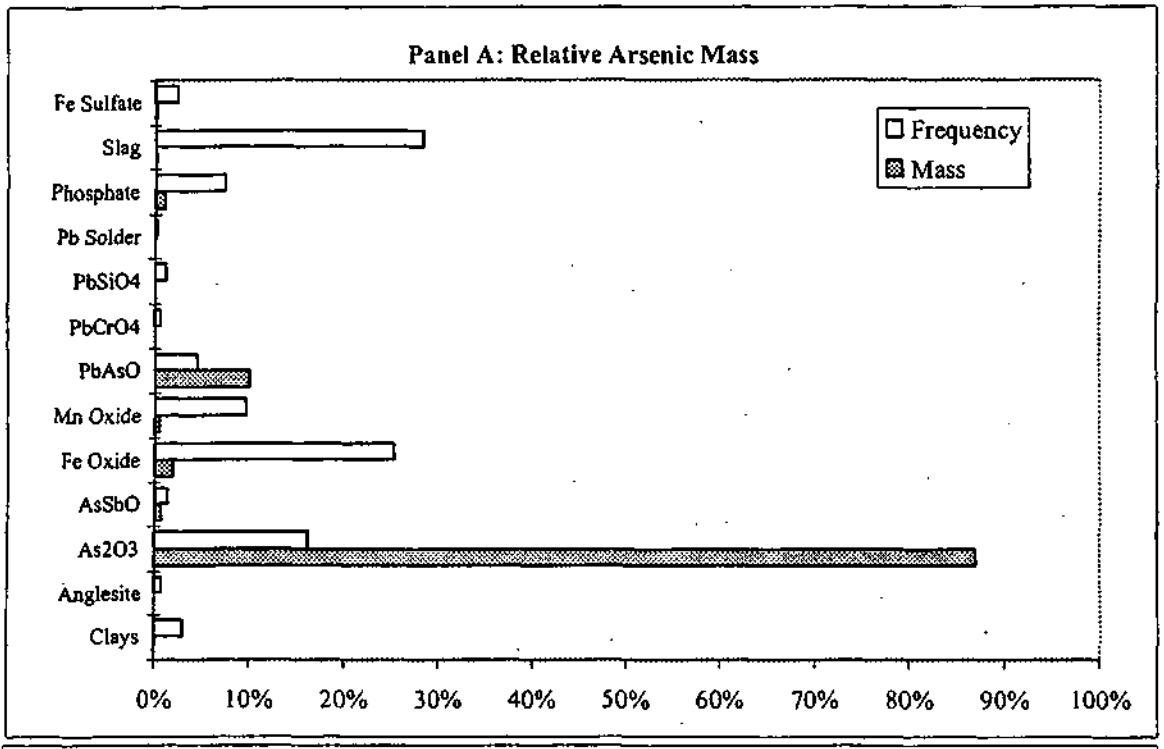


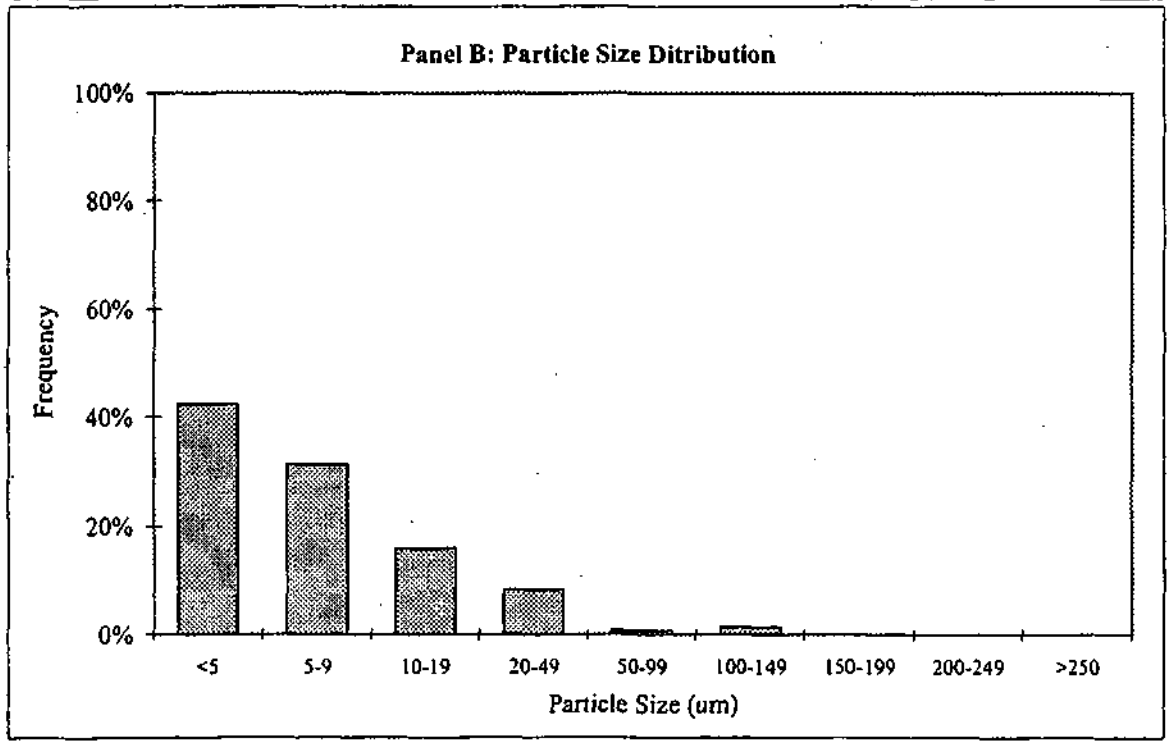


Test Material 4 - Arsenic
Speciation Summary Statistics

Mineral	COUNTS		SIZE			Count Freq (%)		LW Freq (%)		Rel. As Mass (%)	
	Total	Lib	Avg	Min	Max	Total	Liberated	Total	Liberated	Total	Liberated
Clays	9	9	5	1	11	6.3%	6.3%	3.0%	3.0%	0.1%	0.1%
Anglesite	3	3	3	1	8	2.1%	2.1%	0.7%	0.7%	0.0%	0.0%
As2O3	33	33	7	1	22	22.9%	22.9%	16.2%	16.2%	87.1%	87.1%
AsSbO	3	3	6	2	8	2.1%	2.1%	1.3%	1.3%	0.6%	0.6%
Fe Oxide	40	40	9	1	32	27.8%	27.8%	25.2%	25.2%	1.9%	1.9%
Mn Oxide	14	14	10	2	25	9.7%	9.7%	9.6%	9.6%	0.4%	0.4%
PbAsO	4	4	16	1	60	2.8%	2.8%	4.5%	4.5%	10.0%	10.0%
PbCrO4	1	1	8	8	8	0.7%	0.7%	0.6%	0.6%	0.0%	0.0%
PbSiO4	2	2	8	3	12	1.4%	1.4%	1.1%	1.1%	0.0%	0.0%
Pb Solder	1	1	2	2	2	0.7%	0.7%	0.1%	0.1%	0.0%	0.0%
Phosphate	20	20	5	1	38	13.9%	13.9%	7.3%	7.3%	1.0%	1.0%
Slag	8	8	50	8	125	5.6%	5.6%	28.3%	28.3%	0.0%	0.0%
Fe Sulfate	6	6	5	2	8	4.2%	4.2%	2.3%	2.3%	0.2%	0.2%
TOTAL	144	144	10			75.7%	75.7%	100.00%	100.00%	100.0%	100.0%

Test Material 4 - Speciation and Particle Size Data

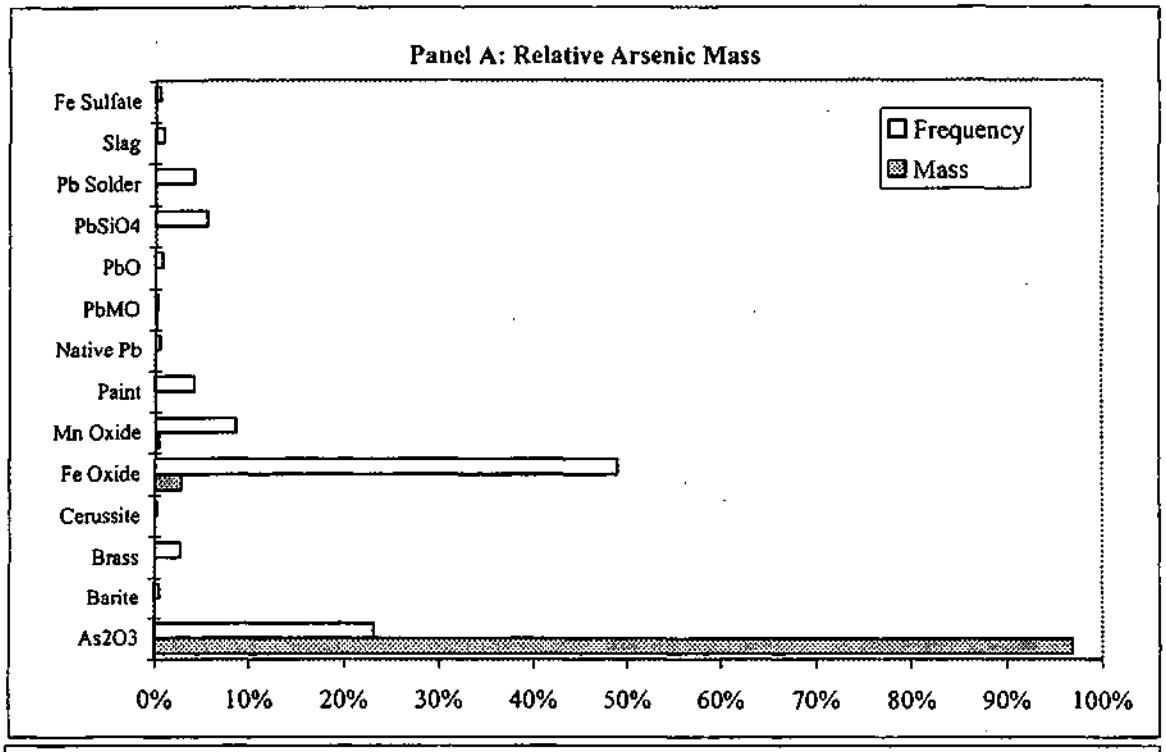


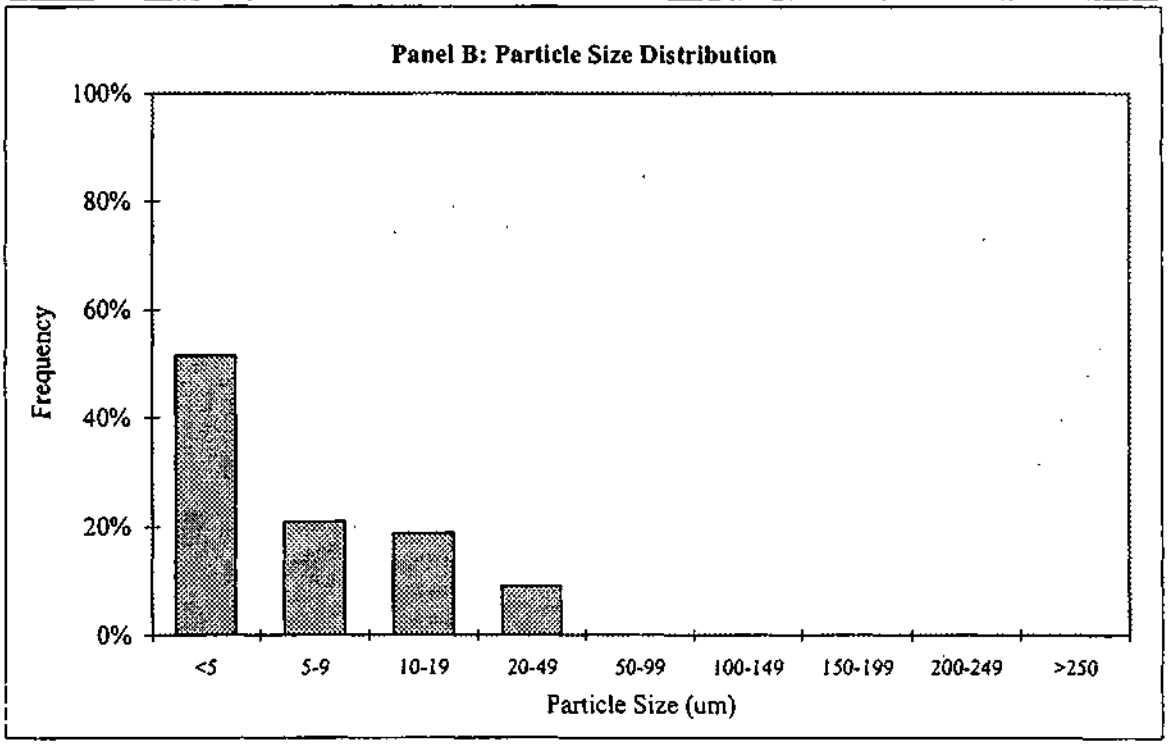


Test Material 5 - Arsenic
Speciation Summary Statistics

Mineral	Counts		Size (um)			Count Freq (%)		LW Freq (%)		Rel. As Mass (%)	
	Total	Lib	Avg	Min	Max	Total	Liberated	Total	Liberated	Total	Liberated
As2O3	35	35	7	2	17	26.1%	26.1%	23.1%	23.1%	96.8%	96.8%
Barite	2	2	3	2	3	1.5%	1.5%	0.4%	0.4%	0.0%	0.0%
Brass	3	3	10	2	25	2.2%	2.2%	2.7%	2.7%	0.0%	0.0%
Cerussite	2	2	1	1	1	1.5%	1.5%	0.2%	0.2%	0.0%	0.0%
Fe Oxide	38	38	14	2	45	28.4%	28.4%	48.9%	48.9%	2.8%	2.8%
Mn Oxide	3	3	32	15	42	2.2%	2.2%	8.5%	8.5%	0.3%	0.3%
Paint	1	1	45	45	45	0.7%	0.7%	4.0%	4.0%	0.0%	0.0%
Native Pb	1	1	4	4	4	0.7%	0.7%	0.4%	0.4%	0.0%	0.0%
PbMO	1	1	3	3	3	0.7%	0.7%	0.3%	0.3%	0.1%	0.1%
PbO	1	1	8	8	8	0.7%	0.7%	0.7%	0.7%	0.0%	0.0%
PbSiO4	24	24	3	1	8	17.9%	17.9%	5.5%	5.5%	0.0%	0.0%
Pb Solder	16	16	3	1	15	11.9%	11.9%	4.0%	4.0%	0.0%	0.0%
Slag	6	6	2	1	3	4.5%	4.5%	0.8%	0.8%	0.0%	0.0%
Fe Sulfate	1	1	5	5	5	0.7%	0.7%	0.4%	0.4%	0.0%	0.0%
TOTAL	134	134	8.3			100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Test Material 5 - Speciation and Particle Size Data

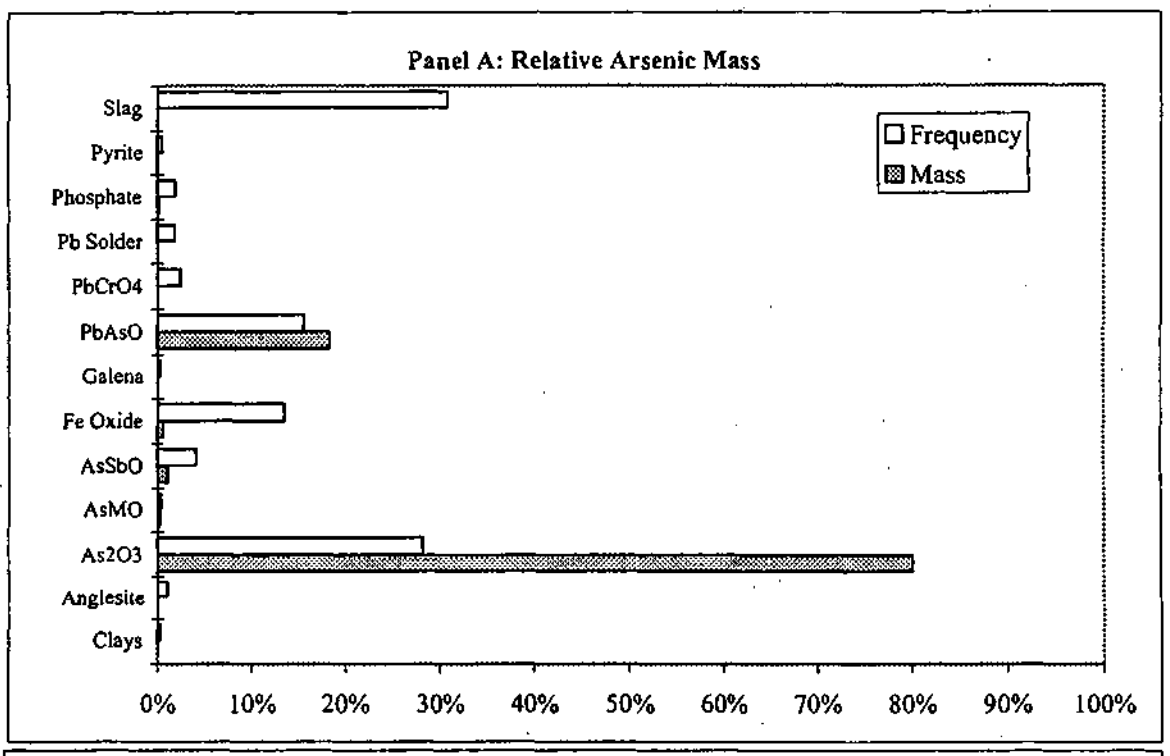


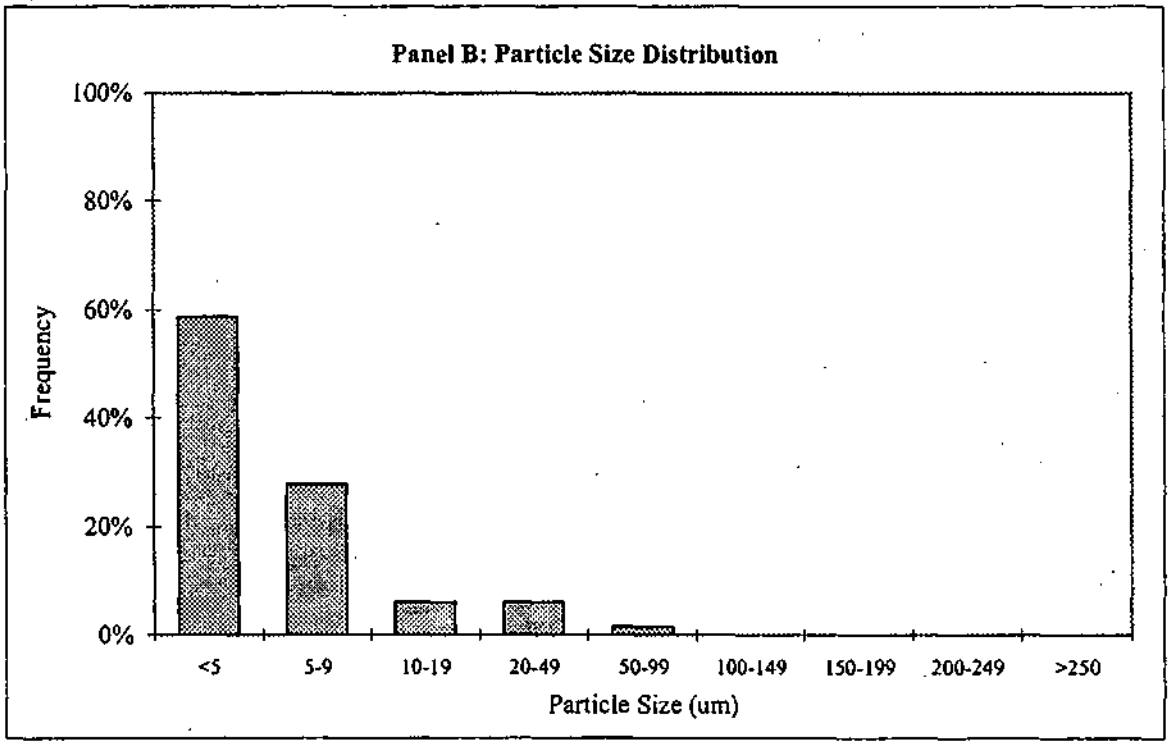


Test Material 6 - Arsenic
Speciation Summary Statistics

	COUNTS		SIZE			Count Freq (%)		LW Freq (%)		Rel. As Mass (%)	
Mineral	Total	Lib	Avg	Min	Max	Total	Liberated	Total	Liberated	Total	Liberated
Clays	1	1	2	2	2	0.8%	0.8%	0.2%	0.2%	0.0%	0.0%
Anglesite	8	8	1	1	1	6.0%	6.0%	1.0%	1.0%	0.0%	0.0%
As2O3	30	30	8	2	26	22.6%	22.6%	28.2%	28.2%	80.1%	80.1%
AsMO	1	1	2	2	2	0.8%	0.8%	0.2%	0.2%	0.1%	0.1%
AsSbO	7	7	5	1	9	5.3%	5.3%	4.0%	4.0%	1.0%	1.0%
Fe Oxide	7	7	16	3	48	5.3%	5.3%	13.4%	13.4%	0.5%	0.5%
Galena	1	1	2	2	2	0.8%	0.8%	0.2%	0.2%	0.0%	0.0%
PbAsO	47	47	3	1	8	35.3%	35.3%	15.5%	15.5%	18.2%	18.2%
PbCrO4	20	20	1	1	1	15.0%	15.0%	2.4%	2.4%	0.0%	0.0%
Pb Solder	1	1	15	15	15	0.8%	0.8%	1.8%	1.8%	0.0%	0.0%
Phosphate	2	2	8	1	14	1.5%	1.5%	1.8%	1.8%	0.1%	0.1%
Pyrite	1	1	4	4	4	0.8%	0.8%	0.5%	0.5%	0.0%	0.0%
Slag	7	7	37	20	58	5.3%	5.3%	30.8%	30.8%	0.0%	0.0%
TOTAL	133	133	6			91.7%	91.7%	100.00%	100.00%	100.0%	100.0%

Test Material 6 - Speciation and Particle Size Data





4.4 In Vitro Bioaccessability

Recently, an alternative approach for estimating the solubility (and hence the potential toxicity) of arsenic in soils and other solid material has been developed. The details of the approach are described in the project plan for this study (USEPA 1999). In brief, samples of soil are placed in a test fluid designed to be similar to gastric fluid, and the fraction of the total amount of arsenic in the sample which dissolves into the fluid under a specified set of conditions (temperature, time, pH) is measured. This fraction of the total that is solubilized is referred to as the *in vitro* bioaccessability (IVBA). IVBA results for the six test materials in this study are summarized below:

Test Material	IVBA (%)
TM1	41.8
TM2	33.2
TM3	40.3
TM4	22.0
TM5	19.3
TM5 (dup)	18.2
TM6	17.6
TM6 (dup)	19.6

Because of the many differences between the *in vitro* test system and the gastrointestinal tract of a living organism (swine, human), it is not expected that the IVBA for a sample should be equal to the ABA or the RBA for that sample. However, if solubility is a key determinant of ABA and RBA, then it is expected that there should be a correlation between IVBA and RBA. Figure 4-12 plots the measured IVBA values as a function of the measured RBA values. As seen, there is a moderately good correlation between RBA and IVBA ($R^2 = 0.645$), with a slope of 0.8 and an intercept near zero. This indicates that, at this site, an *in vitro* measurement of bioaccessability is a moderately good predictor of *in vivo* gastrointestinal absorption.

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APPENDIX F

APPENDIX F

Monte Carlo Modeling of Exposure and Risk from Arsenic in Soil at the VB/I-70 Site

SCREENING LEVEL MONTE CARLO MODELING OF EXPOSURE AND RISK FROM ARSENIC IN SOIL AT THE VBI70 SITE

1.0 INTRODUCTION

Monte Carlo modeling is a computer-based mathematical technique that may be used for calculating exposure and risk where input terms are characterized as Probability Density Functions (PDFs) rather than point estimates. This approach has the advantage that the full distribution of exposure and risk may be predicted (as opposed to two point estimates, the CTE and RME values), and that the percentiles of those estimates may be quantified. In addition, the Monte Carlo approach helps guard against "compounding conservatism", whereby a series of conservative assumptions are combined into a single but unlikely scenario.

2.0 BASIC EQUATIONS

The basic equations used to calculate risk using the Monte Carlo approach are identical to those used in the point estimate approach. These equations are presented in Section 4.2 of the main risk assessment.

3.0 SELECTION OF INPUT VARIABLES

In concept, every term used in the point estimate equation is a variable, and could be modeled as a probability density function (PDF). However, for simplicity, it is generally not necessary to evaluate every term as a PDF. Rather, only those terms that are the most variable and which are the primary sources of variability in the output (exposure and risk) need be modeled as PDFs.

For this screening level evaluation, the following inputs are judged to be the chief sources of variability in exposure and risk among individuals:

Exposure frequency (EF)
Exposure duration (ED)
Intake rate for soil and dust (IRsd)
Fraction of intake that is soil (Fs)
Vegetable intake rate (IRveg)

The distribution functions selected to model each of these variables are described below.

Exposure Frequency (EF)

Exposure frequency is the average number of days per year spent at home. No data were located on the distribution this variable, so a triangular distribution was selected, as follows:

$$EF \sim TRI(200, 234, 365)$$

The central tendency value of 234 days/yr is based on the default CTE value recommended by EPA, while the upper bound would represent the case where a person was at home continuously. This distribution yields a average value of 266 days per year (somewhat higher than the EPA default of 234 days/year for the CTE resident), and a 95th percentile value of 332 days per year (slightly lower than the EPA default of 350 days/year for the RME receptor).

Exposure Duration (ED)

Data on the length of time that people live in a specific residence are available in the Exposure Factors Handbook (USEPA 1997) (see Table 15-167). The empiric cumulative distribution based on data from 500,000 individuals is shown in Table D-1.

Soil and Dust Intake Rate (IRsd)

Two alternative distributions were used to evaluate soil and dust intake by children. The first is a lognormal distribution selected to match the USEPA default values of 100 and 200 mg/day for the CTE and RME child. The parameters of this distribution (mean and standard deviation) are as follows:

$$IR(soil,dust)_{child} \sim LN(100,53)$$

The second distribution is an empiric cumulative distribution based on the recent study by Stanek and Calabrese (1999). The study included observations on 64 children for a period of 2-7 days (a total of 331 child-days). The parameters of this distribution are shown in Table D-1.

Fraction Soil (Fs)

Data on the fraction of total intake of soil plus dust that is soil are very limited. Stanek and Calabrese (1992) analyzed data from 64 pre-school children over a 2-week period. The data ranged from a minimum of zero percent up to a maximum of 100%, and the cumulative distribution was very nearly equal to a straight line. On this basis, Fs was modeled as a uniform distribution with parameters (0,1).

Vegetable Intake Rate

Data on seasonally adjusted consumer-only intake of home grown vegetables, stratified by region, are provided in the Exposure Factors Handbook (Table 13-33). The empiric cumulative distribution function is shown in Table D-1.

Other Inputs

All other exposure and risk model terms were the same as used in the point estimate calculations.

4.0 RESULTS

Table D-2 shows the results of a Monte Carlo simulation at an exposure point where the concentration of arsenic in soil (fine fraction) is assumed to be 200 ppm. Similar results are obtained at other soil concentrations.

Figure D-1 plots the distribution of cancer risks from ingestion of soil and dust at this location (concentration in fines = 200 ppm). The two curves shown in the figure represent the results for the two different PDFs assumed for soil intake (see above). Inspection of this figure reveals the following main points:

1. The distribution of risks based on the soil intakes reported by Stanek and Calabrese (2000) are substantially lower than the values based on the EPA default intake parameters

2. Compared to the distribution that assumes default EPA intake rates, the CTE point estimate is lower than the mean of the distribution, and corresponds to the 56th percentile. The RME point estimate is substantially higher than the 95th percentile of the distribution, and corresponds to a value above the 99th percentile.

3. Compared to the distribution that assumes the soil intake data of Stanek and Calabrese (2000), the CTE point estimate corresponds to the 86th percentile, while the RME point estimate corresponds to a value well above the 99.9th percentile.

These results indicate that RME point estimates of risk are likely to be conservative (i.e., will provide protection to more than 95% of the exposed population), especially if soil intake is actually closer to the data of Stanek and Calabrese (2000) than to the EPA defaults.

Figure D-2 compares point estimates and Monte Carlo estimates of total risk from arsenic (the sum of exposure via vegetable intake and soil/dust intake) across a range of soil concentrations. In all cases, the Monte Carlo calculations assume a soil intake that is lognormal and the parameters are matched to the EPA defaults. The upper panel compares the CTE point estimate of risk (CTE soil + CTE vegetable) with the mean of the Monte Carlo simulation. As noted above, at any specified soil level, the point estimate of CTE risk is below the mean value of the

MCA. The lower panel compares the 95th percentile of the MCA with three alternative estimates of the total RME risk:

Method 1 = RME soil + CTE vegetables
Method 2 = CTE soil + RME vegetables
Method 3 = RME soil + RME vegetables

As seen, the 95th percentile of total risk calculated by MCA is lower than the point calculations of RME total based on Method 1 (used in this risk assessment) at all soil levels. As expected, Method 3 (RME soil + RME vegetable) yields a result much higher than Method 1 or the MCA value. These results provide assurance that the estimates of total risk calculated across pathways calculated using Method 1 are likely to be conservative (higher than actual).

TABLE D-1 EMPIRIC DISTRIBUTION FUNCTIONS USED IN MONTE CARLO MODELING

Exposure Duration		Soil Intake		Veg Intake	
Years		mg/day		kg ww/kg bw/day	
EFH Table 15-167		(Stanek and Calabrese 1999)		EFH Table 13-33	
1	0.00	0	0.00	1.80E-03	0.00
1.9	0.05	2	0.10	1.91E-02	0.05
2	0.10	9	0.20	3.83E-02	0.10
3	0.25	16	0.30	1.14E-01	0.25
9	0.50	21	0.40	4.92E-01	0.50
16	0.75	24.5	0.50	1.46E+00	0.75
26	0.90	29	0.60	2.99E+00	0.90
33	0.95	35	0.70	5.04E+00	0.95
41	0.98	53	0.80	8.91E+00	0.99
47	0.99	75	0.90	1.12E+01	1.00
55	0.998	91	0.95		
59	0.999	137	0.99		
87	1.000	173	1.00		

TABLE D-2 MONTE CARLO RESULTS
Soil Conc = 200 ppm in fines

Soil IR	Percentile	Risk(s+d)	Risk(veg)	Risk(total)
LN(100,53)	0.050	1E-06	2E-08	1E-06
	0.250	4E-06	2E-07	5E-06
	0.500	9E-06	9E-07	1E-05
	0.750	2E-05	3E-06	3E-05
	0.900	4E-05	9E-06	5E-05
	0.950	6E-05	1E-05	7E-05
	0.990	1E-04	3E-05	1E-04
	0.999	2E-04	8E-05	2E-04
Empiric (see Table D-1)	0.050	7E-08	2E-08	3E-07
	0.250	6E-07	2E-07	1E-06
	0.500	2E-06	9E-07	4E-06
	0.750	6E-06	3E-06	1E-05
	0.900	1E-05	8E-06	2E-05
	0.950	2E-05	1E-05	3E-05
	0.990	5E-05	4E-05	6E-05
	0.999	1E-04	7E-05	1E-04

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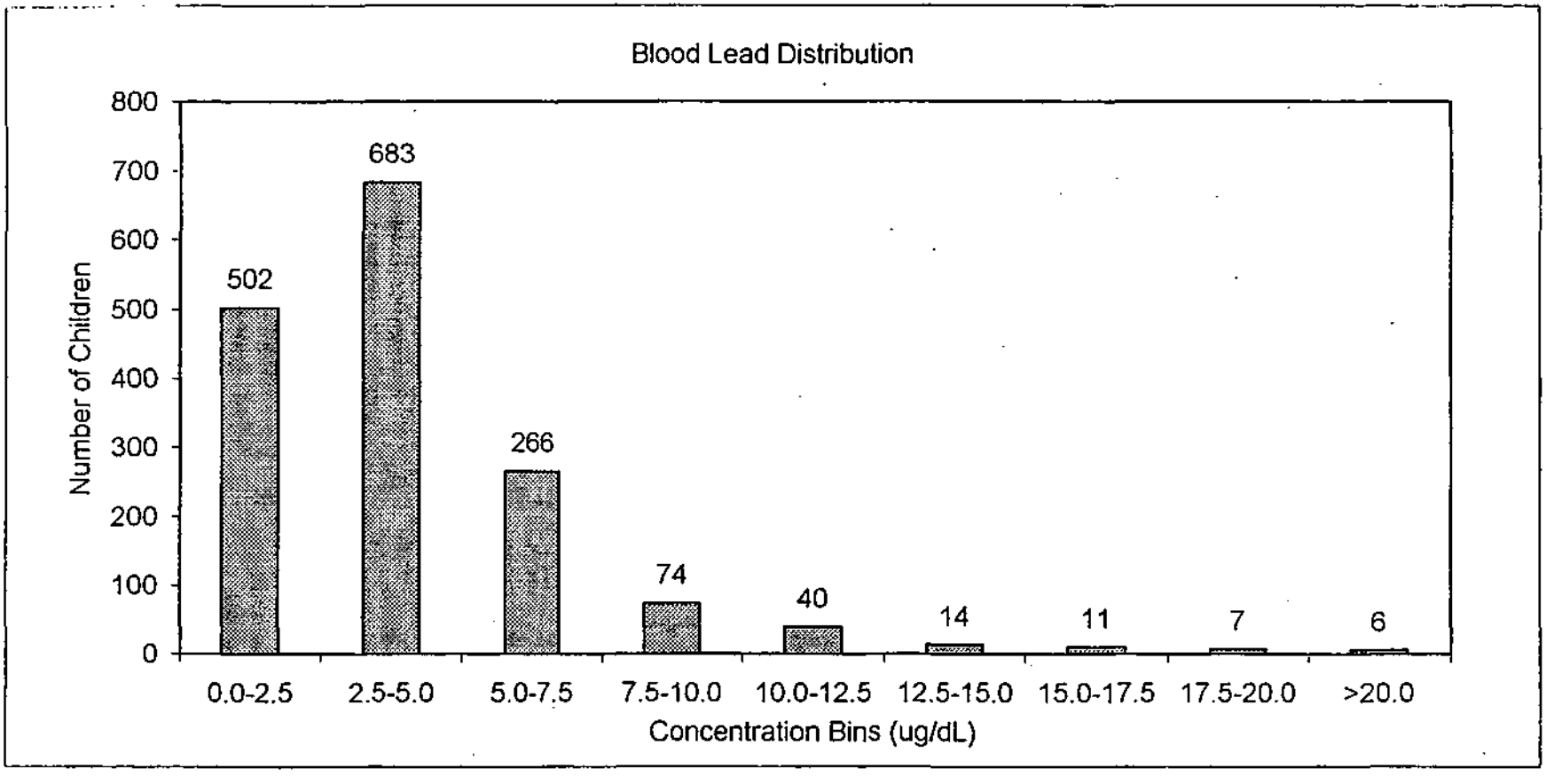
APPENDIX G

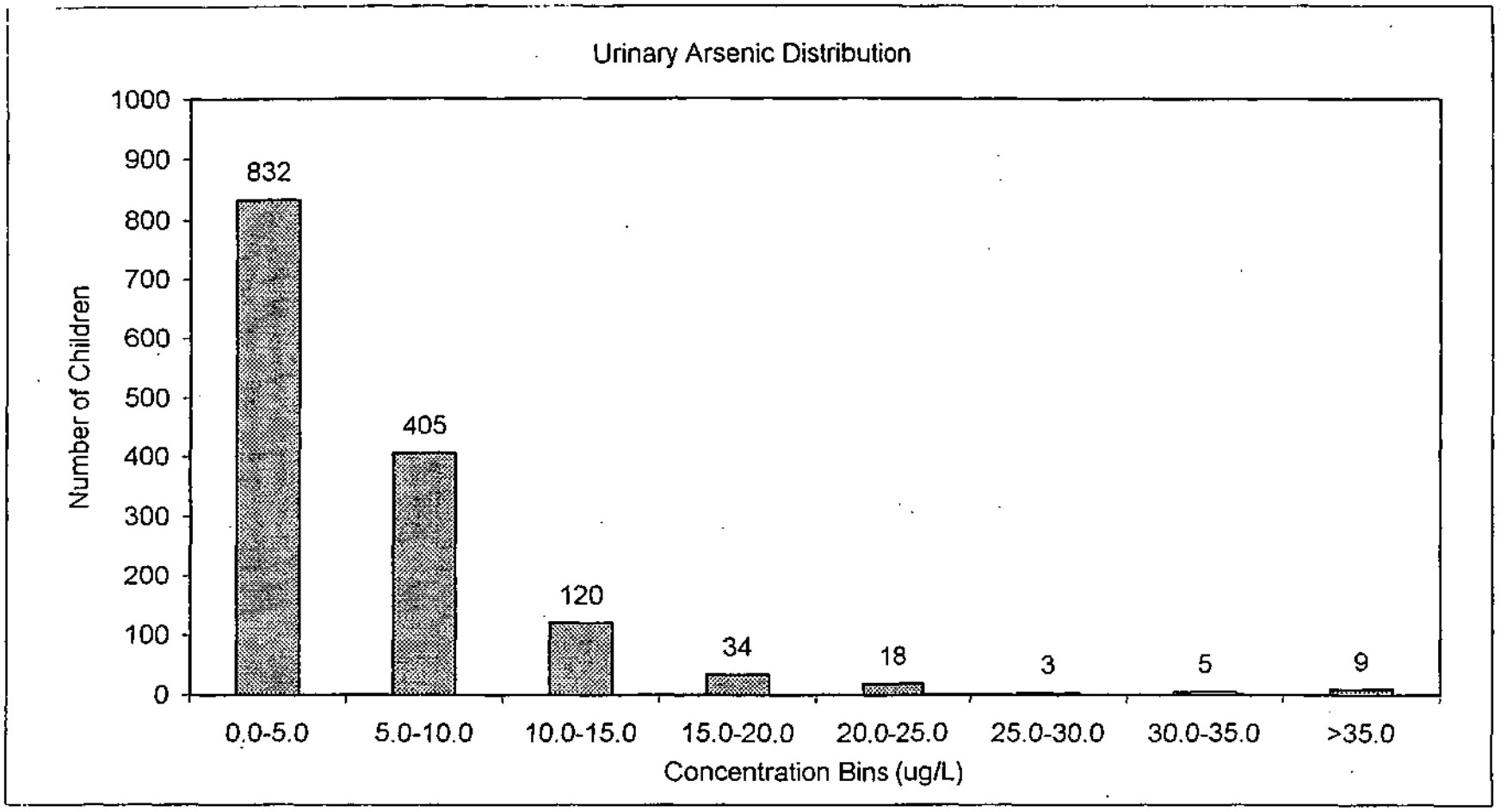
APPENDIX G

Summary Data from the
Kids at Play Health Survey
at the
VB/I-70 Site



Statistic	Value	Units
N	1603	
AM	4.2	ug/dL
StDev	3.62	ug/dL
P10	4.9%	

Statistic	Value	Units
GM	3.39	ug/dL
GSD	1.93	



Statistic	Value	Units
N	1426	
AM	5.7	ug/L
StDev	6.25	ug/L
%>30	1.0%	
%>60	0.1%	

Statistic	Value	Units
GM	3.94	ug/L
GSD	2.35	

FIGURE D-1

MONTE CARLO RESULTS FOR EXPOSURE TO ARSENIC IN SOIL/DUST

Concentration in Fine Fraction = 200 ppm

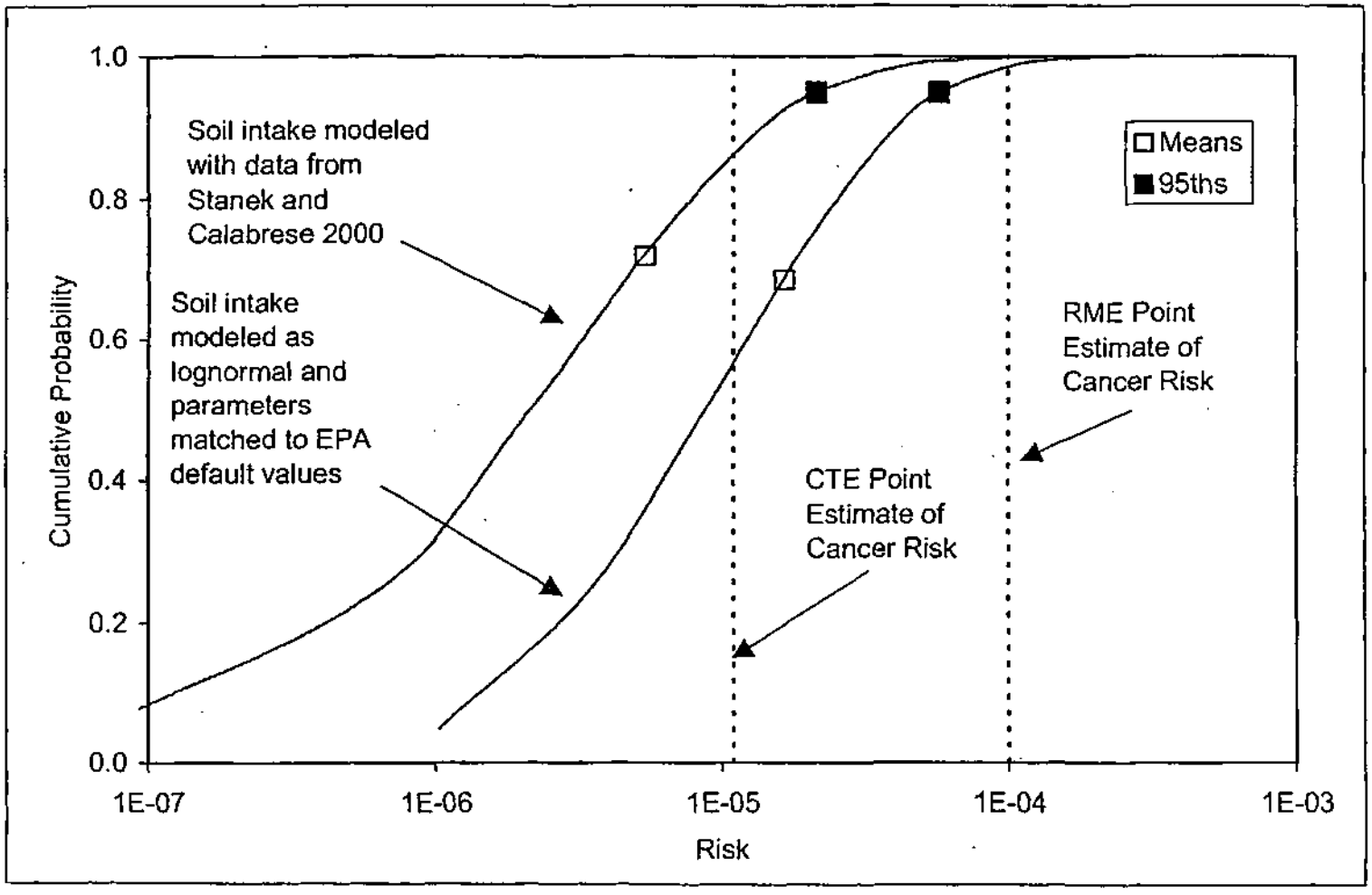
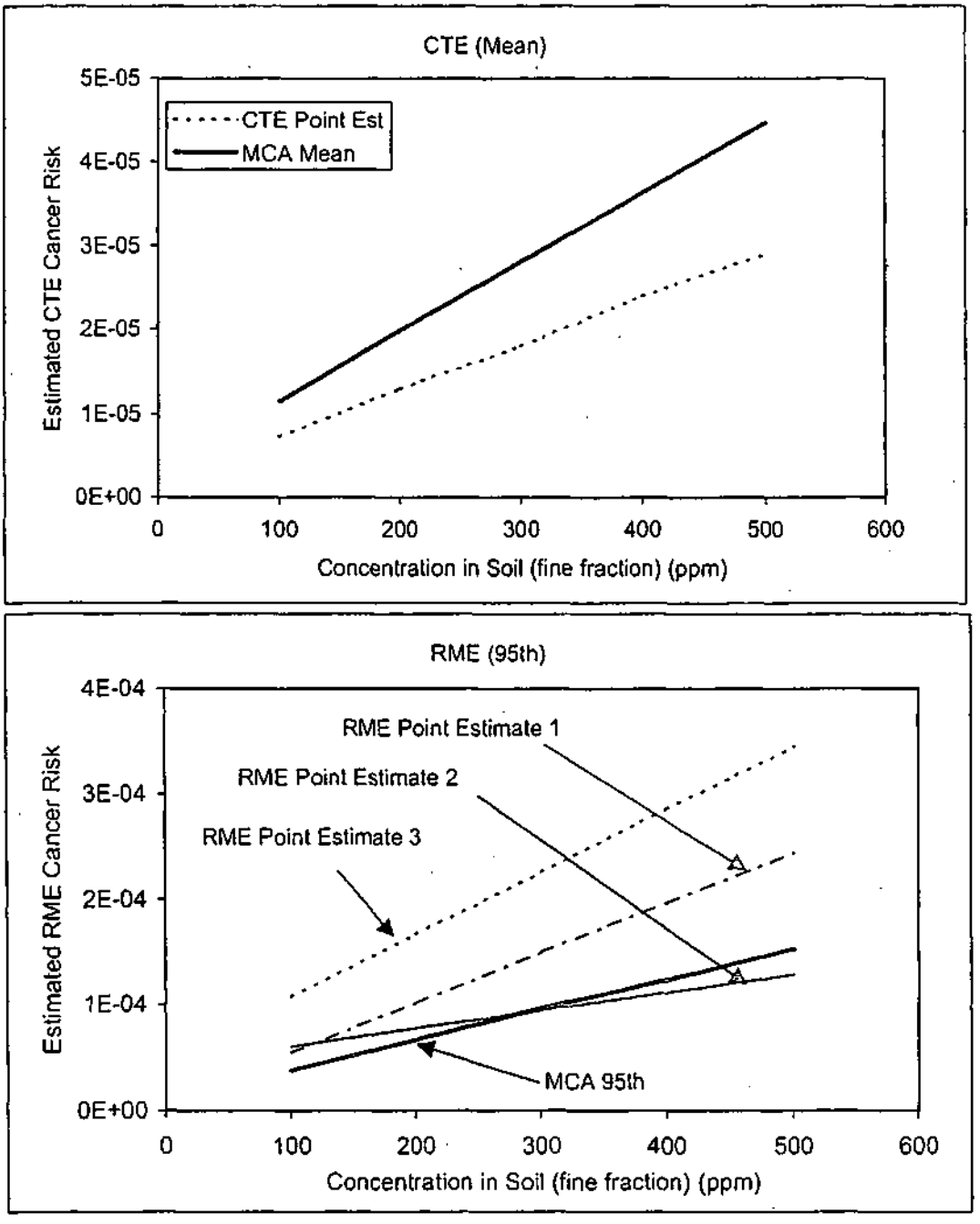


FIGURE D-2
COMPARISON OF POINT ESTIMATE AND MONTE CARLO ESTIMATES OF TOTAL RISK ACROSS A RANGE OF ARSENIC CONCENTRATIONS IN SOIL



Monte Carlo evaluation assumes soil intake is distributed lognormally with a mean of 100 mg/day and a standard deviation of 53 mg/day (95th percentile - 200 mg/day)

FIGURE D-1

MONTE CARLO RESULTS FOR EXPOSURE TO ARSENIC IN SOIL/DUST

Concentration in Bulk Soil = 70 ppm (simulation run where Csoil = Cfine (84.7ppm))

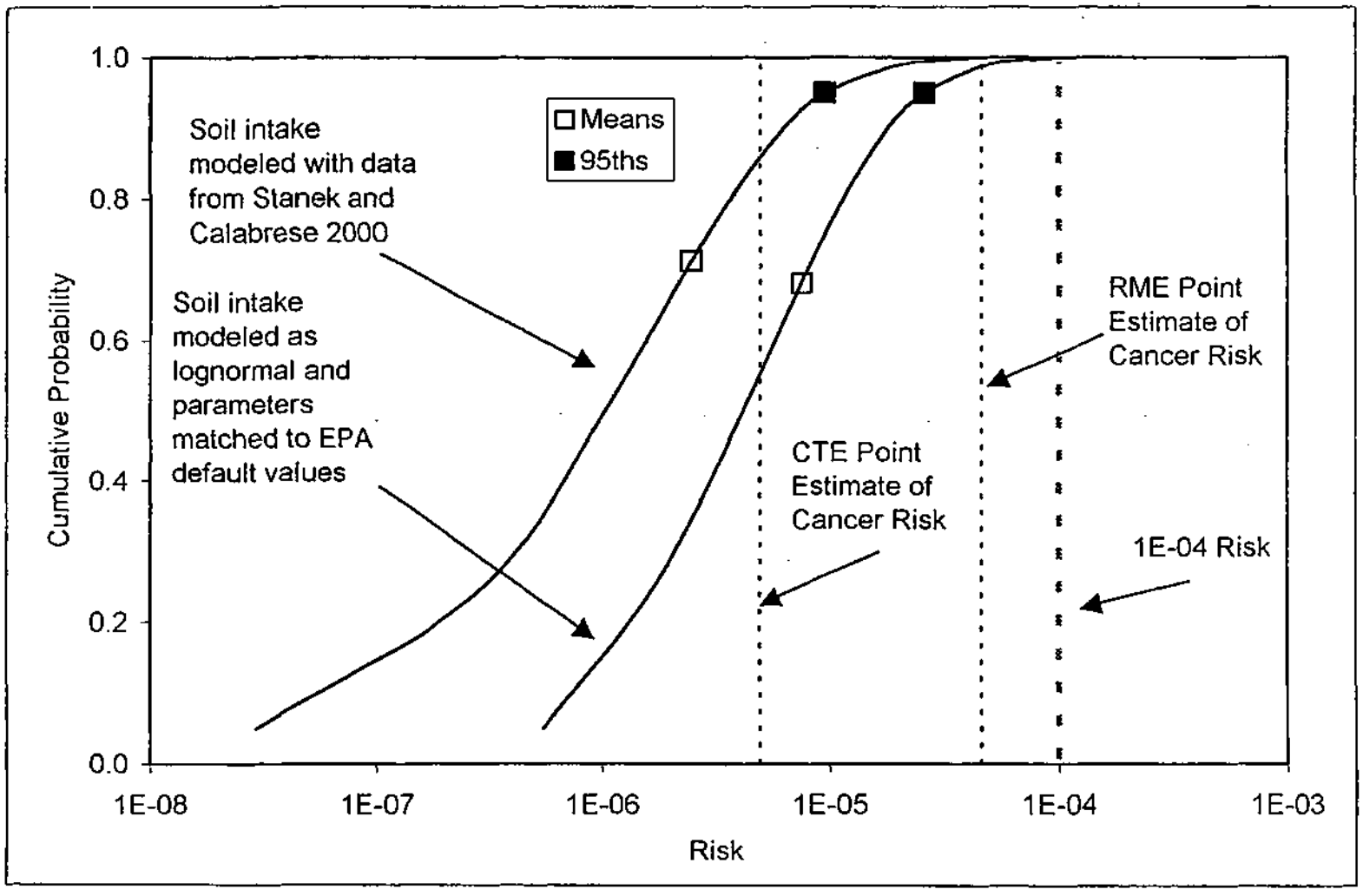


TABLE D-2 MONTE CARLO RESULTS FOR CANCER RISK UPDATED BASED ON A BULK SOIL CONCENTRATION OF 70 p

N = 25,000

Fine Soil = 84.7 ppm (Bulk soil = 70 ppm)

Soil IR	Percentile	Risk(s + d)	Risk(veg)	Risk(total)
LN(100,53)	0.050	5E-07	2E-08	8E-07
	0.250	2E-06	2E-07	2E-06
	0.500	4E-06	7E-07	6E-06
	0.750	9E-06	3E-06	1E-05
	0.900	2E-05	7E-06	2E-05
	0.950	3E-05	1E-05	4E-05
	0.990	5E-05	3E-05	6E-05
	0.999	9E-05	6E-05	1E-04
Empiric (see Table D-1)	0.050	3E-08	2E-08	2E-07
	0.250	3E-07	2E-07	9E-07
	0.500	1E-06	7E-07	2E-06
	0.750	3E-06	3E-06	6E-06
	0.900	6E-06	7E-06	1E-05
	0.950	9E-06	1E-05	2E-05
	0.990	2E-05	3E-05	4E-05
	0.999	4E-05	6E-05	8E-05

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APPENDIX H

The United States Environmental Protection Agency is pleased to announce...

The Proposed Plan for Cleaning Up Residential Soils within the Vasquez Boulevard & Interstate 70 Superfund Site Denver, Colorado May 2002

This Proposed Plan describes the Environmental Protection Agency's (EPA's) and the Colorado Department of Public Health and Environment's (CDPHE's) preferred alternative for addressing public health risks from lead and arsenic found in the soil of residential yards within the Vasquez Boulevard & Interstate 70 (VB/I-70) Superfund Site. The VB/I-70 Site includes the Elyria, Swansea, Cole, and Clayton neighborhoods of Denver, Colorado and a small portion of Globeville. EPA is the lead agency for the Superfund activities at the site. CDPHE is the support agency.

This fact sheet describes the cleanup alternative preferred by EPA and CDPHE for the VB/I-70 Site, and it explains why it is preferred. EPA's and CDPHE's preferred alternative, Alternative 4, is to remove the top 12 inches of soil from yards where arsenic levels exceed 128 parts per million (ppm) and/or lead levels exceed 540 ppm and dispose of the soil off the site at an appropriate facility. The soil will be replaced with clean soil and yards will be restored. EPA will make every effort to sample yards that have not yet been sampled and these yards will be cleaned up as necessary. A community health program will be established to protect children with soil pica behavior and children who may be at risk of exposure to lead from sources other than soil.

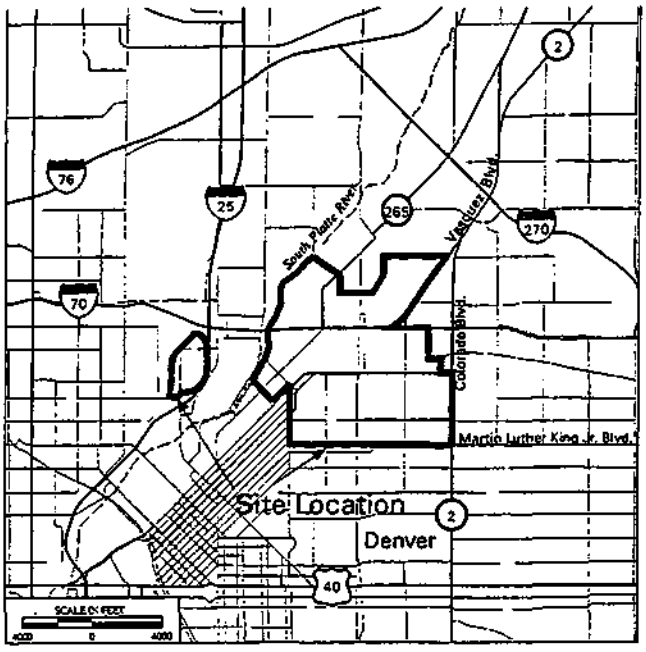
The VB/I-70 Site is an Environmental Justice (EJ) Site because the community is predominantly low income and minority and is disproportionately affected by environmental impacts from many sources including industry, other Superfund sites, and major transportation corridors. EPA and CDPHE took EJ concerns into consideration when selecting the preferred alternative.

The public has 60 days to comment on this Proposed Plan: May 20 - July 19, 2002

During this time, send written comments to:

VB/I-70 Comments
Bonnie Lavelle, Remedial Project Manager
EPA Region 8 (8EPR-SR)
999 18th Street, Suite 300
Denver, CO 80202-2466
or email: vbi70@epa.gov

The public can find detailed information on the VB/I-70 Site in EPA reports located in the information repositories listed on the last page of this fact sheet. One of EPA's responsibilities is to provide this opportunity for the public to comment on this Proposed Plan. During the comment period, comments may be submitted in writing by mail, email, or orally at the public meetings on June 20, June 22 and June 29, 2002. The last page of this fact sheet contains information about the public meetings. EPA encourages the public to review and comment on all the alternatives presented in this Proposed Plan. In the final cleanup decision, made after the comment period is over, EPA will consult with CDPHE and may modify the preferred alternative or choose a different alternative, based on public comments or new information.



How did the VB/I-70 Site become a Superfund Site?

In 1998, CDPHE requested EPA's assistance in sampling residential yards in the Swansea and Elyria neighborhoods of Denver. EPA and CDPHE were initially concerned about the area because lead, gold, and silver smelters had operated in the vicinity in the early 1900's. After starting an investigation of the area, both agencies became aware of other potential sources of contamination including products containing arsenic and lead to control crabgrass and lawn pests that may have been used by residents in these neighborhoods and elsewhere.

Lead and arsenic are found naturally in soil. However, smelting activities and/or the use of lawn products containing arsenic and lead may have increased the levels of these substances in yards enough to pose a health risk to people who live in the area. EPA and CDPHE believed that sampling was necessary to determine the levels of metals currently in residential yards, schools and playgrounds.

In March 1998, EPA began a large soil sampling effort to gather information about the levels of metals in soils of residential yards. One soil sample was collected from the front yard and one soil sample was collected from the back yard of each property sampled. Samples were collected from yards in Swansea, Elyria, and the northern half of the Cole and Clayton neighborhoods. Based on the results of the 1998 sampling, EPA defined a study area that includes all of the Swansea/Elyria, Cole, and Clayton neighborhoods and a portion of Globeville. On July 22, 1999, EPA added all the residential yards in the study area that have elevated levels of arsenic or lead to the National Priorities List. This is a list of sites that are eligible for cleanup funding under EPA's Superfund program. The area became known as the VB/I-70 Superfund Site.

In August 1999, EPA began a new soil sampling program to collect more complete information on the levels of metals people may be exposed to throughout their entire yard. This required that many more soil samples be collected from each yard. Soil samples were collected from local schools and parks as well. EPA also took samples of indoor dust, garden vegetables, and garden soil from selected yards. EPA measured the levels of arsenic and lead in each sample. EPA completed this soil-sampling program in September 2000.

EPA measured the levels of 23 metals in selected soil samples from the VB/I-70 Site and determined that arsenic and lead are the metals most likely to be of human health concern in the residential soils at the VB/I-70 Site.

Soil Sampling Results

The VB/I-70 Site includes approximately 4000 residential yards. EPA sampled 3000 of these yards. EPA seeks the permission of property owners to collect samples from their yards. EPA was not able to get the permission of the property owners at 1000 yards even though two letters were sent and an EPA representative visited these homes at least twice. As part of the final cleanup, EPA will begin another sampling program that will target the 1000 un-sampled yards.

EPA's sampling found that yards with elevated arsenic levels occur randomly throughout the entire VB/I-70 Site. In many cases, a yard with higher levels of arsenic is located next to a yard where no arsenic was detected at all. EPA also found:

- The most commonly identified form of arsenic in soil is arsenic trioxide.
- Lead levels are, in general, slightly higher in the western neighborhoods of the site. However, similar to the arsenic pattern, properties with higher lead are sometimes near properties with little or no detectable amounts of lead.
- Levels of arsenic and lead are highest in the first two inches of soil and decrease with depth.
- Levels of arsenic in indoor dust are much lower than in soil. On average, arsenic levels in dust are about 6% of levels in soil.

- Levels of lead in indoor dust are lower than in soil. On average, levels of lead in dust are about 34% of levels in soil. However, in some houses, the amount of lead in dust is much higher than the amount of lead in soil.
- Levels of both arsenic and lead are lower in gardens than in yard soil. This might be because residents add fertilizers, compost, and other substances to gardens or because whatever caused the arsenic and lead to be in the yard did not equally affect the gardens.
- Lead and arsenic levels at area schools and parks are low and are not of concern to area children.

EPA findings indicate that the high levels of arsenic in yard soils may be the result of lawn care products applied to the yards. EPA is continuing to investigate the sources of arsenic and lead in soil.

In order to assure protection of children in VB/I-70, EPA immediately removed the soil from 48 yards and replaced it with clean soil. EPA completed this work in the fall of 2000. This Proposed Plan addresses the remaining yards where the levels of arsenic and lead in soil are not an urgent concern.

How are residents getting exposed to arsenic and lead in soil in these neighborhoods?

EPA considered all the possible ways people could come in contact with arsenic and lead in soil. These include getting soil on skin, breathing soil particles that have blown into the air, eating vegetables grown in a home garden, and swallowing soil particles that are on fingers or hands while eating, playing, gardening, or during other hand-to-mouth activity.

EPA also recognizes that some children intentionally eat non-food items. This unusual behavior is called "pica behavior". Some children with pica behavior may intentionally eat unusually large amounts of soil. This could be a health concern because soil can contain bacteria or other harmful substances. Nobody knows how many children exhibit soil pica behavior or how often, but it is thought to be rare. There are very few scientific studies available with information on soil pica behavior. Until better information is available, EPA makes assumptions about the amount of soil that pica children might eat and how often. EPA believes it is important to recognize this uncertainty and to consider how the arsenic and lead in soil at the VB/I-70 Site might affect the health of children with pica behavior.

EPA concluded that at the VB/I-70 Site, it is most important to look at the health risks to:

- children and long time adult residents who swallow soil and dust particles through routine hand-to-mouth contact during activities such as playing or working outdoors;
- children and long time adult residents who regularly eat garden vegetables grown in home gardens; and
- children with soil pica behavior who may intentionally eat soil.

What are the health effects from too much exposure to arsenic?

The toxic effects of arsenic have been determined mainly from studies of humans exposed to arsenic in food and water, not soil. Those studies show that cancer and non-cancer effects may occur if a person is exposed to a sufficient amount of arsenic.

As part of its responsibility to protect public health, EPA established safe doses of arsenic which will protect people against non-cancer effects. If exposure to soil within the VB/I-70 Site could potentially result in arsenic doses above the established safe doses, then EPA will take action to reduce exposure.

For substances that may cause cancer, EPA does not establish "safe" doses but rather, evaluates the increase in risk of cancer with increasing exposure. EPA's Superfund regulations require cleanup action where the estimated risk of getting cancer is greater than 1 in 10,000. The regulations also establish that risks between 1 in 1,000,000 and 1 in 10,000 are within an "acceptable risk range".

If exposure to arsenic in soil within the VB/I-70 Site could potentially result in cancer risks above 1 in 10,000, then EPA will take action to reduce exposure.

To understand how protective EPA's requirement for Superfund action is, consider that the risk of getting cancer just by living in Colorado is 5,000 in 10,000 for men and 3,333 in 10,000 for women. Even though a risk of 1 in 10,000 is small in comparison, EPA considers any greater risk to be unacceptable.

What are the risks to VB/I-70 residents from exposure to arsenic in soil?

Using the latest scientific methods, EPA determined the potential health risks to residents with average levels of exposure and to residents with "reasonable maximum" levels of exposure at all properties that were sampled. Reasonable maximum exposure levels account for people who have a very high amount of contact with soil.

EPA found that the people with the highest risk of health effects from exposure to arsenic in soil are long time residents who have spent their childhood years and adult years living at the same house and who have regularly eaten vegetables grown in their gardens.

Long time residents who have an average amount of contact with soil, dust, and garden vegetables have estimated risks of getting cancer from exposure to arsenic that are within EPA's acceptable risk range.

However, at properties where arsenic levels are greater than 240 parts per million, cancer risks to long time residents with reasonable maximum exposure are predicted to be unacceptable and cleanup action is required by EPA regulations. EPA's estimates of cancer risk are much more likely to overestimate than underestimate the actual risks to residents in the VB/I-70 Site.

EPA found that if it takes cleanup action to protect long time residents from unacceptable cancer risk, residents and children will be protected from non-cancer health effects as well. This is because the level of arsenic in soil at VB/I-70 that is predicted to cause non-cancer effects is greater than 240 parts per million. The exception is that children with soil pica behavior may theoretically be at risk at arsenic levels below 240 parts per million. These children are of special concern and are considered separately by EPA.

What are the health risks to children who have soil pica behavior?

The amount of soil that soil pica children eat and how often they eat it are not known. Scientists agree that more study is needed to understand the behavior.

However, as a precaution, EPA calculated the theoretical risk of health effects to children with soil pica behavior in VB/I-70 using assumptions based on the few studies that are available. Although uncertain, the calculations suggest that at properties where arsenic levels are greater than 47 parts per million, there might be small areas within the yard that have higher arsenic levels which are of potential concern for children with soil pica behavior. Pica children at these properties may experience nausea or vomiting if they happen to eat a large amount of soil from areas in their yards with the highest levels of arsenic.

There has never been a reported case of acute arsenic toxicity in humans from arsenic in soil. So, the predictions of risk to children with soil pica behavior are uncertain, since they predict a very high risk for which there is no supporting medical evidence. Nevertheless, because of the potential risk, EPA developed and evaluated cleanup options to protect children with soil pica behavior in the VB/I-70 Site.

What are the health effects from too much exposure to lead?

Excess exposure to lead can cause behavioral problems in young children and can affect their ability to learn. Exposure can be evaluated by measuring the level of lead in blood. There are often no outward visible signs of lead poisoning in children which is why blood lead measurements are the best method available to determine when excess exposure is occurring. EPA and the Centers for Disease Control and Prevention consider a level of 10 micrograms of lead in a deciliter of blood (ug/dL) to be the level at which health effects in children may begin to occur. In Superfund, EPA's goal for protecting public health is to ensure that there is no greater than a 5% chance that a child will have a blood lead level that exceeds 10 ug/dL as a result of exposure to lead in soil. EPA will take action to reduce exposure if this goal is not achieved.

What are the risks to VB/I-70 residents from exposure to lead in soil?

EPA policy recommends a two-step process for evaluating risks to children from exposure to lead in soil at Superfund sites. The first step is to determine whether the levels of lead in soil are below the "screening level" of 400 parts per million. If the levels are below 400 parts per million, no further action is required. At the VB/I-70 Site, the measured lead levels are greater than 400 parts per million in many yards. So, EPA proceeded to the second step. As the second step, EPA policy recommends using an EPA mathematical model to predict the blood lead levels of children exposed to lead in the environment at a particular site.

Using the model to predict blood lead levels in children at the VB/I-70 Site is uncertain.

To help understand the accuracy of EPA's model predictions of blood lead levels in children as a result of exposure to soil at VB/I-70, EPA reviewed the available information on measured lead levels in samples of blood taken from children in VB/I-70. CDPHE offered three separate blood lead testing programs to children living in the VB/I-70 site during the period 1995 through 2000. Although the blood lead testing was not designed to support the VB/I-70 study, the testing supports the following conclusions:

- some children who live within the VB/I-70 Site have high levels of lead in their blood;
- soil is not likely to be the main source of high blood lead levels in children. Exposure to lead from other sources such as paint is likely a concern at many properties in the VB/I-70 Site; and
- some children who live outside the VB/I-70 Site have high levels of lead in their blood similar to those observed in children who live in VB/I-70.

The recommended EPA model and the specific information from measured blood lead levels indicate that 1100 per parts million in soil is protective for this site. Given, however, the other sources of lead that may be present in a child's home, EPA decided to select a more protective standard of 540 parts per million lead in soil.

What cleanup alternatives did EPA and CDPHE consider?

EPA and CDPHE developed cleanup alternatives to reduce the risks to residents at VB/I-70 to acceptable levels. The alternatives are combinations of the following actions:

No Action: EPA has already removed and replaced the soils at 48 properties in the VB/I-70 Site. Under this option, nothing further would be done by EPA.

Soil Tilling/Treatment: This option would address unacceptable risk to children from exposure to lead in soil. This option was not considered as a way to address arsenic. Under this option, surface soils would be tilled to a depth of 6 inches and treated with phosphate and yard features would be restored. The tilling would reduce concentrations of lead by mixing the top few inches of soil with cleaner soil below. The phosphate treatment would reduce the amount of lead in soil that can be absorbed by the body if someone ingests the lead from soil.

Soil Removal and Disposal: This option would address unacceptable cancer risk from exposure to arsenic in soil and unacceptable risk to children from exposure to lead in soil. EPA also considered this as an option for addressing potential risks to children with soil pica behavior. Under this option, soil would be removed to a depth of 12 inches and disposed of offsite at an appropriate facility. The excavated areas would be backfilled with clean soil.

Community Health Program: This program would address the risks to children with soil pica behavior and children exposed to lead from multiple sources. The program would assess risks from any and all potential sources of lead exposure including those which may present a greater risk to children than lead in soil. The program would also provide a way to evaluate the effectiveness of the other options.

There would be 3 components in this program: (1) health education; (2) biomonitoring; and (3) response.

Health education would include both individual and community education to raise awareness about soil pica behavior, multiple sources of lead and arsenic, strategies to reduce soil pica behavior and to reduce or avoid exposure to lead and arsenic from sources other than soil, and the health effects of exposure. This general awareness would help reduce exposure.

As part of education, residents would be taught the importance of **biomonitoring** and would be encouraged to participate in the biomonitoring program. This would be a program to test children to determine the amount of arsenic in their urine and/or lead in their blood. These tests indicate if individual children have recently been exposed to arsenic or lead. The testing would be available at any time of the year but would include a highly publicized, organized program offered once a year, timed to coincide with other community activities at the start of the school year.

If any child were identified with higher than typical exposure to arsenic or lead, they would be included in the **response** program. The first response would be a referral to a physician if the exposure is judged to be a health concern. In all cases, an investigation of the child's house would be conducted to look for soil and non-soil sources of arsenic or lead. If soil was found to be the source of exposure, the most effective way to eliminate the problem would be identified.

Exterior lead paint would be addressed if it was found to be the main source of soil contamination and soil was the main source of a child's exposure to lead. For non-soil related sources of arsenic or lead, residents would be referred to other agencies that may assist them.

The Community Health Program would address as many sources of lead as practicable.

EPA and CDPHE developed **five cleanup alternatives** each of which will address the health risks to varying degrees, using some combination of the above actions. EPA evaluated these cleanup alternatives against nine criteria specified in Superfund regulations. These criteria are used by EPA at every Superfund site. The nine criteria are:

THRESHOLD CRITERIA

Alternatives must, at a minimum, meet the first two criteria, called the Threshold Criteria, to be retained for further consideration

1. Overall Protection of Human Health and the Environment considers whether or not an alternative provides adequate protection by eliminating, reducing, or controlling unacceptable risks.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs) considers whether or not an alternative will meet all Federal and State standards required by environmental laws or, if not, whether there is justification for waiving the standards.

PRIMARY BALANCING CRITERIA

Alternatives that meet the threshold criteria are next evaluated against the following five criteria known as the Primary Balancing Criteria.

3. Reduction of Toxicity, Mobility, and Volume through Treatment indicates EPA's preference for alternatives that include physical or chemical treatment processes to reduce or eliminate the hazardous nature of material, its ability to move in the environment, and the quantity left after treatment.

4. Long Term Effectiveness and Permanence considers the magnitude of public health risk which will remain after each alternative is implemented.

5. Short Term Effectiveness considers the risks that might be posed to the community and workers during the implementation of each alternative and the time it will take each alternative to achieve protection of human health and the environment.

6. Implementability considers the technical and administrative feasibility of implementing each alternative and the availability of the services and materials required during implementation.

7. Cost considers construction costs as well as long term operation and maintenance costs of each alternative. EPA evaluates each alternative by considering whether more costly alternatives provide additional public health benefits for the increased cost.

MODIFYING CRITERIA

The last two criteria are used to evaluate concerns the State and the public may have regarding each alternative.

8. State Acceptance considers whether the State agrees with, disagrees with, or has no comment on EPA's preferred alternative.

9. Community Acceptance considers the concerns or support the public may have regarding each alternative.

The alternatives usually are evaluated against the modifying criteria after all public comments are received on the Proposed Plan. In the case of VB/I-70, CDPHE has already indicated to EPA a preference for
Alternative 4. EPA therefore evaluated State Acceptance as part of this Proposed Plan.

EPA will evaluate Community Acceptance of the cleanup alternatives after receiving public comments on this Proposed Plan.

THE FOLLOWING ARE THE CLEANUP ALTERNATIVES EPA CONSIDERED:

Cleanup Alternative 1:

No Action. EPA removed and replaced the soil from 48 yards in the VB/I-70 Site during the years 1998 and 2000. In Alternative 1, no further cleanup action would be done. Alternative 1 would not meet the first criteria, overall protection of human health.

Cleanup Alternative 2:

Alternative 2 is a combination of four actions:

(1) Soil sampling program for properties not yet sampled;

(2) Soil tilling with phosphate amendments to treat soil at all properties with lead greater than 540 parts per million;

(3) Soil removal, off site disposal, and replacement of soil at all properties with arsenic greater than 240 parts per million; and

(4) Community Health Program.

Either soil removal and disposal or soil tilling and treatment would be required at 202 properties under Alternative 2. Of these properties, 113 require removal because of arsenic levels and 89 require tilling and treatment because of lead levels. The community health program would be effective in addressing the theoretical health risks to children with soil pica behavior and the health risks to children exposed to lead from many sources. There is some uncertainty about whether the treatment of lead in soil would be effective. More testing would be required to determine exactly how the treatment process would work. So, this alternative would take more time to implement, making it less effective in the short term.

There are short-term risks of accidents occurring due to the increase in truck traffic during construction. There is less short term risk in Alternative 2 when compared to Alternatives 3, 4, and 5 since the soil at 89 properties would not need to be removed and transported off the site. EPA estimates that Alternative 2 will cost $10.6 million.

Cleanup Alternative 3:

Alternative 3 is a combination of three actions:

1) Soil sampling program for properties not yet sampled;

2) Soil removal, off site disposal, and replacement of soil at all properties with arsenic greater than 240 parts per million and/or lead greater than 540 parts per million; and

3) Community Health Program.

Soil removal and disposal would be required at approximately 202 properties under this alternative. Of these properties, 105 require removal because of arsenic levels, 8 require removal because of arsenic and lead levels, and 89 require removal because of lead levels.

Alternative 3 is very similar to Alternative 2 but includes soil removal and disposal, rather than soil tilling, at properties where lead levels exceed 540 parts per million. Since there is no treatment process to design, Alternative 3 could be implemented more quickly. Short-term risks of accidents from increased truck traffic are higher than Alternative 2 and lower than Alternatives 4, and 5. EPA estimates that Alternative 3 will cost $11.1 million

Cleanup Alternative 4: The Preferred Alternative

Alternative 4 is a combination of three actions:

(1) Soil sampling program for properties not yet sampled;

(2) Soil removal, off site disposal, and replacement of soil at all properties with arsenic greater than 128 parts per million and/or lead greater than 540 parts per million; and

(3) Community Health Program.

Alternative 4 is very similar to Alternative 3 but includes soil removal and disposal at properties where arsenic levels exceed 128 parts per million. CDPHE requested that EPA consider a cleanup alternative in which 128 parts per million arsenic is the trigger for soil removal.

Cleanup Alternative 4 (Cont.):

Soil removal and disposal will be required at 403 properties under Alternative 4. Of these properties, 306 require removal because of arsenic levels, 31 require removal because of both arsenic and lead levels, and 66 require removal because of lead levels.

Short term risks of accidents from increased truck traffic are higher in Alternative 4 than Alternatives 2 or 3 due to the greater number of yards that would be replaced. Alternative 4 would take a longer time to complete than Alternative 3. The alternative achieves State acceptance. EPA estimates that Alternative 4 will cost $17.5 million.

Cleanup Alternative 5:

Alternative 5 is a combination of two actions:

(1) Soil sampling program for properties not yet sampled; and

(2) Soil removal, off site disposal, and replacement of soil at all properties with arsenic greater than 47 parts per million and/or lead greater than 208 parts per million.

Soil removal and disposal will be required at 2,122 properties under Alternative 5. Of these properties, 384 require removal because of arsenic levels, 479 require removal because of arsenic and lead levels, and 1259 require removal because of lead levels. 208 parts per million lead is from the recommended EPA model, run without updated information. Removal of soil alone, without a community health program, would not be as effective as Alternatives 2, 3 and 4 in addressing the risks to children with soil pica behavior and children who are exposed to lead from sources other than soil. The non-soil sources of lead may present a greater risk to children than lead in soil.

Alternative 5 would have the highest short-term risks of accidents from increased truck traffic and would take the longest time to complete due to the increased number of yards that would be replaced. Of all the alternatives, Alternative 5 would take the longest time to complete. This alternative achieves State acceptance. EPA estimates that Alternative 5 will cost $61 million.

How is EPA considering Environmental Justice (EJ) concerns?

EPA and CDPHE recognize that the VB/I-70 Site is an EJ site because the community is predominantly low income and minority and is disproportionately affected by environmental impacts from many sources including industry, other Superfund sites, and major transportation corridors. As a result EPA took several actions.

All aspects of the Superfund activities were opened up to community representatives, recognizing that justice means having a voice in decisions that affect their lives. EPA conducted project management and technical meetings at locations in the VB/I-70 community so that anyone interested could participate in the discussions. Community representatives helped to design the soil collection program and advised EPA on ways people come in contact with soil in the VB/I-70 neighborhoods.

The site boundaries were established based on EJ concerns that the integrity of neighborhoods be maintained and that entire neighborhoods be treated equally.

The preferred alternative includes a community health program which will address sources of lead exposure that are not generally considered at other Superfund sites and includes public health actions. We are considering this program because this is an EJ site.

Community Participation

EPA mailed this Proposed Plan to all VB/I-70 residents. During the public comment period for this Proposed Plan, EPA and CDPHE will also provide information about the VB/I-70 Site to the community through public meetings and information placed in several information repositories throughout the community. Please refer to the last page of this fact sheet for details. EPA and CDPHE encourage the community to gain a full understanding of the VB/I-70 cleanup proposal.

Table 1 summarizes the comparison of the five cleanup alternatives against the Superfund evaluation criteria.

Table 1: Comparison of Remedial Alternatives Against the Superfund Evaluation Criteria						
Evaluation Criterion	**Alternative 1**	**Alternative 2**	**Alternative 3**	**Alternative 4**	**Alternative 5**	**Notes**
1. Overall Protection of Human Health and Environment	○	◐	●	●	◐	The community health program is a component of Alternatives 2,3 and 4, providing greater overall protection. Since Alternative 5 doesn't include a community health program, it does not address soil pica behavior in children and/or children exposed to lead from non-soil sources that may present a greater risk than soil.
2. Compliance with ARARs		●	●	●	●	Alternatives 2,3,4 and 5 are expected to meet ARARs.
3. Reduction of Toxicity, Mobility, and Volume through Treatment		◐	○	○	○	Neither Alternative 3, 4 nor 5 include treatment. Alternative 2 includes a phosphate treatment of soil.
4. Long Term Effectiveness and Permanence		●	●	●	◐	Alternative 5 will not address soil pica behavior and children exposed to lead from non-soil sources that may present a greater risk than soil.
5. Short Term Effectiveness		◐	●	◐	○	Alternatives which include a greater number of yards to be removed have higher short term risks because of increased truck traffic in the community.
6. Implementability		◐	●	●	●	Soil tilling in residential yards (Alternative 2) will likely be more difficult to implement than soil removal.
7. Cost Effectiveness		◐	●	◐	○	Alternatives 4 and 5 do not provide greater overall protection for the increased cost.
8. State Acceptance	○	○	○	●	●	CDPHE prefers Alternative 4

● ◐ ○
BETTER → WORSE

The Preferred Alternative

EPA and CDPHE selected ***Alternative 4*** as the preferred cleanup alternative. Although Alternatives 3 and 4 provide similar overall protection of health, Alternative 4 best meets the 8 evaluation criteria considered by EPA. Based on the information available at this time, EPA and CDPHE believe the Preferred Alternative would be protective of human health, would meet all Federal and State standards required by environmental laws, would be effective in the long term, would be able to be implemented in the VB/I-70 community, and best achieves State Acceptance.

EPA will remove the top 12 inches of soil from yards where arsenic levels exceed 128 parts per million and /or lead levels exceed 540 parts per million. The soil will be transported off the VB/I-70 Site for disposal at an appropriate facility. The yards will be backfilled with clean soil and yard features restored. EPA will make every effort to sample yards that have not yet been sampled and these yards will be cleaned up as necessary. EPA estimates that 403 yards will require this cleanup action.

Children who live in VB/I-70 will be further protected by a community health program with the following components:

- health education to raise overall community awareness about soil pica behavior and childhood exposure to lead from all sources. The education will focus on strategies to reduce or avoid exposure to lead and soil pica exposure to arsenic, and the health effects of exposure;
- a testing program to measure levels of lead in children's blood and levels of arsenic in children's urine to find out the level of actual soil pica exposure to arsenic and actual exposure to lead and to identify children with higher than normal exposures; and
- an investigation and response program to identify soil and non-soil sources of lead and arsenic at homes of children with greater than normal exposure, to address the source of lead or arsenic exposure for an individual child, and to refer people with excessive exposure to arsenic or lead to a health care provider.

MARK YOUR CALENDAR:
OPPORTUNITIES FOR PUBLIC INVOLVEMENT
Public Comment Period: May 20, 2002 – July 19, 2002

Public Meetings:
Thursday, June 20, 2002
6:30 p.m. to 8:30 p.m.
Harrington Elementary School

Saturday, June 22, 2002
10:00 a.m. to 12:00 p.m.
Swansea Recreation Center

Saturday, June 29, 2002
10:00 a.m. to 12:00 p.m.
St. Charles Recreation Center

Information Repositories
on the World Wide Web at
http://epa.gov/region8/vbi70

Cross Community Coalition
2332 East 46th Avenue

Valdez-Perry Library
4690 Vine Street

Ford Warren Library
2835 High Street

EPA Records Center
999 18th Street, 3rd Floor, South Tower

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TABBED PAGE

APPENDIX I

APPENDIX I

Detailed Cost Estimates for
Remedial Alternatives

DETAILED COST ESTIMATES

Detailed cost estimates for each action alternative are provided in Tables 1 through 5. Alternative 1 (No Action) is the baseline for the cost estimates for the other alternatives and is assumed to have no associated cost. These detailed estimates present the quantities made in establishing the scope of work (areas, volumes, etc.) and the calculations from which the estimated costs were derived. The unit costs shown for each work item reflect an assessment of the labor, materials and equipment required for each identified item and include allowances for appurtenant and incidental work as well as contractor overhead and profit. Unit cost rates and associated productivity factors are based on historical factors, published industry data, information on previous removals actions at the VB/I70 site, and/or experience on projects of similar scope and nature. The quantities used in assessing the scope of work are based on GIS information from the site and from quantities generated during previous removal actions. However, some uncertainties exist with respect to the potential difficulties which may be encountered and accordingly, contingency allowances have been included in the estimates, consistent with the extent of the unknowns and uncertainties. The contingency allowance is intended to cover unspecified, or unidentified, work required to be completed within the scope of work and not additional work beyond the established scope of work. Notwithstanding these unknowns, the accuracy of the estimates is anticipated to fall within the acceptable range for typical feasibility study evaluations of +50% to -30%, in accordance with EPA guidance ("A Guide to Developing and Documenting Cost Estimates During the Feasibility Study" OSWER 9355.0-75).

1.0 Initial Remedial Action Capital Cost Estimates

The initial phase of remedial action includes engineering activities (such as soil removal/replacement or soil tilling) and setting up the Community Health Program. Detailed cost estimates were generated for: (1) soil tilling/treatment and restoration at an individual property (Table 6); (2) soil removal and disposal and restoration at an individual property (Table 7); and (3) setting up the Community Health Program (Table 8).

2.0 Ongoing Remedial Action Annual Cost Estimates

After the initial phase (described above) some alternatives considered in this FS contain an ongoing Community Health Program as part of remedial action. Estimates of the annual costs for the Community Health Program were prepared for activities anticipated to be performed each year following completion of initial site remediation activities. A 30-year remedial action period has been used for costing purposes. The annual cost estimates for each alternative are included in Tables 1 through 5 and are presented in constant 2002 dollars. No escalation factors have been applied to future costs in performing the present worth analyses. Unit cost rates and associated productivity factors are based on published industry data, and/or experience on projects of similar scope and nature. For the Community Health Program a baseline annual cost was estimated (Table 9). It was assumed that the scope of this program would be reduced during the 30-year remedial action period, as health risks were identified and addressed. For the purposes of costing it was assumed that the cost of the program would reduce to 75% of the initial annual cost after 5 years, and to 33% of the initial cost after 10 years.

3.0 Periodic Costs

For the alternatives considered in this FS the only periodic costs are associated with 5-year reviews. As specified in EPA guidance (EPA, 1988a), a 30-year period has been used for costing purposes. The 5-year review cost estimates for each alternative are included in Tables 1 through 5 and are presented in constant 2002 dollars. No escalation factors have been applied to future costs in performing the present worth analyses. Unit cost rates and associated productivity factors are based on published industry data, and/or experience on projects of similar scope and nature.

4.0 Operation and Maintenance Costs

There are no Operation and Maintenance costs associated with any of the alternatives – all activities are considered to be part of remedial action.

5.0 Present Worth Calculations

Present worth analyses were performed on estimated costs associated with each remedial alternative to provide a common basis for comparison. Present worth analysis calculates a current value, or worth, of all costs incurred in the present or at some future date at an assumed constant rate of return, or discount rate. The present worth calculated represents an amount, which if invested in 2002 at a certain rate of return would yield the appropriate dollar amount to meet the required expenditures over the construction and 30-year remedial action periods. The exact duration of initial implementation and corresponding capital costs will be dependent on the results of the remedial design phase. At that time the most appropriate implementation scenario can be developed. However, the assumed durations are reasonable and allow for an objective, relative comparison of the alternatives.

Because total remedial action costs could be especially sensitive to the prevailing rate of return used in the present worth analyses, rates of return of 3%, 5%, and 10% were used to prepare present worth estimates for each alternative. The capital costs spread out over the anticipated implementation period were also discounted to constant 2002 dollars using rates of return of 3%, 5%, and 10%. For simplicity, only the present worth calculated at an assumed 5% rate of return has been presented in the text and used in the comparison of costs. The present worth analyses performed in this report are considered before-tax analyses and do not consider future escalation of costs. The expenditure of remedial action and 5-year review costs and subsequent present worth analyses for the alternatives are presented in Tables 10 through 14.

TABLE 1

DETAILED COST ESTIMATE
VASQUEZ BOULEVARD/I-70 SITE OU1
ALTERNATIVE 2 - COMMUNITY HEALTH PROGRAM, TILLING/TREATMENT (LEAD), TARGETED REMOVAL AND DISPOSAL (ARSENIC)

Item/Description	Quantity	Unit	Unit Cost	Extension	Total Cost
INITIAL REMEDIAL ACTION DIRECT CAPITAL COSTS					
Tilling & Treatment	89	Property	$15,487		$1,378,346
Removal/Disposal	113	Property	$18,412		$2,080,556
Community Health Program	1	LS	$205,655		$205,655
SUBTOTAL INITIAL REMEDIAL ACTION DIRECT CAPITAL COSTS					$3,664,557
INDIRECT INITIAL REMEDIAL ACTION CAPITAL COSTS					
Mob/Demob			10%	$366,455.73	
Engineering/Administration Costs			10%	$366,455.73	
Construction Management Costs			15%	$549,683.59	
Health & Safety			3%	$109,936.72	
SUBTOTAL INITIAL REMEDIAL ACTION INDIRECT CAPITAL COSTS					$1,392,532
Capital Cost Contingency			25%	$1,264,272.27	
TOTAL ESTIMATED CAPITAL COST FOR INITIAL REMEDIAL ACTION					$6,321,361
ONGOING REMEDIAL ACTION ANNUAL COSTS					
Community Health Program	1	Yr	$328,645		$328,645
SUBTOTAL ONGOING REMEDIAL ACTION ANNUAL COSTS					$328,645
Administrative Costs			10%	$32,864.50	
Contingency			25%	$90,377.38	
TOTAL ONGOING REMEDIAL ACTION ANNUAL COSTS					$451,887
PERIODIC COSTS - FIVE YEAR REVIEWS					
Labor - 2 Engineers ($70/hr) & 2 Technicians ($50/hr) - 1 week @ 40 hrs/wk	40	mh	$240	$9,600.00	
Travel	4	each	$50	$200.00	
Lab Costs	15	each	$500	$7,500.00	
Office/Admin	60	mh	$140	$8,400.00	
SUBTOTAL PERIODIC COSTS					$25,700
Periodic Cost Contingency			10%	$2,570.00	
TOTAL FIVE YEAR REVIEW COSTS					$28,270
TOTAL PRESENT WORTH (5% rate of return, 30 year period)					$10,559,000

NOTES:

Total Present Worth calculation presented in Table 10.

TABLE 2

DETAILED COST ESTIMATE
VASQUEZ BOULEVARD/I-70 SITE OU1
ALTERNATIVE 3 - COMMUNITY HEALTH PROGRAM, TARGETED REMOVAL AND DISPOSAL

Item/Description	Quantity	Unit	Unit Cost	Extension	Total Cost
INITIAL REMEDIAL ACTION DIRECT CAPITAL COSTS					
Removal & Disposal	202	property	$18,412		$3,719,224
Community Health Program	1	LS	$205,655		$205,655
SUBTOTAL INITIAL REMEDIAL ACTION DIRECT CAPITAL COSTS					$3,924,879
INDIRECT INITIAL REMEDIAL ACTION CAPITAL COSTS					
Mob/Demob			10%	$392,488	
Engineering/Administration Costs			10%	$392,488	
Construction Management Costs			15%	$588,732	
Health & Safety			3%	$117,746	
SUBTOTAL INITIAL REMEDIAL ACTION INDIRECT CAPITAL COSTS					$1,491,454
Capital Cost Contingency			25%	$1,354,083	
TOTAL ESTIMATED CAPITAL COST FOR INITIAL REMEDIAL ACTION					$6,770,416
ONGOING REMEDIAL ACTION ANNUAL COSTS					
Ongoing Remedial Action Annual Costs					
Same as Alternative 2					$328,645
SUBTOTAL ONGOING REMEDIAL ACTION ANNUAL COSTS					$328,645
Administrative Costs			10%	$32,865	
Contingency			25%	$90,377	
TOTAL ONGOING REMEDIAL ACTION ANNUAL COSTS					$451,887
PERIODIC COSTS - FIVE YEAR REVIEWS					
Same as Alternative 2					
SUBTOTAL PERIODIC COSTS					$25,700
Contingency			10%	$2,570	
TOTAL PERIODIC COSTS					$28,270
TOTAL PRESENT WORTH (5% rate of return, 30 year period)					$11,096,000

NOTES:

Total Present Worth calculation presented in Table 11.

TABLE 3

DETAILED COST ESTIMATE
VASQUEZ BOULEVARD/I-70 SITE OU1
ALTERNATIVE 4 - COMMUNITY HEALTH PROGRAM, EXPANDED REMOVAL AND DISPOSAL

Item/Description	Quantity	Unit	Unit Cost	Extension	Total Cost
INITIAL REMEDIAL ACTION DIRECT CAPITAL COSTS					
Removal & Disposal	403	property	$18,412		$7,420,036
Community Health Program	1	LS	$205,655		$205,655
SUBTOTAL INITIAL REMEDIAL ACTION DIRECT CAPITAL COSTS					$7,625,691
INDIRECT INITIAL REMEDIAL ACTION CAPITAL COSTS					
Mob/Demob			10%	$762,569	
Engineering/Administration Costs			10%	$762,569	
Construction Management Costs			15%	$1,143,854	
Health & Safety			3%	$228,771	
SUBTOTAL INITIAL REMEDIAL ACTION INDIRECT CAPITAL COSTS					$2,897,763
Capital Cost Contingency			25%	$2,630,863	
TOTAL ESTIMATED CAPITAL COST FOR INITIAL REMEDIAL ACTION					$13,154,317
ONGOING REMEDIAL ACTION ANNUAL COSTS					
Ongoing Remedial Action Annual Costs					
Same as Alternative 2					$328,645
SUBTOTAL ONGOING REMEDIAL ACTION ANNUAL COSTS					$328,645
Administrative Costs			10%	$32,865	
Contingency			25%	$90,377	
TOTAL ONGOING REMEDIAL ACTION ANNUAL COSTS					$451,887
PERIODIC COSTS - FIVE YEAR REVIEWS					
Same as Alternative 2					
SUBTOTAL FIVE YEAR REVIEW COSTS					$25,700
Five Year Review Contingency			10%	$2,570	
TOTAL FIVE YEAR REVIEW COSTS					$28,270
TOTAL PRESENT WORTH (5% rate of return, 30 year period)					$17,480,000

NOTES:

Total Present Worth calculation presented in Table 12.

TABLE 4

DETAILED COST ESTIMATE
VASQUEZ BOULEVARD/I-70 SITE OU1
ALTERNATIVE 5 - REMOVAL AND DISPOSAL

Item/Description	Quantity	Unit	Unit Cost	Extension	Total Cost
DIRECT CAPITAL COSTS					
Sampling and Analysis at Unsampled Properties	1000	Property	$500		$500,000
Removal & Disposal - Lead Only Above Action Level	1259	Property	$18,412		$23,180,708
Removal & Disposal - Arsenic Only Above Action Level	384	Property	$18,412		$7,070,208
Removal & Disposal - Both Lead and Arsenic Above Action Levels	479	Property	$18,412		$8,819,348
SUBTOTAL DIRECT CAPITAL COSTS					$39,570,264
INDIRECT CAPITAL COSTS					
Mob/Demob			10%	$3,957,026	
Engineering/Administration Costs			10%	$3,957,026	
Construction Management Costs			15%	$5,935,540	
Health & Safety			3%	$1,187,108	
SUBTOTAL INDIRECT CAPITAL COSTS					$15,036,700
Capital Cost Contingency			20%	$10,921,393	
TOTAL ESTIMATED CAPITAL COST					$65,528,357
PERIODIC COSTS - FIVE YEAR REVIEWS					
None					
SUBTOTAL FIVE YEAR REVIEW COSTS					$0
Five Year Review Contingency			10%	$0	
TOTAL FIVE YEAR REVIEW COSTS					$0
TOTAL PRESENT WORTH (5% rate of return, 4 year period)					$60,995,000

NOTES:

Total Present Worth calculation presented in Table 13.

TABLE 5

DETAILED COST ESTIMATE
VASQUEZ BOULEVARD/I-70 SITE OU1
ALTERNATIVE 6 - COMMUNITY HEALTH PROGRAM, FURTHER EXPANDED REMOVAL AND DISPOSAL

Item/Description	Quantity	Unit	Unit Cost	Extension	Total Cost
INITIAL REMEDIAL ACTION DIRECT CAPITAL COSTS					
Removal & Disposal	853	property	$18,412		$15,705,436
Community Health Program	1	LS	$205,655		$205,655
SUBTOTAL INITIAL REMEDIAL ACTION DIRECT CAPITAL COSTS					$15,911,091
INDIRECT INITIAL REMEDIAL ACTION CAPITAL COSTS					
Mob/Demob			10%	$1,591,109	
Engineering/Administration Costs			10%	$1,591,109	
Construction Management Costs			15%	$2,386,664	
Health & Safety			3%	$477,333	
SUBTOTAL INITIAL REMEDIAL ACTION INDIRECT CAPITAL COSTS					$6,046,215
Capital Cost Contingency			25%	$5,489,326	
TOTAL ESTIMATED CAPITAL COST FOR INITIAL REMEDIAL ACTION					$27,446,632
ONGOING REMEDIAL ACTION ANNUAL COSTS					
Ongoing Remedial Action Annual Costs					
Same as Alternative 2					$328,645
SUBTOTAL ONGOING REMEDIAL ACTION ANNUAL COSTS					$328,645
Administrative Costs			10%	$32,865	
Contingency			25%	$90,377	
TOTAL ONGOING REMEDIAL ACTION ANNUAL COSTS					$451,887
PERIODIC COSTS - FIVE YEAR REVIEWS					
Same as Alternative 2					
SUBTOTAL FIVE YEAR REVIEW COSTS					$25,700
Five Year Review Contingency			10%	$2,570	
TOTAL FIVE YEAR REVIEW COSTS					$28,270
TOTAL PRESENT WORTH (5% rate of return, 30 year period)					$31,119,000

NOTES:

Total Present Worth calculation presented in Table 14.

TABLE 6

DETAILED CONSTRUCTION COST ESTIMATE FOR SOIL TILLING/TREATMENT PER RESIDENTIAL YARD VASQUEZ BOULEVARD/I-70 SITE OU1

Item/Description	Quantity	Unit	Unit Cost	Extension
DIRECT CAPITAL COSTS				
Site Preparation	1	ls	$750.00	$750.00
Tilling	580	sy	$5.00	$2,900.00
Treatment Chemical Purchase	9,704	lb	$0.25	$2,425.93
Chemical handling and application	9,704	lb	$0.30	$2,911.11
Property Restoration	1	LS	$2,500.00	$2,500.00
Post-Remedy Testing	1	LS	$4,000.00	$4,000.00
TOTAL ESTIMATED CAPITAL COST				**$15,487.04**

Assumptions

1) Area of soils estimated at 580 square yards (Washington Group, 2001b).
2) Treatment chemical P2O5 cost $ 450 per ton.
3) Target concentration 1% P in treated soil = 0.01 * 5240 feet * 0.5 feet * 100 lbs per cubic foot = 2,620 lbs of P. = 2,620/0.27 lbs of P2O5

TABLE 7

DETAILED CONSTRUCTION COST ESTIMATE FOR SOIL REMOVAL & DISPOSAL PER RESIDENTIAL YARD
VASQUEZ BOULEVARD/I-70 SITE OU1

Item/Description	Quantity	Unit	Unit Cost	Extension
DIRECT CAPITAL COSTS				
Site Preparation	1	LS	$750.00	$750
Soil Removal	194	cy	$18.00	$3,492
Transport/ Dispose Excavated Soil	194	cy	$16.00	$3,104
Purchase/Transport Clean Fill	194	cy	$19.00	$3,686
Place & Grade Clean Fill	194	cy	$20.00	$3,880
Property Restoration	1	LS	$3,500.00	$3,500
SUBTOTAL DIRECT CAPITAL COSTS				$18,412

Assumptions

1) Volume of soils estimated at 5,240 square feet excavation areas at a property, 1 foot depth (= 194 cubic yards per property).

Table 8
Detailed Cost Estimate for Community Health Program Setup

	Labor			Materials				Services				
	Person-hours	Avg. Rate	Cost	Quantity	Units	Unit Cost	Cost	Quantity	Units	Unit Cost	Cost	Total
Community Health Program One-Time Start-Up Costs												
1 Education/Public Awareness												
Develop Public Awareness Campaign	400	$90	$36,000	10000	brochures	$2	$20,000	1	art work	$10,000	$10,000	$66,000
Newspaper												
- News/Post								1	ad budget	$6,000	$6,000	$6,000
- LaVoz								1	ad budget	$2,400	$2,400	$2,400
Direct Mail Fact Sheet				4000	fact sheet	$2	$8,000	1	mailing	$1,500	$1,500	$9,500
Task Subtotal	400		$36,000									
2 Biomonitoring Program												
Develop clinic-based biomonitoring program												
- Health Sciences Professional	180	$75	$13,500									$13,500
- Information System Development	320	$75	$24,000									$24,000
Documentation of program	160	$85	$13,600	10	copies	$50	$500					$14,100
Clinic facilities set up	120	$65	$7,800	1	supplies	$5,000	$5,000					$12,800
Task Subtotal	780		$58,900									
3 Source Investigation and Remediation												
Develop sampling and remediation program	200	$85	$17,000									$17,000
Program documentation	160	$85	$13,600	10	copies	$50	$500					$14,100
Task Subtotal	360		$30,600									
4 Program Introduction												
Public Meeting												
- Health Sciences Professional	60	$85	$5,100									$5,100
- Health Sciences Professional	60	$75	$4,500									$4,500
- Hall Rental (Community Center)								2		$150	$300	$300
- AV Equipment								2		$50	$100	$100
- Direct Mail Fact Sheet				4000	fact sheets	$2	$8,000	1	mailing	$1,500	$1,500	$9,500
Task Subtotal	120		$9,600									
Subtotal	**1660**		**$135,100**				**$42,000**				**$21,800**	**$198,900**
Project Management (5% of labor)			$6,755									+ $6,755
Total Start Up Costs			**$141,855**				**$42,000**				**$21,800**	**$205,655**

Table 9
Detailed Annual Cost Estimate for
Community Health Program

		Labor			Materials				Services				
		Person-hours	Avg. Rate	Cost	Quantity	Units	Unit Cost	Cost	Quantity	Units	Unit Cost	Cost	Annual Total
Community Health Program Annual Costs													
1 Education/Public Awareness													
Public education and outreach		168	$80	$13,440	4000	brochures	$1	$4,000					$17,440
Awareness promotions		100	$80	$8,000					1	promo.	$3,500	$3,500	$11,500
Newspaper advertisements													
- News/Post									1	ad budget	$1,200	$1,200	$1,200
- LaVoz									1	ad budget	$600	$600	$600
Direct mail									1	mailing	$1,500	$1,500	$1,500
Task Subtotal		268		$21,440									
2 Ongoing Clinic-based Biomonitoring													
Implement clinic based biomonitoring program													
- Blood lead sampling & analysis		400	$65	$26,000					700	samples	$35	$24,500	$50,500
- Urine arsenic sampling & analysis		400	$65	$26,000					700	samples	$45	$31,500	$57,500
- Participation Incentives	EE Series Savings Bonds				100	bonds	$25	$2,500					$2,500
Case management services		400	$65	$26,000									$26,000
Database/Records Management		400	$45	$18,000									$18,000
Clinic facilities									4	months	$1,000	$4,000	$4,000
Task Subtotal		1600		$96,000									
3 Source Investigation and Remediation													
Implement ongoing sampling program	33/yr	400	$95	$38,000									$38,000
- Interior dust/exterior paint lead samples	4 hr/res	132	$65	$8,580					66	samples	$15	$990	$9,570
- Soil lead & arsenic samples	6 hr/res	198	$65	$12,870					99	samples	$35	$3,465	$16,335
- *Administer questionnaire*	1 hr/residence	33	$65	$2,145									$2,145
Yard Remediation (including exterior paint abatement) when necessary	1/yr								1	property	$45,000	$45,000	$45,000
Task Subtotal		763		$61,595									
Annual Subtotal		2631		$179,035				$6,500				$116,255	$301,790
Health & Safety (10% of labor)				$17,904									+ $17,904
Project Management (5% of labor)				$8,952									+ $8,952
Annual Total				$205,890				$6,500				$116,255	$328,645

TABLE 10

PRESENT WORTH ANALYSIS
VASQUEZ BOULEVARD/I-70 SITE OU1
ALTERNATIVE 2 - COMMUNITY HEALTH PROGRAM, TILLING/TREATMENT (LEAD), TARGETED REMOVAL AND DISPOSAL (ARSENIC)

Year	Capital Costs	Ongoing Costs	Total Annual Expenditure	Rate of Return = 3%		Rate of Return = 5%		Rate of Return = 10%	
				Discount Factor	Present Worth	Discount Factor	Present Worth	Discount Factor	Present Worth
0	$6,321,361	$0	$6,321,361	1.0000	$6,321,361	1.0000	$6,321,361	1.0000	$6,321,361
1		$451,887	$451,887	0.9709	$438,725	0.9524	$430,368	0.9091	$410,806
2		$451,887	$451,887	0.9426	$425,947	0.9070	$409,875	0.8264	$373,460
3		$451,887	$451,887	0.9151	$413,541	0.8638	$390,357	0.7513	$339,509
4		$451,887	$451,887	0.8885	$401,496	0.8227	$371,768	0.6830	$308,645
5		$367,185	$367,185	0.8626	$316,737	0.7835	$287,699	0.6209	$227,993
6		$338,915	$338,915	0.8375	$283,836	0.7462	$252,904	0.5645	$191,309
7		$338,915	$338,915	0.8131	$275,569	0.7107	$240,861	0.5132	$173,917
8		$338,915	$338,915	0.7894	$267,543	0.6768	$229,391	0.4665	$158,106
9		$338,915	$338,915	0.7664	$259,750	0.6446	$218,468	0.4241	$143,733
10		$367,185	$367,185	0.7441	$273,220	0.6139	$225,420	0.3855	$141,566
11		$149,123	$149,123	0.7224	$107,729	0.5847	$87,189	0.3505	$52,267
12		$149,123	$149,123	0.7014	$104,592	0.5568	$83,037	0.3186	$47,515
13		$149,123	$149,123	0.6810	$101,545	0.5303	$79,083	0.2897	$43,196
14		$149,123	$149,123	0.6611	$98,588	0.5051	$75,317	0.2633	$39,269
15		$177,393	$177,393	0.6419	$113,862	0.4810	$85,329	0.2394	$42,466
16		$149,123	$149,123	0.6232	$92,928	0.4581	$68,313	0.2176	$32,453
17		$149,123	$149,123	0.6050	$90,222	0.4363	$65,062	0.1978	$29,503
18		$149,123	$149,123	0.5874	$87,594	0.4155	$61,964	0.1799	$26,821
19		$149,123	$149,123	0.5703	$85,043	0.3957	$59,013	0.1635	$24,383
20		$177,393	$177,393	0.5537	$98,218	0.3769	$66,857	0.1486	$26,368
21		$149,123	$149,123	0.5375	$80,161	0.3589	$53,526	0.1351	$20,151
22		$149,123	$149,123	0.5219	$77,826	0.3418	$50,978	0.1228	$18,319
23		$149,123	$149,123	0.5067	$75,559	0.3256	$48,550	0.1117	$16,654
24		$149,123	$149,123	0.4919	$73,358	0.3101	$46,238	0.1015	$15,140
25		$177,393	$177,393	0.4776	$84,724	0.2953	$52,385	0.0923	$16,373
26		$149,123	$149,123	0.4637	$69,147	0.2812	$41,939	0.0839	$12,512
27		$149,123	$149,123	0.4502	$67,133	0.2678	$39,942	0.0763	$11,375
28		$149,123	$149,123	0.4371	$65,178	0.2551	$38,040	0.0693	$10,341
29		$149,123	$149,123	0.4243	$63,280	0.2429	$36,229	0.0630	$9,401
30		$177,393	$177,393	0.4120	$73,083	0.2314	$41,045	0.0573	$10,166
TOTAL PRESENT WORTH				@ 3% $11,387,000		@ 5% $10,559,000		@ 10% $9,295,000	

TABLE 11

PRESENT WORTH ANALYSIS
VASQUEZ BOULEVARD/I-70 SITE OU1
ALTERNATIVE 3 - COMMUNITY HEALTH PROGRAM, TARGETED REMOVAL AND DISPOSAL

Year	Capital Costs	Ongoing Costs	Total Annual Expenditure	Rate of Return = 3% Discount Factor	Rate of Return = 3% Present Worth	Rate of Return = 5% Discount Factor	Rate of Return = 5% Present Worth	Rate of Return = 10% Discount Factor	Rate of Return = 10% Present Worth
0	$6,770,416	$0	$6,770,416	1.0000	$6,770,416	1.0000	$6,770,416	1.0000	$6,770,416
1		$451,887	$451,887	0.9709	$438,725	0.9524	$430,368	0.9091	$410,806
2		$451,887	$451,887	0.9426	$425,947	0.9070	$409,875	0.8264	$373,460
3		$451,887	$451,887	0.9151	$413,541	0.8638	$390,357	0.7513	$339,509
4		$451,887	$451,887	0.8885	$401,496	0.8227	$371,768	0.6830	$308,645
5		$480,157	$480,157	0.8626	$414,188	0.7835	$376,215	0.6209	$298,140
6		$338,915	$338,915	0.8375	$283,836	0.7462	$252,904	0.5645	$191,309
7		$338,915	$338,915	0.8131	$275,569	0.7107	$240,861	0.5132	$173,917
8		$338,915	$338,915	0.7894	$267,543	0.6768	$229,391	0.4665	$158,106
9		$338,915	$338,915	0.7664	$259,750	0.6446	$218,468	0.4241	$143,733
10		$367,185	$367,185	0.7441	$273,220	0.6139	$225,420	0.3855	$141,566
11		$149,123	$149,123	0.7224	$107,729	0.5847	$87,189	0.3505	$52,267
12		$149,123	$149,123	0.7014	$104,592	0.5568	$83,037	0.3186	$47,515
13		$149,123	$149,123	0.6810	$101,545	0.5303	$79,083	0.2897	$43,196
14		$149,123	$149,123	0.6611	$98,588	0.5051	$75,317	0.2633	$39,269
15		$177,393	$177,393	0.6419	$113,862	0.4810	$85,329	0.2394	$42,466
16		$149,123	$149,123	0.6232	$92,928	0.4581	$68,315	0.2176	$32,453
17		$149,123	$149,123	0.6050	$90,222	0.4363	$65,062	0.1978	$29,503
18		$149,123	$149,123	0.5874	$87,594	0.4155	$61,964	0.1799	$26,821
19		$149,123	$149,123	0.5703	$85,043	0.3957	$59,013	0.1635	$24,383
20		$177,393	$177,393	0.5537	$98,218	0.3769	$66,857	0.1486	$26,368
21		$149,123	$149,123	0.5375	$80,161	0.3589	$53,526	0.1351	$20,151
22		$149,123	$149,123	0.5219	$77,826	0.3418	$50,978	0.1228	$18,319
23		$149,123	$149,123	0.5067	$75,559	0.3256	$48,550	0.1117	$16,654
24		$149,123	$149,123	0.4919	$73,358	0.3101	$46,238	0.1015	$15,140
25		$177,393	$177,393	0.4776	$84,724	0.2953	$52,385	0.0923	$16,373
26		$149,123	$149,123	0.4637	$69,147	0.2812	$41,939	0.0839	$12,512
27		$149,123	$149,123	0.4502	$67,133	0.2678	$39,942	0.0763	$11,375
28		$149,123	$149,123	0.4371	$65,178	0.2551	$38,040	0.0693	$10,341
29		$149,123	$149,123	0.4243	$63,280	0.2429	$36,229	0.0630	$9,401
30		$177,393	$177,393	0.4120	$73,083	0.2314	$41,045	0.0573	$10,166
TOTAL PRESENT WORTH				@ 3%	$11,934,000	@ 5%	$11,096,000	@ 10%	$9,814,000

TABLE 12

PRESENT WORTH ANALYSIS
VASQUEZ BOULEVARD/I-70 SITE OU1
ALTERNATIVE 4 - COMMUNITY HEALTH PROGRAM, EXPANDED REMOVAL AND DISPOSAL

Year	Capital Costs	Ongoing Costs	Total Annual Expenditure	Rate of Return = 3% Discount Factor	Rate of Return = 3% Present Worth	Rate of Return = 5% Discount Factor	Rate of Return = 5% Present Worth	Rate of Return = 10% Discount Factor	Rate of Return = 10% Present Worth
0	$13,154,317	$0	$13,154,317	1.0000	$13,154,317	1.0000	$13,154,317	1.0000	$13,154,317
1		$451,887	$451,887	0.9709	$438,725	0.9524	$430,368	0.9091	$410,806
2		$451,887	$451,887	0.9426	$425,947	0.9070	$409,875	0.8264	$373,460
3		$451,887	$451,887	0.9151	$413,541	0.8638	$390,357	0.7513	$339,509
4		$451,887	$451,887	0.8885	$401,496	0.8227	$371,768	0.6830	$308,645
5		$480,157	$480,157	0.8626	$414,188	0.7835	$376,215	0.6209	$298,140
6		$338,915	$338,915	0.8375	$283,836	0.7462	$252,904	0.5645	$191,309
7		$338,915	$338,915	0.8131	$275,569	0.7107	$240,861	0.5132	$173,917
8		$338,915	$338,915	0.7894	$267,543	0.6768	$229,391	0.4665	$158,106
9		$338,915	$338,915	0.7664	$259,750	0.6446	$218,468	0.4241	$143,733
10		$367,185	$367,185	0.7441	$273,220	0.6139	$225,420	0.3855	$141,566
11		$149,123	$149,123	0.7224	$107,729	0.5847	$87,189	0.3505	$52,267
12		$149,123	$149,123	0.7014	$104,592	0.5568	$83,037	0.3186	$47,515
13		$149,123	$149,123	0.6810	$101,545	0.5303	$79,083	0.2897	$43,196
14		$149,123	$149,123	0.6611	$98,588	0.5051	$75,317	0.2633	$39,269
15		$177,393	$177,393	0.6419	$113,862	0.4810	$85,329	0.2394	$42,466
16		$149,123	$149,123	0.6232	$92,928	0.4581	$68,315	0.2176	$32,453
17		$149,123	$149,123	0.6050	$90,222	0.4363	$65,062	0.1978	$29,503
18		$149,123	$149,123	0.5874	$87,594	0.4155	$61,964	0.1799	$26,821
19		$149,123	$149,123	0.5703	$85,043	0.3957	$59,013	0.1635	$24,383
20		$177,393	$177,393	0.5537	$98,218	0.3769	$66,857	0.1486	$26,368
21		$149,123	$149,123	0.5375	$80,161	0.3589	$53,526	0.1351	$20,151
22		$149,123	$149,123	0.5219	$77,826	0.3418	$50,978	0.1228	$18,319
23		$149,123	$149,123	0.5067	$75,559	0.3256	$48,550	0.1117	$16,654
24		$149,123	$149,123	0.4919	$73,358	0.3101	$46,238	0.1015	$15,140
25		$177,393	$177,393	0.4776	$84,724	0.2953	$52,385	0.0923	$16,373
26		$149,123	$149,123	0.4637	$69,147	0.2812	$41,939	0.0839	$12,512
27		$149,123	$149,123	0.4502	$67,133	0.2678	$39,942	0.0763	$11,375
28		$149,123	$149,123	0.4371	$65,178	0.2551	$38,040	0.0693	$10,341
29		$149,123	$149,123	0.4243	$63,280	0.2429	$36,229	0.0630	$9,401
30		$177,393	$177,393	0.4120	$73,083	0.2314	$41,045	0.0573	$10,166
TOTAL PRESENT WORTH				@ 3%	$18,318,000	@ 5%	$17,480,000	@ 10%	$16,198,000

TABLE 13

PRESENT WORTH ANALYSIS
VASQUEZ BOULEVARD/I-70 SITE OU1
ALTERNATIVE 5 - REMOVAL AND DISPOSAL

Year	Capital Costs	Ongoing Costs	Total Annual Expenditure	Rate of Return = 3% Discount Factor	Rate of Return = 3% Present Worth	Rate of Return = 5% Discount Factor	Rate of Return = 5% Present Worth	Rate of Return = 10% Discount Factor	Rate of Return = 10% Present Worth
0	$16,382,089	$0	$16,382,089	1.0000	$16,382,089	1.0000	$16,382,089	1.0000	$16,382,089
1	$16,382,089	$0	$16,382,089	0.9709	$15,904,941	0.9524	$15,601,990	0.9091	$14,892,808
2	$16,382,089	$0	$16,382,089	0.9426	$15,441,690	0.9070	$14,859,038	0.8264	$13,538,917
3	$16,382,089	$0	$16,382,089	0.9151	$14,991,932	0.8638	$14,151,465	0.7513	$12,308,106
4		$0	$0	0.8885	$0	0.8227	$0	0.6830	$0
5		$0	$0	0.8626	$0	0.7835	$0	0.6209	$0
6		$0	$0	0.8375	$0	0.7462	$0	0.5645	$0
7		$0	$0	0.8131	$0	0.7107	$0	0.5132	$0
8		$0	$0	0.7894	$0	0.6768	$0	0.4665	$0
9		$0	$0	0.7664	$0	0.6446	$0	0.4241	$0
10		$0	$0	0.7441	$0	0.6139	$0	0.3855	$0
11		$0	$0	0.7224	$0	0.5847	$0	0.3505	$0
12		$0	$0	0.7014	$0	0.5568	$0	0.3186	$0
13		$0	$0	0.6810	$0	0.5303	$0	0.2897	$0
14		$0	$0	0.6611	$0	0.5051	$0	0.2633	$0
15		$0	$0	0.6419	$0	0.4810	$0	0.2394	$0
16		$0	$0	0.6232	$0	0.4581	$0	0.2176	$0
17		$0	$0	0.6050	$0	0.4363	$0	0.1978	$0
18		$0	$0	0.5874	$0	0.4155	$0	0.1799	$0
19		$0	$0	0.5703	$0	0.3957	$0	0.1635	$0
20		$0	$0	0.5537	$0	0.3769	$0	0.1486	$0
21		$0	$0	0.5375	$0	0.3589	$0	0.1351	$0
22		$0	$0	0.5219	$0	0.3418	$0	0.1228	$0
23		$0	$0	0.5067	$0	0.3256	$0	0.1117	$0
24		$0	$0	0.4919	$0	0.3101	$0	0.1015	$0
25		$0	$0	0.4776	$0	0.2953	$0	0.0923	$0
26		$0	$0	0.4637	$0	0.2812	$0	0.0839	$0
27		$0	$0	0.4502	$0	0.2678	$0	0.0763	$0
28		$0	$0	0.4371	$0	0.2551	$0	0.0693	$0
29		$0	$0	0.4243	$0	0.2429	$0	0.0630	$0
30		$0	$0	0.4120	$0	0.2314	$0	0.0573	$0
TOTAL PRESENT WORTH				@3% $62,721,000		@5% $60,995,000		@10% $57,122,000	

TABLE 14

PRESENT WORTH ANALYSIS
VASQUEZ BOULEVARD/I-70 SITE OU1
ALTERNATIVE 6 - COMMUNITY HEALTH PROGRAM, FURTHER EXPANDED REMOVAL AND DISPOSAL

Year	Capital Costs	Ongoing Costs	Total Annual Expenditure	Rate of Return = 3% Discount Factor	Rate of Return = 3% Present Worth	Rate of Return = 5% Discount Factor	Rate of Return = 5% Present Worth	Rate of Return = 10% Discount Factor	Rate of Return = 10% Present Worth
0	$13,723,316	$0	$13,723,316	1.0000	$13,723,316	1.0000	$13,723,316	1.0000	$13,723,316
1	$13,723,316	$451,887	$14,175,203	0.9709	$13,762,333	0.9524	$13,500,193	0.9091	$12,886,548
2		$451,887	$451,887	0.9426	$425,947	0.9070	$409,875	0.8264	$373,460
3		$451,887	$451,887	0.9151	$413,541	0.8638	$390,357	0.7513	$339,509
4		$451,887	$451,887	0.8885	$401,496	0.8227	$371,768	0.6830	$308,645
5		$480,157	$480,157	0.8626	$414,188	0.7835	$376,215	0.6209	$298,140
6		$338,915	$338,915	0.8375	$283,836	0.7462	$252,904	0.5645	$191,309
7		$338,915	$338,915	0.8131	$275,569	0.7107	$240,861	0.5132	$173,917
8		$338,915	$338,915	0.7894	$267,543	0.6768	$229,391	0.4665	$158,106
9		$338,915	$338,915	0.7664	$259,750	0.6446	$218,468	0.4241	$143,733
10		$367,185	$367,185	0.7441	$273,220	0.6139	$225,420	0.3855	$141,566
11		$149,123	$149,123	0.7224	$107,729	0.5847	$87,189	0.3505	$52,267
12		$149,123	$149,123	0.7014	$104,592	0.5568	$83,037	0.3186	$47,515
13		$149,123	$149,123	0.6810	$101,545	0.5303	$79,083	0.2897	$43,196
14		$149,123	$149,123	0.6611	$98,588	0.5051	$75,317	0.2633	$39,269
15		$177,393	$177,393	0.6419	$113,862	0.4810	$85,329	0.2394	$42,466
16		$149,123	$149,123	0.6232	$92,928	0.4581	$68,315	0.2176	$32,453
17		$149,123	$149,123	0.6050	$90,222	0.4363	$65,062	0.1978	$29,503
18		$149,123	$149,123	0.5874	$87,594	0.4155	$61,964	0.1799	$26,821
19		$149,123	$149,123	0.5703	$85,043	0.3957	$59,013	0.1635	$24,383
20		$177,393	$177,393	0.5537	$98,218	0.3769	$66,857	0.1486	$26,368
21		$149,123	$149,123	0.5375	$80,161	0.3589	$53,526	0.1351	$20,151
22		$149,123	$149,123	0.5219	$77,826	0.3418	$50,978	0.1228	$18,319
23		$149,123	$149,123	0.5067	$75,559	0.3256	$48,550	0.1117	$16,654
24		$149,123	$149,123	0.4919	$73,358	0.3101	$46,238	0.1015	$15,140
25		$177,393	$177,393	0.4776	$84,724	0.2953	$52,385	0.0923	$16,373
26		$149,123	$149,123	0.4637	$69,147	0.2812	$41,939	0.0839	$12,512
27		$149,123	$149,123	0.4502	$67,133	0.2678	$39,942	0.0763	$11,375
28		$149,123	$149,123	0.4371	$65,178	0.2551	$38,040	0.0693	$10,341
29		$149,123	$149,123	0.4243	$63,280	0.2429	$36,229	0.0630	$9,401
30		$177,393	$177,393	0.4120	$73,083	0.2314	$41,045	0.0573	$10,166
TOTAL PRESENT WORTH				@ 3%	$32,211,000	@ 5%	$31,119,000	@ 10%	$29,243,000

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APPENDIX J

APPENDIX J

STATEMENT FROM THE
CLAYTON, ELYRIA, AND SWANSEA ENVIRONMENTAL COALITION ("**CEASE**")

RECIPIENT OF A TECHNICAL ASSISTANCE GRANT FOR VB/I-70

CEASE

2332 East 46th Avenue
Denver, Colorado 80216
(303) 292-3203
FAX (303-292-3341

December 4, 2005

Bonnie Lavelle
EPA Region VIII
999 19th Street
Denver, CO 80202

Dear Bonnie,

Greetings. I hope this finds you well and at peace. I am writing on behalf of CEASE to a request for comments on the proposed options for clean-up of the VBI70 Superfund site.

Our understanding is that the Remedy Review Board will be discussing what next steps are for the site and will be considering various options for clean-up. As CEASE has indicated for some time now, we are requesting, on behalf of community, that 400ppm lead and 70ppm arsenic be the levels set for clean-up action at the VBI70 site. We are including a copy of our comments to the initial FS. These comments fully explain our position, our proposal for clean-up and the rational for our comments.

We are also requesting to be full partners in the process of developing a Community Health Education and Case Management plan should the Remedy Review Board agree that community health education be included in the final plan for clean-up. Please know that CEASE members, community residents who have been fully involved in this process since it's inception, do not want to be allowed simply to "give input" to the Community Health Education and Case Management, we want to be full partners in its design, strategy and implementation.

Thank you for your attention to this letter. Please call should you have questions or care to discuss anything related to VBI70.

Sincerely,

Lorraine L. Granado

Lorraine L. Granado
on behalf of CEASE

July 15, 2001

Bonita Lavelle
EPA Region VIII
999 18th Street
Denver, CO 80202

Ms. Lavelle,

Following are the comments of CEASE members and residents and representatives of the Cole, Elyria, Swansea and Globeville neighborhoods, to the Feasibility Study and EPA's preferred alternative for the VBI70 Superfund site:

Environmental Justice:

The VBI70 Superfund site includes the Clayton, Cole, Elyria, Swansea and southwest Globeville neighborhoods. The population of the neighborhood residents is predominantly people of color. In the Cole, Elyria and Swansea neighborhoods the population is majority Mexian-American/Latino, many Black and some white families. In Elyria, Swansea and Globeville the population is 82% Mexican-American/Latino. In Cole the Mexican-American/Latino population is approximately 70%. In Clayton the majority of the population is divided between Black and Mexican-American/Latino families with a small percentage of white families. (2000 US Census, Piton Foundation)

The Cole neighborhood is the second poorest neighborhood in Denver. Families in the Elyria and Swansea neighborhoods are working class, working poor families and 80% of children qualify for the free lunch program at school. (Piton Foundation) Family income for the homes located in southwest Globeville is among the lowest in the city of Denver.

The 80216 zip code, which includes Elyria, Globeville and Swansea, is the most polluted zip code in Denver - and probably the most polluted zip code in Colorado. In 1998, the last year for which we have TRI data, the 80216 zip code received 2 million pounds of legal hazardous emissions into the air, water and soil. However, TRI data from 1998 do not include hazardous emissions from the 2 interstate highways (I25 and I70), Colorado State highways (Vasquez Blvd., Josephine Street, York Street, Brighton Boulevard, Washington Street) the two petroleum refineries (Conoco and Valero), the Cherokee coal fired power plant, or the dozens of print shops, wood treatment facilities, auto body repair and paint shops, or the 8,400 semi-truck trailers that are stationed at 72 trucking firms located in the 80216 zip code.

The hazardous pollution from the above named sources likely contribute as much, or more, pollution than is reported by TRI.

The factors named above demonstrate that the entire VBI70 site is an Environmental Justice (Environmental Racism) community. Per President Clinton's Executive order, the EPA (and other governmental entities) are required to acknowledge Environmental Justice sites and take steps above and beyond those taken at sites that are not located in Environmental Justice communities.

The Feasibility Study developed by EPA fails totally in its mandate to address Environmental Justice at the VBI70 Superfund site. No mention of Environmental Justice is made in the Feasibility Study. No mention is made of the population being low-income, people of color, or of the historical and ongoing burden of hazardous pollution, the increased rates of cancer (in some cases double or triple what wold be expected) or the fact that 40% of the population is composed of youth/children ages 18 and under.

At the VBI70 Work Group meeting on July 11, 2002, the Site Manager was asked why Environmental Justice was not included in the Feasibility Study. She responded, stating that the mandate was met by "letting" us (CEASE) participate in the Work Group. Anthony Thomas, the Clayton representative to CEASE, pointed out that the Presidential Executive Order mandated participation by affected parties (i.e. CEASE). We interpret this mandate to mean that we would have opportunities to assist the EPA in addressing Environmental Justice by taking steps that go above and beyond what is done at non-EJ sites in order to address the current and historical legacy of hazardous pollution forced on our communities.

Instead of assisting the EPA to take bold steps to address the environmental injustices that have been forced on us, we have found ourselves pleading to get action levels for clean-up that protect the health of children and provide permanent solutions for both present and future residents.

In our opinion, EPA's preferred alternative not only fails to address environmental justice, it attempts to shift blame on the victims. This issue will be addressed specifically in the comments that follow.

We request an explanation of EPA's failure to mention or include information about VBI70's demographics and status as an Environmental Justice site. We want EPA to give us an explanation of how the mandate to address Environmental Justice has been met at this site as concerns risk assessment, including cumulative risk, the determination of action levels, and information about how EPA met its obligation to be more diligent and thorough at this site because it is an EJ site.

Also missing in the introduction of the FS is a description of the topography of the neighborhoods. There is no mention of the South Platte River that borders Elyria and is located a half mile east of southwest Globeville. There is no mention of the fact that Globeville, Swansea and Elyria lie in a 100 year flood plain and that a wetlands preservation project has been implemented at the North Side Park that borders Elyria.

We request an explanation for the absence of information and attention to the issue of the flood plain and the wetlands located in the neighborhoods.

VBI70 Work Group:

CEASE members have been involved at this site since the Colorado Department of Health brought in the EPA and the Work Group was convened. We have faithfully attended all Work Group sessions, monthly meetings and conference calls with the ATSDR, meetings to plan and carry out the health care provider education project that was so successful, and meetings to plan and carry out the Health Study Project that is currently underway. When possible, we have also attended technical meetings. Additonally, CEASE holds meetings at least monthly..

It is very important to us to note that when the Work Group meetings first started Bonnie Lavelle wanted us to identify a method for working together that would mitigate or help to prevent disagreements. She said to us that this could be done if we could all agree that we would "trust the science." We agreed to "trust the science" as long as we could believe that the science is sound. Unfortunately, there are many areas where we feel the science is not sound, or the science has been used to lower the risk to our health, or to avoid EPA's responsibility to remove the contamination

Site specific information and data:

When the Work Group meetings first started, a consulting firm was hired to give notification of meetings to all members of the Work Group, facilitate meetings, record the minutes and distribute minutes of the meetings to all members. The consulting firm was used only during the first few months of meetings. We are concerned because there are no minutes of subsequent meetings. Much discussion that included questions raised, comments made, and agreements formed is lost because no minutes were taken. For example: during the meetings CEASE consistently raised concerns about Environmental Justice and verbal commitments were made by the EPA to address EJ. Because no minutes were kept these commitments are lost and one consequence is that EJ has not been addressed at this site.

It is true, as we have been reminded, that we are not scientists and do not have a solid understanding of the science that is used to determine the scope and extent of the contamination or the risks to human health. However, members of CEASE have been involved in other CERCLA and Superfund sites and thus can compare what they have experienced at other sites with the VBI70 site.

VBI70 was named as a Superfund site because the contamination from the Asarco plant in Globeville extended beyond Globeville's boundaries. The Colorado Department of Health and Environment and Asarco were required by the ROD to continue testing outward from Globeville until they could find the end of the contamination. The end to the contamination has still not been found. What is known is the lead and arsenic trioxide found at VBI70 is the same as that in Globeville. However, given the way this site has been treated by the EPA, it would seem that no connection to Globeville or Asarco ever existed.

Instead of using information from the Globevile site (e.g. default values, action levels) as a point of departure, EPA, has treated this site as if it were unique and without precedent. They have chosen, instead using default values, to do "site specific studies."

The EPA has: (1) Used a pig study to determine the bioavailability and health risk of arsenic in children and used this information to set action levels for arsenic. (2) Used a pig study to determine the bioavailability and health risk of lead in children.

EPA did the tests and used the information to set action levels although it is understood that tests on animals are not good predictors of human response and, in the case of arsenic, it is known that people - especially children - are much more sensitive to arsenic that animals.

CEASE members supported the bioavailability studies because we believed that if anything could be learned from the studies that would help not only our own families but people in other communities, then something positive could come from our experience.

We learned after the study was done that the information from the a single pig study would

be used to change the way action levels are set at this site - because the information was site specific. Had we understood this in advance we would at least have consulted Dr. Kossnett and Dr. David Mellard to get a better understanding before deciding whether or not to support the studies.

CEASE objects using the EPA determining risk by the information from a single study on pigs.

In addition to the above, the EPA, acting on a suggestion from Asarco, specifically stated in the FS that residents may have contaminated themselves with the use of pesticides in our yards. We see no scientific evidence in the FS that arsenic in the community can be definitively identified as coming from pesticides. However, we do know that arsenic trioxide is the type of arsenic found in Globeville, Also, in the recent past, companies that made and sold pesticides have been located near our neighborhoods but the possibility that these companies contributed to the arsenic burden in the neighborhoods has not been addressed. One such company, the Colorado Organic Chemical Company, was located at the Sand Creek Industrial (CERCLA site) and the site was contaminated with arsenic.

Additionally, Dr. Michael Kosnett states in his comments to the FS that the EPA's use of a 1.5 mg/kg-d of arsenic seriously underestimates health risks to community residents. We request that EPA respond to Dr. Kossnett's comments/questions regarding the use of 1.5 instead of 7.0 to determine risk. We also want a response to our questions concerning the science that proves EPA's assertion that residents are responsible for the arsenic trioxide in the community.

Spacial distribution of pollutants:

As has been noted by EPA and ATSDR, the spacial distribution of the arsenic and lead is not even across the site. In many cases homes whose soil have lead and arsenic in them are located next to homes with little or no lead or arsenic. EPA's initial and continuing response to this has been to suggest that residents may have contaminated themselves.

CEASE members have suggested at meetings that there may another explanation for the uneven distribution of the contaminants. We have asked EPA to examine the possibility that there might be another explanation for the distribution but EPA has not acted on our request.

Following is another possible explanation: All five the neighborhoods are very old neighborhoods and in Elyria and Cole much of housing stock is pre 1950's. Elyria is the oldest neighborhood in Denver and Cole is one of the oldest. These two neighborhoods are the most contaminated.

It is probable that all five neighborhoods were contaminated with historical emissions of lead and arsenic by the three refineries that were located most closely to Elyria and Cole. However during the decades after two of the refineries stopped operations, much new and in-fill housing was - and continues to be - developed in all four neighborhoods. When new housing is built the soil is excavated for the foundation, garage, porches, etc. The ground is also turned for landscaping, i.e. grass, trees, shrubs, flowers, gardens, etc.

We believe it is possible that those homes with little or no contamination may have been built after 2 of the refineries stopped operations and that the contamination could have been

disturbed (buried or removed) as the new housing was built. We asked that EPA get records from the city of Denver and compare the age of the homes with the levels of contamination in the yards to see if there is any difference in levels of contamination between older (pre 1940's or 50's) and newer (post 1940'3 or 50's) homes. This might shed some light on the uneven distribution of the contaminants.

Since Clayton and Swansea are "newer" neighborhoods with fewer older homes, it could be expected, under this scenario, that they would not be as heavily contaminated - as is true at this site.

Margaret Shoenbeck from the Colorado Department of Health did obtain and shared with CEASE and EPA records from the City of Denver that show the ages of the homes in the VBI70 Superfund site. However, CEASE is unable to use the records because we do not have access to information about the levels of contamination at the homes that were tested.

We request that EPA compare the age of each of the tested homes to the level of contamination found at the homes to determine if there is any correlation between the age of the homes and the levels of contamination found at that home. We request that EPA share this information with CEASE, ATSDR, CDPHE, and Dr. Michael Kosnett.

Arsenic:

In EPA's preferred plan the action level for arsenic is 128 ppm. At Asarco the action level was 78 ppm. In Eureka Mills, Utah, a community that is 99% white, the action level for arsenic was 77 ppm. We are concerned that at an EJ site the action levels for arsenic would be almost double that of a white community. We would like EPA to fully explain the differences in the communities that would justify such a disparity in treatment.

Listed below are industrial sites located throughout the county, most of which are located next to residential areas, where action levels for arsenic were significantly lower than the 128 ppm. proposed for VBI70. At most of these industrial sites lead was also removed. At all but 4 of these sites lead was removed at 500 ppm - 40 parts per million lower than is proposed for VBI70. In only one case was the action level for lead higher than at VBI70. At that site lead was removed at 600 pm.

Site Name	State	Arsenic clean-up level (mg/kg - ppm)
Rentokil, Inc.	VA	33 ppm
Adam's Plating	MI	6.7 ppm
Silresim Chemical Corp.	MA	21 ppm
Cannelton Industries	MI	12.8 ppm
Allied Chemical & Ironton Coke	OH	0.56 ppm
Interstate Lead Co.	AL	10 ppm
Mid Atlantic Wood Presevers	MD	10 ppm
Whitmoyer Laboratories	PA	21 ppm
Whitehouse Oil Pits	FL	42 ppm
Defense General Supply Center	VA	5.7ppm

USMC Camp Lejeune	NC	23 ppm
Golden Septic Tank Service	SC	18 pm
Sharon Steel Corp	UT	8 ppm
Salem Acres	MA	40 ppm
Sand Creek Industrial	CO	12.7 ppm
Joseph Forest Products	OR	36 ppm
Bonneville Power Administration Ross Complex	WA	32 ppm
Industrial Latex Corp	NJ	3.6 ppm
Facet Enterprises	NY	19 and 17 ppm
Ogden Defense Depot	UT	35 ppm
PAB Oil & Chemical Service	LA	10 ppm
H. Brown Co., Inc.		6.6 ppm
Chemical Insecticide Corp.	NJ	20 ppm
Fairchild Air Force Base	WA	20 ppm
Sinclair Refinery	NY	25 ppm
Oklahoma Refining	OK	25 ppm
Crystal Chemical	TX	30 ppm
Lorentz Barrel and Drum Co.	CA	23 ppm
Ellis Property	NJ	20 ppm

We would appreciate the EPA explaining to us why at industrial sites - where no children live - EPA would set arsenic clean-up levels for soil at levels that are as much as 90% lower than those set at VB70.

We request that arsenic levels at this site be set at least as low as those in Globeville and Eureka Mills, Utah. That is 77 or 78 ppm.and responsive to recommendations by CDPDE and ATSDR that action levels should be set between 42ppm and 128ppm.

Lead:

EPA excluded inhalation of lead through air as a pathway of exposure for lead and arsenic. We would appreciate an explanation, in plain English, of the process used to eliminate inhaling lead and arsenic as a pathway of exposure. EPA did not explain (we don't know if they studied) any potential harm to the South Platte River or the wetlands at Northside Park of runoff from contaminated soil into these bodies of water. We would appreciate an explanation about the lack of information about the river and wetlands.

EPA focused its studies of lead on contaminated soil at residential properties. In the process of studying the soil they also performed limited testing on internal and external paint on a small number of homes (130 of 2,989 homes). We want to know if the science supports making a decision about the entire site based on a sampling of less than 5% of tested homes. We want to know if 130 positive tests is statistically significant for the whole site.

In 130 the homes, EPA found internal and/or external lead based paint. As a result of this limited testing, EPA states that external and indoor lead based paint are secondary, and significant,

contributors to the lead exposure to residents and use this assertion to justify setting the lead removal action levels at 540 ppm. EPA also states, based on 130 homes, that soil is not a significant contributor to the elevated blood lead levels in children at this site. We would appreciate EPA explaining, in plain English, the science that supports these conclusions.

EPA staff have also stated that EPA does not have the authority to remove or treat internal lead based paint. EPA's site manager has never clearly stated - even though we have asked - whether EPA prohibits the removal or treatment of external lead based paint. However, she has not included removal or treatment of lead based paint in the actions to be taken in FS. Dr. Kossnett's comments indicate that EPA may have within its authority the ability to remove or treat both external and internal lead based paint, especially in light of the mandate to address Environmental Justice. We look forward to EPA's response to this issue.

In support of its position related to the lead paint exposures that EPA contends contribute to elevated blood lead levels in children at this site, EPA sites blood lead tests taken years ago by agencies other than the EPA. We are not clear how the results of these old tests, using an unknown protocol, are used to draw conclusions and set action levels at this site. We would appreciate information about the ages of the children tested, the protocol for testing, the dates tests were taken, any relationship between the children tested and lead and arsenic in the soil at their homes and, last, the length of time the children lived in those homes.

Again, please explain to us the "science" that was used to draw the correlations that the site manager described when she explained this at the meetings for public comment on the FS.

We are troubled at the use of site-specific information at this site (i.e. bioavailability tests) when the outcome seems to reduce risk and the use of old tests when current site specific tests for blood lead and urine arsenic in children are currently underway.

The Health Study project, currently underway, involves knocking on every single door in the entire site with the goal of identifying and testing every child up to six years of age for lead and arsenic. This is the most comprehensive testing ever done in the neighborhoods and will result in information that can be used to make decisions based on the actual, rather than estimated, lead and arsenic exposures to children.

We strongly request that the comments on the Feasibility Study be halted until the data from the Health Study program can be included. We do not think that delaying the FS by three months is significant given the years that we have already committed to this work. In fact, we believe that the inclusion of this information is fundamental to the goal of assessing actual risks to children at the site.

Should EPA chose not to include the data from the Health Study, we request an explanation for the refusal.

CEASE requests that the action levels for lead be 231 parts per million as was done at Eureka Mills unless EPA can provide sufficient rational for the differences in the sites that mandated lower levels for removal of lead at Eureka Mills.

Should there be some extraordinary reason(s), acceptable to CEASE, for why Eureka Mills was cleaned-up at such a much lower level, CEASE requests that lead be removed at 400 ppm, the national screening level.

Arsenic and Lead:

CEASE is requesting 77 or 78 ppm as the action level for arsenic and 231 ppm as the action level for lead because these action levels would be protective of human health and are measures that have been used at other sites (some of which are industrial). These action levels would help to address Environmental Justice (Environmental Racism) mandates at this site.

Community Health Education Plan:

CEASE views the Community Health Education Plan as a temporary measure that will not, even in the short term, protect children and adults from exposure to arsenic and lead exposure.

Based on budget figures proposed in the FS for the first year, EPA proposes that 4/5 time FTE staffing will be provided to do community education, biomonitoring for children, and source identification and referral for lead abatement for the approximate 4,500 homes located in the site. Case management for the families of children who have elevated blood levels is not addressed. (Attached please find information regarding case management) The budget for CHP will be reduced by 5% each year for the following 5 years.

Although the CHP is not fully developed, some specific actions are named. For example, the health educator will use publications such as La Voz and local newspapers to educate residents. LaVoz does not distribute its newspaper in this neighborhood. They do have 2 drop-off sites (Cross Community Coalition and El Centro Su Teatro) in the community where about 40 papers are dropped off weekly. This is clearly insufficient to reach even all of the Spanish speaking population (and assumes that all people can read). The local newspapers do not publish in Spanish but 42% of families in Elyria, Globeville and Swansea identify Spanish as their primary language.

CHP also states that "individual" outreach education will be provided. Given that the Health Study project (that has 10 staff working 40 hours each per week, knocking on every door) resulted in only 100 arsenic and lead tests in its first 2 months, it seems impossible that at a 4/5 time FTE could knock on every door and do "individual" outreach to every home even once in a year.

If the goal is to do individual education to only those homes where a child is identified with elevated as/pb levels, the staff person(s) would have to constantly update their information about homes where ownership or renters have changed and new children are living in order to test those children. Again, this seems impossible for a 4/5 time FTE.

At the base, however, it seems that the goal is to change behavior. Dr. Kosnett and Dr. David Mellard agree that pica behavior in small children is probably innate and cannot be changed. If this is true, the behavior change must occur in the parent(s), child care provider, or older children in families who take care of their younger siblings while parents are at work. It follows then, that should a child have elevated levels of metals in their bodies, the fault will be that of the parent, child care provider or older sibling who did not effectively "manage" exposure to the contamination. This is an injustice.

Most important, however is the fact that Community Health Education, however long it lasts, is a temporary solution. Only the contamination is permanent.

CEASE requests action levels of 77 or 78 ppm arsenic and 231 ppm lead be set, that at

least 3 FTE staffing be provided for the CHP, and that Community Health Education be fully funded during the years that clean-up activities are being implemented.

Risk Assessment Studies:

CEASE is concerned about the use of pig studies, information from Asarco, Monte Carlo and the ISE to determine risk and set action levels at this site. We feel that, to some degree, the people at this site may have been used as "guinea pigs" for new technologies or processes. We cannot make this statement definitively but we do have concerns, especially given outcomes that seem to reduce risk assessments.

We would appreciate information from EPA about other sites where these same processes were used and how the risk assessment outcomes at those sites compare to the risk assessment outcomes at VBI70. We would like information about sites where the same processes were used to determine risk, i.e. how many sites, what sites and where the sites are located

Additionally, CEASE has many times expressed its disappointment at the total lack of accessibility and accountability of Dr. Chris Weis. He only attended about 2 Work Group meetings and was present, briefly, at 2 community meetings during the entire RI/FS process. Many of the questions we have asked in this document could have been addressed before now if Dr Weis had been available. We do understand that he was very busy in Lubby, Montana and appreciate the extremely serious needs at that site. However, we do feel that this site was neglected because instead of dealing with a qualified, accessible EPA staff, we had only infrequent contact with a consulting firm and its employee, Bill Bratt, and this contact happened at technical meetings whose topics were highly technical and, therefore, inaccessible to us.

Environmental Justice;:

We request that the EPA address Environmental Justice at this site by setting action levels based on cumulative exposures (at least 77-78ppm arsenic and 231ppm lead), developing a Community Health Education Program that is comprehensive, culturally competent and fully funded, and that the EPA respond fully and completely to the requests for information contained in these comments.

CEASE believes that the FS is an incomplete document given the lack of information about the community, the lack focus on Environmental Justice, the failure to include the results of the Health Study Project in calculating risk, a Community Health Program that is insufficient to meet the stated goals, and the setting action levels that will not provide a permanent solution that reduces risk for both present and future residents at this site.

CEASE respectfully requests that the FS be withdrawn and public comment stopped until issues raised by CEASE, Dr. Kossnett, ATSDR and the Colorado Department of Public Health and the Environment are addressed and resolved.

CEASE Members:

Lorraine L. Granado
Swansea Resident

Michael Maes
Pres. Elyria/Swansea
Neighborhood Assn.

Akwe Starnes
Whittier Resident

Tony Garcia
Resident, Elyria
Exec. Director
El Centro Su Teatro

Clair Monash
Exec. Director
ESG-CEDC

Tom Anthony
Elyria Resident

Erma Zamora
Board President
Cross Community Coalition

Mary Miera
Staff
COPEEN

Antonia Montoya
Globeville Resident

Co-Resident

Micaela Garcia de Benavidez
Elyria Resident

Paul Garcia
Youth Worker
Swansea Resident

Swansea Resident

Swansea Resident

Swansea Resident

Swansea Resident

Swansea Resident

Swansea Resident

Swansea Resident

Lorraine L. Granado
Swansea Resident

Michael Maes
Pres. Elyria/Swansea
Neighborhood Assn.

Akwe Starnes
Whittier Resident

Tony Garcia
Resident, Elyria
Exec. Director
El Centro Su Teatro

Clair Monash
Exec. Director
ESG-CEDC

Tom Anthony
Elyria Resident

Erma Zamora
Board President
Cross Community Coalition

Mary Miera
Staff
COPEEN

Antonia Montoya
Globeville Resident

Co-Resident

Micaela Garcia de Benavidez
Elyria Resident

Paul Garcia
Youth Worker
Swansea Resident

Tillie Granado
Swansea Resident

Swansea Resident

Virginia Valenzuela
Swansea Resident

Swansea Resident

Swansea Resident

Fay Maes
Swansea Resident

Raquel Hedgin
Swansea Resident

TABBED PAGE

APPENDIX K

APPENDIX K

STATEMENT FROM ASARCO

ASARCO

October 3, 2002

Ms. Bonnie Lavelle
Remedial Project Manager
EPA Region 8 (8EPR-SR)
999 18th Street, Suite 300
Denver, Colorado 80202-2466

RE: Proposed Plan for Cleaning Up Residential Soils within the Vasquez Boulevard & Interstate 70 Superfund Site-Denver, Colorado

Dear Ms. Lavelle

Asarco is providing in this letter additional comment on EPA's approach for addressing residential soils at the Vasquez Boulevard / I-70 site in Denver. ASARCO is providing this comment without waiving any of the objections and comments it has previously made on the Risk Assessment and Remedial Investigation / Feasibility Study, either in writing or in meetings with the EPA and the Work Group. This letter is also in addition to those comments on the proposed plan sent to you on June 10, 2002.

ASARCO has become aware that EPA has apparently elected to modify the proposed cleanup criteria for residential soils at the Vasquez Boulevard / I-70 site form the proposed levels of 540 ppm Lead and 128 ppm Arsenic. We understand that the revised levels will be 400 ppm Lead and 70 ppm Arsenic. ASARCO views this modification as arbitrary, capricious, and inconsistent with the goal of establishing cost effective remedies that are protective of human health and the environment.

In the proposed plan EPA noted that levels of 1100 ppm Lead and 240 ppm Arsenic would be protective based on modeling. Additionally, under conditions as they exist today, ASARCO knows of no significant elevation of children's blood lead levels in the community that can be attributed to lead in soil. Moreover the impact of arsenic in soil has not been shown to be providing adverse health impact. ASARCO's June 10 comments noted that the reasons and support for reducing the 1100 and 240 criteria to 540 and 128 was not clearly stated. This current additional reduction is even less understood and in ASARCO's view is not scientifically justified.

The 400ppm lead remediation level is particularly problematic. This level of lead in soil was developed nationally by EPA as a screening level, not a cleanup criteria. In

2575 EAST CAMELBACK ROAD, SUITE 500 · PHOENIX, ARIZONA 85016-4240 · (602) 977-6500 · FAX (602) 977-6500

an urban area like the VB/I-70 part of Denver, ASARCO believes that there is a potential that the geographical size of the cleanup area will become enormous. The reason for this lies in the fact that historical use of lead based paint, tetraethyl lead in gasoline, pesticides and herbicides containing lead, etc. may result in a large number of residential properties with soil lead levels in excess of 400 ppm, thus requiring remediation and sampling to continue into the foreseeable future.

Although ASARCO understands that EPA will be the lead entity in this residential cleanup, ASARCO views the cleanup criteria and the manner it was selected as a dangerous precedent. ASARCO is looking at how it can work cost effectively to accomplish its environmental cleanup obligations, and based on the attached article ASARCO believes that EPA is being asked to do the same. The arbitrary selection of overly conservative cleanup criteria is inconsistent with good scientific practice and runs counter to the goal of cost effective environmental and public health protection.

Should you have questions on this comment, I can be reached at (602) 977-6513.

Very Truly Yours,

Donald A. Robbins
Director of Environmental Services

cc: Thomas L Aldrich
Robert A. Litle
Scott Thomas

As agency concedes $200 million shortfall

EPA ASKS REGIONS TO MOVE SUPERFUND MONIES TO COMPLETING CLEANUPS

EPA has asked its regional offices to re-examine where they have allocated funding in their Superfund programs and to shift available funds towards the areas of greatest need — with EPA making the biggest push towards funding sites nearing cleanup, or "construction," completion, agency and congressional sources say.

The move comes as EPA recently announced that its Superfund program is facing a shortfall as high as $200 million for fiscal year 2002 and that the situation may "snowball" if funding is not increased in upcoming years, despite earlier projections of a much smaller funding deficit.

"We clearly face a shortfall of money for construction in the Superfund program," said Mike Cook, director of the Superfund program, at the second meeting of the National Advisory Council on Environmental Policy & Technology (NACEPT) panel considering the future of the Superfund program. "The demand [for cleanup funds] clearly exceeds the availability of money," he said.

As a result, EPA has asked its regions to begin "redirecting a modest amount [of money] from the pipeline," — or earlier phases of the cleanup process like study and design — towards construction completion, according to one regional source. "There's definitely an interest in getting sites to construction," the source says. "We have been asked to look at moving funding" from areas where it may not be needed to areas of greater need, the source says.

The source says the move is unusual because "historically we've been able to fund all of our construction work." But with the budget shortfall, EPA has had to take unique steps to save or redirect funding wherever possible.

Another agency source says EPA was actually considering asking regions to shift all of its funding away from the pipeline and towards construction, but was unsure whether the agency followed through with that proposal. But a high-level waste office official denies EPA asked the regions to do so.

The program's deficit appears to be significantly higher than the $80 million EPA officials had previously estimated, despite agency efforts to cut costs through programmatic reforms. The funding shortfall has also left the agency unable to provide funds for seven Superfund sites of 33 identified in a May Inspector General report as lacking sufficient cleanup funds.

The latest deficit figures are also likely to boost Democrats' and environmentalists' efforts to reinstate the expired Superfund taxes, which they say will cause significant funding shortfalls in the future. Last week, Senate Majority Leader Tom Daschle (D-SD) vowed to press for a Finance Committee vote before the end of the congressional session on newly introduced legislation to reinstate the expired Superfund taxes (*see related story*).

Cook told the panel that in its efforts to cut costs, EPA has stepped up efforts to locate liable parties earlier in the cleanup process, and increased the use of enforcement orders. In addition, the agency is reviewing post cleanup activities to try to "bring down costs in the program as much as we can," Cook said.

While environmentalists and state officials have feared that EPA would use the NACEPT panel as a justification for not listing sites on the National Priority List (NPL) of Superfund sites, Cook emphasized that NPL listings would continue, but under tighter criteria. "We are going to continue to list but I think we're going to tighten up the listing requirements," Cook said.

EPA will also likely require its regions to begin turning over more unspent, or de-obligated, cleanup funds to headquarters for Superfund cleanups, agency officials said. Regions have historically been able to retain de-obligated funds but EPA changed that policy this year in order to allow headquarters to distribute funds to regions that may need them.

By shifting de-obligated monies to regions with funding deficits, the program may only face a shortfall of $140 million, one EPA source says.

Other EPA officials warned at the meeting that the funding condition will "snowball" in upcoming years as neglected sites create a backlog of cleanup work as new sites are identified as needing cleanup.

WHITMAN SAYS DHS, NOT EPA, SHOULD TAKE LEAD ON CHEMICAL SECURITY

EPA Administrator Christine Todd Whitman is conceding that the new Department of Homeland Security (DHS) — not EPA — should be the lead agency responsible for chemical plant security.

Whitman told a hearing of the Senate Environment & Public Works Committee Sept. 24 that the Bush administration is working with a bipartisan group of senators to propose legislation that gives the new department a coordinating role in overseeing the security of hazardous industrial facilities, as an alternative to legislation sponsored by Sen. Jon Corzine (D-NJ) that gives EPA that responsibility.

Whitman's statements come as sources say the White House has stalled indefinitely a proposal by EPA to require security enhancements at chemical plants and other facilities storing hazardous materials. The agency had expected to roll out the initiative earlier this month, but an internal debate over the administration's statutory authority has left the fate of the proposal uncertain, industry and EPA sources say.

High-level cabinet officials from EPA, the Department of Justice, the White House's Office of Management &

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APPENDIX L

APPENDIX L

PUBLIC COMMENTS ON THE
MAY 2002
PROPOSED PLAN FOR VB/I-70 OU-1

Lucille Davis 4675 Thompson St.

Would like to know how one gets in a block is contained I not any more. Maybe some one knows some one in LPA

To Whom

I Know my Yard need's new So I I can't grow grass or Flowers and when my Grandchildren are playing out Side Some Time's the comes with upset Stomach or diarrhea or headache's So I hope something is done with our Soil

Than K You

Mary

Harrington Ele
1-20-02

Arsenic should be removed to 10 ppb.
The arsenic lead soil test should be
extended to Whittier neighborhood.
Why ~~did~~ it stop short of testing this area until the end of
contaminated soil is clear?

I support the
Cesar proposal

Marilyn Haines
303-294-9275

Harrington Ele
1-20-02

How long are you proposing to stay in our
community, Harrington and Chilton
Street? How are you going to handle
the transitory behavior of people in
the community? You will this say?
How does your thinking correspond to re
testing a long term monitoring prog
The details are essential but vital to us

non compounding terms
used thinking about
- try
- look at

Marilyn
303-294-9275

Robin Hecht (303) 294-9723

My yard is dying and I have very
little I can to help stop the high lead
levels. I put flowers everywhere but they
don't grow. I don't know what the problem
is. I left the meeting to go to work due
to a late start. I need to find out how
soon things are going to be repaired or if
we need to do repairs. I was never told
there was arsenic & lead in my soil.
We'd would never have bought my house.
So please inform me of your progress
because I am spending too much money
on my yard to keep doing it if it's not
going to grow anyway. Thank you

Mrs Hecht

6-29-02

Dan Mulqueen
1422 S York
Denver CO 80210
720.530.1522

Dear EPA,

I hereby request an
Extension to the Public Comment period
for the UBT70 proposed plan for 45 additional
days for the reasons which I stated in my
oral comments on this day.

Thank you

Dan Mulqueen

Please contact me, so that I may request a copy of the transcript or minutes from today's meeting.

Thank you,

Monica Perales
Sr. Community Relations Consultant
& Community Development
for City & County of Denver
monica.perales@ci.denver.co.us
720-913-1569

Allison Sullivan
3554 Marion St.

I do appreciate the time that EPA staff has spent in our neighborhood. I especially thought Bonnie's presentation was clear, intelligent and well presented.
However, after listening to many other opinions from folks who have consulted medical specialists and done research on other communities, I have come to the conclusion that the current proposal, while meeting the EPA's model for cleanup, does not adequately meet our level of acceptable lead and arsenic.
I urge you to please consider revising the current plans to clean homes below a 400 level lead to clean homes that have high levels but do not have children currently living in homes.

What are the people thinking about?
Be thankful that EPA has started the cleanup program. Otherwise we would never hear about the lead and arsenic. People should realize that there is just so much money for such projects. It is all your tax money. The EPA can only do as much at the time.
Lead paint with in homes should be removed by the homeowner. Even the removal of lead pipes. I've lived in my home for 79 years and have taken care of their problems and didn't ask for others to pay for it.
Be thankful that the EPA started this cleanup program.

Sincerely,
Ruth Bryden

June 29, 2002

Stephanie Sanders - Cole Resident

I support all the comments made by the residents + CEASE.
I have done my own research on the soil contamination issue, and I cannot find anything that supports the EPA's proposal of 540 ppm. Everything I have read supports 400 ppm.

Please, think of our children in the neighborhood and clean-up homes that have the 400+ ppm. levels.

Thank you!

Jose Cardenas 29 Años

Estoy recien casado y mi sueño como tal es tener familia y les pido su mejor esfuerzo Pensando en los niños y como el mio aun no nacen.

Jose Cardenas - 29 yrs old

~~I recently m~~

I am a newlywed, and my dream as such is to have a family. I request your best efforts, thinking about children and those like mine who have yet to be born.

Dunlous McConnell

3als Filmore

I disagree with the EPA solution.

I am more inclined to endorse the CCC solution.

The environmental reason mentioned and documented seems to be in play already.

I believe the issues of [illegible] Cotton should be insulated.

The process has been done and why has it become accepted [illegible]

6-29-02

Is the EPA liable for setting certain levels of P.P.M. for current and future levels. If concrete levels are set and a clean up is taken up the levels drop and would there ten years could the levels drop and would there EPA go back to old superfund site to maintain level that may not is agreed upon today.

6/29/02

I Dimps Humphrey
Property owner at 3221 Fillmore St.
for 50 years. have gotten our soil
tested ~~to~~ have gotten a letter with
results, stating that my yard does
not require an immediate clean up.
according to the Decision Value sheet,
my Arsenic level results is higher at
153.1 exceeding 128 parts per million.

Alternative 4,

EPA have my permission to remove the
top 12 inches of soil from my yard
where arsenic level exceed 128 parts per
million. The soil will be transported off
to the site for disposal at an appropriate
facility, backfill with clean soil and
yard features restore. I would like
Sprinkling system put in at my expence.

My wife have a heath problem (Illness)
that none of the Doctors or Specialists
have been able to find out what is wrong
with her, for many years. Do you think
the cleaning of the soil will correct
her problem?

My next question is, ~~in~~
be willing to pay for some pu
my wife or I to stay while the clean
is being done, so we do not have to
breathe contaminated dust?

Dimps Humphrey

DIANA DEGETTE
1ST DISTRICT, COLORADO

1530 LONGWORTH HOUSE OFFICE BUILDING
WASHINGTON, DC 20515
202-225-4431
FAX 202-225-5657

DISTRICT OFFICE:
1600 DOWNING STREET, SUITE 550
DENVER, CO 80218
303-844-4988
FAX 303-844-4996

E-mail: degette@mail.house.gov

Congress of the United States
House of Representatives
Washington, DC 20515–0601

ENERGY AND COMMERCE COMMITTEE

SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS

SUBCOMMITTEE ON TELECOMMUNICATIONS AND THE INTERNET

SUBCOMMITTEE ON COMMERCE, TRADE, AND CONSUMER PROTECTION

2002 JUL 22 AM 11:09
EPA
SUPERFUND BRANCH

July 19, 2002

Vasquez Boulevard/I-70 Comments
Ms. Bonnie Lavelle
Remedial Project Manager
EPA Region 8 (8EPR-SR)
999 18th Street, Suite 300
Denver, Colorado 80202-2466

Dear Ms. Lavelle:

I am writing in regards to the Environmental Protection Agency's (EPA) proposed clean up plan for the Vasquez-Boulevard and Interstate 70 Superfund Site (VB I-70). I commend you and EPA Region 8 for keeping my office apprised of this important Superfund project and for undergoing a truly unique public outreach and community involvement process.

I also appreciate the special consideration the EPA has exhibited toward the VB I-70 project and EPA's willingness to think beyond the normal confines of Superfund to address the unique needs of what truly is an environmental justice community.

It is evident a tremendous amount of work and analysis went into the proposed plan and that environmental justice is a relatively new concept that the EPA is trying to incorporate into their risk analysis and clean up plans.

The impact of lead contamination on our children is a well documented public health concern. The compounded risks of elevated lead contamination in the paint and in the yards of the community's homes combined with the other multiple pollution sources constitute a cumulative risk that deserves urgent attention.

The environmental justice aspects of this clean up combined with the multiple risks to the children demand a clean up to the highest standards. Therefore, I support a lead clean up level of 400 ppm. This level also has strong support in the community. While I recognize this is a screening level for initial site investigation for EPA's Superfund sites, in light of the cumulative risks at the VB I-70 site, I believe this is a reasonable baseline cleanup level.

I understand the EPA is now considering guidance on how to address cumulative pollution impacts at Superfund sites across the nation. While we need to move quickly to select a remedy for the site, we also need to consider the broader cumulative impacts.

PRINTED ON RECYCLED PAPER

We cannot allow the admitted need for additional testing of children for lead and other impacts to delay the cleanup.

Because current law is unable to adequately address this cumulative and complicated risk, the EPA should move forward on what it does have authority to do, and that is to clean up as many yards as reasonably possible.

Lastly, in briefings I have received about the VB I-70 project, the EPA proposed, as part of the sites remedial action, to consider the multiple sources of contamination and to identify: "chemicals, exposure pathways, and areas of concern to assist in the efforts to address cumulative risks." We see no mention of this commitment in the preferred alternative and would like clarification on how EPA intends to implement this proposal.

Thank you for the opportunity to comment on the VB I-70 proposed plan. I look forward to working with the EPA on the further investigation of the multiple pollution impacts these neighborhoods face. It is vitally important that the cumulative risks suffered by these communities are defined and quickly acted upon. In this day and age, with all we know about the health impacts of air and water pollution and extended exposure of hazardous chemicals and heavy metals to our citizens, no community in our country should disproportionately suffer from environmental pollution.

Thank you for consideration of my comments.

Sincerely yours,

Diana DeGette

Diana DeGette
Member of Congress

Dear Bonnie Lavelle

My name is Melissa Edwards and I'm a home owner of 2 1/2 years at 4645 Fillmore in Swansea I've lived in Swansea about 17 yrs. and I was never aware that I or neighbors of Swansea and surrounding areas could ever had been affected by contaminated soils. I'm now very concerned because I am a mother of 2 and they love to play outside and I have not yet had my soil tested and I think I may need it done. My husband has tried to regrow our grass in the back yard

and haven't had
and luck now for
2 summers this
summer will be our
3rd time trying
he wanted to dig up
the whole back yard
and cover with
fertilizer but I'm
afraid that he shouldn't
do that who or how
can I contacted
someone to come
and test my soil
for free or not
to expensive. We are
not a very rich
family like most
of us in these
areas we just trying
to live happy and
raise healthy and
happy children.
I think replacing
to soils with fresh
clean soil and
restoring the yards
is a wonderful

and most definitly
going to be very
hard thing to do.
But if it assures
us and our childrens
to have healthy
lives then God
Bless you and the
people who are going
to fund this task
Thank you for your
time. I hope this
makes a difference

Thankyou.
Melissa Edwards
A concerned Mother.
home # 303 296-8674

3221 Fillmore
Denver, Colorado 80205

July 6, 2002

Patricia Courtney
U.S. Environmental Protection Agency
999 18th Street Suite 500
Denver, Colorado 80202-2466

Dear Ms. Courtney:

Subject:VB/I70 Cleanup Project

I was in attendance at the meeting conducted by the U.S. Environmental Protection Agency (EPA) at the St. Charles Recreation Center which was addressing the Vasquez Boulevard/Interstate-70 (VBI70) super fund project on Saturday June 29, 2002. My name is Mr. Dimps R. Humphrey; I have been a home owner for 50+ years in the aforementioned neighborhood at 3221 Fillmore Street. I was some what interested in the information provided by the EPA on what they propose to do about the soil cleanup in these areas, but more importantly I was very much enlightened by the disclosure and proposal initiative offered on Saturday by Ms. Lorraine Granado (Spokes person for the Clayton, Elyria, Sweansea, and Southwest Globeville (CEASE) Committee). After listening to the proposal of both what EPA hopes to accomplish and CEASE projected needs for our community, I adamantly concur with the request of CEASE plan i.e. that any and all levels of lead or arsenic found in our soils should be deemed dangerous enough to be removed and replaced. I have been notified by the EPA that our soil was tested to have 153.1 ppm of arsenic, therefore exceeding the screening standard of 128 ppm. I agree to fully participate with EPA in the effort to have the contaminated soil in my home dug up, removed, and replaced. I have recently made plans to have a lawn sprinkler system installed at my home, but now I would choose to forgo such a procedure pending the soil remediation job needed to be done by EPA. If at all possible, I would request that the sprinkler system would be installed (at my cost) during the same time that my soil is to be removed and replaced.

In the last few years my wife has experienced several physical and medical problems some of which remain inexplicable by doctors and medical specialist. One question and concern I would propose to you to answer for me is; while this process of soil removal takes place how many total suspended particulate (TSP) of the same arsenic will become air borne and further add to the effect or potential of an unhealthy environment? Secondly would the EPA be willing to relocate me and my wife (for the sake of our health and safety) during this soil remediation process?

I would very much appreciate a prompt and courteous response to the issues addressed in this document either by mail or a telephone call.

I can be reached by telephone at (303) 388-1718.

Sincerely,

Dimps R. Humphrey

Dimps R. Humphrey
Home Owner

July 18, 2002

Dear Environmental Protection Agency:

I have been reading the report at the Bond-Warner Library on Kalamazoo Boulevard/I-70 Superfund Site. I have also attended two public meetings held at Harrington Elementary School!

I don't understand why it is taking so long to get all of the properties tested? I was very frustrated with this reality!

2002 JUL 18 PM 3:59
EPA
SUPERFUND BRANCH

Federal, State and local officials and departments should cooperate with one another to clean up the arsenic and lead in contaminated yards, to clean the tap water and to take care of the lead paint problem. The clean up should be begun immediately.

All children should be tested and observed for any health problems

resulting from lead and arsenic poisoning. A Community Health program should have already been in place and functioning. This program should be ongoing as long as there is arsenic and lead poisoning in our community. It should consist of community members, social workers, psychologists psychiatrists and medical

doctors who specialize in arsenic and lead poisoning. There should be constant monitoring of our community on a regular basis. Every three to four months would not be too much.

Flyers, newsletters, newspapers and letters should be sent out with updated information on the lead-arsenic situation

written in both English and Spanish!

Our children are our future and we must do ~~fe~~everything humanly possible to ensure as a community that they have the brightest, safest, healthiest lives possible every day of every month of every year!

If we each do our part then God will make a way

(06)

for all of us to have a safer, cleaner and more informed community.

Sincerely,

Lazlen D. Brent

Michael J. Kosnett, MD, MPH
Diplomate, American Boards of Internal Medicine,
Preventive Medicine (Occupational Medicine) and Medical Toxicology

Toxicology Consulting Office: 1630 Welton Street, Suite 300
Denver, CO 80202
(303) 571-5778
Fax: (303) 892-5628
email: Michael.Kosnett@UCHSC.edu

July 13, 2002

Bonnie Lavelle
Remedial Project Manager
Vasquez Boulevard/Interstate 70 Superfund Site
U.S. Environmental Protection Agency, Region 8 (8EPR-SR)
999 18th Street, Suite 300
Denver, CO 80202-2466

Re: Comments on the Baseline Human Health Risk Assessment (BHHRA), Feasibility Study Report (FSR), and Preferred Alternative for the Vasquez Boulevard/Interstate 70 (VB/I70) Superfund Site

Dear Ms. Lavelle:

Enclosed please find a copy of my comments for the public record on the above-entitled project. These were prepared in my capacity as a technical advisor to the CEASE community coalition.

I look forward to working with you and the community further on this important project.

Sincerely,

Michael J. Kosnett, MD, MPH

enclosure

cc: CEASE community coalition

July 13, 2002.

To: Bonnie Lavelle
Remedial Project Manager
Vasquez Boulevard/Interstate 70 Superfund Site
U.S. Environmental Protection Agency, Region 8 (8EPR-SR)
999 18th Street, Suite 300
Denver, CO 80202-2466

From: Michael J. Kosnett, MD, MPH
1630 Welton, Suite 300, Denver, CO 80202
303/571-5778; Michael.Kosnett@uchsc.edu

Technical Advisor
CEASE Community Coalition

Re: Comments on the Baseline Human Health Risk Assessment (BHHRA), Feasibility Study Report (FSR), and Preferred Alternative for the Vasquez Boulevard/Interstate 70 (VB/I70) Superfund Site

The comments in this memorandum are subdivided into 3 main parts. The first two parts address the methods and approach used by EPA in its assessment and presentation of the health risk posed by arsenic and lead, respectively, at the VB/I70 Superfund Site. The methods and approach in question were presented primarily in the Baseline Human Health Risk Assessment, and the comments contained herein supplement those submitted previously during the comment period on the draft of the Baseline Risk Assessment. The third part of this memorandum provides comments on the Feasibility Study Report, and the preferred remedial alternative for VBI70 proposed by EPA in May, 2002.

A. Comments regarding the methods and analytical approach used by EPA to assess health risks from arsenic.

A.1. As was noted in prior comments on the Draft Baseline Human Health Risk Assessment, the slope factor used by EPA in assessment of cancer risk from ingestion of arsenic in soils continues to be the value of 1.5 mg/kg/day contained in the IRIS database. This value, which has remained unchanged in the IRIS database since 1988, is based solely on the risk of arsenic-induced skin cancer. As discussed in detail in two recent reports by the National Research Council (NRC 1999, 2001), and as acknowledged by U.S. EPA itself in its adoption last year of a revised MCL for arsenic in drinking water (EPA, 2001), there is extensive scientific data that establishes that arsenic ingestion

increases the risk of lung cancer and bladder cancer. The analysis presented in the most recent NRC report, (NRC, 2001) indicates that the slope factor (i.e. cancer risk divided by arsenic dose in mg/kg-day) associated with arsenic-induced lung and bladder cancer combined is likely to exceed 1.5 mg/kg-day by a considerable margin. NRC (2001) concluded that the combined excess lung and bladder cancer risk associated with a drinking water arsenic concentration of 10 µg/L (0.010 mg/L) was likely to be equal to *or greater than* 1 in 1,000 (one in one thousand). In this same report, NRC noted and utilized recent findings that indicate that a typical 70 kg adult consumes 1 liter of tap water per day. The NRC analysis can be used to calculate a slope factor as follows:

slope factor = excess risk/(mg/kg-day) = 0.001/(0.01mg/L x l L/70 kg) = 7.0 mg/kg-d

Accordingly, the discussion on "Cancer Effects" on pages 65 and 66 of the Baseline Human Health Risk Assessment should be revised to reflect the fact that the most recent NRC assessment supports the use of a slope factor of 7.0, a value nearly 5 times higher than the value of 1.5 mg/kg-d that was actually used in the cancer risk calculations. The implications of this higher slope factor for assessment of cancer risk posed by arsenic in soil at VB/I70 properties should be qualitatively and quantitatively addressed in a revision of the document, and in a revision of the preliminary action levels for arsenic set forth in EPA's risk management memorandum of October 19, 2001 (Appendix C of the Feasibility Study Report). [1] Carefully and explicitly addressing the implications of this recent NRC report would be consistent with an approach used elsewhere in the document of citing and incorporating calculations based on several recent studies or techniques, many of which have served to reduce risk estimates.

A.2. In the section on Acute Noncancer Effects of arsenic, the BHHRA (page 64) states that EPA, in a report written by Dr. Robert Benson, has established an acute RfD for arsenic of 0.015 mg/kg-d. This RfD was used in the identification of a soil exposure point concentration (EPC) of 47 ppm as a Preliminary Action

[1] Several other aspects of the discussion of cancer risk in the Baseline Human Health Risk Assessment appear outdated and merit revision. On page 65, rather than focus on skin cancer, the narrative should emphasize that arsenic causes lung cancer and bladder cancer, which are much more likely to be associated with fatal outcomes. It may be noted that in contrast to the cited paper by Morales et al (2000), NRC (2001) expressed a strong preference for the use of an external reference population in risk assessments using the SW Taiwanese dataset. The discussion on page 85 in the subsection entitled, "Uncertainty in Toxicity Factors" suggests that in vivo methylation may be a detoxification mechanism for arsenic, when the weight of recent evidence suggests otherwise (NRC, 2001). The discussion on page 85 may also be interpreted by some readers to infer that nutritional factors may exert a considerable influence on susceptibility to arsenic induced cancer; however, current evidence for such a hypothesis is scant (NRC, 2001)

Level based on acute hazard for a child with pica behavior (FSR, page 23). The narrative of the BHHRA states that the acute RfD of 0.015 mg/kg-d was derived from a study of individuals in India chronically exposed to arsenic in drinking water (Mazumder et al, 1998) in which 0.015 mg/kg-d was identified as a NOAEL for chronic skin lesions. No uncertainty factor was applied to the NOAEL derived from this study. Several concerns exist regarding this determination. First, the study in question was a survey of a chronic health endpoint, i.e. arsenic skin lesions, and was not designed to detect acute adverse health effects of arsenic. Second, the dose calculations used in that study must be interpreted with caution, because the study used an unspecified technique to "estimate daily water intake" and the actual data on water intake were not reported. Third, the study was cross-sectional in nature, and although it may be presumed that many of the subjects had longterm exposure to well-water, the length of time associated with water of a particular arsenic content was not specified. Fourth, skin lesions in that study were detected in some subjects, including one child under nine years of age, whose current arsenic dose was estimated to be less than 0.015 mg/kg-d.

As noted in the BHHRA, ATSDR has relied on alternative studies to derive an acute minimum risk level (akin to an acute RfD) of 0.005 mg/kg-d. It should also be noted that a recent FIFRA Scientific Advisory Panel (EPA, 2001) convened by EPA recommended that a margin of exposure ranging from 10 to 30 be applied to a LOAEL of 0.05 mg/kg for purposes of a short-term oral arsenic exposure guideline for children. This in effect identified an acute RfD of 0.005 to 0.0017 mg/kg-d. (I served as a member of this SAP, and endorsed the value of 0.005 mg/kg-d).

There is no dispute that major uncertainties exist regarding the assessment of acute arsenic risk posed by soil pica behavior, and that it also poses a considerable challenge with respect to risk management. The issue of acute RfD aside, major factors in the uncertainty of the risk assessment pertain to the frequency of pica behavior, the intake rate, and the absorption fraction associated with high dose ingestions of a soil matrix. In light of the human data available for determination of an acute LOAEL for arsenic, and EPA's traditional approach for assigning margins of exposure, the agency should discuss why it did not give at least equal consideration to selecting an acute RfD of 0.005 mg/kg-d (as opposed to 0.015 mg/kg-d) in setting the preliminary action level at VBI70.

B. Comments regarding the methods and analytical approach used by EPA to assess health risks from lead

B.1. In assessing the risk to young children of oral lead exposure from soil, the BHHRA noted that EPA, acting on policy established in the early 1990's, has identified 10 µg/dL as the "blood lead level at which effects that warrant avoidance begin to occur". In like manner, it noted that since 1994, EPA has "set as a goal that there should be no more than 5% chance that any child will have a blood lead value above 10 µg/dL" (BHHRA, page 89). However, in the section of the BHHRA that discusses the uncertainty in the lead hazard risk assessment, no mention is made of recent data that indicates that the level of 10 µg/dL may not be sufficiently protective. The history of public health recognition of the adverse effect of lead on children has been characterized by a progressive lowering of the blood lead level of concern over time. This fact was acknowledged by the US Centers for Disease Control and Prevention when it identified 10 µg/dL as the level of concern in its last major review of this topic in 1991. A recent study by Lanphear et al (2000) found that blood lead levels less than 5 µg/dL were associated with adverse neurocognitive outcomes in young children. The authors concluded, "Collectively, the results of the present analyses and other studies argue for a reduction in blood lead levels that are considered "acceptable" - from 10 µg/dL to 5 µg/dL or lower." The BHHRA and the FSR should discuss the implications for lead risk assessment and risk management, respectively, of the very real possibility that a reevaluation of this topic by the CDC in the near future may lower the blood lead level of concern to 5 µg/dL, or lower.

C. Comments regarding the Feasibility Study Report and EPA's Preferred Alternative for VBI70

C.1. The remedial action objective set forth for lead in soil is to "Limit exposure to lead in soil such that no more than 5 percent of young children (72 months or younger) who live within the VB/I70 site are at risk for blood lead levels higher than 10 µg/dL from such exposure." (FSR page 22).

Implementation of a successful strategy to achieve that goal, and verification of such success, requires that EPA clarify the manner in which it will consider in its analysis and plan the likelihood that children in the VBI70 study area have an elevated baseline in blood lead concentration from non-soil sources such as lead paint. The premise that there is an elevated background in blood lead within VBI70 is supported by the following: a) The socioeconomic demographics of the community, i.e. an urban community with a high proportion of Hispanic and African-American families, are associated with increases in

blood lead concentration relative to the national average (NCEH/CDC, 1997); b) the community has a high percentage of pre-1970 housing, a risk factor for lead paint exposure; c) the results of recent blood lead monitoring in the community collected by CDPHE are consistent with an elevation relative to national data (see BHHRA pp 103-104); d) a recent door to door survey of a Denver neighborhood with relatively similar demographic characteristics (Denver Childhood Blood Lead Survey, Final Report- January, 1996, CDPHE, 1996), found that 16.2% of children aged 12 to 35 months of age had blood lead concentrations in excess of 10 µg/dL; and e) 8 of 86 children (nearly 10%) screened by CDPHE in the VBI70 area on September 25, 2000 had blood lead concentrations greater than 10 µg/dL (see ATSDR Public Health Assessment, 2002, page 47).

A decision by EPA to acknowledge and incorporate this likely elevation in baseline blood lead concentration in its approach to limit the capacity of soil lead exposure to cause more than 5% of children to have blood lead concentrations in excess of 10 µg/dL may require not only a vigorous program of community education on lead hazard risk reduction, but also more stringent reductions in the acceptable concentration of lead in soil, and/or a program that will directly mitigate or eliminate non-soil sources of lead, particularly lead paint. There is authority and precedent within EPA and the Superfund program to consider these latter approaches. In this regard, it can be noted that there has been a growing trend within EPA in support of risk assessments that explicitly consider a community's *cumulative* exposure to toxicants such as lead in the design and implementation of a remedy. This has been discussed in two recent agency documents: 1) Guidance on Cumulative Risk Assessment. Part 1. Planning and Scoping (EPA, 1997); and 2) Framework for Cumulative Risk Assessment (EPA, 2002 draft). This latter document, currently an external review draft developed by EPA's Risk Assessment Forum, notes the following:

> One of the concepts that can be used in risk assessments (both for human health and ecological assessments) is that of vulnerability of the population or ecosystem. Vulnerability of a population places them at increased risk of adverse effect, and may be an important factor in deciding which stressors are important in doing a cumulative risk assessment. The Agency 's risk characterization policy and guidance (US EPA, 2000c) touches on this concept by recommending that risk assessments "address or provide descriptions of [risk to] ...important subgroups of the population, such as highly exposed or highly susceptible groups ". Further, the Agency 's guidance on planning and scoping for cumulative risk assessments (US EPA, 1995b) recognizes the importance of "defining the characteristics of the population at risk, which include individuals or sensitive subgroups which may be highly susceptible to risks from stressors or groups of stressors due to their age,

> gender, disease history, size or developmental stage". That guidance also recognizes the potential importance of other social, economic, behavioral or psychological stressors that may contribute to adverse health effects (e.g., existing health condition, anxiety, nutritional status, crime and congestion). These same concepts may also be discussed as a group in terms of "population vulnerability."... The various ways in which a population may be vulnerable are discussed below in four categories: susceptibility, differential exposure, differential preparedness, and differential ability to recover....The second category of vulnerability is differential exposure. While it is obvious by examining a dose-response curve that two individuals at different exposure levels may have a different likelihood of effects, *this also extends to differences in historical exposure, body burden, and background exposure, which are sometimes overlooked in an assessment.* [emphasis added]. (EPA, 2002).

EPA is strongly urged to revise the BHHRA, the FSR, and its conception of the preferred alternative to provide a discussion of the socioeconomic demographics and elevation in non-soil lead exposure and body burden that likely characterize the VBI70 study area. EPA should indicate how it will consider cumulative lead exposure in devising, implementing, and verifying the effectiveness of the remedy. It should be noted that consideration of cumulative exposures is a recognized component of EPA's Environmental Justice initiative. Mr. Martin Halper of EPA's Office of Environmental Justice made a presentation on the significance of the Framework for Cumulative Risk Assessment document for environmental justice at the December, 2001 meeting of EPA's National Environmental Justice Advisory Council. According to the official meeting summary, Mr. Halper "stated that the framework document, which includes traditional quantitative considerations, as well as qualitative considerations, has the potential to affect the way in which EPA and other federal agencies operate." (EPA, 2001).

A recent EPA funded research report issued by the Environmental Law Institute suggested that, in the interest of environmental justice, EPA has statutory authority under CERCLA to directly address the hazards posed by lead based paint. The report stated:

> Section 104(a)(4) establishes exceptions to the limitations on EPA's removal and remedial authority that are contained in Section 104(a)(3). The limitations prevent EPA from taking removal or remedial action in response to releases or threats of releases from a naturally occurring substance from a location where it is naturally found; from products that are part of the structure of, and result in exposure within, residential buildings or business or community structures; or releases into public or

> private drinking water supplies due to deterioration of the system through ordinary use. Despite these limitations, Section 104(a)(4) allows EPA to respond to these types of releases or threats of releases of hazardous substances when it constitutes a "public health or environmental emergency" and no other person with authority and capability to respond will do so in a timely manner. 42 U.S.C. § 9604(a)(4). EPA has issued regulations implementing these provisions. 40 C.F.R. § 300.400(b). EPA has rarely used these exceptions to the limitations on its removal and remedial authority. EPA could, however, rely on this section to address hazardous substance releases in low-income communities and communities of color that may otherwise go unaddressed. This may include releases from products, such as asbestos or lead paint, that are part of the structure of buildings. They may also include releases into public or private drinking water supplies due to deterioration of the system through ordinary use, particularly in communities with limited financial resources for maintaining buildings and water systems. In addition, such releases may pose particular public health threats in many low-income communities and communities of color because of factors such as sensitive populations and cumulative risks. Furthermore, because many low-income communities and communities of color have limited resources, it may be likely that there are no other authorities with capability to respond to the releases. (Environmental Law Institute, 2001, page 151).

Members of EPA's Region VIII Environmental Justice team have participated in the VBI70 process to foster community involvement, but it is not clear how environmental justice concerns were incorporated in the FSR or EPA's development of a preferred alternative for VBI70. EPA should revise the FSR and its presentation of a preferred alternative to explicitly discuss how environmental justice concerns have been factored into design and selection of the remedy. In accordance with the above cited Environmental Law Institute Report, EPA should analyze whether existing mechanisms for detection and abatement of lead based paint within the VBI70 community have adequate scope and funding to reduce, in a timely fashion, the vulnerability of the community's children to this component of cumulative lead exposure. EPA should examine whether direct EPA support for lead paint abatement is warranted to help EPA achieve, in what may be a cost effective manner, a RAO for lead that incorporates the impact of cumulative lead exposure. [2]

[2] Consonant with the approach of considering cumulative exposure and environmental justice issues, the FSR and the process of selecting a remedial action objective for arsenic should examine the implications of the recent cancer study by CDPHE (2001) that adults within the VBI70 community may have increased exposure or vulnerability to other lung carcinogens. The Standardized Incidence Ratio (SIR) for lung cancer (both sexes) in a study area that encompassed the VBI70 community was 1.25 (95% C.I. 1.05 - 1.48). Because lung cancer is a major cause of mortality, an increase in SIR of this magnitude has considerable [footnote continued on next page]

C.2. In a memorandum to the Administrative Record File dated October 19, 2001, (FSR Appendix C, page 11), EPA identified 540 ppm as a preliminary action level for lead in soil requiring engineering (e.g. removal) action. The memorandum stated, "This is the soil concentration at the higher end of the range of soil concentrations that the IEUBK model predicts EPA's health goal will be exceeded." The parameter values resulting in derivation of this value were not specified, but based on Table 2 of the memorandum, it appears that 540 ppm may have been derived using default dietary lead values and a geometric standard deviation (GSD) of 1.2 μg/dL for blood lead concentration. If that were the case, the GSD value of 1.2 represents a departure from the default GSD value of 1.6. Per table 2, the default GSD value of 1.6 would yield a preliminary action level for lead in soil of 208 ppm. The BHHRA (page 101) provides a qualitative explanation of reasons why the default GSD value of 1.6 may overestimate the true GSD. It also provides the results of a an ISE model iteration that yielded a GSD of 1.2. [3] However, justification for the selection of a GSD value of 1.2 would be enhanced if EPA could provide a statistical analysis of the parameters used in the IEUBK that reveals that the overestimation inherent in the default value of 1.6 quantitatively supports a revised value of 1.2.

C.3. EPA's bulletin of May, 2002 identifying Clean-up Alternative 4 as the preferred alternative indicates that 306 properties require soil removal because of arsenic. Can EPA report how many of these properties require soil removal because of the cancer risk from RME soil exposure alone, and how many because of the combined cancer risk of RME soil exposure plus CTE garden vegetable consumption?

C.4. EPA's preferred alternative (Clean-up Alternative 4) contains as a key remedial component a Community Health Plan (CHP) intended to contribute to the implementation and verification of the remedial action objectives for lead and arsenic. The CHP intends to achieve this through a program of health education and biomonitoring. The goals of the CHP are laudable, and a CHP may have the capacity to improve public health within the VBI70 study area. However, in its present form, the information provided in the FSR is insufficient

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public health significance. It should also be noted that Hispanic and African-American children appear more likely than non-Hispanic white children to suffer from iron deficiency, a condition that may be at least additive with lead poisoning in having adverse impacts on neurocognitive development (CDC, 1998; CDC, 2002).

[3] It should be noted that the GSD value of 1.2 reported for the ISE model was derived using an age range for childhood exposure of 1 to 84 months (BHHRA, page 101). This appears to be slightly inconsistent with the RAO for lead in soil stated on page 22 of the FSR, which cites an age range of less than 72 months. The potential impact of this discrepancy, though possibly slight, should be explored.

to establish that the CHP will adequately satisfy several of the relevant primary balancing criteria required for selection of a remedial alternative.

C.4.a. Although the FSR noted that there is no precedent that establishes the efficacy of health education in reducing soil pica behavior, it cited examples of parental education programs dealing with childhood depression and drug use as evidence that an educational intervention will be effective. This analysis fails to consider that soil pica behavior in toddlers may be an innate behavior that is not amenable to substantive reduction through education. Can EPA point to evidence that counters the opinion of David Mellard, PhD of ATSDR in a letter to Bonnie Lavelle of EPA dated June 19, 2001, in which he stated, "Soil-pica behavior is an innate behavior in 1 and 2 year old children and teaching them about the hazards of such behavior will not stop that behavior. While it is possible to educate parents about the hazards of soil-pica behavior, it is not reasonable to assume that parents can watch their children constantly to prevent that behavior. ATSDR views health education on soil-pica behavior as an interim measure to reduce the risk from soil-pica behavior while more permanent solutions are investigated."

C.4.b. Without providing logistical details or quantitative estimates, the FSR states that a voluntary childhood biomonitoring program will achieve a sufficient participation rate to provide detection and secondary prevention of elevated exposure to lead and arsenic. Can EPA examine and comment on whether the rate of participation in the nearby Globeville biomonitoring program provides confidence that a somewhat similar program for VBI70 will achieve an acceptable participation rate? At moderate dose levels, the half-time of arsenic excretion via the urine is a matter of a few days to a week. After estimating the frequency of soil pica behavior among the community's approximately 2500 young children, and the anticipated biomonitoring participation rate, can EPA present a statistical power analysis that examines the feasibility of a urine arsenic biomonitoring program for detecting, with an acceptable degree of confidence, the true prevalence or incidence of elevated arsenic exposure from soil-pica behavior? What criteria would EPA apply to assess whether health education was an acceptable remedy for reduction of soil pica behavior?

In like manner, can EPA explain how it proposes to utilize the results of the blood lead monitoring program to assess the effectiveness of the CHP in meeting the RAO for lead? The lack of clarity regarding the scope of the RAO for lead with respect to soil-related versus cumulative lead exposure was noted above. If EPA will consider the RAO for lead to be achieved by a specified change in the contribution of soil lead exposure to the percentage of children with blood lead concentrations above 10 μg/dL, what criteria will it employ in this assessment? In the event of case management investigations for specific children with elevated blood lead levels, how will the relative contribution of

exposure to lead in soil and paint be determined, particularly when lead is present in both media? If EPA will determine that the RAO for lead is achieved when less than 5% of children in VBI70 have blood lead concentrations less than 10 µg/dL due to all (i.e. cumulative) lead sources, what level of participation in the biomonitoring program will be necessary to detect this level of success with confidence?

C.4.c. The FSR states that the CHP will be a factor in establishing the "long-term effectiveness and permanence" of the preferred Clean-up Alternative. By its very nature, it would appear that the effectiveness of health education and secondary prevention through biomonitoring will persist only as long as the CHP remains active. However, if the detection of sources of hazardous lead exposure through the CHP results in their eventual abatement, then the CHP may be regarded as having contributed to permanent effectiveness at those particular properties. By what criteria will EPA judge the CHP to have successfully contributed to a permanent remedy that persists after the CHP is discontinued? [4]

C.4.d. The FSR states that the CHP will be readily implementable, due in part to the existence of organizational structures for lead poisoning detection and prevention at the state and local levels. To what extent will the effectiveness of the CHP developed by EPA be dependent on the continued existence of these state and local programs? If such dependence is significant, will EPA provide funding, above and beyond that envisioned for the VBI70 CHP alone, to assure the longterm stability and existence of the state and local lead hazard reduction programs?

C.5.d. Notwithstanding the lack of adequate details on the CHP within the narrative portion of the FSR, the budget for the CHP presented in Appendix B, Tables B-7 and B-8, suggests that the scope of the program will be insufficient to accomplish the intended goals. For example, the budget suggests that approximately one half of an FTE (full time equivalent, or full-time position) will

[4] It is noteworthy that a recent research report by the Environmental Law Institute observed that establishment of truly permanent solutions is a component of environmental justice. The authors wrote "The CERCLA cleanup provisions state a strong preference for cleanups that are permanently protective of public health. This preference, along with other stated goals, is consistent with ensuring that protective remedies are selected for sites in communities of color and low-income communities. Therefore, EPA should be able to consider environmental justice factors in developing and implementing remedy selection procedures. In addition to the general authority granted under this section, the statute specifically requires EPA to take into account in selecting among alternative remedies "the propensity to bioaccumulate" of hazardous substances. See 42 U.S.C. § 9621(b)(1)(C). The statute also attempts to hold EPA accountable in circumstances in which it does not select permanent treatment remedies by requiring an explanation. This provision, in particular, could benefit communities of color if used proactively, in light of studies that have indicated that EPA is more likely to select non-treatment remedies for sites in communities of color than for sites in white communities. See Ferris at 673 (citing Lavelle & Coyle)." [Environmental Law Institute, 2001, page 160].

be sufficient, on an annual basis, to publicize the program, and obtain biological monitoring samples on 700 children. This is derived from Table B-8, which allocates 268 person hours to Education/Public Awareness, and 800 hours (400 hours x 2) for collection of urine arsenic and blood lead samples. This subtotal, 268 + 800 = 1068, represents approximately one person working slightly more than half time for a year. A total of only 400 additional hours, or approximately one-fifth of a full time position, is envisioned for case management services. Thus, the FSR appears to suggest that the key components of an effective CHP, i.e. publicity, recruitment, sampling, and case management, can be accomplished by less than one full time position. This seems doubtful, particularly in a community where a relatively high proportion of children may have elevations in blood lead. The section of the budget dealing with "source investigation and remediation" indicates that an average of 33 residences, or less than one percent of the area residences, will be investigated each year. EPA should present a relatively detailed narrative that explains how the seemingly modest level of subject recruitment, case management, and residential investigations set forth in the budget will constitute a CHP sufficient to assure that the public health needs of the community are addressed.

C.6. The University of Colorado Health Sciences Center is currently (summer, 2002) conducting an investigation, funded by EPA and ATSDR, that will gather information on childhood soil contact, and arsenic and lead exposure, in the VBI70 study area. It seems likely that the information gathered in this study will contribute to a greater understanding of the risks posed by arsenic and lead exposure in the study area, as well as the capacity of a biomonitoring program to effectively assess the situation. This information may also assist in the development of an optimal remedy, and provide information on the required scope and resources needed for a community health plan.

In light of 1) the questions and concerns expressed in this memorandum regarding selected aspects of the health risk assessment and the uncertainty analysis in the BHHRA, 2) the data-gaps in the discussion of remedies in the FSR, and 3) the impending availability of information from the summer health study, it is respectfully requested that the comment period for the VBI70 docket remain open until the revised or supplemental information has been provided and reviewed.

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DEPARTMENT OF HEALTH & HUMAN SERVICES

Public Health Service

Agency for Toxic Substances
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JUL 19 2002

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EPA
SUPERFUND BRANCH

Mr. Max Dodson
US EPA Region VIII
Mail Code 8EPR-SR
999 18th Street
Denver, Colorado 80202

Re: ATSDR comments on EPA's proposed plan for the VBI70 site

Dear Mr. Dodson:

The Agency for Toxic Substances and Disease Registry (ATSDR) appreciates the opportunity to comment on the Environmental Protection Agency's (EPA) proposed plan for the Vasquez Boulevard and I-70 site (VBI70). We understand that the preferred alternative (i.e., alternative 4) is a combination of continued soil sampling at properties that have not yet been sampled, soil removal at certain properties, and a community health program. Under this program, EPA will remove soil from properties with average arsenic levels above 128 ppm and average lead levels above 540 ppm. The community health program will involve health education, biological testing of children, and a response program to identify the source of lead or arsenic in order to stop exposure.

ATSDR is concerned that alternative #4 for the VBI70 site does not adequately protect children because some children will remain at risk for exposure to harmful effects from arsenic and lead in soil. A major drawback to alternative #4 is that a child who lives at a property with soil arsenic levels less than 128 ppm or soil lead levels less than 540 ppm must be tested and found to be exposed before soil removal action is taken. ATSDR has provided funds to the Colorado Department of Public Health and Environment (CDPHE) to conduct a health study into arsenic and lead exposure at the VBI70 site. While the results of this study can be useful in deciding future public health activities, the results cannot be used to determine if the proposed clean-up levels for arsenic (i.e., 128 ppm) and lead (i.e., 540 ppm) are protective.

Since the proposed clean-up levels do not protect children, a community health program should not be used in lieu of preventing exposure through environmental engineering controls. While a community health program can be an important element of the overall remedy for this site, the program needs to be implemented in conjunction with the appropriate clean-up levels.

The Agency is also concerned that the preferred clean-up level for lead at VBI70 is not consistent with lead clean-up levels at other sites in Region VIII. Therefore, ATSDR recommends that EPA re-evaluate the input parameters for the IEUBK lead model that were used for the VBI70 site. For example, comparison of the IEUBK parameters that were used at the Eureka Mills Site in Utah could be made.

ATSDR encourages EPA to consider a new alternative, what we call alternative #6, which is described in detail in the attachment. Briefly, Alternative #6 will protect children from the dangers of arsenic and lead contamination by providing lower clean-up levels and will put in place a comprehensive community health program to reduce exposure while clean up is occurring. We also suggest that the design of the community health program should take place through a series of collaborative meetings of site-stake holders.

VBI70 residents have expressed concerns about environmental, social, and economic disparities that exist in their community. We would suggest that the development of an effective remedial and community health program at VBI70 will facilitate a better understanding and where possible development of mechanisms to potentially address some of the environmental justice concerns. To that end, ATSDR is very supportive of EPA's effort to expand the availability of CDPHE's lead poisoning prevention and the City of Denver's mitigation programs to the VBI70 communities. ATSDR is available to assist EPA, the State of Colorado, the City of Denver, and the VBI70 communities to try and augment these and potentially other important public health programs.

While ATSDR supports the concept of a community health program as part of an overall remedy for the site, such a program needs to be clearly delineated and its design phase should involve a collaborative effort with the community and government representatives participating in the VBI70 Working Group. Guaranteeing the continued involvement of all stakeholders is the only way to ensure a strong, long-term commitment to EPA's proposed multi-year community health program.

Thank you again for the opportunity to provide comments.

Sincerely,

Elizabeth H. Howze, ScD., CHES
Director
Division of Health Education
and Promotion

Robert C. Williams, P.E., DEE
Assistant Surgeon General
Director, Division of Health Assessment
and Consultation

Enclosure

cc:
Ms. Bonnie Lavelle
VBI70 Health Team Members
Dr. Henry Falk
ORO

Attachment 1
Specific Comments on EPA's Proposed Plan for the VBI70 Site
The Agency for Toxic Substances and Disease Registry
July 19, 2002

Arsenic Clean-up Level

About 390 properties will have average arsenic levels between 47 to 127 ppm, and the preferred alternative (i.e., #4) will allow arsenic exposure at these properties until a child is found to have elevated arsenic levels in urine.

At an average arsenic level of 127 ppm, some parts of the yard could contain arsenic levels as high as 800 ppm. Should a preschool child with soil-pica behavior eat 5,000 milligrams (mg) dirt from this part of the yard, the estimated dose is 0.17 mg/kg/day (800 ppm x 5000 mg/day x 0.42 x E-6 / 10 kg). This estimated dose of 0.17 mg/kg/day is well above the 0.05 mg/kg/day dose known to cause nausea, vomiting, diarrhea, headache, facial swelling, fatigue, chills, and sore throats in humans (Mizuta 1956, Armstrong 1984, Franzblau and Lilis 1989, ATSDR 2000).

A serious public health threat remains at these properties because a 1-time exposure could cause harmful effects in children. The approach of testing children to find children with elevated urine arsenic will allow serious arsenic exposure to occur before EPA will take action. It should also be pointed out that a testing program as proposed in the alternative #4 cannot prove that a child's *environment is safe.*

As we mentioned in ATSDR's Public Health Assessment for the VBI70 site (released March 5, 2002), some uncertainty exists in deciding if harmful effects might occur in children and adults because of elevated soil arsenic levels and in children because of elevated soil lead levels at the VBI70 site. Therefore, ATSDR proposes that lower clean-up levels be selected and that the clean-up levels should be somewhere between the levels proposed in alternative #4 and alternative #5.

Arsenic and Cancer

ATSDR is concerned that the proposed 128 ppm arsenic clean-up level will not sufficiently reduce the risk of cancer from long-term exposure. This concern arises from some of the input parameters used to estimate cancer risk and include the following points:

1. *The relative bioavailability of arsenic in soil may not be accurately assessed.* In conducting the swine study for the VBI70 site, the control pigs were lost for 1 of the 2 dosing periods resulting in having to use the control pigs from the 2nd dosing period of the study to estimate bioavailability for the entire study.
2. Only 5 soil samples were used to assess the variation in arsenic bioavailability for the entire site.
3. The use of a 95% upper confidence limit to assess variation may not accurately account for all the variation that exists in arsenic bioavailability.

4. It is important to realize that the swine study protocol has never been critically reviewed by an expert panel.
5. EPA used an exposure period of 30 years to estimate cancer risk. However, a significant portion of adults live in the neighborhood for more than 30 years.
6. EPA based a portion of someone's exposure to arsenic by assuming that approximately 50% of "soil" exposure comes from indoor dust. This assumption is based on one study.
7. EPA used a whole-house indoor sample to estimate someone's exposure to arsenic from indoor dust. Information is not available to show that a whole-house indoor dust sample (versus discrete indoor dust samples from various parts of the house) is the best method to use to estimate people's exposure to contaminants in indoor dust. For example, at the Eureka Mill site, EPA used three indoor discrete dust samples to estimate a child's exposure to lead in dust.

Arsenic Clean-up Levels at Other Sites

The 128 ppm clean-up level for arsenic at the VBI70 site, which is based on cancer risk, appears inconsistent with the significantly lower clean-up levels for arsenic at other sites in EPA Region VIII, which are also based on cancer risk. For example, at the Eureka Mills Site in Utah, EPA Region VIII developed a clean-up level of 77 ppm for arsenic, and at the ASARCO Globeville Site in Denver, a clean-up level of 70 ppm was established. The attached Table 1 shows arsenic clean-up levels at other sites in Region VIII.

Table 1				
EPA Region	EPA ID	Site Name	Arsenic Clean-up Level Surface Soil ppm	Land Use
VIII	CO0002259588	Vasquez Boulevard and I-70 (VBI70)	128 ppm	Residential
VIII	COD980717953	Sand Creek Industrial	12.7 ppm	Residential
VIII	COD007063530	Globeville ASARCO, Inc.	70 ppm	Residential
VIII	MTD093291656	Anaconda Co. Smelter (OU1)	73 ppm	Residential
VIII	MTD093291656	Anaconda Co. Smelter (OU 4, 7, 11)	250, 500, 1,000 and 2,500 ppm	Residential and Industrial
VIII	UT9210020922	Ogden Defense Depot	35 ppm	Residential
VIII	UT0002240158	Eureka Mills	77 ppm	Residential
VIII	UTD980718670	Portland Cement Kiln	70 ppm	Residential

Lead Clean-up Levels

At the Eureka Mills Site in Utah, EPA developed a remedial action level of 231 ppm based on the IEUBK lead model. A comparison of the IEUBK parameters for the Eureka Mills Site and the VBI70 site follow:

Table 2. Comparison of IEUBK Parameters for Eureka Mills and VBI70

	VBI70	*Eureka Mills*
Lead clean-up level	540 ppm	231 ppm
Geometric Standard Deviation (GSD)	1.2	1.4
Dietary intake	1.82 to 2.02 μg/day	3.87 to 4.9 μg/day

One of the reasons the clean-up levels vary is the difference in the Geometric Standard Deviation (GSD) value used in the IEUBK model. At the VBI70 site, a GSD of 1.2 was used to develop the remedial action level of 540 ppm while a higher GSD level (i.e., 1.4) was used at the Eureka Mills Site. Using a lower GSD level is one of the main reasons that the clean-up levels are vastly different.

It is interesting to note that the relative bioavailability (RBA) of lead for the VBI70 site was found to be 84% based on a site-specific pig study and the RBA for the Eureka Mill site was estimated to be 70% based on a comparison to other pig studies. Even though the lead at the VBI70 site has a higher bioavailability, the ultimate clean-up number at VBI70 was not lower but higher than the Eureka Mills Site.

It should be pointed out that recent food basket surveys from the FDA show that lead intake in children's diet has decreased since the model was developed. The default dietary lead intake for the model should probably be adjusted in light of this new information. Adjusting the dietary intake to a lower level was done at both the VBI70 site and the Eureka Mills Site. What is interesting to note is that the adjusted dietary intakes differ even though the baseline risk assessments for both sites were released within a month of each other (i.e., August 2001 for the VBI70 site and September 2001 for the Eureka Mills Site). It is important to realize that using a lower dietary intake for lead for the VBI70 site presumably sets the baseline blood lead levels lower, which means that it takes a higher lead intake to exceed the 10 μg/dL level of concern. In essence, this increases the clean-up level for lead in soil. Whether or not this is a significant increase can only be determined by comparing the influence of the dietary intake level on the resulting clean-up level.

Geometric Standard Deviation

In using the IEUBK model to derive the lead action level of 540 ppm for the VBI70 site, EPA adjusted the GSD for blood lead distribution from the default value of 1.6 to several lower GSDs; and, used the lowest GSD (i.e., 1.2) to develop the action level of 540 ppm. To ATSDR's knowledge, this is the lowest GSD that has been used at a hazardous waste site. EPA's guidance on selecting the GSD for the IEUBK model states the following:

"The Guidance Manual describes the selection of the GSD value of 1.6, based on calculations of GSDs from a number of specific sites. The manual emphasizes that the GSD value should be similar at all sites and site-specific values should not be needed unless there are great differences in child behavior and lead biokinetics among different sites." The Guidance Manual specifically states, "We must discourage the user from changing the GSD value by use of empirical site-specific data from a blood lead study." The manual points out that site-specific studies may be subject to subtle sampling biases and changes in child behavior in response to the study (Guidance Manual for the Integrated Exposure Uptake Biokinetic Model for Lead in Children, US EPA, Feb 1994; and Technical Support Document: Parameters and Equations Used in the Integrated Exposure Uptake Biokinetic (IEUBK) Model for Lead in Children (v 0.99d), US EPA, Dec 1994).

EPA's IEUBK FAQs, which is published by EPA's Technical Review Workgroup for Lead, has this to say about changing the default GSD:

> "In general, the TRW does not recommend that site-specific estimates of the GSD be attempted. This parameter is particularly difficult to evaluate at a site, as it is demanding with regard to the amount and quality of the data and the potential complications in the analysis. Unless there are substantial differences in child behavior and lead biokinetics at your site, the default GSD should be used (since it is based on national averages). Thus, site-specific GSD values should not be needed. In particular, the TRW recommends that site-specific estimates of GSD not be substituted for the default value without detailed, scientifically defensible studies documenting site-specific differences in child behavior or lead biokinetics." (http://www.epa.gov/superfund/programs/lead/ieubkfaq.htm)

In a 1998 article by several EPA scientists, the authors review the basis for the GSD. The authors point out that the GSD of 1.6 is based on studies in children who live in Utah, Montana, and Baltimore and that the default GSD of 1.6 is likely to underestimate the true GSD because the GSD is based on a median value (White, PD et al., EHP 106, Supplement 6: 1513-1530, 1998).

EPA's guidance on using GSD limits its use to relatively small neighborhoods. Among other criteria, the manual points out that small neighborhoods consist of approximately 400 households and 100 children. The intent of this criteria is that smaller geographic areas are likely to have more uniform lead levels in a child's environment and therefore the default GSD of 1.6 is more likely to be accurate.

As noted in EPA's baseline risk assessment for the VBI70 site, the GSD for blood lead distribution has a significant effect on the predicted percent of children with blood lead levels above 10 $\mu g/dL$. It is important to realize that lowering the GSD to 1.2 will raise the clean-up level for lead and thus lower the number of properties that qualify for clean up. It should be noted that EPA's baseline risk assessment for the VBI70 site provides no data to support using a lower GSD, and changing the value arbitrarily (or with limited data) seems contradictory to EPA policy.

Community Health Program

The proposed plan makes the following statement: "Children who live in VBI70 will be further protected by a community health program with the following components... health education to raise overall community awareness about soil pica behavior and childhood exposure to lead from all sources."

Based on the current proposal, EPA is planning to use the community health education program in lieu of preventing future exposure by removing contaminated soil. ATSDR does not believe that the proposed soil clean-up levels are protective of public health; therefore, the agency does not think that the community health program is an appropriate use of medical testing and health education. We are concerned that using a medical testing and health education program as a substitute for appropriate soil clean-up levels will have limited value and will not protect public health in the long term.

To be effective, community health education must approach public health problems at multiple levels. (K. Glanz and B. Rimer, Theory at a Glance: A Guide for Health Promotion Practice, US DHHS, NIH, 1998)

Contemporary health promotion includes not only educational activities but also;

1. Developing advocacy groups to promote better health practices in a community,
2. Changing local policy that support educational activities,
3. Developing economic support for local communities,
4. Developing engineering controls to reduce pollution, and
5. Developing a comprehensive program to address a problem at multiple levels.

Similar health education programs have been implemented at other Superfund sites throughout the country. These programs, such as the one in Ruston North Tacoma, have encountered problems such as difficulties with evaluating their effectiveness and other issues which make it difficult to document the long-term usefulness of such programs. ATSDR suggests that EPA contact EPA and state staff from other regions who have worked with these programs to find out how effective the programs are before making a final decision about a community health program at the VBI70 site. It is important to note that at a minimum, community health education programs require adequate funding and staff to be effective.

Long-term Effectiveness of A Community Health Program
The proposed plan makes the following statement: "...EPA and CDPHE believe the Preferred Alternative would be protective of human health, would meet all Federal and State standards required by environmental laws, would be effective in the long term, and would be able to be implemented in the VBI70 community... "

Based on information from similar programs, and experience with the VBI70 community, ATSDR has concerns regarding the long-term effectiveness of the proposed community health program. Similar programs, such as, the Community Protection Measures Program in Ruston North Tacoma, Washington, have been in existence for several years. ATSDR suggests that EPA Region VIII gather information about the effectiveness of this program to determine if a program could be effective for the VBI70 site.

For example, the Ruston North Tacoma program encountered several unforseen obstacles while developing and implementing activities in that community. Some of the same obstacles could develop at the VBI70 site. For example, the area is a mix of rental and owner-occupied properties. As with any neighborhood, a certain percentage of owner-occupied homes will be bought and sold. Therefore, notification of future property owners will present a problem that could affect the long-term effectiveness of the proposed health education program. The most efficient method for notifying new property owners would include deed notices or some other documentation on the property deed that would alert new property owners of the health precautions that are in place for the area. However, such actions could adversely effect property values in the VBI70 area and could prevent some residents from selling or buying homes.

Community Involvement
It is important to realize that for a community health program to be successful, collaborative discussions need to take place with community representatives and local, state, and federal governmental and non-governmental agencies. For these discussions to be successful, the participants need to be treated as equal partners in decision making. ATSDR suggests that EPA avoid the standard approach of an agency developing a design followed by a comment period. Instead, ATSDR proposes that the participants develop the design jointly through group discussion and consensus building on the design components. Once the design components are agreed upon by the participants, a draft protocol is then appropriate.

Biological Monitoring
The proposed plan makes the following statement, "... a testing program to measure levels of lead in children's blood and levels of arsenic in children's urine to find out the level of actual soil pica exposure..."

In the past, both EPA and the State of Colorado have offered urine arsenic and blood lead testing to residents in the VBI70 communities with very limited response. This is similar to another site in Region X that offered long-term testing of children for urine arsenic, and the number of children who participated in the testing was very low. The low participation rate in these

programs could be for several reasons. For example, people may not want their children tested because:

1. They are afraid of the results,
2. They might be influenced by their doctor's advice to not be tested,
3. They have difficulty in scheduling an appointment,
4. They cannot pay for the test.

Based on the poor participation rates in the past at the VBI70 site and the continued trust issues that exist between the community and some government agencies, ATSDR questions whether a long-term testing program could achieve higher participation rates and whether the program could in fact identify children with exposure to arsenic or lead.

Similar to developing a community health program, the success of a biological testing program is dependent upon the community being involved in the discussions and the development of the program. Past experience at the VBI70 site and other sites have shown that government agencies alone setting up a testing program will not be successful. ATSDR suggests that EPA work with community representatives as equal partners in developing and implementing the testing program.

Alternative #6

ATSDR proposes an alternative #6 that incorporates the following points:

1. Developing lower clean-up levels for arsenic and lead at the VBI70 site,
2. Involving the community representatives as equal partners at every step,
3. Evaluating and reviewing similar programs at other hazardous waste sites, and
4. Developing and implementing a community health program that will be in place until clean-up is finished.

ATSDR suggests that EPA engage community representatives and staff members from other agencies to discuss and jointly determine the most appropriate soil clean-up levels for the VBI70 site. It is important that community representatives be treated as equal partners in developing and implementing all components of the community health program. By doing this, the community health program becomes a complement to the environmental engineering controls that will eventually reduce exposure to arsenic and lead in soil to safe levels.

ASARCO

2002 JUN 12 PM 12:24

EPA, REGION VIII
SUPERFUND BRANCH

June 10, 2002

Ms. Bonnie Lavelle
Remedial Project Manager
EPA Region 8 (8EPR-SR)
999 18TH Street, Suite 300
Denver, Colorado 80202-2466

RE: Proposed Plan for Cleaning Up Residential Soils within the Vasquez Boulevard & Interstate 70 Superfund Site – Denver, Colorado

Dear Ms. Lavelle:

Thank you for the opportunity to review and make comments on the Proposed Plan for Cleaning Up Residential Soils within the Vasquez Boulevard & Interstate 70 Superfund Site – Denver, Colorado, that were provided to the VB/I-70 Working Group on May 16, 2002. Asarco is making these general comments without waiving any of the objections and comments it has previously made on the Risk Assessment and Remedial Investigation/Feasibility Study, either in writing or in meetings with the EPA and the Work Group. Our general points about the proposed plan are as follows:

- All of the alternatives except for the "No Action" alternative appear to be directed at least in part (if not totally) at cleaning up sources that are outside the scope of EPA's statutory authority (e.g., homeowners application of herbicides/pesticides and exterior/interior lead based paint).

- EPA states in the proposed plan that action levels of 240 ppm for arsenic and 1100 ppm for lead would have been protective for the site but the proposed plan does not evaluate an alternative with those action levels. The EPA should have done an alternative for those action levels.

- The action level for arsenic was reduced from 240 ppm in alternatives 2 & 3 down to 128 ppm in alternative 4 (the preferred alternative) and 47 ppm in alternative 5. The reason for these reductions is not clearly stated in the proposed plan.

ASARCO Incorporated, 495 East 51st Avenue, Denver, Colorado 80216-2098
Phone (303) 296-5900 • Fax. (303) 296-0508

- If the arsenic action level was reduced because of soil pica behavior, then the reduction is inappropriate. There is no reported soil pica behavior at this site. There has never been a reported case of acute arsenic toxicity in humans from arsenic in soil. All of the numbers reported surrounding this theoretical soil pica behavior are highly uncertain. Lowering the action level for a behavior that likely does not exist is not justifiable and is inconsistent with the National Contingency Plan.

- On page 6, the proposed plan states that CDPHE has already indicated to EPA a preference for alternative 4 and that EPA therefore evaluated state acceptance as part of this Proposed Plan. If the arsenic action level was reduced to get state acceptance to the Proposed Plan or because the state believes there is a state requirement that dictates a lower number, then EPA should have analyzed the incremental cost and the state should be prepared to pay the incremental cost pursuant to section 121 (f) of CERCLA.

- On page 5 the proposed plan states that given the other sources of lead that may be present in a child's home, EPA decided to select a more protective standard of 540 ppm lead in soil. This decision is not well supported in the proposed plan. EPA's authority relates to soil and outdoor exposures only. The more appropriate remedy would have been to keep the 1100 ppm lead action number and have the community health program to deal with the other sources. During Work Group Meetings, EPA discussed successes at other sites with community health programs that dealt with the site specific "multi-media" additional sources of lead.

Thank you for the opportunity to comment on this document. If you have any questions regarding these comments, please contact me at 303-296-5115.

Sincerely,

Bob Litle

Bob Litle
Asarco

Cc: VB I-70 Work Group Members

CITY AND COUNTY OF DENVER

DEPARTMENT OF ENVIRONMENTAL HEALTH
Chris Veasey, Ph.D., Manager

WELLINGTON E. WEBB
Mayor

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2002 JUL 24 AM 11:10
EPA REGION VIII
SUPERFUND BRANCH

July 19, 2002

Ms. Bonnie Lavelle
U.S. Environmental Protection Agency
Region VIII
999 18th Street, Suite 500
Denver, CO 80202-2466

RE: Proposed plan for cleaning up residential soils within the Vasquez Boulevard & Interstate 70 Superfund site, Denver, Colorado, May 2002

Dear Ms. Lavelle:

Thank you for the opportunity to review the draft Proposed Plan for arsenic and lead in soil at the Vasquez Boulevard/I-70 (VB/I-70) site, that was provided to the VB/I-70 Working Group on May 16, 2002. We have the following comments:

1. We strongly agree with the sentiment repeatedly expressed by community members during public meetings, "it is important to begin cleaning up the site as soon as possible." We support efforts to sign a record of decision (ROD) and begin remedial activities as soon as possible. We suggest that changes to the ROD or other site activities can be evaluated as the project progresses. At a minimum, the 5-year review process allows for a comprehensive review of the effectiveness of the remedy. If needed, changes in the selected remedy could be implemented at that time, if supported by appropriate data.

2. DEH supports the proposal to "...clean the worst first." Given the number of properties that require cleanup, it is extremely unlikely that the remedy will be completed within the span of one or two years. In addition, there is a strong possibility that the cleanup timeframe may be extended because of federal budget constraints. It is important that properties with higher levels of contamination, and properties at which small children reside, are prioritized for cleanup. A prioritization process should be developed during the remedial design phase, with community input, that considers both the likelihood of exposure, as well as contaminant concentrations. Elevated properties with, or regularly visited by, young children should be placed at a higher priority than elevated properties

without young children, just as more highly contaminated properties should be a higher priority than those with lower levels of contamination.

3. DEH strongly supports the implementation of a community health program for lead and arsenic, as part of the VB/I-70 site remedy. The community health program can provide numerous benefits to this community. These include:

    a. Most importantly, the community health program will help prevent children's exposures before they occur, through education and outreach activities. The program should be designed to minimize children's exposures to lead and arsenic, by raising awareness of potential harm and providing community education on ways to reduce exposure.
    b. Minimizing potential exposures during the timeframe in which the remedy is being implemented, but is not yet complete.
    c. Addressing environmental justice concerns regarding exposure to environmental contaminants. Especially for lead, it is well documented that there are multiple potential sources of exposure, including deteriorated lead-based paint, the predominant source of exposure for most children. The community health program is essential to identify children at risk from all sources of lead, including sources other than soil.
    d. Ensuring that community members are appropriately tested for exposure to the contaminants of concern.
    e. Ensuring that community members with elevated levels of exposure are provided with appropriate follow-up investigation, referral, and mitigation.
    f. The community becomes an integral component of ensuring that a protective remedy is implemented.
    g. Identifying and providing interventions for children exhibiting pica behavior. Typically, pica children require additional interventions than provided by a simple soil removal program. This is because they are at risk for health effects from contaminants such as lead in soil, even at urban background levels.
    h. Verification of remedy effectiveness. It is important to collect data on remedy effectiveness to ensure that a protective remedy has been selected. Data can be evaluated periodically to address community concerns regarding the protectiveness of the remedy. At a minimum, the data can be used during the five-year review process.

4. We agree that education, biomonitoring, and response are essential to the success of a community health program. It is critical that the community health program be community-based. Community members must be involved and be integral in the design and implementation of the program. The education and outreach efforts should be community-based, culturally-appropriate, flexible, sustainable, and implemented by community members whenever possible. For example, the educational effort could include an outreach effort staffed by community lay health workers that are trained and paid a stipend, to contact their neighbors providing health messages in the manner most appropriate to the target audience (verbally, written materials, demonstrations, etc.).

Also, the program must be flexible, because the approach used in one neighborhood may not be appropriate for another neighborhood. For example, in some communities it may be decided that a mass media campaign (e.g., television, radio) would meet program goals, but in another an outreach effort in the churches or schools might work better. The community health program should be flexible enough to accommodate and encourage different approaches for different communities.

5. The community health program must be of sound design and contain sustainable elements, that provide a measurable community health benefit. The program must include performance goals, so that the success of the program can be judged. Performance goals should be set for things like measures of hazard awareness, numbers of successful contacts made, and participation rates in biomonitoring events. For example, if minimum participation rates were not met for biomonitoring (to ensure adequate sampling of the community), then a reevaluation and redirection of outreach efforts would be required. The health program must have a comprehensive and sound design to ensure sustainability and effectiveness, and so progress towards these goals can be measured.

6. If elevated cases of exposure are identified from biomonitoring activities, each must be investigated individually, to ascertain the source of exposure. In Denver, DEH already performs investigations for children with elevated blood lead levels. Investigations conducted for cases identified within the VB/I70 site should follow similar protocols, be documented appropriately, and be coordinated with DEH. DEH has responsibility for management of elevated blood lead cases in Denver, and wishes to ensure that cases identified through site biomonitoring activities are investigated and managed appropriately. This is important because individual cases may require management by DEH, even after a VB/I-70 health program is discontinued.

7. After case investigations are completed, we suggest that proposed response actions for each case be reviewed by a multi-agency team, that includes the participation of a community member. We believe this team could function and yet maintain patient confidentiality concerns, that are mandated by Colorado statute. This team approach would help assure that all parties understand and become comfortable with assignment of exposure source, as well as response actions, for each case. DEH would like to participate on this evaluation team (for arsenic as well as lead). It is expected that this team would be charged with reviewing whether appropriate response activities were being considered and implemented, including the removal of soil when appropriate. In addition, this team could act as an unofficial review board, to help assess the appropriateness and effectiveness of the selected site remedy.

8. In briefly reviewing the budget for the community health program presented in the feasibility study, we suggest that it may be insufficient to fund a comprehensive community-based health program. We suggest EPA re-evaluate the proposed budget to ensure that sufficient funding is provided for a truly community-based health program. Extensive outreach and educational efforts,

through a variety of time-intensive methods, such as door-to-door contacts, will be needed to ensure that the program reaches every community member.

9. We are very concerned regarding the potential for insufficient funding available for cleanups from the Superfund trust fund. We encourage EPA Region VIII to make every effort to ensure funding for remedial activities at the VB/I-70 site, including expediting decisions that may increase the opportunity for funding. Should the competition for limited funds affect the remedial schedule, we encourage the prioritization of cleanups, as discussed in comment #2.

10. EPA must fund community health program activities during the period of cleanup, even if EPA should decide to select a cleanup alternative that does not contain a community health program action (e.g., EPA alternative 5). We make this distinction, to emphasize the difference between "health program activities" (e.g., education/outreach, biomonitoring, response) that might occur only during the period of cleanup, versus a "community health program" that has been described by EPA as having a more extended existence to satisfy remedial action objectives. The implementation of health program activities during the period of cleanup would ensure that exposure risks are minimized until individual properties are addressed. This is doubly important if the period of cleanup is extended because of funding limitations.

11. We concur with EPA's goal of sampling all properties not yet sampled, which is included as an action under all proposed cleanup alternatives. An additional benefit of outreach activities conducted under the community health program would be to increase property-owner's participation in the sampling program.

12. Of the cleanup proposals presented for the site, EPA's preferred alternative, alternative number 4, best addresses our concerns for ensuring community health in the VB/I-70 site. Alternative 4 includes soil sampling for properties not yet sampled, soil removal and replacement for properties with arsenic levels greater than 128 ppm and/or lead levels greater than 540 ppm, and a community health program.

    DEH has heard many in the community suggest an alternate cleanup scenario, in which arsenic is cleaned to 128 ppm (as per EPA alternative number 4), but lead is cleaned to 400 ppm. We agree with these community members that any lowering of a soil cleanup value results in reduced risk for a child exposed to soil. However, the majority of children in the site are at greater risk from exposure to lead in lead-based paint, than to lead in soil. A recent federal report on childhood lead poisoning reaffirms that children at the highest risk of lead poisoning are those living in pre-1960 housing, particularly if those children are from low-income families (Federal Taskforce, 2000). This is reinforced by our own experiences in investigating children with elevated blood lead levels.

The vast majority of houses in the VB/I-70 area were built prior to 1960[1] and many of the children in the VB/I-70 area are from low-income families. Pre-1960 homes with paint in a deteriorated condition (paint condition is typically worse in low-income areas, especially if populated by rental homes) are likely to contain lead-based paint hazards for young children. A soil cleanup level of 400 ppm would result in a marginal added reduction in risk for children whose primary exposure is to lead-based paint. Additionally, several studies of lead in soil have shown very little reduction in levels of lead in children's blood, when soil levels are reduced by 1000 ppm (e.g., EPA 1993, Weitzman, et al. 1993).

We believe that a well-funded, well-designed, and well-implemented community health program (as discussed in our comments above) coupled with soil cleanups under EPA's alternative 4, will provide greater overall risk reduction for the majority of children in the VB/I-70 communities, than merely reducing the cleanup value to 400 ppm lead in soil. This, along with the other benefits of the community health program, some of which are enumerated above, lead us to conclude that EPA's preferred alternative would best protect the health of site residents. We believe the community would benefit more from a lead cleanup value of 540 ppm coupled with a community health program, than a cleanup level of 400 ppm with no community health program.

13. We agree with EPA's intent to provide "comfort letters" to property owners as soon as appropriate, indicating that their property is clean. The Superfund process is long and arduous for many landowners within the site, and should be completed as soon as possible, to remove any real or perceived stigma of Superfund.

14. EPA has identified VB/I-70 as an environmental justice site, indicating that individuals in the site are disproportionately affected by health concerns other than arsenic and lead in soil, as identified under the Superfund program. Because of concerns for environmental justice, we suggest EPA include a health study as one component of the proposed community health program. A main goal of the health study would be to determine if the health of community members is being, or has been, adversely affected by the presence of arsenic in their soil. We believe it is important to make this determination, given the uncertainty of exposures for longtime residents. A health study would address community concerns and provide some level of confidence that proposed remedial activities are adequately health protective. We understand that ATSDR and EPA currently are funding an exposure study focusing on children's exposures to arsenic and lead, and applaud that effort. The long-term health effects of exposure should also be considered and studied.

15. Because VB/I-70 is an environmental justice site we suggest that it is important to understand cumulative health risks for the affected communities. As described by EPA in the past, a critical component to understanding environmental health risk in an environmental justice community would include the collection and evaluation of additional data to identify and target the largest contributors to

[1] At properties already sampled by EPA, 95 percent of houses were built before 1960 (CDPHE 2002).

health risks for residents. We encourage EPA to perform such an evaluation, given environmental justice concerns, and the cumulative risks likely present for site residents from things other than arsenic and lead in soil.

16. Because of local drought conditions, we suggest EPA offer residents a xeriscape landscaping option, for properties requiring soil removal and replacement. EPA should investigate if this option could be offered to residents for a cost comparable to standard landscape replacement. Not only would this reduce water use, but would help ensure that soil cover remains in place even during drought conditions. Soil cover is important to reduce windblown fugitive dust, even for clean replacement soil.

References:

CDPHE. 2002. Electronic summary of age of housing data for houses sampled by U.S. EPA at VB/I-70 Superfund site. Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division. Age of construction data from City and County of Denver Assessor's Office.

EPA. 1993. Urban soil lead abatement demonstration project, Volume I: Integrated report. United States Environmental Protection Agency, Office of Research and Development, Washington, D.C. July.

Federal Taskforce. 2000. Eliminating Childhood Lead Poisoning: A federal strategy targeting lead paint hazards. President's taskforce on environmental health risks and safety risks to children. February.

Weitzman, M., A. Aschengrau, D. Bellinger, R. Jones, J.S. Hamlin, and A. Besier. 1993. Journal American Medical Association, Vol. 269, 13: 1647-1654.

Thank you for this opportunity to comment. If you have any questions, please contact Celia VanDerLoop at 720 865-5459, or me at 720 865-5443.

Sincerely,

Gene C. Hook
Environmental Protection Division

cc: VB/I70 Working Group

Mmcstewart@aol.com
05/15/02 01:01 PM

To: VBI70@EPA
cc:
Subject: Information

How would I get specific information as to what levels were found at what sites.

Johnny Stewart
Asset Manager
Trees of Denver

"Cherino, Barbara A. - H&NDS" <barbara.cherino@ci.denver.co.us>

To: VBI70@EPA
cc:
Subject: FW: Proposed Cleanup I-70 Superfund Site

05/16/02 11:01 AM

ooops

-----Original Message-----
From: Cherino, Barbara A. - H&NDS
Sent: Thursday, May 16, 2002 11:00 AM
To: 'vbi@epa.gov'
Subject: Proposed Cleanup I-70 Superfund Site

After reviewing the material mailed to me I would like to comment:

Clean-up Alternative 4: is my choice. I feel if the soil is contaminated or has a slim chance of being contaminated to some degree, get rid of it.

This area is inundated with constant truck traffic, so people should not see a significant change.

I would like to know, what will become of the property where the smelter plant was?

Thanks for your time

Barb

Jodi Ross
<ross@moaarch.com>
05/24/02 09:02 AM

To: VBI70@EPA
cc:
Subject: Residential Soil Clean-up

I live at 3910 High St., Denver, CO 80205. I believe that Alternative 4 would be the best action.

Jodi D. Ross
Office Administrator
M+O+A Architectural Partnership
1900 Wazee Street, Suite 100
Denver, CO 80202
303.308.1190x100
303.308.1197 fax
ross@moaarch.com

Coleen M Lyon
<lyondraw@juno.com
>

07/14/02 02:26 PM

To: VBI70@EPA
cc:
Subject: Cleanup Alternatives

Dear folks,
I am a member of the Clayton Neighborhood Association, and also on the Program Commitee of the same. I'm writing to comment on my preference for
Cleanup alternative 4. In particular, I want to put emphasis on the importance of the Community Health Program portion of the plan. In many ways, this is the most important part of the plan, education being the prime objective. We need to enact a serious outreach program for the members of the community to educate them on:

* What the dangers are, and aren't.
* How folks can protect themselves and their children.
* What to do to correct and eliminate contaminated situations.
* Exactly what aide we can expect from the E.P.A. and the C.D.P.H.E.

This information needs to be delivered in person to every member of the community.
Pamflets are marginal in their effectiveness, since most folks won't take the time to read them, and others don't trust "Government" sources.
I am interested in helping to develop a task force of community members to meet this challenge, but we will need help in the way of training and incentives, at least.
I look forward to positive and rewarding participation with the E.P.A., and C.D.P.H.E., in achieving our goals for the Clayton and nearby communities.

Sincerely,

Coleen Lyon
3605 St. Paul Street
Denver, Co. 80205

DouglasKay@aol.com
07/18/02 11:26 PM

To: VBI70@EPA
cc: DouglasKay@aol.com
Subject: Proposed Plan - Comments

TO: Bonnie Lavelle, Remedial Project Manager, Region 8 (8EPR-SR)

Attached are my comments relating to the VBI70 site, Proposed Plan.
It has been a learning experience working with this project. One most important truth proven is that "residents do matter." We can and did make a difference in this entire effort. We appreciate having had the opportunity.

We breath a sigh of relief with the knowledge that our soil will be cleaned up and that that other possible sources will be investigated and followed through. We now move on to the implementation phase of the education agenda, speciafically the Community Health Program. The Program brings with it much hope and possibility.

Sandra H. Douglas
3725 Gaylord Street
Denver, CO 80205
(303) 297-8653

THEPRO~1.DO

The Proposed Plan for Cleaning Up Residential Soils within the VBI-70 Superfund Site

July 18, 2002

FROM: Sandra H. Douglas
3725 Gaylord Street
Denver, CO 80205
(303) 297-8653

TO: Bonnie Lavelle, Remedial Project Manager

I have been with this project since EPA's VBI-70 initial inclusion of the Cole and Clayton neighborhoods in the Fall of 1998. I helped to create the CEASE organization designed to represent community. In fact, I continue to sit at the CEASE table. My participation in this project has been long, busy, and intense, having served hundreds of volunteer hours toward the cause of a cleaner, safer neighborhood for the children and families of the Cole neighborhood. At this juncture of the process, I am excited and hopeful for a better day, a healthier day for the residents impacted by the conditions described as the VBI-70 Site.

I SUPPORT ALTERNATIVE 4 OF THE PROPOSED PLAN AND THE COMMUNITY HEALTH PLAN AS DESCRIBED IN THE PROPOSED PLAN DOCUMENT, WITH THE EXCEPTION OF SOIL REMOVAL LEVELS AS FOLLOWS: I DESIRE A SOIL REMEDIATION LEVEL OF LEAD AT 400 PPM OR HIGHER; and I DESIRE ARSENIC REMOVAL LEVEL AT 128 PPM.

(These two soil remediation levels are in agreement with the CEASE position of Clean-up.)

FURTHER, I SUPPORT THE PUBLIC HEALTH EDUCATION PROGRAM. The health education program would include both individual and community education to raise awareness about soil pica behavior, multiple sources of lead and arsenic, strategies to reduce soil pica behavior and to reduce or avoid exposure to lead and arsenic from sources other than soil, and the health effect of exposure. The Community Health Program would address as many sources of lead as practicable. Another attractive portion of this Plan is that the children in these neighborhoods will be tested for lead and arsenic at no cost to the families. I especially appreciate the inclusion of the residents in the health education efforts, striving for a cultural approach to the process. I see that a good faith effort is currently being undertaken by EPA in that the process of testing the children is underway, with community and many necessary organizations at the table. Not only are they providing the much needed funding for the project but they are working with existing service providers, establishing partnerships that will ensure the success of all efforts. This good faith effort provides me with the assurance that the Plan (Alternative 4) proposed by EPA is at this time the best of all alternatives, leaving

flexibility that the Plan will respond to situations relating to the project as they occur, especially those findings from the testing of the children.

FURTHER IN SUPPORT OF ALTERNATIVE 4: With the recent coverage and outreach of the soil contamination situation, many residents have signed up for soil sampling. Alternative 4 allows for soil sampling program availability for those not yet sampled, as well as soil removal.

WITH THE EXCEPTION OF THE AFOREMENTIONED CONDITIONS, WHICH INCLUDES LEAD LEVEL CLEAN-UP AT 400PPM, I SUPPORT ALTERNATIVE 4 OF THE PROPOSAL PLAN.

I ALSO SUPPORT THE COMMUNITY HEALTH PROGRAM AS DESCRIBED IN THE PROPOSED PLAN FOR THE REASONS STATED ABOVE.

Date: 7/19/2002

To: EPA VB/I-70 Project

From: Richard Machado

Re: Proposed Alternatives for the VB/I-70 Remediation

I have many questions and comments with regard to EPA's proposed alternatives for the VB/I-70 Superfund project. To date, my wife and I have had great difficulty getting legitimate responses to our questions. During the meeting with congresswoman DeGette for example, my wife asked about owners of section 8 housing or landlords otherwise receiving federal money and their obligation, if any, to have lead testing performed on their properties. The EPA representative expressed grave concern over this matter and promised to "look into the matter", but failed to return several voice messages regarding the outcome to this question. My wife is concerned about the many children often living in section 8 housing. As a pediatrician at Denver Health and the Children's Hospital of Denver, I think she at least deserved the courtesy of a returned call if not an answer.

I have also been disappointed in what I can best describe as demeaning or insulting attitude toward Clayton residents. Our opinions and concerns are routinely dismissed. I have heard Clayton residents insulted with the threat of heavy equipment noise and traffic for example as to why they should not want a cleanup. When citing findings from published, peer reviewed, health and environmental studies as well as resulting clean-up levels from other superfund sites, primarily in the Eastern United States, my wife and I were given the response that the science in the West is better than the science in the East. This is a ludicrous and insulting dismissal of scientific research. Keep in mind that I have a B.S. degree in health physics from the Georgia Institute of Technology while my wife has a masters and MD degree from Washington University School of Medicine, which is routinely one of the top five medical schools in the country. Couple this with the several research publications my wife has and the fact that she is currently performing bench research in the field cystic fibrosis, one can sense our amazement with how quickly and flippantly our cited scientific findings from renowned researchers was being dismissed.

This trend has seemed to continue with the release of the health impact study by ATSDR. I would like to know, very specifically, how the findings of this study were incorporated into the current proposed clean-up alternatives. The EPA alternatives appear to me to be unchanged from those I read at the public meetings when the study was released by ATSDR. Is it the EPA's opinion that the findings of this health study are to also be dismissed? This study predicts potential health effects from arsenic in soil at levels much lower (approx. 42 ppm) than the action levels proposed in the EPA alternatives (128 ppm or higher). Furthermore, the arsenic in soil data predicts with a very high level of confidence that hotspots of arsenic are likely to exist in yards at 6 to 7 times the yard average arsenic level. Arsenic hot-spot soil concentration data correlates amazingly well to average soil arsenic concentrations. A yard cleaned to the best EPA proposal of 128 ppm would likely leave a hot-spot in the yard at a level from about 770 to 900 ppm. This is like an Arsenic land mine in the yard. If a child inadvertently stumbles into it, the outcome could be a negative one to say the least.

The first meeting regarding the release of the ATSDR health impact study was with local, state, and federal officials. At this meeting, I inquired about the 400 ppm lead standard for bare soil in children's play areas. I was told that I was wrong, that 400 ppm is the level at which no further study, action, or consideration would be given. I was subsequently given a copy of an EPA interoffice memo from 1994 outlining this position. This disturbed me as I was referencing the January 2001 Code of Federal Regulations, promulgated by no other than the EPA. It appears to me, that for this project, the EPA is not following its own guidelines and regulations. Refer below to correspondence forwarded to various government officials and colleagues outlining my experience from the public meeting.

One of the issues is this 400 ppm in children's play areas. I tried to get some information about **Environmental Protection Agency *40 CFR Part 745 Lead; Identification of Dangerous Levels of Lead;* Final Rule** (see web-link below)
Where it defines the hazard standard as 400ppm in the bare soil of children's play areas. I was told it didn't apply somehow and then got some tangent lecture about the chemistry of lead and paint. My question that was never answered to my satisfaction is, "Does this federal regulation apply to our project? If it doesn't, what regulation does apply? If there is no regulation why shouldn't we use 40 CFR Part 745 as guidance?"

I think the regulation does apply. I did some more looking and cut and pasted this from the EPA website:**www.epa.gov/lead/leadhaz.htm**

Residential Lead Hazard Standards - TSCA Section 403

As part of EPA's ongoing efforts to protect children from lead poisoning, the Agency announces, new standards to identify dangerous levels of lead in paint, dust and soil. These new national standards are more protective than previous EPA guidance...

These hazard standards will also serve as general guidance for other EPA programs engaged in toxic waste cleanups.

Under the new standards, lead is considered a hazard if there are greater than: 400 parts per million (ppm) of lead in bare soil in children's play areas
This action appears in the **January 5, 2001 Federal Register**

I was given the brush-off type of answer about the reg. being TSCA and this site (VB/I-70) is CERCLA. As you can clearly see by the highlighted line in the middle it says that these hazard standards will serve as guidance for other EPA programs engaged in toxic waste clean-ups. I don't want to pat myself on the back too much but using common sense I thought that it should serve as guidance. If this is the only number EPA has, then this is exactly what they are supposed to be doing. I can't help but get the feeling that EPA hopes that I will be frustrated and drop the whole issue but it just makes me more determined when I still think I'm right.

It isn't so much that I want to push the 400 ppm standard, it is the insulting and demeaning way that I and my questions are dismissed. If Clayton resident environmental scientists and board certified pediatricians are being treated as though we are uneducated and intellectually inferior, then how are our hard-working, non-college degreed residents being treated? This brings me to environmental justice (EJ) issues. It is well known and documented that low-income, minority, working class, urban neighborhoods such as Clayton, disproportionately shoulder the brunt of environmental pollution and the accompanying health effects. The EPA claims that environmental justice was served on this project by "allowing" us to participate in the decisions affecting our community. I understand that EJ mandates going above and beyond what would normally be done if Clayton were not a low-income, minority, etc. neighborhood. It would appear to me that nothing was done above or beyond that which is routinely done at other EPA sites.

I have worked at several environmental and superfund clean-up sites, mostly in rural areas and areas where EJ is not an issue, and in every case, community members were integral members of the decision process. I might also add that these rural areas with low population density usually had lower clean-up levels than what are being proposed for densely populated Clayton. In cases where clean up levels were higher, they were not much higher, with the end use being primarily conservation or natural areas.

There are also several publications correlating lead in soil concentrations to lead in blood levels. The results of the majority of these studies indicate lead clean-up levels lower than 540 ppm to ensure lead in blood levels of children below 10 ug/dL. It is my opinion that we need to keep lead in blood levels of children significantly below 10 ug/dL in hopes that they will not experience a negative effect from just this one parameter. Ironically, my recent lead in blood level result from May 2002 was 7 ug/dL. Fortunately, except for pregnant women or women of child bearing age, the impact on an adults is much less because our development has completed. It concerns me that lead in blood of children exhibiting soil pica behavior or even normal hand to mouth activity, could be much higher than my result of 7 ug/dL.

Keep in mind that children in Clayton already have multiple strikes against them. This VB/I-70 project only addresses 2 of those. Other issues facing Clayton children are *poorer access to health care, lack of health insurance, poorer schools, higher air pollution,* lower incomes, lack of pre-natal health care, higher crime, higher alcohol and drug abuse rates, and many more. This is exactly why environmental justice mandates going above and beyond normal actions, to try and help offset the many other anchors weighing our kids down. Issues that affluent neighborhoods never see, much less experience.

From EPA Lead safe site

In addition, the "level of concern" for blood lead levels has continued to drop. Most recently the CDC has recommended 10ug/dL as the level that should trigger environmental or clinical intervention. To date, only about 5% of homes contaminated with lead have in fact been abated nationwide. The soil in yards of inner city homes is also potentially a major contributor to lead poisoning in youth, is largely unregulated and thus ignored by current programs. To compound the issue, the turnover in the poorest inner city homes leads to a new, largely uninformed, often immigrant population that reside in the most poorly maintained and highly contaminated areas of our cities.

The current focus of major HUD funding is directed at structure abatement. The focus of this EPA/EMPACT project is directed at collecting residential soil lead data with the aim of increasing public awareness of this health risk and applying low-cost mitigation techniques. The long term goal is to develop a "template for community action" which might be replicated in impacted communities

Lead levels in children's blood was set at 10 ug/dL in 1991, Over 10 years ago. As you can see by the highlighted text, even in 1991, theories were emerging that negative effects may occur below 10 ug/dL.

As you can see, the acceptable level of lead in the blood of children has dropped significantly over the years.

From website http://www.epa.gov/lead/leadtpbf.htm

Preventing Lead Poisoning in Young Children

U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control

Publication date: 10/01/1991

ADVISORY COMMITTEE ON CHILDHOOD LEAD POISONING PREVENTION
New data indicate significant adverse effects of lead exposure in children at blood lead levels previously believed to be safe. Some adverse health effects have been documented at blood lead levels at least as low as 10 ug/dL of whole blood .
The 1985 intervention level of 25 ug/dL is, therefore, being revised downwards to 10 ug/dL.
A multitier approach to follow up has been adopted.
Primary prevention efforts (that is, elimination of lead hazards before children are poisoned) must receive more emphasis as the blood lead levels of concern are lowered.
The goal of all lead poisoning prevention activities should be to reduce children's blood lead levels below 10 ug/dL. If many children in the community have blood lead levels > or = ug/dL, community wide interventions (primary prevention activities) should be considered by appropriate agencies. Interventions for individual children should begin at blood lead levels of 15 ug/dL.
Childhood lead poisoning is one of the most common pediatric health problems in the United States today, and it is entirely preventable. Enough is now known about the sources and pathways of lead exposure and about ways of preventing this exposure to begin the efforts to eradicate permanently this disease. The persistence of lead poisoning in the United States, in light of all that is known, presents a singular and direct challenge to public health authorities, clinicians, regulatory agencies, and society.
LEAD POISONING IS ONE OF THE MOST COMMON AND PREVENTABLE PEDIATRIC HEALTH PROBLEMS TODAYThis document provides guidelines on childhood lead poisoning prevention for diverse groups. Public health programs that screen children for lead poisoning look to this document for guidance on screening regimens and public health actions. Pediatricians and other health-care practitioners look to this document for information on screening and guidance on the medical treatment of poisoned children. Government agencies, elected officials, and private citizens seek guidance about what constitutes a harmful level of lead in blood what the current definition of lead poisoning is and what blood lead levels should trigger environmental and other interventions.
IT IS NOT POSSIBLE TO SELECT A SINGLE NUMBER TO DEFINE LEAD POISONING FOR THE VARIOUS PURPOSES OF ALL OF THESE GROUPS.

Epidemiologic studies have identified harmful effects of lead in children at blood lead levels at least as low as 10 ug/dL. Some studies have suggested harmful effects at even lower levels, but the body of information accumulated so far is not adequate for effects below about 10 ug/dL to be evaluated definitively. As yet, no threshold has been identified for the harmful ejects of lead.

Nevertheless, important environmental sources and pathways of lead remain. Lead-based paint and lead-contaminated dusts and soils remain the primary sources and pathways of lead exposure for children. In addition, children continue to be exposed to lead through air, water, and food, as well as occupations and hobbies of parents and caretakers. The focus of prevention efforts, therefore, must expand from merely identifying and treating individual children to include primary prevention-preventing exposure to lead before children become poisoned. This will require a shared responsibility among many public and private agencies. Public agencies will have to work with pediatric health-care providers to identify communities with childhood lead- poisoning prevention problems and unusual sources of lead and to ensure environmental followup of poisoned children. Public housing and economic development agencies will have to integrate lead paint abatement into housing rehabilitation policies and programs. Health- care providers will need to phase in virtually universal screening of children. Public and private organizations must continue to develop economical and widely-available blood lead tests to make such screening possible. Public and private housing owners must bear a portion of the financial burden for abatement

LEVELS OF CONCERN

Since 1970, our understanding of childhood lead poisoning has changed substantially. As investigators have used more sensitive measures and better study designs, the generally recognized level for lead toxicity has progressively shifted downward. Before the mid-1960s, a level above 60 ug/dL was considered toxic (Chisolm and Harrison, 1956). By 1978, the defined level of toxicity had declined 50% to 30 ug/dL figure 2.2 shows how the federal definition of an elevated blood lead level has changed over the years.

Very severe lead exposure in children (blood lead levels 380 ug/dL) can cause coma, convulsions, and even death. Lower levels cause adverse effects on the central nervous system, kidney, and hematopoietic system. Blood lead levels as low as 10 ug/dL, which do not cause distinctive symptoms, are associated with decreased intelligence and impaired neurobehavioral development (Davis and Svendsgaard, 1987; Mushak et al., 1989). Many other effects begin at these low blood lead levels, including decreased stature or growth (Schwartz et al., 1986; Bornschein et al., 1986; Shulka et al., 1989), decreased hearing acuity (Schwartz and Otto, 1987), and decreased ability to maintain a steady posture (Bhattacharya et al., 1988). Lead's impairment of the synthesis of the active metabolite 1,25-(OH)2, vitamin D is detectable at blood lead levels of 10-15 ug/dL. Maternal and cord blood lead levels of 10-15 ug/dL appear to be associated with reduced gestational age and reduced weight at birth (ATSDR, 1988). Although researchers have not yet completely defined the impact of blood lead levels <10 ug/dL on central nervous system function, it may be that even these levels are associated with adverse effects that will be clearer with more refined research.

SOIL AND DUST

Soil and dust act as pathways to children for lead deposited from paint, gasoline, and industrial sources. The long-term efficacy and cost-effectiveness of different measures to reduce lead levels in soil need to be evaluated.

Reduction of dust lead is important both as part of deleading and as a means of interim risk reduction. Soil and dust act as pathways to children for lead deposited by primary lead sources such as lead paint, leaded gasoline, and industrial or occupational sources of lead. Since lead does not dissipate, biodegrade, or decay, the lead deposited into dust and soil becomes a long-term source of lead exposure for children. For example, although lead emissions from gasoline have largely been eliminated, an estimated 4-5 million metric tons of lead used in gasoline remain in dust and soil, and children continue to be exposed to it (ATSDR, 1988).

Because lead is immobilized by the organic component of soil, lead deposited from the air is generally retained in the upper 2-5 centimeters of undisturbed soil (EPA, 1986). Urban soils and other soils that are disturbed or turned under may be contaminated down to far greater depths. Soil lead levels within 25 meters of roadways are typically 30-2,000 parts per million (ppm) higher than natural levels, with some roadside soils having concentrations as high as 10,000 ppm. Soils adjacent to houses painted with exterior lead paints may also have lead levels above 10,000 ppm. Measured lead levels in soil adjacent to smelters range as high as 60,000 ppm (EPA, 1986).

As part of normal play and hand-to-mouth exploratory activities, young children may inhale or ingest lead from soil or dust. Ingestion of dust and soil during meals and playtime activity appears to be a more significant pathway than inhalation for young children (EPA, 1986).

Even if ongoing deposition of lead into soil and dust is eventually halted, measures will have to be taken to reduce exposures from lead- contaminated soils and dusts. Until data demonstrating the efficacy and cost-effectiveness of permanent soil and dust abatement measures are available, interim risk reduction steps will be needed in some places. Dust control via wet mopping and frequent hand washing has been shown to reduce the blood lead levels of children with high blood lead levels (Charney et al., 1983), but this is not a permanent solution so long as the source of the lead in the dust remains. For urban and smelter communities, where outdoor soil can be a major source of lead in house dust (Diemel et al., 1981; Yankel et al., 1977), indoor dust abatement may not be effective unless abatement of soil lead is also conducted. Soil abatement may consist of either establishing an effective barrier between children and the soil or the removal and replacement of at least the top few centimeters of soil. Grass cover, if properly maintained, may be an effective means of limiting exposure to dusts originating from lead-contaminated soil (Jenkins et al., 1988).

The idea that residents of neighborhoods such as Clayton are in poorer health, receive poorer health care, and bare the brunt of environmental hazards should no longer be a

subject of debate, but rather accepted as fact. It should only be a subject of solution and action.

FROM ATSDR WEB SITE FOR MISS. DELTA PROJECT

Minority Health Programs

Preventing adverse health effects in disadvantaged communities and people of color exposed to environmental hazards is a priority for government health agencies at all levels. Minority populations, particularly African Americans, Hispanics, and Native Americans, suffer disproportionately from preventable morbidity and mortality. Regardless of income, education, or geographic locale, these populations are in poorer health than their white, non-Hispanic counterparts. However, the health impact of the environment on minority populations has not been adequately characterized.

Reducing the disparity in health and improving quality of life among disadvantaged groups and among ethnic and racial populations impacted by environmental hazards will require the collective commitment of health professionals and environmental health scientists. Federal agencies and state health departments in the Region all have health outcome data that characterize the health of the public. For example, mortality data and disease incidence data are generally available. However, resources have generally been lacking in terms of linking morbidity and mortality databases and environmental quality data

Following are excerpts from records of decisions (RODs) for various other superfund projects. These are just a few that I looked up. As you can see, many other sites are receiving decisions of much lower clean-up levels in sparsely populated areas.

Doerun plant clean-up in Herculanium, Missouri
The AOC requires that a soil concentration of 400 mg/kg of lead will be used as an initial cleanup level. This initial cleanup level was selected because it has been shown to be effective at lowering blood lead levels.

The Weldon Spring Site Remedial Action Project in the predominantly white St. Louis suburb county of St. Charles, MO. WSSRAP soil clean-up levels are 240 ppm for lead and 45 ppm for soil.

Record of Decision (ROD): SITE HISTORY/DESCRIPTION: The 485-acre Sacramento Army Depot (SAAD) site is a military facility in Sacramento County, California. Land use in the area is predominantly commercial and light industrial. PERFORMANCE STANDARDS OR GOALS: Chemical- specific soil clean-up goals for the primary metals of concern including arsenic 5 mg/kg; and lead 174 mg/kg. (5 ppm and 174 ppm respectively)

Glynn County Georgia: **PERFORMANCE STANDARDS OR GOALS: Chemical-specific surface soil goals are based on the risk assessment of 1x10[-6] for future land use, and include; arsenic 5 mg/kg (5 ppm).**

I respectfully request that EPA go back to the drawing board on this project and reassess the health impact study by ATSDR as well as waiting for results of other studies such as the Kids at Play Health Survey. It may also be prudent to benchmark other superfund sites to see how EJ issues were handled there and why it seemed necessary to clean up many sites to lower levels.

Sincerely,

Richard Machado

Clayton Resident.

Karen and Jim Halberg Weaver
<halbergweaver@yahoo.com>

To: VBI70@EPA
cc:
Subject: Response to EPA Proposal

07/19/02 04:29 PM

Hi, my name is Karen Halberg Weaver. I live in the Cole neighborhood at 3554 Marion with my husband Jim and twenty-three-month-old son, Daniel. I am writing in response to the Public Health Assessment regarding the VBI-70 Superfund site.

First, I support the ATSDR's nine recommendations (pp. 63-64 of the proposal). I agree with the proposals to continue educating residents on how to lower their risk of contamination, and recognize the importance of continued studies, including studies beyond the current VBI-70 contamination sites. The continued testing of children will be of utmost importance in continued studies.

In addition, I concur with the importance of the ongoing Public Health Education Plan.

However, after having read the proposal, I have several concerns which were not addressed to my satisfaction in the proposal or any of the forums:

1. According to the ATSDR report (p. 48), the EPA itself outlines "soil lead levels ranging from as little as 208 ppm to as much as 540 ppm as being a concern for increasing blood lead levels in children." Why, then, do we settle for 540 ppm as the mark for contaminated soil removal? The children of the VBI-70 site are already very vulnerable to contaminant exposure due to their high exposure to contaminants through other sources.

(The concern in my particular community is for lead, but the logic would apply equally to the arsenic levels.)

2. We recently received the results of our son's blood lead level test. He tested at 7 micrograms of lead/dL. According to EPA and CDCP, this lead test is "normal." However, for a child who at not-quite-two is living in an old house with contaminated soil in an inner-city area, we are very concerned. We HAVE been educated on how to reduce the risk of contaminants. We have tested all paint and ceramics in our house for possible lead exposure. We keep our house as free of dust and dirt as we can. We wash our hands and shoes after working in the garden. Daniel has never shown pica behavior. If Daniel in two years reached a level of 7, what is going to happen in the next two to four years? He seems to us to be frighteningly close to a critical level, and we're already doing all we can to lower his risk. We need EPA to do all you can to lower his risk, too, and that of all the children.

within this superfund site who are also at risk.

3. Our biggest concern for Daniel and all children in the VBI-70 site is that lead and arsenic are cumulative. I don't see any information dealing with the difference of a seven-month-old infant with seven micrograms of lead/dL and a six-year-old with the same blood count. Since lead and arsenic are cumulative, it seems that not all blood counts should be treated equally. Would it not be true that an infant with a blood count of seven would be at higher risk than a six-year-old with the same lead level? The infant, continuing the same behavior and in the same environment ought to be likely to reach a higher count than seven by the time he is six years old.

4. Another question that I have asked at public forums without a satisfactory response is what is possible once a child has reached the toxic levels of contaminant poisoning? It seems that this information should be part of the public education. All the proposals discuss the high need for follow-up blood lead and arsenic tests for children in this area, but that should be part of the study, not the solution. It seems that once poisoning reaches a certain level the detrimental effects to the person are permanent. Therefore, I ask that the EPA take permanent measures as well. Removal of the contaminated soil and paints seems to be the only permanent solution.

5. What happens in the proposal as outlined when the contaminated soil of a given household is not removed because no child lives there with a high enough count to demonstrate a need to remove it? When another family moves in decades from now and their children are exposed to the contaminants, will there then be a possibility of cleanup? Will there still be a community health program going on? The information I have at this point leads to a "no" which is unacceptable. Why not make permanent efforts now to protect the health of generations of families living in this area?

One thing we all agree on is that children should not be at risk for contamination of toxic substances. What appears to be elusive is how to significantly reduce the risk for contamination. We get caught up in numbers. It is clear to me, however, that it is not acceptable that my child, or any other child, be at risk.

Because of all that I have outlined above, I accept the EPA's Alternative 4, with the following amendment: The EPA should remove and replace soil at all properties with arsenic greater than 77 ppm and lead at 400 ppm or higher, the national screening levels for these toxic substances.

Thank you for your efforts.

Sincerely,

Karen M. Halberg Weaver

Do You Yahoo!?
Yahoo! Autos - Get free new car price quotes
http://autos.yahoo.com

lumumbaphd@yahoo.com

07/19/02 11:42 PM

To: VBI70@EPA
cc:
Subject: Comment Period

Conspicuously absent in all the Alternatives, including ASTDR's Alternative #6, is a cultural approach to decision making.

Beverly Lumumba, Ph.D.

Do You Yahoo!?
Yahoo! Health - Feel better, live better
http://health.yahoo.com

July 15, 2001

2002 JUL 26 PM 12: 14

EPA, REGION VIII
SUPERFUND BRANCH

Bonita Lavelle
EPA Region VIII
999 18th Street
Denver, CO 80202

Ms. Lavelle,

Following are the comments of CEASE members and residents and representatives of the Cole, Elyria, Swansea and Globeville neighborhoods, to the Feasibility Study and EPA's preferred alternative for the VBI70 Superfund site:

Environmental Justice:

The VBI70 Superfund site includes the Clayton, Cole, Elyria, Swansea and southwest Globeville neighborhoods. The population of the neighborhood residents is predominantly people of color. In the Cole, Elyria and Swansea neighborhoods the population is majority Mexian-American/Latino, many Black and some white families. In Elyria, Swansea and Globeville the population is 82% Mexican-American/Latino. In Cole the Mexican-American/Latino population is approximately 70%. In Clayton the majority of the population is divided between Black and Mexican-American/Latino families with a small percentage of white families. (2000 US Census, Piton Foundation)

The Cole neighborhood is the second poorest neighborhood in Denver. Families in the Elyria and Swansea neighborhoods are working class, working poor families and 80% of children qualify for the free lunch program at school. (Piton Foundation) Family income for the homes located in southwest Globeville is among the lowest in the city of Denver.

The 80216 zip code, which includes Elyria, Globeville and Swansea, is the most polluted zip code in Denver - and probably the most polluted zip code in Colorado. In 1998, the last year for which we have TRI data, the 80216 zip code received 2 million pounds of legal hazardous emissions into the air, water and soil. However, TRI data from 1998 do not include hazardous emissions from the 2 interstate highways (I25 and I70), Colorado State highways (Vasquez Blvd., Josephine Street, York Street, Brighton Boulevard, Washington Street) the two petroleum refineries (Conoco and Valero), the Cherokee coal fired power plant, or the dozens of print shops, wood treatment facilities, auto body repair and paint shops, or the 8,400 semi-truck trailers that are stationed at 72 trucking firms located in the 80216 zip code.

The hazardous pollution from the above named sources likely contribute as much, or more, pollution than is reported by TRI.

The factors named above demonstrate that the entire VBI70 site is an Environmental Justice (Environmental Racism) community. Per President Clinton's Executive order, the EPA (and other governmental entities) are required to acknowledge Environmental Justice sites and take steps above and beyond those taken at sites that are not located in Environmental Justice communities.

The Feasibility Study developed by EPA fails totally in its mandate to address Environmental Justice at the VBI70 Superfund site. No mention of Environmental Justice is made in the Feasibility Study. No mention is made of the population being low-income, people of color, or of the historical and ongoing burden of hazardous pollution, the increased rates of cancer (in some cases double or triple what wold be expected) or the fact that 40% of the population is composed of youth/children ages 18 and under.

At the VBI70 Work Group meeting on July 11, 2002, the Site Manager was asked why Environmental Justice was not included in the Feasibility Study. She responded, stating that the mandate was met by "letting" us (CEASE) participate in the Work Group. Anthony Thomas, the Clayton representative to CEASE, pointed out that the Presidential Executive Order mandated participation by affected parties (i.e. CEASE). We interpret this mandate to mean that we would have opportunities to assist the EPA in addressing Environmental Justice by taking steps that go above and beyond what is done at non-EJ sites in order to address the current and historical legacy of hazardous pollution forced on our communities.

Instead of assisting the EPA to take bold steps to address the environmental injustices that have been forced on us, we have found ourselves pleading to get action levels for clean-up that protect the health of children and provide permanent solutions for both present and future residents.

In our opinion, EPA's preferred alternative not only fails to address environmental justice, it attempts to shift blame on the victims. This issue will be addressed specifically in the comments that follow.

We request an explanation of EPA's failure to mention or include information about VBI70's demographics and status as an Environmental Justice site. We want EPA to give us an explanation of how the mandate to address Environmental Justice has been met at this site as concerns risk assessment, including cumulative risk, the determination of action levels, and information about how EPA met its obligation to be more diligent and thorough at this site because it is an EJ site.

Also missing in the introduction of the FS is a description of the topography of the neighborhoods. There is no mention of the South Platte River that borders Elyria and is located a half mile east of southwest Globeville. There is no mention of the fact that Globeville, Swansea and Elyria lie in a 100 year flood plain and that a wetlands preservation project has been implemented at the North Side Park that borders Elyria.

We request an explanation for the absence of information and attention to the issue of the flood plain and the wetlands located in the neighborhoods.

VBI70 Work Group:

CEASE and other community members have been involved at this site since the Colorado Department of Health brought in the EPA and the Work Group was convened. We have faithfully attended all Work Group sessions, monthly meetings and conference calls with the ATSDR, meetings to plan and carry out the health care provider education project that was so successful, and meetings to plan and carry out the Health Study Project that is currently underway. When possible, we have also attended technical meetings. Additonally, CEASE holds meetings at least

monthly..

It is very important to the undersigned CEASE members and other community residents to note that when the Work Group meetings first started Bonnie Lavelle wanted us to identify a method for working together that would mitigate or help to prevent disagreements. She said to us that this could be done if we could all agree that we would "trust the science." We agreed to "trust the science" as long as we could believe that the science is sound. Unfortunately, there are many areas where we feel the science is not sound, or the science has been used to lower the risk to our health, or to avoid EPA's responsibility to remove the contamination

Site specific information and data:

When the Work Group meetings first started, a consulting firm was hired to give notification of meetings to all members of the Work Group, facilitate meetings, record the minutes and distribute minutes of the meetings to all members. The consulting firm was used only during the first few months of meetings. We are concerned because there are no minutes of subsequent meetings. Much discussion that included questions raised, comments made, and agreements formed is lost because no minutes were taken. For example: during the meetings CEASE consistently raised concerns about Environmental Justice and verbal commitments were made by the EPA to address EJ. Because no minutes were kept these commitments are lost and one consequence is that EJ has not been addressed at this site.

It is true, as we have been reminded, that we are not scientists and do not have a solid understanding of the science that is used to determine the scope and extent of the contamination or the risks to human health. However, members of CEASE and other community members have been involved in other CERCLA and Superfund sites and thus can compare what they have experienced at other sites with the VBI70 site.

VBI70 was named as a Superfund site because the contamination from the Asarco plant in Globeville extended beyond Globeville's boundaries. The Colorado Department of Health and Environment and Asarco were required by the ROD to continue testing outward from Globeville until they could find the end of the contamination. The end to the contamination has still not been found. What is known is the lead and arsenic trioxide found at VBI70 is the same as that in Globeville. However, given the way this site has been treated by the EPA, it would seem that no connection to Globeville or Asarco ever existed.

Instead of using information from the Globevile site (e.g. default values, action levels) as a point of departure, EPA, has treated this site as if it were unique and without precedent. They have chosen, instead using default values, to do "site specific studies."

The EPA has: (1) Used a pig study to determine the bioavailability and health risk of arsenic in children and used this information to set action levels for arsenic. (2) Used a pig study to determine the bioavailability and health risk of lead in children.

EPA did the tests and used the information to set action levels although it is understood that tests on animals are not good predictors of human response and, in the case of arsenic, it is known that people - especially children - are much more sensitive to arsenic that animals.

CEASE members supported the bioavailability studies because we believed that if anything could be learned from the studies that would help not only our own families but people in other communities, then something positive could come from our experience.

The community learned after the study was done that the information from the a single pig study would be used to change the way action levels are set at this site - because the information was site specific. Had we understood this in advance we would at least have consulted Dr. Kossnett and Dr. David Mellard to get a better understanding before deciding whether or not to support the studies.

The undersigned CEASE members and community residents object using the EPA determining risk by the information from a single study on pigs.

In addition to the above, the EPA, acting on a suggestion from Asarco, specifically stated in the FS that residents may have contaminated themselves with the use of pesticides in our yards. We see no scientific evidence in the FS that arsenic in the community can be definitively identified as coming from pesticides. However, we do know that arsenic trioxide is the type of arsenic found in Globeville, Also, in the recent past, companies that made and sold pesticides have been located near our neighborhoods but the possibility that these companies contributed to the arsenic burden in the neighborhoods has not been addressed. One such company, the Colorado Organic Chemical Company, was located at the Sand Creek Industrial (CERCLA site) and the site was contaminated with arsenic.

Additionally, Dr. Michael Kosnett states in his comments to the FS that the EPA's use of a 1.5 mg/kg-d of arsenic seriously underestimates health risks to community residents. We request that EPA respond to Dr. Kossnett's comments/questions regarding the use of 1.5 instead of 7.0 to determine risk. We also want a response to our questions concerning the science that proves EPA's assertion that residents are responsible for the arsenic trioxide in the community.

Spacial distribution of pollutants:

As has been noted by EPA and ATSDR, the spacial distribution of the arsenic and lead is not even across the site. In many cases homes whose soil have lead and arsenic in them are located next to homes with little or no lead or arsenic. EPA's initial and continuing response to this has been to suggest that residents may have contaminated themselves.

CEASE members have suggested at meetings that there may another explanation for the uneven distribution of the contaminants. We have asked EPA to examine the possibility that there might be another explanation for the distribution but EPA has not acted on our request.

Following is another possible explanation: All five the neighborhoods are very old neighborhoods and in Elyria and Cole much of housing stock is pre 1950's. Elyria is the oldest neighborhood in Denver and Cole is one of the oldest. These two neighborhoods are the most contaminated.

It is probable that all five neighborhoods were contaminated with historical emissions of lead and arsenic by the three refineries that were located most closely to Elyria and Cole. However during the decades after two of the refineries stopped operations, much new and in-fill housing was - and continues to be - developed in all four neighborhoods. When new housing is built the soil is excavated for the foundation, garage, porches, etc. The ground is also turned for landscaping, i.e. grass, trees, shrubs, flowers, gardens, etc.

We believe it is possible that those homes with little or no contamination may have been

built after 2 of the refineries stopped operations and that the contamination could have been disturbed (buried or removed) as the new housing was built. We asked that EPA get records from the city of Denver and compare the age of the homes with the levels of contamination in the yards to see if there is any difference in levels of contamination between older (pre 1940's or 50's) and newer (post 1940'3 or 50's) homes. This might shed some light on the uneven distribution of the contaminants.

Since Clayton and Swansea are "newer" neighborhoods with fewer older homes, it could be expected, under this scenario, that they would not be as heavily contaminated - as is true at this site.

Margaret Shoenbeck from the Colorado Department of Health did obtain and shared with CEASE and EPA records from the City of Denver that show the ages of the homes in the VBI70 Superfund site. However, CEASE members have been unable to use the records because we do not have access to information about the levels of contamination at the homes that were tested.

We request that EPA compare the age of each of the tested homes to the level of contamination found at the homes to determine if there is any correlation between the age of the homes and the levels of contamination found at that home. We request that EPA share this information with CEASE, ATSDR, CDPHE, and Dr. Michael Kosnett.

Arsenic:

In EPA's preferred plan the action level for arsenic is 128 ppm. At Asarco the action level was 78 ppm. In Eureka Mills, Utah, a community that is 99% white, the action level for arsenic was 77 ppm. We are concerned that at an EJ site the action levels for arsenic would be almost double that of a white community. We would like EPA to fully explain the differences in the communities that would justify such a disparity in treatment.

Listed below are <u>industrial sites</u> located throughout the county, most of which are located next to residential areas, where action levels for arsenic were significantly lower than the 128 ppm. proposed for VBI70. At most of these <u>industrial sites</u> lead was also removed. At all but 4 of these sites lead was removed at 500 ppm - <u>40 parts per million lower than is proposed for VBI70.</u> In only one case was the action level for lead higher than at VBI70. At that site lead was removed at 600 pm.

Site Name	State	Arsenic clean-up level (mg/kg - ppm)
Rentokil, Inc.	VA	33 ppm
Adam's Plating	MI	6.7 ppm
Silresim Chemical Corp.	MA	21 ppm
Cannelton Industries	MI	12.8 ppm
Allied Chemical & Ironton Coke	OH	0.56 ppm
Interstate Lead Co.	AL	10 ppm
Mid Atlantic Wood Presevers	MD	10 ppm
Whitmoyer Laboratories	PA	21 ppm
Whitehouse Oil Pits	FL	42 ppm

screening level.

Arsenic and Lead:

We are requesting 77 or 78 ppm as the action level for arsenic and 231 ppm as the action level for lead because these action levels would be protective of human health and are measures that have been used at other sites (some of which are industrial). These action levels would help to address Environmental Justice (Environmental Racism) mandates at this site.

Community Health Education Plan:

We view the Community Health Education Plan as a temporary measure that will not, even in the short term, protect children and adults from exposure to arsenic and lead exposure.

Based on budget figures proposed in the FS for the first year, EPA proposes that 4/5 time FTE staffing will be provided to do community education, biomonitoring for children, and source identification and referral for lead abatement for the approximate 4,500 homes located in the site. Case management for the families of children who have elevated blood levels is not addressed. (Attached please find information regarding case management) The budget for CHP will be reduced by 5% each year for the following 5 years.

Although the CHP is not fully developed, some specific actions are named. For example, the health educator will use publications such as La Voz and local newspapers to educate residents. LaVoz does not distribute its newspaper in this neighborhood. They do have 2 drop-off sites (Cross Community Coalition and El Centro Su Teatro) in the community where about 40 papers are dropped off weekly. This is clearly insufficient to reach even all of the Spanish speaking population (and assumes that all people can read). The local newspapers do not publish in Spanish but 42% of families in Elyria, Globeville and Swansea identify Spanish as their primary language.

CHP also states that "individual" outreach education will be provided. Given that the Health Study project (that has 10 staff working 40 hours each per week, knocking on every door) resulted in only 100 arsenic and lead tests in its first 2 months, it seems impossible that at a 4/5 time FTE could knock on every door and do "individual" outreach to every home even once in a year.

If the goal is to do individual education to only those homes where a child is identified with elevated as/pb levels, the staff person(s) would have to constantly update their information about homes where ownership or renters have changed and new children are living in order to test those children. Again, this seems impossible for a 4/5 time FTE.

At the base, however, it seems that the goal is to change behavior. Dr. Kosnett and Dr. David Mellard agree that pica behavior in small children is probably innate and cannot be changed. If this is true, the behavior change must occur in the parent(s), child care provider, or older children in families who take care of their younger siblings while parents are at work. It follows then, that should a child have elevated levels of metals in their bodies, the fault will be that of the parent, child care provider or older sibling who did not effectively "manage" exposure to the contamination. This is an injustice.

Most important, however is the fact that Community Health Education, however long it lasts, is a temporary solution. Only the contamination is permanent.

We, the undersigned CEASE and community residents requests action levels of 77 or 78 ppm arsenic and 231 ppm lead be set, that at least 3 FTE staffing be provided for the CHP, and that Community Health Education be fully funded during the years that clean-up activities are being implemented.

Risk Assessment Studies:

We are concerned about the use of pig studies, information from Asarco, Monte Carlo and the ISE to determine risk and set action levels at this site. We feel that, to some degree, the people at this site may have been used as "guinea pigs" for new technologies or processes. We cannot make this statement definitively but we do have concerns, especially given outcomes that seem to reduce risk assessments.

We would appreciate information from EPA about other sites where these same processes were used and how the risk assessment outcomes at those sites compare to the risk assessment outcomes at VBI70. We would like information about sites where the same processes were used to determine risk, i.e. how many sites, what sites and where the sites are located

Additionally, CEASE has many times expressed its disappointment at the total lack of accessibility and accountability of Dr. Chris Weis. He only attended about 2 Work Group meetings and was present, briefly, at 2 community meetings during the entire RI/FS process. Many of the questions we have asked in this document could have been addressed before now if Dr Weis had been available. We do understand that he was very busy in Lubby, Montana and appreciate the extremely serious needs at that site. However, we do feel that this site was neglected because instead of dealing with a qualified, accessible EPA staff, we had only infrequent contact with a consulting firm and its employee, Bill Bratt, and this contact happened at technical meetings whose topics were highly technical and, therefore, inaccessible to us.

Environmental Justice;:

We request that the EPA address Environmental Justice at this site by setting action levels based on cumulative exposures (at least 77-78ppm arsenic and 231ppm lead), developing a Community Health Education Program that is comprehensive, culturally competent and fully funded, and that the EPA respond fully and completely to the requests for information contained in these comments.

We believe that the FS is an incomplete document given the lack of information about the community, the lack focus on Environmental Justice, the failure to include the results of the Health Study Project in calculating risk, a Community Health Program that is insufficient to meet the stated goals, and the setting action levels that will not provide a permanent solution that reduces risk for both present and future residents at this site.

We respectfully requests that the FS be withdrawn and public comment stopped until issues raised by CEASE, community residents, Dr. Kossnett, ATSDR and the Colorado Department of Public Health and the Environment are addressed and resolved.

Lorraine L. Granado
Swansea Resident

Michael Maes
Pres. Elyria/Swansea
Neighborhood Assn.

Akwe Starnes
Whittier Resident

Tony Garcia
Resident, Elyria
Exec. Director
El Centro Su Teatro

Clair Monash`
Exec. Director
ESG-CEDC

Tom Anthony
Elyria Resident

Erma Zamora
Board President
Cross Community Coalition

Mary Miera
Staff
COPEEN

Antonia Montoya
Globeville Resident

Lorraine L. Granado
Swansea Resident

Michael Maes
Pres. Elyria/Swansea
Neighborhood Assn.

Akwe Starnes
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Mary Miera
Staff
COPEEN

Antonia Montoya
Globeville Resident

Co-Resident

Micaela Garcia de Benavidez
Elyria Resident

Paul Garcia
Youth Worker
Swansea Resident

Tillie Granado
Swansea Resident

Swansea Resident

Swansea Resident

Swansea Resident

Swansea Resident

Swansea Resident

Swansea Resident

July 17, 2002
3328 Josephine
Denver, Co 80205
303 3220920

EPA Remedial Project Manager
Bonnie Lavelle
999 18th St. Suit 300
Denver, Co 80202

Dear Bonnie;
Thank you for the opportunity to comment on the proposed Clean up plan. I read the written Comments Cease, proposed by Lorraine Granado. I thought she did a excellent job. I support her Comments. She is not talking up Money. She wants more Health study information. Lorraine Neighborhood will be the Next study.
Numbers 4 & 5 would be my choice, Public Health at the top of the list. Reduce the Health risk by reducing the exposure to Arsenic and lead to a lower Clean up level.

Levels low, enough that Heath is no longer a concern. For better health as soon as possible.

Parents are not going to Water Children close enough. Belive me I know. I am a Great grand Mother of five. Grandmother of Eleven total (16) sixteen. Have lived in my home over 40 years I am tired of trying to teach.

A.T.S.D.R with Colo. Department of Health University of Colo and all that are doing a Health Investigation is a good thing.

Bioavilability test, Lead Base Paint, lead removal and action. All the Home Children or no Children

Educate People in this Neighborhoods to reach & live a better quality of Life, no more illness from these unhealty things in our enviorment.

Thank you
Joan Hooker

Clayton
Neighborhood
Association

Anthoy B. Thomas
3966 Adams ST
Denver, Colorado 80205-
July 18, 2002

Ms. LaVelle:

I am in favor of alternative number four, "numberone", and number "three." as shown by the community health program meeting on July thirteenth, and 128 ppm arsenic, and 150 ppm. Lead.

Anthony B Thomas
President

2002 JUL 23 AM 6:48
EPA
SUPERFUND BRANCH

EPA'S PROPOSED CLEANUP PLAN
VASQUEZ BOULEVARD AND INTERSTATE 70 SUPERFUND SITE

THURSDAY, JUNE 20, 2002

HARRINGTON ELEMENTARY SCHOOL
2401 EAST 37th AVENUE
DENVER, COLORADO

Reported by:
Mary J. George, CMR, CRR
Wilson George Court Reporters

1 PROCEEDINGS

2 MS. KAREN KELLEN: I think we've waited long

3 enough, it's probably time to start.

4 So my name is Karen Kellen, and I'm going to

5 be facilitating the meeting tonight. What that

6 basically means is I'm kind of your master of

7 ceremonies. I'm going to try to keep things moving,

8 make sure everyone gets a chance to talk that wants to

9 talk, and get the information out to you. Did we catch

10 everyone? Is there anyone -- this is something I can't

11 really ask, do you want to ask?

12 (Someone spoke in Spanish.)

13 MS. KAREN KELLEN: Okay. Good.

14 I just wanted to make sure we got -- everyone

15 can understand what's going on.

16 So, to get started, I'm going to give a little

17 bit of background about why we're here tonight. And we

18 are here to listen to you tonight. The whole purpose of

19 this meeting is to get public comment on EPA's proposed

20 plan in the Superfund arena, which is what we're talking

21 about with the site up here.

22 There's a whole process that we go through at

23 EPA where EPA studies the site, they come up with some

24 ideas on how to fix it, they put out a proposal, and

25 then we get comments from the public about what they

1 think about that proposal.

2 And this is a very important part of the

3 process, hearing from you folks who live in the

4 community or who are interested in the community about

5 what you think about this proposal. And we're -- we'd

6 like to hear good, we'd like to hear bad, we'd like to

7 hear specifics about what you think about the proposal,

8 because the more specific you can get in your comments,

9 the more it will help us to shape the proposal to fit

10 the needs of this community.

11 So I thank you all for coming, I welcome you

12 here tonight, and I hope to make this a little more

13 comfortable and relaxed so that people feel free to get

14 up to the microphone and talk and express their views.

15 I have to admit, standing here behind this podium I

16 don't feel so comfortable and relaxed. I'd rather

17 wander around in the audience and be talking, but

18 apparently I don't have my Phil Donahue microphone, so

19 I'm stuck back here for now.

This is your first chance of three to make comments on this plan. You will have another chance this Saturday morning, 10:00 to 12:00 at the Elyria/Swansea Rec Center, and then there's another opportunity a week from Saturday from 10:00 to 12:00 at the St. Charles Rec Center in the Cole neighborhood.

1 In addition, you'll have the opportunity --
2 you have opportunity throughout the comment period to
3 write up comments and either send them in, or I believe
4 we have some cards in the back of the room where you can
5 write down comments tonight and set them in the box.
6 And those comments will be considered.
7 So if you're feeling a little shy and you
8 don't want to get up to the microphone but you have
9 something to say, please write down those comments and
10 send them in to us, leave them for us, so we can get
11 your views on this.
12 Okay. The way we're working this tonight, or
13 the way we had planned to work this, was to have a
14 sign-up sheet in the back. And a few people have signed
15 up and we'd really like you to sign up to talk. The
16 reason for the sign-up sheet is so that we can allocate
17 the time better among everyone so that everyone gets an
18 equal chance to talk. If we don't get that many people
19 signing up, I may call on you.

20 Okay, maybe I won't call on you, but I will

21 encourage more people to sign up as we go through.

22 My jokes aren't going anywhere tonight, are

23 they?

24 Okay. We did develop a few ground rules just

25 to try to make sure things work well tonight. The first

1 ground rule -- and I'm just going to read these off,
2 mostly, if I can adjust it so that I can still read --
3 all participants are encouraged to comment for the
4 public record. We really want to hear your comments.
5 That's why we're here.
6 Well, we may throw this ground rule out, but
7 right now we'll still make it a ground rule: Please
8 sign up on the sign-in sheet if you want to comment.
9 That way we know how many people we have and we can
10 regulate how much time everyone gets.
11 You know how the government is, we always want
12 to regulate things, so you have to give us a little
13 leeway on that one.
14 Participants will be given the opportunity to
15 comment in the order that they sign up on the sign-in
16 sheet.
17 What we need you to do when you start your
18 comment is to give your name very clearly. We may ask
19 some of you to spell your name, or you could spell it,

20 because we do have a court reporter over here who is

21 recording everything for our record. And sometimes, as

22 you just saw, she has trouble keeping up. Or if you

23 talk too fast she may ask you to slow down. She'll

24 probably tell me to slow down several times yet before

25 I'm done.

1 If she has trouble understanding you, she may
2 ask you to repeat something. It's very important for us
3 to have the information on the record so that we can go
4 back -- so that the EPA site team can go back to it
5 later, look at it, really evaluate those comments, and
6 respond to them at a later date.
7 Another ground rule: We'd like you to help
8 foster a safe, respectful environment, so that people
9 feel free to make their comments and so they feel
10 comfortable about expressing their views tonight.
11 We'd like you to respect time limitations,
12 although we may end up without time limitations, so who
13 knows if we're going to run with this one.
14 And, of course, one of the most important
15 rules: You have to respect the facilitator. That's me,
16 okay? So just so you know.
17 We would ask that you not bring any signs or
18 banners or anything into the room that would obstruct
19 the view or could cause a safety hazard.

20 And, lastly, I think you probably already

21 know, we have translation equipment available for anyone

22 who needs it. And we have people in the back that,

23 hopefully, will catch anyone who might come late.

24 So, essentially what we're going to do -- and

25 I'm going to stop talking real soon because I've

1 probably talked enough already, is we're going to have
2 Bonnie Lavelle talk for about 10 minutes and give you a
3 little bit of background of the Superfund proposed plan.
4 And then we're going to open up the public comment
5 period -- we're going to digress a little bit from the
6 standard procedure of the sign-up sheet because we're
7 going to have the CEASE group have a representative talk
8 for the first 10 minutes or so of the public comment to
9 give you their views on what's going on.
10 We'll talk a little bit more about that in a
11 minute.
12 I want to introduce a few people, though,
13 first. We have a lot of people in this room who have
14 put a lot of time and effort into this process, who have
15 been working with EPA and in EPA to look at the
16 situation here and to come up with some ideas on how to
17 fix the situation.
18 And so I wanted to introduce some of the
19 working group members and a few other people here. And

20 I'm going to start with some of the members of CEASE. I

21 see a few of them in the audience. If you could stand

22 up when I call your name.

23 Lorraine Granado in the back. Anthony Thomas.

24 You can just wave if you want, Anthony. Thank you.

25 Joan Hooker. Joan. Sandy Douglas. I thought

1 I saw Sandy. There she is. Over on this side. Antonia
2 Montoya. Antonia, you were here before. She stepped
3 out. Akwe Starmis. Just met Akwe.
4 Michael Maes, is he here tonight? Gloria
5 Shearer. Gloria. Thank you. Then we have Michael
6 Koznet, who is CEASE's consultant sitting in the back of
7 the room.
8 We have Barbara O'Grady from the Colorado
9 Department of -- what CDPHE, I always forget what that
10 means. She works for the State. That works for most of
11 us. And Jane Mitchell for -- from the State as well.
12 And from the City and County of Denver, not
13 CDPHE, we have Gene Hook.
14 Also in the back, there in front of Gene is
15 Chris Poulet from ATSDR. Two other people to introduce
16 and then we'll really get into some good stuff.
17 Barry Levene is here tonight, he works for
18 EPA. He's the Colorado Superfund program manager.
19 Basically that means he's Bonnie's boss. And then we

20 have Dale Vodehnal who is the remedial program manager

21 at EPA.

22 So we have quite a group of people and I am

23 happy to say it does look like the community members do

24 outnumber the government people, so, good job.

25 So now I'm going to introduce Bonnie Lavelle,

1 who probably most of you know. Bonnie is the EPA
2 project manager for this site and Bonnie's been working
3 on this site, I think, from the beginning of it becoming
4 a site for EPA. And I know she's put in a lot of hours
5 and a lot of hard work to get to this point where they
6 have a proposal.
7 Bonnie is also -- was responsible for
8 instigating the working group process here where we were
9 able to have more input from the community, where we had
10 these individuals we just talked about, the government
11 people, the community people, working together, sharing
12 information and trying to do a better job of getting
13 information out at an earlier stage.
14 And so Bonnie is going to talk for a few
15 minutes and I think I should shut up and let Bonnie
16 talk.
17 MS. BONNIE LAVELLE: You're doing fine.
18 Thanks, Karen.
19 Hi, everyone, I'm Bonnie. Thanks so much for

20 coming out tonight. We are very excited at EPA and the

21 State because finally, finally, finally, after all these

22 years of working very hard on this project, and actually

23 after years of asking you to be patient with us, we

24 finally tonight want to tell you about our proposal for

25 cleaning up the lead and arsenic we found in soils.

1 We're proud of this proposal. EPA and the
2 State are very proud of what we've done here. We
3 believe that it's based on the best science that we have
4 available to us. And what's really important, too, is
5 that we believe it takes into account the advice of
6 people outside of EPA and the State who probably are
7 some of the smartest people in the Denver area. So
8 we're proud of this.
9 The details are written down, just so all of
10 you residents know exactly what it is we're talking
11 about. They're written down in a fact sheet that we
12 mailed to residents and property owners about a month
13 ago. But the reason I'm here tonight is, you know, you
14 can read this, we -- we hope you do, we hope you're
15 talking about it with your neighbors, but I thought it
16 would be best if you heard from someone at EPA
17 face-to-face exactly what it is that we're proposing and
18 why.
19 So that's why I'm here tonight. And I'm going

20 to start by telling you what we found in our sampling

21 efforts, because as you know we've spent about three

22 years and millions of dollars collecting information

23 from your yards. Some of you, I know, we've been back

24 about four times because we sampled soil and then we

25 decided we needed to sample dust, and then we decided

1 some of you had gardens that we wanted to know what was
2 in the garden soil, so we came back, and then we got
3 garden vegetables, and then some of you we decided, you
4 know, we need to collect some more samples in your yard
5 because we want to make sure that we're getting hot
6 spots, if they're out there.
7 So, you know, if I counted it up, there could
8 be someone here that we've been back to your house about
9 five times. So I'm going to tell you, after all of that
10 effort, what we found. And I'm going to start by
11 letting you know right off the bat that the levels that
12 we found in the schools, in the parks here, are really
13 low. That goes for arsenic and lead. So there is no
14 concern about schools and parks here. And I know a lot
15 of you have been really worried about sending your kids
16 to school and letting them play in the parks. That's
17 not a problem.
18 But we did find problems in residential yards.
19 So I'm going to show you a couple of pictures because I

20 think that's -- that -- I can tell you some statistics,

21 some of you will respond to that, but some of you will

22 probably want to see this picture of what we found at

23 the site. So, I'm going to ask for the first slide.

24 This is a graph that shows the average

25 concentrations of arsenic that we found in yards. And

1 the way that you read this graph is the soil
2 concentrations are on the bottom line and if you're
3 interested in a particular soil concentration, you go to
4 that and then you look at the box and that tells you how
5 many yards are at that particular concentration.
6 So if you start at the left-hand side of that
7 slide, that's the lowest concentrations. That's zero to
8 25. And we measured these things in parts per million.
9 So that's parts of arsenic per million part of soil.
10 And right away, you can see the biggest box is
11 that low concentration. Most of the homes out here have
12 very low concentrations of arsenic. But as you go
13 further along that horizontal line, you get higher and
14 higher and higher concentrations of arsenic. And at a
15 couple of homes, we found arsenic as high as 750 part
16 per million. So most folks have concentrations of,
17 like, zero to 25, zero to 50, and there's very few folks
18 that have these high levels. And that's where we're
19 concerned. So I want to make sure that you all know

20 that this cleanup plan addresses those homes where

21 there's elevations, that the cleanup plan applies to

22 only a small percentage of homes.

23 So you don't need to feel like your entire

24 neighborhood is contaminated, but we really want to

25 focus on those homes where there is this problem and

1 clean it up for you.

2 The other thing I want to point out is that

3 these homes that have elevations of arsenic are

4 scattered all over the place. There is an equal number

5 of them -- although it's a small number, there's an

6 equal number in Swansea and Elyria and Cole and Clayton.

7 So they're kind of randomly scattered all over the area

8 that we studied. And that's important for you to know.

9 The other thing we looked at, which is really

10 important, is: So we know what's in the yard. What is

11 in the house dust? Because, of course, children and,

12 frankly, adults, spend a lot of time inside, and we know

13 that soil contributes to dust. So that's why we went

14 back and sampled dust.

15 And what we found for arsenic was that the

16 arsenic levels in the indoor dust are very low compared

17 to the outdoor soil. They're only on average about

18 6 percent of what we found in the soil. And that's good

19 news. And this applies across the board. If you've got

20 low concentration in the soil, there's only about

21 6 percent of that in the dust. Even if you have high

22 concentration in the soil, we're not finding more than

23 about 6 percent of that in the interior dust.

24 So I hope you walk away with a picture of the

25 arsenic across the site. We sampled 3,000 homes, most

1 of them, 2,000 of them, are in that first low
2 concentration. And then we have a scattering of yards
3 that have higher concentrations that we're concerned
4 about.
5 The picture for lead is very different. That
6 is the picture of the lead concentrations that we found
7 in yards across the site. Again, most homes have low
8 concentrations of lead in soil. We have very few homes
9 that have some high concentrations. And unlike the
10 arsenic, which is very interesting, the higher levels of
11 lead in soil are in the western part of this area. So
12 the Cole neighborhood and the Elyria neighborhood have
13 more of the homes with elevated concentrations of lead
14 than Swansea and Clayton. So the levels tend to be
15 higher on the western part of the study area for lead.
16 And we did find, too, that the lead in the
17 indoor dust is, again, lower than what we found in soil,
18 but it's about 34 percent of what we found in soil.
19 The other interesting thing, and something I'm

20 going to talk about more tonight, is there are some

21 homes out there where there is very, very high levels of

22 lead in dust. Higher than the soil. So we know there's

23 another source out there contributing to indoor dust.

24 And we think that's paint and we want -- we are very

25 concerned about that. We want you to know about that,

1 and that's part of our cleanup plan, to try to address
2 that.
3 So this is the picture of lead and arsenic in
4 soil and in dust. I also wanted you to know that we did
5 sample garden soils and garden vegetables, and we didn't
6 find much arsenic or lead in those. So we're not
7 concerned about garden vegetables or garden soils.
8 The other thing that we've been spending time
9 on, I just wanted you to know, because it goes to the
10 quality of the science that we're trying to bring to
11 this problem, we also took a lot of soil and sieved it
12 to a very, very fine fraction because we wanted to know,
13 is there more arsenic and lead in the tiny particles?
14 And what we found was the answer is yes,
15 there's a little bit more. And that's important to us,
16 and we factored that into our decision here because we
17 know that the tiny particles of soil are what stays on
18 your hands. And although you might be out of contact
19 with soil and come inside, you could possibly get those

20 particles in your body, as you're eating or just have

21 any kind of hand-to-mouth activity.

22 So we measured that and we factored that into

23 our cleanup plan. The other thing that we looked at was

24 how much arsenic and lead gets absorbed once it's in

25 your body. And we did a special study on both of those

1 things, and we factored that in.

2 So that's what we've been doing for three

3 years, basically I wanted you to know that this is a

4 huge site and we've been collecting all this information

5 to increase the accuracy of what we're -- what we're

6 predicting are your health risks.

7 So, this is what we found, but the real

8 question is, what needs to be cleaned up? This is our

9 cleanup proposal. We want to remove and replace the

10 soil from any yard where the average arsenic

11 concentrations are above 128 part per million. Or, the

12 lead concentrations are above 540 parts per million.

13 There are about 400 -- 403 houses that are going to

14 require this type of cleanup.

15 And we are very confident that in removing

16 that soil from those homes, that is going to protect

17 this community from the health effects of lead and

18 arsenic in soil.

19 Now, at other Superfund sites, that's where we

20 would stop. We say we're taking care of the soil

21 problem, end of story. But we have another component to

22 our proposal that I want to focus on tonight because

23 it's different for us, it's innovative and there's a lot

24 of confusion about it.

25 And it is the community health program. What

1 we want to do as part of our cleanup is to work with
2 local agencies and you, community members, to establish
3 and run a community health program that can address
4 other risks that we found that don't have anything
5 really to do with the soil. That is risks to --
6 exposure to arsenic and lead from other sources other
7 than soil, like paint, like home remedies, like tap
8 water is potentially a source of lead. And also to deal
9 with the behavior that we all, a couple of months ago
10 got -- became aware of when ATSDR was in town and let us
11 know about soil pica behavior. And we want a community
12 health program to address that behavior and the risks
13 associated with it.
14 So, I'm going to talk a little bit more about
15 the community health program. The next slide.
16 I want to focus on: The community health
17 program is absolutely not a substitute for removing
18 soil. We are going to remove soil and we are confident
19 that's going to protect you from anything in the soil.

20 It is a program to address other risks. Risks that have

21 to do with lead in paint, home remedies, and tap water,

22 and risks associated with soil pica behavior.

23 And I want to talk to you a little bit about

24 how we came up with this program. And the next slide is

25 where I'm going to start.

1 This is a picture of levels of lead in
2 children's blood that live here in the community. This
3 is a picture of some blood-lead levels that were
4 measured in kids in Cole and Clayton. When we started
5 looking into setting our cleanup action for lead at 540,
6 we really wanted to make sure that we were confident we
7 were going to be protecting kids from lead in soil, that
8 that lead in soil was not going to get into their blood
9 and cause health effects. So we used the best science
10 that we could and we used a model. And then we checked
11 that model by looking at actual measurements of
12 blood-lead concentrations.
13 And two things happened. It made us very
14 confident that if we remove the soils at 540, then we're
15 not going to have a problem with lead in soil. But it
16 also told us that there are kids here now that have
17 elevated levels of lead in their blood. And they are --
18 this graph shows you they're living at yards with
19 concentrations of lead that are very low.

20 And, remember, I told you that the

21 concentrations of lead in soil in Cole are a little bit

22 higher than in Clayton. This graph shows you -- the

23 pink dots show you blood-lead levels of children in

24 Clayton and the blue dots show you blood-lead levels of

25 kids in Cole and there's no difference. So the soil is

1 not causing the problem, we don't believe. The soil is
2 not the major contributor here.
3 So that made us say, well, okay, all of these
4 kids on this graph are living where soil is below 500
5 parts per million, but the kids with elevations are
6 living at yards where there is very low concentrations.
7 There's something else going on here.
8 So the next slide we started digging into
9 this, and what we dug up was what I told you before,
10 that there is a lot of lead in dust in some of these
11 houses. And this shows that in some homes, the level of
12 lead in dust is very much higher than in soil. So this
13 shows you a couple of examples.
14 The left-hand side of this shows you the
15 concentration we found in yard soil and then the
16 right-hand side shows you, at that very house, what's in
17 the dust. So let's look at this.
18 At a yard with 320 parts per million lead in
19 soil, there's 9,000 parts per million in the dust. At

20 another house with about 200 parts per million in soil,

21 there's 2,000 parts per million in dust. There is

22 another source, obviously, and we think that is paint.

23 So, this was our thought process. I have

24 regulation after regulation in the Superfund program

25 that tells me again and again you're not supposed to be

1 spending Superfund money to address a lead paint
2 problem; there are other programs in place. But the EPA
3 and State didn't want to just say, oh, okay, that's
4 someone else's problem. We're going to deal with the
5 soil and go away. We really wanted to find a way in
6 Superfund to at least help with this paint problem.
7 And so what we wanted to do is understand why
8 it's there. And we started talking to local agencies.
9 And we found out that what -- there's lots of folks with
10 the desire and the energy that want to help this
11 community deal with lead paint and other sources of
12 lead. The missing piece is that -- the folks at the
13 City, the folks at some nonprofit organizations, and the
14 folks at the State, they can't respond with their
15 resources and energy unless there's someone who's
16 monitoring the kids.
17 So our idea is in our Superfund cleanup, let's
18 monitor the kids as a way of saying, hey, we're going to
19 prove to you that our lead in soil action level is

20 protective, and we're going to do that by monitoring

21 children. And if we find a child that looks like

22 they've got lead in the blood above a typical level,

23 we're going to go to that house and I'm going to make

24 sure it's not soil, because, remember, that's my

25 responsibility. But in order to make sure it's not

1 soil, I've got to sample paint. I've got to sample the
2 soil. So I've got to figure out what the problem is.
3 And if EPA can use our resources to figure out where a
4 problem is, I can then work with the local agencies and
5 they can respond.
6 And the idea of this program is not really to
7 make this a federal program, but actually to have EPA
8 resources beef up the people that are already here in
9 the local and state governments. So it's a way of
10 monitoring children, finding the kids who are at risk,
11 going to their houses, figuring out the problem. And
12 then if it's lead paint, we'll get someone to deal with
13 it. That's the idea.
14 The next slide is telling you about the other
15 part of this, because, remember, I did talk about kids
16 with soil pica behavior. And I am just going to assume
17 that maybe you haven't heard of this, but pica is a
18 tendency for a child -- it's a behavior where the child
19 eats nonfood items. It's a very -- we think it's a rare

20 behavior, it's unusual, and there's a small percentage

21 of kids with pica that eat dirt.

22 And this is not kids that just play in dirt

23 and get dirt in their mouth, these are kids that really

24 sit down and eat dirt. They just do it intentionally.

25 For some reason they want to do it.

1 Well, we looked at the risks of those kids
2 being exposed to lead and arsenic. But in looking
3 really hard at that, we decided that removing and
4 replacing soil from yards where arsenic is lower than
5 our action level is not going to be protective for these
6 kids. The reason for that is, if we remove soil, we're
7 going to bring in clean soil. But soil all over the
8 western United States has some arsenic in it.
9 We're not quite sure how much dirt these kids
10 eat, but we are not -- we can't be certain that even if
11 we replace the soil, that these kids are not going to
12 get a dose of arsenic, if they're eating enough. And,
13 frankly, nobody really knows how much soil soil-pica
14 kids eat. This isn't a good plan. I think that if
15 people saw us removing dirt and replacing it to protect
16 pica kids, you would want some guarantee that we would
17 protect them, and we couldn't do that.
18 In other words, the bottom line is we cannot
19 make soil clean enough for kids to eat it. What we need

20 to do is address that behavior. And so we were

21 thinking, okay, this community health program, our first

22 priority is kids with elevated blood-lead because

23 they're there and we've got to protect them. We've got

24 to respond to them. We have this sort of theoretical

25 risk of kids with pica behavior because we don't know if

1 they're out there and we don't know if they're getting
2 exposed to arsenic.
3 But while we're responding to children who
4 have elevated blood-lead, why not design a program where
5 we can also find children who are at risk with soil pica
6 behavior.
7 One thing we do know is we can monitor
8 children's urine to find out if they've been recently
9 exposed to arsenic. So as part of this community health
10 program we were wanting to also monitor kids' urine, and
11 if we find kids that seem to be getting arsenic in their
12 urine, we will go to their home and find out, is it a
13 behavior problem, or is it a home remedy, or what is it?
14 And if it's soil pica behavior, we're able to then use
15 our resources to respond to that individual child.
16 So those are the ideas. So we have -- we know
17 we have the soil problem, that's something we're used to
18 dealing with and we're going to deal with that. This
19 community health program is extra to really recognize

20 some of these other risks in the community.

21 The next slide I think -- where are we? Oh,

22 the components of this program. As we started

23 conceptualizing it, it's basically three components:

24 The first is education. And there's been a lot of talk,

25 I know, in the community that EPA is talking about

1 educating us where we're going to have to wash our hands
2 more, we're going to have to keep our homes cleaner.
3 That's not what we're talking about. The
4 education that we are talking about has very little to
5 do with soil and everything to do with lead paint and
6 tap water and soil pica behavior. What we want to do is
7 raise awareness in this community about those risks,
8 what you can do to potentially prevent them.
9 And, actually, the biggest thing we want to
10 educate people about it, is it's so important to get
11 your children monitored.
12 And then the second component is we can
13 provide resources to get the children monitored. It's
14 not happening now and that's because it costs money, you
15 know, to have someone who's a professional to take a
16 blood sample or a urine sample. It costs money to rent
17 a clinic, it costs money to get those analyzed. And we
18 want to provide those resources.
19 And then the other component is: It's very

20 nice to be educated, it's nice to get your kids tested,

21 but the real safety net is what we want to do is if

22 there are kids at risk, we will respond to their

23 individual homes. So that's what the community health

24 program's all about. And the next slide is a little

25 cartoon of it. And I have a poster of it.

1 It's kind of color coded because what we want
2 to show you is comprehensively what we're talking about.
3 That big circle shows you, in green, all the ways that
4 kids could get exposed to lead and arsenic. There's
5 outdoor paint, there's indoor paint, there's dust that
6 indoor paint can contribute to. There's outdoor soil,
7 there's tap water. There's also behavioral sources.
8 People who use home remedies that have arsenic and lead,
9 that's a source. And soil pica behavior.
10 So the three components are color coded. The
11 blue is education. Education to raise awareness about
12 some of those behavioral problems that are in blue in
13 the circle. The yellow is the testing program that it's
14 focused on the kids. The kids in the middle who could
15 be at risk from all these other sources. And the blue
16 is what we -- EPA can respond to. We can respond to the
17 outdoor soil if it's a problem, we can respond to the
18 exterior paint, we can even stretch it and respond to
19 indoor dust, although that's pretty much stretching my

20 Superfund authority, but we're willing to try.

21 And then there's other agencies in the local

22 area that can respond to other paint problems. Those

23 are in green. We would refer those to those agencies.

24 So that's the idea of the community health program.

25 So, that's it. I wanted to address, though --

1 I know that the next slide talks a little bit about this
2 controversy that we're very aware of. We know that
3 there's a lot of concern about our proposed action level
4 for lead in soil. We've heard this. And one of the
5 things we've heard is there's a lot of people
6 questioning: Why is EPA saying we're only going to
7 remove soil above 540? Doesn't their guidance tell
8 them, aren't they required, to remove soil where it's
9 above 400? And I wanted to tell you the facts about
10 that guidance.
11 The Superfund guidance does say there is a
12 screening level at 400. That's not a cleanup level.
13 That's a level at which, if you're above 400, we need to
14 look at you a little bit more closely to find out
15 exactly what's going on. That guidance says -- the next
16 bullet -- oh, no, I can't read that. Oh, thank you.
17 If you're above -- if you have lead above 400
18 parts per million, our guidance says you need to use an
19 EPA model and that's what we did at this site. All that

20 information I described that we collected, we used that

21 in the model and that's how we came up with 540.

22 The next bullet -- thank you -- in our

23 guidance does say collect information that's site

24 specific to run that model. And -- thank you. Okay.

25 And this guidance applies to Superfund sites.

1 The Superfund guidance expects that we are
2 going to have money from the federal government to
3 collect the right information to run this model
4 accurately. And that 400 is a place to start. If
5 you're above 400, you need to run this model.
6 We did that. That model, along with our
7 understanding of blood-lead levels here and soil levels
8 here, leads us to believe that 540 part per million is
9 going to protect your kids from lead in soil. The model
10 also -- or the information on blood-lead levels tells us
11 that we could keep removing soil and go down to 400 part
12 per million. We're not going to be helping your kids
13 unless we deal with that paint problem. That's what we
14 think.
15 There's some other guidance, too, that people
16 have been talking about, and that's from the Toxic
17 Substances Control Act. And this really is confusing
18 because it's confusing for us, too, but that establishes
19 national standards that are supposed to apply to houses

20 that have lead paint problems. It uses the same EPA

21 model, but it's meant to be used where you don't have

22 the resources to collect information like you do in

23 Superfund, to run the model for site specific

24 conditions.

25 And the other important thing is that Act does

1 not require soil removal. There's many other things
2 that you can do if the soil is above 400 part per
3 million under that Act. We are talking about: What is
4 the level in soil that we need to come in and remove
5 your entire yard? We would come in and take a foot of
6 soil off of that.
7 So I understand, I think -- although, you
8 know, you guys are the community folks -- I think I can
9 understand if you're thinking that EPA is not following
10 its own guidance or regulations, I would be mad if I
11 were you. But we looked into this and our plan does not
12 include 400 part per million because I couldn't write a
13 plan that says that that's our regulations because
14 that's not -- really not factual.
15 So -- so that's what we're proposing, 540
16 parts per million. The other thing I wanted to leave
17 you with is the next slide. And the -- I'm suspecting
18 that you're going to want to know that this lead level
19 that we're talking about, 540 parts per million, how

20 does it compare to other sites around the country?

21 So we did some research and we put -- and we

22 put together a graph of various cleanup levels for

23 Superfund sites that are environmental justice sites and

24 also nonenvironmental justice sites. So the graph that

25 you see here is -- the bars in the red are environmental

1 justice sites and the action levels for lead that EPA
2 has set. And they range from 500 to 3500. One is about
3 600, one is about 1400, but they're all in the range of
4 about 500, 1400. 3500 is kind of the highest one.
5 The other sites which are not environmental
6 justice sites are shown in the blue. And VB/I-70, the
7 site here, is yellow. And we're just hoping to
8 illustrate to you that the lead level that we're
9 proposing is actually one of the lowest ones and in line
10 with other environmental justice sites.
11 Now, I'm going to end by just letting you know
12 that I realize I am one EPA person and I am the person
13 that you see as EPA, but I want you to know that there
14 is a team of people that have worked so hard on this
15 site, people who work in the EPA's Denver office, people
16 who work in EPA in Washington. There isn't a time when
17 someone in Washington doesn't come here and say, What's
18 going on with VB/I-70?
19 We had Dr. Peter Gravat, who is the Superfund

20 science advisor, helping us out on this site. All of

21 the sciences and engineers from many areas of the

22 country that we asked and we contracted with to work on

23 the site, all the sciences at the State health

24 department who've worked so hard and the folks in the

25 hazardous waste division, even the folks in our

1 mailroom, you know, they know about you guys, because
2 we -- they worked really hard over time to get those
3 proposals out, and we -- I just want you to know that we
4 really care about this community. We're really all
5 pulling for you. We want you to have a healthy
6 community.
7 And I hope that you know from this
8 presentation that what we are proposing is what we think
9 is the best science and meets our regulations. We know,
10 though, that what's really important is what you think
11 as community folks. You might have completely different
12 perspectives and some things that are more important to
13 you that we haven't thought of, and that's what we want
14 to hear tonight.
15 We haven't made a final decision, so anyone
16 that is telling you that, that is not true. We are here
17 to hear from you. We won't make that decision until we
18 hear from you.
19 Okay.

20 MS. KAREN KELLEN: Thank you, Bonnie. I'm

21 going to move right into the public comment period

22 because we are running a little late. We have set aside

23 the first portion of the public comment period to hear

24 from a representative from the CEASE group, and I

25 mentioned them a little bit earlier, I introduced them,

1 but I want to tell you a little bit about them.

2 This is a neighborhood group from the Cole,

3 Clayton, Elyria/Swansea neighborhood. These are people

4 who live in your community, who have taken their own

5 time to come to these meetings, to listen to sometimes

6 very complicated scientific information, to try to sift

7 through it and understand it, and to give feedback to

8 the government during this very long and difficult

9 process. And this has been going on for several years.

10 I'm a relative newcomer to this process here

11 at this site, but these people have been involved a long

12 time, and they wanted to -- they asked if they could

13 take some time at the beginning of the public comment

14 period, as part of the official public comment, to talk

15 to you folks and to give you their views on the process,

16 on the proposal, and on where things are basically

17 going.

18 So what I'm going to do is I'm going to let

19 Lorraine Granado from CEASE come up and talk to you for

20 a bit and then I'm going to do a count of the rest of

21 the people that have signed up. So if people want to

22 sign up on the list, please pop over there and sign up

23 and we'll figure out how much time everyone else gets.

24 But, first, Lorraine.

25 MS. LORRAINE GRANADO: Thank you. I am the

1 treasurer of CEASE, but we have representatives, as
2 Karen said, from every neighborhood organization. And
3 we, in fact, have been involved since Globeville.
4 We -- not CEASE, but I and some of the
5 members, worked on the Globeville Superfund site that
6 was contaminated also with lead and arsenic, cadmium and
7 zinc.
8 And what wasn't discussed is where did this
9 contamination come from. But it's interesting that
10 Elyria and Globeville -- I mean Elyria and Cole, the two
11 western-most communities, are the most heavily
12 contaminated. And those are also the communities that
13 are closest to the three smelters that have -- that
14 operated starting in the late 1800s.
15 As Karen indicated, this is not our job, we
16 don't get paid, we do this because we live here. I have
17 four generations living in Swansea, my mom, my son, my
18 grandchildren, myself. And I'm a lifelong resident of
19 Globeville and Swansea. So we do this because we care.

20 And, yes, this stuff is technical and, yes, it's

21 difficult, but we are also very bright people and we

22 think we understand it very well.

23 Another thing is that we didn't give feedback.

24 What we did was we participated in monthly meetings that

25 some days went seven hours. We participated in health

1 team meetings, we participated in health study meetings.
2 When the EPA was initially doing the testing, we were
3 doing five grab samples in a yard, we convinced them
4 this was insufficient. And they responded and they went
5 to doing 30 samples in three grids in yards. So they
6 increased from five to 30 samples, and this was our
7 recommendation.
8 Along the way, we helped design a program that
9 educated doctors, nurses, health care providers, about
10 issues of heavy metals contamination, so that when you
11 go to the doctors, they'll at least know what to look
12 for or maybe, you know, believe you.
13 When we were working on Globeville, I wanted
14 to have my son tested for lead and they refused. My
15 doctor refused. He said, unless the Colorado Department
16 of Health put out an advisory, they wouldn't do it.
17 We didn't want that to happen to anyone else
18 and so we worked really hard to educate doctors, nurses,
19 and other folks. We were there every step of the way.

20 And we advocated for you every step of the way.

21 This stuff is hard, but it's not rocket

22 science, and some things are pretty simple. You can

23 make it look tough, but it isn't.

24 First of all, the most simple things to

25 understand is there is no such thing as a safe level of

1 lead or arsenic. Lead or arsenic are not safe, period.

2 Lead and arsenic are heavy metals. They cause

3 serious harm. The more there is, the more harm they

4 cause.

5 And we used to be around the Asarco mine, they

6 used to have a thing called standards, you know, a

7 lead -- a standard for a certain metal, and above that

8 standard they would clean up. They moved away from that

9 term, perhaps because it got real expensive, but they

10 moved away from that term and, in fact, we did

11 participate in the whole two-, three-year process where

12 the EPA did stay at a national screening level.

13 Now, above 400 parts per million, why do you

14 think the EPA is asked to do testing and figure out

15 risk? Because they know that above 400 parts per

16 million there is a risk. There's a risk under 400 parts

17 per million, but it's significant enough above 400 parts

18 per million that they need to study it.

19 And so it just stands to reason because,

20 again, it's not rocket science, folks, if over 400 parts

21 per million, you're going to see health effects, you're

22 going to have to be concerned about that, you're going

23 to have to determine risk. Then what you do know is the

24 higher it goes, the higher the risk. That's not rocket

25 science.

1 There are a lot of things involved. What's
2 the exposure, where does it come from, all the rest of
3 that. But above that, as the amount of the metals
4 increase so does the risk, especially to children.
5 So why 400? Because that's the lowest EPA
6 will go before they'll test. That doesn't mean there's
7 no risk under 400. It does not mean that. It means
8 that's as low as they're willing to go. So when we say
9 540 parts per million, that's real high to us.
10 This is a nice graph and, of course, you know,
11 our tax dollars pay for really good stuff. We,
12 unfortunately, can't do that. We don't have the
13 resources to do a Power Point, but we've done some
14 research, and I want to tell you that, in fact -- and
15 I'm going to put this in writing and I don't have my
16 paperwork in front of me, so I can't give you details,
17 but I can tell you fact: EPA has cleaned up lead in at
18 least one community in this country at 1 part per
19 million. At 5 parts per million.

20 There is a community in Utah similar in the

21 sense that they had lead contamination issues, the

22 bioavailability of that lead in that community, and what

23 it means is if someone gets lead in their system, let's

24 say a kid, gets some lead in their system, how much of

25 it stays in the body and how much is expelled? The

1 bioavailability, the amount that stayed in the system in
2 that area, was 70 parts per million. Here at this site,
3 the bioavailability is 80 percent. That community was
4 cleaned up at 250 parts per million.
5 That gets to the issue of environmental
6 justice. What is environmental justice? Environmental
7 justice came out in a movement that was -- part of that
8 started in the mid-1980s. What it was, was people of
9 color getting together and saying, Hey, what's going on
10 here is wrong. The General Accounting Office, the
11 Racial Justice and Reconciliation Project of the United
12 Church of Christ, followed up by the National Lawyers
13 Guild, found out that throughout the country, throughout
14 the entire country, there was a consistent pattern that
15 could not have been random, that that was deliberate.
16 In communities of color, across this country,
17 there are higher levels of cleanup rather than lower.
18 Cleanup takes years longer, and when juries made jury
19 awards, they make higher awards to more affluent white

20 communities than they do communities of color. And so

21 what was the response to this fact? The response was

22 that President Clinton issued an executive order saying,

23 Look, you have to take into consideration environmental

24 justice. What has been done to communities of color is

25 deliberate, it's clear, there is no argument. And so

1 you have to take into consideration environmental
2 justice.
3 I don't think, we don't think, it's
4 environmental justice if a community in Utah can get
5 cleaned up to 250 parts per million and we are asked at
6 540. We didn't ask for the world, we're not asking for
7 the world, we're asking 400 parts per million because
8 that's as low as EPA will go before they do a study.
9 And common sense says the higher you get above
10 that, the higher the risk. They can clean up to 400.
11 400, you know, what does this add? This adds 100
12 houses. This is not huge. We're not talking, hey, this
13 is going to mean thousands more houses, this adds 100
14 houses in an area that has between 4- and 5,000 houses.
15 It's not huge.
16 And then as we speak of lead, there are two
17 sources: We here -- now, when we sat down at this table
18 and we agreed to participate -- and I have told you we
19 were here before the EPA, we were here when the Colorado

20 Department of Health was testing outward from Asarco,

21 which is how this site resulted because they never found

22 the end of the contamination, they came, we talked.

23 They said they were going to turn it over to

24 the EPA. We worked and had community meetings to get

25 the community to approve making this a Superfund site.

1 Why? Because we knew that unless it was a Superfund
2 site, there would be no money to clean it up.
3 We've been here the whole way, folks.
4 Now, going back to the issue of lead, I think
5 I was talking about -- oh, the two sources. Well, one
6 of the things and Bonnie said -- when we sat down at the
7 table and we all agreed to work together, Bonnie said
8 this, she said, you know, we don't want this to be
9 contentious. We want to work together. We all want to
10 bring our best to the table. We want, really, to do the
11 best job we can, all of us together, everyone
12 contributing what we can.
13 And we said, Great, that's what we want, too.
14 It's -- it doesn't make sense to argue and hassle, let's
15 sit down together, let's work it out, but what's going
16 to be the basis for our work? And I quote Bonnie. She
17 said, Let's base it on the science.
18 Great. If the science is there, we'll base it
19 on the science. Well, when we talk about -- or when

20 Bonnie talks about being a second source, we've got to

21 ask ourselves what's good science sense?

22 You keep hearing these terms, statistically

23 significant. If you don't study enough, then you can't

24 really prove your hypothesis or you can't even really

25 have a strong hypothesis. And so it is our

1 understanding that there were about 30 homes tested for
2 paint -- for lead-based paint. That's not statistically
3 significant. Do we know that there's internal
4 lead-based paint in these houses? You bet, they're old
5 houses, got to be there. It's got to be there.
6 The EPA, as she said to you, isn't going to
7 clean it up. They're going to refer us to other places
8 because they don't deal with indoor paint. They are
9 willing and -- you know, grateful, you know, always
10 credit where credit is due -- they're willing to do some
11 testing, they're willing to see if it's there, but if
12 it's there, they're not going to clean it up. Their
13 obligation is external, their obligation is to the
14 environment. It is their obligation to clean up the
15 environment, not the insides of our houses.
16 And so you say there's two sources. Let's say
17 for a minute there are, there's two sources, there's
18 inside paint and there's soil, or there's outside paint
19 and there's soil. Well, folks, if somebody's got a gun

20 pointed at my house and a gun pointed at my head on this

21 side, I would say get rid of both the guns. Both of

22 them. Not one, both of them. Remove the soil, clean up

23 the paint. They can't clean up inside, we're not even

24 sure we -- we have never heard directly, and Bonnie did

25 not say it tonight, if there is lead-based paint on the

1 outside of your homes, we will clean it up. She didn't
2 say that. And we've never heard that in a meeting. It
3 is not clear whether EPA will clean that up or not.
4 And so what we say is, if there is over 400
5 parts per million, clean it up. And we're not asking
6 for the world. It's about an additional hundred houses.
7 The other thing around the 540 that she has
8 said at other meetings but didn't say clearly tonight,
9 and so I will, is that cleanup at 540 and then we will
10 go back to houses, as she said, we're going to go find
11 children. They'll find children under the age of six,
12 they will draw their blood. If the children have lead
13 in their blood, she said a typical level -- I don't know
14 what that means -- if kids have elevated levels of lead
15 in their blood, then they'll come back and they'll clean
16 up the yard.
17 Well, that's after the fact, right? We got a
18 kid here who's lead poisoned, we don't need to wait for
19 someone to be lead poisoned. But let's suppose -- and I

20 see some seniors out here right now -- let's suppose

21 they go back to the houses -- and they'll do this, I

22 know they'll keep their word -- they go to their houses,

23 540. They ask, Are there any children here under six?

24 No, there's no children here under six, they'll take no

25 action. They won't have any kid to draw blood from.

1 On my block last year, there were three
2 seniors, one died, two went to nursing homes. Right now
3 in each of those homes there are small children under
4 six living in those homes. And so, you know, what we
5 are asking for is a permanent solution, not a temporary
6 solution. Once it's gone, it's gone.
7 I mean, I don't know what home you've lived
8 in, but if you've lived in, you know, Clayton or Cole,
9 or Elyria, those homes have probably housed, you know,
10 hundreds of families over, you know, what, 60 years? I
11 mean, 70 years old, 80 years old. Lots of families have
12 lived there and lots of children have lived there, and
13 lots more children are going to live there. And if
14 there's not a child there right now, there's going to be
15 some day.
16 So get rid of the lead. Get rid of the
17 arsenic, so that not just for this moment, for this
18 time, this space, this place, but that forever we have a
19 forever solution. See, heavy metals don't go away.

20 That's why you have to remove 12 inches of soil. They

21 don't go away, folks. They stay there. And some day,

22 some child is going to play in that soil. Well, remove

23 it.

24 Again, we're not asking for the world. It's

25 100 houses, roughly. Remove it. Make it safe not just

1 for the child today, but for the child next week, next
2 year, in 10 years, in 20 years.
3 And I got right into our plan, which I wasn't
4 going to do.
5 At any rate, that's our proposal for lead.
6 Clean it up at 400.
7 Arsenic is also very interesting. Used to be
8 they had a standard. In Globeville, the standard was 70
9 parts per million, they clean up at 70 parts per
10 million. And now they don't have that anymore. They
11 have things like screening levels. They also have a
12 thing called a default. I don't remember what it's
13 called, default assumption, default level. But a
14 default assumption, if you will -- let's look at
15 arsenic -- is based on decades of study. We all know
16 arsenic and old lead -- arsenic and old -- what is that
17 called? Old lace. Thank you.
18 We've known arsenic how long? We've known
19 forever and ever and ever, right, arsenic kills people,

20 and -- or harms people. And there have been studies,

21 many, many, many studies all over the world on arsenic.

22 We know arsenic's really dangerous. And so there's no

23 question about that.

24 And they used to have a level, but now they

25 have -- what they have is a default value -- that's the

1 word -- and what that means is they look at all the
2 studies over time, and they come to a default value.
3 And in Globeville, that was 70 parts per million. And
4 so they removed the arsenic at 70 parts per million.
5 At this site, based on a bioavailability
6 study -- and I'm going to tell you, we're real sorry we
7 agreed to that -- what they did is fed soil to pigs,
8 baby pigs, and determined what amount of the arsenic
9 stayed in that -- in the baby pig and that's what they
10 based their risk assessment on.
11 Well, what they first proposed was to do the
12 cleanup at 240 parts per million. And they got a lot of
13 not real support for that. In fact, they got a lot of
14 comments on that, a lot of questions on that. And to
15 their credit, they did respond. They backed away from
16 the 240 and lowered it to 128.
17 Well, that's what site specific means. It
18 means you don't look at everything that's happened
19 before and say, Look, they used 70 parts per million in

20 Globeville, they had a reason for it, it was based on

21 studies. They do a test on pigs here and say, Well, the

22 risk here means we can clean up initially at 240 and now

23 128.

24 We feel pretty good about the 128 because it

25 feels a lot better than the 240 that was initially

1 proposed. And the only reason that we're not fighting
2 for 70 is because we don't think we can get 70, so we're
3 willing to go along with the 128.
4 The other thing is the -- the health
5 education, the community health education process.
6 Well -- Bonnie said that, well, some people -- I'm
7 assuming this means me -- are running around trying to
8 scare you all and telling people that we're going to
9 have folks do all these extraordinary things, and that's
10 not true.
11 Well, you know, we had three really huge
12 poster sessions, and we worked for months together on
13 these. All of us in that working group, we worked for
14 months together on these. We didn't make these up
15 yesterday, this was months ago. And it says right here,
16 you can read it, wash and peel all your fruits,
17 vegetables. Wipe your shoes or remove your shoes before
18 you come in. Don't eat food, chew gum, or smoke when
19 working in the yard. Damp-mop your floors and dust your

20 counters and furniture regularly. Wet -- wet dust.

21 Wash your dogs regularly. Wash your children's toys

22 regularly. Wash their hands and feet when they've been

23 playing outside and they come in the house.

24 We didn't make that up, folks. We did that

25 together with the EPA, ATSDR, the Department of Health

1 and the Denver Department of Health Services. Why?
2 Because there's a risk and these are the things that are
3 going to reduce that risk.
4 And, you bet, if folks who are living in yards
5 of more than 400 parts per million lead or more than
6 128 -- or, I'm sorry, anything up to 128 parts per
7 million of arsenic, yeah, you bet this stuff is going to
8 be important. And if they're not teaching about that,
9 that's wrong. They need to be teaching about that.
10 There is no safe levels of lead and arsenic.
11 It doesn't exist. Nobody's safe. It's just to what
12 degree are you at risk, is the question. So we didn't
13 make it up. It was there. We worked on it
14 all together. We had the poster sessions, we shared it
15 with all the folks. Everyone had an ability to comment
16 on that. So you've got to know that, because it's
17 important.
18 The other thing is, we had a meeting with
19 Bonnie and we said, Well, what does this community

20 health education project look like? And, you know, you

21 got some of the things. We're going to do community

22 health education, knocking on doors. You know, we're

23 going to talk to people about, you know, how to -- good

24 practices, like the not, you know, smoking in your

25 yards, whatever -- smoking while you're out in the yard,

1 that kind of stuff.

2 But the reality is that it actually hasn't

3 been designed yet, and that's Bonnie's words. It hasn't

4 been designed yet. We know what our goals are, but it

5 hasn't been designed yet.

6 And so we asked, Well, could we help design

7 that? And Bonnie said that she was going to be hiring,

8 she thought, a consultant from Boulder and that we could

9 have input.

10 And -- and to be fair, she said our input was

11 important. Well, we go back to the same thing: We're

12 being asked to accept and to support a health education

13 project for which we do not have the details. I mean, I

14 was pretty surprised to hear Bonnie say, really, truly,

15 I mean this, I was surprised to hear her say we're not

16 going to be telling people about these things like

17 washing your floors and stuff like that, well, why are

18 we not? We always thought that was going to be a part

19 of it. But then if it's not designed, I guess then it

20 doesn't have to be a part of it.

21 So it's a little bit of a pig in a poke. We

22 don't object to that either. We're not saying don't do

23 health education. We're saying a couple of things. One

24 is we'd really like to participate in designing it.

25 And, two, we would like it -- we would like to take the

1 money because when -- when people ask, Well, how long is
2 this health education project to go on, then Bonnie has
3 said, 10 -- and this is a quote, 10, 20, 30 years.
4 Depends how long we need it to go on.
5 And so then we're saying, Well, we don't want
6 it to go on 10, 20, 30 years. What we want is we want
7 you to take some of the money that you would have used
8 for the health education and we want you to put it into
9 cleaning up those yards at 400 parts per million lead.
10 And we do want health education because, you
11 know, at Asarco we saw that -- let's say there's 500,
12 let's say they clean up lead at 400 and there's 500
13 houses, because they do our extra hundred. Well, we saw
14 Asarco. It could take years. And Asarco, it took
15 like -- in 1992. I think they just stopped cleaning up
16 the last ones three or four years ago, and it could take
17 six, seven, eight years.
18 So the folks that are at the end of that list
19 need health education to help them to manage the

20 contamination until someone can get to their house and

21 clean it up. So those are the things that I wanted to

22 tell you. It's a real different experience working on

23 this site. This is the fourth Superfund site I

24 personally have worked on. It's a real different

25 experience.

1 The good things were, we were at the table.
2 We were there to speak our minds, we were able to
3 advocate for you, we were able to fight for you, we were
4 able to do the best we could. The sad things are, is
5 that there are no more standards. There are things like
6 site specific that let you forget about all the other
7 studies and just focus on a single test on pigs to do
8 your risk assessment.
9 There are some goods things, there are some
10 bad things about it, but mostly we believe that what we
11 are proposing to you as our alternative for cleanup is
12 in your best interest, and in the interest of the
13 people, both adults and children, that are going to live
14 in your house long after you're gone forever and ever.
15 And please remember two things, if you don't
16 remember anything else I say tonight. There is no safe
17 level of lead or arsenic. And heavy metals stay in the
18 soil forever unless they are removed.
19 I'm going to go ahead and go now. I was told

20 I could have the same time Bonnie had, but other kids

21 are -- I'm getting run out. But, anyway -- there's one

22 last thing I was asked to say from -- to you from CEASE,

23 which is, if you feel that you want to make a comment

24 this evening, please do. But don't feel pressured to.

25 As Karen said, you can think about it, you can

1 talk to us, you can talk more to EPA, you can take home
2 the information that's on the table, you can give it
3 some thought. There are two more opportunities to
4 comment verbally. You also have until July the 19th to
5 comment, if you'd like to put your comments in writing.
6 Thank you very much.
7 MS. KAREN KELLEN: Thank you, Lorraine. And
8 sorry, but we're running a little late and I wanted to
9 make sure Lorraine had her chance, and we ran a little
10 over before, too. But we only have five names on the
11 list, so if other people want to comment, there's still
12 time. I'm going to start with the first person on the
13 list, and I'm thinking if you could just take three or
14 four minutes, if that works for you, that way if people
15 decide during the process that they want to comment, we
16 still have some more time at the end.
17 Beverly, you're first. From the microphone,
18 please, so the court reporter can get it.
19 MS. BEVERLY LUMUMBA: Thank you. My name is

20 Beverly Lumumba. I am the education coordinator for the

21 Clayton Neighborhood Association. And I've raised two

22 sons in this neighborhood and both boys attended

23 Harrington Elementary School, the old school and the

24 new.

25 I'm really excited about this entire process

1 and that, clearly, it impacts the quality of our lives,
2 family, friends, neighbors. So this is very, very
3 important. In taking a look at the proposed plan for
4 cleanup and the community health plan, Clayton's
5 education proposal is this: That you consider attaching
6 a cultural perspective to your community health program
7 and to your education agenda.
8 I can appreciate, very much, the emphasis on
9 best science and best authority, et cetera, in terms of
10 scholarship, but it seems to all be specific to the
11 science or the technical piece of this. There is a best
12 pedagogy, as well, and my concern would be in
13 communities of color. And when you say you're going to
14 consider linking and connecting with local agencies,
15 well, our school's a fill-in. There isn't a local
16 education agency with which you can connect and -- and
17 derive best pedagogical methods and practices. There
18 isn't one.
19 And it is my concern that until we approach

20 education from a different perspective, from a cultural

21 perspective, we'll spin our wheels on the whole

22 community health plan, on the whole education focus,

23 much like DPS is spinning its wheels with its deficient

24 programs and its inadequacies in terms of responding to

25 the educational needs of our children.

1 And one last thing: I was taking a look at
2 your -- the last page and it's the preferred
3 alternative -- alternative four, there is a mindset that
4 exists in this document. There's a mindset that exists
5 in this document specific to the community health plan
6 particularly, and the overall plan in general, that
7 speaks to our -- what is called, among educators, a
8 Eurocentric approach to an agenda.
9 I just strongly encourage you to consider a
10 different perspective, a different approach when you're
11 considering pedagogy. And I'll be very interested in
12 knowing: Who are your representatives on your education
13 team? Bonnie referenced your scientists, et cetera, but
14 who are your -- who are your educators? Since we're
15 looking at moving in an educational direction, who are
16 they?
17 Accountability is key and I would be
18 especially interested in knowing who these people are.
19 Thank you.

20 MS. KAREN KELLEN: Thank you very much,

21 Beverly.

22 Next is Adam. Adam, I'm having trouble

23 reading the last name.

24 MR. ADAM SANDERS: Sanders.

25 I lived in the old -- I live in the Cole

1 neighborhood.

2 MS. KAREN KELLEN: If you state your name

3 again in the microphone.

4 MR. ADAM SANDERS: Adam Sanders. I guess the

5 most questions that I have kind of relate to the

6 community health program. And it seems like what that

7 program does is, essentially, it doesn't address what

8 the Superfund addresses. The Superfund addresses soil,

9 the community health program addresses something outside

10 of that.

11 So it would seem that it would fit into every

12 alternative, whether it was alternative five, four,

13 three, it doesn't matter. But I like the idea of -- I

14 like CEASE's idea of the lower cleanup of lead. I like

15 it a lot. And I think it is a more permanent, long-term

16 solution, and the community health program could be used

17 in coordination with that -- with that level of cleanup

18 to address the children that are already -- have high

19 levels of lead.

20 And so that's really what I wanted to say, was

21 that the community health program I think is --

22 shouldn't be excluded, I would consider it a valuable

23 part, a valuable piece in the process, and the reason

24 it's a valuable piece is it addresses things outside of

25 the soil contamination. So you clean up the soil, you

1 put that aside, that's a separate issue, it's done.

2 The other things are the dust inside the

3 homes. The dust is there, it doesn't -- it's always

4 going to be there unless you do something about it. So

5 it's still going to be there after you clean up. So

6 that's why the community health program, I think, is a

7 valuable piece and doesn't matter, really, what level

8 you clean up at, though, it should be there in any

9 alternative. Thanks.

10 MS. KAREN KELLEN: Thank you very much.

11 Next we have -- excuse me for mispronouncing

12 your name, Napue. Napue, are you still here? Okay.

13 We'll move on to Anthony. And just as a

14 little reminder, as Anthony's coming to the microphone,

15 I probably forgot to say this because I never look at my

16 notes once I write them, but we're not going to be

17 responding to the comments here tonight, we're just

18 listening. That there's a formal response summary

19 that's written at the end of the process and we respond

20 to everything. So thank you.

21 Anthony.

22 MR. ANTHONY THOMAS: My name is Anthony

23 Thomas. I am a member of CEASE. The president of the

24 Clayton Neighborhood Association and a long-time

25 resident of Clayton neighborhood.

1 I've been standing here listening to
2 everything. The chart that's up here, one thing I feel
3 that Bonnie neglected to tell everybody that some of
4 these sites are not residential, they're actually
5 mines -- mine cleanup. Mine tailings are naturally
6 going to have a higher level of arsenic and lead.
7 Number two, my -- my home, I know, is not
8 going to be -- is not going to fit into to be cleaned.
9 I'm not here for myself. I'm here for the children,
10 grandchildren, great-grandchildren, of everybody in
11 here. The EPA's own web site says that 400 parts per
12 million nationally is to be considered as a safe health
13 level. Apparently this neighborhood for some reason has
14 got to be different.
15 They're not -- we're not being treated fairly.
16 The deal with the pig study, one single study is what
17 decided what they're going to do to us. And like I said
18 before, I'm a human being, I'm not a pig. I do not want
19 to have a test done on a pig to determine what the EPA

20 considers for my health. Thank you.

21 MS. KAREN KELLEN: Thank you, Anthony.

22 I'm going to try Napue again, in case he

23 stepped out. No?

24 Okay, George Love.

25 MR. GEORGE LOVE: Yes. My name is George

1 Love, and I own property in both the Clayton and Cole
2 area. And Bonnie had said something earlier this
3 evening in terms of how ridiculous it must appear when,
4 in fact, EPA doesn't appear to be following its own
5 policy guidance, so to speak, in relation to the 400
6 parts per million of lead versus the preferred
7 alternative to clean it up at 540 parts per million.
8 The point -- primary point that I'd like to
9 make is this: I'd like to ask EPA, particularly in the
10 presence of Mr. Levene, who I understand is the regional
11 EPA administrator, to do just that, to -- in the area of
12 the policy as it relates to homeowners exempted from
13 Superfund cleanup costs. The specific point and issue
14 that I'd like to see not adhered to, if you will, in
15 this policy guidance is the issue of not exempting
16 owners of more than four units with respect to having
17 you incur the cost of cleanup.
18 There are many property owners in the affected
19 areas that do own properties that consist of more than

20 four units. To be very candid with you, initially in

21 this process two or three years ago I was somewhat

22 reluctant to submit my properties to sampling -- soil

23 sampling until, in fact, I -- this policy could be

24 straightened out, if you will, and to some degree, by

25 virtue of involving members of Colorado's Congressional

1 delegation, city officials, EPA staff, et cetera, trying
2 to hold meetings to talk about how unfair, blatantly
3 unfair this would be, the issue was somewhat diffused,
4 but not totally. It was still sort of left hanging.
5 And my concern at this particular point in
6 time is that we're in an environment, obviously, of
7 dwindling budget surpluses nationally, et cetera,
8 et cetera, disappearing budget surpluses, and I just
9 don't think that this is the time to -- to literally
10 make anybody, simply because they own more than four
11 units, who might necessitate having -- depending upon
12 whichever of these alternatives are selected -- and
13 personally let me just say to all of the people, the
14 CEASE members and everybody else that's a member of this
15 community, as a rental property owner I'm supportive of
16 the community. I have cooperated and I think that
17 whatever the community en masse thinks is best for it,
18 that's what I support. That's the particular
19 alternative I support.

20 But, again, I just don't see holding anyone

21 liable for their own cleanup simply because they happen

22 to own more than four units, unless they, themselves,

23 were a contributor to the contamination that exists

24 there, which I think would not be the case for most

25 people.

1 So that's my biggest plea, that we not do that
2 to anybody because that would be the antithesis, to me,
3 of what environmental justice is all about, or should be
4 all about.
5 And then the last point that I would make, it
6 just has to do with the timing of this thing. The
7 comments are going to be collected and massaged and that
8 kind of thing, through July 19th, and I've been on
9 board, for the most part, almost from the beginning in
10 terms of participating whenever I could in meetings,
11 even being on one of the advisory committees. But the
12 one thing that I would ask is simply that, following
13 July 19th, that -- that EPA move with all deliberate
14 speed in terms of bringing this to a close, because I
15 just think it's been dragging on far, far too long.
16 And on behalf of other property owners, even
17 homeowners, but for the most part, certainly
18 multi-housing or multi-unit housing owners, there is --
19 there is some concern and there has been some distress

20 in terms of being able to, if you will, sell or

21 disengage one's self from the ownership of multi-unit

22 housing in these affected areas with the kind of cloud

23 that's been hanging over it, namely, that of a

24 designation of a Superfund site area. It just doesn't

25 make it a very easy thing to do.

1 So, you know, the bottom line is I just would
2 like to see, with all deliberate speed, these final
3 letters be sent out following July 19th, that either
4 something -- you know, you have to have something
5 cleaned up or, A, you've got a clean slate and go
6 forward from there, thank you. Thank you.
7 MS. KAREN KELLEN: Thank you very much.
8 Just a little clarification. Barry Levene is
9 actually not our regional administrator, to give you a
10 little idea. The regional administrator is the top
11 political appointee of the EPA. We didn't quite get
12 that high up. Dale is -- but Dale Vodehnal is Barry's
13 boss, so I think it's still a good message to deliver.
14 And thank you very much, appreciate it.
15 Anyone else? We have time left. We have
16 microphones that are just dying to have someone talk in
17 them. And I'd love to hear from some more people. You
18 don't have to say a whole lot. Give us a few words,
19 give us a yay or nay.

20 Thank you, Joan.

21 MS. JOAN HOOKER: Okay. I'm Joan Hooker from

22 Clayton Neighborhood Association, and also I live here

23 in the Clayton area neighborhood. I would like to point

24 out how important it is to the health part for children.

25 On my block there's 40 children and I know that the

1 parents didn't really understand what kind of situation
2 they were in, health-wise, with their children.
3 So I received a grant, over $1,000, and bought
4 $1,000 worth of soap, shampoo, all kinds of hygiene
5 products, and we made up baskets two times to pass in
6 the neighborhood. It's a very important issue. And you
7 should do all that you can on your block to see that
8 children are doing what they should be doing. They
9 don't only eat dirt from the ground, they like the
10 cracks between the sidewalks, lifting up the ants or
11 whatever's in there, and then licking their fingers.
12 They do a lot of things.
13 So being clean, teaching parents how to be
14 clean, is very, very important. My children are very
15 strict with their children. So my grandchildren don't
16 get to visit as much as they used to because they're
17 pretty sure my house has more lead than what it should
18 be. And for my great-grandchildren, they think it's
19 kind of an unhealthy place to be.

20 So I have to keep the carpet clean and do a

21 lot of things that I wouldn't do as often. But I would

22 like to be a little closer to my family. And the reason

23 one -- one of the great reasons is my home is not

24 healthy. So take that in consideration about your

25 family. I think it's very, very important.

1 MS. KAREN KELLEN: Thank you, Joan.

2 Anyone else? Still more time. Yes, please.

3 MR. JIM WEAVER: My name is Jim Weaver, I live

4 in the Cole neighborhood. This is my son, Daniel. And

5 as Joanne was saying, you know, kids play and, you know,

6 Daniel, you've seen him around tonight, getting in

7 almost everything that's here, and it's the same thing

8 in our neighborhood, when he goes around our yard, our

9 neighbor's yard.

10 And I think it is great to try to teach kids

11 to wash their hands more and try to clean the dust when

12 possible, but I would sure like EPA to clean up to a

13 level that would ensure safety for kids who are going to

14 play, so move to the 400 parts per million level,

15 because I think, you know, kids are going to be the same

16 100 years from now, you know, playing in the dirt. So I

17 would ask that they clean up to a level that would lower

18 the chances that they would be subject to a higher level

19 of lead that would affect their overall health.

20 I think it's great we're going to have a

21 community health piece, probably going to have a

22 community health piece as part of the EPA's proposed

23 cleanup method, but to -- to use it as a way to catch

24 kids who already have elevated levels I think is a

25 mistake because there's very little you can do once the

1 child's lead levels become elevated.

2 So I would rather EPA do their part in

3 cleaning up the soil to a level that would remove that

4 likelihood of higher lead levels in our children.

5 The health piece would be to catch those who

6 might have paint problems or something, but I would see

7 it as EPA's role to clean up the soil to lower the

8 chances of higher levels. Thank you.

9 MS. KAREN KELLEN: Thank you very much.

10 MR. DEREK OFFICER: Good evening. Derek

11 Officer.

12 I haven't lived here all my life, but I do

13 live two doors down from this building right now. I

14 intend to live here for quite some time. I know you're

15 not responding to any of the comments here, but I would

16 ask a question and would ask that in some way I get an

17 answer, whether it be here or down the road.

18 I'd like to know how the EPA is backing up its

19 assertion that 540 parts per million is not as -- is a

20 level that's acceptable, even though the level is --

21 obviously the red flag, as they say, is raised at 400.

22 So I'd throw that out there for consideration and ask

23 for a response in some way at some time in the near

24 future. Thank you.

25 MS. KAREN KELLEN: Thank you. And I can

1 assure you there will -- the minimum, there will be a
2 response in the responsiveness summary. I expect that
3 someone will grab you at some point and talk to you,
4 too.
5 Please. Thank you.
6 MS. LINDA RODINE: I'm Linda Rodine. And
7 actually, we have the Rodine's Auto Repair shop next
8 door.
9 And it concerns me that they are putting such
10 a limit on testing just where the children are. Because
11 we have a pay phone at our business and the children
12 often come over there and play in the yard while their
13 parents are on the phone. So to limit it to just where
14 the children are is a terrible mistake.
15 MS. KAREN KELLEN: Thank you. Thank you very
16 much. I appreciate that input.
17 Anyone else? Still some time. I'd love to
18 hear from a few more of you.
19 MR. ANTHONY THOMAS: I would like to encourage

20 everyone, if you have not had yourself tested, please

21 sign up tonight and have it done. And pass the word on

22 to your neighbors.

23 MS. KAREN KELLEN: If you could come to the

24 microphone, or so that -- did you hear okay? Okay.

25 Yell loud.

1 MS. LORRAINE GRANADO: I was going to say, I
2 would ask everyone, please comment. It doesn't matter
3 whether you agree with CEASE or whether you, you know,
4 support the EPA, please comment. This is so important
5 that you comment. If you don't do it tonight, do it at
6 the next two meetings. If you want to put it in
7 writing, put it in writing. Back at the table, we have
8 handouts for you, we have our names, a phone number that
9 you can call if you want to talk to us. I'm sure the
10 EPA has that information available for them.
11 Please don't pass up your opportunity, because
12 it's only the decision -- the decision will be based so
13 much on what the community says. The community has a
14 huge responsibility and you can have a huge impact, so
15 please do not let this pass you by without a comment.
16 It doesn't matter if it's a sentence, doesn't matter if
17 it's three pages, just don't pass up the opportunity
18 tonight or at another time to comment.
19 MS. KAREN KELLEN: Thank you.

20 And Lorraine is very right. We can only

21 respond to the comments we get. And so if you don't

22 take the chance to tell us what's on your mind, to tell

23 us what you think, we can't respond to that.

24 So I thank everyone who has commented. I

25 invite other people to join us either Saturday morning,

1 10:00 to 12:00, Elyria/Swansea; a week from Saturday
2 10:00 to 12:00 again at the St. Charles Rec Center in
3 Cole, or jot something down on a card, give us -- send a
4 letter, send an E-mail. Let us know what you think.
5 And we have a minute, so if anyone wants to
6 get up there, I'll give -- this is kind of the last
7 call, okay? We're not -- we had a few drinks, but last
8 call for comments tonight only. There's still time, but
9 please, we want your comments.
10 Thank you all very much. I appreciate you all
11 coming out and giving of your time.
12 (Proceedings concluded at 8:30 p.m.)
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1 STATE OF COLORADO)

2) REPORTER'S CERTIFICATE

3 COUNTY OF LARIMER)

4

5 I, Mary J. George, a Registered Professional

6 Reporter, Registered Merit Reporter, Certified Realtime

7 Reporter, and Notary Public within the State of

8 Colorado, do hereby certify that the foregoing is an

9 accurate transcript of the proceedings at that time.

10 In witness whereof, I have affixed my

11 signature and seal this 28th day of June, 2002.

12 My commission expires October 2, 2002.

13

14

15

MARY J. GEORGE

16 Registered Professional Reporter
Certificate of Merit Holder

17 Certified Realtime Reporter

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EPA'S PROPOSED CLEANUP PLAN
VASQUEZ BOULEVARD AND INTERSTATE 70 SUPERFUND SITE

SATURDAY, JUNE 22, 2002

SWANSEA RECREATION CENTER
2650 EAST 40TH AVENUE
DENVER, COLORADO

Reported by:
Jacque Wilson, RDR
Wilson George Court Reporters, Inc.

1 PROCEEDINGS

2 MS. KAREN KELLEN: All right. I think
3 we're finally ready to start, and I'm so sorry for
4 the delay, but we'll try to pick up the pace a
5 little bit and move through this without talking too
6 quickly because I know we have people who are
7 recording everything we say here tonight. And we
8 want to speak clearly and slowly. And I'm saying
9 that for my own benefit as well as everyone else.
10 My name is Karen Kellen, and I work in the
11 Environmental Justice Group of EPA, and I'm
12 basically going to run this meeting tonight. I'm
13 going to keep things going and make sure everyone
14 gets a chance to -- you're right. It's morning. I
15 need more coffee besides. What time is it? Okay.
16 Thank you for that reminder. I should be
17 in my garden right now, frankly, but we'll just
18 pretend.
19 Anyway, this is the EPA public comment
20 period which we're here for tonight, and this is
21 your chance to speak to EPA, to get your comment on

22 the record to say what you think about what's going

23 on, and to make sure that they're heard and

24 responded to.

25 So this is a very important part of the

1 process. This is your part of the process. EPA has
2 issued a proposed plan, and public comments are due
3 by July 19th of this year, so you have a couple
4 chances to make comments. There is today, and then
5 there is another meeting that will be a week from
6 today at the St. Charles Rec Center in the Cole
7 neighborhood.
8 In addition, we have comment cards over
9 here on the table where you signed in where you can
10 write down comments. If you don't feel comfortable
11 coming up and talking at the microphone or if you
12 have additional things you want to say, you can
13 write them on the comment cards and leave them for
14 us, and they will be included in the record.
15 You can also write up comments and send
16 them in. I believe we have addresses over at the
17 table where to send them. So there is many ways to
18 make comments, and we encourage you to take
19 advantage of one of these ways and tell us what you
20 think about this process.
21 The way we're going to do this tonight is

22 we have a signup sheet -- tonight. I'm still in

23 tonight. Eventually I'll figure out what day it is

24 even or maybe where I'm at. I don't know where that

25 is either.

1 But this morning, we do have a signup
2 sheet for people who want to speak. We encourage
3 you to sign up ahead of time because that way we
4 know better how many people want to talk and we can
5 allocate the time a little better to make sure that
6 everyone has time to talk because we don't want to
7 run out of time if people still have things to say.
8 So we will leave a little bit of time so
9 that if people have a burning desire at the end and
10 they want to speak, you get a chance. But we would
11 prefer -- if you could sign up ahead of time, that
12 would be great.
13 Basically, we have a few ground rules, and
14 I'm going to run over them quickly. They're very
15 simple. One is that we encourage everyone to make a
16 comment, to get up and say something about how you
17 feel about this process tonight -- today.
18 I'm catching it quicker now, though.
19 We would like you to state your name for
20 the record at the -- at the beginning of your
21 comment. When you get up to the microphone, state

22 your name, slowly and clearly so that they can

23 record that. We ask you, again, to speak clearly

24 and slowly, and I will try to do that, too.

25 We'd like you to help to foster a safe and

1 respectful environment so that everyone feels free
2 and comfortable to talk. And that's one of the
3 things I try to do, too. I know we're all standing
4 in front of microphones and talking, which kind of
5 puts people off sometimes.
6 But we want you to feel comfortable and
7 relax because this is your chance. And it's
8 really -- once you get started, it's really not so
9 bad. I always get real nervous before I start
10 talking, then I forget everything including what I'm
11 supposed to say and what day it is.
12 Please respect time limitations. We will
13 probably -- we will be dividing up the time and
14 giving you an idea of how much time to talk. We're
15 trying to be a little loose with it so that people
16 do have time, although if people start to run real
17 long, we're going to start making subtle reminders.
18 And then we'll get less subtle reminders
19 and eventually we'll hold up a big sign saying,
20 "Thank you. Sit down." So please respect other
21 people's times and opportunity to talk as well.

22 No signs or banners are permitted into the

23 room here. They can obstruct people's view and

24 sometimes they can be dangerous to people, so we ask

25 you to respect that. And lastly, we have

1 translation services for people who speak Spanish,
2 and I see some you of have taken advantage of it.
3 I'm glad to see that.
4 Basically what we're going to do is I'm
5 going to shut up here shortly and then we're going
6 to let Bonnie Lavelle do a short presentation -- I
7 hope short presentation about the proposed plan.
8 After that, we will open up the public
9 comment period, and the first commenter will be a
10 representative from the CEASE group who has been
11 working with EPA in the working group. After that,
12 we will just start calling the names from the list
13 and run through that.
14 Before I go on to Bonnie, I want to
15 introduce a few people. And I'm definitely looking
16 at my notes here because I always forget who
17 everyone is, and once I get up here, I forget what
18 everyone's name is. So I'm going to start with the
19 representatives from the CEASE group from the Cole,
20 Clayton, Elyria, Swansea neighborhoods who have been
21 working on the working group with EPA.

22 Some of these people are here, some are

23 not, but I'ming going to read all their names

24 anyway. We have Michael Maes, Anthony Thomas. I

25 know Anthony is not here tonight. Joan Hooker. No

1 Joan tonight either. Lorraine Granado. Lorraine is
2 over here in the back.
3 Akwe Starmis. I thought I saw her
4 earlier. Gloria Shearer. Sandy Douglas and Antonio
5 Montoya. Antonio Montoya is in the back. We
6 also -- I don't see him here. Mike Koznet, who is
7 CEASE's consultant. We also have some people here
8 from the Colorado Department of Public Health and
9 Environment.
10 Thank you. I remembered the name tonight.
11 Barbara O'Grady in the back over here.
12 And Ginny Brannon from the Colorado Attorney
13 General's office. Is Jane Mitchell here tonight?
14 Jane's not here. Okay.
15 In addition, we have Celia Vanderloop from
16 the Denver Department of Environmental Health, and
17 Celia is --
18 MS. CELIA VANDERLOOP: Right here.
19 MS. KAREN KELLEN: -- over here on the
20 right. Thank you. We have from the ATSDR -- please
21 don't ask me to tell you what ATSDR stands for --

22 Chris Poulet. Chris is in the back, and if you

23 really want to know what that stands for, I bet he

24 knows.

25 MR. CHRIS POULET: Agency for Toxic

1 Substances and ^ D Register.

2 Ms. KAREN KELLEN: See? I knew it.

3 And last, we have Barry Levine, who is the

4 Colorado Superfund program site manager from EPA. I

5 think that's everyone I was supposed to introduce;

6 and if I missed anyone, I apologize, and I thank you

7 all for being here and taking your time out this

8 morning to come and sit with us and talk with us.

9 So I'm going to let Bonnie talk. Bonnie

10 Lavelle is the project manager for the DV I-70 site,

11 which is the area they call this, which includes the

12 contamination that we've been looking up here.

13 Bonnie has been working on this process pretty much

14 since the beginning, leading the investigation and

15 working through the issues.

16 She set up the working group, which was an

17 innovative way of trying to get more input into the

18 process at the earlier stages of the process rather

19 than waiting until just tonight to start hearing

20 from people.

21 So Bonnie's going to talk a little bit

22 about the proposed plan and where we are with it

23 right now. Bonnie.

24 MS. BONNIE LAVELLE: Thanks. Hi,

25 everyone. Or good morning. I'm Bonnie, and I am

1 the project manager.

2 I -- I want to make sure you all know that

3 this is a Superfund project, and that's why EPA is

4 involved. I work in the EPA Superfund program, and

5 we all decided that the problem of lead and arsenic

6 in the soils here was big enough that we needed to

7 draw into the Superfund. And that has allowed to us

8 get money from Washington to work on this project

9 and also to clean it up.

10 So thanks everyone for coming, and what

11 we're calling this area is the Vasquez Boulevard and

12 Interstate 70 site. You're going to hear us throw

13 around DV I-70 because that's our short name for

14 Vasquez Boulevard I-70. I'm here to tell you about

15 the plan, the cleanup plan.

16 And it's a proposal. So right away, I

17 want you to know that we have not made a final

18 decision on what we're going to do. We need to hear

19 from you and we need to take your comments into

20 account because we want to, when we make our final

21 decision, get a cleanup plan that you -- you are

22 happy with and you can live with and you feel is

23 going to be very protective of you.

24 So I'm going to tell you about the plan.

25 We're very proud of it. The State and EPA have come

1 up with this plan, and we're finally at the point of
2 telling you the details. We mailed a copy of the
3 plan to everyone.
4 Did you get this in the mail? It's a fact
5 sheet. And although you can read it, and I hope
6 that you do, the reason I'm here is so you can see a
7 person from EPA tell you face to face exactly what
8 it is we're proposing and really why.
9 And I want to emphasize right upfront that
10 from the beginning, we have been totally committed
11 to using the best science available to us. We have
12 been fortunate to be working with some of the
13 smartest people in Denver, not in EPA, but other
14 agencies that -- Karen actually mentioned some of
15 them. Dr. Koznet, Jane Mitchell from the State
16 Health Department, the folks over at Denver Health,
17 and many consultants from all over the country
18 actually have been working with us on this.
19 So we think it's really sound science.
20 But let me tell you what we found and tell you how
21 we're going to deal with it.

22 The first thing I'm going to show you

23 because I -- hang on.

24 The first thing I'm going to show you is

25 what we found in the residential soils arsenic

1 levels, and I'm going to focus on residential soils
2 because one of the points I want to make upfront so
3 you all understand it is that we did not find a
4 problem with lead or arsenic in soils at schools or
5 parks.
6 We get a lot of questions about that. I
7 know parents are -- are very concerned about sending
8 their kids to schools and parks. And this problem
9 is not there. It's -- we are focused on residential
10 yards. And this is a picture of what we found, the
11 arsenic levels we found in residential yards.
12 And I'll show you how you can read this.
13 This -- this describes the arsenic levels we found
14 in all 3,000 homes that we sampled. And how you
15 read this is, the horizontal line shows you what we
16 found in soil in -- parts of arsenic per million
17 parts of soil. That's how we measure it.
18 So we take a -- a soil sample, we send it
19 to a laboratory. It tells us how many parts of
20 arsenic per million parts of soil. And we call that
21 ppm.

22 So the way you read this is if you -- this

23 tells you the concentrations of arsenic and you look

24 at a specific concentration that you might be

25 interested in. You might want to know, well, how

1 many properties have a concentration of about a
2 hundred?
3 So you go to the hundred and you look up
4 here. This box tells you how many properties were
5 sampled at that concentration. So, for example,
6 between a hundred and 125, we have 64 properties.
7 Now, I do want to point out two things
8 here that are very important for everyone to
9 understand. Most properties that we sampled, the
10 vast majority have very, very low concentrations of
11 arsenic and are not of concern.
12 So out of the 3,000 properties that we
13 sampled, about 2,000 have concentrations between
14 zero and 25. So this box tells you that the lowest
15 concentrations have the most properties.
16 But we go all the way up to about 758
17 parts per million. We have a couple of properties
18 that have that level, so the picture of the site we
19 have is most properties don't have this problem, but
20 there are a few -- a small percentage that have an
21 arsenic problem, and that's what this cleanup is

22 about.

23 So I don't want you to have the -- the

24 impression that this entire neighborhood is

25 contaminated. It's a wide area with few properties

1 that have this problem and for arsenic, these
2 properties are scattered all over the place. So
3 there is an equal number of properties in Swansea
4 and Clayton and Cole and Elyria. It seems that
5 about every place we sample, a couple of percentage
6 of properties have this problem.
7 We also looked -- we did a study on the
8 concentrations of arsenic in indoor dust because we
9 do get concerned -- people can get in contact with
10 soil. But they also spend so much time indoors, you
11 can get in contact with indoor dust, and we know
12 that soil contributes to dust.
13 And I'm happy to report all of our
14 scientists were very happy to see from the
15 laboratory that the arsenic levels inside are very,
16 very low compared to the soil.
17 So on average across the board, the
18 arsenic levels in dust are about 6 percent of what
19 we found in soil. So that goes for low properties
20 and high properties, so that was very good news.
21 This slide -- this slide shows you what we

22 found for lead. And the picture's a little bit

23 different, but kind of a similar pattern in that a

24 lot of properties are at lower concentrations.

25 So if you want to read this map, similarly

1 you go on this line to find the amount of lead in
2 soil that you're interested in and then you look to
3 the box for how many properties are at that
4 concentration.
5 I want to point out here that most
6 properties have lead concentrations between a
7 hundred and 200 part per million. We have a few
8 properties that have concentrations at the higher
9 end that we're concerned about. And that's what
10 this cleanup program is about.
11 Those of you that like statistics, about
12 90 percent of the properties have lead levels below
13 400 part per million. So there is 10 percent that
14 have elevated levels that we're looking at.
15 And we also did a study on lead in dust
16 and we also found the same result, the lead levels
17 in dust on average are lower than what we found in
18 the soil. But they're about 34 percent of what we
19 found in soil. So that's the picture of the site.
20 And the other thing I wanted to point out
21 about lead, which is very important and very

22 different from the arsenic, the lead concentrations

23 in the western part of the study area, which is

24 Elyria and Cole, tended to have a higher percentage

25 of homes at the higher concentrations.

1 So where arsenic levels were scattered
2 randomly over the study area, the levels in the
3 western part of this study area for lead were
4 slightly higher. So the big question is, okay,
5 that's what we found. What's our proposal?
6 Actually, in coming up with the proposal,
7 I wanted you to know that we looked at the risks to
8 you as residents and the risks to your children from
9 living here for a lifetime. Could you get exposed
10 to arsenic or lead or both and how could you do
11 that?
12 And in order to answer that question, we
13 had to do a number of studies, and that's where we
14 really were committed to very sound science. That's
15 what's taken us so long also. I wanted to let you
16 know that's why it's taken us three years to get to
17 this point.
18 Some of you may remember this. We came
19 back and did dust sampling, as I mentioned. We also
20 were very concerned about the levels in gardens, so
21 we did a study on how much lead and arsenic was in

22 garden soil and also how much lead and arsenic was

23 in vegetables. So we sampled both the soil and the

24 vegetables.

25 We also get concerned about whether the

1 fine particles of soil tend to have high -- higher
2 concentrations of arsenic and lead. We get worried
3 about that because the fine particles of soil are --
4 are what tends to stick to your hands, so even if
5 you're not in contact with soil anymore, you could
6 be getting arsenic and lead just from fine particles
7 that are stuck onto your hands.
8 Those fine particles we found had slightly
9 more lead and arsenic than the bulk soil. So we did
10 a separate study on that, and we factored that into
11 our cleanup plan.
12 The other thing we looked at was how much
13 arsenic and lead can get absorbed in your body, and
14 that is called bioavailability. And we did a
15 separate study on that. So you can hear me talk
16 about study after study after study. That's what's
17 taken us so long, but that's what's given us more
18 confidence in our cleanup plan.
19 You see, the way these cleanups are done
20 is if you don't have good information, you've got to
21 use what's available nationwide. So we felt that

22 for this community, it's much better to measure

23 exactly what's in the environment here and factor

24 that in rather than assuming that this community is

25 the same as every community in the country. So

1 that's why we've spent so much time and energy doing
2 these study.
3 So I'm going to cut to the chase here.
4 The cleanup proposal is, we are going to remove and
5 replace soil from every, single yard here where
6 arsenic has been found to be greater than 128 parts
7 per million, 128 ppm, and/or the lead is greater
8 than 540 parts per million.
9 That means we're going to be cleaning up,
10 removing the soil, and replacing it approximately
11 400 yards.
12 So to know how that affects you, if you
13 have your -- have had your yard sampled, you should
14 have received a letter from me that tells you what
15 we found in your yard, and you compare that -- what
16 we called a decision value in my letter, compare
17 that to these two numbers. And if your levels are
18 above either of those two numbers, we're going to
19 clean up your yard.
20 We're very confident in these numbers. We
21 know that they're going to protect your health and

22 the health of your children. The reason we're very

23 confident is, again, all the science that we have

24 done has made us believe that we've got accurate

25 estimates of the risk to you and also we feel that

1 we have more likely overestimated the risk than
2 underestimated the risk.
3 So we're very confident that we're going
4 to remove this soil; you're not going to need to
5 worry about arsenic and lead in soil.
6 And ordinarily at another Superfund site,
7 we would stop there. That would be EPA's
8 responsibility. We'd do the cleanup, say we're done
9 with Superfund. But what I really want to focus on
10 this morning is talk to you about another problem
11 that we found and -- and additional actions we want
12 to take that we're proposing as part of our cleanup.
13 And that -- the additional problems that
14 we found have caused us to propose that not only are
15 we going to remove the soil at 400 yards, but we're
16 going to work with local agencies and you, the
17 community, to establish and run a community health
18 program.
19 That program is not a substitute for soil
20 removal. I know a lot of people have been concerned
21 about that.

22 UNIDENTIFIED SPEAKER: You're blocking the

23 screen.

24 BONNIE LAVELLE: Oh, I'm sorry. Thank

25 you.

1 This is not -- this is not a substitute
2 for soil removal and replacement. A lot of
3 people -- can you not hear me? Is that okay? Okay.
4 Why don't you take that. I'll grab it
5 from you if I need it.
6 I've heard a lot of concern that we're
7 proposing a program instead of soil removal, and I
8 want to make sure that you hear from me that that's
9 not the case. The -- the community health program
10 is not a substitute for soil removal and
11 replacement. It's an addition.
12 And what it's meant to do is it's -- we
13 think it's going to be an effective way to protect
14 your kids who are exposed to lead from other sources
15 because we know that children here are being exposed
16 to lead in paint. We -- we have a concern they
17 could be exposed to lead in some home remedies that
18 may be used.
19 And there could also be a concern about
20 getting exposed to lead in tap water and there could
21 be other sources of lead.

22 Now, ordinarily, it -- in Superfund, I

23 have limited authority to use the Superfund to clean

24 up paint, but what we're trying to do is find a way

25 to address this problem and help local agencies

1 address it using Superfund money.

2 The other thing that this program is

3 designed to do is to protect children who might have

4 soil Pica behavior. A couple of months ago, we were

5 all sensitized to this -- this behavior when ATSDR

6 was here and had a couple of public meetings. They

7 told us about this behavior, which is a tendency or

8 a behavior where children eat dirt. They -- they

9 eat nonfood items, and a small percentage of kids

10 with Pica are soil Pica children and they tend to

11 eat dirt.

12 This is not kids getting just exposed to

13 dirt, this is kids who sit down and intentionally

14 eat dirt. So we think this community health program

15 is a way to address that concern.

16 Let me tell you what it is. Well, first

17 I'm going to focus on lead. The reason we get

18 concerned about lead is lead can cause problems for

19 children if they get exposed to too much of it. It

20 can cause them to have problems learning, and that

21 can be a permanent effect.

22 If a child gets exposed to too much lead

23 when they're young are, they have this problem

24 probably for the rest of their lives.

25 What we want to do is make sure that we

1 protect children so the level of lead in their blood
2 is below a level of concern, and that level is 10.
3 So that's why I have this up here. For lead in
4 blood, we want to make sure that it never gets above
5 10.
6 And we measure that in micrograms per
7 deciliter. So that's what this UG/DL is. Just
8 remember, a level of lead in blood in children of 10
9 is where we are very concerned. And we want to keep
10 those levels below that.
11 So we started looking at, well, what --
12 what do we know about the lead levels of children
13 who live out here? And the scientists at the State
14 Health Department gathered information on blood lead
15 monitoring they have done, and this -- this graph
16 shows you what they found.
17 First of all, what concerns us is there
18 kids out here with levels of lead in the blood that
19 is over 10. I don't know if you all are aware of
20 that, but that's what we found. That's an
21 indication of exposure. I mean real exposure.

22 So we think that's the Number 1 problem

23 that we all need to deal with. So we began to look

24 at, well, where are the children living who have

25 these concentrations over 10, and that's what this

1 graph is.

2 And, Karen, can I borrow that again?

3 What I want to point out to you is

4 remember when I told you that the concentrations of

5 lead in soil in Clayton were less than the Cole

6 neighborhood. This graph shows you levels of lead

7 in blood that were measured in children in both of

8 those neighborhoods.

9 This is the concentration of lead in soil

10 in their yards, and this shows you the level of lead

11 in blood. The pink box is children who live in

12 Clayton and the blue circle children who live in

13 Cole. There is no difference here really between

14 the blood lead levels of children who live in

15 Clayton and Cole, but there are children with

16 elevations in both neighborhoods.

17 Now, if the soil was causing the

18 elevations in blood lead, you would expect that it

19 would -- that the relationship between lead in soil

20 and lead in blood would look like this.

21 If this was soil, as the concentrations in

22 soil went up, you would expect that the levels of

23 lead in blood would go up -- right? -- if the soil

24 was causing the problem. But what we're seeing is

25 there is no relationship.

1 So even if we were to do more and more and
2 more soil removal and say that what we want is lower
3 levels of lead in soil, that would not effectively
4 help the blood lead problem here. Soil is not the
5 major contributor. There is something else going
6 on.
7 So we began to dig a little bit deeper.
8 Remember I told that you we sampled dust. So we
9 began to look at the levels of lead in -- in indoor
10 dust, and what we found has a hint to why we are
11 proposing this community health program.
12 Where the levels of lead in soil at some
13 houses are low, the levels of lead in dust are very
14 high. For example, at this home, the level of lead
15 in soil is 320, the level that we found in dust was
16 9,000. The level of lead at this home in soil was
17 268, the level in dust is 2,000.
18 So there is another source that's causing
19 the lead in dust to go up, and we think that that's
20 paint.
21 So also, we're worried about children with

22 Pica behavior. We looked at whether we should

23 remove more soil to protect those children, and we

24 found that removing and replacing soil from yards

25 where arsenic is less than 128 is not going to

1 protect those kids.

2 That's because if the child has Pica

3 behavior, if they're eating a lot of soil, even if

4 we replace that soil, it's going to have a little

5 bit of arsenic in it, and they could get a big dose

6 of arsenic if they're eating too much soil.

7 So we began to think what is a program

8 that can deal with these problems. And particularly

9 we started with the lead problem. What we want to

10 do is find a way that's going to deal with that

11 problem that's other than soil. And when I say we

12 want to work with local agencies, this is the -- the

13 program that we're talking about.

14 What -- what -- we looked into what's

15 going on with protecting kids from lead in paint

16 now. And I'll show you. We've got a couple of

17 things. We have the State Health Department who

18 is -- who does lead testing of blood. So they do

19 that right now.

20 If they find children with too much lead

21 in their blood, but their level is above 20 or

22 above -- two tests above 15 two times, they refer

23 them to Denver County. And the folks in Denver

24 County, they do home investigations, they do

25 education, and they can also refer people.

1 If there is a paint problem, they refer
2 people to -- I'm going to call them the Northeast
3 Denver Housing Center. Do you know these folks?
4 They're a local agency. They do lead paint cleanup.
5 Okay?
6 So the question is why -- why do we still
7 have kids with elevated blood lead -- and it looks
8 like it's coming from paint? Well, looking further
9 at what's going on right now, I'll tell you part of
10 the problem. All of these folks want to protect
11 your kids. They are just ready and willing.
12 The folks at Northeast Denver Housing have
13 people and money to do paint abatement, but what
14 they need is referrals. The State can only do so
15 much testing. They've been trying to do some, but
16 they have to wait for some resources to do some
17 cleanups, so they've been able to do a couple over
18 the last couple of years.
19 That's the key. The key to getting the
20 paint taken care of is first getting kids tested.
21 And then even when they do get tested now,

22 the only time they're getting referred is if their

23 levels are twice what we're concerned about. And

24 then the folks in Denver County have folks that are

25 dying to do the home investigations and the

1 education and all the work that's necessary, but
2 they also don't have enough people.
3 So what we thought is what we can do in
4 Superfund is do the soil cleanups, but put a program
5 in place where we can help. We can help the State
6 do blood lead testing. It just takes resources. We
7 can help them set up a clinic, we can work with you
8 about what's the best way to get children tested.
9 Should we set things up in the neighborhoods? What
10 should we do?
11 But someone needs to help that testing
12 happen. And that's what we're proposing to do.
13 That way if we get -- and if we get enough kids
14 tested, we can refer kids if they're over 10 to
15 Denver County. So we don't need to wait until
16 they're at 15 or 20, we would catch them when
17 they're at 10, and we'd refer them to Denver.
18 Denver's going to need some help because
19 there is going to be more kids. If we do more
20 testing, we're going to find them, and they're going
21 to have to help those children. What's EPA really

22 good at? We're really good at these home

23 investigations, we can sample. Boy, we can get

24 crews out there and just sample.

25 So we would like to work with Denver

1 County, beef up their ability to do home
2 investigations by us sampling, and then they're
3 going to be able to do education and referral. If
4 they need help in this neighborhood to do some more
5 education, we're -- we're ready and willing to do
6 all of this, but they are the experts at this. We
7 just want to help.
8 And then finally, if all of this work can
9 be done, we can refer people who have paint problems
10 to the people who are ready and willing to do the
11 paint removal. That's where the permanent solution
12 is going to come in. That's what we're proposing.
13 Now, for the kids with Pica behavior, it's
14 going to be pretty easy to, while we're testing
15 blood, also test their urine to see if they're
16 getting exposed to arsenic. And if -- if they are,
17 then we can also find a way to deal with that
18 behavior because kids with Pica behavior probably
19 need some medical attention.
20 So that's the idea of the program. It's
21 very innovative and different probably for you to

22 hear EPA stand up here and say, well, we're going to

23 do something extra. We don't want to come in and

24 design another Federal program. What we want to do

25 is provide resources to make what's going on now

1 work better.

2 So that's the idea of our program. There

3 is three components that we're talking about.

4 One -- here we go. One is an education program

5 because one of the things that -- to make this work,

6 people are going to have to be aware of it. And

7 that's where you all come in, that's where the

8 community part of this comes in.

9 If we can educate people about some of

10 these risks and some of the services that are

11 available to them, we're convinced that people are

12 concerned enough about their children that they will

13 participate. So we want to work with you on that

14 component.

15 And then the program to test kids is the

16 key. And then we have this response and referral

17 program. So this is in addition to our soil

18 cleanup.

19 Okay. I do want to wrap this up, but

20 before I end, I want to address a concern that we

21 have heard over and over again, and that is about

22 the level of lead in soil that we're proposing as

23 our action level, 540 part per million.

24 There are some folks who are concerned

25 that we need to bring that level down to 400 part

1 per million. And a couple of arguments have been
2 put forward, and one I wanted to address right
3 upfront.
4 Folks are saying that EPA regulations
5 require us to clean up to 400 part per million. And
6 I wanted to give you the facts about that because I
7 don't want you to walk away thinking that we're
8 proposing something that's not in accordance with
9 our own regulations.
10 So I'll go over a couple of them. We have
11 guidance in the Superfund program. That guidance
12 tells us that for lead, 400 part per million is a
13 screening level. It's not an action level. That's
14 a level at which we should be doing site-specific
15 work.
16 It doesn't mean that we need to clean that
17 up, but we need to look further at it. So if there
18 is levels of lead in soil above 400, we need to look
19 further at it, and that's what we did at this site.
20 Above 400 part per million lead in soil,
21 the Superfund guidance tells me, as a project

22 manager, I need to use a specific EPA model to make

23 that determination about whether cleanup is needed.

24 And that's what we did. So we used that model and

25 at this site, we determined that lead in soil needs

1 to be cleaned up if it's above 540.

2 Superfund guidance requires us to collect

3 all of this site information to be used in that

4 model so that we accurately can make sure that we're

5 protecting you and your children. And finally, this

6 guidance applies to these types of sites, Superfund

7 sites where there are resources available to allow

8 us to collect good site-specific information.

9 There is other guidance that I've seen

10 people have some copies of, so I wanted to

11 straighten this out. There's something called a

12 Toxic Substances and Control Act. That's another

13 regulation of EPA that regulates lead paint.

14 This is -- that's the standard that's

15 meant to be applied to millions of homes that have

16 lead paint problems. And that's 400 part per

17 million lead in soil. That's also based on the same

18 EPA model that's used in Superfund, but this

19 standard is meant to be used where there is not

20 resources to collect site-specific information to

21 set a site-specific level.

22 And, you know, this regulation does not
23 require soil removal over 400. This regulation
24 requires other sorts of actions, but what we are
25 talking about is what's the level of lead in soil

1 that we're going to remove the entire yard. And
2 that's why we did this site-specific study, and
3 that's how we came up with 540 part per million.
4 I know that folks are a little bit
5 concerned about, well, how does this -- this
6 540 part per million lead compare to other sites.
7 So this is a slide I'm going to show you. And we
8 also have a poster of it so you can walk over and
9 take a look at it with -- in a little more detail.
10 But what we tried to do -- our EPA team
11 has looked at other sites, residential areas that
12 have lead in soil problems, and we asked ourselves,
13 well, what other types of action levels has EPA set
14 around the country at these types of sites.
15 And we know that this site is an
16 environmental justice site itself, so we took a look
17 at other environmental justice sites and sites that
18 aren't environmental justice sites. These -- these
19 boxes show action levels for lead in soil in
20 residential properties at environmental justice
21 sites, and you can see that this is 500 part per

22 million lead. And the levels fluctuate, but 500

23 part mer million is -- is within the range of what

24 we have set.

25 And the reason these fluctuate is, again,

1 we use this EPA model and we collect site
2 information and that's how we establish these
3 cleanup levels. So it is pretty logical that there
4 is very different things happening at different
5 sites. We take that into account in setting these
6 cleanup levels.
7 These blue sites are sites that are not
8 environmental justice sites and also they range from
9 a little bit over a thousand -- probably 1200 part
10 per million -- up to 2,000. There are some of these
11 at 500 part per million. And in yellow, that's the
12 level that we are proposing for this site.
13 So concerns about are we being consistent
14 in setting this level, how does this level compare
15 with other places around the country, we're right in
16 there in that range, and I wanted to just make sure
17 that you understood that.
18 Now, remember, the graph I showed you
19 about the blood lead levels. Here, let me go back
20 to it. We are going to clean up yards where lead is
21 above 500 part per million. If we lower that level

22 to 400, 300, 200, we still will have kids with

23 elevated blood lead, so we're not really helping

24 that problem.

25 If we lower that level, there will be a

1 lot more cleanup in the Cole neighborhood because
2 that's where those -- those yards are. But we're
3 going to still have kids with elevated blood lead in
4 Clayton and in Swansea. So in our view, we could do
5 a whole lot more yards and lower that level, but
6 we're not really gaining anything in terms of
7 health -- real health protection.
8 And I want to make sure that you know that
9 in doing -- in doing additional cleanups, there are
10 impacts to your neighborhood. So I can't walk away
11 from you this morning without telling you what a
12 cleanup does entail, and it is a lot of truck
13 traffic, as you will note.
14 We need trucks coming in here to dig up
15 the soil, taking it out, trucks coming in to bring
16 in clean fill, trucks coming in to do landscaping.
17 So we looked at a number of different alternatives,
18 and I want to show you what more and more soil
19 cleanup means really in terms of truck traffic.
20 So if we only do 200 homes under one
21 alternative, each of these trucks represents 2,000

22 trips for a semi, a 20-yard capacity semi. If we do

23 200 under one alternative, there will be 2,000 truck

24 trips.

25 Under another alternative, we looked at

1 200 yards being cleaned up, this time removing soil
2 and bringing in new, and that was going to be about
3 4,000 trips. The cleanup proposal that we are
4 advocating and proposing to you will require the
5 cleanup of 400 yards, and there will be 8,000 --
6 approximately 8,000 truck trips.
7 If we do more soil cleanup for lead, we're
8 going to be doing 200 more homes if we lower that
9 lead level to 400 as is being discussed. What that
10 will mean is 200 more homes, 4,000 more truck trips.
11 So what we would have is 12,000 truck trips coming
12 into these neighborhood.
13 We also looked at an alternative where we
14 did massive soil removal and there was approximately
15 42,000. So I want to -- I want the -- I hope that
16 you, as people in the community, are talking about
17 those consequences, too, when you're weighing
18 different cleanup alternatives.
19 So finally, I'm just going to go over it
20 again so you hear it from me. What we are proposing
21 is to remove and replace soil where arsenic is above

22 128 and lead is greater than 540.

23 And we want to work with local communities

24 and agencies to establish and run a community health

25 program that's going to make these resources work

1 for you to address lead in paint, lead in other
2 sources, and to protect your children from lead and
3 also address soil Pica behavior.
4 Now, that's our proposal. I'm trying to
5 get across to you that we think that it's based on
6 sound science. We know that it meets our
7 regulations, but the last thing I need to take into
8 account is what you think of it. There may be
9 things that we didn't consider that are very
10 important to the community, and so we're here to
11 listen.
12 We established a 60-day comment period.
13 Usually we have 30 days, but for this community, we
14 gave you 60. So even after today, you still have
15 another month to think about it. And we hope that
16 you kind of discuss -- are discussing among
17 yourselves some of these -- these things that we've
18 been weighing.
19 And lastly, I just want you to know that
20 the folks at EPA, both in our Denver office and in
21 our Washington office, really care about this

22 community. We're really hoping that we can all come

23 up with a cleanup plan that you guys are really

24 comfortable with and that we know will protect you.

25 So I spoke way too long, but now it's your

1 turn to speak. Thanks, Karen.

2 MS. KAREN KELLEN: Thank you, Bonnie.

3 Yes. It is time to open up the public comment

4 period, and I thank you for your patience and for

5 waiting.

6 And we have been working with the CEASE

7 group for a period of time. They've been actually

8 working out here since Globeville, I understand, and

9 they have asked if they could have equal time with

10 Bonnie to talk to you.

11 And I have asked if they could hold their

12 comments to 15 or 20 minutes so that we can get into

13 the comment period and give you all a chance to

14 talk, and they have agreed. And so the first person

15 to speak in the public comment period will be

16 Lorraine Granado from CEASE.

17 It is part of the public comment and then

18 we will open up the list. Right now we only have

19 three people signed up. So please, go ahead. There

20 is another list over there. You can sign up.

21 On Thursday we found a lot of people felt

22 more comfortable once we got started, so we will

23 give you an opportunity to talk even if you don't

24 sign up. So . . .

25 MS. LORRAINE GRANADO: Yeah. That would

1 be great. Thanks, Karen.

2 Hi, I'm Lorraine Granado. I've lived in

3 Globeville/Swansea my entire life, and I have four

4 generations of my family here, my mother, my sons,

5 and my two grandchildren. I've been working on

6 environmental issues since 1987 when we started on

7 the ASARCO Globeville plant. And we worked on

8 three. This is our fourth environmental justice

9 project that we will work on.

10 We have been working on this since before

11 the EPA even -- Department of Health came to us and

12 told us that they were turning over the continued

13 testing from ASARCO and Globeville to the EPA, and

14 that's how the EPA got involved and that's how long

15 we've been involved.

16 We've been at every, single work group

17 meeting, we go to technical meetings. We have

18 helped, for example, plan education for health care

19 providers because health care providers -- some were

20 not responsive.

21 Like in my case, I took my son to get a

22 blood lead test, and the doctor refused because she

23 said that there wasn't any advisory from the

24 Colorado Department of Health. So we have educated

25 health care providers.

1 We have worked with the ATSDR to look at
2 issues of blood and lead and to develop fliers and
3 educational pieces for the community. We have hired
4 a technical assistant, a consultant, Dr. Michael
5 Koznet, who is a world and nationally renowned
6 expert in arsenic.
7 We've been here every, single step of the
8 way. Why do we do this? We did this for three
9 reasons: One, we live here and our families are
10 here; two, we needed to be at the table and advocate
11 for the people in these communities to be there to
12 protect our interests, to learn the stuff that comes
13 in a lot of language and turn it into English and
14 then try to make it make sense; and ultimately to
15 make sure that we're able to talk to you about what
16 we believe are the best cleanup plans for this
17 community.
18 One of the things that we did hope to do,
19 and we're working on it right now and it's started --
20 in fact, it started a week ago -- was to help devise
21 a whole program --

22 THE INTERPRETER: Excuse me. Slow down,

23 please.

24 MS. LORRAINE GRANADA: Okay. I'm

25 hurrying, I guess, because I was supposed to get the

1 same time and we're not. So I'm trying to get
2 through our remarks.
3 We helped develop the whole program where
4 this summer, right now, people are going out --
5 people from the University of Colorado Health
6 Sciences Center are going out right now today and
7 helping for a week and are testing children for lead
8 and arsenic to see what the levels of lead and
9 arsenic are in their bodies.
10 So one of the things that surprises me is
11 that Bonnie's talking about testing for lead and
12 arsenic, when that will be done this summer.
13 They're out knocking literally on every, single door
14 regardless of what the levels of lead or arsenic are
15 in the soil in order to get to children 6 and under.
16 So please participate in that and know
17 that that is already being done.
18 I guess the most important thing I'll say
19 to you and I hope you remember it is that there are
20 no safe levels of lead in arsenic. There are no
21 safe levels of lead and arsenic. There is no such

22 thing as safe. Lead and arsenic are heavy metals.

23 By their very nature they harm human health.

24 The question here is, when do we need to

25 really be concerned about the harm to human health.

1 And that gets into the whole lead issue. The lead
2 is issue is that 400 parts per million. As Bonnie
3 said, is a screening level.
4 Does that mean that health problems don't
5 happen under 400 parts per million? No, it doesn't
6 mean that. What it means is that's as low as the
7 EPA is willing to go before they decide to start
8 looking at risk.
9 Real risk happens above 500 -- 400 parts
10 per million. That's when they're sure that people,
11 especially children, can get sick. Below that,
12 they're not even willing to consider looking at
13 risk. So it's a number set by EPA, but that doesn't
14 mean that below that people don't get sick.
15 Who is most at risk? Children are most at
16 risk because children mostly play outside, although
17 children also bring dust in, as do animals, as do
18 adults. And there is dust in the home.
19 So if at 400 parts per million is where we
20 know for sure that above that there is risk to
21 children from lead, then it just makes common sense

22 that every part per million over 400 is going to

23 increase the risk.

24 If you've got 400 and you've got 540,

25 common sense will tell you there is a whole lot

1 higher risk at 540 than at 400.

2 And especially as Bonnie indicated, there

3 was a site specific test done on pigs which showed

4 that 80 percent of the lead that might be taken in

5 by a child stays in the child's body, and that's

6 what causes the harm.

7 The lead in the body contributes to the

8 lead in the blood. And that's when she talked about

9 taking the blood lead -- taking the test to see how

10 much blood -- 10 micrograms per deciliter and above

11 have been considered the trigger for this is lead

12 poisoning. However, as our expert Dr. Koznet has

13 said in meetings, that new data is showing that you

14 can give -- children can experience serious health

15 effects from exposure to lead at low as 5 parts per

16 million. And that comes from an expert nationally

17 and internationally renowned.

18 Okay. We're arguing that we want 400

19 parts per million cleanup not because it solves a

20 problem, not because it takes away all the risk,

21 but, in fact, that's as low -- we understood that

22 that was as low as EPA would go.

23 But, in fact, we have recent information

24 that there are places where the EPA has cleaned up

25 lead as low as 1 part per million and as low as

1 5 parts per million. In fact, there is a town in
2 Utah where their bioavailability, meaning how much
3 lead stays in the body -- here at this site, they
4 did tests on pigs and learned that 80 percent of the
5 lead that is taken in stays in the child's body. At
6 the site in Utah, it was learned that 70 percent of
7 the -- of the lead that went into the body stayed in
8 the child's body.
9 In Utah they cleaned up at 250 parts per
10 million. Here they only clean up at 540. That's
11 not acceptable to us.
12 We don't think we get 250 parts per
13 million. We would argue that, but it doesn't
14 matter. We don't think we'll get it, and so 400 is
15 about as much of a case as we could build or we
16 would ask for a lower level of lead cleanup.
17 The other thing that Bonnie talked about a
18 lot was sources. She's discussed this with every
19 meeting. Lead in the soil, lead in the house, and
20 lead external paint on houses -- inside and outside
21 houses. They can test and she also said she would

22 test; however, you never heard her say we'll clean

23 it up.

24 You never heard her say that. She said we

25 will refer. Well, let's face it, folks. We got a

1 couple of small nonprofits out here that do do some
2 lead cleanup, but they are in no way prepared to
3 deal with the lead cleanup that comes with having a
4 hundred or more houses who have to have lead removed
5 internally.
6 And so they didn't say -- and that's the
7 most important thing because Bonnie keeps stressing,
8 we want to protect health. We want to protect
9 health. They've never said they'll clean up the
10 lead inside the houses. In fact, they can't.
11 The EPA under certain Superfund sites
12 are -- are prohibited from cleaning up lead inside
13 of the houses. Bonnie also today didn't discuss
14 external lead, although she said to us in our
15 meetings that she thought that the lead-based paint
16 on the outside of homes was contributing to the lead
17 in the soil.
18 Well, she didn't discuss that today. And
19 partly because -- as far as we have never heard her
20 say if there is lead in the paint outside of
21 people's houses, we will clean it up. She's never

22 said that. And so if we know that there are two

23 sources outside of the home, the soil and the paint,

24 then why not say upfront, we'll clean up the soil

25 and we'll clean up the paint.

1 All they said is they will clean up the
2 soil to 540 parts per million, even though there is
3 a very distinct possibility in their minds that
4 there are three other sources: internal paint,
5 external paint, and soil. That is insufficient to
6 us.
7 Okay. The other thing that Bonnie didn't
8 say that, again, has come up in our meetings is when
9 we would discuss this health education. Several
10 things.
11 One is the health education right now has
12 not been designed. She did lay out goals, but when
13 we sat down at a table and said, Look, tell us more
14 about it; she said, We haven't designed it yet.
15 When we said we'll be glad to help you design it
16 because this is a community of people of color, of
17 Spanish-speaking people, ethnic minorities -- and
18 I'm going to stop a minute.
19 That gets to the issue of environmental
20 justice. What is environmental justice?
21 Environmental justice was first called by us, people

22 like me who started the movement was called

23 environmental racism. Why? Because in sites all

24 across the country that were contaminated, the vast

25 majority of those sites were located in low-income

1 and communities of color -- predominantly
2 communities of color.
3 So we called it environmental racism.
4 Later on, President Clinton issued an executive
5 order ordering all Federal agencies to consider
6 environmental racism when they were doing cleanup,
7 meaning they were to do more than they would
8 normally do at other sites.
9 At that point, the EPA, because -- and not
10 just EPA, but the term that he used was the term
11 "environmental justice." Well, the truth is based
12 on studies by the GAO, based on studies by the
13 United Church of Christ, based on studies by the
14 ^ murling project, based on studies by the National
15 Lawyers Guild, at these sites, communities that are
16 people of color and low income don't get as high a
17 level of cleanup as White communities.
18 They take years longer to clean up than
19 White communities, and jury awards in case of suits
20 reward higher awards to White communities. Folks,
21 that's a fact. It's a fact. It's not Lorraine

22 saying this. It's a fact. And so that's why we

23 have to be vigilant, that's why we're at every

24 meeting because we have to protect us.

25 Okay. Going back to the rest of the

1 community education. When Bonnie was talking about
2 community education, we offered to help design it,
3 and she said that they -- she was thinking that they
4 would be hiring a consultant from Boulder to design
5 this. So we don't even know yet what the design is.
6 Now, as she stated today, they want to do
7 blood lead testing. What we heard in the meetings
8 was if a home has 540 parts per million, if they are
9 allowed to clean up at 540 parts per million, then
10 they will go back to those homes at 540 parts per
11 million or, I guess, above, and they will -- not
12 above -- between 400 and 440.
13 But anyway, the point was they'll go back
14 to those homes, they will look for children who are
15 6 years old and under. And if they test those
16 children and they have 10 micrograms per deciliter
17 of lead in their blood, then they will clean up the
18 yard.
19 That wasn't said here today, but that's
20 what we heard in the meetings.
21 And I -- I remember that because I looked

22 at everyone and I say, Well, golly that means that a

23 kid has to be like poisoned before they clean up the

24 yards. They did not appreciate my interpration of

25 that, but I stand by that. The kid's got to be

1 poisoned before they will clean up the yards.

2 That's not acceptable. At least take a

3 stand at 400, which is the lowest that the EPA will

4 go for screening level. Again, they've cleaned up a

5 heck of a lot lower in other places. And she didn't

6 mention that today, but that's what we heard.

7 And another thing is what she did mention,

8 and which is true and we happen to think it's not

9 like this big, huge deal. If they cleaned up the

10 homes above -- at 400 -- all of homes at 400, they'd

11 be adding about a hundred houses.

12 This is not huge. A hundred houses. It's

13 expensive, it's not cheap, but we're worth it. Our

14 children are worth it. They can clean up an extra

15 hundred houses for us. Especially if you clean up

16 other communities to 250, they can clean us up.

17 And it is our money, folks. Or it will be

18 because Bush is going to eliminate polluter pays, so

19 it's our tax dollars. So, you know, we're paying

20 for it.

21 Then a minute about arsenic. She said

22 something about -- and again, site-specific

23 information, what that means is -- and she was clear

24 about it, and I thank her. They're not going to

25 rely on all the science that ever came before, we're

1 going to do a test here and then decide based on
2 what's here.
3 So, I mean, they've been studying arsenic
4 forever, you know, like decades. 10, 20, 30, 40 --
5 decades. So here instead of relying on what we've
6 learned from 10, 20, 30, 40 years of studying, we're
7 going to do a study on pigs and feed pigs arsenic,
8 and then based on what the pigs keep in their body,
9 we're going to make a special number for this site
10 based on one test.
11 This is not okay with us. And we went
12 along with that because we didn't understand that.
13 We had said and we have had said every step of the
14 way, at every Superfund site and everything we ever
15 dealt with, if you can learn something here that
16 helps other people, please do it. Please learn from
17 us. Because if it helps somebody else, it's, like,
18 the best thing that we could possibly do.
19 But we never understood that this one,
20 single study on pigs was going to replace all of the
21 information that ever came before on arsenic. That

22 does not feel good to learn that at a very late

23 date.

24 And she also talked about the sites being

25 different. Well, it isn't folks. This site comes

1 out of the Asarco. It's the exact, same type of
2 arsenic in -- she talked about if you bring in new
3 soil, it might have arsenic in it, whatever. This
4 is a very specific type of arsenic. It's called
5 arsenic trioxide. Very, very specific.
6 It is exactly the type of arsenic that was
7 found at Globeville. And the reason we're sitting
8 here is because they never found the end of the
9 contamination. They kept testing out and testing
10 out. So it's the same arsenic. It's not different
11 than any other community.
12 And in Globeville, they cleaned at
13 70 parts per unit. Here, her original proposal --
14 EPA's original proposal was to clean up at 240 parts
15 per million arsenic. We didn't like that, Colorado
16 Department of Health had some comments on it. ATSDR
17 had comments. There were a lot of comments, so it
18 got lowered to 128 parts per million instead of 240.
19 But 128 parts per million is still
20 50 parts per million higher than they cleaned up at
21 Globeville. This is not okay with us.

22 The other thing -- okay. I want to --

23 before -- I wanted to say something about, too, the

24 testing of the kids for lead in their blood that

25 Bonnie talked about in trying to relate that.

1 The EPA didn't do this testing. This was
2 testing that was done by the Colorado Department of
3 Health and Denver Environmental Health Services on
4 children no way related to site -- to this site. It
5 wasn't let's go out and find this home and test
6 these kids. These -- and this is what Dr. Koznet
7 told me last night.
8 These kids were -- these were results of
9 tests taken by somebody else at some other time.
10 Now, I don't know how the relationship was built
11 between the houses. I don't know that they tested
12 for dust inside of those very same houses where
13 those children live, how long those children lived
14 here, if they still live here.
15 We don't know any of that, but that's a
16 little bit confusing because these were not tests by
17 the EPA, they were tests done by other agencies.
18 And the other thing that was quite a
19 surprise to me -- well, I'm jumping all over, but --
20 let me go back to the health education.
21 Okay. So the first arsenic was 240, the

22 second is 128. We really think it ought to be 70,

23 but we don't feel like we're going to be able to do

24 this.

25 I know what I was going to say. She kept

1 saying that EPA requires us to use a model. EPA
2 requires us to use a model, EPA requires us to use a
3 model.
4 Well, that was another interesting thing.
5 EPA uses a model called IEUBK model, and that's a
6 model, as far as I understood, is always used. It's
7 real interesting how we got into this a little bit
8 and they switched models on us and started using a
9 thing called the Monte Carlo.
10 The Monte Carlo model, frankly, we didn't
11 understand it very well. We really tried, we really
12 couldn't. But -- but we still had remaining
13 questions about why if you always use this model
14 called the IEUBK did you switch to the Monte Carlo
15 and why can't it be made to make sense to us?
16 We were told we could go to technical
17 meetings. But technical meetings are not, I think,
18 what we can expect to understand. I think it is the
19 obligation of the EPA to take this technical
20 language and turn it into people language and to
21 help us to understand what it is.

22 But it wasn't a single model that has

23 always been used by the EPA. It is a rather, my

24 understanding, newer model called the Monte Carlo.

25 It's not something that we are familiar with that we

1 had heard about before.

2 Okay. Then back to health education.

3 When we asked, how long are you going to do this,

4 and I quote, Bonnie had said 10, 20, 30 years. We

5 don't believe EPA is going to be here in 30 years,

6 but you know who s going to be here in 30 years? We

7 are, you know.

8 And so let's suppose you go back to the

9 homes today where there is 540 parts per million

10 of -- of -- between 400 and 540 parts per million of

11 lead and you test the kids and -- for lead. And

12 that's what they're proposing.

13 Well, you know, I see a senior citizen

14 here, I see another senior citizen. I'm almost a

15 senior citizen. My kid's almost grown. And so --

16 and so in our houses, there is not going to be any

17 kid under 6 years old. And so there is no testing,

18 and so there is no chance of cleaning up that soil.

19 But I'm going to sell my house. Just like

20 on my block there are three senior citizens in this

21 past year, one died, two were sent to nursing homes.

22 I know Miss Kale went to a nursing home. The other

23 lady may have gone to a nursing home or she may have

24 gone with family.

25 But in each one of those houses now there

1 are children under 6 and so, you know, I guess the
2 most important thing I want to say is we can't clean
3 this up for today. Because like I told you in the
4 beginning, lead -- there are no safe levels of lead
5 in arsenic.
6 Also lead and arsenic never, ever, ever go
7 away. That's why they have to take out 12 inches of
8 soil because they don't go away. They remain
9 forever. And some of the stuff she was saying like
10 Cole -- I'm sorry -- Cole and Elyria are the most
11 polluted. Well, they're the ones that were closest
12 to the three smelters here. And this lead could
13 very well be from smelters that were operating in
14 the late 1800s.
15 It doesn't go away, folks. So it seems
16 kind of really narrow and even a little way selfish
17 to think that, well, we're going to clean it up
18 where there are kids under 6 today, but next week,
19 you know, if there happened to be, you know, another
20 50 homes with kids under 6, I guess that's their
21 problem because we didn't clean it up.

22 It's kind of like too bad. We don't

23 accept that.

24 Clean up the 400 and let's be sure that

25 today and tomorrow and in a hundred years when

1 people are living in those homes that those kids
2 will at least have the security of 400 parts per
3 million.
4 So I guess there is a lot more stuff I
5 could say, but that's where I'm going to end. I've
6 been asked to stop. I appreciate the opportunity to
7 speak for us. We will be putting all of our
8 comments in writing and submitting them.
9 Please know that you do not have to
10 comment today. If you want to ask more questions of
11 us or of the EPA, if you want to think about it, you
12 can do that. If you feel prepared to comment today,
13 that would be great; but whatever you do, don't pass
14 up your opportunity to comment.
15 Please comment, whatever you think. If
16 you like some of this and some of that or either
17 one, please don't pass up your opportunity to
18 comment.
19 We thank you for the opportunity of
20 representing you. We've done the very best that we
21 could. I speak to you the truth as we understand

22 the truth from the perspective of wanting to get the

23 very best we can to protect the health of the people

24 and especially the children who are here today and

25 those who will come later.

1 Thank you.

2 MS. KAREN KELLEN: Thank you, Lorraine.

3 And I only have three people signed up so far. I

4 want to make a special note to the Spanish speakers

5 that you can make your comments in Spanish. The

6 translator will translate for the court reporter.

7 The rest of us, I don't know if we have the ability

8 to hear, but it will get on the record.

9 So please feel free to comment in --

10 I'd like to say any language, but I'm afraid we're

11 only prepared for Spanish and English. So I'm just

12 going to start with the first person on the list.

13 Augustin Martinez. And if you could just

14 come up to the microphone and tell us what you

15 think. Please come to the microphone so we can --

16 the translator has to hear.

17 MR. AUGUSTIN MARTINEZ: I believe it's

18 fine mostly for the future of the kids and for

19 everybody else because it's good for the community

20 most of all. I'm sorry. For the future. I

21 remember when I started in Swansea, I used to live

22 in Swansea. I was in Globeville also for about two

23 years. And the progress and even though they're not

24 doing it fast enough, but little by little they're

25 doing it.

1 They're doing a lot for the community in
2 general. I hope that they will do their best, and
3 thank you very much.
4 MS. KAREN KELLEN: Gracias.
5 Kathy Powers. If you could just wait a
6 second until our translator gets back into the
7 booth.
8 MS. KATHY POWERS: Hi. I'm Kathy Powers
9 and I live in the Cole neighborhood. I'm -- I'm one
10 of the homes that's within the screening above the
11 400, but below the 540. And, you know, when I
12 received a letter back when I had my soil tested
13 saying we want to wait on your yard to see what our
14 final proposal number was going to be, my concern is
15 since I'm above 400 -- I'm at 490 and I have a
16 little son and I want him to play in the yard.
17 Is the EPA willing to send out something
18 in writing saying that my child is going to be safe
19 or any of the other children in the yards that are
20 above 400 are going to be safe? And so I'd like to
21 know if they're going to be able to provide

22 something like that for all the families in that

23 area.

24 MS. KAREN KELLEN: Thank you. And we're

25 not responding tonight, but I expect someone will

1 grab you before you leave and talk to you.

2 MS. KATHY POWERS: Okay.

3 MS. KAREN KELLEN: Celia Vanderloop.

4 MS. CELIA VANDERLOOP: Hi. I'm Celia

5 Vanderloop. I'm with Denver Environmental Health,

6 and we also have been involved, as have a lot of

7 other agencies, since the site started.

8 I wanted to just stress the importance

9 that the site cleanup be a safe cleanup. And we

10 also, all of us here, are real committed to making

11 sure that the cleanup protects families and children

12 from exposures to metals.

13 And I also wanted to echo what Lorraine

14 said. It's very important that people comment and

15 provide comment either verbally or in writing or let

16 EPA know what your opinions are. The other thing I

17 had wanted to say was I wanted to support the

18 community health program.

19 Yes, there is going to be testing this

20 summer for children, and that's very important. On

21 the other hand, you know, I see a number of very

22 small children here that are probably not at their

23 time of maximum exposure, which once the child

24 becomes mobile and becomes very exploratory and

25 there is a lot of hand-to-mouth activity.

1 So perhaps these children this summer --
2 you know, your child might be crawling, but I don't
3 think he's walking. And so that testing needs to
4 continue through time. And it needs to continue --
5 it's very important that children be tested whether
6 they're in this Superfund site or whether they're
7 without.
8 And this community health program gives us
9 the opportunity to provide some program that does
10 health education, make people aware of the hazards
11 of metal poisoning lead and arsenic hazard, give
12 them a chance to be tested, give them a chance to
13 learn how to do mitigation. And then if there are
14 unacceptable exposures, it gives the chance to
15 provide referrals for cleanup.
16 So I think that's -- that's a real
17 valuable component of this project. I think it's
18 very innovative for a Superfund program to be
19 thinking about providing a community health program
20 that provides a lasting benefit for issues that
21 aren't normally addressed through Superfund.

22 And I also wanted to stress that Denver

23 Environmental Health right now does the

24 environmental investigations for the City. We are

25 only able to go to the homes where children have two

1 readings over 15 because of the lack of resources,
2 you know.
3 And this is selfish. We're really looking
4 forward to the opportunity to be able to do more
5 investigations to get to children at lower levels
6 and to do a better program. And we're also looking
7 forward to having someone, whether it be our agency
8 or another agency or community-based program, to be
9 able to do health education and outreach before a
10 problem happens because that's -- for lead and
11 arsenic, that's what's really important, to deal
12 with the problem before it happens.
13 MS. KAREN KELLEN: Thank you very much.
14 That's the end of my list, but it's hopefully not
15 the end of the comments because I see a lot of faces
16 out there who haven't signed up to comment. And I
17 encourage you, please.
18 State your name for the record.
19 MR. MICHAEL MAES: My name is Michael
20 Maes. I'm a resident of the Swansea neighborhood.
21 I've been attending some of these meetings for a

22 long time, and it's nice to see a group of people

23 here today taking an interest in what's going on.

24 And I have just a few brief comments, but

25 I think it's real important that participation like

1 this needs to happen to get the proper questions
2 asked, to understand some information when we get
3 our questions answered.
4 And I think most of all is to take this
5 information that we do get at these meetings back to
6 the communities. And there is a number of -- of
7 ways that you can gain this information and -- with
8 the Cross-Community Coalition right up the block,
9 there is regular meetings that go on there that
10 discuss these issues.
11 You can can involved with that. If you're
12 not involved or can't get to those meetings, you can
13 always call that office and get information from
14 some individual there that will work with you
15 one-on-one to give us information.
16 The United Swansea Elyria Association
17 normally meets three -- one month -- once a month on
18 the third Thursday of the month and that we also
19 discuss some of the things that go on here. We let
20 people know what's happening and take comments from
21 people there to bring back to meetings like this or

22 encourage people to go to meetings like this.

23 But -- so we would appreciate you taking

24 that word back out to your neighbors. Whatever

25 community you're in, there is a neighborhood

1 organizations in each community.

2 Back to the things that are here. Just

3 some of the comments that -- that we have been

4 hearing through the community and -- and people

5 talking about, and it's about the -- probably the

6 lead thing is, people are really very uncomfortable

7 about there being such a high level, but there not

8 being an exact response to where is it coming from.?

9 I mean, we're guessing it might be paint,

10 we're guessing that it could be a couple of things,

11 what the levels are because there wasn't really

12 quite enough testing on enough of the houses, in our

13 opinion, to get a good grasp as to where that stuff

14 is coming from.

15 And without knowing where it's coming

16 from -- and I thought that's what EPA is all about --

17 that you're unable to make informed, wise decisions.

18 That would carry on forever. And we don't want to

19 be having to come back and revisit this again with

20 somebody's new information that came up.

21 As far as the action levels that we have

22 over here, we feel real strongly about that being

23 back down to 400 and even at that being too high.

24 We see a lot of places here where it's been done

25 at -- at the 500 level and -- and above or -- and on

1 some of these things, I would just like to question,
2 how many of these are in a community like ours? How
3 many of these are rural areas or areas where it's
4 not dense population of people living in communities
5 like ours?
6 They cleaned up to the same level they're
7 going to clean ours up to. Asarco up there is the
8 only one I'm familiar with. And the rest I would
9 like to know just, you know, are they communities
10 like ours, people who live in communities in a dense
11 populated or are these outside of the City in rural
12 areas or outside the -- you know, the dense living
13 areas and how do they really compete with ours.
14 We know that with our community that we
15 have a lot of problems here that are -- you don't
16 see in other communities. We are right in the
17 middle of the City and County of Denver in inversion
18 area with the bowl, with the dirty air, surrounded
19 by lots of different contaminants.
20 And all along, as a -- an environmental
21 justice site, we've been talking about there are so

22 many other pollutants that affect us, a wide range

23 of pollutants that affect us, and does that lower

24 our immune system and make us more vulnerable to

25 these kinds of things we're seeing here, the lead

1 and the arsenic.

2 And we, as a community, aren't comfortable

3 with knowing those answers or that we feel that we

4 know those answers, and those are some of the

5 answers we'd like. Without people from the

6 community asking those questions, we don't get to a

7 lot of those questions for the EPA.

8 Thank you.

9 MS. KAREN KELLEN: Thank you very much.

10 And just so that you know, there is information in

11 the back of the room. There is information from

12 some of the government entities, and CEASE has a

13 table with additional information as well. So

14 please pick up some of the information and education

15 yourself about what's going on.

16 Plenty of time and after I hurried

17 everyone else to get done quicker. So please, I

18 encourage you to stand up and have a few words at

19 the microphone. It's really not as tough as it

20 seems once you get going.

21 MS. AVA MALLARD: I lived in the

22 Cole/Clayton --

23 MS. KAREN KELLEN: State your name,

24 please.

25 MS. AVA MALLARD: Ava Mallard. I lived in

1 the Cole/Clayton and -- I can't remember what the
2 site is -- neighborhoods all my life, actually.
3 Started out where I-70 was. They tore down our
4 house so -- and I bought an older home.
5 So I have seen a lot of changes and
6 things. And a lot of things -- when they were
7 saying a lot of rehab and things that were done and
8 the times that were before they started the lead and
9 arsenic -- looking for the lead and arsenic levels
10 in the neighborhood, they were doing a lot of re --
11 rehabbing of old houses and things at the same time
12 I was having mine done.
13 Well, at that time is when I started
14 having a lot of ailments and things having the dirt
15 and things uprooted. Even though I don't have a
16 high level of lead or arsenic in my blood, I've had
17 a lot of ailments, something that would be like, I
18 guess, like lupus, but they said it's not.
19 Like I said, I've lived here all my life.
20 I've been in this neighborhood. I've walked these
21 streets and I've done everything, you know, helping

22 elderly and everything with their homes and all.

23 And who knows?

24 What other -- like the man said, other

25 pollutants might as well, too, with these --

1 alongside with the lead and the arsenic.

2 These are things we have to be concerned

3 about, too, other things as well as lead. Even

4 though the lead for children is the most important,

5 lead and the arsenic for children.

6 But we all have to be aware, even as

7 adults that older homes and things do have risks,

8 too, associated with them. And I'm pretty sure

9 that's probably part of it because it was in my 20s

10 when I started doing these -- helping with the rehab

11 project and things, too, but they -- what they

12 didn't tell you that you had to wear masks and stuff

13 with older homes and things, you know, working on

14 old paint and old things.

15 My house is a hundred years old. It was

16 around the same time that the smelters and things

17 got started, probably at their worst.

18 So you have to think about these older

19 homes and things and what's going on under the

20 ground, under those -- under those older homes and

21 things if you're -- under them or, you know, old

22 lead pipes and things like that, too.

23 So it's like you have lead, everything

24 from all -- other pollutants from other sources. So

25 these are things we have to make people aware of

1 very much, families aware that these older homes do
2 pose some health risks that would need to be dealt
3 with before -- as people are buying -- younger
4 people that don't understand or don't know and
5 they're redoing homes and things.
6 But they need to really be aware and
7 companies and things need to be -- especially
8 government companies like Dura and things like that
9 need to really make people aware of the health risks
10 and things of -- of rehabbing older homes.
11 That's all I can say.
12 MS. KAREN KELLEN: Thank you very much.
13 Appreciate you sharing that. I think I have another
14 taker.
15 MS. LORRAINE GRANADO: Yeah. Lorraine
16 Granado.
17 I had one other comment to make that I
18 didn't -- I didn't get to all my comments, but I
19 have to say this one. Bonnie mentioned today the
20 issue of the possibility of lead in tap water. We
21 did ask and they did test to see if there were lead

22 in water. And as far as everything we understood,

23 there is no lead in water. I don't want people to

24 be unduly concerned around that.

25 If the issue is is there lead piping that

1 could be contributing to lead, then that's a serious
2 question for people, especially in older homes. But
3 again, it is not my understanding that even if you
4 found old lead piping that could be a contributor
5 that, in fact, EPA could do anything about that old
6 lead piping.
7 So that adds yet a possibility of a fourth
8 contributor to lead; however, I want to emphasize
9 that EPA is only willing at this point, at least, to
10 remove one source, and that is lead over 540.
11 MS. KAREN KELLEN: Thank you. And there
12 is information about lead and the different sources
13 of exposure to that.
14 I think I have someone else. Okay.
15 MR. GEORGE LOVE: Yeah. My name is George
16 Love, and I didn't come here intending to make any
17 comments. Just wanted to listen. I had a couple of
18 comments to make Thursday night at the Harrington
19 meeting.
20 But sitting down listening, there is one
21 point that I think I have not heard anybody say, the

22 lady from CEASE or Bonnie or anybody, and I think

23 it's extremely relevant.

24 And it's this point: Bonnie referenced

25 that, you know, the people in EPA in Washington as

1 well as here are really concerned about this
2 specific community, et cetera, et cetera. I would
3 contend this: I would contend that it's my
4 understanding that there are approximately a
5 thousand homes in this VB I-70 area, site area that
6 have not been tested, and -- I'm not trying to
7 impress anybody when I say this, but I use it
8 basically for the hyperbole of the contrast.
9 I've got a graduate degree in business
10 administration, but the best piece of business
11 advice I ever received in my lifetime came from a
12 guy who had a third-grade education who told me, If
13 you're going to go into business, I've got one piece
14 of advice to give you and that is, if you take care
15 of business like it's supposed to be taken care of,
16 you won't have any regrets.
17 I tie all of that into this concern about
18 this community. If there is genuine, legitimate
19 concern, then something will be done about roughly
20 25 percent of the residential sites that have not
21 even been tested. You know, irrespective of where

22 you set these limits, 400, 540, 10 deciliters,

23 whatever, whatever you -- that's one argument and

24 that's what I've heard sitting here a lot.

25 But if I've got 25 percent of -- of my

1 community that hasn't even submitted to testing and
2 EPA is going to come in and do its thing and then
3 just walk out and leave that alone, that begs to be
4 addressed, and that's not taking care of business in
5 my opinion.
6 And something should be done about it.
7 MS. KAREN KELLEN: Thank you.
8 Kara.
9 MS. KARA PICCIRILLI: Hello. My name is
10 Kara Piccirilli. I'm with Coping, which is the
11 Colorado Peoples Environmental and Economic Network.
12 Our offices are actually over here on 46th and
13 Josephine in the Cross-Community Coalition building.
14 We're a program of the Cross-Community Coalition, so
15 please come talk to us if you have any environmental
16 concerns including this project.
17 I just want to say first of all, Coping
18 supports CEASE's recommendations for this -- for
19 this site. And I want to -- I appreciate George's
20 concern. That's a concern of ours as well, that
21 these thousand homes are tested.

22 We do get a lot of calls regarding people

23 who are now very much aware of what is going on and

24 do want to be tested. And I -- I strongly

25 encourage -- I know that the money is because of

1 the -- the failure to reauthorize by Congress, the
2 moneys are low in Superfund, and taxpayers will be
3 paying for it.
4 We also encourage a long relationship in
5 these neighborhoods. We are very, very concerned
6 about the infrastructure of the community health
7 program. We encourage EPA to continue work -- I
8 mean, as much as working with HUD as possible. We
9 understand that HUD and -- HUD and EPA ^ kiss where
10 they can't cross mandates, and that's a division of
11 labor among government agencies that has caused a
12 lot of frustration in the -- in this site.
13 And the Northeast Denver Housing which
14 Bonnie talked about is a -- is primarily funded by
15 the Housing and Urban Development Agency, and so
16 there has been a lot of kind of heartache in
17 figuring out who is going to do what and things like
18 that.
19 But Bonnie has sat down with Northeast
20 Denver Housing and has talked about a lot of these
21 things with us and with CEASE as well. So just

22 increased capacity.

23 And also as you all are aware, the Kids at

24 Play Health Service is going on right now, and it's

25 very much attached to this site so -- and I urge EPA

1 to be informed by this health survey. It's going to
2 be very important. And Bonnie is at the table for
3 the health survey and EPA contributed, and we
4 encourage that as well.
5 And lastly I just want to say that these
6 are internal -- eternal issues of environmental
7 residents' health, and Coping supports what we can
8 best do for residents that will come in the next
9 hundreds of years.
10 Thank you.
11 MS. KAREN KELLEN: Thank you. We still
12 have time. Please.
13 MS. ROSE PRIETO: My name is Rose Prieto,
14 and I'm with the Latin American Research Services
15 Agency here in Denver, and I just have a couple of
16 questions.
17 First -- and I think the lady that was
18 here talking before mentioned some of the models,
19 but I'm only concerned about what the cleanup model,
20 which one was used. How many are there? Why was
21 this particular model chosen over all the others?

22 In addition, is EPA willing to provide or

23 make funding available to clean up inside the home

24 or are there other sources that are going to be made

25 available for these either nonprofit or business or

1 for profit businesss to get money in order to come
2 in and clean up these homes?
3 And then finally, I realize and I
4 understand the importance and focusing on children,
5 but it negates the elderly who are declining and
6 whose health risks are just as high, if not higher,
7 than those of children.
8 So I'm just concerned as to whether or not
9 EPA is actually thinking about going back and
10 testing the elderly because the neighborhood's are
11 getting a little older. And I'm just concerned that
12 we're ignoring a larger part of the population by
13 simply focusing on lead in children. Those are my
14 comments.
15 Thank you.
16 MS. KAREN KELLEN: Thank you very much.
17 And, as I mentioned earlier, we're not going to
18 respond right now, but there will, at a minimum, be
19 a response to everything that's been said here in
20 the responsive summary. And there is a very good
21 chance that someone from one of the government

22 entities will catch the people with questions before

23 they leave tonight.

24 Anyone else? Lots of time. I have a few

25 faces. I'm not going to do like school and call on

1 you, although I've thought about it.

2 Would you like to do a comment?

3 MR. BRUCE SHUPE: Yeah.

4 MS. KAREN KELLEN: Can we bring it over

5 closer to you to make it easier?

6 MR. BRUCE SHUPE: Thank you. I'm -- Bruce

7 Shupe is my name. I live at Swansea, and I -- I've

8 lived 66 years of my life. My dad was a painter for

9 most of his life, and we used lead-based paint. I

10 washed the brushes out for him every night in

11 kerosene. I got it on my hands.

12 And I don't think I'm in any danger. I

13 mean, I've lived a good life. And I was wondering

14 what -- what all the concern is about. I -- I've

15 also played with mercury, rubbed it on my hands,

16 rubbed it on coins. Didn't get sick from that. And

17 I've -- I've -- I'm sure I've eaten paint when I was

18 a kid, lead-based paint, and I just -- just wonder

19 what all the concern is about.

20 MS. KAREN KELLEN: Thank you very much.

21 Appreciate your comment.

22 Anyone else? We are coming upon the hour,

23 but there is still time. Yes, sir.

24 MR. THOMAS TRUJILLO: My name is Thomas

25 Trujillo; I live on 43rd and Race. And just to

1 answer the gentleman's question, here is the concern
2 right here. This is my concern. I want her to grow
3 up to be healthy.
4 MR. BRUCE SHUPE: I understand that. I'm
5 healthy. I'm healthy. I grew up in the age of lead
6 paint.
7 MR. THOMAS TRUJILLO: Anything that's
8 harmful to her health I am against. And anything
9 that -- I believe her name is Lorraine can do for
10 us, I wholeheartedly support.
11 That's all I have to say.
12 MS. KAREN KELLEN: Thank you very much.
13 Appreciate the comments.
14 Time for at least one more. Let's not
15 waste this opportunity. Love to hear from one more
16 person. Going, going.
17 I guess we'll close up tonight. I want to
18 thank everyone for putting in the time for coming
19 here, for speaking with us, for listening, for
20 taking time out of your morning when you could be in
21 the garden to sit through a public meeting.

22 I appreciate it and please take the

23 opportunity if you didn't say anything tonight to

24 write out a card and leave us a comment.

25 Enjoy the rest of your Saturday.

1 (Proceedings adjourned 11:58 a.m.)

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1 STATE OF COLORADO)

2) REPORTER'S CERTIFICATE

3 COUNTY OF LARIMER)

4 I, JACQUE WILSON, a Registered Diplomate

5 Reporter and Notary Public of the State of Colorado,

6 do hereby certify that the foregoing transcript is a

7 full, true, and complete transcription of my

8 stenotype notes taken in my capacity as Official

9 Reporter at the time and place above set forth.

10 IN WITNESS WHEREOF, I have hereunto set my

11 hand and affixed my Notarial Seal this 28th day of

12 June, 2002.

13 _____

14 JACQUE WILSON
Registered Diplomate Reporter

15 My Commission Expires 3/2/2004.

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EPA'S PROPOSED CLEANUP PLAN
VASQUEZ BOULEVARD AND INTERSTATE 70 SUPERFUND SITE

June 29, 2002

St. Charles Recreation Center
3777 Lafayette Street
Denver, Colorado

Reported by:
Mary J. George, CMR, CRR
Wilson George Court Reporters

1 P R O C E E D I N G S

2 MS. KELLEN: Okay. This time we're really

3 going to start.

4 My name is Karen Kellen and I work for the

5 Environmental Protection Agency and the Environmental

6 Justice Program and I'm here to kind of help keep things

7 moving tonight. And I'm going to run through a little

8 bit of basic information first and then we'll move on to

9 the rest of the program.

10 This is a very important night -- morning.

11 Last -- last week, Saturday, I had a hard time keeping

12 straight that this was morning instead of evening. And

13 there was a gentleman in the front row who liked to

14 remind me every time I said tonight, so if I start

15 talking about being here tonight, you can all just make

16 faces at me, if you want.

17 I'll try to keep in the present and be here

18 this morning.

19 But I know how hard it is to come out on a

20 Saturday morning. You all have a lot of things that

21 you'd rather be doing, I'm sure, and I appreciate you

22 being here to give us comments and to give us feedback

23 on this plan. As you probably know, we're taking public

24 comment tonight on the proposed plan the EPA has put out

25 for the Superfund site that includes this neighborhood

1 and a couple others.
2 The proposed plan came out in May and comments
3 are being taken until July 19th of this year. That's a
4 60-day public comment period. Normally we do a 30-day
5 comment period, but we knew that there would be a lot of
6 interest here and so they immediately extended it to 60,
7 so there were 12 previous meetings. And this is the
8 last of the public meetings.
9 But it's not your only opportunity to comment.
10 We have comment cards up here in the front that you can
11 fill out if you don't feel like saying something, or if
12 you think of something afterwards that you want to get
13 in the record you can fill out the comment card and
14 leave it for us, or you can send in a comment to the EPA
15 and put in your comments that way.
16 So this is your first -- this is the last
17 public meeting, but not your last chance to comment.
18 But we do encourage you to stand up tonight and make a
19 comment.
20 We will be speaking into the microphones
21 because we have a translator who is translating into
22 Spanish for some of you, and we have a court reporter
23 who is making a record of everything, so that all the
24 comments can be fully and accurately considered by the
25 EPA when they go back and look at the proposal again in

1 light of all your comments.
2 So the idea -- I like to keep this a little
3 more relaxed because I know it's hard for some people,
4 myself included, to stand up in front of a group and
5 talk into a microphone, speak your mind.
6 So we have some goodies in the back and I'd
7 like to just kind of relax. We're going to put on a
8 little show for you first and then we'll open up the
9 comments and we'll listen to you.
10 The way the process is set up is we don't
11 respond to your comments tonight. The comments will be
12 responded to formally and officially in the response to
13 comments when the record of decision comes out. The
14 record of decision is the document that EPA will issue
15 when it actually chooses the remedy after it considers
16 all of your comments.
17 So there may be instances where people have
18 questions and in those cases, oftentimes someone from
19 the EPA will approach you afterwards and try to give you
20 some answers anyway, but at the very minimum, we'll get
21 responses in the response to comments.
22 We do have a sign-up sheet in the front and we
23 do have a good crowd tonight. So it's very important,
24 if you want to comment, to sign up ahead of time so that
25 we can allocate time efficiently and make sure that

1 everyone gets a chance to comment and that we get out of
2 here in time so you can go off and do things that you
3 need to do.
4 We have a few ground rules. And I'm just
5 going to read these off because I can't remember what
6 they are.
7 Once again, everyone is encouraged to comment
8 for the record. Please state your name at the beginning
9 of your comment, so that we have a record of who is
10 making the comments. Speak clearly and slowly for the
11 court reporter and translator. I always have to remind
12 myself of that one because I tend to get going a little
13 fast.
14 Please, help foster a safe and respectful
15 environment where people feel free to speak your minds
16 and express their concerns.
17 Respect time limitations as well as guidance
18 of the facilitator. That's me. It's always good to
19 respect me, and I respect you as well. So my jokes
20 aren't going anywhere again, today, so I'll try
21 something new and different maybe later.
22 No signs or banners are permitted. They
23 obstruct views and could impose a safety problem.
24 And, lastly, we do have translation services
25 available for anyone who needs them. Unfortunately, we

1 only have Spanish, so hopefully we don't have any
2 additional languages that we're not able to cover.
3 So what we're going to do is I'm going to turn
4 this over to Bonnie Lavelle in just a few minutes --
5 Bonnie is the project manager for this site -- and she's
6 going to talk, and then we will open up the public
7 comment period.
8 Our first commenter will be a representative
9 from the CEASE group, which is a neighborhood group and
10 has been working on this project a long time.
11 I'm going to introduce a few people first and
12 then I'm going to sit down and be quiet for a while.
13 I'd like to first introduce the
14 representatives of the CEASE group, and some of them are
15 here and some of them are not, but I'm going to read off
16 all their names so that you know who's been out there
17 working for the communities for the last several years.
18 Michael Maes. Anthony Thomas, I know
19 Anthony's here. Joan Hooker, I saw Joan come in, in the
20 back. Lorraine Granado. Akwe Starnes. Gloria Shearer.
21 I haven't seen Gloria. Sandy Douglas, I saw Sandy sneak
22 in at some point. She's hiding but she's here. Antonia
23 Montoya. And then we have the CEASE consultant, Michael
24 Koznet, who I don't believe is here today also.
25 From the Colorado Department of Public Health

1 and Environment, we have Mary Ann Gallant and Mark
2 Rudolph. And they're around. Mary Ann's over here. I
3 don't know where Mark is. Oh, I actually don't know
4 that I know Mark, so I don't know if he were here.
5 I don't believe that Chris Poulet of the ATSDR
6 is here this morning, but -- okay, thank you. And I
7 think that's all that I will introduce.
8 So without further ado, let me introduce
9 Bonnie Lavelle to talk to you for, hopefully, 10 or 15
10 minutes. She'll give you some background on the
11 project.
12 Bonnie's been working on this site since the
13 beginning. She put in a lot of time and effort and
14 she's going to explain to you a little bit more about
15 the proposed plan and what it looks like. So here's
16 Bonnie.
17 MS. BONNIE LAVELLE: Thanks, Karen.
18 Good morning. I'm Bonnie Lavelle, I'm the
19 project manager for this site. This is -- can you hear
20 me? Okay.
21 We're very happy to be in the Cole
22 neighborhood. I think this is the first time that we
23 had an EPA public meeting here in Cole, and so we're
24 really excited that you're interested in the project and
25 we're here to hear you.

1 We've been working on sampling all of your
2 properties and looking into the problem of lead and
3 arsenic in the soils in your yards. We've been doing
4 this for so long, you've been very patient, and we are
5 finally proposing a plan for cleanup of this problem.
6 And we mailed that plan to everyone. It looked like
7 this. I hope you received it in the mail. That's what
8 we're talking about this morning.
9 I am here because I thought it would be
10 helpful for you to hear from me exactly what we're
11 talking about because sometimes the written word isn't
12 exactly clear. I wanted you to see all of these
13 documents, too, this morning, because this represents
14 all the work that we've been doing for the last 3-1/2
15 years.
16 So what we've tried to do is summarize all of
17 this work into this little fact sheet, and I'm hoping to
18 explain a little bit more this morning. So let me just
19 get right into it.
20 What we're talking about is what we call the
21 Vasquez Boulevard and Interstate 70 Superfund site. I
22 work in a Superfund program. That means that all the
23 work that has been done has been paid for by the
24 Superfund, which is the federal government pot of money.
25 And in working in that program, we have certain rules

1 that we have to follow for coming up with cleanup
2 proposals. So I'm going to talk to you, number one,
3 about what we found in all of this investigation we've
4 been doing for 3-1/2 years, and the health risks that
5 are out there to residents due to this arsenic and lead
6 that we found in soils, and then our proposal for
7 protecting you from those health risks.
8 I'm going to start with lead. This is a
9 picture of all the results of all the sampling of soil
10 that we did. We were able to sample 3,000 yards in all
11 the neighborhoods. And this shows you in a very concise
12 way the results for all 3,000 yards. The way you read
13 this is, these are the levels of lead that we found.
14 This end is very low, between zero, we didn't detect
15 anything, and it ranges all the way up to 1100 parts per
16 million. And that was the highest level that we
17 measured in anyone's yard. So this is the range.
18 And the boxes tell you how many yards were in
19 each range, so what you can see right off the bat, is
20 most yards, the biggest box, the most yards, had levels
21 between 100 and about 300 part per million. There are a
22 few yards with high levels, but you can see where the
23 levels get higher and higher, the boxes are smaller
24 indicating there's less yards with those levels.
25 So this shows you the picture of lead in all

1 four neighborhoods. I want to tell you, though, that
2 the properties -- these few properties, with the higher
3 levels of lead, all seem to be in the Cole neighborhood
4 and the Elyria neighborhood predominantly. So we have a
5 situation where on the western parts of the area that we
6 studied, there are higher levels of lead. There may be
7 a couple of reasons for this, we --
8 UNIDENTIFIED SPEAKER: What -- I just want to
9 know, what four neighborhoods are you talking about?
10 MS. BONNIE LAVELLE: Cole, Clayton, Swansea,
11 Elyria and a small part of Globeville. The southwest
12 part of Globeville.
13 The reasons that we think there are higher
14 levels of lead are the Cole and Elyria neighborhoods are
15 closer to the Omaha and -- where the Omaha and Grand
16 smelter used to be. It was a lead smelter that operated
17 last century. It shut down in the 19- -- 1902. It's
18 also possible that the proximity to the two highways,
19 I-25 and I-70, caused gasoline emissions that were full
20 of lead in past years to have lead in the soils. So --
21 and it's also possible that there is some influence of
22 lead paint and some lawn care products. So you've got a
23 whole mixture of things here.
24 But what's important is to know that the Cole
25 and the Elyria neighborhoods have a little bit higher

1 levels of lead. Mostly these properties are on the
2 eastern portion. I also want to let you know that we --
3 why it's taken us 3-1/2 years is we sampled a lot of
4 other things that are very important to understand the
5 health risks. We took a look at indoor dust and we
6 found that, on average, the indoor dust levels of lead
7 are much lower than the outdoor soil levels. That's
8 important. Because you not only get exposed to soil,
9 but also while you're indoors, you get exposed to dust.
10 Although I do have to tell you that at some
11 homes, we found very high levels of lead in dust, and we
12 think that that is from leaded paint. We also looked at
13 garden vegetables and garden soils. We didn't find any
14 problem with lead in those things. It's very safe to
15 garden. If you are concerned about that, you can do a
16 couple of things, which are very easy: Just wash your
17 vegetables. But we didn't find the problem of lead in
18 soil and vegetables.
19 We also did a couple of other studies to try
20 to help us understand the health risk. And what I want
21 to emphasize to you is what we did in this project is we
22 hit it with as much science as we could. We worked with
23 a lot of scientists in the Denver area and all over the
24 country, with the State Health Department, with the City
25 of Denver, with the community groups, so we're real

1 confident in these results.

2 Now, I'm going to talk to you about the health

3 risks associated with exposure to lead. Some of you may

4 know this. What we are concerned about is children

5 getting exposed to lead. They're very sensitive to its

6 effects.

7 Too much lead in a child can cause difficulty

8 learning and that is an effect that is permanent. And

9 so we're very concerned to make sure the kids are not

10 exposed to too much lead. The way we measure exposure

11 to lead in children is to measure it in their blood.

12 The blood-lead level of concern is 10. It's measured in

13 micrograms per deciliter of blood, but I just want you

14 to remember, blood-lead level in a child of 10 is a

15 concern to us.

16 What we want to do is make sure that we clean

17 up yards where there is lead in soil that has a

18 potential to cause this effect. So we want to protect

19 your children from ever having levels of 10 in their

20 blood.

21 So what we're proposing to do is we are going

22 to remove and replace soil from every single yard where

23 lead is greater than 540 parts per million. We are

24 confident that if we do this for lead in soil, there's

25 not -- we are going to protect your children and you

1 from exposure to lead in soil that could cause that
2 level of blood-lead.
3 Now, normally we would stop there in the
4 Superfund program. EPA and the Superfund generally
5 deals with environmental problems like soil, water,
6 sediment, air. We want to go a step further for this
7 community and I'm going to tell you why. We think there
8 is another -- we know there is another source of lead
9 that is more dangerous to your children than the soil.
10 And we wanted -- we want to push Superfund to deal with
11 that problem. And the problem is lead paint.
12 I'm going to tell you why we think that, so
13 that you can know what we have found. We started
14 looking at what are the levels of lead in children that
15 have already been measured in these communities. And
16 you would suspect that if the problem was only lead in
17 soil, that children with elevated blood-leads would be
18 living on soil with high lead levels, and the children
19 that are living on soil with lower lead levels would not
20 have a blood-lead problem, if it was only soil that we
21 were dealing with.
22 We started looking into this. And what we
23 found is that the State Health Department has been doing
24 some blood-lead measuring of children in the area.
25 There are children with elevated levels of lead in their

1 blood. We consider that a very serious problem. It's
2 not a predicted problem, it's not a potential, it's
3 measured and it's happening to kids.
4 This graph shows you some of the levels that
5 were measured in children and where they were living.
6 It's an important graph because I want you to go back
7 and remember that I said the levels of lead in soil in
8 Cole were higher than the levels in Clayton. So this
9 graph shows you some of the results of blood-lead levels
10 in children from Cole and Clayton. The children that
11 were measured in Clayton are these boxes, and you can
12 see this is the soil-lead level -- level of lead in
13 their soil. It's low. But the levels of lead in their
14 blood are a little bit higher for some of the children.
15 This is 10. Remember our level of concern?
16 Some of the kids in Clayton are over 10. These dots are
17 children who live in Cole who have their blood-lead
18 measured. Can you see the soil levels are a little bit
19 higher, but they're still about the same levels of lead
20 in their blood except for this child whose soil-lead is
21 about 200, but their blood-lead is higher.
22 The conclusion is soil is not the major
23 contributor to these blood-lead levels. There's
24 something else going on. If it were soil, as the soil
25 was going up, the blood-lead levels would go up.

1 So, we have to deal with the other problem if
2 we want to protect the kids from elevated blood-leads.
3 We have to deal with the other problem, which is paint.
4 The other piece of information we looked at is this will
5 show you what we measured in dust in some of these
6 houses.
7 This is the level in soil at a house, this is
8 the level of dust -- level of lead in dust in that same
9 house. The soil's 320, the lead and dust is 9,000.
10 The soil at this house is 264, the level of
11 lead in dust is 2,000. The paint is contributing to
12 those high levels of dust. Conclusion is, all this
13 information, EPA cannot stop at soil to protect your
14 children. We have to do something to deal with the
15 paint problem. Problem is, I'm not supposed to be
16 dealing with paint in Superfund.
17 So we have -- we are proposing something to
18 help local agencies who can deal with the paint problem.
19 Our proposal is we want to work with local agencies, and
20 especially you, to establish and run a community health
21 program. We want to get to the point where there's more
22 paint cleanup in these neighborhoods. And in order to
23 figure out how to do that, I want to tell you what's
24 happening now.
25 If any of you saw the Channel 4 news clip the

1 other night that showed the Northeast Denver Housing
2 Center actually doing lead paint cleanup, how did they
3 get there? Well, let me tell you how that happens.
4 Right now, the -- it all starts with blood-lead testing.
5 The State Health Department does some blood-lead testing
6 and doctors do some blood-lead testing. Doctors report
7 those results to the State. The State reports to the
8 Denver Department of Environmental Health. But they
9 only -- Denver Department of Environmental Health can
10 only handle kids when their blood-lead levels are over
11 20. Remember the level of concern is 10? They get
12 reported levels over 20, or a child who's had two tests
13 over 15.
14 The reason for that is they just need more
15 folks. They need more people to help. And what Denver
16 does for those children is they go to the home and
17 educate the family. They do a house investigation, they
18 try to figure out where the lead is coming from. They
19 can do medical referrals and follow-up work.
20 If Denver determines that it's a paint
21 problem, then they can refer them to Northeast Denver
22 Housing Center who can do the paint cleanup. Everybody
23 involved in this wants to do more. Northeast Denver
24 Housing has a certain amount of money, they have
25 actually spent some money to do their own testing,

1 because they want kids referred to them.
2 Okay. So, what do we want to do as part of
3 this project? EPA can help by establishing a program
4 where we can help the State do more blood-lead testing.
5 We can either help them do it or we can do it. We want
6 to get to the point where children are referred to
7 Denver if their levels are 10 or even close to that.
8 That's going to be a whole lot more kids. That's going
9 to be kids that have not been caught before. Then what
10 else we can do is we can help Denver in a number of
11 ways, but what we're thinking of now is we're really
12 good at collecting samples. We can help them by doing
13 house investigations with them, we can help them do home
14 education, we can do whatever we can.
15 But the point is, if we can help them, their
16 folks can handle more kids and eventually this will get
17 us all to the point where paint cleanup is happening
18 more and more.
19 That's our community health program, but the
20 part of the community that we need is this isn't going
21 to work unless everyone knows about it and participates.
22 So what we want to do is work with you, figure out how
23 to get the word out in your communities. That might be
24 different in Cole than what we do in Swansea, it might
25 be different in Clayton. But the point is, we've got to

1 get people to understand the problem of paint exposure,
2 get them to understand the importance of testing their
3 kids and, you know, just get the word out.
4 One of the other benefits of this program is
5 we will always report back to the community what the
6 blood-lead levels are in your children. Right now I
7 don't think the people know this and so I think what we
8 want to do is a program to raise this awareness and keep
9 reporting back to you how the kids are being protected.
10 This community health program is absolutely
11 not a substitute for soil removal. We're going to do
12 soil removal. What we're saying is that's not enough.
13 This is a program which will be effective in protecting
14 children who are exposed to lead in paint and also we
15 know that there may be some other sources of lead
16 exposure: home remedies and tap water. So this is
17 going to be a way to deal with those problems.
18 There's been a lot of talk about removing more
19 yards and lowering that level in soil to 400 part per
20 million. And I know I've heard it from folks in Cole
21 and there's a lot of concern about that. One of the
22 concerns I heard was that there's people think that
23 there are EPA regulations that require us to remove soil
24 where it's above 400 part per million. So I wanted to
25 hit that this morning, too, and let you know exactly

1 what our guidance says.
2 I have worked in the Superfund program, we
3 have specific guidance. I have to follow this. 400
4 part per million lead in soil is a screening level, it's
5 not a level where we take action. It's actually a level
6 where we screen out a bunch of yards. If a level of
7 lead in soil is below 400 part per million, EPA doesn't
8 do any more work, doesn't even look further at the risk.
9 If it's above 400, we do a lot of work, which
10 is what this stuff is. So it's a screening level, it's
11 not an action level.
12 Above -- if the yards from soil is above 400
13 part per million, we're required to use an EPA model to
14 determine whether cleanup is necessary. And that's what
15 all that collecting data was for, was to be able to use
16 that model. We are supposed to use Superfund money to
17 collect as much information as we need to run that model
18 correctly.
19 And, finally, this guidance applies to sites
20 like this that have the money to do the type of research
21 that we did here.
22 There is another law that I think a lot of
23 folks have looked at and -- and got concerned about.
24 What does this law say? It's called the Toxic
25 Substances Control Act. That law allows EPA to regulate

1 lead in paint. So that law established a national
2 standard of 400 part per million lead in soil. And
3 that's supposed to be used at millions of homes around
4 the country that are suspected to have lead paint.
5 That number is based on the same model that we
6 use in Superfund, so it's the same model. The
7 difference is this law applies to sites where it's not
8 Superfund. So you don't have the ability to collect the
9 type of information that we collected at your homes.
10 It's supposed to apply to sites where you just don't
11 have the funds to do the type of dust sampling --
12 vegetable garden sampling, soil sampling. And what's
13 more important is that law doesn't require us to do soil
14 removal.
15 So there's two different things EPA is doing,
16 and what we do in Superfund is determine the level of
17 lead in soil where we're going to remove your entire
18 yard. And this law says if you're going to do that, you
19 better collect enough information to run that model
20 accurately.
21 We did that here. We also took an extra step
22 and ran a different model just to make sure that we were
23 being accurate. But our proposal to clean up soil where
24 it exceeds 540 part per million is based on that EPA
25 model.

1 This shows you -- and please come up and see
2 the poster if you're more interested in this -- a lot of
3 concern about: How does this proposal for 540 compare
4 to other sites? So we did a little bit of research and
5 put together this graph.
6 This shows a number of different Superfund
7 sites around the whole country that are residential
8 soils contaminated with lead. This shows you -- oh, you
9 can't see it very well, it's off the -- you'll have to
10 come up and see the poster. This shows you the various
11 levels that EPA at these other sites around the country
12 has done cleanups. They range from about 500 part per
13 million -- this one is 3500 part per million -- but the
14 normal range is from about 500 part per million to about
15 1500 part per million to 2,000.
16 Here you guys are. The VB/I-70, if you just
17 take a look at this, I'm hoping that it will give you
18 confidence that what we are proposing is not
19 inconsistent with what we've done at other sites.
20 Okay. Arsenic's easy, now that we've hit
21 lead. I'm going to tell you about arsenic. It's a
22 little bit different. This is another picture of all
23 the arsenic levels that we measured in all the 3,000
24 soils that we sampled. Different picture, because most
25 of the arsenic levels are very, very low.

1 The arsenic levels range from nothing, we
2 didn't detect it, all the way up to 758 part per
3 million. But you can see that as the levels get higher
4 and higher, there's fewer homes. The difference is
5 these problem -- the yards with higher levels of arsenic
6 are spread all over the neighborhoods. There's an equal
7 number in Swansea, Elyria, Cole, Clayton, and
8 Globeville. So they're randomly scattered all over.
9 We also found that arsenic in dust is very,
10 very low compared to what's in soil. We also found that
11 it's not in vegetables. And what we are proposing to do
12 is remove any clay soil from all yards where arsenic is
13 greater than 128 part per million. The health risk that
14 we are worried about for arsenic is it can't -- over a
15 long term, low levels can increase your risk to -- of
16 getting cancer.
17 So what we did was looked at people who have a
18 lot of exposure to soil and live here for a very long
19 time. What's going to protect them from getting cancer?
20 Also, if children get -- over the short term get exposed
21 to a lot of dirt with a lot of arsenic in it, they could
22 get exposed to even more. And their health effect would
23 be different. It can cause stomachache, vomiting and
24 diarrhea, if you get enough arsenic.
25 So we looked at that and we are confident that

1 if we can remove the soil where it's above 128, we're
2 going to protect all of you from any of those health
3 effects. As a matter of fact, we've already cleaned up
4 about 48 yards, specifically to protect kids.
5 Now, the community health program that we're
6 talking about is also an opportunity to take a look at
7 whether children here have soil-pica behavior. I think
8 a lot of you have heard that from when ATSDR was in town
9 before. There may be some children -- it's a very rare
10 behavior, but some children eat a lot of dirt
11 intentionally. And we looked at whether it makes sense
12 to clean up more and more yards to protect children like
13 that.
14 The bottom line, folks, is that we can't.
15 Arsenic appears naturally in soil. And children who
16 have soil-pica behavior potentially could get too much
17 arsenic even with background soils. So what we want to
18 do is in the community health program, raise awareness
19 about this behavior. As kids are getting tested for
20 blood-lead levels, it's a real easy thing to get their
21 urine tested. And let's focus on the kids with this
22 behavior, because they really need medical attention,
23 not environmental response.
24 So, finally, what we are talking about in our
25 whole proposal is we are going to remove and replace

1 soil from every single yard out here, I don't care who
2 lives there, if the arsenic is greater than 128 or the
3 lead is greater than 540. That is 400 yards.
4 And we're going to go that extra step and work
5 with local agencies, the State, the City, Northeast
6 Denver Housing Center, other nonprofits, and you, the
7 community, to establish and run a community health
8 program to deal with what we think is the biggest
9 problem, lead paint. And also to try to get some
10 medical help for kids with soil-pica behavior.
11 As you are thinking about more and more soil
12 removal, because this is really what we want to hear
13 from you, whether you think this is a good plan for your
14 community, I want you to think about the impacts also on
15 your community. When you do these soil removals, we are
16 going to pull in a lot of trucks to take this soil out
17 and bring in the new stuff.
18 We looked at four different alternatives for
19 soil removal and each of them required doing more and
20 more yards. What this illustrates is more and more soil
21 removal means more and more trucks. Each of these
22 trucks represents 2,000 trips. The alternative that we
23 are proposing is to clean up 403 yards. We're
24 estimating about 8,000 truck trips. If we lower our
25 level of concern and do more and more yards, especially

1 for lead, more and more trucks are going to be coming
2 into the neighborhood. And I just want to make sure
3 that you know, because I want to make sure it's not a
4 surprise to you.
5 There are impacts associated with soil
6 removal. And our view is that more and more soil
7 removal is not really addressing the biggest health
8 concern. We've got to deal with the paint. The soil
9 removal levels we are proposing is going to protect you.
10 So if you do more and more and more, all you're doing is
11 removing more soil and bringing more trucks in. I also
12 need you to know that if we do that for lead, the Cole
13 neighborhood and the Elyria neighborhood are going to
14 get the brunt of more and more trucks.
15 So that's something the community -- I wanted
16 to be straight with you about. If you knew that
17 beforehand, I hope you're discussing it among
18 yourselves.
19 That's it. Now you need to -- we need to hear
20 from you.
21 MS. KELLEN: Okay, if we could, because we
22 weren't going to take questions tonight, can I just
23 connect you up with Bonnie later.
24 UNIDENTIFIED SPEAKER: I want to tell you the
25 area I live in.

1 MS. KELLEN: Could you ask the question in the
2 microphone, then, or --
3 UNIDENTIFIED SPEAKER: I don't want to. I
4 just want to know -- what -- we're considered nothing
5 out there.
6 MS. KELLEN: Yeah, I think we need to get you
7 two together to look at a map and figure this out.
8 Thank you.
9 We are going to open up the public comment
10 period now and I'm trying to push things along because
11 there's a lot of people here, not many people have
12 signed up yet, but we would like you to come on up and
13 sign up, if you'd like to. We'd really love to hear
14 from you.
15 The public comment is officially opened right
16 now. But our first commenter, the group from CEASE who
17 has been working on this project for years and years and
18 years, and has come to the working group meetings and
19 has been working with the EPA, has been asked to make
20 the first comment and so Lorraine Granado is going to
21 talk in just a few minutes.
22 I actually -- can I have everyone stand up and
23 shake and wake up again? I feeling like we're all kind
24 of losing it right now. There's food, there's doughnuts
25 in the back. I've been told that the people do not want

1 to take any doughnuts home, so it's up to you guys to
2 eat these. So thank you. Wake up.
3 And now Lorraine Granada -- Granado -- I'm
4 just going to shut up and let Lorraine talk.
5 MS. LORRAINE GRANADO: I'm going to wait until
6 people take their seats so it's not a distraction.
7 (Pause.)
8 MS. LORRAINE GRANADO: Okay, folks.
9 Okay, folks. I know some of you are still
10 back there, but I hope that you're listening.
11 My name is Lorraine Granado, and I'm pretty
12 much a life -- well, not pretty much, I'm actually a
13 lifetime resident of the Globeville neighborhood where I
14 grew up until I was 11 and then the Swansea neighborhood
15 for the rest of my life.
16 I'm here speaking on behalf of CEASE. CEASE
17 is a community group that we formed at the beginning of
18 this process. We actually began getting involved even
19 before the EPA came in because this really started with
20 the contamination of Globeville.
21 When the -- when the ROD, record of decision,
22 was made for Globeville, one of the mandates that Asarco
23 and the State had was to keep testing outward until they
24 found the end of the arsenic and lead contamination.
25 Well, they still haven't found the end of that

1 contamination. And that's how we got here to Swansea,
2 Elyria, Cole and Clayton.
3 And so we worked on that Superfund site, we
4 worked on the Broadrick Superfund site and we worked on
5 the Woodbury Superfund site and we have a long
6 experience on working on Superfund sites because,
7 unfortunately, because of the environmental racism in
8 this country most of the -- and this is absolute fact,
9 Government Accounting Office, Office of Racial Justice
10 and Reconciliation, the United Church of Christ and the
11 National Lawyers Guild, that where this country has
12 elected to put its hazardous facilities such as
13 refineries, smelters, et cetera, has been in communities
14 of color.
15 So we have a lot of experience and we've been
16 at this since the first day. We do not get paid. This
17 is not our job. We have attended -- I put in about a
18 week a month on this, about a whole week a month. We
19 have attended the work group meetings, which used to go
20 from like 9:00 till 2:00 or 3:00, now they're like 9:00
21 to 1:00; the health team meetings, the health study
22 meetings.
23 We helped plan a whole strategy to educate
24 health care providers to be able to treat people from
25 these communities. I had an experience around

1 Globeville where I took my son in to get him tested for
2 lead, and the doctor refused. He said not unless the
3 Department of Health puts out an advisory.
4 And so we knew that health care providers
5 needed to be educated and we worked with the Agency for
6 Toxic Substances and Disease Registry and the Colorado
7 Department of Public Health to do that education. We
8 have helped to plan and are involved in the health
9 study.
10 You know that they're coming to your doors and
11 the -- this is a study funded by the ATSDR, the money
12 goes to the Colorado Department of Health, and the
13 actual study is done by the University of Colorado
14 Medical Center. They will be coming to every door
15 looking for children to test for arsenic and for lead.
16 And so we helped to plan that. We have been
17 involved in it, we're involved in it now. We've also
18 attended technical meetings. We've attended more
19 meetings than they care and that I can even remember, I
20 think.
21 But we have come up with the plan for cleanup
22 that is an alternative to the EPA's. And I will give
23 you our plan and I will tell you our rationale. The
24 first thing, though, that I want you to understand, and
25 if you don't remember anything else I say, please

1 remember this: There are no safe levels of lead and
2 arsenic. There is no such thing. Lead and arsenic are
3 heavy metals. By their very nature, they are harmful to
4 human health. So, please, remember that there are no
5 safe metals. No one can say so much is safe. There are
6 none.
7 Given that, I will talk to you about starting
8 with lead, because that's the really big issue here.
9 And it is a bigger issue in Cole and Clayton -- I mean,
10 Cole and Elyria, and that's true. But let's remember
11 that Cole and Elyria are closer to the three smelters
12 that were originally in this area: The ARCO, Omaha,
13 Grant and Asarco smelters. And so there is some,
14 perhaps, reason why they're more contaminated than the
15 others and why you see the contamination drop off as you
16 move further away.
17 EPA is proposing to clean up at 540 parts per
18 million lead. And they say to you that's really --
19 that's a screening level. They're right, it's a
20 screening level. What that means is below that they
21 don't have to do anything. Above that they have to
22 investigate. Why? Because above that is where you
23 begin to see harm, then, to people and to children.
24 That above 400 is where you begin to see the risk. So
25 they are required to do the testing.

1 They said -- Bonnie said to you, gosh, 500
2 looks good if you look at this graph, and they've
3 cleaned up a lot of places much higher than this, you
4 know, left much higher levels. What we don't know as we
5 look at this graph is: Are these industrial sites? Are
6 they rural sites? Are they urban sites? Are they
7 communities like this? We don't know that.
8 And we know that this is only a handful of the
9 sites that EPA has cleaned up across this nation. I can
10 tell you of a specific. In Utah -- Eureka Falls, Utah,
11 there was a site like this. And in that community, the
12 lead -- you know you take lead into your body, that's
13 how it gets poisoned -- the lead in that community was
14 70 percent bioavailable. That means that 70 percent of
15 what gets into the body stays there. In these
16 communities, the lead is 80 percent bioavailable.
17 80 percent stays in the body.
18 At Eureka Falls, they cleaned up at 231 parts
19 per million. Here they propose 540 parts per million.
20 And one discussion that we had at our working group
21 meetings was the plan that EPA has that they say, if
22 they -- if you have between 400 and 540 and they leave
23 it in your yard, they're going to go back and knock on
24 doors and see, Are there any kids under six?
25 If there are kids under six, then they're

1 going to do a blood draw. If the child under six has 10
2 micrograms per deciliter or more, as Bonnie pointed out,
3 then they'll clean up the yard. But, folks, the way
4 that we interpret that is you have to wait until a kid
5 is lead poisoned to clean up the yard. That's not
6 acceptable to us. That's not acceptable.
7 The other thing is that I see seniors in this
8 room, and I'm getting there myself, you know. I'm going
9 to sell my house sometime. And on my block this year,
10 if they had been knocking on doors this past year, they
11 would have found three seniors: Mrs. Kane, my dear
12 friend who was sent to a nursing home; Mr. Johnson, who
13 lived three houses away from me, he died; and then a
14 lovely elderly woman on the corner, real nice lady, I
15 never knew her name, but we always said hello. Well,
16 she also left her house, and I don't know if she died or
17 went to live somewhere else, but she left.
18 If they'd have knocked on those doors when
19 those seniors were there, they wouldn't have found any
20 children under six. But I can say to you that today in
21 all three of those houses there are children under six
22 living in those houses.
23 And so it isn't good enough for us to say,
24 Let's clean up for the kids today. It's not good enough
25 to have a temporary solution. We want a permanent

1 solution. We want to know that next week, next year,
2 next decade, in a hundred years, that if some child
3 moves into that house, that they will not have to live
4 with more than 540 parts per million.
5 I'd like to think of this as not being
6 selfish, just thinking, well, I don't care about anybody
7 else, I just care about my kids. I like to think that
8 we care about all kids and when EPA leaves this
9 community, they will leave it clean enough so that any
10 kid can live in a home at least that we know meets the
11 screening level. At least meets the screening level.
12 And, again, in another community they cleaned
13 up to 31 -- to 231 parts per million. We can document
14 this. If they can do it in that community, they can do
15 it here.
16 The major difference that we can see between
17 that community and this community is that that community
18 was 99 percent white.
19 Bonnie also -- oh, there's another thing about
20 the 10 micrograms per deciliter of lead, in blood. You
21 know, that's where they say that they have to take
22 action. There's several things you have to hear about
23 that.
24 The first is that Dr. Michael Koznet, who is
25 our consultant that we have paid considerable money to

1 through the Tie grant to be able to help us, has said
2 that increasingly -- oh, and he's a national and
3 international renowned expert on arsenic and knows a lot
4 about lead because that is also one of the areas of his
5 expertise -- he says that we've been going along
6 thinking that 10 micrograms per deciliter is where, you
7 know, you know the kids are going to start having
8 problems like learning disabilities, central nervous
9 system damage, that kind of stuff, but that more recent
10 data, more recent studies, are showing that this could
11 be as low as five micrograms per deciliter.
12 And so, once again, instead of waiting 10 or
13 15 years to find out that five micrograms per deciliter
14 is now the place that kids really start getting ill,
15 that clean it up to 400 and you don't have to worry
16 about it and wait for 15 years to find out that 10's too
17 high.
18 The other thing is that, you know, some people
19 have been going around asking for cleaning up more
20 houses. Well, you bet, that some people is us.
21 And the only people we represent is you and
22 the only thing we want to do is get the best possible
23 cleanup for you that we can.
24 And so Bonnie talks about several sources.
25 Indoor paint. Possible? Absolutely. Because some of

1 these houses are real old and so they are likely to have
2 deteriorating lead paint. Will they clean it up? The
3 simple answer is no. No, folks. They can refer, they
4 can call, they can send you to somebody else, but are
5 they going to clean it up? No. And they can't. EPA
6 guidelines for this surplus Superfund site say they
7 can't clean it up so no is the answer.
8 External paint, can they clean it up? Maybe
9 yes, maybe no, we're never sure. Bonnie was never able
10 to say. And I am not putting Bonnie down, okay. Bonnie
11 has her own guidelines. But we need to state it clearly
12 and in simple language. Bonnie has never been able to
13 say in a community meeting that they will clean up
14 lead-based paint. And, in fact, she didn't say that
15 today and in fact we don't think we're ever going to
16 hear her say they can clean up external lead-based
17 paint.
18 The other day at a meeting at Swansea she
19 mentioned tap water. Well, our tap water's safe.
20 There's no lead in our tap water. It could be that some
21 of the older homes have lead pipes. But EPA can't clean
22 up lead pipes. And so the answer is, if there's any
23 lead getting in the pipes, they can't do anything about
24 it.
25 What can they do something about? One thing:

1 soil. That's the only thing they can actually remove,
2 change, fix, make better, is soil. So we're demanding
3 400 parts per million because it's the lowest -- we
4 thought it was the lowest we could get. Now we hear
5 someplace else got cleaned up to 238 parts per million.
6 But we set our proposal at 400, understanding the
7 screening levels, and, gosh, under the screening level
8 they really weren't going to take any action. Well,
9 obviously that isn't true because it happened. But that
10 is our proposal.
11 The next issue to deal with is the issue of
12 arsenic. And, again, let's be very clear. The type of
13 arsenic we have is arsenic trioxide. It is the exact
14 same type of arsenic that was found at -- in Globeville
15 from the contamination due to the Asarco plant.
16 In Globeville, they cleaned up arsenic -- I've
17 been saying 70, recently someone said to me it was 78
18 parts per million. So they cleaned up arsenic at 178
19 parts per million. The first proposal the EPA offered
20 for cleanup here was 240 parts per million. And we
21 said, What the heck is that? That's, you know, almost
22 three times as much you're going to leave.
23 And then comments came back from the Agency
24 for Toxic Substances and Disease Registry, comments came
25 back from Colorado Department of Public Health, and they

1 lowered it to 128 parts per million.
2 But let's be clear. If they cleaned up at 78
3 parts per million in Globeville, they're leaving 50
4 parts per million more arsenic in our yards. And I have
5 to say this, too, that this goes hand in hand with other
6 information we learned, which is that the cancer rates
7 for pancreatic cancer, lung cancer and breast cancer, at
8 least in Swansea/Elyria are double and even triple what
9 we could expect in a population this size. You know,
10 there's serious stuff here.
11 So all we're trying to say is if you clean it
12 up in Globeville, clean it up here. If you can clean up
13 231 parts per million in Eureka Falls, do it here. If
14 you can clean up every house over 400 and not just the
15 houses where kids are, do it here. We count.
16 Now, the other thing is that one assertion
17 that EPA has made is they can't say it's all the soil.
18 That there are other contributing factors that are a
19 major source -- that's a quote -- a major source of
20 lead.
21 Well, if it's external based paint is a major
22 source, we don't know it, because as far as we know --
23 and I'm glad to be corrected if I'm wrong -- they only
24 tested 30 houses out of 4,500. That's not good science,
25 folks. They haven't been called statistically

1 significant, which means you have to test enough houses
2 to really determine a pattern and decide an outcome.
3 Well, they didn't. And so if they can clean up the
4 lead-based paint and that is on the outside of houses,
5 and -- and, again, we're not clear about that because
6 they never said they could, they never said they
7 couldn't. But if they can, they need to. They need to
8 clean up the lead-based paint.
9 Also about arsenic, Anthony Thomas is one of
10 our members, did some really good research, and he just
11 gave me the results of that research. And this is
12 around arsenic. There's a place Bonneville Power
13 Administration of Ross Complex in Washington. This
14 obviously is an industrial site. Arsenic is cleaned up
15 to a level of 32 parts per million. This is an
16 industrial site. PAD Oil and Chemical Service in
17 Louisiana, an industrial site, arsenic is cleaned up to
18 10 parts per million. Ellis property in New Jersey, an
19 industrial site, arsenic was cleaned up to 20 parts per
20 million.
21 We get offered 128. We have to ask, What's
22 going on here? What's going on here? And that's our
23 job is to do that. We've done that all along the way
24 and we're doing it again today.
25 Now we get to the community education program.

1 Well, the community education program, as we sat in
2 those meetings, was proposed to do community education,
3 to change people's behavior for those folks that had 540
4 parts per million or less of arsenic in their yards.
5 And it's proposed in the cleanup plan that they're
6 asking us to support.
7 Well, we had a meeting with them and we asked,
8 Tell us about this community health education program.
9 What does it look like? How does it work? And they
10 said to us, Well, it's not designed yet. They have
11 goals, but it's not designed yet. That's a little bit
12 of a pig in the poke.
13 Are we going to stand up and say, yeah, we're
14 going to support this, but golly, we don't really know
15 what it is? And so we offered to help. We said, Well,
16 we'll design it. And we're told, no, that they thought
17 they were going to be working with the consultant out of
18 Boulder who would design it. But we could have some
19 input.
20 Our question, of course, is: Based on the
21 fact that there is a thing called environmental justice,
22 which addresses an absolutely clear amount of
23 environmental waste system, we said to ourselves, what
24 does a consulting firm from Boulder know about working
25 class, low-income communities who are predominantly

1 people of color? I don't know. But we felt like we
2 could help. We felt like we could make a difference on
3 how to design that. So I am not going to say anybody's
4 doing anything, you know, deliberately, I won't make any
5 accusations, but I can tell you the facts, they can
6 clean up to 231 parts per million in Eureka Falls, they
7 can clean up here. They can clean up to 20 parts per
8 million in industrial areas in New Jersey, they can
9 clean up here. If they can remove lead paint, they
10 should be removing the lead paint.
11 And please understand, there is nothing they
12 can or will do, other than refer you, which anybody
13 could do. I mean, you've got lead paint, you could call
14 up the Colorado Department of Health, you could call up
15 the Cross Community Coalition and we will refer you.
16 They didn't say they're giving money to these folks to
17 clean up your houses. In fact, at least one of these
18 organizations, what they'll do is come into a home with
19 lead-based paint and if they can confirm that there's
20 lead-based paint, they will help you to take out a loan
21 to clean it.
22 Well, we know a lot of the folks that are
23 living in these older houses, they're poor. They can't
24 afford a loan to clean up the lead-based paint.
25 So we need to hold them to what they can do.

1 What they can do within Superfund is they can clean up
2 and we know they've cleaned up to at least 231. They
3 can clean up the arsenic and we know that in Globeville
4 that was at least 78 parts per million.
5 And they can do health education during the
6 period of time that the cleanup is taking place.
7 Because cleanup can take years. I mean, they're still
8 cleaning up Globeville, right? And we won that suit in
9 1992. It's 10 years.
10 And so it's not that we don't want health
11 education, because in the meetings they said, you
12 know -- how long will you be here? 10, 20, 30 years.
13 Well, we don't believe EPA's going to be here 30 years
14 for now. That's not even reasonable.
15 The other piece is that, well, okay, you'll be
16 here 30 years, but this lead and arsenic could have been
17 here 200 years and it could be here 200 years after you
18 leave. So 30 years is not the answer.
19 What is the answer is that during the period
20 of time that there's cleanup, because if your house is
21 like on the last part of it, you could wait six, seven,
22 eight, 10 years. And so you better have good education
23 about how to protect your family and yourself until they
24 actually get to your house to clean it up.
25 That's who we are. That's what we do. We

1 don't get paid. And certainly we don't get any glory.
2 In fact, we get put down, you know, kind of quite a bit.
3 And so it's hard for me even to stand up here and do
4 this. You know, we don't have the slick slide shows, we
5 don't have the rest of it. All we have is our really
6 truly commitment to our families, first. I have four
7 generations in Swansea, my mom, two of my sons, and two
8 of my grandchildren, tied to the health of our
9 community.
10 And so whatever I'm doing up here, it
11 certainly isn't self-promoting, folks. Whatever I'm
12 doing up here on behalf of us, every step of the way
13 it's about you, it's been about your family, it's been
14 about families of children that don't live here yet.
15 We ask you, please, if you make a comment that
16 you come up here and support CEASE's proposal. If you
17 don't make a comment today, please make a comment by
18 July the 19th. Please make a comment. If EPA does not
19 hear from you, they will act without your input. And if
20 they don't hear from lots of us, it very well may be
21 that the proposal that is before you today will go
22 forward. And I hope you understand how at least -- we
23 do not believe that it is in the best interests of this
24 community. Thank you very much.
25 MS. KELLEN: Thank you, Lorraine. And now

1 we're going to move into the general comment period, and
2 we have quite a few people who have signed up. So we're
3 going to start at the top of the list and go through it.
4 And I'm going to have to limit you to two minutes, if
5 you can do that.
6 So I have someone who's going to hold up a
7 sign saying, Thank you, at the end of two minutes. So
8 if you could try to wrap it up quickly, then. I
9 apologize for having to do this, but we do want to have
10 time to get everyone in here and maybe have a little
11 time left in case some stragglers want to get a comment.
12 And remember, the comments cards, if you're
13 unable to stand up and talk, you can fill out one of
14 these and leave it right here, you don't even have to
15 mail it, and your comment will be taken.
16 Let me find the list. The first name on the
17 list, I believe, is Marilyn -- Starnes? I'm not getting
18 this right. It's --
19 MS. MARILYN STARNES: That's me.
20 MS. KELLEN: I'm way off, then.
21 MS. MARILYN STARNES: My name on the paper is
22 Marilyn, but you know me, and my friends know me as
23 Akwe, and Starnes, for the record, because I think you
24 had on there Akwe Starmis, but it's Starnes, so S T A R
25 N E S.

1 And I want to go back to the chart that was
2 put up by Bonnie, and just want everybody to see that
3 what is circled up there is what the State is doing,
4 what the City of Denver is doing, and what Northeast
5 Denver Housing is doing. You see nowhere on that chart
6 what EPA will do. The comment that I heard her make was
7 what they can do. I want you to pay attention to that.
8 Also, I want you to know that I came into this
9 process about three months ago when the meetings started
10 at Swansea, and I was looking for information and glad
11 to hear that meetings were forthcoming. I had heard
12 about the process in 1999 in an article written in the
13 Rocky Mountain News and did some of my own
14 investigation.
15 I called Atlanta, Georgia, and was sent a
16 toxicology report, a very thick book. I had my blood
17 tested. And I heard nothing more about it. So I was
18 really glad to hear about it.
19 And, furthermore, I was glad to meet the
20 people that are sitting to my left. And I can say that
21 I have not got anywhere wet as they have in the struggle
22 to look after the rest of us. And I wanted to refer to
23 something else that was said today, that kind of got me.
24 And that is, that in reference to the arsenic, that we
25 don't need an environmental response. I think that's

1 rather insulting, because it's always been assumed that
2 all we need is information and that we could be
3 placated. And I want it to be made very clear that we
4 cannot be placated with information anymore. That we do
5 need an environmental response.
6 Another information -- I have to look over
7 here. Take off my glasses, because I'm over 50 now and
8 I can't see very well.
9 I had something else to say, but I can't quite
10 remember what it was. But I do want to say that another
11 issue that I have is that the boundaries have been set
12 right at Martin Luther King Avenue and I want to know
13 why they haven't been extended to Whitney or other areas
14 if, in fact, the arsenic levels have not been found to
15 end at a certain area, you know, that they should be
16 extended.
17 That's about it for now. Thank you.
18 MS. KELLEN: Thank you very much. And if you
19 do think of that comment, if you could write it down,
20 that would be great.
21 Joan Hooker.
22 MS. JOAN HOOKER: I'm Joan Hooker from Clayton
23 neighborhood, and the neighborhood representative, and
24 I'm also with CEASE.
25 Had it not been for Lorraine, we would not --

1 I would not be aware of what's going on. And I really
2 am very thankful for being a part of her group.
3 I'm also -- on my block, I'm block captain,
4 and I have 40 children. We've had a lot of information
5 for over three years and I've gotten good cooperation
6 from the families trying to get them involved in
7 everything the EPA was doing. They also are taking a
8 big part in the CU Health Plan.
9 One of the projects that we did, trying to
10 protect them until something is done, is a hygiene
11 package that we gave to all the families so that the
12 children know that they must wash their hands and take
13 care of their bodies, shampoo their hair, do all these
14 things, in order to keep some of the arsenic and lead
15 maybe out of their beds and hair and whatnot, until a --
16 something is actually done and we really have correct
17 findings.
18 It worked out quite well; everyone's
19 cooperating. All the older adults are very cooperative
20 and we're waiting for an EPA evaluation on what they're
21 going to do.
22 In the meanwhile, five of my children that are
23 in the CU plan came to the house and said, Mrs. Hooker,
24 we've been working with you for three years and we're
25 getting tired. We have worked every summer. Now summer

1 is here again and it's time to have fun.
2 And so they would like for someone to help
3 them have fun. So they would like to go to Elitch's,
4 they would like stories, they would like anything that
5 someone could do for them to keep their mind off of the
6 dirty soil.
7 So all the plans that we have done and all the
8 work that we have done have come from other foundations,
9 and we would like for EPA and CU, whatever, wherever the
10 money is, to help children have some fun for the summer
11 as well as clean up.
12 And that's, I think, about it. Thank you.
13 MS. KELLEN: Thank you, Joan.
14 Anthony Thomas.
15 MR. ANTHONY THOMAS: Thank you. My name is
16 Anthony Thomas. I've been working with the EPA work
17 group and with CEASE now for three years. I believe
18 there's been a few things this morning that was said by
19 the EPA representative that may be -- may have given you
20 some false impressions.
21 First thing she was talking about the children
22 with the blood-lead. EPA have no idea how many children
23 may have blood -- may have elevated blood levels,
24 because testing just started a few weeks ago.
25 As you also have been told, this is an

1 environmental justice site, and I think that Region 8
2 feels that environmental justice is giving us the -- a
3 part in the working -- in the working group that is
4 giving us a little bit of say-so or let us think we have
5 say-so.
6 But that's nothing. That is mandated by the
7 Executive Order 12898, signed into law in 1994 by then
8 President William Clinton. They're giving us nothing.
9 The EPA also did not mention about the work
10 group. There's a group that sits at that table who are
11 Asarco, their representatives, their attorneys. Nobody
12 mentioned that they're sitting there. And until this
13 day, I still don't know why if they're not -- if they're
14 not going to be named as the responsible party. They're
15 the one who contaminated Globeville. And I believe
16 they're the one who contaminated us.
17 Yes, I received a letter, and so did other
18 members of the CEASE, saying that Asarco feels that we
19 contaminated ourselves with pesticides. Come on, man,
20 give us a break.
21 I also feel that EPA does not know what
22 environmental justice is because I personally have been
23 insulted in a working group meeting by one of EPA's top
24 scientists, that was Dr. Chris Weis. In it, which we
25 were sitting there in a group, and he picks on me, and

1 asks me do I know about the atom? I said, yeah. He
2 said all right, explain it. I explained to him about
3 the atom.
4 I asked, Do you want me to explain how the
5 atom is split and what happens? He says, Yes. I did
6 that.
7 After I made my comment, he said, well, we got
8 an Einstein in the group -- a junior Einstein. If
9 that's not an insult, and I personally think it was a
10 racial insult.
11 Thank you.
12 MS. KELLEN: Thank you, Anthony.
13 A quick reminder, I know some people had asked
14 for a copy of the proposed plan and we had run out of
15 versions in English and if you would like a copy sent to
16 you, you can sign up and we will mail them to you. We
17 do still have Spanish versions available. I put the
18 note on my water bottle. I finally read it.
19 Sara Douglas. Sara. Sandra. At the
20 microphone, please.
21 MS. SARA DOUGLAS: Hi, my name is Sara
22 Douglas, and I work at Youth Energy, a division of Youth
23 Biz.
24 And I'm here today to talk to you about the
25 soil that is contaminated in the Cole neighborhood and

1 the lead that is also in the soil. Adults, I'm just
2 asking you, if you live in the Cole neighborhood, would
3 you want your child playing in the soil and give -- get
4 very sick? I don't think you would.
5 So I'm just asking you to clean the soil until
6 you think that the children in the Cole neighborhood is
7 safe.
8 Thank you.
9 MS. KELLEN: Thank you very much. Our youth
10 in action. Thank you.
11 Loralie Cole. And, please, forgive my
12 mispronunciations.
13 MS. LORALIE COLE: That was right.
14 I'm Loralie Cole. I live down Lafayette a
15 couple of blocks and I'm also a teacher at Maria
16 Mitchell Elementary on Martin Luther King and Marion.
17 And I first want to say I'm very appreciative
18 of the work that people have done to go into this,
19 especially Lorraine. And I think that this process has
20 really allowed for the residents to have a lot of input
21 and I really thank you for that.
22 I next want to say that I don't agree with the
23 EPA's proposed plan as it currently is. And part of
24 that reason is my property soil is at 454 parts per
25 million for lead, so I fall into that abyss of it's

1 above the screening level but below the proposed
2 cleanup.
3 And if someone comes to my house -- I don't
4 currently have children under six, but my neighbors are
5 at my house three or four days a week and they're
6 playing with my pets that have just rolled in my dirt,
7 and they're running through my sprinkler and they're
8 helping me plant. And I have children under six who
9 come to my house, and that's going to get missed and
10 it's not going to get cleaned up.
11 And one of the questions that I have -- one
12 thing I want to have added, I don't know if there can be
13 amendments to the proposals or not, but as a teacher, I
14 would like to see the EPA do everything that they can to
15 require -- or have mandatory testing for children who
16 display, at the very least, any behavioral or learning
17 disorders at all grade levels. And if possible, test
18 every child at every school and see what -- what is
19 really going on.
20 I would also like to know, with all the trucks
21 that are going to be going through our neighborhood, for
22 anyone who's lived around construction, what's going to
23 be done for, like, street repairs and things like that
24 afterwards and who's going to cover that and how long is
25 that going to take? And I don't know if it's possible,

1 if you take suggestions, but I'm wondering if -- I know
2 that the proposal is to clean 12 inches of soil from the
3 yards that are contaminated. Is it possible to clean --
4 one of the statements in the proposal also said that
5 after 2 inches, the contamination drops significantly,
6 so why are we cleaning 12 inches? Is it possible to
7 clean 6 inches from contaminated yards and then clean
8 twice as many yards for the same amount of work and, you
9 know -- anyway, that would be something that I would ask
10 them to look at.
11 And if possible, if they don't clean up to the
12 screening level of 400 parts per million, is there a way
13 to provide grants for people to get reimbursed if they
14 choose to remove the -- their own soil and get clean
15 soil, because I would not feel comfortable knowing how
16 much lead is in my soil if I don't get it cleaned up.
17 If I wanted to do myself, is there a way that I can get
18 a grant or someone else to reimburse or pay for
19 something like that to happen, because I feel that it
20 should happen.
21 Thank you.
22 MS. KELLEN: Thank you very much.
23 I've had a request from someone who has to
24 leave and asked if they could move up on the list. Do I
25 have any objections?

1 Thank you.
2 Debra Johnson.
3 MS. DEBRA JOHNSON: Good morning. There's
4 always one in the bunch that has to leave, but I'm a
5 native Coloradoan. I went to elementary school here at
6 Mitchell, Columbine, graduated from Manual, I'm now a
7 property manager in the area in the Cole neighborhood,
8 and I've received what I consider to be a blessing from
9 God. I have an almost two-year-old baby now, and in
10 layman terms for me and maybe some of you that are here
11 this morning, if it's not one thing, it's another, okay?
12 We've been bombarded with the crack and the
13 drugs and everything else that's out there. And that's
14 my job, to raise her and protect her from those things,
15 and believe me, I'll do my best to do all of that. But
16 now she can't play in the dirt. She's looking forward
17 to playing in the dirt. It's her turn to play in the
18 dirt. And I want as much done as soon as possible. I
19 want it all out. I want my baby to play in the dirt. I
20 want her to continue to be as bright and as healthy as
21 she is. Right now she's vibrant and I want her to
22 remain that way.
23 I want her bones strong. And this may all
24 sound very personal, but we should all take it just that
25 way. It's a very personal thing for all of us.

1 I heard a statement that shame is a great
2 teacher. Let's fire this teacher, let's not be under
3 that, and get this thing done.
4 MS. KELLEN: Thank you.
5 Terry Smith.
6 MR. TERRY SMITH: Hi, everyone. My name is
7 Terry Smith, and I work at Youth Wise, a division of
8 Youth Biz. We're basically a community oriented
9 organization. We do 77 hours, which we go and we clean
10 up other alleys, we pass out free bread every Tuesday,
11 and just wanted to say that, EPA, I really think that if
12 they could clean up like other places in Utah to like
13 200, I believe that they should clean below 100, because
14 I think that makes me feel comfortable to go outside and
15 play with my friends.
16 So I just wanted to say that. Thank you.
17 MS. KELLEN: Thank you. Tafari Lumumba.
18 MR. TAFARI LUMUMBA: Good morning, and buenos
19 dias. My name is Tafari Lumumba, and I'm the youth
20 coordinator of the Clayton Neighborhood Association's
21 youth education and leadership community. I'm 18 years
22 old and I'm very concerned, very concerned, about the
23 environmental issue affecting our community today.
24 And the Clayton Neighborhood Association, in
25 response to the EPA's proposed plan for a community

1 health program, I would like to invite all members of
2 the community to a steering committee to support the
3 education of families, churches, schools, and all
4 members of the community by creating a cultural approach
5 to learning, a cultural approach to environmental
6 education in communities of color within this Superfund
7 site. We would like to meet July 13th, 2002. Once
8 again that's July 13th, 1:00 p.m., at 3840 York Street.
9 That's 3840 York Street. You can talk to me, or
10 Ms. Hooker, if you'd like to get more details about the
11 meeting.
12 Thank you.
13 MS. KELLEN: Thank you. Thank you very much.
14 Sandra Douglas. That would be Sandy Douglas.
15 MS. SANDRA DOUGLAS: Good morning, I'm Sandra Douglas,
16 Sandy Douglas. I'm the vice president of the Cole
17 Neighborhood Association and I have been in Cole for
18 about 15 years. I've raised two sons in Cole, I have
19 six grandbabies, I think. Three or four of them are
20 here. My son is here, my daughter-in-law is here.
21 They need to know more about this, because
22 even though I raised my sons here, I have my grandbabies
23 here now. I have two or three grandbabies at my house
24 every day in the week. I need to make sure the soil is
25 clean, is safe. I'm not a scientist, so I can't say 400

1 versus 540, but just looking at Commonsense 101 tells me
2 if you're digging into the soil, if the soil -- if
3 you're trying to dig up all of the contamination from
4 the soil, then you need to go as far as you can go.
5 And since they're already working in the
6 neighborhoods, why not go 400 versus 540? And -- oh, I
7 had another thought. The difference from what I
8 understand -- and I might not be correct on this -- is
9 200 homes. So, if it only means that we clean up 200
10 extra homes, this means that probably we will save at
11 least 400 children. Isn't that worth it? It's worth
12 going 400 if we only save one family. So if you can
13 clean it up, clean it up. As Sara said, clean it up so
14 that we can feel safe. Because you can never explain to
15 us 400 versus 540. We can't understand those numbers,
16 but we do understand, Folks, we're going to clean this
17 up until we're comfortable. And that's all we want.
18 Thank you.
19 MS. KELLEN: Thank you.
20 Linda Younger-Qualls.
21 MS. LINDA YOUNGER-QUALLS: Hi, my name is
22 Linda Younger-Qualls, and I live in the Cole
23 neighborhood.
24 This is actually my second meeting that I've
25 attended. And one of the first things that really

1 struck me when I attended the first one, first of all,
2 was that there was a term used as environmental justice.
3 And basically environmental justice is another term for
4 a conscience; for people doing what's -- what's morally
5 right, you know. And, you know, I thought about some of
6 the people that work for the EPA and thought about, you
7 know, them and if they have families and for them to put
8 themselves in our situation.
9 Another thing that struck me was that, I mean,
10 I listened to, I think it was, Mrs. Hooker. She spoke
11 at the last meeting. And she was saying that her
12 children don't want to bring their grandchildren around,
13 you know, her anymore because they're concerned about
14 them playing in the soil, you know. We've got to be
15 concerned about the kids, you know, that live and play
16 in this soil in our communities now, you know.
17 And then we've got to be concerned, if we
18 decide to stay in these neighborhoods, about our
19 grandchildren, you know, that are going to be coming and
20 staying in the neighborhoods.
21 I think that, you know, with a lot of our --
22 with the people in our communities, we're not really
23 educated enough to know, you know, when we really should
24 be screaming and hollering and jumping up and down.
25 We should be screaming, hollering and jumping

1 up and down. We really should. Because for one thing,
2 the city council should be attending these meetings. We
3 should be contacting the Congressmen to let them know
4 what's going on in the community, because, actually,
5 that's what gets things done.
6 When you contact these people and you stay on
7 them and stay on them and you ride them -- and I know,
8 because I've fought and I'm tired. You know, after you
9 fought all the crack houses and, you know, all of the
10 major things that we're concerned with in our
11 communities, it wears you out. It really does. I
12 understand that.
13 But, you know, when you're thinking about
14 something as personal as your children and your
15 grandchildren's health, you know, and something that,
16 you know, you can actually do something about, you know,
17 then you should. Everybody should be screaming and
18 hollering.
19 And I really want to compliment the CEASE task
20 force because, you know, I mean, they've worked really
21 hard. You can tell. I mean, they're educated, you
22 know, they know all of their statistics, you know, and
23 they can quote them just as well as the people can from
24 the EPA, you know. And, I mean, that's rare.
25 So I think that we really need to applaud you

1 guys, and I personally want to thank you for that. And
2 I just really want to say that -- another thing that
3 really bothered me was that one of the ladies got up and
4 said that the EPA asked that -- or they said, yeah,
5 okay, we might possibly test another hundred homes, but
6 we take money from the health and education fund. We
7 ought to be screaming and hollering. That is -- that is
8 such an insult, you know, for the people in this
9 neighborhood, to say, okay, well, we'll take a little
10 less of your education to help you on your health
11 issues. That's ridiculous, you know.
12 So we really should be in support -- everybody
13 ought to be in support of at least -- they're talking
14 about, what, 100 to 200 homes additionally if they go
15 down to 400 parts per million? You know, I think that
16 the EPA needs to rethink this whole thing, you know. I
17 do.
18 Thank you.
19 MS. KELLEN: Thank you very much.
20 I just want to let you know, too, that there
21 are some representatives from some of your elected
22 officials here. I know there's a representative from
23 Congresswoman DeGette's office, and if there's anyone
24 else here who's representing a represented official or
25 an elected official, please -- representing a

1 representative official, that's -- if there's anyone
2 else here, please let us know so that the community
3 knows you're here.
4 MR. ANTHONY THOMAS: Representatives from
5 Allard's office was here.
6 MS. LORRAINE GRANADO: Yeah, Dick Poole just
7 left.
8 I do want to let you know, we have done
9 everything working again together, we've tried as much
10 as we can to work together with the EPA. ATSDR, all
11 those folks, together. When we did these poster
12 sessions, some of you probably heard of them, we did do
13 a briefing for the elected officials, and credit where
14 credit is due, Chris from Diana DeGette's office has
15 been virtually almost at every single meeting. Diana
16 has been very supportive.
17 Councilwoman Debbie Ortega and Councilwoman
18 Elbra Wedgeworth have both been very supportive. They
19 need to speak for themselves so I'm not going to say to
20 you -- speak on behalf of them, but they certainly have
21 been supportive, stood with us, and we have tried to do
22 our best to make sure our elected officials are informed
23 and involved as they could be.
24 Some, like Chris from Diane DeGette's office,
25 has been there just about as much as we have, and then

1 Dick Poole from Senator Allard's office, who has come to
2 several meetings and has responded to requests, so we
3 should really appreciate that they're doing that.
4 MS. KELLEN: Thank you.
5 MS. LORRAINE GRANADO: The mayor has been
6 nonresponsive.
7 MS. KELLEN: Amalio Rayan? Amalio? Am I
8 screwing up the name so badly or did we -- how about
9 Thom Foster.
10 MR. THOM FOSTER: My name is Thom Foster, I'm
11 a long-time resident and activist in this community, and
12 I'm glad to see so many of my friends out.
13 One of the things I think that we all are
14 hearing and hearing, that EPA is not necessarily
15 operating in our best interest. And I'm saying that
16 from listening to not only what's happening here in our
17 neighborhood -- recently a documentary was done on
18 Anderson, Alabama, and to hear what those folks in
19 Alabama have to say about EPA and the problems that they
20 have, really reflects on some of the issues that I think
21 are so political at this point, we don't even truly
22 understand the dynamics of all that's taking place.
23 But I do think that for one thing for sure,
24 we're going to have to pull together as a neighborhood
25 or neighborhoods. This is a very big issue.

1 Now, my wife died of breast cancer in '97 and
2 I lived in the 3300 block of Gaylord. I never had her
3 -- an autopsy done on the body, but there may be a
4 correlation between her breast cancer and her death and
5 her loving to work in the soil. We never tested the
6 soil.
7 So I'm saying, we are dealing with a
8 life-and-death issue, whether we're talking about those
9 of us who have children or grandchildren, or those of us
10 who like to have vegetables or flowers in the garden.
11 So what I'm saying to us, I know that some of
12 you are talking about 400, some are saying 200, the
13 young man said 100. My thinking is that whatever the
14 lowest level we can get, we should fight for. Because
15 at this point, we do not know what's going to be a
16 safety factor 10 years from now. They may come out and
17 say it should be only five parts per million.
18 So at this point, we all are learning, so --
19 but I do think that as citizens and community folks, we
20 need to spread the word to our neighbors and make sure
21 that all of our children, the residence we live in,
22 whether we rent or whether we own, we need to get tested
23 and come together on this.
24 And if we have to sue EPA -- I'm saying it --
25 if we have to sue EPA, it's worth fighting for.

1 Thank you.
2 MS. KELLEN: Thank you. Next is R.S. Iacca.
3 How badly did I do? Still here? R.S.? No?
4 I'm going to let Anthony Thomas take -- he
5 wanted another 15 seconds or -- you could probably have
6 30 seconds if you really . . .
7 MR. ANTHONY THOMAS: I'd like to also say that
8 I am also the president of the Clayton Neighborhood
9 Association, and I would like to again invite everyone
10 here to the meeting that Clayton is going to have
11 because, number one, we don't want the EPA to get some
12 firm out of Boulder or nowhere else to decide our health
13 plan. The environ -- the President Clinton's mandate
14 says the community, that's you and me and all of us,
15 shall have input in this. Don't let the EPA take this
16 away from us. No matter what it takes.
17 Four weeks ago I was ready to -- to walk with
18 a picket sign. If we got to walk the EPA building with
19 picket signs, I'm ready to go.
20 MS. KELLEN: Thank you. Dan Mulqueen.
21 MR. DAN MULQUEEN: I'm Dan Mulqueen. Hello?
22 Does this work?
23 My name is Dan Mulqueen, and I'd like to start
24 out by asking for an extension for the public comment
25 period of another 30 or 45 days, inasmuch as that

1 English versions of the proposed plan aren't available
2 at this time.
3 I was formerly -- two years ago I got on the
4 original mailing list for this site with Ted Fellman and
5 the EPA. I understand this morning he's no longer
6 there. And I don't know how I fell off the mailing
7 list, but I would really like the opportunity to
8 comment -- to provide comprehensive comments to the
9 proposed plan once I can see it.
10 I'd also like to take the time this morning to
11 comment on the presentation that I've just heard, which
12 is all that I know, but I'm confident -- I think I can
13 comment on some of the things I've heard.
14 I think there are issues of environmental
15 justice and equity in this community. And I think that
16 the chart that I saw on cleanup levels at various
17 communities was designed to be misleading. I think
18 there are communities that get great cleanup, but
19 they're 99 percent white.
20 I think the Environmental Protection Agency
21 has done a really good job of pointing the fingers at
22 there's a huge problem here for children, and there's
23 been a problem for maybe 50 years and they'd like to
24 leave it for another 50 years. And at the same time,
25 point their fingers at the State Health Department or

1 the City of Denver or even us for having the
2 responsibility for cleaning this up.
3 The lead standards that we have in this
4 country, that she was talking about, of 10 parts in
5 blood, have been around for about 50 years. And lead
6 industry in the '50s fought to have any leads -- against
7 having any standard of lead, and they ended up caving in
8 and agreeing to about 10.
9 Those haven't been changed, even though the
10 science has come a lot further. And the best science in
11 the world today tells us that 1 part of lead in a
12 child's blood probably costs them 10 to 15 points in IQ.
13 So if you have -- we're making stupid kids by
14 exposing them to lead in any way. I don't think this
15 plan, from what I've seen today, addresses at all
16 airborne lead and airborne arsenic that our kids can
17 receive by breathing dust. Even if they don't play in a
18 yard that's highly contaminated, the fact that the dust
19 gets stirred up and these contaminants can reach into
20 other yards and reach into window sills or reach into
21 bicycles, swimming pools, and the kids can be exposed by
22 that, I think that's something that needs to be paid
23 attention to.
24 I also think that visitors and students that
25 come to this neighborhood are completely left out in

1 this. I think kids that don't live in the house on the
2 day that they knock aren't going to be protected that
3 day or ever, and that's wrong.
4 Children and families in this neighborhood, in
5 these neighborhoods, have been exposed for over 50 years
6 to this stuff. We've waited two years to look at a
7 plan. The significant part of this plan is that they'll
8 provide us some mysterious education. Well, all the
9 education we need we can get for ourselves, and many of
10 us have. The EPA hasn't come around and told us that we
11 need to give our kids multivitamins every day,
12 especially iron, we need to feed them spinach to keep
13 their normal blood levels high so that they're not
14 uptaking this stuff out of the blood.
15 When a child shows a blood level of 10, that
16 tells us almost nothing about how much lead has already
17 been absorbed permanently into their liver, their heart,
18 and their brains. What's floating around in their blood
19 is soon going to be picked up by their organs, including
20 their brains. And it doesn't show us what's in their
21 brains. I think that's a real important thing to look
22 at.
23 I support CEASE. I support the comments of
24 the other members of the community here today, and I
25 again request an extension to give me adequate time to

1 respond to the proposed plan when I see it.
2 Thank you.
3 MS. KELLEN: Thank you.
4 Gabriela JACOBO. How bad was it?
5 MS. GABRIELA JACOBO: Kinda. Hello. Hi, my
6 name is Gabriela Jacobo, and I'm a resident of this Cole
7 neighborhood.
8 I am -- I just have a really brief comment,
9 and it's also to talk in behalf of the Latino community.
10 It is very important because most of the times we feel
11 intimidated and we don't speak. We don't speak up. I'm
12 a -- I don't have kids, and at the beginning it didn't
13 concern me a lot about the contamination about lead and
14 arsenic.
15 I have three nephews and three of them
16 normally play around just like our teacher that just
17 talked, and I will support that if you're knocking on my
18 door, you're not going to see no kids. So I'm very
19 concerned because that doesn't mean nothing. We should
20 all be equal and we need our soil cleaned.
21 I support every single resident that came up
22 and talked, and support CEASE. Lorraine, thank you very
23 much for all the work. And we need to respond and we
24 need a very fair response from EPA.
25 Thank you.

1 MS. KELLEN: Thank you. Thank you very much.
2 And just to let you know that, for the Spanish
3 speakers, we have translation services going the other
4 way. So if you want to comment, we can make that
5 happen. And we're going to have enough time, I think
6 I'm on my last name. Barry Zuberer.
7 So think about if anyone else would like to
8 come up after Barry's done.
9 MR. BARRY ZUBERER: Can you hear me? My
10 name's Barry Zuberer. I'm -- I moved into the
11 neighborhood in 1992.
12 When I moved into this neighborhood, half of
13 it was burned down. It was the worst place that I had
14 ever lived. There was graffiti from one end to the
15 other. I moved into a neighborhood that was totally
16 defeated. You talk to people about their children and
17 they say we can't touch them because of child abuse.
18 What I'm talking about is attitude and
19 ignorance. Now, there's a difference between ignorance
20 and intelligence. An example would be in 1945, they
21 blew up an atomic bomb, they had a bunch of soldiers in
22 trenches around it. And we're talking about the main
23 idea, right, the government.
24 And they had some tanks and then a little
25 farther back they had some other things and they wanted

1 to see what this bomb would do. Well, it killed
2 everybody. It took 50 years. Well, how did they know?
3 They were ignorant. And so they were intelligent enough
4 to create this bomb, but they were ignorant enough to
5 kill everybody.
6 What we got here, that what this community
7 needs to do, as they always have, is educate themselves
8 and spread the word among each other. I noticed a
9 silent message right here. If you want 202 houses
10 cleaned up, you get one truck. 403, you got four
11 trucks. But if you want to do a real good job, look at
12 all these trucks you're going to have in your
13 neighborhood. Right? Who cares?
14 What I want to say is this, when we moved into
15 the neighborhood, this was the situation. I talked to a
16 lady at Cole coalition, I came up with an idea, I said,
17 Hey, let's have a multi-cultural Christmas.
18 And what that means was each ethnic group
19 would bring to the party the dish they most celebrated
20 at Christmas. Well, first thing I heard was a couple of
21 people tell me, well, it will never work. You'll never
22 get this neighborhood to do it. Well, we went and
23 pursued it anyway. And about 2,000 people showed up
24 right here in this gymnasium, huh? I'm still touched by
25 it and I never ate so good in my life.

1 And what it demonstrated to me is this: This
2 is a good neighborhood. If they get educated, they're
3 smart, they're not stupid people. They're just ignorant
4 about a lot of things, as we all are. And if you get
5 together and decide you want to do something, you can do
6 it. People like numbers.
7 If everybody in the Cole neighborhood was in
8 here tonight, the television cameras would be in here.
9 So, it's really true that democracy works this way.
10 When everybody gets upset, the people at the top listen.
11 When nobody is upset, who cares?
12 And so I just want to encourage everyone here
13 to love their community and to talk to each other. And
14 if you want this thing cleaned up at 100 parts per
15 million you have the power to do it.
16 MS. KELLEN: Thank you. Thank you very much.
17 Juana Gonzales.
18 Un momento.
19 MS. JUANA GONZALES: (Through the interpreter)
20 I am supporting the proposed, because we're
21 not just thinking about the kids that are contaminated,
22 but also the adults, because in the last 10 years, in my
23 community, people have died due to cancer.
24 And we are also thinking about our students in
25 Cole because they are not out -- to their capacity when

1 it comes to education, because our community's very low
2 when it comes to them. I think it's prejudicial to the
3 students, also.
4 And so I would like to tell the EPA to please
5 to get on with the situation. Do it. We are very
6 interested in our community and our neighbors.
7 And I want to thank everybody that's here
8 supporting us. Thank you very much.
9 MS. KELLEN: Muchas gracias.
10 Okay. Jimmy Vayes. Jimmy.
11 MR. JIMMY VALEZ: Hello, I'm Jimmy Valez.
12 I work with the youth and service program and
13 we go around helping elderly people do a lot of things,
14 and most of the things that we do is yard work. And I
15 have kids from 12 years and up. And I mean all -- most
16 of the time, we're just cleaning up like plants and
17 stuff, so we're really getting in the dirt a lot.
18 And I'm concerned about that, because I'm --
19 all that stuff's in the dirt and I don't want to know of
20 anybody getting sick or things happen like that. And if
21 this -- I mean, if that keeps happening, you know, we
22 don't get the soil cleaned up or something and somebody
23 does have to get sick, we're going to have to stop this
24 program because -- and that way, you know, our elderly
25 people will not get the help that they need.

1 And I just hope that we can get this like
2 speeded up so we can clean up the soil faster.
3 MS. KELLEN: Thank you.
4 David King. David King.
5 MR. DAVID KING: Hi, I'm David King. And my
6 main concern is my younger siblings and my little baby
7 cousins and everything. And I don't really know too
8 much about the numbers and everything, I don't know that
9 much about it, but I do know that I care about, you
10 know, my family and myself, because I like to play
11 outside sometimes. And I just hope that we can get this
12 taken care of as quick as possible and, you know, put
13 your -- put our hearts into it so that my younger
14 siblings and everybody else's children and grandchildren
15 can play outside again and no worries.
16 Thanks.
17 MS. KELLEN: Thank you. Let me go back
18 quickly. Is Amalio Payan? Or R.S. Biacca? Did they
19 come back? Then I think there's a gentlemen here that
20 would like to say something. You.
21 MR. JUNIOUS McCONNELL: My name is Junious
22 McConnell. I live in the Clayton neighborhood.
23 MS. KELLEN: Could you say your name again.
24 MR. JUNIOUS McCONNELL: Junious McConnell, I
25 live in the Clayton neighborhood.

1 And my concern is, we're talking about what
2 we're going to do. What can we do now as homeowners, as
3 people that live in these residences, to keep the soils
4 from being this, you know, this contaminated, as they
5 are, you know, just to protect us for the present?
6 Another problem would be that our neighborhood
7 has this program instituted a long time ago and they did
8 a yard across the street from us. We thought they were
9 through. Then they come back again with all this new
10 information, so that just raises the red flag within the
11 neighbors that, what, they didn't do it right the first
12 time? Why did you come back if the program has been
13 done?
14 So there must be a problem and it must not all
15 have been remedied the first time through. So that
16 raises a concern with me. And I will go along with the
17 CEASE program to get the levels as low as possible, as
18 was done in Utah and other places.
19 And I do have children and I'm concerned, and
20 we just need to go get this done as soon as possible.
21 Thank you.
22 MS. KELLEN: Thank you.
23 MR. JEREMY SIMONS: Jeremy Simons, and I live
24 here in Cole.
25 And I'm up here for all kids who are going to

1 be coming into this neighborhood in the future. I do
2 think that the CEASE proposal is good, that we need to
3 bring the blood levels down further. There are so many,
4 like, everyone that's pointed out, there's also
5 different sources of lead, especially in lead paint.
6 And with so many different sources, we really need to
7 cut back as much as possible from each one and so we
8 need to take the lead in the soil down because the --
9 that's just going to be one less factor. There's so
10 many other factors our people have to deal with in
11 worrying about lead, whether it's in so many different
12 causes, that if we can reduce that one factor, that's
13 going to make it -- that could be the difference between
14 in a little kid being able to handle the lead in their
15 system and then -- or not -- or having too much lead
16 that's going to affect them developmentally, or in
17 school.
18 So we need to work on -- on all levels and we
19 really need to deal with the lead in the paint as well.
20 But for the EPA, they need to do their part. They need
21 to put this, you know, environmental justice into
22 action. Justice has to come down to the people and
23 we've got -- we've got to move and take it. And we can
24 do it, we just got to work together. So go Cole and go
25 Clayton, and go all the different neighborhoods.

1 MS. KELLEN: Thank you. Thank you.
2 We are out of time, but I would like to give a
3 last call -- yes.
4 MS. JAN CHAVEZ: Okay.
5 MS. KELLEN: Bear with us, please.
6 MS. JAN CHAVEZ: Okay. My name is Jan Chavez.
7 And I've been a long-time resident of the -- of this
8 area, and I have to say, I'm a bit disappointed but not
9 surprised that out of, what, 3,000 people, neighbors,
10 homes that were sampled, there's this few people. And I
11 think the reason why is because we as people think, oh,
12 another governmental thing, my voice won't be heard,
13 because we've had our hopes raised and we've been
14 disappointed so many times.
15 And I think that we, as people, feel we won't
16 be heard, as so many people said. And somebody said we
17 have to stomp our feet and get mad and be fussy and then
18 we're heard. And I think that's why there's such a poor
19 turnout today.
20 And I personally am trying really, really hard
21 not to look at the EPA representatives and put blame,
22 because I know this is your job and you're just
23 representing the governmental agency. However, if the
24 EPA went in and cleaned up the Globeville area, all
25 homes, then why is it impossible for them to -- why

1 isn't it possible for them to come and clean all the
2 homes in our area? You know, one side of the highway
3 versus the other side of the highway. And I don't think
4 it ought to be just the 200 homes that have the higher
5 lead and arsenic levels, it ought to be every home.
6 Because what Lorraine said, it's not just
7 about my house today not having any children, but
8 eventually I'll sell, and in good conscious --
9 conscienceness, I want to be able to sell it to children
10 and know that the area is clean.
11 So regardless of the levels across the board,
12 it ought to be all 3,000 homes in this area, regardless
13 to the cost, because it's about what's good for the
14 people.
15 MS. KELLEN: Thank you. Thank you.
16 And I have one more eastern who would like
17 to --
18 MS. SANDRA DOUGLAS: One last comment. I
19 appreciate your coming out and this is a great turnout,
20 guys. This is a great turnout. We have been meeting
21 for quite some time and this is the largest group we
22 have ever had. So we need to give some -- you know, we
23 did an excellent job.
24 I've been with this process since 1998, guys,
25 it's been a long haul. I belong over there at the CEASE

1 table. It's been a long haul, but we're almost at the
2 end of this piece of this process. And I believe that
3 Bonnie is going to give us 400 parts per million. I
4 just feel it, you know what I mean?
5 Okay. Thank you. And thanks for coming
6 out.
7 MS. KELLEN: Thank you very much.
8 And thank you, everyone, especially the youth
9 that were willing to stand up and talk in the microphone
10 and give us your comments. Thank you very much for
11 coming out.
12 And if you have further comments and you want
13 to write them down, please grab a card and give us your
14 comments because we really want to hear. Thank you.
15 (Proceedings concluded at 12:04 p.m.)
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1 STATE OF COLORADO)
2) REPORTER'S CERTIFICATE
3 COUNTY OF LARIMER)
4
5 I, Mary J. George, a Registered Professional
6 Reporter, Registered Merit Reporter, Certified Realtime
7 Reporter, and Notary Public within the State of
8 Colorado, do hereby certify that the foregoing is an
9 accurate transcript of the proceedings at that time.
10 In witness whereof, I have affixed my
11 signature and seal this 15th day of July, 2002.
12 My commission expires October 2, 2002.
13
14
15 _____
16 MARY J. GEORGE
Registered Professional Reporter
Certificate of Merit Holder
17 Certified Realtime Reporter
18
19
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21
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TABBED PAGE

APPENDIX M

APPENDIX M

STATEMENT OF SUPPORT FOR THE PREFERRED ALTERNATIVE

FROM THE STATE OF COLORADO

STATE OF COLORADO

Bill Owens, Governor
Douglas H. Benevento, Acting Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department
of Public Health
and Environment

January 6, 2003

Mr. Dale Vodehnal
U.S. EPA Region 8, Superfund Program
999 19th Street, Suite 500
Denver, CO 80202

Re: Vasquez Boulevard and I-70 Superfund Site, Denver, CO.
National Remedy Review Board

Dear Mr. Vodehnal:

The State of Colorado wishes to thank you for the opportunity to participate in the Remedy Review process for the Vasquez Boulevard and I-70 (VBI70) Site (Denver, CO). The state has been an active participant in the CERCLA process since the listing of the site in 1998.

The Colorado Department of Public Health and Environment (CDPHE) has been providing administrative and technical over sight at the Asarco Globe Site, which is immediately adjacent to the VBI70 site, since July 1993 when the State of Colorado and ASARCO reached a settlement to clean up the site. In December 1983, CDPHE sued ASARCO for damages to natural resources using EPA's Comprehensive Environmental Response, Compensation, and Liability Act (Superfund). Because of this suit, CDPHE and ASARCO entered into an agreement in 1987 to conduct joint studies to determine the extent and nature of the site contamination.

The CDPHE brought the VBI70 site to the U.S. EPA's attention after studies resulting from the Asarco Globe Site indicated that levels of arsenic in soils were not decreasing with distance away from the former Globeville smelter. Because of the findings in the southern portion of the Asarco Globe site, and results of a Site Investigation conducted by CDPHE at the former Omaha and Grant Smelter location, EPA decided to conduct further investigations for metals contamination in soils. These investigations culminated in placing the VBI70 site on the National Priorities List in 1998.

The state has consistently taken the position that all impacted Denver communities should receive equal protection and that the citizens in the VBI70 area deserve a cleanup that is at least as protective as the cleanup provided to residents of the Globeville neighborhood. Such a cleanup would correspond to a risk range of 3×10^{-5} to 8×10^{-5}. Based on site-specific information obtained for VBI70, this corresponds to a cleanup level for arsenic in soil that would fall between 42 ppm and 128 ppm.

The state supports selecting a more protective cleanup level than was offered in the Proposed Plan because the community has consistently expressed concern about the potential for multiple or cumulative exposures to human health or environmental hazards in their communities. The alternative before you today, while more costly, is a good investment in confronting some of the community's concerns. The new alternative will provide an extra level of protectiveness to help address specific Environmental Justice concerns, other chemical exposures in the VBI70 community, and evidence of additional cancer burden in the community, all of which indicate that this community might benefit from additional risk reduction strategies.

The state commends EPA for the thorough and scientific approach used in evaluating risk at the VBI70 site. We can be confident that this alternative significantly increases the community's comfort level and provides a sense of fairness by applying environmental protection equitably among neighbors.

We look forward to meeting with you in Denver. Please do not hesitate to call me at (303) 692-3387 if you have any questions.

Sincerely,

Jeffrey Deckler
Remedial Program Manager
Hazardous Materials
and Waste Management Division

CC: Ginny Brannon, AGO