



DEPARTMENT OF THE NAVY  
SOUTHWEST DIVISION  
NAVAL FACILITIES ENGINEERING COMMAND  
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ALAMEDA POINT  
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December 2, 2002

Ms. Anna-Marie Cook  
US EPA  
Region 9  
75 Hawthorne Street  
San Francisco, CA 94105-3901

Dear Ms. Cook:

This letter transmits the Alameda Point, Final OU-5 Remedial Investigation (RI) Report. Also transmitted are Navy responses to comments on the draft final version of this document. Comments received from regulatory agencies and the public have been addressed and/or incorporated into the Final OU-5 RI Report.

Please feel free to contact me if you have questions.

Sincerely,

RICHARD C. WEISSENBORN, P.E.  
Remedial Project Manager

Enclosures: *Operable Unit 5 Remedial Investigation Report, Alameda Point, Alameda, California*  
*DTSC Comments Draft Final Remedial Investigation Report Operable Unit 5 Alameda Point, Alameda, California*  
*Alameda Point Restoration Advisory Board OU-5 Focus Group*  
*United States Coast Guard Comments Draft Final Remedial Investigation Report, Operable Unit 5, Alameda Point, Alameda, California*  
*Comments from USEPA, Operable Unit 5 Remedial Investigation Report, Draft Final*

Copy to :  
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ENCLOSURE

FINAL OU-5 REMEDIAL INVESTIGATION REPORT

DATED 02 DECEMBER 2002

IS ENTERED IN THE DATABASE AND FILED AT  
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**DTSC COMMENTS**  
**DRAFT FINAL REMEDIAL INVESTIGATION REPORT**  
**OPERABLE UNIT 5**  
**ALAMEDA POINT, ALAMEDA, CALIFORNIA**

*Part I: Comments from Office of Military Facility (OMF)*

1. *Operable Unit 5 (OU-5) consists of three parcels, 181, 182 and 183. Investigation was done to all three parcels in 1994, 1995, 1998 and 1999. In 2001 Parcel 181 was further investigated. The risk assessment for OU-5 soil is based on the 2001 data for Parcel 181. It does not contain data from the previous investigations, i.e. 1994 through 1999. There are two problems here.*

*First, this document is entitled OU-5 remedial investigation (RI) report but does not contain any data for Parcels 182 and 183. The risk assessment addresses Parcel 181, but not Parcels 182 and 183.*

*Secondly, unlike previous investigations, the 2001 RI focused on polynuclear aromatic hydrocarbons (PAHs) and metals associated with historical industrial activities in the vicinity and the subsequent dredge and fill operation. By excluding the historical data, the OU-5 RI lacks any discussion of chemicals other than PAHs and metals and their potential impact on human health (see "Other Spills" under OMF Comment #3).*

*In our opinion, the current RI is a focused RI which covers only Parcel 181 (i.e. not Parcels 182 and 183) and is based on the PAH and metals data of 2001 investigation (i.e. not historical data of constituents other than PAHs and metals). It is not a RI for OU-5 in conventional sense.*

**Response:** The scope of the OU-5 Remedial Investigation (RI) focuses primarily on soil in Parcel 181, as described in the *Final Remedial Investigation Work Plan for Operable Unit-5, Alameda Point, Alameda, California* (RI Work Plan) and as discussed in detail in the Introduction (Section 1) of the RI Report. Soils in Parcels 182 and 183 were not included in this OU-5 RI because the BRAC Closure Team (BCT) felt that existing data in these areas adequately indicated the need for soil remediation, and the Navy had committed to soil remediation in these parcels. The initial removal action commenced during the writing of the OU-5 RI.

The scope of the OU-5 RI included the evaluation of historical data from previous investigations. These data were evaluated to form the basis for the RI design, and in discussions among the BCT prior to implementing the RI, the list of constituents of concern for the RI was developed and agreed upon. The historical soil data are, however, predominantly PAH data since petroleum contamination from historical industries has always been the main focus of investigations in this area. The evaluation of historical data, and the identification of analytical suites for additional soil sampling, is described in

the RI Work Plan for OU-5. A summary of the results of previous investigations at OU-5 is provided in Section 2.3 of the RI Report.

2. *Much of the contamination resulted from the dredge and fill operation has been mitigated by the 2002 time-critical removal action (TCRA) in which a large portion of Parcel 181 and nearly all of Parcel 182 was excavated down to 2 ft and backfilled with clean soil. Action level was 1.8 mg/kg BaP-equivalent. There are two concerns here.*

*First, some areas of OU-5 were not part of the TCRA. What is the level of contamination and associated health risks at these areas?*

*Secondly, a significant portion of the 2001 RI data used in the risk assessment, especially those within the 0-2 ft bgs interval, are associated with soil that has been excavated during the 2002 TCRA and no longer represent the current site condition. What is the level of contamination and associated health risks at these areas?*

*DTSC believes that a clear representation of the residual contamination and health risk associated with current day OU-5 is necessary for the public and the agencies to determine what final remedies would be appropriate.*

**Response:** The distribution of contaminants in soils at Parcel 181, and the associated risk assessment, is discussed in the RI Report for areas that were part of the TCRA as well as areas where the TCRA was not conducted. In the area where soils were removed during the TCRA, the risk assessment was conducted for baseline conditions (*i.e.*, prior to the removal of any soil). Contamination remaining after the TCRA is discussed in Section 5.9.6. The Navy will provide further evaluation of health risks associated with post-TCRA conditions in the Feasibility Study for OU-5. Additionally, data collected during the TCRA will be presented in the TCRA Closeout Report, currently under preparation.

3. *Soil contamination at OU-5 is believed to come from historical dredge and fill operation, on-site waste disposal, and spills and leaks (see Figure 5-1 of the RI report). Despite all the efforts documented in the RI, questions remain as to whether these contamination sources have been adequately investigated and/or mitigated and what is the health risk associated with residual contamination left on site.*

#### *Historical Dredge and Fill Operation*

*Although not part of OU-5, a portion of Parcel 179 (Miller Elementary School), Parcel 180 (Daycare Center) and Parcel 178 appear to have been filled at the same period (1887-1915) as most of the OU-5 (see Figure 2-1). What is the level of contamination and associated health risk at these parcels?*

**Response:** A screening-level evaluation of health risks related to PAHs in Parcels 179 and 180, based on supplemental soil samples collected in October 2001, is provided in Section 5.9.7 of the RI Report. The Navy has begun its internal process to secure funding to characterize and mitigate, as needed, contamination at the Miller Elementary School and the Daycare Center as independent sites.

#### On-Site Waste Disposal

*The conceptual site model (Figure 5-1) shows on-site disposal as a primary release mechanism. But little detail has been provided. It is unclear how widespread this disposal practice was and to what extent it could impact human health.*

**Response:** The available information relating to the fill events that formed the area of Alameda Island comprising OU-5 is provided in Section 2.4 of the RI Report. The reviewer is correct in noting that the details of these events are unclear. Because of uncertainties in the site conceptual model, the study design was quite spatially extensive, providing empirical data upon which to base conclusions. While the site conceptual model acknowledges that onsite disposal and leakage are possible source terms, the empirical data did not find evidence of either of these potential source terms being significant or primary. There is limited evidence of onsite disposal and/or leakage. For example the “stained area”, which may represent a spill at Mayport and Kollman Circle (discussed below), and evidence of low levels of MTBE. There is no indication of widespread waste disposal or major spills at OU-5. Additional data collected by the Coast Guard and as part of the or groundwater RI/FS related to the stained area are being considered to ensure that soil is not acting as a source to groundwater at this time.

#### Spill at Mayport and Kollmann Circle

*It appears that little data is currently available to ascertain that the historic soil stain at the present-day intersection of Mayport and Kollmann Circle has been adequately investigated and mitigated. DTSC believe this is a data gap and merits investigation.*

*We further believe the spill investigation should expand to include parameters other than polynuclear aromatic hydrocarbon (PAHs) and metals. This is because of the unknown nature of the spill. Parameters such as volatile organic chemical (VOC), semivolatile chemicals (SVOCs), and polychlorinated biphenyls (PCBs) should be considered.*

*The preliminary groundwater plume maps from the neighboring Alameda Annex study have shown that the benzene plume in the vicinity generally aligns the historical soil stain at Mayport and Kollmann Circle. It is our opinion that an understanding of the subject soil stain helps not only to assure adequate cleanup, but also to shed light on the groundwater contamination beneath OU-5 and the neighboring Annex Site.*

**Response:** The reviewer is correct that there is little information available on the nature of the soil stain or the remediation that was reportedly conducted at the time of the Parcel Evaluation Plan. Soil samples collected in the vicinity of the historic stain have not revealed noticeably higher PAH concentrations such as might be associated with a historical release of petroleum products. Indoor air samples collected by the Coast Guard and additional samples to be collected by the Navy will aid in determining if the “stained area” soil is acting as a continuing source of contaminants.

### Other Spills

*Investigation prior to the 2001 RI has found presence of methyl tertiary butyl ether (MTBE) at OU-5 suggesting a more recent fuel spill. Other analytes including endosulfan sulfate, dichlorodiphenyltrichloroethane and methoxychlor were also detected.*

*To put this historical information into perspective, please provide visual representation to help demonstrate that the distribution of these chemicals is not widespread (see first sentence of Section 2.3.2.1 of the RI report). Heterogeneity, though a problem for PAH contouring, is not expected to pose a problem for contaminants that are originated from point sources such as waste disposals and spills and leaks.*

*Also, please explain why the presence of these chemicals at OU-5 is not a health concern for the residents.*

**Response:** As discussed in Section 2.3.2 of the RI Report, the number of detections of MTBE in historical soil data were four in 43 samples in one sample interval, and two in ten samples in another. The pesticides were detected in only one or two of ten samples analyzed. With one exception, the detected concentrations were qualified as estimated because they were near the analytical limits of detection. The low number of detected values, and the uncertainty related to these values, renders the use of graphical tools to describe the distribution of contamination of little value. Additionally, the concentrations of the detected analytes were far below residential soil screening levels such as EPA Region 9 PRGs. Since the reported concentrations were less than the respective PRGs, Navy decided that graphical presentations of the data would serve no beneficial purpose.

4. *This RI report contains only limited information on groundwater contamination. It does not clearly define the nature and extent of contamination and groundwater exposure pathways were only partially evaluated (please see attached GSU comments #2).*

*The Navy explains that this RI is intended for soil operable unit only. Any groundwater information included in this report is meant to enhance the understanding of soil contamination and the risk posed by soils at OU-5. The*

*groundwater, according to the Navy, will constitute another operable unit which is to be discussed in the Remedial Investigation/Feasibility Study (RI/FS) report for the neighboring Annex site.*

*In our opinion, this RI report does not clearly convey the Navy's intent to the readers. The executive summary, report scope (Section 1.1) and summary and conclusions (Section 6) all make no such mention that this RI pertains to soil only. Groundwater appears to have received equal coverage throughout the report. Discussions on exposure pathways and risk characterization even contain sections dedicated to risk posed by groundwater (e.g. Sections 5.5.3.2, 5.9.2.2, 5.9.3.2, and 5.9.4.2). It is reasonable to say that an average reader would be hard pressed to know that this RI is for soil only and the risk discussed is risk posed by soils only.*

**Response:** Preparation of a groundwater RI/FS Report, which will address groundwater and soil gas contamination in OU-5 and within the adjoining Alameda Annex property, is underway. The document will address risk(s) associated with groundwater in the area. The approach, agreed to by the BCT, will incorporate groundwater quality and soil gas data from two politically distinct areas into a single "site" document. The "site" will be defined in terms of the extent of contamination rather than in the aforementioned political context. Text has been added to the RI to clarify the role of the GW discussions in this report, and to make clear that the Navy has decided, based on the OU-5 GW data that GW would be defined as a separate OU, and that a separate RI will be developed to address GW in this region, including the plume detected under a portion of OU-5.

5. *Section 5.5.3.2 of this RI states, "A technical memorandum prepared for Alameda point concluded that groundwater at OU-5 is not suitable as a potable drinking water supply". This is a potentially misleading statement.*

*Based on our communication with the Regional Water Quality Control Board (RWQCB), the "Proposed Groundwater Amendments to the Water Quality Control Plan" (Basin Plan) has dedesignated the shallow groundwater aquifer at Alameda Point shoreward (west) of Saratoga Street as potential drinking water source. OU-5 is located east of Saratoga Street. Therefore, the shallow water aquifer of OU-5 should be considered as a potential drinking water source unless the Navy can prove that yield is less than 200 gallons/day or total dissolved solids (TDS) is less than 3,000 mg/L. RWQCB has also cautioned that the dedesignation is only for the shallow aquifer and only as a potential drinking water source.*

**Response:** The *Determination of the Beneficial Uses of Groundwater, Alameda Point, Alameda, California* was developed over three years, with numerous revisions to the document at the request of US Environmental Protection Agency (EPA), the Regional Water Quality Control Board (Regional Board), and the Department of Toxic Substances

Control (DTSC). All three agencies concurred that the technical memorandum presented a viable definition of the beneficial uses of groundwater within Alameda Point.

The Alameda Annex property, north, east, and south of OU-5, has been exempted from Water Resources Control Board Resolution 88-63. Navy has taken the logical step of having an accepted definition of beneficial uses at Alameda Point and having groundwater in the property surrounding the subject parcels exempted from drinking water criteria serve as the basis for there not being potable use of OU-5 groundwater.

Part II: Comments from Geological Services Unit (GSU)

*The following comments are in response to comments from the Navy related to GSU's previous memorandum dated April 5, 2002.*

*GSU Comment:*

- 1. Figures 4-7 through 4-10 show the distribution of composite benzo(a)pyrene (BaP) equivalent concentrations in four separate depth intervals. BaP concentrations are posted on each map; however, the data should also be contoured to provide a better visual representation of the distribution of BaP in each depth interval. In addition, all other figures where only chemical concentrations are posted, the data should also be contoured to provide a better visual representation of the distribution of various chemicals in soil, air and groundwater.*

*Navy Response: Because of the heterogeneity of the soils and analytical results it is very difficult to contour data. We believe the best representation of the data is a point plot of the data results.*

*GSU Response Contouring of data provides a useful and valuable visual representation of the distribution chemicals in soil. Contouring of data is useful in the identification and evaluation of potential hot spots and assists in the identification of data gaps, where additional investigation may be required. All resources, including contouring of data, should be utilized in order to provide a clear visual representation of the data to DTSC as well as the public. Difficulty in contouring data, as stated by the Navy, may be an indication that identified data gaps exist and suggest additional investigation is needed. GSU also questions the presentation of Benzo(a)pyrene (BaP) equivalent concentrations in the RI Report since this evaluation is typically conducted during the risk assessment. The RI Report should determine, define and graphically present the lateral and vertical extent of each Contaminant of Potential Concern (COPC) including the lateral and vertical extent for each individual Polynuclear Aromatic Hydrocarbon (PAH). The BaP equivalent graphical information is however useful and can also be presented as supplemental information. The distribution of PAH contamination may be more closely associated with the heterogeneity of the dredge and fill material placed on the site. However, evaluation of other potential sources of contamination should be considered such as spills, waste disposal and/or other specific point source areas.*

**Response:** The Navy has carefully considered the full range of COPCs targeted in the RI. The only risk drivers identified were PAHs and arsenic. Spatial plots of BaP concentrations in each depth interval using colored dots were distributed to the agencies at the briefing on January 12, 2002. Appendix B of the RI Report contains spatial bubble plots of BaP equivalents in each depth interval and bubble plots of arsenic in the surface interval. Additional posting plots for antimony, mercury, and vanadium were also developed and presented as part of the response to earlier comments. Because of the heterogeneity of the soils and analytical results, the Navy elected not to develop contour

plots of the data. Additional factors considered by the Navy in deciding to not contour the soil data were the facts that contouring works effectively in a more fluid receiving medium such as groundwater, when illustrating the apparent distribution of contaminants from a "point" source, and previous efforts to illustrate the distribution of PAHs in the soil at OU-5, using nearest neighbor and kriging methods, resulted in predicted distributions that were not representative of those measured.

*GSU Comment:*

- 2. Section 2.2.5 states that "groundwater elevation data indicates that shallow groundwater flows to the northwest". No data was provided to support this conclusion. Appropriate groundwater gradient maps should be prepared and included in the RI Report. In addition, groundwater monitoring well construction information and copies of the boring and monitoring well completion logs should be included in the RI Report. A graphical presentation for each groundwater monitoring well should also be included which presents historical groundwater elevation data related to well screen interval and chemical concentrations detected in each groundwater monitoring well. Tabulated historical information should also be provided.*

*Navy Response: A reference has been provided for the groundwater flow direction information used in Section 2.2.5. A basewide groundwater monitoring program will be instituted in June 2002, which includes OU-5. Monitoring will include measuring the water levels quarterly and collecting analytical samples on a quarterly and semiannual basis. This information will be used to determine the groundwater gradient and flow direction, and groundwater contaminant profiles.*

*GSU Response: GSU understands that the purpose of this RI report is to evaluate groundwater as a potential exposure pathway and media of concern. GSU also understands that groundwater beneath OU-5 is considered to be suitable, or potentially suitable, for use as a municipal or domestic water supply. However, groundwater did not seem to be considered as a potential drinking water resource and exposure pathway. It is critical that the extent of groundwater contamination be completely defined during this RI Investigation and not deferred to a proposed future basewide groundwater monitoring program. The Navy states that "The extent of the VOC plume in groundwater was not well bounded to the west, south and southeast. Because only four groundwater samples were recovered from the bottom sampling interval, the VOC plume is not bounded in depth". A complete evaluation of the nature and extent of groundwater contamination should be conducted. In addition, a fate and transport evaluation should be conducted to evaluate potential future migration of contaminants onto OU-5 from offsite areas that may change future exposure pathway concentrations. As stated in GSU's initial comment, appropriate groundwater gradient maps should be prepared and included in the RI Report. In addition, groundwater monitoring well construction information and copies of the boring and monitoring well completion logs should be included in the RI Report. A graphical presentation for each groundwater monitoring well should also be included which presents historical groundwater elevation data related to well screen*

*interval and chemical concentrations detected in each groundwater monitoring well. Tabulated historical information should also be provided. If the purpose and intent of this RI Report is to only evaluate soil exposure pathways than it should be clearly stated in the RI Report and references to groundwater characterization should be removed.*

**Response:** Groundwater was considered in the OU-5 RI Report as a potential exposure medium through dermal contact and inhalation of vapors emanating from the subsurface to the atmosphere. The ingestion pathway was not considered because of the previously approved beneficial use technical memorandum discussed above. The Groundwater RI/FS Report will include groundwater ingestion as a potential exposure pathway. The lack of complete definition of the groundwater contaminant plume at OU-5 will not be "...deferred to a proposed future basewide groundwater monitoring program." The monitoring program will be used in lieu of fate and transport modeling, based on the premise that an encircled groundwater contaminant plume moves in directions that are readily measured rather than estimated from mathematical projections. The requested historical groundwater quality data has been summarized in the Draft Basewide Groundwater Monitoring Work Plan, reviewed by DTSC, EPA, and the Regional Board. Each quarterly monitoring report will include analytical results, logs of wells installed during the relevant quarter, and water level data. One quarterly report will be submitted annually for agency review and comment.

#### *GSU Comment*

- 3. Section 4.5, Spatial Distribution of Chemicals in Soil Gas states "These low soil gas concentrations indicate that little volatilization of benzene and naphthalene from groundwater to the vadose zone is occurring."*

*It is unclear from the discussion in Section 3.4.3.2, Soil Gas Activities, if the Suma canisters were equipped with a regulator that allowed retrieval of soil gas under a constant low-flow rate. If flow regulators were not used, the laboratory results may not accurately represent subsurface conditions. It is also GSU's opinion that there is insufficient information to conclude that little volatilization of benzene and naphthalene from groundwater occurs. The spatial distribution of soil gas sample locations is limited and an evaluation of subsurface utility corridors has not been conducted in order to determine if the utility corridors may act as preferential pathways for soil gas migration. Comparison of subsurface geologic conditions with soil gas data should be conducted to determine data gap areas that identifies additional soil gas and subsurface stratigraphic investigation areas.*

**Response:** Text discussion has been changed to reflect that there seems to be little volatilization of benzene and other VOC to soil. The VOCs were reportedly present at higher concentrations in groundwater samples collected from the 16 to 20 foot depth interval. Contaminant concentrations in groundwater samples collected from more shallow depths were less than those reported for samples from the 16 to 20 foot depth interval. Since the higher groundwater concentrations were present at greater depths,

one would not expect to have high soil gas concentrations in the 2 foot and 5 to 7 foot intervals that were sampled. The soil gas results are consistent with this line of thinking.

Additionally, five soil gas wells have been installed as part of the basewide groundwater monitoring program at OU-5 and the Alameda Annex in locations corresponding to the higher reported groundwater concentrations. These wells will be sampled on a quarterly basis, with results presented in the quarterly monitoring reports. The first sampling event was September 2002.

Part III: Comments from Human and Ecological Risk Division (HERD)

(Comments from James M. Polisini to Marcia Liao, September 3, 2002)

**General Comments**

HERD defers to the DTSC Geological Services Unit for assessment of the adequacy of the groundwater sampling (Section 3.4.2.1) and the associated conclusions. However, it appears that the presentation of the benzene and naphthalene groundwater concentrations indicate maxima in the southeast portion of parcel 181.

**Specific Comments**

1. Response to Specific Comment number 1: Please include a statement in the text that there is presently no visible staining in the area indicated on the figure.

**Response:** This statement has been provided.

2. Response to Specific Comment number 2: HERD understands that the samples designated as OU5-177, OU5-178 and OU5-179 were collected as part of the characterization of the Miller Elementary School and not collected as part of the RI work plan. However, any polynuclear aromatic hydrocarbon (PAH) soil data from area near OU5 should be examined to determine whether the soil concentrations support the conclusions of the OU5 RI. Please present the data from OU5-177, OU5-178 and OU5-179 in this report. The results from these samples can be 'flagged' or otherwise identified as not within the scope of the OU5 RI.

**Response:** Samples OU5-177, OU5-178 and OU5-179 were actually collected within the boundaries of OU-5, adjacent to the eastern boundary of Parcel 179. These data are discussed in Section 5.9.7 of the RI Report. The locations and BaP-equivalent soil concentrations for these supplemental soil samples are shown in Figures 4-5 through 4-8 of the RI Report.

3. Response to Specific Comment number 5 and number 6: The change in the Conceptual Site Model (CSM) to indicate that the chlorinated compounds found in groundwater may be the result of recent releases requires a deed restriction on the use of groundwater and remedial action by the Navy. Please make further investigation and potential remediation of groundwater explicit in the RI Report.

**Response:** The CSM has been revised to indicate post-fill use of the OU-5 area and potentially associated spills or releases as sources of chemical contaminants. The need for land use covenants or other institutional controls is being evaluated in the soil FS Report and in the Groundwater RI/FS Report.

4. *Response to Specific Comment number 7: Comment noted is not responsive. Please indicate whether language will be inserted in the RI Report recommending that protection of ecological receptors must be considered if future land use changes. Please also include the mechanism for implementing this recommendation.*

**Response:** A statement regarding re-evaluation if a land use change is effected is included in the second paragraph of Section 5.0. The proposed land use for OU-5 is residential with the Coast Guard leasing from the City of Alameda for fifty years after transfer from the Navy.

5. *Response to Specific Comment number 8: Please explain how the text will be modified. Specifically, the comment (Section 5.2.1, page 5-4) that human activities '...have not affected soil concentrations of metals.' A response which states 'see response to Specific Comment ' does not outline any proposed change to the text.*

**Response:** The sentence identified by HERD has been changed to read (Section 5.4.1 page 5-4): "This suggests that the human activities responsible for the distribution of PAHs in site soils have not affected the soil concentrations of metals"

6. *Response to Specific Comment number 14: HERD agrees that dual tracking the incremental risk and non-cancer hazard using the CalEPA soil adherence factors (SAFs), dermal absorption factors (DAFs) and California-specific cancer slope factors (Specific comment number 23) addresses HERD comments regarding the risk assessment. Dual tracking has been implemented at other Department of Defense (DoD) sites reviewed by HERD. This comment is intended for the DTSC Project Manager and no response is required for this comment.*
7. *Response to Specific Comment number 16: Given the additional clarification for the intake calculation supplied in this response HERD was able to duplicate the calculation of intake. As indicated in the response, Table 5-7 should be modified to indicate that these intake values are time-weighted based on site specific Exposure Duration (ED) and are age-adjusted for all exposure routes. No response is required for this comment given a change in the table.*
8. *Response to Specific Comment number 18: HERD recommended point estimates of incremental risk and hazard, which could be contoured, based on previous experience with 'decision areas' regardless of their definition. Given that the nine balancing criteria outlined in Superfund guidance must be implemented for consideration of remedial alternatives, isopleths of risk and/or hazard provide the risk manager with guidance on the extent of any remedial action. In order to implement the 'decision area' approach the DTSC risk manager and all other regulatory agencies and resource trustees must agree a priori to the definition of the 'decision areas'.*

**Response:** The use of decision areas as the basis for calculating exposure point concentrations for the risk assessment was proposed in Section 5.2.2 of the RI Work Plan for OU-5 and accepted by all reviewing agencies (EPA, Regional Board, DTSC). The decision areas correspond to areas of relatively homogenous BaP-equivalent concentrations. This approach is consistent with EPA guidance on estimating exposure concentrations using a conservative estimate of average concentrations in a potential exposure area (Section 6.5 of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Part A). A point estimate of risk or hazard from a single soil sample would incorrectly imply that the single sample represents a possible chronic exposure medium.

### Conclusions

*This memorandum supplies comments only to the response to previous HERD comments on the Draft OU5 Remedial Investigation Report transmitted via electronic mail. Given the clarification of the intake calculations provided in this communication, complete comments on the Draft Final Remedial Investigation Report will be forwarded in a separate HERD memorandum once the risk assessment is evaluated.*

*(Comments from James M. Polisini to Marcia Liao, September 19, 2002)*

### General Comments

*This HERD memorandum only addresses issues raised in the review of the Draft RI report and HERD review of the Response to Comments on that Draft RI which were forwarded under separate cover.*

*HERD defers to the DTSC Geological Services Unit for assessment of the adequacy of the groundwater sampling (Section 3.4.2.1) and the associated conclusions. However, it appears that the presentation of the benzene and naphthalene groundwater concentrations indicate maxima in the southeast portion of parcel 181. In addition, the San Francisco Regional Water Quality Control Board (SFRWQCB) has indicated that the shallow aquifer at OU5 is currently considered a potential drinking water source.*

*Subsequent to HERD review of the Draft Remedial Investigation (RI) Report, community representatives (i.e., the City of Alameda Homeless Cooperative Project) have expressed the opinion that gardening may be significant in some areas of OU5. Exposure via ingestion of homegrown produce should, therefore, be added to estimation of total intake via other routes. This would require only the addition of a paragraph in the risk characterization summary of the RI Report.*

### Specific Comments

- 1. The SFRWQCB representative, Ms. Judy Huang, has indicated to DTSC and HERD that the shallow water aquifer of OU5 should be considered as a potential source of drinking water in an electronic mail message (Dated 8/27/2022). In order to remove exposure to shallow drinking water from the Human Health Risk Assessment (HHRA) the Navy must demonstrate that the yield is less than 200 gallons per day or the Total Dissolved Solids (TDS) is greater than 3000 mg/l.*

**Response:** *The Determination of the Beneficial Uses of Groundwater, Alameda Point, Alameda, California* was developed over three years, with numerous revisions to the document at the request of US Environmental Protection Agency (EPA), the Regional Water Quality Control Board (Regional Board), and the Department of Toxic Substances Control (DTSC). All three agencies concurred that the technical memorandum presented a viable definition of the beneficial uses of groundwater within Alameda Point.

The Alameda Annex property, north, east, and south of OU-5, has been exempted from Water Resources Control Board Resolution 88-63. Navy has taken the logical step of having an accepted definition of beneficial uses at Alameda Point and having groundwater in property surrounding the subject parcels exempted from drinking water criteria serve as the basis for there not being potable use of OU-5 groundwater.

2. *The pagination of the copy of the Draft Final RI Report forwarded by the DTSC Project Manager to HERD for review appears in error. For example, the first page of the section 4.0 is listed at 4-1. The second page, which logically continues the last sentence on page 4-1, is listed as 4-15. Please correct the pagination to facilitate review and discussion.*

**Response:** The pagination in the Draft Final RI Report was taking into account sequential page numbers for the figures and tables since they were imbedded in the text. However, this format has been changed for the Final RI Report. The text pagination will logically be numbered (1-1, 1-2, 1-3, etc) while the tables and figures will not be assigned a sequential page number.

3. *There are several problems with the Conceptual Site Model (CSM) as presented (Figure 5-1):*
  - a. *One proposed source of contamination is the former Manufactured Gas Plant. This is misspelled as a 'Manufactured Gas Plan' in the figure. Please correct this typographic error.*

**Response:** This has been corrected.

- b. *The point of the HERD comment on the CSM in the Draft RI Report was that the presence of chlorinated solvents in groundwater is an indication of releases by the Navy which may require remedial action or a deed restriction. The Primary Source category of the current CSM attributes no release to the Navy. If the Primary Release Mechanism of 'Onsite Disposal' is meant to include Navy activities, then there must be an additional Primary Source of Navy Activities or Navy Operations. Please amend the CSM figure to include releases due to Navy activities.*

**Response:** The CSM presented in Figure 5-1 has been modified to indicate the presence of possible spills and releases or disposal from post-fill activities.

- c. *Ingestion of homegrown produce should be added to the CSM, and evaluated, given the concerns of representatives of the City of Alameda outlined in the General Comments.*

**Response:** Ingestion of homegrown produce is included in the CSM. The potential risks associated with ingestion of homegrown produce are discussed in the Uncertainty Assessment in Section 5.9.8 of the RI Report. A qualitative analysis of potential exposure via this pathway in this section of the RI Report concluded that significant exposure was unlikely due to the very limited ability of plants to uptake PAHs via their roots. There seems to be some confusion on the part of City or Alameda Coalition

reviewers. The OU-5 property will be leased to the Coast Guard for at least 50 years following transfer from the Navy. Existing Coast Guard Housing regulations do not allow residents to plant in the yards. Housing within EDC-5, west of OU-5, is proposed and is being used for residential uses. Gardening within this area will be allowed.

4. *The possibility of further valuation of ecological hazard, in the event of a change in land use at OU5, has been included in the report (Section 5.0, page 5-1) in response to a previous HERD comment on the Draft RI Report. No response is required for this comment.*
5. *Additional sampling of indoor air at Miller Elementary School and near the intersection of Mayport and Kolmann Circle is apparently planned (personal communication, Marcia Liao, DTSC Project Manager) for inclusion in the Feasibility Study (FS) Report. The soil samples designated as OU5-188, OU5-178 and OU5-179, which have already been collected as part of the characterization of the Miller Elementary School, should be included in the FS Report. Any available polynuclear aromatic hydrocarbon (PAH) soil data from area near OU5 should be examined to determine whether the soil concentrations support the conclusions of the OU5RI. The results from these samples can be 'flagged' or otherwise identified as not within the scope of the OU5RI.*

**Response:** [same as 9/13 James Polisini Comment 2] Samples OU5-177, OU5-178 and OU5-179 were actually collected within the boundaries of OU-5, but adjacent to the eastern boundary of Parcel 179. These data are discussed in Section 5.9.7 of the RI Report. The locations and BaP-equivalent soil concentrations for these supplemental soil samples are shown in Figures 4-5 through 4-8 of the RI Report.

6. *As suggested by HERD, dual tracking of both EPA and DTSC estimates of risk and Hazard has been included in the Draft Final RI Report (Section 5 and associated tables). No response is required for this comment.*
7. *The intake calculation tables have been modified to indicate that the intake values are time-weighted based on site specific Exposure duration (ED) and are age-adjusted for all exposure routes. No response is required for the comment given a change in the table.*
8. *HERD previously recommended contouring of sample specific risk and/or hazard. There appears to be no change in the document to include point estimates of incremental risk and hazard, which could be contoured. Based on previous experience with 'decision areas' regardless of their definition they have not contributed to the risk management decisions. In order to implement the 'decision area' approach the DTSC risk manager and all other regulatory agencies and resource trustees must agree a priori to the definition of the 'decision areas.'*

**Response:** [same as 9/13 James Polisini Comment 8] The use of decision areas as the basis for calculating exposure point concentrations for the risk assessment was proposed in Section 5.2.2 of the RI Work Plan for OU-5 and accepted by all reviewing agencies (EPA, Regional Board, DTSC). The decision areas correspond to areas of relatively homogenous BaP-equivalent concentrations. This approach is consistent with EPA guidance on estimating exposure concentrations using a conservative estimate of average concentrations in a potential exposure area (Section 6.5 of Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Part A). A point estimate of risk or hazard from a single soil sample would incorrectly imply that the single sample represents a possible chronic exposure medium.

*(Comments from Marcia Liao to Richard Weissenborn, September 23, 2002)*

*The Department of Toxic Substances Control (DTSC) has completed the review of the above referenced remedial investigation (RI) report for Operable Unit 5 (OU-5) prepared by Neptune and Company, IT Corporation, and Environ and submitted by the Navy on July 12, 2001. The following comments/concerns are noted:*

- 1. The RI pertains to the soil operable unit of parcel 181 which is only a portion of the OU-5. This is not what the title of the document conveys and is confusing.*

**Response:** The scope of the OU-5 RI, focusing primarily on soil in Parcel 181, as described in the Work Plan and in detail in the Introduction (Section 1) of the RI Report. Soils in Parcels 182 and 183 were not included in this OU-5 RI because the BRAC Closure Team (BCT) felt that existing data in these areas adequately indicated the need for soil remediation, and the Navy had committed to soil remediation in these parcels. The initial removal action commenced during the writing of the OU-5 RI.

- 2. The risk assessment represents the site prior to the 2002 time-critical removal action (TCRA), not the current condition. To determine what final remedies are appropriate, a risk assessment showing the current risk at OU-5 is necessary.*

**Response:** The distribution of contaminants in soils at Parcel 181, and the associated risk assessment, is discussed in the RI Report for areas that were part of the TCRA as well as areas where the TCRA was not conducted. In the area where soils were removed during the TCRA, the risk assessment was conducted for baseline conditions (*i.e.*, prior to the removal of any soil). Contamination remaining after the TCRA is discussed in Section 5.9.6. The Navy will provide further evaluation of health risks associated with post-TCRA conditions in the Feasibility Study for OU-5.

- 3. This RI does not provide adequate discussion of on-site waste disposal and spills and leaks and their roles as potential sources of contamination. These could be considered data gaps and merit further discussion.*

**Response:** The available information relating to potential sources of contamination is provided in Section 2.4 of the RI Report. The presence of MTBE and chlorinated hydrocarbons in some groundwater samples indicates that there are local sources of environmental contamination in addition to petroleum related to historical industrial activities. However, it remains uncertain whether the origin of this contamination may in part be from sources within the boundary of OU-5 (such as the stained area near Mayport and Kollmann Circles). A quarterly groundwater monitoring program, initiated in Summer 2002, has among its objectives the identification of the spatial dimensions of groundwater contamination in and around OU-5. Navy believes that sufficient data have been collected to proceed with the development of FS reports for the soil and groundwater at OU-5. The collection of indoor air quality data will occur in the near future.

4. *This RI provides little graphical representation of contaminant distribution in the soil making it difficult to assess or conclude if all contamination sources have been adequately investigated and/or mitigated (i.e. no "hot spots").*

**Response:** Spatial plots of BaP concentrations in each depth interval using colored dots were distributed to the agencies at the briefing on January 12, 2002. Appendix B in the RI Report contains spatial bubble plots of BaP Equivalents in each depth interval and bubble plots of arsenic in the surface interval. Due to soil heterogeneity and analytical variability, the Navy decided not to produce contour plots of the RI soil data. Additional factors considered by the Navy in deciding to not contour the soil data were the facts that contouring works effectively in a more fluid receiving medium such as groundwater, when illustrating the apparent distribution of contaminants from a "point" source, and previous efforts to illustrate the distribution of PAHs in the soil at OU-5, using nearest neighbor and kriging methods, resulted in predicted distributions that were not representative of those measured.

5. *This RI does not clearly define the nature and extent of contamination and groundwater exposure pathways were only partially evaluated. The comments prepared by the DTSC Geological Services Unit (see attached) should be consulted for the future production of groundwater RI.*

**Response:** See responses to GSU comments.

6. *The shallow aquifer at OU-5 is currently considered a potential drinking water source. The Regional Water Quality Control Board should be consulted to clarify this issue.*

**Response:** The *Determination of the Beneficial Uses of Groundwater, Alameda Point, Alameda, California* was developed over three years, with numerous revisions to the document at the request of US Environmental Protection Agency (EPA), the Regional Water Quality Control Board (Regional Board), and the Department of Toxic Substances Control (DTSC). All three agencies concurred that the technical memorandum presented a viable definition of the beneficial uses of groundwater within Alameda Point.

The Alameda Annex property, north, east, and south of OU-5, has been exempted from Water Resources Control Board Resolution 88-63. Navy has taken the logical step of having an accepted definition of beneficial uses at Alameda Point and having groundwater in property surrounding the subject parcels exempted from drinking water criteria serve as the basis for there not being potable use of OU-5 groundwater.

7. *There is insufficient information to conclude that little volatilization of chemicals from groundwater occurs.*

**Response:** Text discussion has been changed to reflect that there seems to be little volatilization of benzene and other VOCs to soil. The VOCs were reportedly present at higher concentrations in groundwater samples collected from the 16 to 20 foot depth interval. Contaminant concentrations in groundwater samples collected from more shallow depths were less than those reported for samples from the 16 to 20 foot depth interval. Since the higher groundwater concentrations were present at greater depths, one would not expect to have high soil gas concentrations in the 2 foot and 5 to 7 foot intervals that were sampled. The soil gas results are consistent with this line of thinking.

Additionally, five soil gas wells have been installed as part of the basewide groundwater monitoring program at OU-5 and the Alameda Annex in locations corresponding to the higher reported groundwater concentrations. These wells will be sampled on a quarterly basis, with results presented in the quarterly monitoring reports. The first sampling event was September 2002.

8. *Exposure via ingestion of homegrown produce should be evaluated because gardening may be pursued by residents in some areas of OU-5.*

**Response:** The homegrown produce pathway is addressed qualitatively in the RI Report. Assumptions currently required to model produce pathway exposure for PAHs are not yet scientifically justified. As mentioned above, the OU-5 property will be occupied by the Coast Guard for 50 years after transfer from the Navy to the City of Alameda, and current housing regulations do not allow gardening in the housing area.

9. *The definition of "decision areas" will need agency concurrence.*

**Response:** The process for defining decision areas, and their use as the basis for calculating exposure point concentrations for the risk assessment, was proposed in Section 5.2.2 of the RI Work Plan for OU-5 and accepted by all reviewing agencies (EPA, Regional Board, DTSC). Decision areas were selected through a post stratification process to minimize the problems of edge effects and other issues typically associated with decision areas selected ahead of time.

**ALAMEDA POINT RESTORATION ADVISORY BOARD  
OU-5 FOCUS GROUP**

(Comments submitted by Lea Loizos, September 17, 2002)

1. We were pleased to see that the Estuary Park was added to the TCRA of Parcel 181, OU-5, and that the immediate risk to residents from PAHs in the soil has been temporarily mitigated. It is unclear, however, why Parcels 182 and 183 were left out of the OU-5 RI. At what point does the Navy plan to perform a HHRA for Parcels 182 and 183? When will the public have the opportunity to evaluate the effectiveness of the removal action to reduce the health risk of future users of the park? Conducting a TCRA does not replace the need for a Remedial Investigation.

**Response:** Available data indicated that PAHs were present in the parcels at concentrations many orders of magnitude greater than the PRGs. In essence, a human health risk screening was performed by Navy and the BCT to come to the conclusion that remediation of soils in parcels 182 and 183 was required. A human health risk assessment will be included in the FS Report for OU-5. Human health risk in the park after the TCRA will be presented in the FS Report.

2. *There seems to be a trend forming on writing risk assessments assuming institutional controls rather than using a baseline risk assessment, which assumes unrestricted use of the site, to make appropriate risk management decisions. At several points in the Draft Final RI, the Navy admits its intention to restrict digging below 2 feet across all of OU-5 in the Record of Decision (Sections 5.5.3.1, pg. 17, and 5.9.8.1, pg. 231.) This, according to the Navy, will eliminate the exposure via direct contact or root uptake for soils below this depth, thereby removing the need to evaluate the gardening pathway. Aside from the impossibility of enforcing such a restriction over any period of time, choosing to eliminate certain exposure pathways based on ICs that have yet to be agreed upon is unacceptable. The OU-5 focus group is requesting that a baseline risk assessment be done for the site including the gardening pathway as an exposure assumption.*

**Response:** Part of the development of the RI Work Plan and implementing the RI is anticipation of likely remedial approaches for the contaminant(s) of concern. Historical data at OU-5 indicate that PAH concentrations increase as depth increases. The necessary protection of human health can be provided by providing clean surface soils and limiting access to deeper soils. The inclusion of the land use covenants is not inappropriate in presenting the thought process that leads to the ultimate site remedial action(s) presented in the Proposed Plan and memorialized in the Record of Decision.

3. *Rather than assuming that the gas bubbles in the soil gas samples were due to methane, the soil gas in all parcels of OU-5 needs to be checked for methane and*

*other toxic gases. In the RTC, the Navy has proposed analyzing for methane gas during the regular groundwater monitoring at the site, however this data was not included in the initial round of groundwater sampling. Due to the explosive nature of methane and the potentially dangerous levels present at the site, please provide us with soil gas data for methane and other toxic gases that may be present with the next round of groundwater sampling.*

**Response:** Methane, ethane, and ethene were analytical parameters that were analyzed for groundwater samples collected during the 1<sup>st</sup> basewide groundwater sampling event. Additionally, five soil gas wells have been installed as part of the basewide groundwater monitoring program at OU-5 and the Annex area corresponding to the higher concentration areas of the plume. These wells will be sampled on a quarterly basis, with results presented in the quarterly monitoring reports. The first sampling event was September 2002.

- 4. The OU-5 focus group echoes the request of Dr. Sophia Serda that indoor air sampling be done on site. While we were pleased to see that the Navy chose to employ both the VLEACH and Johnson and Ettinger models, the fact remains that they are just that: models. It is unclear why the Navy is refusing to take indoor air samples on OU-5. There are too many assumptions used in groundwater-to-indoor air models, including vertical homogeneity in soil characteristics, steady state conditions, and assumptions about the structure of the homes, which may or may not be representative of site conditions.*

*In section 5.9.8.2, pg. 235, mention is made to indoor and outdoor air samples conducted by the Coast Guard at several locations within OU-5. According to the Navy, a preliminary evaluation of the unvalidated benzene data indicated that interior benzene air concentrations and benzene concentrations in exterior air samples are roughly equivalent. What does roughly equivalent mean? What is the ratio of the concentrations? Roughly equivalent concentrations do not equal equivalent risk. What did the results of other VOC air samples indicate (e.g., naphthalene)?*

**Response:** Navy plans to collect additional indoor air samples and present its formal evaluation of the Coast Guard indoor air quality data in the Groundwater RI/FS Report, currently under preparation.

- 5. The presence of MTBE in both soil gas and groundwater should not be overlooked. While the concentrations were not measured at levels that present a potential human health risk, its presence could be a strong indicator of the source of the plume. Further investigations into the source of MTBE should be conducted.*

**Response:** The presence of MTBE is not being overlooked. Reported concentrations have been less than concentrations presenting a health risk. Samples collected during the basewide groundwater monitoring program are analyzed for VOCs, including MTBE.

6. *In the Conceptual Site Model (Figure 5.1) the assumption is made that soil is brought up from depth and mixed prior to potential chronic exposure occurring at the ground surface. Please justify this assumption.*

**Response:** The assumption that subsurface soils will be mixed if they are excavated and distributed on the ground surface is based on common practice relating to excavation techniques. Excavation such as trenching (foundation walls, utilities, etc.), whether using a backhoe or trenchers, will generate a pile of excavated soil along the length of the trench. Excess soil may also be removed to a remote location, especially when the trench will be used for a foundation wall or other such structure. In either case, the excavation process entails some degree of mixing of the subsurface soil. If the soil is then redistributed for use as cover or fill on the ground surface, or is replaced in the trench, additional mixing will occur. Mixing of subsurface soil that is spread on the ground surface is also implied in the derivation of an exposure concentration following such an event, since by definition an exposure concentration reflects an average concentration across some area where chronic exposure may occur. Depth-weighted averages are consistent with DTSC risk assessment guidance (Supplemental Guidance for Human Health Multimedia Risk Assessment of Hazardous Waste Sites and Permitted Facilities, July 1992).

7. *To ensure the most conservative of assessments, the OU-5 focus group requests that the potential for residents to come into contact with groundwater, for example by using a backyard well for watering, be included as an exposure assumption in the groundwater RI/FS.*

**Response:** This request will be considered during development of the Groundwater RI FS Report. Please note that, consistent with EPA guidance in Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Part A, the objective of an exposure assessment is to reflect potential exposures under reasonable maximum exposure conditions. As noted in responses to DTSC comments, above, the issue of whether or not the OU-5 groundwater is technically a drinking water is under discussion.

8. *Although the remedial action objectives listed in Section 6.4 have been listed as “proposed”, we find them to be inappropriate in the text of the RI and are requesting that this entire section be deleted. Furthermore, the “proposed” remedial action objective to “prevent human exposure to soil containing PAHs at concentrations that represent an incremental lifetime cancer risk exceeding the approximate mid-point range of the NCP risk range” is a misinterpretation and misuse of the risk range. According to the NCP, the 1xE-6 risk level is to “be used as a point of departure for determining remediation goals for alternatives.” (Title 40 of the Code of Federal Regulations 300.430) Suggesting the use of the mid-point of the risk range as a remediation goal in the RI is unsuitable.*

**Response:** The inclusion of proposed remedial action objectives is consistent with EPA guidance for the format of an RI Report in “Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA”, October 1988. The proposed remedial action objectives also concur with the DTSC-proposed “screening level” of 0.62 mg/kg, expressed as BaP-equivalents, which represents a  $10^{-5}$  risk for PAHs.

Minor comment:

Figure 2-3 shows the B(a)P equivalents in micrograms per kilograms and parenthetically states this as parts per million, rather than parts per billion.

**Response:** This has been corrected.

**UNITED STATES COAST GUARD COMMENTS  
DRAFT FINAL REMEDIAL INVESTIGATION REPORT  
OPERABLE UNIT 5  
ALAMEDA POINT, ALAMEDA, CALIFORNIA**

*General Comments*

1. *The Objectives section should include the remedial goals as far as cancer and non-cancer risks.*

**Response:** The objectives of the Operable Unit (OU)-5 Remedial Investigation (RI) were to characterize the nature and extent of chemical contamination in the OU and to estimate the human health and ecological risks associated with the contaminants. The proposed remedial action objectives have been presented in the RI Report. The remedial action objectives will be fully developed and evaluated in the forthcoming Soil Feasibility Study (FS) Report and the Groundwater RI/FS Report. The FS Reports will also present and evaluate alternative methods for achieving the remedial action objectives, and recommend the selected alternative(s).

2. *Please explain why Navy elected to model the indoor air concentrations from soil-gas sampling rather than directly monitoring indoor air*

**Response:** The decision on whether or not indoor air samples would be collected was to be made after evaluation of the soil gas data and completion of the human health risk assessment, as presented in the *Final Remedial Investigation Work Plan for Operable Unit 5, Alameda Point, Alameda, California*. The human health risk assessment, using modeled indoor air concentrations did not indicate that inhalation was a risk driver. However, to address concerns voiced by the Coast Guard, Alameda Unified School District, U.S. Environmental Protection Agency (EPA), and the California Department of Toxic Substances Control (DTSC), indoor air samples will be collected in selected Coast Guard housing units, Miller Elementary School, and Woodstock Child Development Center. Additionally, permanent soil gas monitoring points have been installed near the locations with highest reported groundwater contaminant concentrations, and soil gas samples will be regularly collected from the sampling probes as part of the quarterly monitoring being performed by Navy.

3. *The risk assessment only covered three populations: the child, the adult male, and the construction worker. Are the risks substantially the same across genders and races?*

**Response:** The receptor-specific parameters included in the human health risk assessment have been developed by and are presented in the EPA's Risk Assessment Guidance for Superfund. The parameters and resulting risks are substantially the same across genders and races. There may be specific individual differences which are not accounted for by the population based human health risk assessment.

4. *Has there been any analysis of the contamination's effect on former residents of the site including Coast Guard and Navy?*

**Response:** Navy has not performed such an analysis nor is Navy aware of any such analysis being performed.

5. *The RI states that Navy excluded Estuary Park from analysis in the RI because existing data were adequate to support remedial decisions there. Ideally, even if no new data were collected at Estuary Park, analysis of the risks to users of the park would be included in this RI. If users are interested in delving into this administrative record, it is difficult to know where to go for information on Estuary Park with the information scattered across the Operable Unit 5 (OU-5) (in part) RI, the RI Work Plan for OU-5, and the forthcoming combined groundwater Remedial Investigation/ Feasibility Study (RI/FS).*

**Response:** The historical data collected in Estuary Park has been presented in a technical memorandum. The technical memorandum has been added as a reference to the OU-5 RI Report. Analysis of risk to Estuary Park users after the recently completed time critical removal action will be presented in the forthcoming soil feasibility study report.

6. *What is the risk to present and future residents in the areas where the time critical removal action occurred?*

**Response:** The risk to current and future residents in the areas where the time critical removal action occurred will be presented in the forthcoming soil feasibility study report.

### **SPECIFIC COMMENTS**

1. *Section 1.0, Page 1-1: What are the "offsite properties" referenced in the first paragraph? Later they are referenced as Parcels 178-180, but they should also be referenced by their common names as Marina Housing and the Miller School and Child Development Center.*

**Response:** The requested correlation between parcel numbers and common names has been made in the text.

2. *Section 2.0, Page 2-1: U.S. Coast Guard has an Interim Use Agreement, not a lease, from the Navy.*

**Response:** The text has been changed to indicate the Interim Use Agreement and not a lease.

3. *Section 3.4, Pages 3-3 to 3-4: Please define "housing unit" and "housing complex."*

**Response:** The requested definitions have been added to the text.

4. *Section 3.4, Page 3-3: It is counterintuitive that areas of historically high Polycyclic Aromatic Hydrocarbon (PAH) concentrations would be allocated fewer samples than areas of historically moderate concentrations, unless Navy had already decided to remediate the areas with higher concentrations. Please provide some data correlating historical data and contemporary data, proving that the allocation of samples was correct.*

**Response:** Rather than present data correlating historical and contemporary data for the reviewer, reference is made to figures within the RI Report. Figures 2-3 through 2-6 present historical benzo-a-pyrene (BaP)-equivalent concentrations in OU-5 over the same depth intervals as those sampled during the RI. Figures 4-7 through 4-10 present the contemporary BaP-equivalent concentrations in OU-5. Figures 2-3 through 2-6 also illustrate the relative lack of data within the residential area, and a general decrease in BaP-equivalent concentrations proceeding from the northwest toward the southeast. The relatively high northwestern concentrations had led Navy to the conclusion that remediation was required. The areas where historical concentrations were moderate were sampled more densely than the historically high concentration areas to aid in delineating the full extent of future remediation. Following the same rationale, fewer samples were collected in areas where the historic BaP-equivalent concentrations were relatively low.

In the Operable Unit 5 Remedial Investigation Report (RI Report), cancer risks and noncancer hazard indices were calculated for potential current resident, future resident, and construction worker exposure to chemicals detected in soil, soil gas, and groundwater. For soil, weighted averages of soil analytical data with depth (e.g., 0-0.5 feet, 0-2 feet, 0-4 feet, and 0-8 feet) were calculated as the weighted mean of the original samples (i.e., 0-0.5 feet, 0.5-2 feet, 2-4 feet, and 4-8 feet). The weighted averages were used to calculate exposure point concentrations (EPCs) for soil in the risk assessment.

The EPA has requested the estimated risks and hazard indices be calculated separately for each original soil-sampling interval. These calculations are presented in the attached tables (See attached master list of tables). The calculations were conducted using EPCs calculated for each soil depth interval (Tables 1-4) and the exposure assumptions and toxicity values presented in the RI Report under EPA methodology. If a chemical was not detected in a specified depth interval, then an EPC has not been calculated for that chemical at that depth. Instead, the concentration is listed as "ND" in the EPC tables. Four individual polynuclear aromatic hydrocarbons (PAHs) were not detected in all intervals in all decision areas. These PAHs are acenaphthene, acenaphthylene, fluorene, and naphthalene.

Additional tables include summary cancer risks for PAHs in soil by each depth interval (Tables 6-8), summary noncancer hazard indices for PAHs in soil by each depth interval (Tables 9-11), summary cancer risks for inorganic chemicals in soil by each depth interval (Tables 12-14) and summary noncancer hazard indices for inorganic chemicals in soil by each depth interval (Tables 15-17). Tables 18-20 summarize the risks for all chemicals by all media (including vapor migration from groundwater and soil gas which is not effected by soil depth interval).

All supporting information (including all risks and noncancer hazard indices presented by chemical) is included in Tables A-1 through A-55.

## Summary Tables

Table 1	Exposure Point Concentrations for Benzo(a)pyrene-Equivalents in Soil – Current and Future Residents –EPA Methodology
Table 2	Exposure Point Concentrations for Individual Polynuclear Aromatic Hydrocarbons in Soil – Current and Future Residents
Table 3	Exposure Point Concentrations for Benzo(a)pyrene-Equivalents in Soil – Construction Worker – EPA Methodology
Table 4	Exposure Point Concentrations for Individual Polynuclear Aromatic Hydrocarbons in Soil – Construction Workers
Table 5	Exposure Point Concentrations for Inorganic Chemicals in Soil
Table 6	Summary of Estimated Pathway-Specific Cancer Risks for Polynuclear Aromatic Hydrocarbon in Soil – Current Residents –EPA Methodology
Table 7	Summary of Estimated Pathway-Specific Cancer Risks for Polynuclear Aromatic Hydrocarbons in Soil – Future Residents –EPA Methodology
Table 8	Summary of Estimated Pathway-Specific Cancer risks for Polynuclear Aromatic Hydrocarbons in Soil Construction Workers –EPA Methodology
Table 9	Summary of Estimated Pathway-Specific Noncancer Hazard Indices for Polynuclear Aromatic Hydrocarbons in Soil – Current Residents –EPA Methodology
Table 10	Summary of Estimated Pathway-Specific Noncancer Hazard Indices for Polynuclear Aromatic Hydrocarbons in Soil – Future Residents –EPA Methodology
Table 11	Summary of Pathway Specific Noncancer Hazard Indices for Polynuclear Aromatic Hydrocarbons in Soil – Construction Worker –EPA Methodology
Table 12	Summary of Estimated Pathway –Specific Cancer Risks for Inorganic Chemicals in Soil – Current Residents –EPA Methodology
Table 13	Summary of Estimated Pathway-Specific Cancer Risk for Inorganic Chemicals in Soil – Future Residents –EPA Methodology
Table 14	Summary of Estimated Pathway-Specific Cancer Risk for Inorganic Chemicals in Soil – Construction Workers –EPA Methodology
Table 15	Summary of Estimated Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil – Current Resident –EPA Methodology s
Table 16	Summary of Estimated Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil – Future Residents –EPA Methodology
Table 17	Summary of Estimated Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil – Construction Workers –EPA Methodology
Table 18	Cumulative Risks and Hazard Indices – Parcel 181 – Current Residents – EPA Methodology
Table 19	Cumulative Risks and Hazard Indices – Parcel 181 – Future Residents – EPA Methodology
Table 20	Cumulative Risks and Hazard Indices – Parcel 181 – Construction Workers –EPA Methodology

## Attachment Tables

- A-1 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 1 – Current and Future Residents
- A-2 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 2 – Current and Future Residents
- A-3 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 3 – Current and Future Residents
- A-4 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 4 – Current and Future Residents
- A-5 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 5 – Current and Future Residents
- A-6 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 6 – Current and Future Residents
- A-7 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 7 – Current and Future Residents
  
- A-8 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2 feet) - Exposure Area 1 – Current and Future Residents
- A-9 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2 feet) - Exposure Area 2 – Current and Future Residents
- A-10 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2 feet) - Exposure Area 3 – Current and Future Residents
- A-11 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2 feet) - Exposure Area 4 – Current and Future Residents
- A-12 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2 feet) - Exposure Area 5 – Current and Future Residents
- A-13 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2 feet) - Exposure Area 6 – Current and Future Residents
- A-14 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2 feet) - Exposure Area 7 – Current and Future Residents
  
- A-15 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2-4 feet) - Exposure Area 1 – Current and Future Residents
- A-16 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2-4 feet) - Exposure Area 2 – Current and Future Residents
- A-17 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2-4 feet) - Exposure Area 3 – Current and Future Residents
- A-18 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2-4 feet) - Exposure Area 4 – Current and Future Residents
- A-19 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2-4 feet) - Exposure Area 5 – Current and Future Residents
- A-20 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2-4 feet) - Exposure Area 6 – Current and Future Residents

- A-21 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2-4 feet) - Exposure Area 7 – Current and Future Residents
- A-22 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4-8 feet) - Exposure Area 1 –Future Residents
- A-23 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4-8 feet) - Exposure Area 2 –Future Residents
- A-24 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4-8 feet) - Exposure Area 3 –Future Residents
- A-25 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4-8 feet) - Exposure Area 4 –Future Residents
- A-26 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4-8 feet) - Exposure Area 5 –Future Residents
- A-27 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4-8 feet) - Exposure Area 6 –Future Residents
- A-28 Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4-8 feet) - Exposure Area 7 –Future Residents
  
- A-29 Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (0-0.5 feet) by Site – Construction Workers
- A-30 Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (0.5-2 feet) by Site – Construction Workers
- A-31 Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (2-4 feet) by Site – Construction Workers
- A-32 Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (4-8 feet) by Site – Construction Workers
  
- A-33 Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (0-0.5 feet) by Northern and Southern Area – Construction Workers
- A-34 Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (0.5-2 feet) by Northern and Southern Area – Construction Workers
- A-35 Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (2-4 feet) by Northern and Southern Area – Construction Workers
- A-36 Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (4-8 feet) by Northern and Southern Area – Construction Workers
  
- A-37 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0-0.5 feet) – Current Residents
- A-38 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0.5-2 feet) – Current Residents
- A-39 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (2-4 feet) – Current Residents
  
- A-40 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0-0.5 feet) – Future Residents

- A-41 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0.5-2 feet) – Future Residents
- A-42 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (2-4 feet) – Future Residents
- A-43 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (4-8 feet) – Future Residents
  
- A-44 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0-0.5 feet) – Construction Workers
- A-45 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0.5-2 feet) – Construction Workers
- A-46 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (2-4 feet) – Construction Workers
- A-47 Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (4-8 feet) – Construction Workers
  
- A-48 Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (0-0.5 feet) – Current and Future Residents
- A-49 Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (0.5-2 feet) – Current and Future Residents
- A-50 Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (2-4 feet) – Current and Future Residents
- A-51 Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (4-8 feet) – Future Residents
  
- A-52 Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (0-0.5 feet) – Construction Workers
- A-53 Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (0.5-2 feet) – Construction Workers
- A-54 Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (2-4 feet) – Construction Workers
- A-55 Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (4-8 feet) – Construction Workers

**Table 1**  
**Exposure Point Concentrations for BaP Equivalents in Soil -**  
**Current and Future Residents - EPA Methodology**

<b>Area</b>	<b>Depth Interval (feet bgs)</b>	<b>Exposure Point Concentration (mg/kg)</b>
1	0-0.5	1.04
1	0.5-2.0	0.47
1	2.0-4.0	0.75
1	4.0-8.0	1.23
2	0-0.5	2.84
2	0.5-2.0	2.52
2	2.0-4.0	11.93
2	4.0-8.0	19.02
3	0-0.5	1.15
3	0.5-2.0	1.11
3	2.0-4.0	1.06
3	4.0-8.0	23.41
4	0-0.5	3.04
4	0.5-2.0	3.41
4	2.0-4.0	7.54
4	4.0-8.0	8.45
5	0-0.5	2.97
5	0.5-2.0	4.83
5	2.0-4.0	10.33
5	4.0-8.0	3.02
6	0-0.5	1.33
6	0.5-2.0	2.12
6	2.0-4.0	6.56
6	4.0-8.0	30.17
7	0-0.5	9.63
7	0.5-2.0	7.53
7	2.0-4.0	11.42
7	4.0-8.0	146.04

**Table 2**

**Exposure Point Concentrations for Individual PAHs in Soil (mg/kg) - Current and Future Residents**

Chemical	Depth Interval (feet bgs)	Area						
		1	2	3	4	5	6	7
Acenaphthene	0-0.5	0.02	0.13	ND	ND	0.08	0.03	ND
	0.5-2.0	ND	0.14	0.02	0.03	0.18	0.08	ND
	2.0-4.0	ND	0.68	0.03	0.04	0.69	0.27	ND
	4.0-8.0	ND	0.02	1.20	ND	0.03	ND	7.80
Acenaphthylene	0-0.5	0.06	0.67	0.12	1.10	0.32	0.08	0.87
	0.5-2.0	0.08	0.37	0.09	0.29	1.53	0.26	ND
	2.0-4.0	0.20	0.73	0.05	0.60	0.96	0.70	1.70
	4.0-8.0	ND	ND	ND	1.50	0.11	ND	69.00
Anthracene	0-0.5	0.06	0.11	0.07	0.22	0.29	0.11	1.94
	0.5-2.0	0.04	0.11	0.12	0.32	0.68	0.25	1.24
	2.0-4.0	0.05	0.87	0.06	0.40	0.49	0.48	2.51
	4.0-8.0	0.02	5.60	1.90	1.90	0.24	5.40	89.00
Benzo(a)anthracene	0-0.5	0.33	0.92	0.72	0.82	0.97	0.45	2.90
	0.5-2.0	0.16	1.10	0.62	1.05	1.68	0.73	2.85
	2.0-4.0	0.27	4.40	0.61	1.50	2.74	1.89	4.50
	4.0-8.0	0.27	7.70	12.00	3.08	1.32	11.00	68.00
Benzo(a)pyrene	0-0.5	0.75	1.69	1.05	2.00	1.75	0.92	4.80
	0.5-2.0	0.35	1.76	0.81	2.26	2.91	1.32	4.77
	2.0-4.0	0.64	7.10	0.86	3.54	8.36	3.96	7.50
	4.0-8.0	0.58	12.00	17.00	5.40	1.98	17.00	110.00
Benzo(b)fluoranthene	0-0.5	0.51	1.42	1.50	1.07	1.24	0.74	3.20
	0.5-2.0	0.30	1.74	0.93	1.56	2.25	1.11	3.24
	2.0-4.0	0.43	7.60	1.18	2.35	4.51	3.35	5.50
	4.0-8.0	0.53	6.20	17.00	3.10	1.06	12.00	74.00
Benzo(g,h,i)perylene	0-0.5	0.70	1.25	0.62	1.72	1.84	0.97	4.39
	0.5-2.0	0.22	1.66	0.64	1.99	2.86	1.71	5.30
	2.0-4.0	0.36	6.20	0.60	3.50	7.17	7.31	9.00
	4.0-8.0	0.73	5.60	8.80	4.79	1.07	16.00	76.00
Benzo(k)fluoranthene	0-0.5	0.23	0.42	0.16	0.53	0.57	0.29	1.47
	0.5-2.0	0.15	0.65	0.09	0.65	0.91	0.56	1.52
	2.0-4.0	0.19	2.20	0.37	0.97	1.62	0.93	2.40
	4.0-8.0	0.22	2.30	8.10	1.80	0.27	6.70	36.00
Chrysene	0-0.5	0.34	0.97	1.08	0.97	1.04	0.60	3.56
	0.5-2.0	0.17	1.20	0.49	1.20	1.67	0.88	3.16
	2.0-4.0	0.23	3.80	0.56	1.60	3.05	1.95	5.40
	4.0-8.0	0.33	5.10	9.90	3.40	1.13	14.00	81.00
Dibenz(a,h)anthracene	0-0.5	0.18	0.99	0.20	1.10	1.11	0.37	4.14
	0.5-2.0	0.07	0.85	0.23	1.16	1.81	0.75	2.48
	2.0-4.0	0.09	2.33	0.17	2.73	2.79	1.89	1.40
	4.0-8.0	0.66	4.90	2.60	2.80	1.10	12.00	12.00
Fluoranthene	0-0.5	2.71	3.90	1.22	4.70	4.04	1.94	23.83
	0.5-2.0	0.63	5.61	1.50	4.99	7.75	3.33	20.19
	2.0-4.0	0.97	13.00	1.08	10.55	15.44	8.63	35.00
	4.0-8.0	1.88	37.50	14.00	22.00	6.66	55.00	750.00
Fluorene	0-0.5	0.08	0.11	ND	ND	0.13	0.05	0.55
	0.5-2.0	0.02	0.07	0.04	0.18	0.20	0.08	0.25
	2.0-4.0	0.04	0.24	ND	0.03	0.20	0.18	0.43

**Table 2**  
**Exposure Point Concentrations for Individual PAHs in Soil (mg/kg) - Current and Future Residents**

Chemical	Depth Interval (feet bgs)	Area						
		1	2	3	4	5	6	7
	4.0-8.0	ND	ND	0.67	1.20	0.04	0.74	36.30

**Table 2**

**Exposure Point Concentrations for Individual PAHs in Soil (mg/kg) - Current and Future Residents**

Chemical	Depth Interval (feet bgs)	Area						
		1	2	3	4	5	6	7
Ideno(1.2.3-cd)pyrene	0-0.5	0.60	1.24	0.57	1.54	1.60	0.91	4.41
	0.5-2.0	0.23	1.46	0.49	2.07	3.13	1.86	6.44
	2.0-4.0	0.31	5.50	0.51	3.30	7.53	7.45	9.40
	4.0-8.0	0.56	7.00	8.20	4.00	1.46	17.00	94.00
Naphthalene	0-0.5	0.02	0.11	0.03	ND	0.12	0.03	ND
	0.5-2.0	0.11	0.05	0.02	0.04	0.13	0.07	ND
	2.0-4.0	0.09	0.22	0.03	0.05	0.50	0.30	ND
	4.0-8.0	0.02	0.20	0.57	ND	0.39	ND	140.00
Phenanthrene	0-0.5	0.45	0.91	0.28	1.06	1.27	0.68	8.13
	0.5-2.0	0.19	2.10	0.76	1.45	3.35	0.76	5.57
	2.0-4.0	0.19	7.00	0.36	2.45	3.46	3.11	12.85
	4.0-8.0	0.15	22.90	6.20	11.00	0.62	16.00	580.00
Pyrene	0-0.5	1.59	2.98	1.96	3.55	3.50	1.74	12.77
	0.5-2.0	0.53	4.14	1.70	4.22	5.91	2.46	11.21
	2.0-4.0	0.88	13.00	1.27	8.97	16.96	7.80	21.00
	4.0-8.0	1.19	32.60	16.00	19.40	5.61	45.00	470.00

ND = not detected in the depth interval.

**Table 3**  
**Exposure Point Concentrations for BaP Equivalents in Soil -**  
**Construction Workers - USEPA Methodology**

<b>Portion of OU-5</b>	<b>Depth Interval (feet bgs)</b>	<b>Exposure Point Concentration (mg/kg)</b>
<b>All of Parcel 181</b>	<b>0-0.5</b>	2.64
	<b>0.5-2.0</b>	3.33
	<b>2.0-4.0</b>	5.97
	<b>4.0-8.0</b>	34.19
<b>Northern</b>	<b>0-0.5</b>	2.96
	<b>0.5-2.0</b>	2.91
	<b>2.0-4.0</b>	4.24
	<b>4.0-8.0</b>	80.70
<b>Southern</b>	<b>0-0.5</b>	2.67
	<b>0.5-2.0</b>	4.76
	<b>2.0-4.0</b>	12.27
	<b>4.0-8.0</b>	2.16

**Table 4**  
**Exposure Point Concentrations for Individual PAHs in Soil (mg/kg) - Construction Workers**

Chemical	Depth Interval (feet bgs)	Northern Area	Southern Area	All of Parcel 181
Acenaphthene	0-0.5	0.03	0.13	0.13
	0.5-2.0	0.14	0.18	0.18
	2.0-4.0	0.27	0.69	0.69
	4.0-8.0	7.80	0.03	7.80
Acenaphthylene	0-0.5	0.97	0.67	0.98
	0.5-2.0	0.37	1.17	0.98
	2.0-4.0	0.90	0.96	1.05
	4.0-8.0	20.37	0.33	5.44
Anthracene	0-0.5	0.23	0.17	0.18
	0.5-2.0	0.25	0.27	0.23
	2.0-4.0	0.26	0.37	0.28
	4.0-8.0	73.68	0.17	12.61
Benzo(a)anthracene	0-0.5	0.82	0.77	0.74
	0.5-2.0	0.84	1.33	0.94
	2.0-4.0	1.16	3.03	1.56
	4.0-8.0	44.81	0.48	15.04
Benzo(a)pyrene	0-0.5	1.63	1.62	1.51
	0.5-2.0	1.74	2.98	1.99
	2.0-4.0	2.51	9.17	3.93
	4.0-8.0	64.33	1.29	22.15
Benzo(b)fluoranthene	0-0.5	1.12	1.05	0.99
	0.5-2.0	1.12	2.14	1.35
	2.0-4.0	1.77	4.70	2.40
	4.0-8.0	38.63	0.79	12.19
Benzo(g,h,i)perylene	0-0.5	1.59	1.67	1.46
	0.5-2.0	1.76	2.73	1.91
	2.0-4.0	3.11	7.58	3.95
	4.0-8.0	41.28	1.38	14.19
Benzo(k)fluoranthene	0-0.5	0.49	0.41	0.40
	0.5-2.0	0.53	0.66	0.52
	2.0-4.0	0.59	1.19	0.73
	4.0-8.0	26.20	0.33	5.89
Chrysene	0-0.5	1.02	0.85	0.87
	0.5-2.0	0.94	1.43	1.04
	2.0-4.0	1.25	2.75	1.56
	4.0-8.0	47.46	0.66	17.58
Dibenz(a,h)anthracene	0-0.5	1.11	0.85	0.92
	0.5-2.0	1.02	1.23	1.05
	2.0-4.0	1.24	1.99	1.34
	4.0-8.0	12.00	0.71	8.49
Fluoranthene	0-0.5	4.01	4.34	3.76
	0.5-2.0	4.61	8.32	5.29
	2.0-4.0	6.25	20.00	9.46
	4.0-8.0	381.36	4.50	113.20
Fluorene	0-0.5	0.13	0.11	0.11
	0.5-2.0	0.12	0.12	0.11
	2.0-4.0	0.14	0.15	0.13
	4.0-8.0	27.51	0.16	2.11
Indeno(1,2,3-cd)pyrene	0-0.5	1.52	1.43	1.34
	0.5-2.0	1.81	2.78	1.93
	2.0-4.0	2.88	7.24	3.70
	4.0-8.0	49.78	1.15	15.66
Naphthalene	0-0.5	0.03	0.12	0.12
	0.5-2.0	0.07	0.13	0.13
	2.0-4.0	0.30	0.50	0.50
	4.0-8.0	49.03	0.39	10.80
Phenanthrene	0-0.5	1.33	1.04	1.07
	0.5-2.0	1.31	2.43	1.55
	2.0-4.0	1.53	3.17	1.83
	4.0-8.0	580.00	0.81	76.35
Pyrene	0-0.5	3.38	3.32	3.08
	0.5-2.0	3.56	6.88	4.33
	2.0-4.0	5.72	19.00	9.02
	4.0-8.0	219.64	3.27	77.72

**Table 5**  
**Exposure Point Concentrations for Inorganic Chemicals in Soil**

<b>Chemical</b>	<b>Depth Interval (feet bgs)</b>	<b>Exposure Point Concentration (mg/kg)</b>
<b>Antimony</b>	<b>0-0.5</b>	4.98
	<b>0.5-2.0</b>	6.41
	<b>2.0-4.0</b>	4.99
	<b>4.0-8.0</b>	4.57
<b>Arsenic</b>	<b>0-0.5</b>	4.11
	<b>0.5-2.0</b>	4.21
	<b>2.0-4.0</b>	5.31
	<b>4.0-8.0</b>	4.28
<b>Barium</b>	<b>0-0.5</b>	85.09
	<b>0.5-2.0</b>	88.22
	<b>2.0-4.0</b>	105.90
	<b>4.0-8.0</b>	69.83
<b>Beryllium</b>	<b>0-0.5</b>	0.26
	<b>0.5-2.0</b>	0.28
	<b>2.0-4.0</b>	0.39
	<b>4.0-8.0</b>	0.35
<b>Cadmium</b>	<b>0-0.5</b>	0.28
	<b>0.5-2.0</b>	0.28
	<b>2.0-4.0</b>	0.27
	<b>4.0-8.0</b>	0.33
<b>Chromium</b>	<b>0-0.5</b>	43.72
	<b>0.5-2.0</b>	41.95
	<b>2.0-4.0</b>	60.10
	<b>4.0-8.0</b>	62.45
<b>Chromium (VI)</b>	<b>0-0.5</b>	6.25
	<b>0.5-2.0</b>	5.99
	<b>2.0-4.0</b>	8.59
	<b>4.0-8.0</b>	8.92
<b>Cobalt</b>	<b>0-0.5</b>	9.41
	<b>0.5-2.0</b>	8.29
	<b>2.0-4.0</b>	11.69
	<b>4.0-8.0</b>	11.49
<b>Copper</b>	<b>0-0.5</b>	30.78
	<b>0.5-2.0</b>	27.04
	<b>2.0-4.0</b>	35.18
	<b>4.0-8.0</b>	27.60
<b>Lead</b>	<b>0-0.5</b>	39.66
	<b>0.5-2.0</b>	30.95
	<b>2.0-4.0</b>	29.24
	<b>4.0-8.0</b>	25.12
<b>Mercury</b>	<b>0-0.5</b>	0.22
	<b>0.5-2.0</b>	0.27
	<b>2.0-4.0</b>	0.36
	<b>4.0-8.0</b>	0.20

**Table 5**  
**Exposure Point Concentrations for Inorganic Chemicals in Soil**

<b>Chemical</b>	<b>Depth Interval (feet bgs)</b>	<b>Exposure Point Concentration (mg/kg)</b>
<b>Molybdenum</b>	<b>0-0.5</b>	1.91
	<b>0.5-2.0</b>	ND
	<b>2.0-4.0</b>	4.54
	<b>4.0-8.0</b>	2.45
<b>Nickel</b>	<b>0-0.5</b>	41.76
	<b>0.5-2.0</b>	38.81
	<b>2.0-4.0</b>	64.12
	<b>4.0-8.0</b>	64.27
<b>Selenium</b>	<b>0-0.5</b>	0.50
	<b>0.5-2.0</b>	0.55
	<b>2.0-4.0</b>	0.59
	<b>4.0-8.0</b>	1.19
<b>Silver</b>	<b>0-0.5</b>	0.45
	<b>0.5-2.0</b>	0.43
	<b>2.0-4.0</b>	ND
	<b>4.0-8.0</b>	ND
<b>Thallium</b>	<b>0-0.5</b>	0.94
	<b>0.5-2.0</b>	0.76
	<b>2.0-4.0</b>	0.87
	<b>4.0-8.0</b>	2.05
<b>Vanadium</b>	<b>0-0.5</b>	32.60
	<b>0.5-2.0</b>	32.35
	<b>2.0-4.0</b>	44.51
	<b>4.0-8.0</b>	45.03
<b>Zinc</b>	<b>0-0.5</b>	88.55
	<b>0.5-2.0</b>	71.83
	<b>2.0-4.0</b>	94.90
	<b>4.0-8.0</b>	67.27

**Table 6**

**Summary of Pathway-Specific Cancer Risks for PAHs in Soil - Current Residents - EPA Methodology**

Area	Depth Interval (feet bgs)	Exposure Point Concentration (mg/kg)	Estimated Cancer Risk							
			Current Adult Resident				Current Child Resident			
			Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
1	0-0.5	1.04	5.8E-11	8.9E-07	4.6E-07	<b>1E-06</b>	1.3E-10	8.3E-06	3.0E-06	<b>1E-05</b>
1	0.5-2.0	0.47	2.6E-11	4.1E-07	2.1E-07	<b>6E-07</b>	6.1E-11	3.8E-06	1.4E-06	<b>5E-06</b>
1	2.0-4.0	0.75	4.2E-11	6.4E-07	3.3E-07	<b>1E-06</b>	9.7E-11	6.0E-06	2.2E-06	<b>8E-06</b>
2	0-0.5	2.84	1.6E-10	2.4E-06	1.3E-06	<b>4E-06</b>	3.7E-10	2.3E-05	8.3E-06	<b>3E-05</b>
2	0.5-2.0	2.52	1.4E-10	2.2E-06	1.1E-06	<b>3E-06</b>	3.3E-10	2.0E-05	7.3E-06	<b>3E-05</b>
2	2.0-4.0	11.93	6.6E-10	1.0E-05	5.3E-06	<b>2E-05</b>	1.5E-09	9.5E-05	3.5E-05	<b>1E-04</b>
3	0-0.5	1.15	6.4E-11	9.8E-07	5.1E-07	<b>1E-06</b>	1.5E-10	9.2E-06	3.3E-06	<b>1E-05</b>
3	0.5-2.0	1.11	6.1E-11	9.5E-07	4.9E-07	<b>1E-06</b>	1.4E-10	8.9E-06	3.2E-06	<b>1E-05</b>
3	2.0-4.0	1.06	5.9E-11	9.1E-07	4.7E-07	<b>1E-06</b>	1.4E-10	8.5E-06	3.1E-06	<b>1E-05</b>
4	0-0.5	3.04	1.7E-10	2.6E-06	1.4E-06	<b>4E-06</b>	3.9E-10	2.4E-05	8.8E-06	<b>3E-05</b>
4	0.5-2.0	3.41	1.9E-10	2.9E-06	1.5E-06	<b>4E-06</b>	4.4E-10	2.7E-05	9.9E-06	<b>4E-05</b>
4	2.0-4.0	7.54	4.2E-10	6.5E-06	3.4E-06	<b>1E-05</b>	9.7E-10	6.0E-05	2.2E-05	<b>8E-05</b>
5	0-0.5	2.97	1.6E-10	2.5E-06	1.3E-06	<b>4E-06</b>	3.8E-10	2.4E-05	8.6E-06	<b>3E-05</b>
5	0.5-2.0	4.83	2.7E-10	4.1E-06	2.1E-06	<b>6E-06</b>	6.2E-10	3.9E-05	1.4E-05	<b>5E-05</b>
5	2.0-4.0	10.33	5.7E-10	8.9E-06	4.6E-06	<b>1E-05</b>	1.3E-09	8.3E-05	3.0E-05	<b>1E-04</b>
6	0-0.5	1.33	7.4E-11	1.1E-06	5.9E-07	<b>2E-06</b>	1.7E-10	1.1E-05	3.9E-06	<b>1E-05</b>
6	0.5-2.0	2.12	1.2E-10	1.8E-06	9.4E-07	<b>3E-06</b>	2.7E-10	1.7E-05	6.2E-06	<b>2E-05</b>
6	2.0-4.0	6.56	3.6E-10	5.6E-06	2.9E-06	<b>9E-06</b>	8.5E-10	5.2E-05	1.9E-05	<b>7E-05</b>
7	0-0.5	9.63	5.3E-10	8.3E-06	4.3E-06	<b>1E-05</b>	1.2E-09	7.7E-05	2.8E-05	<b>1E-04</b>
7	0.5-2.0	7.53	4.2E-10	6.5E-06	3.4E-06	<b>1E-05</b>	9.7E-10	6.0E-05	2.2E-05	<b>8E-05</b>
7	2.0-4.0	11.42	6.3E-10	9.8E-06	5.1E-06	<b>1E-05</b>	1.5E-09	9.1E-05	3.3E-05	<b>1E-04</b>

**Table 7**  
**Summary of Pathway-Specific Cancer Risks for PAHs in Soil - Future Residents - EPA Methodology**

Area	Depth Interval (feet bgs)	Exposure Point Concentration (mg/kg)	Estimated Cancer Risk			
			Future Resident (age-adjusted)			
			Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
1	0-0.5	1.04	3.6E-10	1.2E-05	4.9E-06	2E-05
1	0.5-2.0	0.47	1.7E-10	5.4E-06	2.2E-06	8E-06
1	2.0-4.0	0.75	2.6E-10	8.6E-06	3.5E-06	1E-05
1	4.0-8.0	1.23	4.3E-10	1.4E-05	5.8E-06	2E-05
2	0-0.5	2.84	9.9E-10	3.2E-05	1.3E-05	5E-05
2	0.5-2.0	2.52	8.8E-10	2.9E-05	1.2E-05	4E-05
2	2.0-4.0	11.93	4.2E-09	1.4E-04	5.6E-05	2E-04
2	4.0-8.0	19.02	6.7E-09	2.2E-04	8.9E-05	3E-04
3	0-0.5	1.15	4.0E-10	1.3E-05	5.4E-06	2E-05
3	0.5-2.0	1.11	3.9E-10	1.3E-05	5.2E-06	2E-05
3	2.0-4.0	1.06	3.7E-10	1.2E-05	5.0E-06	2E-05
3	4.0-8.0	23.41	8.2E-09	2.7E-04	1.1E-04	4E-04
4	0-0.5	3.04	1.1E-09	3.5E-05	1.4E-05	5E-05
4	0.5-2.0	3.41	1.2E-09	3.9E-05	1.6E-05	6E-05
4	2.0-4.0	7.54	2.6E-09	8.6E-05	3.5E-05	1E-04
4	4.0-8.0	8.45	3.0E-09	9.7E-05	4.0E-05	1E-04
5	0-0.5	2.97	1.0E-09	3.4E-05	1.4E-05	5E-05
5	0.5-2.0	4.83	1.7E-09	5.5E-05	2.3E-05	8E-05
5	2.0-4.0	10.33	3.6E-09	1.2E-04	4.8E-05	2E-04
5	4.0-8.0	3.02	1.1E-09	3.4E-05	1.4E-05	5E-05
6	0-0.5	1.33	4.7E-10	1.5E-05	6.2E-06	2E-05
6	0.5-2.0	2.12	7.4E-10	2.4E-05	9.9E-06	3E-05
6	2.0-4.0	6.56	2.3E-09	7.5E-05	3.1E-05	1E-04
6	4.0-8.0	30.17	1.1E-08	3.4E-04	1.4E-04	5E-04
7	0-0.5	9.63	3.4E-09	1.1E-04	4.5E-05	2E-04
7	0.5-2.0	7.53	2.6E-09	8.6E-05	3.5E-05	1E-04
7	2.0-4.0	11.42	4.0E-09	1.3E-04	5.4E-05	2E-04
7	4.0-8.0	146.04	5.1E-08	1.7E-03	6.8E-04	2E-03

**Table 8**  
**Summary of Pathway-Specific Cancer Risks for PAHs in Soil - Construction Workers - EPA Methodology**

Area	Depth Interval (feet bgs)	Exposure Point Concentration (mg/kg)	Estimated Cancer Risk			
			Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
All of Parcel 181	0-0.5	2.64	7.9E-09	6.5E-07	1.2E-07	8E-07
	0.5-2.0	3.33	1.0E-08	8.2E-07	1.5E-07	1E-06
	2.0-4.0	5.97	1.8E-08	1.5E-06	2.6E-07	2E-06
	4.0-8.0	34.19	1.0E-07	8.4E-06	1.5E-06	1E-05
Northern Parcel 181	0-0.5	2.96	8.9E-09	7.2E-07	1.3E-07	9E-07
	0.5-2.0	2.91	8.7E-09	7.1E-07	1.3E-07	8E-07
	2.0-4.0	4.24	1.3E-08	1.0E-06	1.9E-07	1E-06
	4.0-8.0	80.70	2.4E-07	2.0E-05	3.5E-06	2E-05
Southern Parcel 181	0-0.5	2.67	8.0E-09	6.5E-07	1.2E-07	8E-07
	0.5-2.0	4.76	1.4E-08	1.2E-06	2.1E-07	1E-06
	2.0-4.0	12.27	3.7E-08	3.0E-06	5.4E-07	4E-06
	4.0-8.0	2.16	6.5E-09	5.3E-07	9.5E-08	6E-07

**Table 9**

**Summary of Pathway-Specific Noncancer Hazard Indices for PAHs in Soil - Current Residents - EPA Methodology**

Area	Depth Interval (feet bgs)	Estimated Noncancer Hazard Index							
		Current Adult Resident				Current Child Resident			
		Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
1	0-0.5	3E-07	0.0003	0.0001	<b>0.0004</b>	8E-07	0.002	0.001	<b>0.003</b>
1	0.5-2.0	2E-07	0.0001	0.00005	<b>0.0001</b>	4E-07	0.001	0.0003	<b>0.001</b>
1	2.0-4.0	2E-07	0.0001	0.00007	<b>0.0002</b>	5E-07	0.001	0.0005	<b>0.002</b>
2	0-0.5	8E-07	0.0005	0.0002	<b>0.0007</b>	2E-06	0.004	0.002	<b>0.006</b>
2	0.5-2.0	1E-06	0.0007	0.0003	<b>0.0010</b>	3E-06	0.006	0.002	<b>0.009</b>
2	2.0-4.0	4E-06	0.002	0.001	<b>0.003</b>	8E-06	0.019	0.007	<b>0.03</b>
3	0-0.5	3E-07	0.0002	0.0001	<b>0.0003</b>	6E-07	0.002	0.0007	<b>0.003</b>
3	0.5-2.0	4E-07	0.0002	0.0001	<b>0.0004</b>	9E-07	0.002	0.0008	<b>0.003</b>
3	2.0-4.0	3E-07	0.0002	0.00009	<b>0.0003</b>	6E-07	0.002	0.0006	<b>0.002</b>
4	0-0.5	1E-06	0.0006	0.0003	<b>0.0009</b>	2E-06	0.006	0.002	<b>0.008</b>
4	0.5-2.0	1E-06	0.0006	0.0003	<b>0.001</b>	2E-06	0.006	0.002	<b>0.008</b>
4	2.0-4.0	2E-06	0.001	0.0006	<b>0.002</b>	4E-06	0.01	0.004	<b>0.02</b>
5	0-0.5	9E-07	0.0005	0.0003	<b>0.0008</b>	2E-06	0.005	0.002	<b>0.007</b>
5	0.5-2.0	2E-06	0.001	0.0006	<b>0.002</b>	5E-06	0.01	0.004	<b>0.01</b>
5	2.0-4.0	3E-06	0.002	0.001	<b>0.003</b>	7E-06	0.02	0.007	<b>0.03</b>
6	0-0.5	5E-07	0.0003	0.0001	<b>0.0004</b>	1E-06	0.003	0.0009	<b>0.003</b>
6	0.5-2.0	7E-07	0.0004	0.0002	<b>0.0006</b>	2E-06	0.004	0.001	<b>0.005</b>
6	2.0-4.0	3E-06	0.001	0.0008	<b>0.002</b>	7E-06	0.01	0.005	<b>0.02</b>
7	0-0.5	3E-06	0.002	0.001	<b>0.004</b>	8E-06	0.02	0.01	<b>0.03</b>
7	0.5-2.0	3E-06	0.002	0.001	<b>0.003</b>	7E-06	0.02	0.007	<b>0.02</b>
7	2.0-4.0	6E-06	0.004	0.002	<b>0.006</b>	1E-05	0.04	0.01	<b>0.05</b>

**Table 10**

**Summary of Pathway-Specific Noncancer Hazard Indices for PAHs in Soil - Future Residents - EPA Methodology**

Area	Depth Interval (feet bgs)	Estimated Noncancer Hazard Index							
		Future Adult Resident				Future Child Resident			
		Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
1	0-0.5	3E-07	0.0003	0.0001	<b>0.0004</b>	8E-07	0.002	0.001	<b>0.003</b>
1	0.5-2.0	2E-07	0.0001	5E-05	<b>0.0001</b>	4E-07	0.001	0.0003	<b>0.001</b>
1	2.0-4.0	2E-07	0.0001	7E-05	<b>0.0002</b>	5E-07	0.001	0.0005	<b>0.002</b>
1	4.0-8.0	2E-07	0.0002	0.0001	<b>0.0003</b>	6E-07	0.002	0.001	<b>0.002</b>
2	0-0.5	8E-07	0.0005	0.0002	<b>0.0007</b>	2E-06	0.004	0.002	<b>0.006</b>
2	0.5-2.0	1E-06	0.0007	0.0003	<b>0.0010</b>	3E-06	0.006	0.002	<b>0.009</b>
2	2.0-4.0	4E-06	0.002	0.001	<b>0.003</b>	8E-06	0.02	0.007	<b>0.03</b>
2	4.0-8.0	7E-06	0.005	0.002	<b>0.007</b>	2E-05	0.04	0.02	<b>0.06</b>
3	0-0.5	3E-07	0.0002	0.0001	<b>0.0003</b>	6E-07	0.002	0.0007	<b>0.003</b>
3	0.5-2.0	4E-07	0.0002	0.0001	<b>0.0004</b>	9E-07	0.002	0.001	<b>0.003</b>
3	2.0-4.0	3E-07	0.0002	0.00009	<b>0.0003</b>	6E-07	0.002	0.0006	<b>0.002</b>
3	4.0-8.0	4E-06	0.002	0.001	<b>0.004</b>	9E-06	0.02	0.008	<b>0.03</b>
4	0-0.5	1E-06	0.0006	0.0003	<b>0.001</b>	2E-06	0.006	0.002	<b>0.008</b>
4	0.5-2.0	1E-06	0.0006	0.0003	<b>0.001</b>	2E-06	0.006	0.002	<b>0.008</b>
4	2.0-4.0	2E-06	0.001	0.0006	<b>0.002</b>	4E-06	0.01	0.004	<b>0.02</b>
4	4.0-8.0	4E-06	0.003	0.001	<b>0.004</b>	1E-05	0.03	0.01	<b>0.04</b>
5	0-0.5	9E-07	0.0005	0.0003	<b>0.001</b>	2E-06	0.005	0.002	<b>0.007</b>
5	0.5-2.0	2E-06	0.001	0.0006	<b>0.002</b>	5E-06	0.01	0.004	<b>0.01</b>
5	2.0-4.0	3E-06	0.002	0.001	<b>0.003</b>	7E-06	0.02	0.007	<b>0.03</b>
5	4.0-8.0	6E-07	0.0006	0.0003	<b>0.001</b>	1E-06	0.006	0.002	<b>0.008</b>
6	0-0.5	5E-07	0.0003	0.0001	<b>0.0004</b>	1E-06	0.003	0.001	<b>0.003</b>
6	0.5-2.0	7E-07	0.0004	0.0002	<b>0.0006</b>	2E-06	0.004	0.001	<b>0.005</b>
6	2.0-4.0	3E-06	0.001	0.0008	<b>0.002</b>	7E-06	0.01	0.005	<b>0.02</b>
6	4.0-8.0	8E-06	0.006	0.003	<b>0.009</b>	2E-05	0.06	0.02	<b>0.08</b>
7	0-0.5	3E-06	0.002	0.001	<b>0.004</b>	8E-06	0.02	0.01	<b>0.03</b>
7	0.5-2.0	3E-06	0.002	0.001	<b>0.003</b>	7E-06	0.02	0.01	<b>0.02</b>
7	2.0-4.0	6E-06	0.004	0.002	<b>0.006</b>	1E-05	0.04	0.01	<b>0.05</b>
7	4.0-8.0	0.0002	0.1	0.06	<b>0.2</b>	0.0005	1.0	0.4	<b>1.4</b>

**Table 11**  
**Summary of Pathway-Specific Noncancer Hazard Indices for PAHs in Soil - Construction Workers -**  
**EPA Methodology**

Area	Depth Interval (feet bgs)	Estimated Noncancer Hazard Index			
		Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
All of Parcel 181	0-0.5	0.0003	0.0009	0.0002	0.001
	0.5-2.0	0.0004	0.001	0.0002	0.002
	2.0-4.0	0.0006	0.002	0.0004	0.003
	4.0-8.0	0.009	0.03	0.005	0.04
Northern Parcel 181	0-0.5	0.0003	0.001	0.0002	0.001
	0.5-2.0	0.0003	0.001	0.0002	0.001
	2.0-4.0	0.0005	0.002	0.0003	0.002
	4.0-8.0	0.06	0.1	0.02	0.2
Southern Parcel 181	0-0.5	0.0003	0.0009	0.0002	0.001
	0.5-2.0	0.0003	0.0009	0.0002	0.003
	2.0-4.0	0.001	0.004	0.0007	0.006
	4.0-8.0	0.0002	0.0009	0.0002	0.001

**Table 12**  
**Summary of Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil - Current Residents -**  
**EPA Methodology**

Depth Interval (feet bgs)	Estimated Cancer Risk							
	Current Adult Resident				Current Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
0-0.5	7.1E-09	7.2E-07	8.7E-08	<b>8E-07</b>	1.7E-08	6.8E-06	5.7E-07	<b>7E-06</b>
0.5-2.0	6.9E-09	7.4E-07	8.9E-08	<b>8E-07</b>	1.6E-08	6.9E-06	5.8E-07	<b>8E-06</b>
2.0-4.0	9.9E-09	9.3E-07	1.1E-07	<b>1E-06</b>	2.3E-08	8.7E-06	7.3E-07	<b>9E-06</b>

**Table 13**  
**Summary of Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil - Future Residents -**  
**EPA Methodology**

Depth Interval (feet bgs)	Estimated Cancer Risk			
	Future Resident (age-adjusted)			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
0-0.5	4.5E-08	9.7E-06	9.1E-07	1E-05
0.5-2.0	4.3E-08	9.9E-06	9.4E-07	1E-05
2.0-4.0	6.2E-08	1.2E-05	1.2E-06	1E-05
4.0-8.0	6.2E-08	1.0E-05	9.5E-07	1E-05

**Table 14**  
**Summary of Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil - Construction Workers -**  
**EPA Methodology**

Depth Interval (feet bgs)	Estimated Cancer Risk			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
0-0.5	3.9E-07	2.1E-07	8.5E-09	6E-07
0.5-2.0	3.7E-07	2.1E-07	8.7E-09	6E-07
2.0-4.0	5.4E-07	2.7E-07	1.1E-08	8E-07
4.0-8.0	5.4E-07	2.2E-07	8.9E-09	8E-07

**Table 15**  
**Summary of Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil - Current Residents - EPA Methodology**

Depth Interval (feet bgs)	Estimated Noncancer Hazard Index							
	Current Adult Resident				Current Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
0-0.5	0.0009	0.08	0.004	<b>0.08</b>	0.002	0.7	0.03	<b>0.7</b>
0.5-2.0	0.0009	0.08	0.005	<b>0.08</b>	0.002	0.7	0.03	<b>0.8</b>
2.0-4.0	0.001	0.09	0.005	<b>0.09</b>	0.003	0.8	0.04	<b>0.9</b>

**Table 16**

**Summary of Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil - Future Residents - EPA Methodology**

Depth Interval (feet bgs)	Estimated Noncancer Hazard Index							
	Future Adult Resident				Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
<b>0-0.5</b>	0.0009	0.08	0.004	<b>0.08</b>	0.002	0.7	0.03	<b>0.7</b>
<b>0.5-2.0</b>	0.0009	0.08	0.005	<b>0.08</b>	0.002	0.7	0.03	<b>0.8</b>
<b>2.0-4.0</b>	0.0013	0.09	0.005	<b>0.09</b>	0.003	0.8	0.04	<b>0.9</b>
<b>4.0-8.0</b>	0.001	0.1	0.006	<b>0.1</b>	0.003	1.0	0.04	<b>1</b>

**Table 17****Summary of Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil - Construction Workers - EPA Methodology**

Depth Interval (feet bgs)	Estimated Noncancer Hazard Index			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
0-0.5	0.3	0.1	0.003	0.4
0.5-2.0	0.3	0.1	0.003	0.4
2.0-4.0	0.4	0.2	0.003	0.6
4.0-8.0	0.4	0.2	0.003	0.6

**Table 18**

**Cumulative Estimated Risks and Noncancer Hazard Indices - Parcel 181 - Current Residents - EPA Methodology**

Area	Depth Interval (feet)	Estimated Cancer Risk (child)					Estimated Noncancer Hazard Index (child)			
		PAHs in Soil	Metals in Soil	VOCs in Soil-Gas	Total Cancer Risk	Incremental Cancer Risk	PAHs in Soil	Metals in Soil	VOCs in Soil-Gas	Total Hazard Index
1	0-0.5	1x10 <sup>-5</sup>	7x10 <sup>-6</sup>	1x10 <sup>-8</sup>	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	0.003	0.7	0.02	0.8
1	0.5-2.0	5x10 <sup>-6</sup>	8x10 <sup>-6</sup>	1x10 <sup>-8</sup>	1x10 <sup>-5</sup>	5x10 <sup>-6</sup>	0.001	0.8	0.02	0.8
1	2.0-4.0	8x10 <sup>-6</sup>	9x10 <sup>-6</sup>	1x10 <sup>-8</sup>	2x10 <sup>-5</sup>	8x10 <sup>-6</sup>	0.002	0.9	0.02	0.9
2	0-0.5	3x10 <sup>-5</sup>	7x10 <sup>-6</sup>	1x10 <sup>-8</sup>	4x10 <sup>-5</sup>	3x10 <sup>-5</sup>	0.006	0.7	0.02	0.8
2	0.5-2.0	3x10 <sup>-5</sup>	8x10 <sup>-6</sup>	1x10 <sup>-8</sup>	4x10 <sup>-5</sup>	3x10 <sup>-5</sup>	0.009	0.8	0.02	0.8
2	2.0-4.0	1x10 <sup>-4</sup>	9x10 <sup>-6</sup>	1x10 <sup>-8</sup>	1x10 <sup>-4</sup>	1x10 <sup>-4</sup>	0.03	0.9	0.02	0.9
3	0-0.5	1x10 <sup>-5</sup>	7x10 <sup>-6</sup>	1x10 <sup>-8</sup>	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	0.003	0.7	0.02	0.8
3	0.5-2.0	1x10 <sup>-5</sup>	8x10 <sup>-6</sup>	1x10 <sup>-8</sup>	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	0.003	0.8	0.02	0.8
3	2.0-4.0	1x10 <sup>-5</sup>	9x10 <sup>-6</sup>	1x10 <sup>-8</sup>	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	0.002	0.9	0.02	0.9
4	0-0.5	3x10 <sup>-5</sup>	7x10 <sup>-6</sup>	1x10 <sup>-8</sup>	4x10 <sup>-5</sup>	3x10 <sup>-5</sup>	0.008	0.7	0.02	0.8
4	0.5-2.0	4x10 <sup>-5</sup>	8x10 <sup>-6</sup>	1x10 <sup>-8</sup>	4x10 <sup>-5</sup>	4x10 <sup>-5</sup>	0.008	0.8	0.02	0.8
4	2.0-4.0	8x10 <sup>-5</sup>	9x10 <sup>-6</sup>	1x10 <sup>-8</sup>	9x10 <sup>-5</sup>	8x10 <sup>-5</sup>	0.016	0.9	0.02	0.9
5	0-0.5	3x10 <sup>-5</sup>	7x10 <sup>-6</sup>	1x10 <sup>-8</sup>	4x10 <sup>-5</sup>	3x10 <sup>-5</sup>	0.007	0.7	0.02	0.8
5	0.5-2.0	5x10 <sup>-5</sup>	8x10 <sup>-6</sup>	1x10 <sup>-8</sup>	6x10 <sup>-5</sup>	5x10 <sup>-5</sup>	0.01	0.8	0.02	0.8
5	2.0-4.0	1x10 <sup>-4</sup>	9x10 <sup>-6</sup>	1x10 <sup>-8</sup>	1x10 <sup>-4</sup>	1x10 <sup>-4</sup>	0.03	0.9	0.02	0.9
6	0-0.5	1x10 <sup>-5</sup>	7x10 <sup>-6</sup>	1x10 <sup>-8</sup>	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	0.003	0.7	0.02	0.8
6	0.5-2.0	2x10 <sup>-5</sup>	8x10 <sup>-6</sup>	1x10 <sup>-8</sup>	3x10 <sup>-5</sup>	2x10 <sup>-5</sup>	0.005	0.8	0.02	0.8
6	2.0-4.0	7x10 <sup>-5</sup>	9x10 <sup>-6</sup>	1x10 <sup>-8</sup>	8x10 <sup>-5</sup>	7x10 <sup>-5</sup>	0.02	0.9	0.02	0.9
7	0-0.5	1x10 <sup>-4</sup>	7x10 <sup>-6</sup>	1x10 <sup>-8</sup>	1x10 <sup>-4</sup>	1x10 <sup>-4</sup>	0.03	0.7	0.02	0.8
7	0.5-2.0	8x10 <sup>-5</sup>	8x10 <sup>-6</sup>	1x10 <sup>-8</sup>	9x10 <sup>-5</sup>	8x10 <sup>-5</sup>	0.02	0.8	0.02	0.8
7	2.0-4.0	1x10 <sup>-4</sup>	9x10 <sup>-6</sup>	1x10 <sup>-8</sup>	1x10 <sup>-4</sup>	1x10 <sup>-4</sup>	0.05	0.9	0.02	0.9

PAH denotes polynuclear aromatic hydrocarbon

Decision areas 1 through 7 defined on the basis of similar soil benzo(a)pyrene-equivalent concentrations from 0 to 4 feet depth.

Risk and hazard for metals in soil at each depth calculated using an exposure point concentration for data across all of Parcel 181.

Risk and hazard for volatile organic compounds (VOC) calculated using maximum reported value in Parcel 181.

Incremental cancer risk is equivalent to the total risk minus the risk due to metals in soil.

**Table 19**

**Cumulative Cancer Risks and Noncancer Hazard Indices - Parcel 181 - Future Residents - EPA Methodology**

Area	Depth Interval (feet)	Estimated Cancer Risk (age-adjusted)					Estimated Noncancer Hazard Index (child)			
		PAHs in Soil	Metals in Soil	VOCs in Soil-Gas	Total Cancer Risk	Incremental Cancer Risk	PAHs in Soil	Metals in Soil	VOCs in Soil-Gas	Total Hazard Index
1	0-0.5	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	3x10 <sup>-5</sup>	2x10 <sup>-5</sup>	0.003	0.7	0.02	0.8
1	0.5-2.0	8x10 <sup>-6</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	2x10 <sup>-5</sup>	8x10 <sup>-6</sup>	0.001	0.8	0.02	0.8
1	2.0-4.0	1x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	3x10 <sup>-5</sup>	1x10 <sup>-5</sup>	0.002	0.9	0.02	0.9
1	4.0-8.0	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	3x10 <sup>-5</sup>	2x10 <sup>-5</sup>	0.002	1	0.02	1.0
2	0-0.5	5x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	6x10 <sup>-5</sup>	5x10 <sup>-5</sup>	0.006	0.7	0.02	0.8
2	0.5-2.0	4x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	5x10 <sup>-5</sup>	4x10 <sup>-5</sup>	0.009	0.8	0.02	0.8
2	2.0-4.0	2x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	2x10 <sup>-4</sup>	2x10 <sup>-4</sup>	0.03	0.9	0.02	0.9
2	4.0-8.0	3x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	3x10 <sup>-4</sup>	3x10 <sup>-4</sup>	0.06	1	0.02	1.1
3	0-0.5	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	3x10 <sup>-5</sup>	2x10 <sup>-5</sup>	0.003	0.7	0.02	0.8
3	0.5-2.0	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	3x10 <sup>-5</sup>	2x10 <sup>-5</sup>	0.003	0.8	0.02	0.8
3	2.0-4.0	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	3x10 <sup>-5</sup>	2x10 <sup>-5</sup>	0.002	0.9	0.02	0.9
3	4.0-8.0	4x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	4x10 <sup>-4</sup>	4x10 <sup>-4</sup>	0.03	1	0.02	1.1
4	0-0.5	5x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	6x10 <sup>-5</sup>	5x10 <sup>-5</sup>	0.008	0.7	0.02	0.8
4	0.5-2.0	6x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	7x10 <sup>-5</sup>	6x10 <sup>-5</sup>	0.008	0.8	0.02	0.8
4	2.0-4.0	1x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	1x10 <sup>-4</sup>	1x10 <sup>-4</sup>	0.02	0.9	0.02	0.9
4	4.0-8.0	1x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	1x10 <sup>-4</sup>	1x10 <sup>-4</sup>	0.04	1	0.02	1.1
5	0-0.5	5x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	6x10 <sup>-5</sup>	5x10 <sup>-5</sup>	0.007	0.7	0.02	0.8
5	0.5-2.0	8x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	9x10 <sup>-5</sup>	8x10 <sup>-5</sup>	0.01	0.8	0.02	0.8
5	2.0-4.0	2x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	2x10 <sup>-4</sup>	2x10 <sup>-4</sup>	0.03	0.9	0.02	0.9
5	4.0-8.0	5x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	6x10 <sup>-5</sup>	5x10 <sup>-5</sup>	0.008	1	0.02	1.0
6	0-0.5	2x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	3x10 <sup>-5</sup>	2x10 <sup>-5</sup>	0.003	0.7	0.02	0.8
6	0.5-2.0	3x10 <sup>-5</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	5x10 <sup>-5</sup>	3x10 <sup>-5</sup>	0.005	0.8	0.02	0.8
6	2.0-4.0	1x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	1x10 <sup>-4</sup>	1x10 <sup>-4</sup>	0.02	0.9	0.02	0.9
6	4.0-8.0	5x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	5x10 <sup>-4</sup>	5x10 <sup>-4</sup>	0.08	1	0.02	1.1
7	0-0.5	2x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	2x10 <sup>-4</sup>	2x10 <sup>-4</sup>	0.03	0.7	0.02	0.8
7	0.5-2.0	1x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	1x10 <sup>-4</sup>	1x10 <sup>-4</sup>	0.02	0.8	0.02	0.8
7	2.0-4.0	2x10 <sup>-4</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	2x10 <sup>-4</sup>	2x10 <sup>-4</sup>	0.05	0.9	0.02	0.9
7	4.0-8.0	2x10 <sup>-3</sup>	1x10 <sup>-5</sup>	4x10 <sup>-8</sup>	2x10 <sup>-3</sup>	2x10 <sup>-3</sup>	1	1	0.02	2.4

PAH denotes polynuclear aromatic hydrocarbon

Decision areas 1 through 7 defined on the basis of similar soil benzo(a)pyrene-equivalent concentrations from 0 to 4 feet depth.

Risk and hazard for metals in soil at each depth calculated using an exposure point concentration for data across all of Parcel 181.

Risk and hazard for volatile organic compounds (VOC) calculated using maximum reported value in Parcel 181.

Incremental cancer risk is equivalent to the total risk minus the risk due to metals in soil.

**Table 20**

**Cumulative Cancer Risks and Noncancer Hazard Indices - Parcel 181 - Construction Workers - EPA Methodology**

Area	Depth Interval (feet)	Estimated Cancer Risk					Estimated Hazard Index			
		PAHs in Soil	Metals in Soil	VOCs in Soil-Gas	Total Cancer Risk	Incremental Cancer Risk	PAHs in Soil	Metals in Soil	VOCs in Soil-Gas	Total Hazard Index
All of Parcel 181	0-0.5	8x10 <sup>-7</sup>	6x10 <sup>-7</sup>	2x10 <sup>-10</sup>	1x10 <sup>-6</sup>	8x10 <sup>-7</sup>	0.001	0.4	0.0008	0.4
	0.5-2.0	1x10 <sup>-6</sup>	6x10 <sup>-7</sup>	2x10 <sup>-10</sup>	2x10 <sup>-6</sup>	1x10 <sup>-6</sup>	0.002	0.4	0.0008	0.4
	2.0-4.0	2x10 <sup>-6</sup>	8x10 <sup>-7</sup>	2x10 <sup>-10</sup>	3x10 <sup>-6</sup>	2x10 <sup>-6</sup>	0.003	0.6	0.0008	0.6
	4.0-8.0	1x10 <sup>-5</sup>	8x10 <sup>-7</sup>	2x10 <sup>-10</sup>	1x10 <sup>-5</sup>	1x10 <sup>-5</sup>	0.04	0.6	0.0008	0.6
Northern Parcel	0-0.5	9x10 <sup>-7</sup>	6x10 <sup>-7</sup>	2x10 <sup>-10</sup>	1x10 <sup>-6</sup>	9x10 <sup>-7</sup>	0.001	0.4	0.0008	0.4
	0.5-2.0	8x10 <sup>-7</sup>	6x10 <sup>-7</sup>	2x10 <sup>-10</sup>	1x10 <sup>-6</sup>	8x10 <sup>-7</sup>	0.001	0.4	0.0008	0.4
	2.0-4.0	1x10 <sup>-6</sup>	8x10 <sup>-7</sup>	2x10 <sup>-10</sup>	2x10 <sup>-6</sup>	1x10 <sup>-6</sup>	0.002	0.6	0.0008	0.6
	4.0-8.0	2x10 <sup>-5</sup>	8x10 <sup>-7</sup>	2x10 <sup>-10</sup>	2x10 <sup>-5</sup>	2x10 <sup>-5</sup>	0.2	0.6	0.0008	0.8
Southern Parcel	0-0.5	8x10 <sup>-7</sup>	6x10 <sup>-7</sup>	2x10 <sup>-10</sup>	1x10 <sup>-6</sup>	8x10 <sup>-7</sup>	0.001	0.4	0.0008	0.4
	0.5-2.0	1x10 <sup>-6</sup>	6x10 <sup>-7</sup>	2x10 <sup>-10</sup>	2x10 <sup>-6</sup>	1x10 <sup>-6</sup>	0.003	0.4	0.0008	0.4
	2.0-4.0	4x10 <sup>-6</sup>	8x10 <sup>-7</sup>	2x10 <sup>-10</sup>	4x10 <sup>-6</sup>	4x10 <sup>-6</sup>	0.006	0.6	0.0008	0.6
	4.0-8.0	6x10 <sup>-7</sup>	8x10 <sup>-7</sup>	2x10 <sup>-10</sup>	1x10 <sup>-6</sup>	6x10 <sup>-7</sup>	0.001	0.6	0.0008	0.6

PAH denotes polynuclear aromatic hydrocarbon

Northern and southern areas defined on the basis of similar soil benzo(a)pyrene-equivalent concentrations from 4 to 8 feet depth.

Risk and hazard for metals in soil at each depth calculated using an exposure point concentration for data across all of Parcel 181.

Risk and hazard for volatile organic compounds (VOC) calculated using maximum reported value in Parcel 181, using the greater of soil gas, hydropunch groundwater, or monitoring well groundwater samples; the hydropunch samples yielded both the maximum cancer risk and the maximum hazard index.

Incremental cancer risk is equivalent to the total risk minus the risk due to metals in soil.

**Table A-1**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 1 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	6.6E-11	4.3E-07	2.3E-07	<b>6.6E-07</b>	1.5E-10	4.0E-06	1.5E-06	<b>5.5E-06</b>
Acenaphthylene	1.5E-08	4.2E-06	2.2E-06	<b>6.4E-06</b>	3.5E-08	3.9E-05	1.4E-05	<b>5.3E-05</b>
Anthracene	3.8E-11	2.5E-07	1.3E-07	<b>3.8E-07</b>	8.9E-11	2.4E-06	8.6E-07	<b>3.2E-06</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.7E-07	4.8E-05	2.5E-05	<b>7.3E-05</b>	4.0E-07	4.5E-04	1.6E-04	<b>6.1E-04</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1.4E-08	9.3E-05	4.8E-05	<b>1.4E-04</b>	3.3E-08	8.7E-04	3.2E-04	<b>1.2E-03</b>
Fluorene	4.1E-10	2.7E-06	1.4E-06	<b>4.1E-06</b>	9.5E-10	2.5E-05	9.1E-06	<b>3.4E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	4.4E-09	1.2E-06	6.4E-07	<b>1.9E-06</b>	1.0E-08	1.2E-05	4.2E-06	<b>1.6E-05</b>
Phenanthrene	1.1E-07	3.1E-05	1.6E-05	<b>4.7E-05</b>	2.6E-07	2.9E-04	1.1E-04	<b>4.0E-04</b>
Pyrene	1.1E-08	7.3E-05	3.8E-05	<b>1.1E-04</b>	2.6E-08	6.8E-04	2.5E-04	<b>9.2E-04</b>
<b>Total</b>	<b>3.3E-07</b>	<b>2.5E-04</b>	<b>1.3E-04</b>	<b>3.9E-04</b>	<b>7.6E-07</b>	<b>2.4E-03</b>	<b>8.6E-04</b>	<b>3.2E-03</b>

**Table A-2**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 2 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	4.5E-10	3.0E-06	1.5E-06	<b>4.5E-06</b>	1.1E-09	2.8E-05	1.0E-05	<b>3.8E-05</b>
Acenaphthylene	1.6E-07	4.6E-05	2.4E-05	<b>7.0E-05</b>	3.8E-07	4.3E-04	1.6E-04	<b>5.8E-04</b>
Anthracene	7.5E-11	5.0E-07	2.6E-07	<b>7.5E-07</b>	1.8E-10	4.6E-06	1.7E-06	<b>6.3E-06</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3.0E-07	8.5E-05	4.4E-05	<b>1.3E-04</b>	7.1E-07	8.0E-04	2.9E-04	<b>1.1E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2.0E-08	1.3E-04	6.9E-05	<b>2.0E-04</b>	4.7E-08	1.2E-03	4.5E-04	<b>1.7E-03</b>
Fluorene	5.7E-10	3.7E-06	1.9E-06	<b>5.7E-06</b>	1.3E-09	3.5E-05	1.3E-05	<b>4.8E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	2.7E-08	7.5E-06	3.9E-06	<b>1.1E-05</b>	6.2E-08	7.0E-05	2.6E-05	<b>9.6E-05</b>
Phenanthrene	2.2E-07	6.2E-05	3.2E-05	<b>9.4E-05</b>	5.1E-07	5.8E-04	2.1E-04	<b>7.9E-04</b>
Pyrene	2.1E-08	1.4E-04	7.1E-05	<b>2.1E-04</b>	4.8E-08	1.3E-03	4.6E-04	<b>1.7E-03</b>
<b>Total</b>	<b>7.5E-07</b>	<b>4.8E-04</b>	<b>2.5E-04</b>	<b>7.3E-04</b>	<b>1.8E-06</b>	<b>4.5E-03</b>	<b>1.6E-03</b>	<b>6.1E-03</b>

**Table A-3**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 3 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	2.9E-08	8.2E-06	4.3E-06	1.3E-05	6.8E-08	7.7E-05	2.8E-05	1.0E-04
Anthracene	4.6E-11	3.0E-07	1.6E-07	4.6E-07	1.1E-10	2.8E-06	1.0E-06	3.8E-06
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.5E-07	4.3E-05	2.2E-05	6.5E-05	3.5E-07	4.0E-04	1.4E-04	5.4E-04
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	6.3E-09	4.2E-05	2.2E-05	6.3E-05	1.5E-08	3.9E-04	1.4E-04	5.3E-04
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	8.0E-09	2.3E-06	1.2E-06	3.4E-06	1.9E-08	2.1E-05	7.7E-06	2.9E-05
Phenanthrene	6.8E-08	1.9E-05	9.9E-06	2.9E-05	1.6E-07	1.8E-04	6.5E-05	2.4E-04
Pyrene	1.4E-08	9.0E-05	4.6E-05	1.4E-04	3.2E-08	8.4E-04	3.0E-04	1.1E-03
<b>Total</b>	2.8E-07	2.0E-04	1.1E-04	3.1E-04	6.4E-07	1.9E-03	6.9E-04	2.6E-03

**Table A-4**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 4 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	2.7E-07	7.5E-05	3.9E-05	1.1E-04	6.2E-07	7.0E-04	2.6E-04	9.6E-04
Anthracene	1.5E-10	1.0E-06	5.2E-07	1.5E-06	3.6E-10	9.3E-06	3.4E-06	1.3E-05
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	4.2E-07	1.2E-04	6.1E-05	1.8E-04	9.8E-07	1.1E-03	4.0E-04	1.5E-03
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2.4E-08	1.6E-04	8.4E-05	2.4E-04	5.7E-08	1.5E-03	5.5E-04	2.0E-03
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	2.6E-07	7.3E-05	3.8E-05	1.1E-04	6.0E-07	6.8E-04	2.5E-04	9.3E-04
Pyrene	2.5E-08	1.6E-04	8.4E-05	2.5E-04	5.8E-08	1.5E-03	5.5E-04	2.1E-03
<b>Total</b>	9.9E-07	5.9E-04	3.1E-04	9.0E-04	2.3E-06	5.5E-03	2.0E-03	7.5E-03

**Table A-5**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 5 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	2.6E-10	1.7E-06	9.0E-07	<b>2.6E-06</b>	6.2E-10	1.6E-05	5.9E-06	<b>2.2E-05</b>
Acenaphthylene	7.8E-08	2.2E-05	1.1E-05	<b>3.3E-05</b>	1.8E-07	2.0E-04	7.4E-05	<b>2.8E-04</b>
Anthracene	2.0E-10	1.3E-06	6.9E-07	<b>2.0E-06</b>	4.7E-10	1.2E-05	4.5E-06	<b>1.7E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	4.5E-07	1.3E-04	6.5E-05	<b>1.9E-04</b>	1.0E-06	1.2E-03	4.3E-04	<b>1.6E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2.1E-08	1.4E-04	7.2E-05	<b>2.1E-04</b>	4.9E-08	1.3E-03	4.7E-04	<b>1.8E-03</b>
Fluorene	6.7E-10	4.4E-06	2.3E-06	<b>6.7E-06</b>	1.6E-09	4.1E-05	1.5E-05	<b>5.6E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	2.9E-08	8.2E-06	4.3E-06	<b>1.3E-05</b>	6.8E-08	7.7E-05	2.8E-05	<b>1.0E-04</b>
Phenanthrene	3.1E-07	8.7E-05	4.5E-05	<b>1.3E-04</b>	7.2E-07	8.1E-04	3.0E-04	<b>1.1E-03</b>
Pyrene	2.4E-08	1.6E-04	8.3E-05	<b>2.4E-04</b>	5.7E-08	1.5E-03	5.4E-04	<b>2.0E-03</b>
<b>Total</b>	<b>9.1E-07</b>	<b>5.5E-04</b>	<b>2.8E-04</b>	<b>8.3E-04</b>	<b>2.1E-06</b>	<b>5.1E-03</b>	<b>1.9E-03</b>	<b>7.0E-03</b>

**Table A-6**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 6 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	1.1E-10	7.1E-07	3.7E-07	<b>1.1E-06</b>	2.5E-10	6.6E-06	2.4E-06	<b>9.0E-06</b>
Acenaphthylene	2.0E-08	5.6E-06	2.9E-06	<b>8.5E-06</b>	4.6E-08	5.2E-05	1.9E-05	<b>7.2E-05</b>
Anthracene	7.7E-11	5.0E-07	2.6E-07	<b>7.7E-07</b>	1.8E-10	4.7E-06	1.7E-06	<b>6.4E-06</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	2.4E-07	6.7E-05	3.5E-05	<b>1.0E-04</b>	5.5E-07	6.2E-04	2.3E-04	<b>8.5E-04</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1.0E-08	6.6E-05	3.4E-05	<b>1.0E-04</b>	2.4E-08	6.2E-04	2.3E-04	<b>8.4E-04</b>
Fluorene	2.3E-10	1.5E-06	8.0E-07	<b>2.3E-06</b>	5.5E-10	1.4E-05	5.2E-06	<b>2.0E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	7.5E-09	2.1E-06	1.1E-06	<b>3.2E-06</b>	1.8E-08	2.0E-05	7.2E-06	<b>2.7E-05</b>
Phenanthrene	1.7E-07	4.7E-05	2.4E-05	<b>7.1E-05</b>	3.9E-07	4.4E-04	1.6E-04	<b>5.9E-04</b>
Pyrene	1.2E-08	7.9E-05	4.1E-05	<b>1.2E-04</b>	2.8E-08	7.4E-04	2.7E-04	<b>1.0E-03</b>
<b>Total</b>	<b>4.5E-07</b>	<b>2.7E-04</b>	<b>1.4E-04</b>	<b>4.1E-04</b>	<b>1.1E-06</b>	<b>2.5E-03</b>	<b>9.2E-04</b>	<b>3.4E-03</b>

**Table A-7**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0-0.5 feet) - Exposure Area 7 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	2.1E-07	6.0E-05	3.1E-05	9.1E-05	4.9E-07	5.6E-04	2.0E-04	7.6E-04
Anthracene	1.3E-09	8.8E-06	4.6E-06	1.3E-05	3.1E-09	8.3E-05	3.0E-05	1.1E-04
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.1E-06	3.0E-04	1.6E-04	4.6E-04	2.5E-06	2.8E-03	1.0E-03	3.8E-03
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1.2E-07	8.2E-04	4.2E-04	1.2E-03	2.9E-07	7.6E-03	2.8E-03	1.0E-02
Fluorene	2.9E-09	1.9E-05	9.7E-06	2.9E-05	6.7E-09	1.8E-04	6.4E-05	2.4E-04
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	2.0E-06	5.6E-04	2.9E-04	8.5E-04	4.6E-06	5.2E-03	1.9E-03	7.1E-03
Pyrene	8.9E-08	5.8E-04	3.0E-04	8.9E-04	2.1E-07	5.4E-03	2.0E-03	7.4E-03
<b>Total</b>	3.5E-06	2.3E-03	1.2E-03	3.6E-03	8.1E-06	2.2E-02	8.0E-03	3.0E-02

**Table A-8**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2.0 feet) - Exposure Area 1 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	1.9E-08	5.3E-06	2.8E-06	<b>8.1E-06</b>	4.4E-08	5.0E-05	1.8E-05	<b>6.8E-05</b>
Anthracene	2.8E-11	1.9E-07	9.6E-08	<b>2.8E-07</b>	6.6E-11	1.7E-06	6.3E-07	<b>2.4E-06</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	5.3E-08	1.5E-05	7.8E-06	<b>2.3E-05</b>	1.2E-07	1.4E-04	5.1E-05	<b>1.9E-04</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3.3E-09	2.2E-05	1.1E-05	<b>3.3E-05</b>	7.6E-09	2.0E-04	7.3E-05	<b>2.7E-04</b>
Fluorene	7.8E-11	5.1E-07	2.7E-07	<b>7.8E-07</b>	1.8E-10	4.8E-06	1.7E-06	<b>6.5E-06</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	2.7E-08	7.5E-06	3.9E-06	<b>1.1E-05</b>	6.2E-08	7.0E-05	2.6E-05	<b>9.6E-05</b>
Phenanthrene	4.5E-08	1.3E-05	6.6E-06	<b>1.9E-05</b>	1.1E-07	1.2E-04	4.3E-05	<b>1.6E-04</b>
Pyrene	3.7E-09	2.4E-05	1.3E-05	<b>3.7E-05</b>	8.6E-09	2.3E-04	8.3E-05	<b>3.1E-04</b>
<b>Total</b>	1.5E-07	8.7E-05	4.5E-05	<b>1.3E-04</b>	3.5E-07	8.1E-04	3.0E-04	<b>1.1E-03</b>

**Table A-9**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2.0 feet) - Exposure Area 2 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	4.9E-10	3.2E-06	1.7E-06	<b>4.9E-06</b>	1.1E-09	3.0E-05	1.1E-05	<b>4.1E-05</b>
Acenaphthylene	9.0E-08	2.5E-05	1.3E-05	<b>3.9E-05</b>	2.1E-07	2.4E-04	8.6E-05	<b>3.2E-04</b>
Anthracene	7.6E-11	5.0E-07	2.6E-07	<b>7.6E-07</b>	1.8E-10	4.6E-06	1.7E-06	<b>6.3E-06</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	4.0E-07	1.1E-04	5.9E-05	<b>1.7E-04</b>	9.4E-07	1.1E-03	3.9E-04	<b>1.4E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2.9E-08	1.9E-04	1.0E-04	<b>2.9E-04</b>	6.8E-08	1.8E-03	6.5E-04	<b>2.4E-03</b>
Fluorene	3.5E-10	2.3E-06	1.2E-06	<b>3.5E-06</b>	8.1E-10	2.1E-05	7.8E-06	<b>2.9E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	1.1E-08	3.1E-06	1.6E-06	<b>4.7E-06</b>	2.5E-08	2.9E-05	1.0E-05	<b>3.9E-05</b>
Phenanthrene	5.1E-07	1.4E-04	7.5E-05	<b>2.2E-04</b>	1.2E-06	1.3E-03	4.9E-04	<b>1.8E-03</b>
Pyrene	2.9E-08	1.9E-04	9.8E-05	<b>2.9E-04</b>	6.7E-08	1.8E-03	6.4E-04	<b>2.4E-03</b>
<b>Total</b>	1.1E-06	6.7E-04	3.5E-04	<b>1.0E-03</b>	2.5E-06	6.3E-03	2.3E-03	<b>8.6E-03</b>

Table A-10

## Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2.0 feet) - Exposure Area 3 - Current and Future Residents

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	6.9E-11	4.6E-07	2.4E-07	<b>6.9E-07</b>	1.6E-10	4.3E-06	1.6E-06	<b>5.8E-06</b>
Acenaphthylene	2.3E-08	6.4E-06	3.3E-06	<b>9.7E-06</b>	5.3E-08	5.9E-05	2.2E-05	<b>8.1E-05</b>
Anthracene	8.3E-11	5.5E-07	2.8E-07	<b>8.3E-07</b>	1.9E-10	5.1E-06	1.9E-06	<b>7.0E-06</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.6E-07	4.4E-05	2.3E-05	<b>6.7E-05</b>	3.6E-07	4.1E-04	1.5E-04	<b>5.6E-04</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	7.8E-09	5.1E-05	2.7E-05	<b>7.8E-05</b>	1.8E-08	4.8E-04	1.7E-04	<b>6.5E-04</b>
Fluorene	1.9E-10	1.3E-06	6.6E-07	<b>1.9E-06</b>	4.5E-10	1.2E-05	4.3E-06	<b>1.6E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5.1E-09	1.4E-06	7.5E-07	<b>2.2E-06</b>	1.2E-08	1.3E-05	4.9E-06	<b>1.8E-05</b>
Phenanthrene	1.8E-07	5.2E-05	2.7E-05	<b>7.9E-05</b>	4.3E-07	4.9E-04	1.8E-04	<b>6.6E-04</b>
Pyrene	1.2E-08	7.8E-05	4.0E-05	<b>1.2E-04</b>	2.8E-08	7.2E-04	2.6E-04	<b>9.9E-04</b>
Total	3.9E-07	2.3E-04	1.2E-04	<b>3.6E-04</b>	9.0E-07	2.2E-03	8.0E-04	<b>3.0E-03</b>

**Table A-11**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2.0 feet) - Exposure Area 4 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	1.1E-10	7.3E-07	3.8E-07	<b>1.1E-06</b>	2.6E-10	6.8E-06	2.5E-06	<b>9.3E-06</b>
Acenaphthylene	7.0E-08	2.0E-05	1.0E-05	<b>3.0E-05</b>	1.6E-07	1.9E-04	6.7E-05	<b>2.5E-04</b>
Anthracene	2.2E-10	1.4E-06	7.5E-07	<b>2.2E-06</b>	5.1E-10	1.4E-05	4.9E-06	<b>1.8E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	4.8E-07	1.4E-04	7.1E-05	<b>2.1E-04</b>	1.1E-06	1.3E-03	4.6E-04	<b>1.7E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2.6E-08	1.7E-04	8.9E-05	<b>2.6E-04</b>	6.1E-08	1.6E-03	5.8E-04	<b>2.2E-03</b>
Fluorene	9.4E-10	6.2E-06	3.2E-06	<b>9.4E-06</b>	2.2E-09	5.8E-05	2.1E-05	<b>7.9E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	9.7E-09	2.7E-06	1.4E-06	<b>4.2E-06</b>	2.3E-08	2.6E-05	9.3E-06	<b>3.5E-05</b>
Phenanthrene	3.5E-07	1.0E-04	5.2E-05	<b>1.5E-04</b>	8.2E-07	9.3E-04	3.4E-04	<b>1.3E-03</b>
Pyrene	2.9E-08	1.9E-04	1.0E-04	<b>2.9E-04</b>	6.8E-08	1.8E-03	6.5E-04	<b>2.5E-03</b>
<b>Total</b>	<b>9.7E-07</b>	<b>6.3E-04</b>	<b>3.3E-04</b>	<b>9.6E-04</b>	<b>2.3E-06</b>	<b>5.9E-03</b>	<b>2.1E-03</b>	<b>8.0E-03</b>

**Table A-12**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2.0 feet) - Exposure Area 5 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	6.2E-10	4.1E-06	2.1E-06	<b>6.2E-06</b>	1.5E-09	3.8E-05	1.4E-05	<b>5.2E-05</b>
Acenaphthylene	3.7E-07	1.0E-04	5.4E-05	<b>1.6E-04</b>	8.7E-07	9.8E-04	3.6E-04	<b>1.3E-03</b>
Anthracene	4.7E-10	3.1E-06	1.6E-06	<b>4.7E-06</b>	1.1E-09	2.9E-05	1.1E-05	<b>4.0E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	6.9E-07	2.0E-04	1.0E-04	<b>3.0E-04</b>	1.6E-06	1.8E-03	6.7E-04	<b>2.5E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	4.0E-08	2.7E-04	1.4E-04	<b>4.0E-04</b>	9.4E-08	2.5E-03	9.0E-04	<b>3.4E-03</b>
Fluorene	1.0E-09	6.7E-06	3.5E-06	<b>1.0E-05</b>	2.4E-09	6.3E-05	2.3E-05	<b>8.6E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	3.1E-08	8.9E-06	4.6E-06	<b>1.4E-05</b>	7.3E-08	8.3E-05	3.0E-05	<b>1.1E-04</b>
Phenanthrene	8.1E-07	2.3E-04	1.2E-04	<b>3.5E-04</b>	1.9E-06	2.1E-03	7.8E-04	<b>2.9E-03</b>
Pyrene	4.1E-08	2.7E-04	1.4E-04	<b>4.1E-04</b>	9.6E-08	2.5E-03	9.2E-04	<b>3.4E-03</b>
<b>Total</b>	<b>2.0E-06</b>	<b>1.1E-03</b>	<b>5.6E-04</b>	<b>1.7E-03</b>	<b>4.7E-06</b>	<b>1.0E-02</b>	<b>3.7E-03</b>	<b>1.4E-02</b>

**Table A-13**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2.0 feet) - Exposure Area 6 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	2.9E-10	1.9E-06	9.8E-07	<b>2.9E-06</b>	6.7E-10	1.8E-05	6.4E-06	<b>2.4E-05</b>
Acenaphthylene	6.3E-08	1.8E-05	9.2E-06	<b>2.7E-05</b>	1.5E-07	1.7E-04	6.1E-05	<b>2.3E-04</b>
Anthracene	1.7E-10	1.1E-06	5.8E-07	<b>1.7E-06</b>	4.0E-10	1.0E-05	3.8E-06	<b>1.4E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	4.2E-07	1.2E-04	6.1E-05	<b>1.8E-04</b>	9.7E-07	1.1E-03	4.0E-04	<b>1.5E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1.7E-08	1.1E-04	5.9E-05	<b>1.7E-04</b>	4.0E-08	1.1E-03	3.9E-04	<b>1.5E-03</b>
Fluorene	4.3E-10	2.8E-06	1.5E-06	<b>4.3E-06</b>	1.0E-09	2.6E-05	9.6E-06	<b>3.6E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	1.8E-08	5.1E-06	2.6E-06	<b>7.7E-06</b>	4.2E-08	4.7E-05	1.7E-05	<b>6.5E-05</b>
Phenanthrene	1.9E-07	5.2E-05	2.7E-05	<b>8.0E-05</b>	4.3E-07	4.9E-04	1.8E-04	<b>6.7E-04</b>
Pyrene	1.7E-08	1.1E-04	5.8E-05	<b>1.7E-04</b>	4.0E-08	1.0E-03	3.8E-04	<b>1.4E-03</b>
<b>Total</b>	7.2E-07	4.2E-04	2.2E-04	<b>6.5E-04</b>	1.7E-06	4.0E-03	1.4E-03	<b>5.4E-03</b>

**Table A-14**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (0.5-2.0 feet) - Exposure Area 7 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	8.6E-10	5.7E-06	2.9E-06	<b>8.6E-06</b>	2.0E-09	5.3E-05	1.9E-05	<b>7.2E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.3E-06	3.6E-04	1.9E-04	<b>5.5E-04</b>	3.0E-06	3.4E-03	1.2E-03	<b>4.6E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1.1E-07	6.9E-04	3.6E-04	<b>1.1E-03</b>	2.5E-07	6.5E-03	2.3E-03	<b>8.8E-03</b>
Fluorene	1.3E-09	8.5E-06	4.4E-06	<b>1.3E-05</b>	3.0E-09	7.9E-05	2.9E-05	<b>1.1E-04</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	1.4E-06	3.8E-04	2.0E-04	<b>5.8E-04</b>	3.2E-06	3.6E-03	1.3E-03	<b>4.9E-03</b>
Pyrene	7.8E-08	5.1E-04	2.7E-04	<b>7.8E-04</b>	1.8E-07	4.8E-03	1.7E-03	<b>6.5E-03</b>
<b>Total</b>	2.8E-06	2.0E-03	1.0E-03	<b>3.0E-03</b>	6.6E-06	1.8E-02	6.7E-03	<b>2.5E-02</b>

**Table A-15**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2.0-4.0 feet) - Exposure Area 1 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	4.9E-08	1.4E-05	7.1E-06	<b>2.1E-05</b>	1.1E-07	1.3E-04	4.7E-05	<b>1.7E-04</b>
Anthracene	3.4E-11	2.2E-07	1.1E-07	<b>3.4E-07</b>	7.8E-11	2.1E-06	7.5E-07	<b>2.8E-06</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	8.8E-08	2.5E-05	1.3E-05	<b>3.8E-05</b>	2.1E-07	2.3E-04	8.4E-05	<b>3.2E-04</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	5.1E-09	3.3E-05	1.7E-05	<b>5.1E-05</b>	1.2E-08	3.1E-04	1.1E-04	<b>4.2E-04</b>
Fluorene	2.2E-10	1.5E-06	7.6E-07	<b>2.2E-06</b>	5.2E-10	1.4E-05	4.9E-06	<b>1.9E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	2.2E-08	6.1E-06	3.2E-06	<b>9.3E-06</b>	5.0E-08	5.7E-05	2.1E-05	<b>7.8E-05</b>
Phenanthrene	4.7E-08	1.3E-05	6.8E-06	<b>2.0E-05</b>	1.1E-07	1.2E-04	4.5E-05	<b>1.7E-04</b>
Pyrene	6.1E-09	4.0E-05	2.1E-05	<b>6.1E-05</b>	1.4E-08	3.7E-04	1.4E-04	<b>5.1E-04</b>
<b>Total</b>	2.2E-07	1.3E-04	6.9E-05	<b>2.0E-04</b>	5.0E-07	1.2E-03	4.5E-04	<b>1.7E-03</b>

**Table A-16**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2.0-4.0 feet) - Exposure Area 2 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	2.4E-09	1.6E-05	8.1E-06	<b>2.4E-05</b>	5.5E-09	1.4E-04	5.3E-05	<b>2.0E-04</b>
Acenaphthylene	1.8E-07	5.0E-05	2.6E-05	<b>7.6E-05</b>	4.1E-07	4.7E-04	1.7E-04	<b>6.4E-04</b>
Anthracene	6.0E-10	4.0E-06	2.1E-06	<b>6.0E-06</b>	1.4E-09	3.7E-05	1.4E-05	<b>5.1E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.5E-06	4.2E-04	2.2E-04	<b>6.5E-04</b>	3.5E-06	4.0E-03	1.4E-03	<b>5.4E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	6.8E-08	4.5E-04	2.3E-04	<b>6.8E-04</b>	1.6E-07	4.2E-03	1.5E-03	<b>5.7E-03</b>
Fluorene	1.3E-09	8.3E-06	4.3E-06	<b>1.3E-05</b>	2.9E-09	7.7E-05	2.8E-05	<b>1.1E-04</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5.3E-08	1.5E-05	7.8E-06	<b>2.3E-05</b>	1.2E-07	1.4E-04	5.1E-05	<b>1.9E-04</b>
Phenanthrene	1.7E-06	4.8E-04	2.5E-04	<b>7.3E-04</b>	4.0E-06	4.5E-03	1.6E-03	<b>6.1E-03</b>
Pyrene	9.0E-08	5.9E-04	3.1E-04	<b>9.0E-04</b>	2.1E-07	5.5E-03	2.0E-03	<b>7.6E-03</b>
<b>Total</b>	<b>3.6E-06</b>	<b>2.0E-03</b>	<b>1.1E-03</b>	<b>3.1E-03</b>	<b>8.4E-06</b>	<b>1.9E-02</b>	<b>6.9E-03</b>	<b>2.6E-02</b>

**Table A-17**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2.0-4.0 feet) - Exposure Area 3 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	9.0E-11	5.9E-07	3.1E-07	<b>9.0E-07</b>	2.1E-10	5.5E-06	2.0E-06	<b>7.6E-06</b>
Acenaphthylene	1.1E-08	3.2E-06	1.6E-06	<b>4.8E-06</b>	2.6E-08	2.9E-05	1.1E-05	<b>4.0E-05</b>
Anthracene	4.4E-11	2.9E-07	1.5E-07	<b>4.4E-07</b>	1.0E-10	2.7E-06	9.9E-07	<b>3.7E-06</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.4E-07	4.1E-05	2.1E-05	<b>6.2E-05</b>	3.4E-07	3.8E-04	1.4E-04	<b>5.2E-04</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	5.6E-09	3.7E-05	1.9E-05	<b>5.6E-05</b>	1.3E-08	3.4E-04	1.3E-04	<b>4.7E-04</b>
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	6.5E-09	1.8E-06	9.6E-07	<b>2.8E-06</b>	1.5E-08	1.7E-05	6.3E-06	<b>2.4E-05</b>
Phenanthrene	8.7E-08	2.5E-05	1.3E-05	<b>3.8E-05</b>	2.0E-07	2.3E-04	8.4E-05	<b>3.1E-04</b>
Pyrene	8.8E-09	5.8E-05	3.0E-05	<b>8.8E-05</b>	2.1E-08	5.4E-04	2.0E-04	<b>7.4E-04</b>
<b>Total</b>	<b>2.6E-07</b>	<b>1.7E-04</b>	<b>8.6E-05</b>	<b>2.5E-04</b>	<b>6.2E-07</b>	<b>1.5E-03</b>	<b>5.6E-04</b>	<b>2.1E-03</b>

**Table A-18**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2.0-4.0 feet) - Exposure Area 4 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	1.4E-10	8.9E-07	4.6E-07	<b>1.4E-06</b>	3.2E-10	8.3E-06	3.0E-06	<b>1.1E-05</b>
Acenaphthylene	1.5E-07	4.1E-05	2.1E-05	<b>6.3E-05</b>	3.4E-07	3.8E-04	1.4E-04	<b>5.2E-04</b>
Anthracene	2.7E-10	1.8E-06	9.4E-07	<b>2.7E-06</b>	6.4E-10	1.7E-05	6.1E-06	<b>2.3E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	8.5E-07	2.4E-04	1.2E-04	<b>3.6E-04</b>	2.0E-06	2.2E-03	8.1E-04	<b>3.1E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	5.5E-08	3.6E-04	1.9E-04	<b>5.5E-04</b>	1.3E-07	3.4E-03	1.2E-03	<b>4.6E-03</b>
Fluorene	1.4E-10	9.2E-07	4.8E-07	<b>1.4E-06</b>	3.3E-10	8.6E-06	3.1E-06	<b>1.2E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	1.2E-08	3.4E-06	1.7E-06	<b>5.1E-06</b>	2.8E-08	3.1E-05	1.1E-05	<b>4.3E-05</b>
Phenanthrene	5.9E-07	1.7E-04	8.7E-05	<b>2.6E-04</b>	1.4E-06	1.6E-03	5.7E-04	<b>2.1E-03</b>
Pyrene	6.2E-08	4.1E-04	2.1E-04	<b>6.2E-04</b>	1.5E-07	3.8E-03	1.4E-03	<b>5.2E-03</b>
<b>Total</b>	<b>1.7E-06</b>	<b>1.2E-03</b>	<b>6.4E-04</b>	<b>1.9E-03</b>	<b>4.0E-06</b>	<b>1.1E-02</b>	<b>4.2E-03</b>	<b>1.6E-02</b>

**Table A-19**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2.0-4.0 feet) - Exposure Area 5 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	2.4E-09	1.6E-05	8.2E-06	<b>2.4E-05</b>	5.6E-09	1.5E-04	5.4E-05	<b>2.0E-04</b>
Acenaphthylene	2.3E-07	6.6E-05	3.4E-05	<b>1.0E-04</b>	5.4E-07	6.1E-04	2.2E-04	<b>8.4E-04</b>
Anthracene	3.4E-10	2.2E-06	1.2E-06	<b>3.4E-06</b>	7.9E-10	2.1E-05	7.6E-06	<b>2.8E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.7E-06	4.9E-04	2.5E-04	<b>7.5E-04</b>	4.1E-06	4.6E-03	1.7E-03	<b>6.3E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	8.0E-08	5.3E-04	2.7E-04	<b>8.0E-04</b>	1.9E-07	4.9E-03	1.8E-03	<b>6.7E-03</b>
Fluorene	1.0E-09	6.9E-06	3.6E-06	<b>1.0E-05</b>	2.4E-09	6.4E-05	2.3E-05	<b>8.8E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	1.2E-07	3.4E-05	1.8E-05	<b>5.2E-05</b>	2.8E-07	3.2E-04	1.2E-04	<b>4.4E-04</b>
Phenanthrene	8.4E-07	2.4E-04	1.2E-04	<b>3.6E-04</b>	2.0E-06	2.2E-03	8.0E-04	<b>3.0E-03</b>
Pyrene	1.2E-07	7.7E-04	4.0E-04	<b>1.2E-03</b>	2.7E-07	7.2E-03	2.6E-03	<b>9.9E-03</b>
<b>Total</b>	<b>3.1E-06</b>	<b>2.2E-03</b>	<b>1.1E-03</b>	<b>3.3E-03</b>	<b>7.3E-06</b>	<b>2.0E-02</b>	<b>7.3E-03</b>	<b>2.7E-02</b>

**Table A-20**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2.0-4.0 feet) - Exposure Area 6 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	9.4E-10	6.2E-06	3.2E-06	<b>9.4E-06</b>	2.2E-09	5.8E-05	2.1E-05	<b>7.8E-05</b>
Acenaphthylene	1.7E-07	4.8E-05	2.5E-05	<b>7.3E-05</b>	4.0E-07	4.5E-04	1.6E-04	<b>6.1E-04</b>
Anthracene	3.3E-10	2.2E-06	1.1E-06	<b>3.3E-06</b>	7.8E-10	2.1E-05	7.5E-06	<b>2.8E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.8E-06	5.0E-04	2.6E-04	<b>7.6E-04</b>	4.1E-06	4.7E-03	1.7E-03	<b>6.4E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	4.5E-08	3.0E-04	1.5E-04	<b>4.5E-04</b>	1.0E-07	2.8E-03	1.0E-03	<b>3.8E-03</b>
Fluorene	9.6E-10	6.3E-06	3.3E-06	<b>9.6E-06</b>	2.2E-09	5.9E-05	2.1E-05	<b>8.0E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	7.3E-08	2.1E-05	1.1E-05	<b>3.1E-05</b>	1.7E-07	1.9E-04	7.0E-05	<b>2.6E-04</b>
Phenanthrene	7.6E-07	2.1E-04	1.1E-04	<b>3.2E-04</b>	1.8E-06	2.0E-03	7.2E-04	<b>2.7E-03</b>
Pyrene	5.4E-08	3.6E-04	1.8E-04	<b>5.4E-04</b>	1.3E-07	3.3E-03	1.2E-03	<b>4.5E-03</b>
<b>Total</b>	2.9E-06	1.4E-03	7.5E-04	<b>2.2E-03</b>	6.7E-06	1.4E-02	4.9E-03	<b>1.8E-02</b>

**Table A-20**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2.0-4.0 feet) - Exposure Area 6 - Current and Future Resident**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	9.4E-10	6.2E-06	3.2E-06	<b>9.4E-06</b>	2.2E-09	5.8E-05	2.1E-05	<b>7.8E-05</b>
Acenaphthylene	1.7E-07	4.8E-05	2.5E-05	<b>7.3E-05</b>	4.0E-07	4.5E-04	1.6E-04	<b>6.1E-04</b>
Anthracene	3.3E-10	2.2E-06	1.1E-06	<b>3.3E-06</b>	7.8E-10	2.1E-05	7.5E-06	<b>2.8E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.8E-06	5.0E-04	2.6E-04	<b>7.6E-04</b>	4.1E-06	4.7E-03	1.7E-03	<b>6.4E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	4.5E-08	3.0E-04	1.5E-04	<b>4.5E-04</b>	1.0E-07	2.8E-03	1.0E-03	<b>3.8E-03</b>
Fluorene	9.6E-10	6.3E-06	3.3E-06	<b>9.6E-06</b>	2.2E-09	5.9E-05	2.1E-05	<b>8.0E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	7.3E-08	2.1E-05	1.1E-05	<b>3.1E-05</b>	1.7E-07	1.9E-04	7.0E-05	<b>2.6E-04</b>
Phenanthrene	7.6E-07	2.1E-04	1.1E-04	<b>3.2E-04</b>	1.8E-06	2.0E-03	7.2E-04	<b>2.7E-03</b>
Pyrene	5.4E-08	3.6E-04	1.8E-04	<b>5.4E-04</b>	1.3E-07	3.3E-03	1.2E-03	<b>4.5E-03</b>
<b>Total</b>	<b>2.9E-06</b>	<b>1.4E-03</b>	<b>7.5E-04</b>	<b>2.2E-03</b>	<b>6.7E-06</b>	<b>1.4E-02</b>	<b>4.9E-03</b>	<b>1.8E-02</b>

**Table A-21**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (2.0-4.0 feet) - Exposure Area 7 - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	4.1E-07	1.2E-04	6.0E-05	<b>1.8E-04</b>	9.6E-07	1.1E-03	4.0E-04	<b>1.5E-03</b>
Anthracene	1.7E-09	1.1E-05	5.9E-06	<b>1.7E-05</b>	4.1E-09	1.1E-04	3.9E-05	<b>1.5E-04</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	2.2E-06	6.2E-04	3.2E-04	<b>9.4E-04</b>	5.1E-06	5.8E-03	2.1E-03	<b>7.9E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1.8E-07	1.2E-03	6.2E-04	<b>1.8E-03</b>	4.3E-07	1.1E-02	4.1E-03	<b>1.5E-02</b>
Fluorene	2.2E-09	1.5E-05	7.6E-06	<b>2.2E-05</b>	5.2E-09	1.4E-04	5.0E-05	<b>1.9E-04</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	3.1E-06	8.8E-04	4.6E-04	<b>1.3E-03</b>	7.3E-06	8.2E-03	3.0E-03	<b>1.1E-02</b>
Pyrene	1.5E-07	9.6E-04	5.0E-04	<b>1.5E-03</b>	3.4E-07	8.9E-03	3.3E-03	<b>1.2E-02</b>
<b>Total</b>	<b>6.1E-06</b>	<b>3.8E-03</b>	<b>2.0E-03</b>	<b>5.8E-03</b>	<b>1.4E-05</b>	<b>3.5E-02</b>	<b>1.3E-02</b>	<b>4.8E-02</b>

**Table A-22**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4.0-8.0 feet) - Exposure Area 1 - Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	1.4E-11	9.1E-08	4.7E-08	<b>1.4E-07</b>	3.2E-11	8.5E-07	3.1E-07	<b>1.2E-06</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.8E-07	5.0E-05	2.6E-05	<b>7.6E-05</b>	4.1E-07	4.6E-04	1.7E-04	<b>6.3E-04</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	9.8E-09	6.4E-05	3.3E-05	<b>9.8E-05</b>	2.3E-08	6.0E-04	2.2E-04	<b>8.2E-04</b>
Fluorene	ND	ND	ND	ND	ND	ND	ND	ND
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	5.3E-09	1.5E-06	7.8E-07	<b>2.3E-06</b>	1.2E-08	1.4E-05	5.1E-06	<b>1.9E-05</b>
Phenanthrene	3.7E-08	1.0E-05	5.4E-06	<b>1.6E-05</b>	8.7E-08	9.8E-05	3.6E-05	<b>1.3E-04</b>
Pyrene	8.3E-09	5.5E-05	2.8E-05	<b>8.3E-05</b>	1.9E-08	5.1E-04	1.9E-04	<b>6.9E-04</b>
<b>Total</b>	2.4E-07	1.8E-04	9.4E-05	<b>2.7E-04</b>	5.5E-07	1.7E-03	6.1E-04	<b>2.3E-03</b>

**Table A-23**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4.0-8.0 feet) - Exposure Area 2 - Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	7.6E-11	5.0E-07	2.6E-07	<b>7.6E-07</b>	1.8E-10	4.7E-06	1.7E-06	<b>6.4E-06</b>
Acenaphthylene	ND	ND	ND	<b>ND</b>	ND	ND	ND	<b>ND</b>
Anthracene	3.9E-09	2.6E-05	1.3E-05	<b>3.9E-05</b>	9.1E-09	2.4E-04	8.7E-05	<b>3.3E-04</b>
Benzo(a)anthracene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Benzo(a)pyrene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Benzo(b)fluoranthene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Benzo(g,h,i)perylene	1.4E-06	3.8E-04	2.0E-04	<b>5.8E-04</b>	3.2E-06	3.6E-03	1.3E-03	<b>4.9E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Chrysene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Dibenz(a,h)anthracene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Fluoranthene	2.0E-07	1.3E-03	6.7E-04	<b>2.0E-03</b>	4.6E-07	1.2E-02	4.4E-03	<b>1.6E-02</b>
Fluorene	ND	ND	ND	<b>ND</b>	ND	ND	ND	<b>ND</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Naphthalene	4.8E-08	1.4E-05	7.1E-06	<b>2.1E-05</b>	1.1E-07	1.3E-04	4.7E-05	<b>1.7E-04</b>
Phenanthrene	5.6E-06	1.6E-03	8.1E-04	<b>2.4E-03</b>	1.3E-05	1.5E-02	5.3E-03	<b>2.0E-02</b>
Pyrene	2.3E-07	1.5E-03	7.7E-04	<b>2.3E-03</b>	5.3E-07	1.4E-02	5.1E-03	<b>1.9E-02</b>
<b>Total</b>	<b>7.4E-06</b>	<b>4.8E-03</b>	<b>2.5E-03</b>	<b>7.2E-03</b>	<b>1.7E-05</b>	<b>4.4E-02</b>	<b>1.6E-02</b>	<b>6.1E-02</b>

**Table A-24**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4.0-8.0 feet) - Exposure Area 3 - Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	4.2E-09	2.7E-05	1.4E-05	<b>4.2E-05</b>	9.7E-09	2.6E-04	9.3E-05	<b>3.5E-04</b>
Acenaphthylene	ND	ND	ND	<b>ND</b>	ND	ND	ND	<b>ND</b>
Anthracene	1.3E-09	8.7E-06	4.5E-06	<b>1.3E-05</b>	3.1E-09	8.1E-05	2.9E-05	<b>1.1E-04</b>
Benzo(a)anthracene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Benzo(a)pyrene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Benzo(b)fluoranthene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Benzo(g,h,i)perylene	2.1E-06	6.0E-04	3.1E-04	<b>9.2E-04</b>	5.0E-06	5.6E-03	2.0E-03	<b>7.7E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Chrysene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Dibenz(a,h)anthracene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Fluoranthene	7.3E-08	4.8E-04	2.5E-04	<b>7.3E-04</b>	1.7E-07	4.5E-03	1.6E-03	<b>6.1E-03</b>
Fluorene	3.5E-09	2.3E-05	1.2E-05	<b>3.5E-05</b>	8.1E-09	2.1E-04	7.8E-05	<b>2.9E-04</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	<b>NA</b>	NA	NA	NA	<b>NA</b>
Naphthalene	1.4E-07	3.9E-05	2.0E-05	<b>5.9E-05</b>	3.2E-07	3.6E-04	1.3E-04	<b>5.0E-04</b>
Phenanthrene	1.5E-06	4.2E-04	2.2E-04	<b>6.5E-04</b>	3.5E-06	4.0E-03	1.4E-03	<b>5.4E-03</b>
Pyrene	1.1E-07	7.3E-04	3.8E-04	<b>1.1E-03</b>	2.6E-07	6.8E-03	2.5E-03	<b>9.3E-03</b>
<b>Total</b>	<b>4.0E-06</b>	<b>2.3E-03</b>	<b>1.2E-03</b>	<b>3.6E-03</b>	<b>9.3E-06</b>	<b>2.2E-02</b>	<b>7.9E-03</b>	<b>3.0E-02</b>

**Table A-25**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4.0-8.0 feet) - Exposure Area 4 - Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	3.6E-07	1.0E-04	5.3E-05	<b>1.6E-04</b>	8.5E-07	9.6E-04	3.5E-04	<b>1.3E-03</b>
Anthracene	1.3E-09	8.7E-06	4.5E-06	<b>1.3E-05</b>	3.1E-09	8.1E-05	2.9E-05	<b>1.1E-04</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.2E-06	3.3E-04	1.7E-04	<b>5.0E-04</b>	2.7E-06	3.1E-03	1.1E-03	<b>4.2E-03</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	1.1E-07	7.5E-04	3.9E-04	<b>1.1E-03</b>	2.7E-07	7.0E-03	2.6E-03	<b>9.6E-03</b>
Fluorene	6.2E-09	4.1E-05	2.1E-05	<b>6.2E-05</b>	1.5E-08	3.8E-04	1.4E-04	<b>5.2E-04</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	2.7E-06	7.5E-04	3.9E-04	<b>1.1E-03</b>	6.2E-06	7.0E-03	2.6E-03	<b>9.6E-03</b>
Pyrene	1.3E-07	8.9E-04	4.6E-04	<b>1.3E-03</b>	3.1E-07	8.3E-03	3.0E-03	<b>1.1E-02</b>
<b>Total</b>	4.5E-06	2.9E-03	1.5E-03	<b>4.4E-03</b>	1.0E-05	2.7E-02	9.8E-03	<b>3.7E-02</b>

**Table A-26**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4.0-8.0 feet) - Exposure Area 5 - Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	8.7E-11	5.7E-07	3.0E-07	<b>8.7E-07</b>	2.0E-10	5.3E-06	1.9E-06	<b>7.3E-06</b>
Acenaphthylene	2.7E-08	7.5E-06	3.9E-06	<b>1.1E-05</b>	6.2E-08	7.0E-05	2.6E-05	<b>9.6E-05</b>
Anthracene	1.7E-10	1.1E-06	5.7E-07	<b>1.7E-06</b>	3.9E-10	1.0E-05	3.7E-06	<b>1.4E-05</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	2.6E-07	7.3E-05	3.8E-05	<b>1.1E-04</b>	6.1E-07	6.8E-04	2.5E-04	<b>9.3E-04</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3.5E-08	2.3E-04	1.2E-04	<b>3.5E-04</b>	8.1E-08	2.1E-03	7.8E-04	<b>2.9E-03</b>
Fluorene	2.1E-10	1.4E-06	7.1E-07	<b>2.1E-06</b>	4.9E-10	1.3E-05	4.7E-06	<b>1.7E-05</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	9.4E-08	2.7E-05	1.4E-05	<b>4.1E-05</b>	2.2E-07	2.5E-04	9.1E-05	<b>3.4E-04</b>
Phenanthrene	1.5E-07	4.3E-05	2.2E-05	<b>6.5E-05</b>	3.5E-07	4.0E-04	1.4E-04	<b>5.4E-04</b>
Pyrene	3.9E-08	2.6E-04	1.3E-04	<b>3.9E-04</b>	9.1E-08	2.4E-03	8.7E-04	<b>3.3E-03</b>
<b>Total</b>	6.1E-07	6.4E-04	3.3E-04	<b>9.7E-04</b>	1.4E-06	6.0E-03	2.2E-03	<b>8.1E-03</b>

**Table A-27**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4.0-8.0 feet) - Exposure Area 6 - Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	ND	ND	ND	ND	ND	ND	ND	ND
Acenaphthylene	ND	ND	ND	ND	ND	ND	ND	ND
Anthracene	3.7E-09	2.5E-05	1.3E-05	<b>3.7E-05</b>	8.7E-09	2.3E-04	8.4E-05	<b>3.1E-04</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	3.9E-06	1.1E-03	5.7E-04	<b>1.7E-03</b>	9.1E-06	1.0E-02	3.7E-03	<b>1.4E-02</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	2.9E-07	1.9E-03	9.8E-04	<b>2.9E-03</b>	6.7E-07	1.8E-02	6.4E-03	<b>2.4E-02</b>
Fluorene	3.9E-09	2.5E-05	1.3E-05	<b>3.8E-05</b>	9.0E-09	2.4E-04	8.6E-05	<b>3.2E-04</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene	3.9E-06	1.1E-03	5.7E-04	<b>1.7E-03</b>	9.1E-06	1.0E-02	3.7E-03	<b>1.4E-02</b>
Pyrene	3.1E-07	2.1E-03	1.1E-03	<b>3.1E-03</b>	7.3E-07	1.9E-02	7.0E-03	<b>2.6E-02</b>
Total	8.4E-06	6.2E-03	3.2E-03	<b>9.4E-03</b>	2.0E-05	5.8E-02	2.1E-02	<b>7.9E-02</b>

**Table A-28**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soils (4.0-8.0 feet) - Exposure Area 7 - Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	2.7E-08	1.8E-04	9.2E-05	<b>2.7E-04</b>	6.3E-08	1.7E-03	6.1E-04	<b>2.3E-03</b>
Acenaphthylene	1.7E-05	4.7E-03	2.5E-03	<b>7.2E-03</b>	3.9E-05	4.4E-02	1.6E-02	<b>6.0E-02</b>
Anthracene	6.2E-08	4.1E-04	2.1E-04	<b>6.2E-04</b>	1.4E-07	3.8E-03	1.4E-03	<b>5.2E-03</b>
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.8E-05	5.2E-03	2.7E-03	<b>7.9E-03</b>	4.3E-05	4.9E-02	1.8E-02	<b>6.6E-02</b>
Benzo(k)fluoranthene	NA	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA	NA	NA	NA	NA
Fluoranthene	3.9E-06	2.6E-02	1.3E-02	<b>3.9E-02</b>	9.1E-06	2.4E-01	8.7E-02	<b>3.3E-01</b>
Fluorene	1.9E-07	1.2E-03	6.4E-04	<b>1.9E-03</b>	4.4E-07	1.2E-02	4.2E-03	<b>1.6E-02</b>
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA	NA	NA	NA	NA
Naphthalene	3.4E-05	9.6E-03	5.0E-03	<b>1.5E-02</b>	7.9E-05	8.9E-02	3.3E-02	<b>1.2E-01</b>
Phenanthrene	1.4E-04	4.0E-02	2.1E-02	<b>6.0E-02</b>	3.3E-04	3.7E-01	1.3E-01	<b>5.1E-01</b>
Pyrene	3.3E-06	2.1E-02	1.1E-02	<b>3.3E-02</b>	7.6E-06	2.0E-01	7.3E-02	<b>2.7E-01</b>
<b>Total</b>	2.2E-04	1.1E-01	5.6E-02	<b>1.6E-01</b>	5.1E-04	1.0E+00	3.7E-01	<b>1.4E+00</b>

**Table A-29****Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (0-0.5 feet) by Site - Construction Workers**

Chemical	Estimated Noncancer Hazard Index			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	1.5E-07	5.1E-06	9.1E-07	6.1E-06
Acenaphthylene	7.7E-05	1.1E-04	2.1E-05	2.1E-04
Anthracene	4.0E-08	1.4E-06	2.5E-07	1.7E-06
Benzo(a)anthracene	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.2E-04	1.7E-04	3.1E-05	3.2E-04
Benzo(k)fluoranthene	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA
Fluoranthene	6.4E-06	2.2E-04	3.9E-05	2.7E-04
Fluorene	1.8E-07	6.3E-06	1.1E-06	7.6E-06
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
Naphthalene	9.5E-06	1.4E-05	2.5E-06	2.6E-05
Phenanthrene	8.4E-05	1.3E-04	2.2E-05	2.3E-04
Pyrene	7.0E-06	2.4E-04	4.3E-05	2.9E-04
<b>Total</b>	<b>3.0E-04</b>	<b>9.0E-04</b>	<b>1.6E-04</b>	<b>1.4E-03</b>

**Table A-30****Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (0.5-2.0 feet) by Site - Construction Workers**

Chemical	Estimated Noncancer Hazard Index			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	2.0E-07	7.0E-06	1.3E-06	8.5E-06
Acenaphthylene	7.8E-05	1.2E-04	2.1E-05	2.1E-04
Anthracene	5.2E-08	1.8E-06	3.2E-07	2.2E-06
Benzo(a)anthracene	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.5E-04	2.2E-04	4.0E-05	4.2E-04
Benzo(k)fluoranthene	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA
Fluoranthene	9.0E-06	3.1E-04	5.5E-05	3.7E-04
Fluorene	1.8E-07	6.3E-06	1.1E-06	7.6E-06
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
Naphthalene	1.0E-05	1.5E-05	2.7E-06	2.8E-05
Phenanthrene	1.2E-04	1.8E-04	3.3E-05	3.4E-04
Pyrene	9.8E-06	3.4E-04	6.1E-05	4.1E-04
Total	3.8E-04	1.2E-03	2.1E-04	1.8E-03

**Table A-31****Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (2.0-4.0 feet) by Site - Construction Workers**

Chemical	Estimated Noncancer Hazard Index			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	7.8E-07	2.7E-05	4.8E-06	3.3E-05
Acenaphthylene	8.3E-05	1.2E-04	2.2E-05	2.3E-04
Anthracene	6.3E-08	2.2E-06	3.9E-07	2.6E-06
Benzo(a)anthracene	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA
Benzo(g,h,i)perylene	3.1E-04	4.6E-04	8.3E-05	8.6E-04
Benzo(k)fluoranthene	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA
Fluoranthene	1.6E-05	5.6E-04	9.9E-05	6.7E-04
Fluorene	2.2E-07	7.7E-06	1.4E-06	9.3E-06
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
Naphthalene	3.9E-05	5.9E-05	1.0E-05	1.1E-04
Phenanthrene	1.4E-04	2.1E-04	3.8E-05	4.0E-04
Pyrene	2.0E-05	7.1E-04	1.3E-04	8.5E-04
Total	6.2E-04	2.2E-03	3.9E-04	3.2E-03

**Table A-32****Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (4.0-8.0 feet) by Site - Construction Workers**

Chemical	Estimated Noncancer Hazard Index			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Acenaphthene	8.8E-06	3.1E-04	5.5E-05	3.7E-04
Acenaphthylene	4.3E-04	6.4E-04	1.1E-04	1.2E-03
Anthracene	2.9E-06	9.9E-05	1.8E-05	1.2E-04
Benzo(a)anthracene	NA	NA	NA	NA
Benzo(a)pyrene	NA	NA	NA	NA
Benzo(b)fluoranthene	NA	NA	NA	NA
Benzo(g,h,i)perylene	1.1E-03	1.7E-03	3.0E-04	3.1E-03
Benzo(k)fluoranthene	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA
Dibenz(a,h)anthracene	NA	NA	NA	NA
Fluoranthene	1.9E-04	6.6E-03	1.2E-03	8.0E-03
Fluorene	3.6E-06	1.2E-04	2.2E-05	1.5E-04
Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
Naphthalene	8.5E-04	1.3E-03	2.3E-04	2.3E-03
Phenanthrene	6.0E-03	9.0E-03	1.6E-03	1.7E-02
Pyrene	1.8E-04	6.1E-03	1.1E-03	7.3E-03
<b>Total</b>	<b>8.8E-03</b>	<b>2.6E-02</b>	<b>4.6E-03</b>	<b>3.9E-02</b>

**Table A-33**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (0-0.5 feet) by Northern and Southern Area - Construction Workers**

Area	Chemical	Estimated Noncancer Hazard Index			
		Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Northern	Acenaphthene	3.5E-08	1.2E-06	2.2E-07	1.5E-06
	Acenaphthylene	7.7E-05	1.1E-04	2.0E-05	2.1E-04
	Anthracene	5.2E-08	1.8E-06	3.2E-07	2.2E-06
	Benzo(a)anthracene	NA	NA	NA	NA
	Benzo(a)pyrene	NA	NA	NA	NA
	Benzo(b)fluoranthene	NA	NA	NA	NA
	Benzo(g,h,i)perylene	1.3E-04	1.9E-04	3.3E-05	3.5E-04
	Benzo(k)fluoranthene	NA	NA	NA	NA
	Chrysene	NA	NA	NA	NA
	Dibenz(a,h)anthracene	NA	NA	NA	NA
	Fluoranthene	6.8E-06	2.4E-04	4.2E-05	2.8E-04
	Fluorene	2.2E-07	7.6E-06	1.4E-06	9.2E-06
	Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
	Naphthalene	2.6E-06	3.9E-06	6.9E-07	7.2E-06
	Phenanthrene	1.1E-04	1.6E-04	2.8E-05	2.9E-04
	Pyrene	7.7E-06	2.6E-04	4.7E-05	3.2E-04
	<b>Total</b>	3.3E-04	9.7E-04	1.7E-04	1.5E-03
Southern	Acenaphthene	1.5E-07	5.1E-06	9.1E-07	6.1E-06
	Acenaphthylene	5.3E-05	7.8E-05	1.4E-05	1.5E-04
	Anthracene	3.9E-08	1.3E-06	2.4E-07	1.6E-06
	Benzo(a)anthracene	NA	NA	NA	NA
	Benzo(a)pyrene	NA	NA	NA	NA
	Benzo(b)fluoranthene	NA	NA	NA	NA
	Benzo(g,h,i)perylene	1.3E-04	2.0E-04	3.5E-05	3.6E-04
	Benzo(k)fluoranthene	NA	NA	NA	NA
	Chrysene	NA	NA	NA	NA
	Dibenz(a,h)anthracene	NA	NA	NA	NA
	Fluoranthene	7.4E-06	2.5E-04	4.6E-05	3.1E-04
	Fluorene	1.8E-07	6.2E-06	1.1E-06	7.5E-06
	Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
	Naphthalene	9.5E-06	1.4E-05	2.5E-06	2.6E-05
	Phenanthrene	8.3E-05	1.2E-04	2.2E-05	2.3E-04
	Pyrene	7.5E-06	2.6E-04	4.6E-05	3.1E-04
	<b>Total</b>	2.9E-04	9.4E-04	1.7E-04	1.4E-03

Table A-34

## Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (0.5-2.0 feet) by Northern and Southern Area - Construction Workers

Area	Chemical	Estimated Noncancer Hazard Index			
		Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Northern	Acenaphthene	1.6E-07	5.5E-06	9.8E-07	6.6E-06
	Acenaphthylene	2.9E-05	4.3E-05	7.8E-06	8.1E-05
	Anthracene	5.8E-08	2.0E-06	3.6E-07	2.4E-06
	Benzo(a)anthracene	NA	NA	NA	NA
	Benzo(a)pyrene	NA	NA	NA	NA
	Benzo(b)fluoranthene	NA	NA	NA	NA
	Benzo(g,h,i)perylene	1.4E-04	2.1E-04	3.7E-05	3.8E-04
	Benzo(k)fluoranthene	NA	NA	NA	NA
	Chrysene	NA	NA	NA	NA
	Dibenz(a,h)anthracene	NA	NA	NA	NA
	Fluoranthene	7.8E-06	2.7E-04	4.8E-05	3.3E-04
	Fluorene	2.0E-07	6.9E-06	1.2E-06	8.3E-06
	Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
	Naphthalene	5.8E-06	8.7E-06	1.6E-06	1.6E-05
	Phenanthrene	1.0E-04	1.5E-04	2.7E-05	2.8E-04
	Pyrene	8.1E-06	2.8E-04	5.0E-05	3.4E-04
	Total		2.9E-04	9.8E-04	1.7E-04
Southern	Acenaphthene	2.0E-07	7.0E-06	1.3E-06	8.5E-06
	Acenaphthylene	9.3E-05	1.4E-04	2.5E-05	2.6E-04
	Anthracene	6.1E-08	2.1E-06	3.7E-07	2.5E-06
	Benzo(a)anthracene	NA	NA	NA	NA
	Benzo(a)pyrene	NA	NA	NA	NA
	Benzo(b)fluoranthene	NA	NA	NA	NA
	Benzo(g,h,i)perylene	2.2E-04	3.2E-04	5.7E-05	5.9E-04
	Benzo(k)fluoranthene	NA	NA	NA	NA
	Chrysene	NA	NA	NA	NA
	Dibenz(a,h)anthracene	NA	NA	NA	NA
	Fluoranthene	1.4E-05	4.9E-04	8.7E-05	5.9E-04
	Fluorene	2.0E-07	6.9E-06	1.2E-06	8.4E-06
	Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
	Naphthalene	1.0E-05	1.5E-05	2.7E-06	2.8E-05
	Phenanthrene	1.9E-04	2.8E-04	5.1E-05	5.3E-04
	Pyrene	1.6E-05	5.4E-04	9.6E-05	6.5E-04
	Total		5.4E-04	1.8E-03	3.2E-04

**Table A-35**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (2.0-4.0 feet) by Northern and Southern Area - Construction Workers**

Area	Chemical	Estimated Noncancer Hazard Index			
		Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Northern	Acenaphthene	3.1E-07	1.1E-05	1.9E-06	1.3E-05
	Acenaphthylene	7.1E-05	1.1E-04	1.9E-05	2.0E-04
	Anthracene	5.9E-08	2.0E-06	3.6E-07	2.5E-06
	Benzo(a)anthracene	NA	NA	NA	NA
	Benzo(a)pyrene	NA	NA	NA	NA
	Benzo(b)fluoranthene	NA	NA	NA	NA
	Benzo(g,h,i)perylene	2.5E-04	3.6E-04	6.5E-05	6.8E-04
	Benzo(k)fluoranthene	NA	NA	NA	NA
	Chrysene	NA	NA	NA	NA
	Dibenz(a,h)anthracene	NA	NA	NA	NA
	Fluoranthene	1.1E-05	3.7E-04	6.6E-05	4.4E-04
	Fluorene	2.4E-07	8.4E-06	1.5E-06	1.0E-05
	Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
	Naphthalene	2.4E-05	3.5E-05	6.3E-06	6.5E-05
	Phenanthrene	1.2E-04	1.8E-04	3.2E-05	3.3E-04
	Pyrene	1.3E-05	4.5E-04	8.0E-05	5.4E-04
	Total		4.9E-04	1.5E-03	2.7E-04
Southern	Acenaphthene	7.8E-07	2.7E-05	4.8E-06	3.3E-05
	Acenaphthylene	7.6E-05	1.1E-04	2.0E-05	2.1E-04
	Anthracene	8.4E-08	2.9E-06	5.2E-07	3.5E-06
	Benzo(a)anthracene	NA	NA	NA	NA
	Benzo(a)pyrene	NA	NA	NA	NA
	Benzo(b)fluoranthene	NA	NA	NA	NA
	Benzo(g,h,i)perylene	6.0E-04	8.9E-04	1.6E-04	1.6E-03
	Benzo(k)fluoranthene	NA	NA	NA	NA
	Chrysene	NA	NA	NA	NA
	Dibenz(a,h)anthracene	NA	NA	NA	NA
	Fluoranthene	3.4E-05	1.2E-03	2.1E-04	1.4E-03
	Fluorene	2.5E-07	8.6E-06	1.5E-06	1.0E-05
	Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
	Naphthalene	3.9E-05	5.9E-05	1.0E-05	1.1E-04
	Phenanthrene	2.5E-04	3.7E-04	6.7E-05	6.9E-04
	Pyrene	4.3E-05	1.5E-03	2.7E-04	1.8E-03
	Total		1.0E-03	4.1E-03	7.4E-04

**Table A-36**

**Pathway-Specific Noncancer Hazard Indices for PAHs in Soil (4.0-8.0 feet) by Northern and Southern Area - Construction Workers**

Area	Chemical	Estimated Noncancer Hazard Index			
		Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Northern	Acenaphthene	8.8E-06	3.1E-04	5.5E-05	3.7E-04
	Acenaphthylene	1.6E-03	2.4E-03	4.3E-04	4.4E-03
	Anthracene	1.7E-05	5.8E-04	1.0E-04	7.0E-04
	Benzo(a)anthracene	NA	NA	NA	NA
	Benzo(a)pyrene	NA	NA	NA	NA
	Benzo(b)fluoranthene	NA	NA	NA	NA
	Benzo(g,h,i)perylene	3.3E-03	4.8E-03	8.7E-04	9.0E-03
	Benzo(k)fluoranthene	NA	NA	NA	NA
	Chrysene	NA	NA	NA	NA
	Dibenz(a,h)anthracene	NA	NA	NA	NA
	Fluoranthene	6.5E-04	2.2E-02	4.0E-03	2.7E-02
	Fluorene	4.7E-05	1.6E-03	2.9E-04	2.0E-03
	Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
	Naphthalene	3.9E-03	5.8E-03	1.0E-03	1.1E-02
	Phenanthrene	4.6E-02	6.8E-02	1.2E-02	1.3E-01
	Pyrene	5.0E-04	1.7E-02	3.1E-03	2.1E-02
	Total		5.6E-02	1.2E-01	2.2E-02
Southern	Acenaphthene	2.8E-08	9.8E-07	1.7E-07	1.2E-06
	Acenaphthylene	2.6E-05	3.9E-05	6.9E-06	7.2E-05
	Anthracene	3.8E-08	1.3E-06	2.4E-07	1.6E-06
	Benzo(a)anthracene	NA	NA	NA	NA
	Benzo(a)pyrene	NA	NA	NA	NA
	Benzo(b)fluoranthene	NA	NA	NA	NA
	Benzo(g,h,i)perylene	1.1E-04	1.6E-04	2.9E-05	3.0E-04
	Benzo(k)fluoranthene	NA	NA	NA	NA
	Chrysene	NA	NA	NA	NA
	Dibenz(a,h)anthracene	NA	NA	NA	NA
	Fluoranthene	7.6E-06	2.6E-04	4.7E-05	3.2E-04
	Fluorene	2.7E-07	9.3E-06	1.7E-06	1.1E-05
	Indeno(1,2,3-cd)pyrene	NA	NA	NA	NA
	Naphthalene	3.1E-05	4.6E-05	8.2E-06	8.5E-05
	Phenanthrene	6.4E-05	9.5E-05	1.7E-05	1.8E-04
	Pyrene	7.4E-06	2.6E-04	4.6E-05	3.1E-04
	Total		2.5E-04	8.7E-04	1.6E-04

**Table A-37**

**Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0-0.5 feet) - Current Residents**

Chemical	Estimated Cancer Risk							
	Current Adult Resident				Current Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	1.1E-09	7.2E-07	8.7E-08	<b>8.1E-07</b>	2.6E-09	6.8E-06	5.7E-07	<b>7.3E-06</b>
Barium	NC	NC	NC	NC	NC	NC	NC	NC
Beryllium	3.9E-11	NC	NC	<b>3.9E-11</b>	9.1E-11	NC	NC	<b>9.1E-11</b>
Cadmium	3.1E-11	NC	NC	<b>3.1E-11</b>	7.2E-11	NC	NC	<b>7.2E-11</b>
Chromium	NC	NC	NC	NC	NC	NC	NC	NC
Chromium (VI)	4.7E-09	NC	NC	<b>4.7E-09</b>	1.1E-08	NC	NC	<b>1.1E-08</b>
Cobalt	NC	NC	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	1.3E-09	NC	NC	<b>1.3E-09</b>	2.9E-09	NC	NC	<b>2.9E-09</b>
Selenium	NC	NC	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC	NC	NC
<b>Total</b>	<b>7.1E-09</b>	<b>7.2E-07</b>	<b>8.7E-08</b>	<b>8.2E-07</b>	<b>1.7E-08</b>	<b>6.8E-06</b>	<b>5.7E-07</b>	<b>7.3E-06</b>

**Table A-38**

**Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0.5-2.0 feet) - Current Residents**

Chemical	Estimated Cancer Risk							
	Current Adult Resident				Current Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	1.1E-09	7.4E-07	8.9E-08	<b>8.3E-07</b>	2.6E-09	6.9E-06	5.8E-07	<b>7.5E-06</b>
Barium	NC	NC	NC	NC	NC	NC	NC	NC
Beryllium	4.2E-11	NC	NC	<b>4.2E-11</b>	9.9E-11	NC	NC	<b>9.9E-11</b>
Cadmium	3.2E-11	NC	NC	<b>3.2E-11</b>	7.4E-11	NC	NC	<b>7.4E-11</b>
Chromium	NC	NC	NC	NC	NC	NC	NC	NC
Chromium (VI)	4.5E-09	NC	NC	<b>4.5E-09</b>	1.0E-08	NC	NC	<b>1.0E-08</b>
Cobalt	NC	NC	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC	NC	NC
Molybdenum	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	1.2E-09	NC	NC	<b>1.2E-09</b>	2.7E-09	NC	NC	<b>2.7E-09</b>
Selenium	NC	NC	NC	NC	NC	NC	NC	NC
Silver	NC	NC	NC	NC	NC	NC	NC	NC
Thallium	NC	NC	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC	NC	NC
<b>Total</b>	6.9E-09	7.4E-07	8.9E-08	<b>8.4E-07</b>	1.6E-08	6.9E-06	5.8E-07	<b>7.5E-06</b>

Table A-39

## Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (2.0-4.0 feet) - Current Residents

Chemical	Estimated Cancer Risk							
	Current Adult Resident				Current Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC	NC	NC	NC	NC
Arsenic	1.4E-09	9.3E-07	1.1E-07	<b>1.0E-06</b>	3.3E-09	8.7E-06	7.3E-07	<b>9.5E-06</b>
Barium	NC	NC	NC	NC	NC	NC	NC	NC
Beryllium	5.8E-11	NC	NC	<b>5.8E-11</b>	1.4E-10	NC	NC	<b>1.4E-10</b>
Cadmium	3.0E-11	NC	NC	<b>3.0E-11</b>	7.0E-11	NC	NC	<b>7.0E-11</b>
Chromium	NC	NC	NC	NC	NC	NC	NC	NC
Chromium (VI)	6.4E-09	NC	NC	<b>6.4E-09</b>	1.5E-08	NC	NC	<b>1.5E-08</b>
Cobalt	NC	NC	NC	NC	NC	NC	NC	NC
Copper	NC	NC	NC	NC	NC	NC	NC	NC
Mercury	NC	NC	NC	NC	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC	NC	NC	NC	NC
Nickel	1.9E-09	NC	NC	<b>1.9E-09</b>	4.5E-09	NC	NC	<b>4.5E-09</b>
Selenium	NC	NC	NC	NC	NC	NC	NC	NC
Silver	ND	ND	ND	ND	ND	ND	ND	ND
Thallium	NC	NC	NC	NC	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC	NC	NC	NC	NC
Zinc	NC	NC	NC	NC	NC	NC	NC	NC
<b>Total</b>	<b>9.9E-09</b>	<b>9.3E-07</b>	<b>1.1E-07</b>	<b>1.1E-06</b>	<b>2.3E-08</b>	<b>8.7E-06</b>	<b>7.3E-07</b>	<b>9.5E-06</b>

**Table A-40****Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0-0.5 feet) - Future Residents**

Chemical	Estimated Cancer Risk			
	Future Resident (age-adjusted)			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC
Arsenic	7.0E-09	9.7E-06	9.1E-07	1.1E-05
Barium	NC	NC	NC	NC
Beryllium	2.5E-10	NC	NC	2.5E-10
Cadmium	2.0E-10	NC	NC	2.0E-10
Chromium	NC	NC	NC	NC
Chromium (VI)	3.0E-08	NC	NC	3.0E-08
Cobalt	NC	NC	NC	NC
Copper	NC	NC	NC	NC
Mercury	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC
Nickel	7.9E-09	NC	NC	7.9E-09
Selenium	NC	NC	NC	NC
Silver	NC	NC	NC	NC
Thallium	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC
Zinc	NC	NC	NC	NC
<b>Total</b>	4.5E-08	9.7E-06	9.1E-07	1.1E-05

**Table A-41****Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0.5-2.0 feet) - Future Residents**

Chemical	Estimated Cancer Risk			
	Future Resident (age-adjusted)			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC
Arsenic	7.1E-09	9.9E-06	9.4E-07	1.1E-05
Barium	NC	NC	NC	NC
Beryllium	2.7E-10	NC	NC	2.7E-10
Cadmium	2.0E-10	NC	NC	2.0E-10
Chromium	NC	NC	NC	NC
Chromium (VI)	2.8E-08	NC	NC	2.8E-08
Cobalt	NC	NC	NC	NC
Copper	NC	NC	NC	NC
Mercury	NC	NC	NC	NC
Molybdenum	ND	ND	ND	ND
Nickel	7.4E-09	NC	NC	7.4E-09
Selenium	NC	NC	NC	NC
Silver	NC	NC	NC	NC
Thallium	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC
Zinc	NC	NC	NC	NC
<b>Total</b>	4.3E-08	9.9E-06	9.4E-07	1.1E-05

**Table A-42**

**Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (2.0-4.0 feet) - Future Residents**

Chemical	Estimated Cancer Risk			
	Future Resident (age-adjusted)			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC
Arsenic	9.0E-09	1.2E-05	1.2E-06	1.4E-05
Barium	NC	NC	NC	NC
Beryllium	3.7E-10	NC	NC	3.7E-10
Cadmium	1.9E-10	NC	NC	1.9E-10
Chromium	NC	NC	NC	NC
Chromium (VI)	4.1E-08	NC	NC	4.1E-08
Cobalt	NC	NC	NC	NC
Copper	NC	NC	NC	NC
Mercury	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC
Nickel	1.2E-08	NC	NC	1.2E-08
Selenium	NC	NC	NC	NC
Silver	ND	ND	ND	ND
Thallium	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC
Zinc	NC	NC	NC	NC
<b>Total</b>	6.2E-08	1.2E-05	1.2E-06	1.4E-05

**Table A-43****Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (4.0-8.0 feet) - Future Residents**

Chemical	Estimated Cancer Risk			
	Future Resident (age-adjusted)			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC
Arsenic	7.3E-09	1.0E-05	9.5E-07	1.1E-05
Barium	NC	NC	NC	NC
Beryllium	3.3E-10	NC	NC	3.3E-10
Cadmium	2.4E-10	NC	NC	2.4E-10
Chromium	NC	NC	NC	NC
Chromium (VI)	4.2E-08	NC	NC	4.2E-08
Cobalt	NC	NC	NC	NC
Copper	NC	NC	NC	NC
Mercury	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC
Nickel	1.2E-08	NC	NC	1.2E-08
Selenium	NC	NC	NC	NC
Silver	ND	ND	ND	ND
Thallium	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC
Zinc	NC	NC	NC	NC
<b>Total</b>	6.2E-08	1.0E-05	9.5E-07	1.1E-05

**Table A-44**  
**Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0-0.5 feet) - Construction Workers**

Chemical	Estimated Cancer Risk			
	Construction Worker			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC
Arsenic	6.0E-08	2.1E-07	8.5E-09	2.8E-07
Barium	NC	NC	NC	NC
Beryllium	2.1E-09	NC	NC	2.1E-09
Cadmium	1.7E-09	NC	NC	1.7E-09
Chromium	NC	NC	NC	NC
Chromium (VI)	2.5E-07	NC	NC	2.5E-07
Cobalt	NC	NC	NC	NC
Copper	NC	NC	NC	NC
Mercury	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC
Nickel	6.8E-08	NC	NC	6.8E-08
Selenium	NC	NC	NC	NC
Silver	NC	NC	NC	NC
Thallium	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC
Zinc	NC	NC	NC	NC
<b>Total</b>	3.9E-07	2.1E-07	8.5E-09	6.0E-07

**Table A-45  
Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (0.5-2.0 feet) - Construction Workers**

Chemical	Estimated Cancer Risk			
	Construction Worker			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC
Arsenic	6.1E-08	2.1E-07	8.7E-09	2.8E-07
Barium	NC	NC	NC	NC
Beryllium	2.3E-09	NC	NC	2.3E-09
Cadmium	1.7E-09	NC	NC	1.7E-09
Chromium	NC	NC	NC	NC
Chromium (VI)	2.4E-07	NC	NC	2.4E-07
Cobalt	NC	NC	NC	NC
Copper	NC	NC	NC	NC
Mercury	NC	NC	NC	NC
Molybdenum	ND	ND	ND	ND
Nickel	6.3E-08	NC	NC	6.3E-08
Selenium	NC	NC	NC	NC
Silver	NC	NC	NC	NC
Thallium	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC
Zinc	NC	NC	NC	NC
<b>Total</b>	<b>3.7E-07</b>	<b>2.1E-07</b>	<b>8.7E-09</b>	<b>5.9E-07</b>

**Table A-46**  
**Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (2.0-4.0 feet) - Construction Workers**

Chemical	Estimated Cancer Risk			
	Construction Worker			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC
Arsenic	7.7E-08	2.7E-07	1.1E-08	3.6E-07
Barium	NC	NC	NC	NC
Beryllium	3.2E-09	NC	NC	3.2E-09
Cadmium	1.6E-09	NC	NC	1.6E-09
Chromium	NC	NC	NC	NC
Chromium (VI)	3.5E-07	NC	NC	3.5E-07
Cobalt	NC	NC	NC	NC
Copper	NC	NC	NC	NC
Mercury	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC
Nickel	1.0E-07	NC	NC	1.0E-07
Selenium	NC	NC	NC	NC
Silver	ND	ND	ND	ND
Thallium	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC
Zinc	NC	NC	NC	NC
<b>Total</b>	5.4E-07	2.7E-07	1.1E-08	8.1E-07

**Table A-47**

**Pathway-Specific Cancer Risks for Inorganic Chemicals in Soil (4.0-8.0 feet) - Construction Workers**

Chemical	Estimated Cancer Risk			
	Construction Worker			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NC	NC	NC	NC
Arsenic	6.2E-08	2.2E-07	8.9E-09	2.9E-07
Barium	NC	NC	NC	NC
Beryllium	2.9E-09	NC	NC	2.9E-09
Cadmium	2.0E-09	NC	NC	2.0E-09
Chromium	NC	NC	NC	NC
Chromium (VI)	3.6E-07	NC	NC	3.6E-07
Cobalt	NC	NC	NC	NC
Copper	NC	NC	NC	NC
Mercury	NC	NC	NC	NC
Molybdenum	NC	NC	NC	NC
Nickel	1.0E-07	NC	NC	1.0E-07
Selenium	NC	NC	NC	NC
Silver	ND	ND	ND	ND
Thallium	NC	NC	NC	NC
Vanadium	NC	NC	NC	NC
Zinc	NC	NC	NC	NC
<b>Total</b>	<b>5.4E-07</b>	<b>2.2E-07</b>	<b>8.9E-09</b>	<b>7.6E-07</b>

**Table A-48**

**Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (0-0.5 feet) - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NA	1.7E-02	6.8E-04	<b>1.8E-02</b>	NA	1.6E-01	4.5E-03	<b>1.6E-01</b>
Arsenic	1.0E-04	1.9E-02	2.2E-03	<b>2.1E-02</b>	2.3E-04	1.8E-01	1.5E-02	<b>1.9E-01</b>
Barium	1.3E-04	1.7E-03	6.6E-05	<b>1.9E-03</b>	3.0E-04	1.6E-02	4.4E-04	<b>1.6E-02</b>
Beryllium	9.6E-06	1.8E-04	7.1E-06	<b>2.0E-04</b>	2.2E-05	1.7E-03	4.7E-05	<b>1.7E-03</b>
Cadmium	1.0E-05	7.6E-04	3.0E-06	<b>7.7E-04</b>	2.3E-05	7.1E-03	2.0E-05	<b>7.1E-03</b>
Chromium	NA	4.0E-05	1.6E-06	<b>4.2E-05</b>	NA	3.7E-04	1.0E-05	<b>3.8E-04</b>
Chromium (VI)	4.5E-05	2.9E-03	1.1E-04	<b>3.0E-03</b>	1.0E-04	2.7E-02	7.5E-04	<b>2.7E-02</b>
Cobalt	NA	2.1E-04	8.6E-06	<b>2.2E-04</b>	NA	2.0E-03	5.6E-05	<b>2.1E-03</b>
Copper	NA	1.1E-03	4.5E-05	<b>1.2E-03</b>	NA	1.1E-02	3.0E-04	<b>1.1E-02</b>
Mercury	5.5E-07	3.6E-03	1.4E-04	<b>3.7E-03</b>	1.3E-06	3.4E-02	9.4E-04	<b>3.4E-02</b>
Molybdenum	NA	5.2E-04	2.1E-05	<b>5.4E-04</b>	NA	4.9E-03	1.4E-04	<b>5.0E-03</b>
Nickel	6.1E-04	2.9E-03	1.1E-04	<b>3.6E-03</b>	1.4E-03	2.7E-02	7.5E-04	<b>2.9E-02</b>
Selenium	NA	1.4E-04	5.4E-06	<b>1.4E-04</b>	NA	1.3E-03	3.6E-05	<b>1.3E-03</b>
Silver	NA	1.2E-04	4.9E-06	<b>1.3E-04</b>	NA	1.2E-03	3.2E-05	<b>1.2E-03</b>
Thallium	NA	1.9E-02	7.8E-04	<b>2.0E-02</b>	NA	1.8E-01	5.1E-03	<b>1.9E-01</b>
Vanadium	NA	6.4E-03	2.5E-04	<b>6.6E-03</b>	NA	6.0E-02	1.7E-03	<b>6.1E-02</b>
Zinc	NA	4.0E-04	1.6E-05	<b>4.2E-04</b>	NA	3.8E-03	1.1E-04	<b>3.9E-03</b>
<b>Total</b>	9.0E-04	7.6E-02	4.5E-03	<b>8.1E-02</b>	2.1E-03	7.1E-01	2.9E-02	<b>7.4E-01</b>

**Table A-49**

**Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (0.5-2.0 feet) - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NA	2.2E-02	8.8E-04	<b>2.3E-02</b>	NA	2.0E-01	5.7E-03	<b>2.1E-01</b>
Arsenic	1.0E-04	1.9E-02	2.3E-03	<b>2.2E-02</b>	2.4E-04	1.8E-01	1.5E-02	<b>1.9E-01</b>
Barium	1.3E-04	1.7E-03	6.9E-05	<b>1.9E-03</b>	3.1E-04	1.6E-02	4.5E-04	<b>1.7E-02</b>
Beryllium	1.0E-05	1.9E-04	7.7E-06	<b>2.1E-04</b>	2.4E-05	1.8E-03	5.1E-05	<b>1.9E-03</b>
Cadmium	1.0E-05	7.7E-04	3.1E-06	<b>7.9E-04</b>	2.4E-05	7.2E-03	2.0E-05	<b>7.3E-03</b>
Chromium	NA	3.8E-05	1.5E-06	<b>4.0E-05</b>	NA	3.6E-04	1.0E-05	<b>3.7E-04</b>
Chromium (VI)	4.3E-05	2.7E-03	1.1E-04	<b>2.9E-03</b>	1.0E-04	2.6E-02	7.2E-04	<b>2.6E-02</b>
Cobalt	NA	1.9E-04	7.5E-06	<b>2.0E-04</b>	NA	1.8E-03	4.9E-05	<b>1.8E-03</b>
Copper	NA	1.0E-03	4.0E-05	<b>1.0E-03</b>	NA	9.3E-03	2.6E-04	<b>9.6E-03</b>
Mercury	6.6E-07	4.3E-03	1.7E-04	<b>4.5E-03</b>	1.5E-06	4.0E-02	1.1E-03	<b>4.1E-02</b>
Molybdenum	ND	ND	ND	<b>ND</b>	ND	ND	ND	<b>ND</b>
Nickel	5.7E-04	2.7E-03	1.1E-04	<b>3.3E-03</b>	1.3E-03	2.5E-02	6.9E-04	<b>2.7E-02</b>
Selenium	NA	1.5E-04	6.0E-06	<b>1.6E-04</b>	NA	1.4E-03	4.0E-05	<b>1.5E-03</b>
Silver	NA	1.2E-04	4.7E-06	<b>1.2E-04</b>	NA	1.1E-03	3.1E-05	<b>1.1E-03</b>
Thallium	NA	1.6E-02	6.3E-04	<b>1.7E-02</b>	NA	1.5E-01	4.1E-03	<b>1.5E-01</b>
Vanadium	NA	6.3E-03	2.5E-04	<b>6.6E-03</b>	NA	5.9E-02	1.7E-03	<b>6.1E-02</b>
Zinc	NA	3.3E-04	1.3E-05	<b>3.4E-04</b>	NA	3.1E-03	8.6E-05	<b>3.1E-03</b>
<b>Total</b>	<b>8.6E-04</b>	<b>7.7E-02</b>	<b>4.6E-03</b>	<b>8.3E-02</b>	<b>2.0E-03</b>	<b>7.2E-01</b>	<b>3.0E-02</b>	<b>7.5E-01</b>

**Table A-50**

**Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (2.0-4.0 feet) - Current and Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NA	1.7E-02	6.8E-04	<b>1.8E-02</b>	NA	1.6E-01	4.5E-03	<b>1.6E-01</b>
Arsenic	1.3E-04	2.4E-02	2.9E-03	<b>2.7E-02</b>	3.0E-04	2.3E-01	1.9E-02	<b>2.5E-01</b>
Barium	1.6E-04	2.1E-03	8.3E-05	<b>2.3E-03</b>	3.7E-04	1.9E-02	5.4E-04	<b>2.0E-02</b>
Beryllium	1.4E-05	2.7E-04	1.1E-05	<b>2.9E-04</b>	3.3E-05	2.5E-03	7.0E-05	<b>2.6E-03</b>
Cadmium	9.7E-06	7.3E-04	2.9E-06	<b>7.4E-04</b>	2.3E-05	6.8E-03	1.9E-05	<b>6.8E-03</b>
Chromium	NA	5.5E-05	2.2E-06	<b>5.7E-05</b>	NA	5.1E-04	1.4E-05	<b>5.3E-04</b>
Chromium (VI)	6.2E-05	3.9E-03	1.6E-04	<b>4.1E-03</b>	1.4E-04	3.7E-02	1.0E-03	<b>3.8E-02</b>
Cobalt	NA	2.7E-04	1.1E-05	<b>2.8E-04</b>	NA	2.5E-03	7.0E-05	<b>2.6E-03</b>
Copper	NA	1.3E-03	5.2E-05	<b>1.4E-03</b>	NA	1.2E-02	3.4E-04	<b>1.2E-02</b>
Mercury	8.8E-07	5.8E-03	2.3E-04	<b>6.0E-03</b>	2.0E-06	5.4E-02	1.5E-03	<b>5.5E-02</b>
Molybdenum	NA	1.2E-03	5.0E-05	<b>1.3E-03</b>	NA	1.2E-02	3.3E-04	<b>1.2E-02</b>
Nickel	9.3E-04	4.4E-03	1.8E-04	<b>5.5E-03</b>	2.2E-03	4.1E-02	1.1E-03	<b>4.4E-02</b>
Selenium	NA	1.6E-04	6.5E-06	<b>1.7E-04</b>	NA	1.5E-03	4.2E-05	<b>1.6E-03</b>
Silver	ND	ND	ND	<b>ND</b>	ND	ND	ND	<b>ND</b>
Thallium	NA	1.8E-02	7.2E-04	<b>1.9E-02</b>	NA	1.7E-01	4.7E-03	<b>1.7E-01</b>
Vanadium	NA	8.7E-03	3.5E-04	<b>9.1E-03</b>	NA	8.1E-02	2.3E-03	<b>8.4E-02</b>
Zinc	NA	4.3E-04	1.7E-05	<b>4.5E-04</b>	NA	4.0E-03	1.1E-04	<b>4.2E-03</b>
<b>Total</b>	1.3E-03	8.8E-02	5.4E-03	<b>9.5E-02</b>	3.0E-03	8.2E-01	3.6E-02	<b>8.6E-01</b>

**Table A-51**

**Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (4.0-8.0 feet) - Future Residents**

Chemical	Estimated Noncancer Hazard Index							
	Current and Future Adult Resident				Current and Future Child Resident			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NA	1.6E-02	6.2E-04	<b>1.6E-02</b>	NA	1.5E-01	4.1E-03	<b>1.5E-01</b>
Arsenic	1.0E-04	2.0E-02	2.3E-03	<b>2.2E-02</b>	2.4E-04	1.8E-01	1.5E-02	<b>2.0E-01</b>
Barium	1.0E-04	1.4E-03	5.5E-05	<b>1.5E-03</b>	2.4E-04	1.3E-02	3.6E-04	<b>1.3E-02</b>
Beryllium	1.3E-05	2.4E-04	9.6E-06	<b>2.6E-04</b>	3.0E-05	2.2E-03	6.3E-05	<b>2.3E-03</b>
Cadmium	1.2E-05	9.1E-04	3.6E-06	<b>9.3E-04</b>	2.8E-05	8.5E-03	2.4E-05	<b>8.6E-03</b>
Chromium	NA	5.7E-05	2.3E-06	<b>5.9E-05</b>	NA	5.3E-04	1.5E-05	<b>5.5E-04</b>
Chromium (VI)	6.4E-05	4.1E-03	1.6E-04	<b>4.3E-03</b>	1.5E-04	3.8E-02	1.1E-03	<b>3.9E-02</b>
Cobalt	NA	2.6E-04	1.0E-05	<b>2.7E-04</b>	NA	2.4E-03	6.9E-05	<b>2.5E-03</b>
Copper	NA	1.0E-03	4.1E-05	<b>1.1E-03</b>	NA	9.5E-03	2.7E-04	<b>9.8E-03</b>
Mercury	4.8E-07	3.2E-03	1.3E-04	<b>3.3E-03</b>	1.1E-06	3.0E-02	8.3E-04	<b>3.0E-02</b>
Molybdenum	NA	6.7E-04	2.7E-05	<b>7.0E-04</b>	NA	6.3E-03	1.8E-04	<b>6.4E-03</b>
Nickel	9.4E-04	4.4E-03	1.8E-04	<b>5.5E-03</b>	2.2E-03	4.1E-02	1.2E-03	<b>4.4E-02</b>
Selenium	NA	3.3E-04	1.3E-05	<b>3.4E-04</b>	NA	3.0E-03	8.5E-05	<b>3.1E-03</b>
Silver	ND	ND	ND	<b>ND</b>	ND	ND	ND	<b>ND</b>
Thallium	NA	4.3E-02	1.7E-03	<b>4.4E-02</b>	NA	4.0E-01	1.1E-02	<b>4.1E-01</b>
Vanadium	NA	8.8E-03	3.5E-04	<b>9.2E-03</b>	NA	8.2E-02	2.3E-03	<b>8.5E-02</b>
Zinc	NA	3.1E-04	1.2E-05	<b>3.2E-04</b>	NA	2.9E-03	8.0E-05	<b>2.9E-03</b>
<b>Total</b>	<b>1.2E-03</b>	<b>1.0E-01</b>	<b>5.6E-03</b>	<b>1.1E-01</b>	<b>2.9E-03</b>	<b>9.6E-01</b>	<b>3.7E-02</b>	<b>1.0E+00</b>

**Table A-52****Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (0-0.5 feet) - Construction Workers**

Chemical	Estimated Noncancer Hazard Index			
	Construction Worker			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NA	2.9E-02	4.0E-04	3.0E-02
Arsenic	3.3E-02	3.2E-02	1.3E-03	6.6E-02
Barium	4.1E-02	2.9E-03	3.9E-05	4.4E-02
Beryllium	3.1E-03	3.1E-04	4.2E-06	3.4E-03
Cadmium	3.3E-03	1.3E-03	1.8E-06	4.6E-03
Chromium	NA	6.8E-05	9.4E-07	6.9E-05
Chromium (VI)	1.5E-02	4.9E-03	6.7E-05	2.0E-02
Cobalt	NA	3.7E-04	5.1E-06	3.7E-04
Copper	NA	2.0E-03	2.7E-05	2.0E-03
Mercury	1.8E-04	6.2E-03	8.5E-05	6.4E-03
Molybdenum	NA	9.0E-04	1.2E-05	9.1E-04
Nickel	2.0E-01	4.9E-03	6.7E-05	2.0E-01
Selenium	NA	2.3E-04	3.2E-06	2.4E-04
Silver	NA	2.1E-04	2.9E-06	2.1E-04
Thallium	NA	3.3E-02	4.6E-04	3.4E-02
Vanadium	NA	1.1E-02	1.5E-04	1.1E-02
Zinc	NA	6.9E-04	9.5E-06	7.0E-04
<b>Total</b>	2.9E-01	1.3E-01	2.7E-03	4.3E-01

**Table A-53****Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (0.5-2.0 feet) - Construction Workers**

Chemical	Estimated Noncancer Hazard Index			
	Construction Worker			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NA	3.8E-02	5.2E-04	3.8E-02
Arsenic	3.3E-02	3.3E-02	1.4E-03	6.8E-02
Barium	4.3E-02	3.0E-03	4.1E-05	4.6E-02
Beryllium	3.4E-03	3.3E-04	4.6E-06	3.7E-03
Cadmium	3.4E-03	1.3E-03	1.8E-06	4.7E-03
Chromium	NA	6.6E-05	9.0E-07	6.7E-05
Chromium (VI)	1.4E-02	4.7E-03	6.4E-05	1.9E-02
Cobalt	NA	3.2E-04	4.5E-06	3.3E-04
Copper	NA	1.7E-03	2.4E-05	1.7E-03
Mercury	2.1E-04	7.4E-03	1.0E-04	7.7E-03
Molybdenum	ND	ND	ND	ND
Nickel	1.8E-01	4.6E-03	6.3E-05	1.9E-01
Selenium	NA	2.6E-04	3.6E-06	2.6E-04
Silver	NA	2.0E-04	2.8E-06	2.1E-04
Thallium	NA	2.7E-02	3.7E-04	2.8E-02
Vanadium	NA	1.1E-02	1.5E-04	1.1E-02
Zinc	NA	5.6E-04	7.7E-06	5.7E-04
<b>Total</b>	2.8E-01	1.3E-01	2.7E-03	4.2E-01

**Table A-54**  
**Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (2.0-4.0 feet) - Construction Workers**

Chemical	Estimated Noncancer Hazard Index			
	Construction Worker			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NA	2.9E-02	4.0E-04	3.0E-02
Arsenic	4.2E-02	4.2E-02	1.7E-03	8.5E-02
Barium	5.1E-02	3.6E-03	4.9E-05	5.5E-02
Beryllium	4.6E-03	4.6E-04	6.3E-06	5.1E-03
Cadmium	3.2E-03	1.2E-03	1.7E-06	4.4E-03
Chromium	NA	9.4E-05	1.3E-06	9.5E-05
Chromium (VI)	2.0E-02	6.7E-03	9.2E-05	2.7E-02
Cobalt	NA	4.6E-04	6.3E-06	4.6E-04
Copper	NA	2.2E-03	3.1E-05	2.3E-03
Mercury	2.9E-04	9.9E-03	1.4E-04	1.0E-02
Molybdenum	NA	2.1E-03	2.9E-05	2.2E-03
Nickel	3.0E-01	7.5E-03	1.0E-04	3.1E-01
Selenium	NA	2.8E-04	3.8E-06	2.8E-04
Silver	ND	ND	ND	ND
Thallium	NA	3.1E-02	4.2E-04	3.1E-02
Vanadium	NA	1.5E-02	2.1E-04	1.5E-02
Zinc	NA	7.4E-04	1.0E-05	7.5E-04
<b>Total</b>	<b>4.3E-01</b>	<b>1.5E-01</b>	<b>3.2E-03</b>	<b>5.8E-01</b>

**Table A-55**  
**Pathway-Specific Noncancer Hazard Indices for Inorganic Chemicals in Soil (4.0-8.0 feet) - Construction Workers**

Chemical	Estimated Noncancer Hazard Index			
	Construction Worker			
	Inhalation of Soil Particulates	Incidental Ingestion of Soil	Dermal Contact with Soil	All Pathways
Antimony	NA	2.7E-02	3.7E-04	2.7E-02
Arsenic	3.4E-02	3.4E-02	1.4E-03	6.9E-02
Barium	3.4E-02	2.3E-03	3.2E-05	3.6E-02
Beryllium	4.2E-03	4.1E-04	5.7E-06	4.6E-03
Cadmium	4.0E-03	1.6E-03	2.2E-06	5.5E-03
Chromium	NA	9.8E-05	1.3E-06	9.9E-05
Chromium (VI)	2.1E-02	7.0E-03	9.6E-05	2.8E-02
Cobalt	NA	4.5E-04	6.2E-06	4.6E-04
Copper	NA	1.8E-03	2.4E-05	1.8E-03
Mercury	1.6E-04	5.4E-03	7.5E-05	5.7E-03
Molybdenum	NA	1.2E-03	1.6E-05	1.2E-03
Nickel	3.1E-01	7.5E-03	1.0E-04	3.1E-01
Selenium	NA	5.6E-04	7.7E-06	5.7E-04
Silver	ND	ND	ND	ND
Thallium	NA	7.3E-02	1.0E-03	7.4E-02
Vanadium	NA	1.5E-02	2.1E-04	1.5E-02
Zinc	NA	5.3E-04	7.2E-06	5.3E-04
<b>Total</b>	<b>4.0E-01</b>	<b>1.8E-01</b>	<b>3.3E-03</b>	<b>5.8E-01</b>