APPENDIX C

CALCULATION OF RESIDUAL RISK
INVESTIGATION AREA H1
FEASIBILITY STUDY

Mare Island, Vallejo, California

APPENDIX C1

CALCULATION OF RESIDUAL RISK UPLAND AREAS OUTSIDE THE CONTAINMENT BARRIER

Mare Island, Vallejo, California

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SECTION 1
INTRODUCTION

This appendix presents the human health and ecological residual risk evaluation for the Upland Areas of Investigation Area H1 (IA-H1) of the former Mare Island Naval Shipyard (MINS). A baseline human health risk assessment (HHRA) and baseline ecological risk assessment (ERA) were prepared for soil and groundwater in the Upland Areas of IA-H1 and were included in the Revised Final Remedial Investigation (RI) for IA-H1 (Weston Solutions, Inc. [WESTON], 2006). The baseline HHRA characterized potential cancer risks and the potential adverse noncancer health effects associated with chemicals present in soil and groundwater present in IA-H1 if no additional remedial action had been taken (baseline risk assessment). The baseline ERA integrates the information from the problem formulation and the exposure and ecological effects characterizations to estimate the nature and extent of potential ecological risk.

This residual risk evaluation re-evaluates the potential human health cancer risks, potential adverse noncancer health effects to humans, and ecological risk associated with chemicals present at the Upland Areas after a proposed remedial action alternative is conducted at IA-H1. Both current and future exposure scenarios were evaluated. Exposure point concentrations (EPCs) were calculated for chemicals of concern (COCs) under current and future exposure scenarios. Consistent with United States Environmental Protection Agency (EPA) guidelines, the EPCs used are the lesser of the maximum detected concentration and the upper confidence limit (UCL) of the mean. The EPA ProUCL Software Version 3.0 was used to estimate the UCL for each chemical at each exposure point. The 0- to 2-feet below ground surface (bgs) soil zone was used to represent current soil conditions. The 0- to 10-feet bgs mixed soil zone was used to represent future soil conditions. For the current conditions, the cover material dataset was used to develop the cover EPC since 2 feet of imported cover will be placed on the Upland Areas. Import material has been obtained from several off-site borrow sources and will be used as the final cover in the IA-H1 Upland Areas. For the future conditions, a mixed zone EPC was calculated as a proportion of the cover material 95 percent upper confidence limit (95UCL) and the 0 to10 feet samples UCL, where:

$$EPC\ mixed\ zone\,(mg/kg) = \tfrac{1}{5} \times 95UCL_{\mathrm{cov}er} + \tfrac{4}{5} \times 95UCL_{0-10\,ftsamples}$$

Not all parameters were analyzed for in the cover material samples. In these cases, one-half the highest detection limit for non-detect chemicals in the 0 to 2 feet zone was used as the proxy concentration. The 0 to 10 feet zone EPC was used as the mixed zone EPC if a parameter was not analyzed for in the cover material. The 0 to10 feet zone dataset was developed for each alternative by removing points "excavated" at a hazard quotient (HQ) of 3, a HQ of 5, and a HQ of 10, resulting in three different UCLs for the mixed zone.

It should be noted that an outlier study was conducted on the data set for the Upland Areas prior to calculation of the cancer risks, noncancer adverse health effects, and ecological risks. Outlier chemical concentrations were excluded from the baseline HHRA and baseline ERA presented in the Revised Final IA-H1 RI (WESTON, 2006). The outlier chemical concentrations that were not determined to present a risk to human or ecological receptors, and are not included as areas of remediation under the various alternatives, have been included in the data set for the residual risk calculations.

This Feasibility Study (FS) evaluates five alternatives for the Upland Areas:

- Alternative 1—No Action
- Alternative 2—Institutional Controls, Hot Spot Removal (HQ=10), Groundwater Monitoring, and 2-Foot Soil Cover
- Alternative 3—Institutional Controls, Hot Spot Removal (HQ=5), Groundwater Monitoring, and 2-Foot Soil Cover
- Alternative 4—Institutional Controls, Hot Spot Removal (HQ=3), Groundwater Monitoring, and 2-Foot Soil Cover
- Alternative 5—Debris Excavation and Groundwater Monitoring

Under the current scenario for Alternatives 2 through 4, a 2-foot soil cover is to be placed over the subareas of the Upland Areas. The human health and ecological risk associated with soil within the 0 to 2 feet bgs range would be essentially eliminated by placing 2 feet of clean soil over the area. However, to evaluate how the cover will reduce risk, the residual risk for the current exposure scenario was re-evaluated for human and ecological receptors exposed to the cover material using analytical results from the imported soil. A summary of cover soil and mixed zone EPCs is provided in Tables C1-1a and C1-1b.

The cover soil noncancer HQ estimates are included in Tables C1-1c and C1-1d for the child recreational user and construction worker receptors, respectively. The cover soil cancer risk estimates are included in Tables C1-1e and C1-1f for the child recreational user and construction worker receptors, respectively. Tables C1-1g and C1-1h present current total risk at IA-H1 for the child recreational user and construction worker receptors, respectively. Table C1-1i compares baseline risk estimates to risks from the import cover soil. Risks are reduced over 60 percent from the baseline estimates.

The following sections summarize the residual risk for each of the five Upland Areas alternatives.

SECTION 2
UPLAND AREAS ALTERNATIVE 1

The "No Action" alternative implies that no remedial action would be undertaken within the Upland Areas of IA-H1. Outlier chemical concentrations were excluded from the baseline HHRA and baseline ERA presented in the Revised Final IA-H1 RI (WESTON, 2006). Thus, the residual risk at the Upland Areas of IA-H1 under the "No Action" alternative (which means that outliers would remain) would be greater than the risk estimates presented in the HHRA and ERA for all receptors and exposure pathways.

SECTION 3
UPLAND AREAS ALTERNATIVE 2

Upland Areas Alternative 2 includes institutional controls to be placed on the property to prohibit the development of the land for unauthorized uses; excavation of all hot spots including areas that exceed a human health cancer risk estimate of $1x10^{-4}$, a human health hazard index (HI) of 1 for noncancer adverse health effects, an ecological HQ of 10, threats to groundwater, and locations exhibiting visible oil or free product; groundwater monitoring; and placement of a 2-foot soil cover over upland habitat areas.

3.1 CURRENT EXPOSURE SCENARIO

The current exposure scenario evaluated soil at depths of 0 to 2 feet bgs within the Upland Areas of IA-H1. Alternative 2 includes a 2-foot soil cover to be placed over the subareas of the Upland Areas. The human health and ecological risk associated with soil within the 0 to 2 feet bgs range would be essentially eliminated by placing 2 feet of clean soil over the area. However, to evaluate how the cover will reduce risk under Alternative 2, the residual risk for the current exposure scenario was re-evaluated for humans exposed to the cover material using analytical results from the imported soil. The current risk estimates for the cover material are described in Section 1. Risks are reduced over 60 percent from the baseline estimates.

3.2 FUTURE EXPOSURE SCENARIO

The future exposure scenario evaluated mixed zone soil at depths of 0 to 10 feet bgs within the Upland Areas of IA-H1 for both a child recreational user and an adult construction worker. Placement of the 2-foot soil cover will mitigate risk to most ecological receptors as most ecological receptors are not expected to be exposed to subsurface soils. However, the gray fox may be exposed to subsurface soil while burrowing, and therefore is evaluated for this depth interval.

This alternative includes excavation of hot spot areas within the Upland Areas that exceed a human health cancer risk estimate of $1x10^{-4}$, a human health HI of 1 for noncancer adverse health effects, an ecological HQ of 10 (gray fox only), threats to groundwater, and locations exhibiting visible oil or free product. The data set that was evaluated in the risk assessments was

modified for this residual risk evaluation to remove data from Alternative 2 hot spot sample locations and to include imported cover soil. The EPCs were recalculated for chemicals of concern (COCs) prior to implementation of a remedial alternative. Consistent with EPA guidelines, the EPCs used are the lesser of the maximum detected concentration and the UCL of the mean. The revised analytical data set and the EPA ProUCL Software Version 3.0 were used to estimate the UCL for each chemical at each exposure point. A summary of revised EPCs is provided in Tables C1-1a and C1-1b.

The revised noncancer HQ estimates are included in Tables C1-3a and C1-3b for the child recreational user and construction worker receptors, respectively. The revised cancer risk estimates are included in Tables C1-3c and C1-3d for the child recreational user and construction worker receptors, respectively. Tables C1-3e and C1-3f present total risk across all media at IA-H1 for the child recreational user and construction worker receptors, respectively. Table C1-3h compares baseline risk estimates to risks from Alternative 3. Risks are reduced over 10 percent from the baseline estimates.

3.2.1 Total Risk for Recreational User

As shown in Table C1-1e, the total future reasonable maximum exposure (RME) lifetime excess cancer risk estimate to a recreational user for all exposure media (i.e., soil and groundwater) after removal of hot spots for Alternative 2 is 4.8×10^{-5}. The total lifetime excess cancer risk estimate for exposure to the remaining soil contaminants within the 0 to 10 feet bgs mixed zone is 4.6×10^{-5} after hot spot removal. The only remaining chemical exhibiting a cancer risk estimate greater than 1×10^{-5} is arsenic. The calculated EPC for arsenic is 13.6 milligrams per kilogram (mg/kg), which is significantly lower concentration than the 95th percentile ambient/background concentration of 36 mg/kg. Exposure to arsenic accounts for 85 percent of the total cancer risk estimate for exposure to soil. When exposure to arsenic is excluded from the total risk estimate for soil, the total risk estimate for the remaining contaminants is 6.9×10^{-6} as presented in Table C1-3g. Table C1-3g also presents a comparison of total baseline risk estimates for soil to risk estimates after hot spot removal for Alternative 2. The estimated HI is equal to 0.31 for combined soil and groundwater exposure. The estimated HI for soil exposure is equal to 0.22. No individual chemical or target organ HI exceeded 1. Table C1-3h presents a comparison of EPCs, cancer risk estimates, and noncancer HQ values for soil for the baseline risk assessment

and the residual risk evaluation for Alternative 2. Only the chemicals identified as outlier chemicals or chemicals that presented a risk to human or ecological receptors are included in this comparison.

3.2.2 Total Risk for Construction Worker

As shown in Table C1-3f, the total future RME lifetime excess cancer risk estimate to a construction worker for all exposure media (i.e., soil and groundwater) after removal of hot spots for Alternative 2 is 8.1×10^{-6}. The total lifetime excess cancer risk estimate for exposure to the remaining soil contaminants within the 0 to 10 feet bgs mixed zone is 7.6×10^{-6} after hot spot removal. Exposure to arsenic accounts for 85 percent of the total cancer risk estimate for exposure to soil. When exposure to arsenic is excluded from the total risk estimate for soil, the total risk estimate for the remaining contaminants is 1.1×10^{-6} as presented in Table C1-3g. Table C1-3g also presents a comparison of total baseline risk estimates for soil to risk estimates after hot spot removal for Alternative 2. The estimated HI is equal to 1.4 for combined soil and groundwater exposure. The estimated HI for soil exposure is equal to 1.1. No individual chemical or target organ HI exceeded 1. Table C1-3h presents a comparison of EPCs, cancer risk estimates, and noncancer HQ values for soil for the baseline risk assessment and the residual risk evaluation for Alternative 2. Only the chemicals identified as outlier chemicals or chemicals that presented a risk to human or ecological receptors are included in this comparison.

3.2.3 Ecological Risk

The residual ecological baseline risk analysis indicates that exposure to aluminum in upland mixed zone soil (0 to 10 feet bgs) pose a risk to gray fox. Aluminum is only considered to be toxic to ecological receptors if the pH is less than 5.5, which is not the case at this site. The summary of HQ values based on the low and high toxicity reference values (TRVs) are presented in Table C1-3i. Table C1-3j presents a summary of HQ values for the gray fox based on both the low and high TRV values compared to the ERA risk estimates.

SECTION 4
UPLAND AREAS ALTERNATIVE 3

Upland Areas Alternative 3 includes institutional controls to be placed on the property to prohibit the development of the land for unauthorized uses; excavation of all hot spots including areas that exceed a human health cancer risk estimate of $1x10^{-4}$, a human health HI of 1 for noncancer adverse health effects, an ecological HQ of 5, threats to groundwater, and locations exhibiting visible oil or free product; groundwater monitoring; and placement of a 2-foot soil cover over upland habitat areas.

4.1 CURRENT EXPOSURE SCENARIO

The current exposure scenario evaluated soil at depths of 0 to 2 feet bgs within the Upland Areas of IA-H1. Alternative 3 includes a 2-foot soil cover to be placed over the subareas of the Upland Areas. The human health and ecological risk associated with soil within the 0 to 2 feet bgs range would be essentially eliminated by placing 2 feet of clean soil over the area. However, to evaluate how the cover will reduce risk under Alternative 3, the residual risk for the current exposure scenario was re-evaluated for human receptors exposed to the cover material using analytical results from the imported soil. The current risk estimates for the cover material are described in Section 1. Risks are reduced over 60 percent from the baseline estimates.

4.2 FUTURE EXPOSURE SCENARIO

The future exposure scenario evaluated mixed zone soil at depths of 0 to 10 feet bgs within the Upland Areas of IA-H1 for both a child recreational user an adult construction worker. Placement of the 2-foot soil cover will mitigate risk to most ecological receptors as most ecological receptors are not expected to be exposed to subsurface soils. However, the gray fox may be exposed to subsurface soil while burrowing, and therefore is evaluated for this depth.

This alternative includes excavation of hot spot areas within the Upland Areas that exceed a human health cancer risk estimate of $1x10^{-4}$, a human health HI of 1 for noncancer adverse health effects, an ecological HQ of 5 (gray fox only), threats to groundwater, and locations exhibiting visible oil or free product. The data set that was evaluated in the risk assessments was modified for this residual risk evaluation to remove data from Alternative 3 hot spot sample

locations and to include imported cover soil. The revised analytical data set and the EPA ProUCL Software Version 3.0 were used to estimate the UCL for each chemical at each exposure point. A summary of revised EPCs are provided in Tables C1-1a and C1-1b.

The revised noncancer HQ estimates are included in Tables C1-4a and C1-4b for the child recreational user and construction worker receptors, respectively. The revised cancer risk estimates are included in Tables C1-4c and C1-4d for the child recreational user and construction worker receptors, respectively. Tables C1-4e and C1-4f present total risk across all media at IA-H1 for the child recreational user and construction worker receptors, respectively. Table C1-4h compares baseline risk estimates to risks from Alternative 3. Risks are reduced over 10 percent from the baseline estimates.

4.2.1 Total Risk for Recreational User

As shown in Table C1-4f, the total future RME lifetime excess cancer risk estimate to a recreational user for all exposure media (i.e., soil and groundwater) after removal of hot spots for Alternative 3 is 4.8×10^{-5}. The total lifetime excess cancer risk estimate for exposure to the remaining soil contaminants within the 0 to 10 feet bgs zone is 5.2×10^{-5} after hot spot removal. The only remaining chemical exhibiting a cancer risk estimate greater than 1×10^{-5} is arsenic. The calculated EPC for arsenic is 13.6 mg/kg, which is a significantly lower concentration than the 95th percentile ambient/background concentration of 36 mg/kg. Exposure to arsenic accounts for 85 percent of the total cancer risk estimate for exposure to soil. When exposure to arsenic is excluded from the total risk estimate for soil, the total risk estimate for the remaining contaminants is 5.1×10^{-6} as presented in Table C1-4g. Table C1-4g also presents a comparison of total baseline risk estimates for soil to risk estimates after hot spot removal for Alternative 3. The estimated HI is equal to 0.30 for combined soil and groundwater exposure. The estimated HI for soil exposure is equal to 0.21. No individual chemical or target organ HI exceeded 1. Table C1-2i presents a comparison of EPCs, cancer risk estimates, and noncancer HQ values for soil for the baseline risk assessment and the residual risk evaluation for Alternative 3. Only the chemicals identified as outlier chemicals or chemicals that presented a risk to human or ecological receptors are included in this comparison.

4.2.2 Total Risk for Construction Worker

As shown in Table C1-2f, the total future RME lifetime excess cancer risk estimate to a construction worker for all exposure media (i.e., soil and groundwater) after removal of hot spots for Alternative 3 is 8.1×10^{-6}. The total lifetime excess cancer risk estimate for exposure to the remaining soil contaminants within the 0 to 10 feet bgs zone is 7.2×10^{-7} after hot spot removal. Exposure to arsenic accounts for 85 percent of the total cancer risk estimate for exposure to soil. When exposure to arsenic is excluded from the total risk estimate for soil, the total risk estimate for the remaining contaminants is 7.0×10^{-7} as presented in Table C1-2g. Table C1-2g also presents a comparison of total baseline risk estimates for soil to risk estimates after hot spot removal for Alternative 3. The estimated HI is equal to 1.4 for combined soil and groundwater exposure. The estimated HI for soil exposure is equal to 1.1. No individual chemical or target organ HI exceeded 1. Table C1-2h presents a comparison of EPCs, cancer risk estimates, and noncancer HQ values for soil for the baseline risk assessment and the residual risk evaluation for Alternative 3. Only the chemicals identified as outlier chemicals or chemicals that presented a risk to human or ecological receptors are included in this comparison.

4.2.3 Ecological Risk

The residual ecological baseline risk analysis indicates that exposure to aluminum in upland mixed zone soil (0 to 10 feet bgs) pose a risk to gray fox. Aluminum is only considered to be toxic to ecological receptors if the pH is less than 5.5, which is not the case at this site. The summary of HQ values based on the low and high TRVs are presented in Tables C1-4i. Table C1-4j presents a summary of HQ values for the gray fox based on both the low and high TRV values compared to the ERA risk estimates.

SECTION 5
UPLAND AREAS ALTERNATIVE 4

Upland Areas Alternative 4 includes institutional controls to be placed on the property to prohibit the development of the land for unauthorized uses; excavation of all hot spots including areas that exceed a human health cancer risk estimate of $1x10^{-4}$, a human health HI of 1 for noncancer adverse health effects, an ecological HQ of 3, threats to groundwater, and locations exhibiting visible oil or free product; groundwater monitoring; and placement of a 2-foot soil cover over upland habitat areas.

5.1 CURRENT EXPOSURE SCENARIO

The current exposure scenario evaluated soil at depths of 0 to 2 feet bgs within the Upland Areas of IA-H1. Alternative 4 includes a 2-foot soil cover to be placed over the subareas of the Upland Areas. The human health and ecological risk associated with soil within the 0 to 2 feet bgs range would be essentially eliminated by placing 2 feet of clean soil over the area. However, to evaluate how the cover will reduce risk under Alternative 2, the residual risk for the current exposure scenario was re-evaluated for human receptors exposed to the cover material using analytical results from the imported soil. The current risk estimates for the cover material are described in Section 1. Risks are reduced over 60 percent from the baseline estimates.

5.2 FUTURE EXPOSURE SCENARIO

The future exposure scenario evaluated soil at depths of 0 to 10 feet bgs within the Upland Areas of IA-H1 for both a child recreational user and an adult construction worker. Placement of the 2-foot soil cover will mitigate risk to most ecological receptors as most ecological receptors are not expected to be exposed to subsurface soils. However, the gray fox may be exposed to subsurface soil while burrowing, and therefore is evaluated for this depth.

This alternative includes excavation of hot spot areas within the Upland Areas that exceed a human health cancer risk estimate of $1x10^{-4}$, a human health HI of 1 for noncancer adverse health effects, an ecological HQ of 3 (gray fox only), threats to groundwater, and locations exhibiting visible oil or free product. The data set that was evaluated in the risk assessments was modified for this residual risk evaluation to remove data from Alternative 4 hot spot sample

locations and to include imported cover soil. The revised analytical data set and the EPA ProUCL Software Version 3.0 were used to estimate the UCL for each chemical at each exposure point. A summary of revised EPCs are provided in Tables C1-1a and C1-1b.

The revised noncancer HQ estimates are included in Tables C1-5a and C1-5b for the child recreational user and construction worker receptors, respectively. The revised cancer risk estimates are included in Tables C1-5c and C1-5d for the child recreational user and construction worker receptors, respectively. Tables C1-5e and C1-5f present total risk across all media at IA-H1 for the child recreational user and construction worker receptors, respectively. Table C1-5h compares baseline risk estimates to risks from Alternative 3. Risks are reduced about 15 percent from the baseline estimates.

5.2.1 Total Risk for Recreational User

As shown in Table C1-5e, the total future RME lifetime excess cancer risk estimate to a recreational user for all exposure media (i.e., soil and groundwater) after removal of hot spots for Alternative 4 is 4.7×10^{-5}. The total lifetime excess cancer risk estimate for exposure to the remaining soil contaminants within the 0 to 10 feet bgs zone is 4.3×10^{-5} after hot spot removal. The only remaining chemical exhibiting a cancer risk estimate greater than 1×10^{-5} is arsenic. The calculated EPC for arsenic is 13.6 mg/kg, which is a significantly lower concentration than the 95th percentile ambient/background concentration of 36 mg/kg. Exposure to arsenic accounts for 85 percent of the total cancer risk estimate for exposure to soil. When exposure to arsenic is excluded from the total risk estimate for soil, the total risk estimate for the remaining contaminants is 4.4×10^{-6} as presented in Table C1-5g. Table C1-3g also presents a comparison of total baseline risk estimates for soil to risk estimates after hot spot removal for Alternative 4. The estimated HI is equal to 0.30 for combined soil and groundwater exposure. The estimated HI for soil exposure is equal to 0.21. No individual chemical or target organ HI exceeded 1. Table C1-5i presents a comparison of EPCs, cancer risk estimates, and noncancer HQ values for soil for the baseline risk assessment and the residual risk evaluation for Alternative 4. Only the chemicals identified as outlier chemicals or chemicals that presented a risk to human or ecological receptors are included in this comparison.

5.2.2 Total Risk for Construction Worker

As shown in Table C1-5f, the total future RME lifetime excess cancer risk estimate to a construction worker for all exposure media (i.e., soil and groundwater) after removal of hot spots for Alternative 4 is 7.9×10^{-6}. The total lifetime excess cancer risk estimate for exposure to the remaining soil contaminants within the 0 to 10 feet bgs zone is 7.2×10^{-6} after hot spot removal. Exposure to arsenic accounts for 85 percent of the total cancer risk estimate for exposure to soil. When exposure to arsenic is excluded from the total risk estimate for soil, the total risk estimate for the remaining contaminants is 7.0×10^{-7} as presented in Table C1-5g. Table C1-3g also presents a comparison of total baseline risk estimates for soil to risk estimates after hot spot removal for Alternative 4. The estimated HI is equal to 1.4 for combined soil and groundwater exposure. The estimated HI for soil exposure is equal to 1.1. No individual chemical or target organ HI exceeded 1. Table C1-5h presents a comparison of EPCs, cancer risk estimates, and noncancer HQ values for soil for the baseline risk assessment and the residual risk evaluation for Alternative 4. Only the chemicals identified as outlier chemicals or chemicals that presented a risk to human or ecological receptors are included in this comparison.

5.2.3 Ecological Risk

The residual ecological baseline risk analysis indicates that exposure to aluminum in upland mixed zone soil (0 to 10 feet bgs) pose a risk to gray fox. Aluminum is only considered to be toxic to ecological receptors if the pH is less than 5.5, which is not the case at this site. The summary of HQ values based on the low and high TRVs are presented in Tables C1-5i. Table C1-5j presents a summary of HQ values for the gray fox based on both the low and high TRV values compared to the ERA risk estimates.

SECTION 6
UPLAND AREAS ALTERNATIVE 5

Upland Areas Alternative 5 includes groundwater monitoring and excavation of all debris within upland habitat areas within the Demolition Debris Subarea, Northwest Dump Road Subarea, Fire-Fighting Training Subarea, Solid Waste Disposal/Lead Oxide Storage and Disposal Subarea, and the West Subarea (Pond 1).

6.1 CURRENT EXPOSURE SCENARIO

The current exposure scenario evaluated soil at depths of 0 to 2 feet bgs within the Upland Areas of IA-H1. Alternative 5 includes excavation of all debris disposal areas across the majority of the Upland Areas. The depth of debris is greater than the 2-foot soil interval. The human health and ecological risk associated with soil within the 0 to 2 feet bgs range would be essentially eliminated. Thus, the residual risk for the current exposure scenario was not re-evaluated for human or ecological receptors.

6.2 FUTURE EXPOSURE SCENARIO

The future exposure scenario evaluated soil at depths of 0 to 10 feet bgs within the Upland Areas of IA-H1. Alternative 5 includes excavation of all debris disposal areas across the majority of the Upland Areas. The debris excavation would capture most of the significant concentrations of all chemicals present within the Upland Areas of IA-H1. The human health and ecological risk associated with soil within the 0 to 10 feet bgs range would essentially be eliminated. The residual risk for the future exposure scenario was not reevaluated for human or ecological receptors.

SECTION 7
REFERENCES

Weston Solutions, Inc., 2006. "Revised Final Remedial Investigation, Investigation Area H1, Mare Island, Vallejo, California." May.

Table C1-1a
Medium-Specific Exposure Point Concentration Summary
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material (0 to 2 feet bgs)
Exposure Medium:	Soil
Exposure Point:	On-Site Soil

Chemical of Potential Concern	Distribution[a]	Mean of Normal Data[b]	Mean of Lognormal Data[c]	Median	UCL[d]	Maximum Detected Concentration	Reasonable Maximum Exposure		Central Tendency Exposure	
							Medium EPC Value[e]	Medium EPC Rationale[f]	Medium EPC Value[e]	Medium EPC Rationale[f]
INORGANICS (mg/kg)										
ALUMINUM	Normal	21750	10	18500	33214	36000	33214	Student's-t UCL	33214	Student's-t UCL
ANTIMONY	Non-parametric	0.45	-1.67	0.13	2.11	5.20	2.11	99% Chebyshev (Mean,Sd) UCL	2.11	99% Chebyshev (Mean,Sd) UCL
ARSENIC	Normal	5.32	1.58	5.50	5.97	11.70	5.97	Student's-t UCL	5.97	Student's-t UCL
BARIUM	Normal	149.14	4.91	145.00	167.32	360.00	167.32	Student's-t UCL	167.32	Student's-t UCL
BERYLLIUM	Non-parametric	0.16	-1.93	0.13	0.20	0.60	0.20	Modified-t UCL	0.20	Modified-t UCL
CADMIUM	Non-parametric	0.81	-0.97	0.28	3.02	7.32	3.02	99% Chebyshev (Mean,Sd) UCL	3.02	99% Chebyshev (Mean,Sd) UCL
CHROMIUM	Non-parametric	30.05	3.32	24.70	34.35	76.70	34.35	Modified-t UCL	34.35	Modified-t UCL
COBALT	Normal	11.27	2.39	11.55	12.05	16.40	12.05	Student's-t UCL	12.05	Student's-t UCL
COPPER	Gamma	27.63	3.21	27.20	31.82	73.40	31.82	Approximate Gamma UCL	31.82	Approximate Gamma UCL
LEAD	Gamma	6.86	1.84	6.08	7.75	16.30	7.75	Approximate Gamma UCL	7.75	Approximate Gamma UCL
MANGANESE	Normal	717.5	6.57	710	781.50	790.00	781.50	Student's-t UCL	782	Student's-t UCL
MERCURY	Gamma	0.24	-1.91	0.13	0.32	0.93	0.32	Approximate Gamma UCL	0.324	Approximate Gamma UCL
MOLYBDENUM	Normal	1.19	0.13	1.19	1.30	2.12	1.30	Student's-t UCL	1.302	Student's-t UCL
NICKEL	Normal	43.51	3.71	39.75	47.87	79.00	47.87	Student's-t UCL	47.87	Student's-t UCL
SELENIUM	Non-parametric	0.25	-1.42	0.25	0.28	0.71	0.28	Modified-t UCL	0.2801	Modified-t UCL
SILVER	Non-parametric	0.16	-2.01	0.13	0.22	1.25	0.22	Modified-t UCL	0.2206	Modified-t UCL
THALLIUM	Non-parametric	1.90	0.18	1.49	4.22	19.20	4.22	95% Chebyshev (Mean,Sd) UCL	4.22	95% Chebyshev (Mean,Sd) UCL
VANADIUM	Gamma	35.81	3.54	33.35	38.80	63.00	38.80	Approximate Gamma UCL	38.80	Approximate Gamma UCL
ZINC	Normal	31.44	3.38	30.00	34.64	54.40	34.64	Student's-t UCL	34.64	Student's-t UCL
PESTICIDES (mg/kg)										
Beta-BHC	Non-parametric	0.0008	-7.3123	0.0005	0.0009	0.0021	0.0009	Modified-t UCL	0.0009	Modified-t UCL
SVOCs (mg/kg)										
PHENOL	Non-parametric	0.4308	-1.2570	0.1650	0.8031	1.59	0.803	95% Chebyshev (Mean,Sd) UCL	0.803	95% Chebyshev (Mean,Sd) UCL
TPH (mg/kg)										
TPH AS DIESEL	Non-parametric	3.3347	1.0199	2.5000	4.1475	29.5	4.148	Modified-t UCL	4.148	Modified-t UCL
TPH AS MOTOR OIL	Non-parametric	5.5569	1.3027	2.5000	9.0606	37	9.061	95% Chebyshev (Mean,Sd) UCL	9.061	95% Chebyshev (Mean,Sd) UCL
VOCs (mg/kg)										
METHYLENE CHLORIDE	Non-parametric	0.0027	-5.9315	0.0025	0.0029	0.0068	0.0029	Modified-t UCL	0.0029	Modified-t UCL
XYLENE	Non-parametric	0.0014	-6.6121	0.0013	0.0016	0.0056	0.0016	Modified-t UCL	0.0016	Modified-t UCL

bgs Below Ground Surface.
EPC Exposure Point Concentration.
mg/kg Milligram per kilogram.
NA Not Applicable for small data sets.
PCBs Polychlorinated Biphenyls
SVOC Semivolatile Organic Compound
TPH Total Petroleum Hydrocarbon
UCL Upper confidence limit of the mean.
VOCs Volatile Organic Compounds
a Gamma = Data follow gamma distribution using chi-square approximation.
Normal = Data are normally distributed.
Lognormal = Data are lognormally distributed.
Non-par = Data are non-parametric.
Lilliefors Test was used to determine the distribution for sample sets greater than 50.
Shapiro and Wilk W-Test was used to determine the distribution for sample sets less than 50.
b The value presented is the arithmetic mean calculated using distribution-dependent formulas. One half the sample quantitation limit was used as a proxy concentration for non-detects to calculate the mean.
c The value presented is the mean of log-transformed data calculated using distribution-dependent formulas. One half the sample quantitation limit was used as a proxy concentration for non-detects to calculate the mean.
d The value presented is the UCL calculated using distribution-dependent formulas. One half the sample quantitation limit was used as a proxy concentration for non-detects to calculate the UCL.
e If the UCL value exceeds the maximum detected concentration, the maximum detected concentration is used for the medium EPC value.
f Recommended UCL statistic using United States Environmental Protection Agency ProUCL Version 3.0 software.

Table C1-1b
Medium-Specific Exposure Point Concentration Summary
Mixed Zone Concentrations
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Chemical of Potential Concern	Medium 0-10 ft HQ=1 EPC	Medium 0-10 ft HQ=3 EPC Value	Medium 0-10 ft HQ=5 EPC Value	Medium 0-10 ft HQ=10 EPC Value	Cover Medium 0 2 ft EPC Value	Mixed Zone HQ=1 EPC	Mixed Zone HQ=3 EPC	Mixed Zone HQ=5 EPC	Mixed Zone HQ=10EPC
DIOXINS/FURANS (mg/kg)									
1,2,3,4,6,7,8- HPCDD	8.68E-04	8.68E-04	8.68E-04	8.68E-04		8.68E-04	8.68E-04	8.68E-04	8.68E-04
1,2,3,4,6,7,8- HPCDF	1.33E-04	1.33E-04	1.33E-04	1.33E-04		1.33E-04	1.33E-04	1.33E-04	1.33E-04
1,2,3,4,7,8,9- HPCDF	1.29E-05	1.29E-05	1.29E-05	1.29E-05		1.29E-05	1.29E-05	1.29E-05	1.29E-05
1,2,3,4,7,8- HXCDD	1.20E-05	1.20E-05	1.20E-05	1.20E-05		1.20E-05	1.20E-05	1.20E-05	1.20E-05
1,2,3,6,7,8- HXCDD	3.60E-05	3.60E-05	3.60E-05	3.60E-05		3.60E-05	3.60E-05	3.60E-05	3.60E-05
1,2,3,7,8,9- HXCDD	2.94E-05	2.94E-05	2.94E-05	2.94E-05		2.94E-05	2.94E-05	2.94E-05	2.94E-05
1,2,3,4,7,8- HXCDF	1.71E-05	1.71E-05	1.71E-05	1.71E-05		1.71E-05	1.71E-05	1.71E-05	1.71E-05
1,2,3,6,7,8- HXCDF	9.60E-06	9.60E-06	9.60E-06	9.60E-06		9.60E-06	9.60E-06	9.60E-06	9.60E-06
2,3,4,6,7,8- HXCDF	1.49E-05	1.49E-05	1.49E-05	1.49E-05		1.49E-05	1.49E-05	1.49E-05	1.49E-05
1,2,3,4,6,7,8,9- OCDD	7.48E-03	7.48E-03	7.48E-03	7.48E-03		7.48E-03	7.48E-03	7.48E-03	7.48E-03
1,2,3,4,6,7,8,9- OCDF	1.54E-04	1.54E-04	1.54E-04	1.54E-04		1.54E-04	1.54E-04	1.54E-04	1.54E-04
1,2,3,7,8- PECDD	6.50E-06	6.50E-06	6.50E-06	6.50E-06		6.50E-06	6.50E-06	6.50E-06	6.50E-06
1,2,3,7,8- PECDF	4.30E-07	4.30E-07	4.30E-07	4.30E-07		4.30E-07	4.30E-07	4.30E-07	4.30E-07
2,3,4,7,8- PECDF	5.90E-06	5.90E-06	5.90E-06	5.90E-06		5.90E-06	5.90E-06	5.90E-06	5.90E-06
2,3,7,8- TCDF	4.10E-06	4.10E-06	4.10E-06	4.10E-06		4.10E-06	4.10E-06	4.10E-06	4.10E-06
HERBICIDES (mg/kg)									
2,4- D	0.034	3.40E-02	3.40E-02	3.40E-02	5.00E-02	3.72E-02	3.72E-02	3.72E-02	3.72E-02
INORGANICS (mg/kg)									
ALUMINUM	21,171	2.16E+04	2.13E+04	2.13E+04	3.32E+04	2.36E+04	2.39E+04	2.37E+04	2.36E+04
ANTIMONY	5.2	4.75E+00	4.80E+00	4.90E+00	2.11E+00	4.58E+00	4.22E+00	4.26E+00	4.34E+00
ARSENIC	16.1	1.55E+01	1.55E+01	1.55E+01	5.97E+00	1.41E+01	1.36E+01	1.36E+01	1.36E+01
BARIUM	169	1.62E+02	1.62E+02	1.62E+02	1.67E+02	1.69E+02	1.63E+02	1.63E+02	1.63E+02
BERYLLIUM	0.72	7.40E-01	7.30E-01	7.30E-01	1.99E-01	6.16E-01	6.32E-01	6.24E-01	6.24E-01
CADMIUM	3.4	3.00E+00	3.00E+00	3.00E+00	3.02E+00	3.32E+00	3.00E+00	3.00E+00	3.00E+00
CHROMIUM	137	1.36E+02	1.35E+02	1.36E+02	3.44E+01	1.16E+02	1.16E+02	1.15E+02	1.16E+02
COBALT	13.1	1.55E+01	1.53E+01	1.50E+01	1.21E+01	1.29E+01	1.48E+01	1.47E+01	1.44E+01
COPPER	189	2.40E+02	2.40E+02	2.43E+02	3.18E+01	1.58E+02	1.99E+02	1.98E+02	2.01E+02
HEXAVALENT CHROMIUM	0.09	9.00E-02	9.00E-02	9.00E-02		9.00E-02	9.00E-02	9.00E-02	9.00E-02
LEAD	169	1.03E+02	1.37E+02	1.40E+02	7.75E+00	1.37E+02	8.39E+01	1.11E+02	1.13E+02
MANGANESE	726	7.22E+02	7.20E+02	7.20E+02	7.82E+02	7.37E+02	7.34E+02	7.32E+02	7.32E+02
MERCURY	2.40	2.32E+00	2.30E+00	2.30E+00	3.24E-01	1.98E+00	1.92E+00	1.90E+00	1.90E+00
MOLYBDENUM	7.6	9.02E+01	9.02E+01	9.02E+01	1.30E+00	6.34E+00	7.24E+01	7.24E+01	7.24E+01
NICKEL	115	1.11E+02	1.09E+02	1.09E+02	4.79E+01	1.02E+02	9.87E+01	9.68E+01	9.68E+01
SELENIUM	1	8.50E-01	8.10E-01	8.10E-01	2.80E-01	6.48E-01	7.36E-01	7.04E-01	7.04E-01
SILVER	3.9	3.24E+00	3.80E+00	3.80E+00	2.21E-01	3.16E+00	2.64E+00	3.08E+00	3.08E+00
THALLIUM	0.60	6.10E-01	6.60E-01	6.60E-01	4.22E+00	1.32E+00	1.33E+00	1.37E+00	1.37E+00
TIN	25.0	3.06E+01	3.20E+01	3.20E+01		2.50E+01	3.06E+01	3.20E+01	3.20E+01

Table C1-1b
Medium-Specific Exposure Point Concentration Summary
Mixed Zone Concentrations
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Chemical of Potential Concern	Medium 0-10 ft HQ=1 EPC	Medium 0-10 ft HQ=3 EPC Value	Medium 0-10 ft HQ=5 EPC Value	Medium 0-10 ft HQ=10 EPC Value	Cover Medium 0-2 ft EPC Value	Mixed Zone HQ=1 EPC	Mixed Zone HQ=3 EPC	Mixed Zone HQ=5 EPC	Mixed Zone HQ=10EPC
VANADIUM	106	1.11E+02	1.10E+02	1.10E+02	3.88E+01	9.26E+01	9.69E+01	9.58E+01	9.58E+01
ZINC	296	2.73E+02	2.90E+02	2.92E+02	3.46E+01	2.44E+02	2.25E+02	2.39E+02	2.41E+02
PESTICIDES (mg/kg)									
ALDRIN	0.01	1.00E-02	1.00E-02	1.00E-02	5.00E-04	8.10E-03	8.10E-03	8.10E-03	8.10E-03
ALPHA-CHLORDANE	0.024	2.40E-02	2.40E-02	2.40E-02	5.00E-04	1.93E-02	1.93E-02	1.93E-02	1.93E-02
BETA BHC	0.089	8.90E-02	8.90E-02	8.90E-02	8.92E-04	7.14E-02	7.14E-02	7.14E-02	7.14E-02
4,4- DDD	0.022	2.20E-02	2.20E-02	2.20E-02	5.00E-04	1.77E-02	1.77E-02	1.77E-02	1.77E-02
4,4- DDE	0.019	1.90E-02	1.90E-02	1.90E-02	5.00E-04	1.53E-02	1.53E-02	1.53E-02	1.53E-02
4,4- DDT	0.10	1.00E-01	1.00E-01	1.00E-01	5.00E-04	8.01E-02	8.01E-02	8.01E-02	8.01E-02
DIELDRIN	0.039	3.90E-02	3.90E-02	3.90E-02	5.00E-04	3.13E-02	3.13E-02	3.13E-02	3.13E-02
ENDOSULFAN I	0.003	3.00E-03	3.00E-03	3.00E-03	5.00E-04	2.50E-03	2.50E-03	2.50E-03	2.50E-03
ENDOSULFAN II	0.005	5.00E-03	5.00E-03	5.00E-03	5.00E-04	4.10E-03	4.10E-03	4.10E-03	4.10E-03
ENDOSULFAN SULFATE	0.01	1.00E-02	1.00E-02	1.00E-02	5.00E-04	8.10E-03	8.10E-03	8.10E-03	8.10E-03
ENDRIN ALDEHYDE	0.01	1.00E-02	1.00E-02	1.00E-02	5.00E-04	8.10E-03	8.10E-03	8.10E-03	8.10E-03
ENRIN KETONE	0.012	1.20E-02	1.20E-02	1.20E-02	5.00E-04	9.70E-03	9.70E-03	9.70E-03	9.70E-03
GAMMA-BHC	0.15	1.50E-01	1.50E-01	1.50E-01	5.00E-04	1.20E-01	1.20E-01	1.20E-01	1.20E-01
GAMMA-CHLORDANE	0.023	2.30E-02	2.30E-02	2.30E-02	5.00E-04	1.85E-02	1.85E-02	1.85E-02	1.85E-02
HEPTACHLOR	0.05	5.00E-02	5.00E-02	5.00E-02	5.00E-04	4.01E-02	4.01E-02	4.01E-02	4.01E-02
HEPTACHLOR EPOXIDE	0.016	1.59E-02	1.59E-02	1.59E-02	5.00E-04	1.28E-02	1.28E-02	1.28E-02	1.28E-02
HEXACHLOROBENZENE	0.001	1.00E-03	1.00E-03	1.00E-03	1.65E-01	3.38E-02	3.38E-02	3.38E-02	3.38E-02
METHOXYCHLOR	0.054	5.40E-02	5.40E-02	5.40E-02	2.00E-03	4.36E-02	4.36E-02	4.36E-02	4.36E-02
MIREX	0.001	1.00E-03	1.00E-03	1.00E-03		1.00E-03	1.00E-03	1.00E-03	1.00E-03
TRANS NONACHLOR	0.0008	8.00E-04	8.00E-04	8.00E-04		8.00E-04	8.00E-04	8.00E-04	8.00E-04
PCBs (mg/kg)									
PCBs (TOTAL)	0.97	3.10E-01	3.30E-01	4.00E-01	1.00E-02	7.78E-01	2.50E-01	2.66E-01	3.22E-01
SVOCs (mg/kg)									
*ACENAPHTHENE**	0.10	3.60E-02	3.60E-02	3.60E-02	1.650E-01	1.13E-01	6.18E-02	6.18E-02	6.18E-02
*ACENAPHTHYLENE**	0.20	3.40E-01	3.90E-01	3.90E-01	1.650E-01	1.93E-01	3.05E-01	3.45E-01	3.45E-01
*ANTHRACENE**	0.21	3.40E-01	3.90E-01	3.90E-01	1.650E-01	2.01E-01	3.05E-01	3.45E-01	3.45E-01
*BENZO(A)ANTHRACENE**	0.24	5.30E-01	5.30E-01	5.20E-01	1.650E-01	2.25E-01	4.57E-01	4.57E-01	4.49E-01
*BENZO(A)PYRENE**	0.23	4.70E-01	5.00E-01	4.98E-01	1.650E-01	2.17E-01	4.09E-01	4.33E-01	4.31E-01
*BENZO(B)FLUORANTHENE**	0.28	3.90E-01	4.60E-01	2.80E-01	1.650E-01	2.57E-01	3.45E-01	4.01E-01	2.57E-01
*BENZO(G,H,I)PERYLENE**	0.24	3.60E-01	4.10E-01	2.30E-01	1.650E-01	2.25E-01	3.21E-01	3.61E-01	2.17E-01
*BENZO(K)FLUORANTHENE**	0.21	4.70E-01	4.90E-01	4.80E-01	1.650E-01	2.01E-01	4.09E-01	4.25E-01	4.17E-01
BENZOIC ACID*	1.34	1.34E+00	1.34E+00	1.30E+00	8.0E-01	1.23E+00	1.23E+00	1.23E+00	1.20E+00
BIS(2-ETHYLHEXYL)PHTHALATE	0.39	3.90E-01	3.90E-01	3.90E-01	1.650E-01	3.45E-01	3.45E-01	3.45E-01	3.45E-01
BUTYLBENZYLPHTHALATE*	0.006	6.00E-03	6.00E-03	6.00E-03	1.650E-01	3.78E-02	3.78E-02	3.78E-02	3.78E-02
CARBAZOLE*	0.036	3.60E-02	3.60E-02	3.60E-02	1.650E-01	6.18E-02	6.18E-02	6.18E-02	6.18E-02

Table C1-1b
Medium-Specific Exposure Point Concentration Summary
Mixed Zone Concentrations
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Chemical of Potential Concern	Medium 0-10 ft HQ=1 EPC	Medium 0-10 ft HQ=3 EPC Value	Medium 0-10 ft HQ=5 EPC Value	Medium 0-10 ft HQ=10 EPC Value	Cover Medium 0-2 ft EPC Value	Mixed Zone HQ=1 EPC	Mixed Zone HQ=3 EPC	Mixed Zone HQ=5 EPC	Mixed Zone HQ=10EPC
4- CHLOROANILINE*	0.25	2.50E-01	2.50E-01	2.50E-01	3.30E-01	2.66E-01	2.66E-01	2.66E-01	2.66E-01
*CHRYSENE**	0.46	5.50E-01	5.50E-01	5.50E-01	1.650E-01	4.01E-01	4.73E-01	4.73E-01	4.73E-01
*DIBENZ(A,H)ANTHRACENE**	0.15	2.30E-01	5.40E-01	5.40E-01	1.650E-01	1.53E-01	2.17E-01	4.65E-01	4.65E-01
2,6- DINITROTOLUENE*	0.37	3.70E-01	3.70E-01	3.70E-01	1.650E-01	3.29E-01	3.29E-01	3.29E-01	3.29E-01
DI-N-BUTYLPHTHALATE*	0.19	1.90E-01	1.90E-01	1.90E-01	1.650E-01	1.85E-01	1.85E-01	1.85E-01	1.85E-01
*FLUORANTHENE**	0.52	6.00E-01	6.00E-01	6.00E-01	1.650E-01	4.49E-01	5.13E-01	5.13E-01	5.13E-01
*FLUORENE**	0.26	3.80E-01	4.30E-01	4.30E-01	1.650E-01	2.41E-01	3.37E-01	3.77E-01	3.77E-01
*INDENO(1,2,3-CD)PYRENE**	0.24	3.60E-01	4.10E-01	4.10E-01	1.650E-01	2.25E-01	3.21E-01	3.61E-01	3.61E-01
2- METHYLNAPHTHALENE*	0.50	5.00E-01	5.00E-01	5.00E-01	1.650E-01	4.33E-01	4.33E-01	4.33E-01	4.33E-01
*NAPHTHALENE**	0.22	3.50E-01	4.00E-01	4.00E-01	1.650E-01	2.09E-01	3.13E-01	3.53E-01	3.53E-01
PENTACHLOROPHENOL*	1.30	1.30E+00	1.30E+00	1.30E+00	8.0E-01	1.20E+00	1.20E+00	1.20E+00	1.20E+00
*PHENANTHRENE**	0.36	4.30E-01	4.40E-01	4.40E-01	1.650E-01	3.21E-01	3.77E-01	3.85E-01	3.85E-01
PHENOL	0.40	4.00E-01	4.00E-01	4.00E-01	8.03E-01	4.81E-01	4.81E-01	4.81E-01	4.81E-01
*PYRENE**	0.78	8.40E-01	8.40E-01	8.40E-01	1.650E-01	6.57E-01	7.05E-01	7.05E-01	7.05E-01
TPH (mg/kg)									
TPH AS DIESEL	974	2.37E+02	2.29E+02	2.25E+02	4.15E+00	7.80E+02	1.90E+02	1.84E+02	1.81E+02
*TPH AS GASOLINE**	136	6.40E+01	6.20E+01	6.10E+01	0.025	1.09E+02	5.12E+01	4.96E+01	4.88E+01
TPH AS MOTOR OIL	317	2.88E+02	2.84E+02	2.83E+02	9.06E+00	2.55E+02	2.32E+02	2.29E+02	2.28E+02
TRPH	3,542	3.54E+03	3.54E+03	3.54E+03		3.54E+03	3.54E+03	3.54E+03	3.54E+03
VOCs (mg/kg)									
ACETONE*	0.052	5.20E-02	5.20E-02	5.20E-02	1.10E-02	4.38E-02	4.38E-02	4.38E-02	4.38E-02
BENZENE*	0.031	3.10E-02	3.10E-02	3.10E-02	2.80E-03	2.54E-02	2.54E-02	2.54E-02	2.54E-02
2- BUTANONE*	0.024	2.40E-02	2.40E-02	2.40E-02	5.50E-03	2.03E-02	2.03E-02	2.03E-02	2.03E-02
BROMOMETHANE*	0.004	4.00E-03	4.00E-03	4.00E-03	5.50E-03	4.30E-03	4.30E-03	4.30E-03	4.30E-03
CARBON DISULFIDE*	0.0055	5.50E-03	5.50E-03	5.50E-03	2.80E-03	4.96E-03	4.96E-03	4.96E-03	4.96E-03
CHLOROBENZENE*	0.003	3.00E-03	3.00E-03	3.00E-03	2.80E-03	2.96E-03	2.96E-03	2.96E-03	2.96E-03
CHLOROFORM*	0.008	8.00E-03	8.00E-03	8.00E-03	2.80E-03	6.96E-03	6.96E-03	6.96E-03	6.96E-03
CIS-1,2- DICHLOROETHENE*	0.025	2.50E-02	2.50E-02	2.50E-02	2.80E-03	2.06E-02	2.06E-02	2.06E-02	2.06E-02
ETHYLBENZENE*	0.038	3.80E-02	3.80E-02	3.80E-02	2.80E-03	3.10E-02	3.10E-02	3.10E-02	3.10E-02
METHYLENE CHLORIDE	0.073	7.30E-02	7.30E-02	7.30E-02	2.92E-03	5.90E-02	5.90E-02	5.90E-02	5.90E-02
4- METHYL-2-PENTANONE*	0.008	8.00E-03	8.00E-03	8.00E-03	5.50E-03	7.50E-03	7.50E-03	7.50E-03	7.50E-03
NAPHTHALENE*	0.039	3.90E-02	3.90E-02	3.90E-02	2.80E-03	3.18E-02	3.18E-02	3.18E-02	3.18E-02
TETRACHLOROETHENE*	0.020	2.00E-02	2.00E-02	2.00E-02	2.80E-03	1.66E-02	1.66E-02	1.66E-02	1.66E-02
TOLUENE*	0.03	3.00E-02	3.00E-02	3.00E-02	2.80E-03	2.46E-02	2.46E-02	2.46E-02	2.46E-02
TRICHLOROETHENE*	0.01	1.00E-02	1.00E-02	1.00E-02	2.80E-03	8.56E-03	8.56E-03	8.56E-03	8.56E-03
1,2,4- TRIMETHYLBENZENE*	0.015	1.50E-02	1.50E-02	1.50E-02	2.80E-03	1.26E-02	1.26E-02	1.26E-02	1.26E-02
1,3,5- TRIMETHYLBENZENE*	0.005	4.90E-03	4.90E-03	4.90E-03	2.80E-03	4.48E-03	4.48E-03	4.48E-03	4.48E-03

Table C1-1b
Medium-Specific Exposure Point Concentration Summary
Mixed Zone Concentrations
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Chemical of Potential Concern	Medium 0-10 ft HQ=1 EPC	Medium 0-10 ft HQ=3 EPC Value	Medium 0-10 ft HQ=5 EPC Value	Medium 0-10 ft HQ=10 EPC Value	Cover Medium 0 2 ft EPC Value	Mixed Zone			
						HQ=1 EPC	HQ=3 EPC	HQ=5 EPC	HQ=10EPC
XYLENE (TOTAL)	0.12	1.20E-01	1.20E-01	1.20E-01	1.57E-03	9.63E-02	9.63E-02	9.63E-02	9.63E-02

The UCL for chemicals that are italicized and underlined have been modified for post remediation residual risk.

bgs	Below Ground Surface.
EPC	Exposure Point Concentration.
mg/kg	Milligram per kilogram.
NA	Not Applicable for small data sets.
PCBs	Polychlorinated Biphenyls
SVOC	Semivolatile Organic Compound
TPH	Total Petroleum Hydrocarbon
UCL	Upper confidence limit of the mean.
VOCs	Volatile Organic Compounds

Table C1-1c
Calculation of Noncarcinogenic Hazard Quotients
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	3.63E-02	1.51E-02	mg/kg-day	1.00E+00	mg/kg-day	3.63E-02	1.51E-02
	ANTIMONY	2.1	mg/kg	2.30E-06	9.60E-07	mg/kg-day	4.00E-04	mg/kg-day	5.76E-03	2.40E-03
	ARSENIC	6.0	mg/kg	6.53E-06	2.72E-06	mg/kg-day	3.00E-04	mg/kg-day	2.18E-02	9.07E-03
	BARIUM	167	mg/kg	1.83E-04	7.62E-05	mg/kg-day	7.00E-02	mg/kg-day	2.61E-03	1.09E-03
	BERYLLIUM	0.20	mg/kg	2.17E-07	9.05E-08	mg/kg-day	2.00E-03	mg/kg-day	1.09E-04	4.53E-05
	CADMIUM	3.0	mg/kg	3.30E-06	1.37E-06	mg/kg-day	5.00E-04	mg/kg-day	6.60E-03	2.75E-03
	CHROMIUM	34	mg/kg	3.75E-05	1.56E-05	mg/kg-day	1.50E+00	mg/kg-day	2.50E-05	1.04E-05
	COBALT	12.1	mg/kg	1.32E-05	5.49E-06	mg/kg-day	2.00E-02	mg/kg-day	6.59E-04	2.74E-04
	COPPER	32	mg/kg	3.48E-05	1.45E-05	mg/kg-day	4.00E-02	mg/kg-day	8.69E-04	3.62E-04
	LEAD	8	mg/kg	8.47E-06	3.53E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	782	mg/kg	8.54E-04	3.56E-04	mg/kg-day	1.40E-01	mg/kg-day	6.10E-03	2.54E-03
	MERCURY	0.32	mg/kg	3.54E-07	1.48E-07	mg/kg-day	3.00E-04	mg/kg-day	1.18E-03	4.92E-04
	MOLYBDENUM	1.3	mg/kg	1.42E-06	5.93E-07	mg/kg-day	5.00E-03	mg/kg-day	2.84E-04	1.19E-04
	NICKEL	48	mg/kg	5.23E-05	2.18E-05	mg/kg-day	2.00E-02	mg/kg-day	2.62E-03	1.09E-03
	SELENIUM	0.28	mg/kg	3.06E-07	1.28E-07	mg/kg-day	5.00E-03	mg/kg-day	6.12E-05	2.55E-05
	SILVER	0.22	mg/kg	2.41E-07	1.00E-07	mg/kg-day	5.00E-03	mg/kg-day	4.82E-05	2.01E-05
	THALLIUM	4.22	mg/kg	4.62E-06	1.92E-06	mg/kg-day	6.60E-05	mg/kg-day	6.99E-02	2.91E-02
	VANADIUM	38.8	mg/kg	4.24E-05	1.77E-05	mg/kg-day	7.00E-03	mg/kg-day	6.06E-03	2.52E-03
	ZINC	35	mg/kg	3.79E-05	1.58E-05	mg/kg-day	3.00E-01	mg/kg-day	1.26E-04	5.26E-05
	PESTICIDES									
	BETA-BHC	0.0009	mg/kg	9.75E-10	4.06E-10	mg/kg-day	2.00E-04	mg/kg-day	4.88E-06	2.03E-06
	SVOCs									
	PHENOL	0.8031	mg/kg	8.78E-07	3.66E-07	mg/kg-day	6.00E-01	mg/kg-day	1.46E-06	6.09E-07
	TPH									
	TPH AS DIESEL	4.148	mg/kg	4.53E-06	1.89E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	9.90E-06	4.13E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	3.20E-09	1.33E-09	mg/kg-day	6.00E-02	mg/kg-day	5.33E-08	2.22E-08
	XYLENE (TOTAL)	0.0016	mg/kg	1.72E-09	7.17E-10	mg/kg-day	2.00E-01	mg/kg-day	8.60E-09	3.58E-09

Table C1-1c
Calculation of Noncarcinogenic Hazard Quotients
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	NA	NA	mg/kg-day	1.00E+00	mg/kg-day	NA	NA
	ANTIMONY	2.1	mg/kg	NA	NA	mg/kg-day	6.00E-05	mg/kg-day	NA	NA
	ARSENIC	6.0	mg/kg	8.99E-07	3.75E-07	mg/kg-day	3.00E-04	mg/kg-day	3.00E-03	1.25E-03
	BARIUM	167	mg/kg	NA	NA	mg/kg-day	4.90E-03	mg/kg-day	NA	NA
	BERYLLIUM	0.20	mg/kg	NA	NA	mg/kg-day	1.40E-05	mg/kg-day	NA	NA
	CADMIUM	3.0	mg/kg	1.51E-08	6.31E-09	mg/kg-day	1.25E-05	mg/kg-day	1.21E-03	5.05E-04
	CHROMIUM	34	mg/kg	NA	NA	mg/kg-day	1.95E-02	mg/kg-day	NA	NA
	COBALT	12.1	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	COPPER	32	mg/kg	NA	NA	mg/kg-day	4.00E-02	mg/kg-day	NA	NA
	LEAD	8	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	782	mg/kg	NA	NA	mg/kg-day	5.60E-03	mg/kg-day	NA	NA
	MERCURY	0.32	mg/kg	NA	NA	mg/kg-day	2.10E-05	mg/kg-day	NA	NA
	MOLYBDENUM	1.3	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	NICKEL	48	mg/kg	NA	NA	mg/kg-day	8.00E-04	mg/kg-day	NA	NA
	SELENIUM	0.28	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	SILVER	0.22	mg/kg	NA	NA	mg/kg-day	2.00E-04	mg/kg-day	NA	NA
	THALLIUM	4.22	mg/kg	NA	NA	mg/kg-day	6.60E-05	mg/kg-day	NA	NA
	VANADIUM	38.8	mg/kg	NA	NA	mg/kg-day	1.82E-04	mg/kg-day	NA	NA
	ZINC	35	mg/kg	NA	NA	mg/kg-day	3.00E-01	mg/kg-day	NA	NA
	PESTICIDES									
	BETA-BHC	0.0009	mg/kg	1.79E-10	7.46E-11	mg/kg-day	2.00E-04	mg/kg-day	8.95E-07	3.73E-07
	SVOCs									
	PHENOL	0.8031	mg/kg	5.24E-07	2.18E-07	mg/kg-day	6.00E-01	mg/kg-day	8.73E-07	3.64E-07
	TPH									
	TPH AS DIESEL	4.148	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	NA	NA	mg/kg-day	6.00E-02	mg/kg-day	NA	NA
	XYLENE (TOTAL)	0.0016	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA

Table C1-1c
Calculation of Noncarcinogenic Hazard Quotients
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	1.53E-06	6.36E-07	mg/kg-day	1.40E-03	mg/kg-day	1.09E-03	4.54E-04
	ANTIMONY	2.1	mg/kg	9.69E-11	4.04E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	ARSENIC	6.0	mg/kg	2.75E-10	1.14E-10	mg/kg-day	8.57E-06	mg/kg-day	3.20E-05	1.34E-05
	BARIUM	167	mg/kg	7.69E-09	3.20E-09	mg/kg-day	1.43E-04	mg/kg-day	5.38E-05	2.24E-05
	BERYLLIUM	0.20	mg/kg	9.14E-12	3.81E-12	mg/kg-day	2.00E-06	mg/kg-day	4.57E-06	1.90E-06
	CADMIUM	3.0	mg/kg	1.39E-10	5.78E-11	mg/kg-day	5.71E-06	mg/kg-day	2.43E-05	1.01E-05
	CHROMIUM	34	mg/kg	1.58E-09	6.58E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	COBALT	12.1	mg/kg	5.54E-10	2.31E-10	mg/kg-day	5.70E-06	mg/kg-day	9.72E-05	4.05E-05
	COPPER	32	mg/kg	1.46E-09	6.09E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	LEAD	8	mg/kg	3.56E-10	1.48E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	782	mg/kg	3.59E-08	1.50E-08	mg/kg-day	1.43E-05	mg/kg-day	2.51E-03	1.05E-03
	MERCURY	0.32	mg/kg	1.49E-11	6.21E-12	mg/kg-day	2.57E-05	mg/kg-day	5.80E-07	2.42E-07
	MOLYBDENUM	1.3	mg/kg	5.98E-11	2.49E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	NICKEL	48	mg/kg	2.20E-09	9.16E-10	mg/kg-day	1.43E-05	mg/kg-day	1.54E-04	6.42E-05
	SELENIUM	0.28	mg/kg	1.29E-11	5.36E-12	mg/kg-day	5.71E-03	mg/kg-day	2.25E-09	9.39E-10
	SILVER	0.22	mg/kg	1.01E-11	4.22E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	THALLIUM	4.22	mg/kg	1.94E-10	8.09E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	VANADIUM	38.8	mg/kg	1.78E-09	7.43E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	ZINC	35	mg/kg	1.59E-09	6.63E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	PESTICIDES									
	BETA-BHC	0.0009	mg/kg	4.10E-14	1.71E-14	mg/kg-day	2.00E-04	mg/kg-day	2.05E-10	8.54E-11
	SVOCs									
	PHENOL	0.8031	mg/kg	3.69E-11	1.54E-11	mg/kg-day	5.71E-02	mg/kg-day	6.46E-10	2.69E-10
	TPH									
	TPH AS DIESEL	4.148	mg/kg	1.91E-10	7.94E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	4.16E-10	1.73E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	7.10E-08	2.96E-08	mg/kg-day	8.60E-01	mg/kg-day	8.25E-08	3.44E-08
	XYLENE (TOTAL)	0.0016	mg/kg	1.57E-08	6.52E-09	mg/kg-day	2.86E-02	mg/kg-day	5.48E-07	2.28E-07

Table C1-1c
Calculation of Noncarcinogenic Hazard Quotients
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)

Notes:
CTE = Central Tendency Exposure
EPC = Exposure point concentration
HQ = Hazard Quotient
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RfD = Reference Dose
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-1d
Calculation of Noncarcinogenic Hazard Quotients
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	1.07E-01	1.07E-01	mg/kg-day	1.00E+00	mg/kg-day	1.07E-01	1.07E-01
	ANTIMONY	2.1	mg/kg	6.81E-06	6.81E-06	mg/kg-day	4.00E-04	mg/kg-day	1.70E-02	1.70E-02
	ARSENIC	6.0	mg/kg	1.93E-05	1.93E-05	mg/kg-day	3.00E-04	mg/kg-day	6.43E-02	6.43E-02
	BARIUM	167	mg/kg	5.40E-04	5.40E-04	mg/kg-day	7.00E-02	mg/kg-day	7.72E-03	7.72E-03
	BERYLLIUM	0.20	mg/kg	6.42E-07	6.42E-07	mg/kg-day	2.00E-03	mg/kg-day	3.21E-04	3.21E-04
	CADMIUM	3.0	mg/kg	9.74E-06	9.74E-06	mg/kg-day	5.00E-04	mg/kg-day	1.95E-02	1.95E-02
	CHROMIUM	34	mg/kg	1.11E-04	1.11E-04	mg/kg-day	1.50E+00	mg/kg-day	7.39E-05	7.39E-05
	COBALT	12.1	mg/kg	3.89E-05	3.89E-05	mg/kg-day	2.00E-02	mg/kg-day	1.95E-03	1.95E-03
	COPPER	32	mg/kg	1.03E-04	1.03E-04	mg/kg-day	4.00E-02	mg/kg-day	2.57E-03	2.57E-03
	LEAD	8	mg/kg	2.50E-05	2.50E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	782	mg/kg	2.52E-03	2.52E-03	mg/kg-day	1.40E-01	mg/kg-day	1.80E-02	1.80E-02
	MERCURY	0.32	mg/kg	1.05E-06	1.05E-06	mg/kg-day	3.00E-04	mg/kg-day	3.49E-03	3.49E-03
	MOLYBDENUM	1.3	mg/kg	4.20E-06	4.20E-06	mg/kg-day	5.00E-03	mg/kg-day	8.41E-04	8.41E-04
	NICKEL	48	mg/kg	1.55E-04	1.55E-04	mg/kg-day	2.00E-02	mg/kg-day	7.73E-03	7.73E-03
	SELENIUM	0.28	mg/kg	9.05E-07	9.05E-07	mg/kg-day	5.00E-03	mg/kg-day	1.81E-04	1.81E-04
	SILVER	0.22	mg/kg	7.12E-07	7.12E-07	mg/kg-day	5.00E-03	mg/kg-day	1.42E-04	1.42E-04
	THALLIUM	4.22	mg/kg	1.36E-05	1.36E-05	mg/kg-day	6.60E-05	mg/kg-day	2.07E-01	2.07E-01
	VANADIUM	38.8	mg/kg	1.25E-04	1.25E-04	mg/kg-day	7.00E-03	mg/kg-day	1.79E-02	1.79E-02
	ZINC	35	mg/kg	1.12E-04	1.12E-04	mg/kg-day	3.00E-01	mg/kg-day	3.73E-04	3.73E-04
	PESTICIDES									
	BETA BHC	0.0009	mg/kg	2.88E-09	2.88E-09	mg/kg-day	2.00E-04	mg/kg-day	1.44E-05	1.44E-05
	SVOCs									
	PHENOL	0.8031	mg/kg	2.59E-06	2.59E-06	mg/kg-day	6.00E-01	mg/kg-day	4.32E-06	4.32E-06
	TPH									
	TPH AS DIESEL	4.148	mg/kg	1.34E-05	1.34E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	2.93E-05	2.93E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	9.44E-09	9.44E-09	mg/kg-day	6.00E-02	mg/kg-day	1.57E-07	1.57E-07
	XYLENE (TOTAL)	0.0016	mg/kg	5.08E-09	5.08E-09	mg/kg-day	2.00E-01	mg/kg-day	2.54E-08	2.54E-08

Table C1-1d
Calculation of Noncarcinogenic Hazard Quotients
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	NA	NA	mg/kg-day	1.00E+00	mg/kg-day	NA	NA
	ANTIMONY	2.1	mg/kg	NA	NA	mg/kg-day	6.00E-05	mg/kg-day	NA	NA
	ARSENIC	6.0	mg/kg	1.74E-06	1.74E-06	mg/kg-day	3.00E-04	mg/kg-day	5.79E-03	5.79E-03
	BARIUM	167	mg/kg	NA	NA	mg/kg-day	4.90E-03	mg/kg-day	NA	NA
	BERYLLIUM	0.20	mg/kg	NA	NA	mg/kg-day	1.40E-05	mg/kg-day	NA	NA
	CADMIUM	3.0	mg/kg	2.92E-08	2.92E-08	mg/kg-day	1.25E-05	mg/kg-day	2.34E-03	2.34E-03
	CHROMIUM	34	mg/kg	NA	NA	mg/kg-day	1.95E-02	mg/kg-day	NA	NA
	COBALT	12.1	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	COPPER	32	mg/kg	NA	NA	mg/kg-day	4.00E-02	mg/kg-day	NA	NA
	LEAD	8	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	782	mg/kg	NA	NA	mg/kg-day	5.60E-03	mg/kg-day	NA	NA
	MERCURY	0.32	mg/kg	NA	NA	mg/kg-day	2.10E-05	mg/kg-day	NA	NA
	MOLYBDENUM	1.3	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	NICKEL	48	mg/kg	NA	NA	mg/kg-day	8.00E-04	mg/kg-day	NA	NA
	SELENIUM	0.28	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	SILVER	0.22	mg/kg	NA	NA	mg/kg-day	2.00E-04	mg/kg-day	NA	NA
	THALLIUM	4.22	mg/kg	NA	NA	mg/kg-day	6.60E-05	mg/kg-day	NA	NA
	VANADIUM	38.8	mg/kg	NA	NA	mg/kg-day	1.82E-04	mg/kg-day	NA	NA
	ZINC	35	mg/kg	NA	NA	mg/kg-day	3.00E-01	mg/kg-day	NA	NA
	PESTICIDES									
	BETA BHC	0.0009	mg/kg	3.46E-10	3.46E-10	mg/kg-day	2.00E-04	mg/kg-day	1.73E-06	1.73E-06
	SVOCs									
	PHENOL	0.8031	mg/kg	1.01E-06	1.01E-06	mg/kg-day	6.00E-01	mg/kg-day	1.69E-06	1.69E-06
	TPH									
	TPH AS DIESEL	4.148	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	NA	NA	mg/kg-day	6.00E-02	mg/kg-day	NA	NA
	XYLENE (TOTAL)	0.0016	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA

Table C1-1d
Calculation of Noncarcinogenic Hazard Quotients
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	1.98E-04	1.03E-04	mg/kg-day	1.40E-03	mg/kg-day	1.42E-01	7.36E-02
	ANTIMONY	2.1	mg/kg	1.26E-08	6.54E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	ARSENIC	6.0	mg/kg	3.56E-08	1.85E-08	mg/kg-day	8.57E-06	mg/kg-day	4.16E-03	2.16E-03
	BARIUM	167	mg/kg	9.98E-07	5.19E-07	mg/kg-day	1.43E-04	mg/kg-day	6.98E-03	3.63E-03
	BERYLLIUM	0.20	mg/kg	1.19E-09	6.17E-10	mg/kg-day	2.00E-06	mg/kg-day	5.94E-04	3.09E-04
	CADMIUM	3.0	mg/kg	1.80E-08	9.36E-09	mg/kg-day	5.71E-06	mg/kg-day	3.15E-03	1.64E-03
	CHROMIUM	34	mg/kg	2.05E-07	1.07E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	COBALT	12.1	mg/kg	7.19E-08	3.74E-08	mg/kg-day	5.70E-06	mg/kg-day	1.26E-02	6.56E-03
	COPPER	32	mg/kg	1.90E-07	9.87E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	LEAD	8	mg/kg	4.62E-08	2.40E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	782	mg/kg	4.66E-06	2.42E-06	mg/kg-day	1.43E-05	mg/kg-day	3.26E-01	1.70E-01
	MERCURY	0.32	mg/kg	1.93E-09	1.01E-09	mg/kg-day	2.57E-05	mg/kg-day	7.53E-05	3.91E-05
	MOLYBDENUM	1.3	mg/kg	7.77E-09	4.04E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	NICKEL	48	mg/kg	2.86E-07	1.49E-07	mg/kg-day	1.43E-05	mg/kg-day	2.00E-02	1.04E-02
	SELENIUM	0.28	mg/kg	1.67E-09	8.69E-10	mg/kg-day	5.71E-03	mg/kg-day	2.93E-07	1.52E-07
	SILVER	0.22	mg/kg	1.32E-09	6.84E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	THALLIUM	4.22	mg/kg	2.52E-08	1.31E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	VANADIUM	38.8	mg/kg	2.32E-07	1.20E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	ZINC	35	mg/kg	2.07E-07	1.07E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	PESTICIDES									
	BETA BHC	0.0009	mg/kg	5.32E-12	2.77E-12	mg/kg-day	2.00E-04	mg/kg-day	2.66E-08	1.38E-08
	SVOCs									
	PHENOL	0.8031	mg/kg	4.79E-09	2.49E-09	mg/kg-day	5.71E-02	mg/kg-day	8.39E-08	4.36E-08
	TPH									
	TPH AS DIESEL	4.148	mg/kg	2.47E-08	1.29E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	5.41E-08	2.81E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	2.29E-07	1.19E-07	mg/kg-day	1.14E-01	mg/kg-day	2.00E-06	1.04E-06
	XYLENE (TOTAL)	0.0016	mg/kg	5.05E-08	2.63E-08	mg/kg-day	2.86E-02	mg/kg-day	1.77E-06	9.20E-07

Table C1-1d
Calculation of Noncarcinogenic Hazard Quotients
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)

Notes:
CTE = Central Tendency Exposure
EPC = Exposure point concentration
HQ = Hazard Quotient
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RfD = Reference Dose
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-1e
Calculation of Cancer Risks
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	8.82E-03	3.67E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	2.1	mg/kg	5.60E-07	2.33E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	6.0	mg/kg	1.59E-06	6.61E-07	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	1.50E-05	6.24E-06
	BARIUM	167	mg/kg	4.44E-05	1.85E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.20	mg/kg	5.28E-08	2.20E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.0	mg/kg	8.01E-07	3.34E-07	mg/kg-day	3.80E-01	$(mg/kg\text{-}day)^{-1}$	3.04E-07	1.27E-07
	CHROMIUM	34	mg/kg	9.12E-06	3.80E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	12.1	mg/kg	3.20E-06	1.33E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	32	mg/kg	8.45E-06	3.52E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	8	mg/kg	2.06E-06	8.57E-07	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	1.75E-08	7.28E-09
	MANGANESE	782	mg/kg	2.07E-04	8.64E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	0.32	mg/kg	8.60E-08	3.58E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	1.3	mg/kg	3.45E-07	1.44E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	48	mg/kg	1.27E-05	5.29E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.28	mg/kg	7.44E-08	3.10E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	0.22	mg/kg	5.86E-08	2.44E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	4.22	mg/kg	1.12E-06	4.67E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	38.8	mg/kg	1.03E-05	4.29E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	35	mg/kg	9.19E-06	3.83E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	BETA-BHC	0.0009	mg/kg	2.37E-10	9.87E-11	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	4.26E-10	1.78E-10
	SVOCs									
	PHENOL	0.8031	mg/kg	2.13E-07	8.88E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS GASOLINE	4.148	mg/kg	1.10E-06	4.59E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	2.40E-06	1.00E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	7.76E-10	3.23E-10	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	1.09E-11	4.53E-12
	XYLENE (TOTAL)	0.0016	mg/kg	4.18E-10	1.74E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-1e
Calculation of Cancer Risks
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	2.1	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	6.0	mg/kg	2.18E-07	9.10E-08	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	2.06E-06	8.60E-07
	BARIUM	167	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.20	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.0	mg/kg	3.68E-09	1.53E-09	mg/kg-day	1.52E+01	$(mg/kg\text{-}day)^{-1}$	5.59E-08	2.33E-08
	CHROMIUM	34	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	12.1	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	32	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	8	mg/kg	NA	NA	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MANGANESE	782	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	0.32	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	1.3	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	48	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.28	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	0.22	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	4.22	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	38.8	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	35	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	BETA-BHC	0.0009	mg/kg	4.35E-11	1.81E-11	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	7.83E-11	3.26E-11
	SVOCs									
	PHENOL	0.8031	mg/kg	1.27E-07	5.30E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	4.148	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	NA	NA	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.0016	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-1e
Calculation of Cancer Risks
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	3.71E-07	1.54E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	2.1	mg/kg	2.35E-11	9.80E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	6.0	mg/kg	6.67E-11	2.78E-11	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	8.00E-10	3.33E-10
	BARIUM	167	mg/kg	1.87E-09	7.78E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.20	mg/kg	2.22E-12	9.24E-13	mg/kg-day	8.40E+00	$(mg/kg\text{-}day)^{-1}$	1.86E-11	7.77E-12
	CADMIUM	3.0	mg/kg	3.37E-11	1.40E-11	mg/kg-day	1.50E+01	$(mg/kg\text{-}day)^{-1}$	5.05E-10	2.10E-10
	CHROMIUM	34	mg/kg	3.83E-10	1.60E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	12.1	mg/kg	1.35E-10	5.60E-11	mg/kg-day	9.80E+00	$(mg/kg\text{-}day)^{-1}$	1.32E-09	5.49E-10
	COPPER	32	mg/kg	3.55E-10	1.48E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	8	mg/kg	8.65E-11	3.60E-11	mg/kg-day	4.20E-02	$(mg/kg\text{-}day)^{-1}$	3.63E-12	1.51E-12
	MANGANESE	782	mg/kg	8.72E-09	3.63E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	0.32	mg/kg	3.62E-12	1.51E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	1.3	mg/kg	1.45E-11	6.05E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	48	mg/kg	5.34E-10	2.23E-10	mg/kg-day	9.10E-01	$(mg/kg\text{-}day)^{-1}$	4.86E-10	2.03E-10
	SELENIUM	0.28	mg/kg	3.13E-12	1.30E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	0.22	mg/kg	2.46E-12	1.03E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	4.22	mg/kg	4.71E-11	1.96E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	38.8	mg/kg	4.33E-10	1.80E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	35	mg/kg	3.87E-10	1.61E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	BETA-BHC	0.0009	mg/kg	9.96E-15	4.15E-15	mg/kg-day	1.86E+00	$(mg/kg\text{-}day)^{-1}$	1.85E-14	7.72E-15
	SVOCs									
	PHENOL	0.8031	mg/kg	8.96E-12	3.73E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	4.148	mg/kg	4.63E-11	1.93E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	1.01E-10	4.21E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	1.72E-08	7.18E-09	mg/kg-day	3.50E-03	$(mg/kg\text{-}day)^{-1}$	6.03E-11	2.51E-11
	XYLENE (TOTAL)	0.0016	mg/kg	3.80E-09	1.58E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-1e
Calculation of Cancer Risks
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)

Notes:
CTE = Central Tendency Exposure
EPC = Exposure point concentration
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-1f
Calculation of Cancer Risks
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	1.53E-03	1.53E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	2.1	mg/kg	9.72E-08	9.72E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	6.0	mg/kg	2.76E-07	2.76E-07	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	2.60E-06	2.60E-06
	BARIUM	167	mg/kg	7.72E-06	7.72E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.20	mg/kg	9.17E-09	9.17E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.0	mg/kg	1.39E-07	1.39E-07	mg/kg-day	3.80E-01	$(mg/kg\text{-}day)^{-1}$	5.29E-08	5.29E-08
	CHROMIUM	34	mg/kg	1.58E-06	1.58E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	12.1	mg/kg	5.56E-07	5.56E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	32	mg/kg	1.47E-06	1.47E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	8	mg/kg	3.57E-07	3.57E-07	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	3.04E-09	3.04E-09
	MANGANESE	782	mg/kg	3.60E-05	3.60E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	0.32	mg/kg	1.50E-08	1.50E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	1.3	mg/kg	6.00E-08	6.00E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	48	mg/kg	2.21E-06	2.21E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.28	mg/kg	1.29E-08	1.29E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	0.22	mg/kg	1.02E-08	1.02E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	4.22	mg/kg	1.95E-07	1.95E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	38.8	mg/kg	1.79E-06	1.79E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	35	mg/kg	1.60E-06	1.60E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	BETA BHC	0.0009	mg/kg	4.12E-11	4.12E-11	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	7.41E-11	7.41E-11
	SVOCs									
	PHENOL	0.8031	mg/kg	3.70E-08	3.70E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	4.148	mg/kg	1.91E-07	1.91E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	4.18E-07	4.18E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	1.35E-10	1.35E-10	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	1.89E-12	1.89E-12
	XYLENE (TOTAL)	0.0016	mg/kg	7.26E-11	7.26E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-1f
Calculation of Cancer Risks
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	2.1	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	6.0	mg/kg	2.48E-08	2.48E-08	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	2.34E-07	2.34E-07
	BARIUM	167	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.20	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.0	mg/kg	4.18E-10	4.18E-10	mg/kg-day	1.52E+01	$(mg/kg\text{-}day)^{-1}$	6.35E-09	6.35E-09
	CHROMIUM	34	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	12.1	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	32	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	8	mg/kg	NA	NA	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MANGANESE	782	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	0.32	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	1.3	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	48	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.28	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	0.22	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	4.22	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	38.8	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	35	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	BETA BHC	0.0009	mg/kg	4.94E-12	4.94E-12	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	8.89E-12	8.89E-12
	SVOCs									
	PHENOL	0.8031	mg/kg	1.44E-08	1.44E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	4.148	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	NA	NA	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.0016	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-1f
Calculation of Cancer Risks
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS	**INORGANICS**									
	ALUMINUM	33,214	mg/kg	2.83E-06	1.47E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	2.1	mg/kg	1.80E-10	9.34E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	6.0	mg/kg	5.09E-10	2.65E-10	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	6.11E-09	3.18E-09
	BARIUM	167	mg/kg	1.43E-08	7.42E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.20	mg/kg	1.69E-11	8.81E-12	mg/kg-day	8.40E+00	$(mg/kg\text{-}day)^{-1}$	1.42E-10	7.40E-11
	CADMIUM	3.0	mg/kg	2.57E-10	1.34E-10	mg/kg-day	1.50E+01	$(mg/kg\text{-}day)^{-1}$	3.86E-09	2.01E-09
	CHROMIUM	34	mg/kg	2.93E-09	1.52E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	12.1	mg/kg	1.03E-09	5.34E-10	mg/kg-day	9.80E+00	$(mg/kg\text{-}day)^{-1}$	1.01E-08	5.24E-09
	COPPER	32	mg/kg	2.71E-09	1.41E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	8	mg/kg	6.60E-10	3.43E-10	mg/kg-day	4.20E-02	$(mg/kg\text{-}day)^{-1}$	2.77E-11	1.44E-11
	MANGANESE	782	mg/kg	6.66E-08	3.46E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	0.32	mg/kg	2.76E-11	1.44E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	1.3	mg/kg	1.11E-10	5.77E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	48	mg/kg	4.08E-09	2.12E-09	mg/kg-day	9.10E-01	$(mg/kg\text{-}day)^{-1}$	3.71E-09	1.93E-09
	SELENIUM	0.28	mg/kg	2.39E-11	1.24E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	0.22	mg/kg	1.88E-11	9.78E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	4.22	mg/kg	3.60E-10	1.87E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	38.8	mg/kg	3.31E-09	1.72E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	35	mg/kg	2.95E-09	1.54E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	BETA BHC	0.0009	mg/kg	7.61E-14	3.96E-14	mg/kg-day	1.86E+00	$(mg/kg\text{-}day)^{-1}$	1.41E-13	7.36E-14
	SVOCs									
	PHENOL	0.8031	mg/kg	6.84E-11	3.56E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	4.148	mg/kg	3.54E-10	1.84E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	9.061	mg/kg	7.72E-10	4.02E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	METHYLENE CHLORIDE	0.0029	mg/kg	3.27E-09	1.70E-09	mg/kg-day	3.50E-03	$(mg/kg\text{-}day)^{-1}$	1.14E-11	5.95E-12
	XYLENE (TOTAL)	0.0016	mg/kg	7.22E-10	3.75E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-1f
Calculation of Cancer Risks
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Fill Material
Exposure Medium:	Surface Soil (0 to 2 feet)
Exposure Point:	Surface Soil (0 to 2 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)

Notes:
CTE = Central Tendency Exposure
EPC = Exposure point concentration
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-1g
Summary of Current Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Current
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
Fill (0 to 2 feet)	Soil	On-Site Soil	**INORGANICS (mg/kg)**					**INORGANICS (mg/kg)**					
			ALUMINUM	NA	NA	NA	NA	ALUMINUM	Body Weight	3.63E-02	NA	1.09E-03	3.74E-02
			ANTIMONY	NA	NA	NA	NA	ANTIMONY	Blood; Whole Body	5.76E-03	NA	NA	5.76E-03
			ARSENIC	1.50E-05	2.06E-06	8.00E-10	1.70E-05	ARSENIC	Cardiovascular System; Fetal; Nervous System; Skin	2.18E-02	3.00E-03	3.20E-05	2.48E-02
			BARIUM	NA	NA	NA	NA	BARIUM	Cardiovascular System; Fetal; Kidney; NOEL	2.61E-03	NA	5.38E-05	2.67E-03
			BERYLLIUM	NA	NA	1.86E-11	1.86E-11	BERYLLIUM	GI System; Immune System; Respiratory	1.09E-04	NA	4.57E-06	1.13E-04
			CADMIUM	3.04E-07	5.59E-08	5.05E-10	3.61E-07	CADMIUM	Kidney; Respiratory	6.60E-03	1.21E-03	2.43E-05	7.83E-03
			CHROMIUM	NA	NA	NA	NA	CHROMIUM	NOEL	2.50E-05	NA	NA	2.50E-05
			COBALT	NA	NA	1.32E-09	1.32E-09	COBALT	Cardiovascular System; Respiratory	6.59E-04	NA	9.72E-05	7.56E-04
			COPPER	NA	NA	NA	NA	COPPER	GI System	8.69E-04	NA	NA	8.69E-04
			LEAD	1.75E-08	NA	3.63E-12	1.75E-08	LEAD	NA	NA	NA	NA	NA
			MANGANESE	NA	NA	NA	NA	MANGANESE	Nervous System	6.10E-03	NA	2.51E-03	8.61E-03
			MERCURY	NA	NA	NA	NA	MERCURY	Nervous System	1.18E-03	NA	5.80E-07	1.18E-03
			MOLYBDENUM	NA	NA	NA	NA	MOLYBDENUM	Kidney	2.84E-04	NA	NA	2.84E-04
			NICKEL	NA	NA	4.86E-10	4.86E-10	NICKEL	Body Weight; Respiratory	2.62E-03	NA	1.54E-04	2.77E-03
			SELENIUM	NA	NA	NA	NA	SELENIUM	Cardiovascular System; Liver; Nervous System; Skin	6.12E-05	NA	2.25E-09	6.12E-05
			SILVER	NA	NA	NA	NA	SILVER	Skin	4.82E-05	NA	NA	4.82E-05
			THALLIUM	NA	NA	NA	NA	THALLIUM	Blood; Liver	6.99E-02	NA	NA	6.99E-02
			VANADIUM	NA	NA	NA	NA	VANADIUM	NOEL	6.06E-03	NA	NA	6.06E-03
			ZINC	NA	NA	NA	NA	ZINC	Blood	1.26E-04	NA	NA	1.26E-04
			PESTICIDES (mg/kg)					**PESTICIDES (mg/kg)**					
			BETA-BHC	4.26E-10	7.83E-11	1.85E-14	5.05E-10	ALDRIN	Liver	4.88E-06	8.95E-07	2.05E-10	5.77E-06
			SVOCs (mg/kg)					**SVOCs (mg/kg)**					
			PHENOL	NA	NA	NA	NA	PHENOL	Cardiovascular System; Fetal; Kidney; Liver; Nervous System	1.46E-06	8.73E-07	6.46E-10	2.34E-06
			TPH (mg/kg)					**TPH (mg/kg)**					
			TPH AS DIESEL	NA	NA	NA	NA	TPH AS DIESEL	NA	NA	NA	NA	NA
			TPH AS MOTOR OIL	NA	NA	NA	NA	TPH AS MOTOR OIL	NA	NA	NA	NA	NA

Table C1-1g
Summary of Current Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Current
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			VOCs (mg/kg)					**VOCs (mg/kg)**					
			METHYLENE CHLORIDE	1.09E-11	NA	6.03E-11	NA	ACETONE	Kidney; Liver	5.33E-08	NA	8.25E-08	1.36E-07
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight, Nervous System	8.60E-09	NA	5.48E-07	5.57E-07
						Cancer Risk Across Soil:	1.7E-05					HI Across Soil:	1.7E-01

Notes:
EPC = Exposure point concentration
GI = Gastrointestinal
HQ = Hazard Quotient
HI = Hazard Index
mg/kg = milligrams per kilogram
NA = Not Applicable
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
ug/L = microgram per liter

Table C1-1h
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

				Carcinogenic Risk						Non-Carconogenic Hazard Index			
Medium	**Exposure Medium**	**Exposure Point**	**Chemical**	**Ingestion**	**Dermal**	**Inhalation (Outdoor)**	**Exposure Routes Total**	**Chemical**	**Primary Target Organ**	**Ingestion HQ**	**Dermal HQ**	**Inhalation (Outdoor) HQ**	**Total HI**
Fill	Soil	On-Site	**INORGANICS (mg/kg)**					**INORGANICS (mg/kg)**					
(0 to 2 feet)		Soil	ALUMINUM	NA	NA	NA	NA	ALUMINUM	Body Weight	1.07E-01	NA	1.42E-01	2.49E-01
			ANTIMONY	NA	NA	NA	NA	ANTIMONY	Blood; Whole Body	1.70E-02	NA	NA	1.70E-02
			ARSENIC	2.60E-06	2.34E-07	6.11E-09	2.84E-06	ARSENIC	Cardiovascular System; Fetal; Nervous System; Skin	6.43E-02	5.79E-03	4.16E-03	7.42E-02
			BARIUM	NA	NA	NA	NA	BARIUM	Cardiovascular System; Fetal; Kidney; NOEL	7.72E-03	NA	6.98E-03	1.47E-02
			BERYLLIUM	NA	NA	1.42E-10	1.42E-10	BERYLLIUM	GI System; Immune System; Respiratory	3.21E-04	NA	5.94E-04	9.15E-04
			CADMIUM	5.29E-08	6.35E-09	3.86E-09	6.31E-08	CADMIUM	Kidney; Respiratory	1.95E-02	2.34E-03	3.15E-03	2.50E-02
			CHROMIUM	NA	NA	NA	NA	CHROMIUM	NOEL	7.39E-05	NA	NA	7.39E-05
			COBALT	NA	NA	1.01E-08	1.01E-08	COBALT	Cardiovascular System; Respiratory	1.95E-03	NA	1.26E-02	1.46E-02
			COPPER	NA	NA	NA	NA	COPPER	GI System	2.57E-03	NA	NA	2.57E-03
			LEAD	3.04E-09	NA	2.77E-11	3.07E-09	LEAD	NA	NA	NA	NA	NA
			MANGANESE	NA	NA	NA	NA	MANGANESE	Nervous System	1.80E-02	NA	3.26E-01	3.44E-01
			MERCURY	NA	NA	NA	NA	MERCURY	Nervous System	3.49E-03	NA	7.53E-05	3.56E-03
			MOLYBDENUM	NA	NA	NA	NA	MOLYBDENUM	Kidney	8.41E-04	NA	NA	8.41E-04
			NICKEL	NA	NA	3.71E-09	3.71E-09	NICKEL	Body Weight; Respiratory	7.73E-03	NA	2.00E-02	2.77E-02
			SELENIUM	NA	NA	NA	NA	SELENIUM	Cardiovascular System; Liver; Nervous System; Skin	1.81E-04	NA	2.93E-07	1.81E-04
			SILVER	NA	NA	NA	NA	SILVER	Skin	1.42E-04	NA	NA	1.42E-04
			THALLIUM	NA	NA	NA	NA	THALLIUM	Blood; Liver	2.07E-01	NA	NA	2.07E-01
			VANADIUM	NA	NA	NA	NA	VANADIUM	NOEL	1.79E-02	NA	NA	1.79E-02
			ZINC	NA	NA	NA	NA	ZINC	Blood	3.73E-04	NA	NA	3.73E-04
			PESTICIDES (mg/kg)					**PESTICIDES (mg/kg)**					
			BETA BHC	7.41E-11	8.89E-12	1.41E-13	8.31E-11	BETA BHC	Liver	1.44E-05	1.73E-06	2.66E-08	1.62E-05
			SVOCs (mg/kg)					**SVOCs (mg/kg)**					
			PHENOL	NA	NA	NA	NA	PHENOL	Cardiovascular System; Fetal; Kidney; Liver; Nervous System	4.32E-06	1.69E-06	8.39E-08	6.09E-06
			TPH (mg/kg)					**TPH (mg/kg)**					
			TPH AS DIESEL	NA	NA	NA	NA	TPH AS DIESEL	NA	NA	NA	NA	NA
			TPH AS MOTOR OIL	NA	NA	NA	NA	TPH AS MOTOR OIL	NA	NA	NA	NA	NA

Table C1-1h
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Area Fill Material
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

				Carcinogenic Risk						Non-Carconogenic Hazard Index			
Medium	**Exposure Medium**	**Exposure Point**	**Chemical**	**Ingestion**	**Dermal**	**Inhalation (Outdoor)**	**Exposure Routes Total**	**Chemical**	**Primary Target Organ**	**Ingestion HQ**	**Dermal HQ**	**Inhalation (Outdoor) HQ**	**Total HI**
			VOCs (mg/kg)					**VOCs (mg/kg)**					
			METHYLENE CHLORIDE	1.89E-12	NA	1.14E-11	1.33E-11	METHYLENE CHLORIDE	Cardiovascular System; Liver; Nervous System	1.57E-07	NA	2.00E-06	2.16E-06
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	2.54E-08	NA	1.77E-06	1.79E-06
						Cancer Risk Across Soil:	2.9E-06					HI Across Soil:	1.0E+00

Notes:
EPC = Exposure point concentration
GI = Gastrointestinal
HQ = Hazard Quotient
HI = Hazard Index
mg/kg = milligrams per kilogram
NA = Not Applicable
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
ug/L = microgram per liter

Table C1-1i

Comparisons of EPCs, Cancer Risk Estimates, and Hazard Indices from the Baseline Risk Assessment

Upland Area Fill Material

Investigation Area H1 Feasibility Study

Mare Island, Vallejo, California

Baseline Risk Estimates								Residual Risk from Fill Material					
		Recreational				Construction Worker				Recreational		Construction Worker	
Chemical	EPC (0-2 ft bgs)	Cancer Risk	Hazard Quotient	Chemical	EPC (0-10 ft bgs)	Cancer Risk	Hazard Quotient	Chemical	EPC (Fill Material)	Cancer Risk	Hazard Quotient	Cancer Risk	Hazard Quotient
ALUMINUM	16,867	NA	0.0190	ALUMINUM	21,171	NA	0.1586	ALUMINUM	33214	NA	0.0374	NA	0.2488
ANTIMONY	6.0	NA	0.0163	ANTIMONY	5.2	NA	0.0420	ANTIMONY	2.11	NA	0.0058	NA	0.0170
ARSENIC	15.6	4.45E-05	0.0647	ARSENIC	16.1	7.67E-06	0.2001	ARSENIC	5.97	1.70E-05	0.0248	2.84E-06	0.0742
BARIUM	154	NA	0.0025	BARIUM	169	NA	0.0148	BARIUM	167	NA	0.0027	NA	0.0147
BERYLLIUM	0.63	5.91E-11	0.0004	BERYLLIUM	0.72	5.15E-10	0.0033	BERYLLIUM	0.199	1.86E-11	0.0001	1.42E-10	0.0009
CADMIUM	2.6	3.11E-07	0.0067	CADMIUM	3.39	7.09E-08	0.0281	CADMIUM	3.02	3.61E-07	0.0078	6.31E-08	0.0250
CHROMIUM	109	NA	0.0001	CHROMIUM	137	NA	0.0003	CHROMIUM	34.4	NA	0.0000	NA	0.0001
COBALT	14.2	1.55E-09	0.0009	COBALT	13.1	1.09E-08	0.0158	COBALT	12.1	1.32E-09	0.0008	1.01E-08	0.0146
COPPER	226	NA	0.0062	COPPER	189	NA	0.0153	COPPER	31.8	NA	0.0009	NA	0.0026
HEXAVALENT CHROMIUM	NA	NA	NA	HEXAVALENT CHROMIUM	0.09	3.91E-09	0.0001	HEXAVALENT CHROMIUM	NA	NA	NA	NA	NA
LEAD	228	5.14E-07	NA	LEAD	169	6.69E-08	NA	LEAD	7.75	1.75E-08	NA	3.07E-09	NA
MANGANESE	672	NA	0.0074	MANGANESE	726	NA	0.3196	MANGANESE	782	NA	0.0086	NA	0.3441
MERCURY	2.50	NA	0.0091	MERCURY	2.4	NA	0.0264	MERCURY	0.324	NA	0.0012	NA	0.0036
MOLYBDENUM	10.7	NA	0.0023	MOLYBDENUM	7.6	NA	0.0049	MOLYBDENUM	1.30	NA	0.0003	NA	0.0008
NICKEL	113	1.15E-09	0.0065	NICKEL	115	8.92E-09	0.0666	NICKEL	47.9	4.86E-10	0.0028	3.71E-09	0.0277
SELENIUM	0.75	NA	0.0002	SELENIUM	0.7	NA	0.0005	SELENIUM	0.280	NA	0.0001	NA	0.0002
SILVER	4.90	NA	0.0011	SILVER	3.9	NA	0.0025	SILVER	0.221	NA	0.0000	NA	0.0001
THALLIUM	0.65	NA	0.0108	THALLIUM	0.60	NA	0.0294	THALLIUM	4.22	NA	0.0699	NA	0.2067
TIN	41.1	NA	0.0001	TIN	25	NA	0.0001	TIN	NA	NA	NA	NA	NA
VANADIUM	79.2	NA	0.0124	VANADIUM	106	NA	0.0489	VANADIUM	38.8	NA	0.0061	NA	0.0179
ZINC	348	NA	0.0013	ZINC	296	NA	0.0032	ZINC	34.6	NA	0.0001	NA	0.0004
TOTAL		4.5E-05	0.17			7.8E-06	0.98			1.7E-05	0.17	2.9E-06	1.00

Reduction of Cancer Risk (%):

Recreational User: **62**

Construction Worker: **63**

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	9.49E-10	3.95E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	1.45E-10	6.06E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	1.41E-11	5.87E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	1.31E-11	5.46E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	3.93E-11	1.64E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	3.21E-11	1.34E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.87E-11	7.79E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	1.05E-11	4.37E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	1.63E-11	6.78E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	8.17E-09	3.41E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	1.68E-10	7.01E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	7.10E-12	2.96E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	4.70E-13	1.96E-13	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	6.45E-12	2.69E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	4.48E-12	1.87E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	4.07E-08	1.69E-08	mg/kg-day	1.00E-02	mg/kg-day	4.07E-06	1.69E-06
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	2.58E-02	1.08E-02	mg/kg-day	1.00E+00	mg/kg-day	2.58E-02	1.08E-02
	ANTIMONY	4.34E+00	mg/kg	4.74E-06	1.98E-06	mg/kg-day	4.00E-04	mg/kg-day	1.19E-02	4.94E-03
	ARSENIC	1.36E+01	mg/kg	1.49E-05	6.19E-06	mg/kg-day	3.00E-04	mg/kg-day	4.95E-02	2.06E-02
	BARIUM	1.63E+02	mg/kg	1.78E-04	7.43E-05	mg/kg-day	7.00E-02	mg/kg-day	2.55E-03	1.06E-03
	BERYLLIUM	6.24E-01	mg/kg	6.82E-07	2.84E-07	mg/kg-day	2.00E-03	mg/kg-day	3.41E-04	1.42E-04
	CADMIUM	3.00E+00	mg/kg	3.28E-06	1.37E-06	mg/kg-day	5.00E-04	mg/kg-day	6.56E-03	2.74E-03
	CHROMIUM	1.16E+02	mg/kg	1.26E-04	5.27E-05	mg/kg-day	1.50E+00	mg/kg-day	8.43E-05	3.51E-05
	COBALT	1.44E+01	mg/kg	1.57E-05	6.56E-06	mg/kg-day	2.00E-02	mg/kg-day	7.87E-04	3.28E-04
	COPPER	2.01E+02	mg/kg	2.20E-04	9.15E-05	mg/kg-day	4.00E-02	mg/kg-day	5.49E-03	2.29E-03
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	9.84E-08	4.10E-08	mg/kg-day	3.00E-03	mg/kg-day	3.28E-05	1.37E-05
	LEAD	1.13E+02	mg/kg	1.24E-04	5.16E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	7.32E+02	mg/kg	8.00E-04	3.33E-04	mg/kg-day	1.40E-01	mg/kg-day	5.72E-03	2.38E-03

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	*MERCURY*	1.90E+00	mg/kg	2.08E-06	8.67E-07	mg/kg-day	3.00E-04	mg/kg-day	6.94E-03	2.89E-03
	MOLYBDENUM	7.24E+01	mg/kg	7.91E-05	3.30E-05	mg/kg-day	5.00E-03	mg/kg-day	1.58E-02	6.60E-03
	NICKEL	9.68E+01	mg/kg	1.06E-04	4.41E-05	mg/kg-day	2.00E-02	mg/kg-day	5.29E-03	2.20E-03
	SELENIUM	7.04E-01	mg/kg	7.69E-07	3.21E-07	mg/kg-day	5.00E-03	mg/kg-day	1.54E-04	6.41E-05
	SILVER	3.08E+00	mg/kg	3.37E-06	1.40E-06	mg/kg-day	5.00E-03	mg/kg-day	6.74E-04	2.81E-04
	THALLIUM	1.37E+00	mg/kg	1.50E-06	6.25E-07	mg/kg-day	6.60E-05	mg/kg-day	2.27E-02	9.47E-03
	TIN	3.20E+01	mg/kg	3.50E-05	1.46E-05	mg/kg-day	6.00E-01	mg/kg-day	5.83E-05	2.43E-05
	VANADIUM	9.58E+01	mg/kg	1.05E-04	4.36E-05	mg/kg-day	7.00E-03	mg/kg-day	1.50E-02	6.23E-03
	ZINC	2.41E+02	mg/kg	2.63E-04	1.10E-04	mg/kg-day	3.00E-01	mg/kg-day	8.77E-04	3.65E-04
	PESTICIDES									
	ALDRIN	8.10E-03	mg/kg	8.85E-09	3.69E-09	mg/kg-day	3.00E-05	mg/kg-day	2.95E-04	1.23E-04
	ALPHA-CHLORDANE	1.93E-02	mg/kg	2.11E-08	8.79E-09	mg/kg-day	5.00E-04	mg/kg-day	4.22E-05	1.76E-05
	BETA BHC	7.14E-02	mg/kg	7.80E-08	3.25E-08	mg/kg-day	2.00E-04	mg/kg-day	3.90E-04	1.63E-04
	4,4- DDD	1.77E-02	mg/kg	1.93E-08	8.06E-09	mg/kg-day	5.00E-04	mg/kg-day	3.87E-05	1.61E-05
	4,4- DDE	1.53E-02	mg/kg	1.67E-08	6.97E-09	mg/kg-day	5.00E-04	mg/kg-day	3.34E-05	1.39E-05
	4,4- DDT	8.01E-02	mg/kg	8.75E-08	3.65E-08	mg/kg-day	5.00E-04	mg/kg-day	1.75E-04	7.29E-05
	DIELDRIN	3.13E-02	mg/kg	3.42E-08	1.43E-08	mg/kg-day	5.00E-05	mg/kg-day	6.84E-04	2.85E-04
	ENDOSULFAN I	2.50E-03	mg/kg	2.73E-09	1.14E-09	mg/kg-day	6.00E-03	mg/kg-day	4.55E-07	1.90E-07
	ENDOSULFAN II	4.10E-03	mg/kg	4.48E-09	1.87E-09	mg/kg-day	6.00E-03	mg/kg-day	7.47E-07	3.11E-07
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	8.85E-09	3.69E-09	mg/kg-day	6.00E-03	mg/kg-day	1.48E-06	6.15E-07
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	8.85E-09	3.69E-09	mg/kg-day	3.00E-04	mg/kg-day	2.95E-05	1.23E-05
	ENRIN KETONE	9.70E-03	mg/kg	1.06E-08	4.42E-09	mg/kg-day	3.00E-04	mg/kg-day	3.53E-05	1.47E-05
	GAMMA-BHC	1.20E-01	mg/kg	1.31E-07	5.47E-08	mg/kg-day	3.00E-04	mg/kg-day	4.38E-04	1.82E-04
	GAMMA-CHLORDANE	1.85E-02	mg/kg	2.02E-08	8.42E-09	mg/kg-day	5.00E-04	mg/kg-day	4.04E-05	1.68E-05
	HEPTACHLOR	4.01E-02	mg/kg	4.38E-08	1.83E-08	mg/kg-day	5.00E-04	mg/kg-day	8.76E-05	3.65E-05
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	1.40E-08	5.84E-09	mg/kg-day	1.30E-05	mg/kg-day	1.08E-03	4.49E-04
	HEXACHLOROBENZENE	3.38E-02	mg/kg	3.69E-08	1.54E-08	mg/kg-day	8.00E-04	mg/kg-day	4.62E-05	1.92E-05
	METHOXYCHLOR	4.36E-02	mg/kg	4.76E-08	1.99E-08	mg/kg-day	5.00E-03	mg/kg-day	9.53E-06	3.97E-06
	MIREX	1.00E-03	mg/kg	1.09E-09	4.55E-10	mg/kg-day	2.00E-04	mg/kg-day	5.46E-06	2.28E-06
	TRANS NONACHLOR	8.00E-04	mg/kg	8.74E-10	3.64E-10	mg/kg-day	5.00E-04	mg/kg-day	1.75E-06	7.29E-07

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**PCBs**									
	PCBs (TOTAL)	3.22E-01	mg/kg	3.52E-07	1.47E-07	mg/kg-day	2.00E-05	mg/kg-day	1.76E-02	7.33E-03
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	6.75E-08	2.81E-08	mg/kg-day	6.00E-02	mg/kg-day	1.13E-06	4.69E-07
	ACENAPHTHYLENE	3.45E-01	mg/kg	3.77E-07	1.57E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	3.77E-07	1.57E-07	mg/kg-day	3.00E-01	mg/kg-day	1.26E-06	5.24E-07
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	4.91E-07	2.04E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	4.31E-01	mg/kg	4.71E-07	1.96E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	2.81E-07	1.17E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	2.17E-01	mg/kg	2.37E-07	9.88E-08	mg/kg-day	4.00E-02	mg/kg-day	5.93E-06	2.47E-06
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	4.56E-07	1.90E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.20E+00	mg/kg	1.31E-06	5.46E-07	mg/kg-day	4.00E+00	mg/kg-day	3.28E-07	1.37E-07
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	3.77E-07	1.57E-07	mg/kg-day	2.00E-02	mg/kg-day	1.89E-05	7.85E-06
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	4.13E-08	1.72E-08	mg/kg-day	2.00E-01	mg/kg-day	2.07E-07	8.61E-08
	CARBAZOLE	6.18E-02	mg/kg	6.75E-08	2.81E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	2.66E-01	mg/kg	2.91E-07	1.21E-07	mg/kg-day	4.00E-03	mg/kg-day	7.27E-05	3.03E-05
	CHRYSENE	4.73E-01	mg/kg	5.17E-07	2.15E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	5.08E-07	2.12E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	3.60E-07	1.50E-07	mg/kg-day	1.00E-03	mg/kg-day	3.60E-04	1.50E-04
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	2.02E-07	8.42E-08	mg/kg-day	1.00E-01	mg/kg-day	2.02E-06	8.42E-07
	FLUORANTHENE	5.13E-01	mg/kg	5.61E-07	2.34E-07	mg/kg-day	4.00E-02	mg/kg-day	1.40E-05	5.84E-06
	FLUORENE	3.77E-01	mg/kg	4.12E-07	1.72E-07	mg/kg-day	4.00E-02	mg/kg-day	1.03E-05	4.29E-06
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	3.95E-07	1.64E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	4.73E-07	1.97E-07	mg/kg-day	4.00E-03	mg/kg-day	1.18E-04	4.93E-05
	NAPHTHALENE	3.53E-01	mg/kg	3.86E-07	1.61E-07	mg/kg-day	2.00E-02	mg/kg-day	1.93E-05	8.04E-06
	PENTACHLOROPHENOL	1.20E+00	mg/kg	1.31E-06	5.46E-07	mg/kg-day	3.00E-02	mg/kg-day	4.37E-05	1.82E-05
	PHENANTHRENE	3.85E-01	mg/kg	4.21E-07	1.75E-07	mg/kg-day	3.00E-01	mg/kg-day	1.40E-06	5.84E-07
	PHENOL	4.81E-01	mg/kg	5.25E-07	2.19E-07	mg/kg-day	6.00E-01	mg/kg-day	8.75E-07	3.65E-07
	PYRENE	7.05E-01	mg/kg	7.70E-07	3.21E-07	mg/kg-day	3.00E-02	mg/kg-day	2.57E-05	1.07E-05

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**TPH**									
	TPH AS DIESEL	1.81E+02	mg/kg	1.98E-04	8.24E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	5.33E-05	2.22E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	2.49E-04	1.04E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3.54E+03	mg/kg	3.87E-03	1.61E-03	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	4.79E-08	1.99E-08	mg/kg-day	9.00E-01	mg/kg-day	5.32E-08	2.22E-08
	BENZENE	2.54E-02	mg/kg	2.78E-08	1.16E-08	mg/kg-day	4.00E-03	mg/kg-day	6.94E-06	2.89E-06
	2- BUTANONE	2.03E-02	mg/kg	2.22E-08	9.24E-09	mg/kg-day	6.00E-01	mg/kg-day	3.70E-08	1.54E-08
	BROMOMETHANE	4.30E-03	mg/kg	4.70E-09	1.96E-09	mg/kg-day	1.40E-03	mg/kg-day	3.36E-06	1.40E-06
	CARBON DISULFIDE	4.96E-03	mg/kg	5.42E-09	2.26E-09	mg/kg-day	1.00E-01	mg/kg-day	5.42E-08	2.26E-08
	CHLOROBENZENE	2.96E-03	mg/kg	3.23E-09	1.35E-09	mg/kg-day	2.00E-02	mg/kg-day	1.62E-07	6.74E-08
	CHLOROFORM	6.96E-03	mg/kg	7.61E-09	3.17E-09	mg/kg-day	1.00E-02	mg/kg-day	7.61E-07	3.17E-07
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	2.25E-08	9.36E-09	mg/kg-day	1.00E-02	mg/kg-day	2.25E-06	9.36E-07
	ETHYLBENZENE	3.10E-02	mg/kg	3.38E-08	1.41E-08	mg/kg-day	1.00E-01	mg/kg-day	3.38E-07	1.41E-07
	METHYLENE CHLORIDE	5.90E-02	mg/kg	6.45E-08	2.69E-08	mg/kg-day	6.00E-02	mg/kg-day	1.07E-06	4.48E-07
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	8.20E-09	3.42E-09	mg/kg-day	8.00E-02	mg/kg-day	1.02E-07	4.27E-08
	NAPHTHALENE	3.18E-02	mg/kg	3.47E-08	1.45E-08	mg/kg-day	2.00E-02	mg/kg-day	1.74E-06	7.23E-07
	TETRACHLOROETHENE	1.66E-02	mg/kg	1.81E-08	7.54E-09	mg/kg-day	1.00E-02	mg/kg-day	1.81E-06	7.54E-07
	TOLUENE	2.46E-02	mg/kg	2.68E-08	1.12E-08	mg/kg-day	2.00E-01	mg/kg-day	1.34E-07	5.59E-08
	TRICHLOROETHENE	8.56E-03	mg/kg	9.35E-09	3.90E-09	mg/kg-day	3.00E-04	mg/kg-day	3.12E-05	1.30E-05
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	1.37E-08	5.72E-09	mg/kg-day	5.00E-02	mg/kg-day	2.75E-07	1.14E-07
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	4.90E-09	2.04E-09	mg/kg-day	5.00E-02	mg/kg-day	9.79E-08	4.08E-08
	XYLENE (TOTAL)	9.63E-02	mg/kg	1.05E-07	4.39E-08	mg/kg-day	2.00E-01	mg/kg-day	5.26E-07	2.19E-07
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	9.33E-09	3.89E-09	mg/kg-day	1.00E-02	mg/kg-day	9.33E-07	3.89E-07
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	NA	NA	mg/kg-day	1.00E+00	mg/kg-day	NA	NA
	ANTIMONY	4.34E+00	mg/kg	NA	NA	mg/kg-day	6.00E-05	mg/kg-day	NA	NA
	ARSENIC	1.36E+01	mg/kg	2.05E-06	8.52E-07	mg/kg-day	3.00E-04	mg/kg-day	6.82E-03	2.84E-03
	BARIUM	1.63E+02	mg/kg	NA	NA	mg/kg-day	4.90E-03	mg/kg-day	NA	NA
	BERYLLIUM	6.24E-01	mg/kg	NA	NA	mg/kg-day	1.40E-05	mg/kg-day	NA	NA
	CADMIUM	3.00E+00	mg/kg	1.51E-08	6.28E-09	mg/kg-day	1.25E-05	mg/kg-day	1.21E-03	5.02E-04
	CHROMIUM	1.16E+02	mg/kg	NA	NA	mg/kg-day	1.95E-02	mg/kg-day	NA	NA
	COBALT	1.44E+01	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	COPPER	2.01E+02	mg/kg	NA	NA	mg/kg-day	4.00E-02	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	NA	NA	mg/kg-day	7.50E-05	mg/kg-day	NA	NA
	LEAD	1.13E+02	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	7.32E+02	mg/kg	NA	NA	mg/kg-day	5.60E-03	mg/kg-day	NA	NA
	MERCURY	1.90E+00	mg/kg	NA	NA	mg/kg-day	2.10E-05	mg/kg-day	NA	NA
	MOLYBDENUM	7.24E+01	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	NICKEL	9.68E+01	mg/kg	NA	NA	mg/kg-day	8.00E-04	mg/kg-day	NA	NA
	SELENIUM	7.04E-01	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	SILVER	3.08E+00	mg/kg	NA	NA	mg/kg-day	2.00E-04	mg/kg-day	NA	NA
	THALLIUM	1.37E+00	mg/kg	NA	NA	mg/kg-day	6.60E-05	mg/kg-day	NA	NA

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*TIN*	3.20E+01	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	VANADIUM	9.58E+01	mg/kg	NA	NA	mg/kg-day	1.82E-04	mg/kg-day	NA	NA
	ZINC	2.41E+02	mg/kg	NA	NA	mg/kg-day	3.00E-01	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	8.10E-03	mg/kg	4.06E-09	1.69E-09	mg/kg-day	3.00E-05	mg/kg-day	1.35E-04	5.64E-05
	ALPHA-CHLORDANE	1.93E-02	mg/kg	3.87E-09	1.61E-09	mg/kg-day	5.00E-04	mg/kg-day	7.75E-06	3.23E-06
	BETA BHC	7.14E-02	mg/kg	1.43E-08	5.97E-09	mg/kg-day	2.00E-04	mg/kg-day	7.16E-05	2.98E-05
	4,4- DDD	1.77E-02	mg/kg	2.66E-09	1.11E-09	mg/kg-day	5.00E-04	mg/kg-day	5.33E-06	2.22E-06
	4,4- DDE	1.53E-02	mg/kg	2.30E-09	9.59E-10	mg/kg-day	5.00E-04	mg/kg-day	4.60E-06	1.92E-06
	4,4- DDT	8.01E-02	mg/kg	1.21E-08	5.02E-09	mg/kg-day	5.00E-04	mg/kg-day	2.41E-05	1.00E-05
	DIELDRIN	3.13E-02	mg/kg	1.57E-08	6.54E-09	mg/kg-day	5.00E-05	mg/kg-day	3.14E-04	1.31E-04
	ENDOSULFAN I	2.50E-03	mg/kg	1.25E-09	5.23E-10	mg/kg-day	6.00E-03	mg/kg-day	2.09E-07	8.71E-08
	ENDOSULFAN II	4.10E-03	mg/kg	2.06E-09	8.57E-10	mg/kg-day	6.00E-03	mg/kg-day	3.43E-07	1.43E-07
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	4.06E-09	1.69E-09	mg/kg-day	6.00E-03	mg/kg-day	6.77E-07	2.82E-07
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	4.06E-09	1.69E-09	mg/kg-day	3.00E-04	mg/kg-day	1.35E-05	5.64E-06
	ENRIN KETONE	9.70E-03	mg/kg	4.87E-09	2.03E-09	mg/kg-day	3.00E-04	mg/kg-day	1.62E-05	6.76E-06
	GAMMA-BHC	1.20E-01	mg/kg	2.41E-08	1.00E-08	mg/kg-day	3.00E-04	mg/kg-day	8.03E-05	3.35E-05
	GAMMA-CHLORDANE	1.85E-02	mg/kg	3.71E-09	1.55E-09	mg/kg-day	5.00E-04	mg/kg-day	7.42E-06	3.09E-06
	HEPTACHLOR	4.01E-02	mg/kg	2.01E-08	8.38E-09	mg/kg-day	5.00E-04	mg/kg-day	4.02E-05	1.68E-05
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	6.44E-09	2.68E-09	mg/kg-day	1.30E-05	mg/kg-day	4.95E-04	2.06E-04
	HEXACHLOROBENZENE	3.38E-02	mg/kg	1.70E-08	7.06E-09	mg/kg-day	8.00E-04	mg/kg-day	2.12E-05	8.83E-06
	METHOXYCHLOR	4.36E-02	mg/kg	8.75E-09	3.65E-09	mg/kg-day	5.00E-03	mg/kg-day	1.75E-06	7.29E-07
	MIREX	1.00E-03	mg/kg	5.02E-10	2.09E-10	mg/kg-day	2.00E-04	mg/kg-day	2.51E-06	1.05E-06
	TRANS NONACHLOR	8.00E-04	mg/kg	1.61E-10	6.69E-11	mg/kg-day	5.00E-04	mg/kg-day	3.21E-07	1.34E-07
	PCBs									
	PCBs (TOTAL)	3.22E-01	mg/kg	2.26E-07	9.42E-08	mg/kg-day	2.00E-05	mg/kg-day	1.13E-02	4.71E-03
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	4.03E-08	1.68E-08	mg/kg-day	6.00E-02	mg/kg-day	6.72E-07	2.80E-07
	ACENAPHTHYLENE	3.45E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	2.25E-07	9.37E-08	mg/kg-day	3.00E-01	mg/kg-day	7.50E-07	3.12E-07
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*BENZO(A)PYRENE*	4.31E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	2.17E-01	mg/kg	1.42E-07	5.90E-08	mg/kg-day	4.00E-02	mg/kg-day	3.54E-06	1.47E-06
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.20E+00	mg/kg	6.02E-07	2.51E-07	mg/kg-day	4.00E+00	mg/kg-day	1.50E-07	6.27E-08
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	1.73E-07	7.21E-08	mg/kg-day	2.00E-02	mg/kg-day	8.65E-06	3.61E-06
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	1.90E-08	7.90E-09	mg/kg-day	2.00E-01	mg/kg-day	9.48E-08	3.95E-08
	CARBAZOLE	6.18E-02	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	2.66E-01	mg/kg	1.33E-07	5.56E-08	mg/kg-day	4.00E-03	mg/kg-day	3.34E-05	1.39E-05
	CHRYSENE	4.73E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	1.65E-07	6.88E-08	mg/kg-day	1.00E-03	mg/kg-day	1.65E-04	6.88E-05
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	9.28E-08	3.87E-08	mg/kg-day	1.00E-01	mg/kg-day	9.28E-07	3.87E-07
	FLUORANTHENE	5.13E-01	mg/kg	3.35E-07	1.39E-07	mg/kg-day	4.00E-02	mg/kg-day	8.36E-06	3.48E-06
	FLUORENE	3.77E-01	mg/kg	2.46E-07	1.02E-07	mg/kg-day	4.00E-02	mg/kg-day	6.15E-06	2.56E-06
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	2.82E-07	1.18E-07	mg/kg-day	4.00E-03	mg/kg-day	7.06E-05	2.94E-05
	NAPHTHALENE	3.53E-01	mg/kg	2.30E-07	9.59E-08	mg/kg-day	2.00E-02	mg/kg-day	1.15E-05	4.80E-06
	PENTACHLOROPHENOL	1.20E+00	mg/kg	6.02E-07	2.51E-07	mg/kg-day	3.00E-02	mg/kg-day	2.01E-05	8.36E-06
	PHENANTHRENE	3.85E-01	mg/kg	2.51E-07	1.05E-07	mg/kg-day	3.00E-01	mg/kg-day	8.37E-07	3.49E-07
	PHENOL	4.81E-01	mg/kg	3.13E-07	1.31E-07	mg/kg-day	6.00E-01	mg/kg-day	5.22E-07	2.18E-07
	PYRENE	7.05E-01	mg/kg	4.60E-07	1.92E-07	mg/kg-day	3.00E-02	mg/kg-day	1.53E-05	6.39E-06
	TPH									
	TPH AS DIESEL	1.81E+02	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3.54E+03	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	NA	NA	mg/kg-day	9.00E-01	mg/kg-day	NA	NA
	BENZENE	2.54E-02	mg/kg	NA	NA	mg/kg-day	4.00E-03	mg/kg-day	NA	NA

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	2- BUTANONE	2.03E-02	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	BROMOMETHANE	4.30E-03	mg/kg	NA	NA	mg/kg-day	1.40E-03	mg/kg-day	NA	NA
	CARBON DISULFIDE	4.96E-03	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	CHLOROBENZENE	2.96E-03	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	CHLOROFORM	6.96E-03	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	ETHYLBENZENE	3.10E-02	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	METHYLENE CHLORIDE	5.90E-02	mg/kg	NA	NA	mg/kg-day	6.00E-02	mg/kg-day	NA	NA
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	NA	NA	mg/kg-day	8.00E-02	mg/kg-day	NA	NA
	NAPHTHALENE	3.18E-02	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	TETRACHLOROETHENE	1.66E-02	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	TOLUENE	2.46E-02	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
	TRICHLOROETHENE	8.56E-03	mg/kg	NA	NA	mg/kg-day	3.00E-04	mg/kg-day	NA	NA
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	XYLENE (TOTAL)	9.63E-02	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	3.99E-14	1.66E-14	mg/kg-day	1.14E-08	mg/kg-day	3.49E-06	1.46E-06
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	6.11E-15	2.55E-15	mg/kg-day	1.14E-08	mg/kg-day	5.35E-07	2.23E-07
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	5.93E-16	2.47E-16	mg/kg-day	1.14E-08	mg/kg-day	5.19E-08	2.16E-08
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	5.51E-16	2.30E-16	mg/kg-day	1.14E-08	mg/kg-day	4.83E-08	2.01E-08
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	1.65E-15	6.89E-16	mg/kg-day	1.14E-08	mg/kg-day	1.45E-07	6.04E-08
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	1.35E-15	5.63E-16	mg/kg-day	1.14E-08	mg/kg-day	1.18E-07	4.93E-08
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	7.86E-16	3.27E-16	mg/kg-day	1.14E-08	mg/kg-day	6.88E-08	2.87E-08
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	4.41E-16	1.84E-16	mg/kg-day	1.14E-08	mg/kg-day	3.86E-08	1.61E-08
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	6.85E-16	2.85E-16	mg/kg-day	1.14E-08	mg/kg-day	6.00E-08	2.50E-08
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	3.44E-13	1.43E-13	mg/kg-day	1.14E-08	mg/kg-day	3.01E-05	1.25E-05
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	7.08E-15	2.95E-15	mg/kg-day	1.14E-08	mg/kg-day	6.20E-07	2.58E-07
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	2.99E-16	1.24E-16	mg/kg-day	1.14E-08	mg/kg-day	2.62E-08	1.09E-08
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.98E-17	8.23E-18	mg/kg-day	1.14E-08	mg/kg-day	1.73E-09	7.21E-10
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	2.71E-16	1.13E-16	mg/kg-day	1.14E-08	mg/kg-day	2.37E-08	9.89E-09

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	2,3,7,8- TCDF	4.10E-06	mg/kg	1.88E-16	7.85E-17	mg/kg-day	1.14E-08	mg/kg-day	1.65E-08	6.87E-09
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	1.71E-12	7.12E-13	mg/kg-day	NA	mg/kg-day	NA	NA
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	1.09E-06	4.53E-07	mg/kg-day	1.40E-03	mg/kg-day	7.76E-04	3.23E-04
	ANTIMONY	4.34E+00	mg/kg	1.99E-10	8.31E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	ARSENIC	1.36E+01	mg/kg	6.25E-10	2.60E-10	mg/kg-day	8.57E-06	mg/kg-day	7.29E-05	3.04E-05
	BARIUM	1.63E+02	mg/kg	7.50E-09	3.13E-09	mg/kg-day	1.43E-04	mg/kg-day	5.25E-05	2.19E-05
	BERYLLIUM	6.24E-01	mg/kg	2.87E-11	1.19E-11	mg/kg-day	2.00E-06	mg/kg-day	1.43E-05	5.98E-06
	CADMIUM	3.00E+00	mg/kg	1.38E-10	5.75E-11	mg/kg-day	5.71E-06	mg/kg-day	2.42E-05	1.01E-05
	CHROMIUM	1.16E+02	mg/kg	5.32E-09	2.22E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	COBALT	1.44E+01	mg/kg	6.62E-10	2.76E-10	mg/kg-day	5.70E-06	mg/kg-day	1.16E-04	4.84E-05
	COPPER	2.01E+02	mg/kg	9.24E-09	3.85E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	4.14E-12	1.72E-12	mg/kg-day	2.86E-05	mg/kg-day	1.45E-07	6.02E-08
	LEAD	1.13E+02	mg/kg	5.20E-09	2.17E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	7.32E+02	mg/kg	3.36E-08	1.40E-08	mg/kg-day	1.43E-05	mg/kg-day	2.35E-03	9.80E-04
	MERCURY	1.90E+00	mg/kg	8.75E-11	3.65E-11	mg/kg-day	2.57E-05	mg/kg-day	3.41E-06	1.42E-06
	MOLYBDENUM	7.24E+01	mg/kg	3.33E-09	1.39E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	NICKEL	9.68E+01	mg/kg	4.45E-09	1.85E-09	mg/kg-day	1.43E-05	mg/kg-day	3.12E-04	1.30E-04
	SELENIUM	7.04E-01	mg/kg	3.23E-11	1.35E-11	mg/kg-day	5.71E-03	mg/kg-day	5.67E-09	2.36E-09
	SILVER	3.08E+00	mg/kg	1.42E-10	5.90E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	THALLIUM	1.37E+00	mg/kg	6.31E-11	2.63E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	TIN	3.20E+01	mg/kg	1.47E-09	6.13E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	VANADIUM	9.58E+01	mg/kg	4.40E-09	1.83E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	ZINC	2.41E+02	mg/kg	1.11E-08	4.61E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	8.10E-03	mg/kg	3.72E-13	1.55E-13	mg/kg-day	3.00E-05	mg/kg-day	1.24E-08	5.17E-09
	ALPHA-CHLORDANE	1.93E-02	mg/kg	8.87E-13	3.70E-13	mg/kg-day	2.00E-04	mg/kg-day	4.43E-09	1.85E-09
	BETA BHC	7.14E-02	mg/kg	3.28E-12	1.37E-12	mg/kg-day	2.00E-04	mg/kg-day	1.64E-08	6.83E-09
	4,4- DDD	1.77E-02	mg/kg	8.13E-13	3.39E-13	mg/kg-day	5.00E-04	mg/kg-day	1.63E-09	6.78E-10
	4,4- DDE	1.53E-02	mg/kg	7.03E-13	2.93E-13	mg/kg-day	5.00E-04	mg/kg-day	1.41E-09	5.86E-10

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	4,4- DDT	8.01E-02	mg/kg	3.68E-12	1.53E-12	mg/kg-day	5.00E-04	mg/kg-day	7.36E-09	3.07E-09
	DIELDRIN	3.13E-02	mg/kg	1.44E-12	5.99E-13	mg/kg-day	5.00E-05	mg/kg-day	2.88E-08	1.20E-08
	ENDOSULFAN I	2.50E-03	mg/kg	1.15E-13	4.79E-14	mg/kg-day	6.00E-03	mg/kg-day	1.91E-11	7.98E-12
	ENDOSULFAN II	4.10E-03	mg/kg	1.88E-13	7.85E-14	mg/kg-day	6.00E-03	mg/kg-day	3.14E-11	1.31E-11
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	3.72E-13	1.55E-13	mg/kg-day	6.00E-03	mg/kg-day	6.20E-11	2.58E-11
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	3.72E-13	1.55E-13	mg/kg-day	3.00E-04	mg/kg-day	1.24E-09	5.17E-10
	ENRIN KETONE	9.70E-03	mg/kg	4.46E-13	1.86E-13	mg/kg-day	3.00E-04	mg/kg-day	1.49E-09	6.19E-10
	GAMMA-BHC	1.20E-01	mg/kg	5.52E-12	2.30E-12	mg/kg-day	3.00E-04	mg/kg-day	1.84E-08	7.66E-09
	GAMMA-CHLORDANE	1.85E-02	mg/kg	8.50E-13	3.54E-13	mg/kg-day	2.00E-04	mg/kg-day	4.25E-09	1.77E-09
	HEPTACHLOR	4.01E-02	mg/kg	1.84E-12	7.68E-13	mg/kg-day	5.00E-04	mg/kg-day	3.69E-09	1.54E-09
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	5.90E-13	2.46E-13	mg/kg-day	1.30E-05	mg/kg-day	4.54E-08	1.89E-08
	HEXACHLOROBENZENE	3.38E-02	mg/kg	1.55E-12	6.47E-13	mg/kg-day	3.00E-04	mg/kg-day	5.18E-09	2.16E-09
	METHOXYCHLOR	4.36E-02	mg/kg	2.00E-12	8.35E-13	mg/kg-day	5.00E-03	mg/kg-day	4.01E-10	1.67E-10
	MIREX	1.00E-03	mg/kg	4.59E-14	1.91E-14	mg/kg-day	2.00E-04	mg/kg-day	2.30E-10	9.57E-11
	TRANS NONACHLOR	8.00E-04	mg/kg	3.68E-14	1.53E-14	mg/kg-day	2.00E-04	mg/kg-day	1.84E-10	7.66E-11
	PCBs									
	PCBs (TOTAL)	3.22E-01	mg/kg	1.48E-11	6.16E-12	mg/kg-day	2.00E-05	mg/kg-day	7.40E-07	3.08E-07
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	2.08E-08	8.68E-09	mg/kg-day	6.00E-02	mg/kg-day	3.47E-07	1.45E-07
	ACENAPHTHYLENE	3.45E-01	mg/kg	1.59E-11	6.61E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	2.99E-08	1.25E-08	mg/kg-day	3.00E-01	mg/kg-day	9.96E-08	4.15E-08
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	2.06E-11	8.60E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	4.31E-01	mg/kg	1.98E-11	8.26E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	1.18E-11	4.92E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	2.17E-01	mg/kg	9.97E-12	4.15E-12	mg/kg-day	4.00E-02	mg/kg-day	2.49E-10	1.04E-10
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	1.92E-11	7.98E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.20E+00	mg/kg	5.51E-11	2.30E-11	mg/kg-day	4.00E+00	mg/kg-day	1.38E-11	5.74E-12
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	1.59E-11	6.61E-12	mg/kg-day	2.00E-02	mg/kg-day	7.93E-10	3.30E-10
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	1.74E-12	7.24E-13	mg/kg-day	2.00E-01	mg/kg-day	8.68E-12	3.62E-12
	CARBAZOLE	6.18E-02	mg/kg	2.84E-12	1.18E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	2.66E-01	mg/kg	1.22E-11	5.09E-12	mg/kg-day	4.00E-03	mg/kg-day	3.06E-09	1.27E-09

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*CHRYSENE*	4.73E-01	mg/kg	1.06E-08	4.43E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	2.14E-11	8.90E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	1.51E-11	6.30E-12	mg/kg-day	1.00E-03	mg/kg-day	1.51E-08	6.30E-09
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	8.50E-12	3.54E-12	mg/kg-day	1.00E-01	mg/kg-day	8.50E-11	3.54E-11
	FLUORANTHENE	5.13E-01	mg/kg	2.36E-11	9.82E-12	mg/kg-day	4.00E-02	mg/kg-day	5.89E-10	2.46E-10
	FLUORENE	3.77E-01	mg/kg	6.35E-08	2.65E-08	mg/kg-day	4.00E-02	mg/kg-day	1.59E-06	6.62E-07
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	1.66E-11	6.91E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	1.99E-11	8.29E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	NAPHTHALENE	3.53E-01	mg/kg	4.98E-07	2.07E-07	mg/kg-day	8.57E-04	mg/kg-day	5.81E-04	2.42E-04
	PENTACHLOROPHENOL	1.20E+00	mg/kg	5.51E-11	2.30E-11	mg/kg-day	3.00E-02	mg/kg-day	1.84E-09	7.66E-10
	PHENANTHRENE	3.85E-01	mg/kg	1.77E-11	7.37E-12	mg/kg-day	3.00E-01	mg/kg-day	5.90E-11	2.46E-11
	PHENOL	4.81E-01	mg/kg	2.21E-11	9.20E-12	mg/kg-day	5.71E-02	mg/kg-day	3.87E-10	1.61E-10
	PYRENE	7.05E-01	mg/kg	1.13E-08	4.69E-09	mg/kg-day	3.00E-02	mg/kg-day	3.75E-07	1.56E-07
	TPH									
	TPH AS DIESEL	1.81E+02	mg/kg	8.32E-09	3.47E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	2.24E-09	9.34E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	1.05E-08	4.37E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3.54E+03	mg/kg	1.63E-07	6.78E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	2.12E-07	8.82E-08	mg/kg-day	9.00E-01	mg/kg-day	2.35E-07	9.80E-08
	BENZENE	2.54E-02	mg/kg	5.63E-07	2.35E-07	mg/kg-day	8.57E-03	mg/kg-day	6.58E-05	2.74E-05
	2- BUTANONE	2.03E-02	mg/kg	6.48E-08	2.70E-08	mg/kg-day	2.86E-01	mg/kg-day	2.27E-07	9.44E-08
	BROMOMETHANE	4.30E-03	mg/kg	1.45E-07	6.04E-08	mg/kg-day	1.43E+00	mg/kg-day	1.01E-07	4.22E-08
	CARBON DISULFIDE	4.96E-03	mg/kg	2.51E-07	1.04E-07	mg/kg-day	2.00E-01	mg/kg-day	1.25E-06	5.22E-07
	CHLOROBENZENE	2.96E-03	mg/kg	2.85E-08	1.19E-08	mg/kg-day	5.71E-03	mg/kg-day	4.99E-06	2.08E-06
	CHLOROFORM	6.96E-03	mg/kg	1.56E-07	6.51E-08	mg/kg-day	8.57E-02	mg/kg-day	1.83E-06	7.61E-07
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	4.30E-07	1.79E-07	mg/kg-day	1.00E-02	mg/kg-day	4.30E-05	1.79E-05
	ETHYLBENZENE	3.10E-02	mg/kg	3.48E-07	1.45E-07	mg/kg-day	2.86E-01	mg/kg-day	1.22E-06	5.07E-07
	METHYLENE CHLORIDE	5.90E-02	mg/kg	1.43E-06	5.96E-07	mg/kg-day	1.14E-01	mg/kg-day	1.25E-05	5.22E-06
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	NA	NA	mg/kg-day	8.57E-01	mg/kg-day	NA	NA

Table C1-3a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	NAPHTHALENE	3.18E-02	mg/kg	4.48E-08	1.87E-08	mg/kg-day	8.57E-04	mg/kg-day	5.23E-05	2.18E-05
	TETRACHLOROETHENE	1.66E-02	mg/kg	3.86E-07	1.61E-07	mg/kg-day	1.00E-02	mg/kg-day	3.86E-05	1.61E-05
	TOLUENE	2.46E-02	mg/kg	3.72E-07	1.55E-07	mg/kg-day	8.57E-02	mg/kg-day	4.35E-06	1.81E-06
	TRICHLOROETHENE	8.56E-03	mg/kg	1.57E-07	6.56E-08	mg/kg-day	1.00E-02	mg/kg-day	1.57E-05	6.56E-06
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	3.81E-08	1.59E-08	mg/kg-day	1.70E-03	mg/kg-day	2.24E-05	9.34E-06
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	3.40E-08	1.42E-08	mg/kg-day	1.70E-03	mg/kg-day	2.00E-05	8.32E-06
	XYLENE (TOTAL)	9.63E-02	mg/kg	9.58E-07	3.99E-07	mg/kg-day	2.86E-02	mg/kg-day	3.35E-05	1.40E-05

Notes:
The HQ for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
HQ = Hazard Quotient
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RfD = Reference Dose
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	2.80E-09	2.80E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	4.29E-10	4.29E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	4.17E-11	4.17E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	3.87E-11	3.87E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	1.16E-10	1.16E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	9.49E-11	9.49E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	5.52E-11	5.52E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	3.10E-11	3.10E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	4.81E-11	4.81E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	2.42E-08	2.42E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	4.97E-10	4.97E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	2.10E-11	2.10E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.39E-12	1.39E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	1.91E-11	1.91E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	1.32E-11	1.32E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	1.20E-07	1.20E-07	mg/kg-day	1.00E-02	mg/kg-day	1.20E-05	1.20E-05
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	7.64E-02	7.64E-02	mg/kg-day	1.00E+00	mg/kg-day	7.64E-02	7.64E-02
	ANTIMONY	4.34E+00	mg/kg	1.40E-05	1.40E-05	mg/kg-day	4.00E-04	mg/kg-day	3.50E-02	3.50E-02
	ARSENIC	1.36E+01	mg/kg	4.39E-05	4.39E-05	mg/kg-day	3.00E-04	mg/kg-day	1.46E-01	1.46E-01
	BARIUM	1.63E+02	mg/kg	5.27E-04	5.27E-04	mg/kg-day	7.00E-02	mg/kg-day	7.53E-03	7.53E-03
	BERYLLIUM	6.24E-01	mg/kg	2.01E-06	2.01E-06	mg/kg-day	2.00E-03	mg/kg-day	1.01E-03	1.01E-03
	CADMIUM	3.00E+00	mg/kg	9.70E-06	9.70E-06	mg/kg-day	5.00E-04	mg/kg-day	1.94E-02	1.94E-02
	CHROMIUM	1.16E+02	mg/kg	3.74E-04	3.74E-04	mg/kg-day	1.50E+00	mg/kg-day	2.49E-04	2.49E-04
	COBALT	1.44E+01	mg/kg	4.65E-05	4.65E-05	mg/kg-day	2.00E-02	mg/kg-day	2.33E-03	2.33E-03
	COPPER	2.01E+02	mg/kg	6.49E-04	6.49E-04	mg/kg-day	4.00E-02	mg/kg-day	1.62E-02	1.62E-02
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	2.91E-07	2.91E-07	mg/kg-day	3.00E-03	mg/kg-day	9.69E-05	9.69E-05
	LEAD	1.13E+02	mg/kg	3.66E-04	3.66E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	7.32E+02	mg/kg	2.36E-03	2.36E-03	mg/kg-day	1.40E-01	mg/kg-day	1.69E-02	1.69E-02

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	*MERCURY*	1.90E+00	mg/kg	6.15E-06	6.15E-06	mg/kg-day	3.00E-04	mg/kg-day	2.05E-02	2.05E-02
	MOLYBDENUM	7.24E+01	mg/kg	2.34E-04	2.34E-04	mg/kg-day	5.00E-03	mg/kg-day	4.68E-02	4.68E-02
	NICKEL	9.68E+01	mg/kg	3.12E-04	3.12E-04	mg/kg-day	2.00E-02	mg/kg-day	1.56E-02	1.56E-02
	SELENIUM	7.04E-01	mg/kg	2.27E-06	2.27E-06	mg/kg-day	5.00E-03	mg/kg-day	4.55E-04	4.55E-04
	SILVER	3.08E+00	mg/kg	9.96E-06	9.96E-06	mg/kg-day	5.00E-03	mg/kg-day	1.99E-03	1.99E-03
	THALLIUM	1.37E+00	mg/kg	4.43E-06	4.43E-06	mg/kg-day	6.60E-05	mg/kg-day	6.72E-02	6.72E-02
	TIN	3.20E+01	mg/kg	1.03E-04	1.03E-04	mg/kg-day	6.00E-01	mg/kg-day	1.72E-04	1.72E-04
	VANADIUM	9.58E+01	mg/kg	3.09E-04	3.09E-04	mg/kg-day	7.00E-03	mg/kg-day	4.42E-02	4.42E-02
	ZINC	2.41E+02	mg/kg	7.77E-04	7.77E-04	mg/kg-day	3.00E-01	mg/kg-day	2.59E-03	2.59E-03
	PESTICIDES									
	ALDRIN	8.10E-03	mg/kg	2.62E-08	2.62E-08	mg/kg-day	3.00E-05	mg/kg-day	8.72E-04	8.72E-04
	ALPHA-CHLORDANE	1.93E-02	mg/kg	6.23E-08	6.23E-08	mg/kg-day	5.00E-04	mg/kg-day	1.25E-04	1.25E-04
	BETA BHC	7.14E-02	mg/kg	2.30E-07	2.30E-07	mg/kg-day	2.00E-04	mg/kg-day	1.15E-03	1.15E-03
	4,4- DDD	1.77E-02	mg/kg	5.72E-08	5.72E-08	mg/kg-day	5.00E-04	mg/kg-day	1.14E-04	1.14E-04
	4,4- DDE	1.53E-02	mg/kg	4.94E-08	4.94E-08	mg/kg-day	5.00E-04	mg/kg-day	9.88E-05	9.88E-05
	4,4- DDT	8.01E-02	mg/kg	2.59E-07	2.59E-07	mg/kg-day	5.00E-04	mg/kg-day	5.17E-04	5.17E-04
	DIELDRIN	3.13E-02	mg/kg	1.01E-07	1.01E-07	mg/kg-day	5.00E-05	mg/kg-day	2.02E-03	2.02E-03
	ENDOSULFAN I	2.50E-03	mg/kg	8.07E-09	8.07E-09	mg/kg-day	6.00E-03	mg/kg-day	1.35E-06	1.35E-06
	ENDOSULFAN II	4.10E-03	mg/kg	1.32E-08	1.32E-08	mg/kg-day	6.00E-03	mg/kg-day	2.21E-06	2.21E-06
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	2.62E-08	2.62E-08	mg/kg-day	6.00E-03	mg/kg-day	4.36E-06	4.36E-06
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	2.62E-08	2.62E-08	mg/kg-day	3.00E-04	mg/kg-day	8.72E-05	8.72E-05
	ENRIN KETONE	9.70E-03	mg/kg	3.13E-08	3.13E-08	mg/kg-day	3.00E-04	mg/kg-day	1.04E-04	1.04E-04
	GAMMA-BHC	1.20E-01	mg/kg	3.88E-07	3.88E-07	mg/kg-day	3.00E-04	mg/kg-day	1.29E-03	1.29E-03
	GAMMA-CHLORDANE	1.85E-02	mg/kg	5.97E-08	5.97E-08	mg/kg-day	5.00E-04	mg/kg-day	1.19E-04	1.19E-04
	HEPTACHLOR	4.01E-02	mg/kg	1.29E-07	1.29E-07	mg/kg-day	5.00E-04	mg/kg-day	2.59E-04	2.59E-04
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	4.14E-08	4.14E-08	mg/kg-day	1.30E-05	mg/kg-day	3.19E-03	3.19E-03
	HEXACHLOROBENZENE	3.38E-02	mg/kg	1.09E-07	1.09E-07	mg/kg-day	8.00E-04	mg/kg-day	1.36E-04	1.36E-04
	METHOXYCHLOR	4.36E-02	mg/kg	1.41E-07	1.41E-07	mg/kg-day	5.00E-03	mg/kg-day	2.82E-05	2.82E-05
	MIREX	1.00E-03	mg/kg	3.23E-09	3.23E-09	mg/kg-day	2.00E-04	mg/kg-day	1.61E-05	1.61E-05
	TRANS NONACHLOR	8.00E-04	mg/kg	2.58E-09	2.58E-09	mg/kg-day	5.00E-04	mg/kg-day	5.17E-06	5.17E-06

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**PCBs**									
	PCBs (TOTAL)	3.22E-01	mg/kg	1.04E-06	1.04E-06	mg/kg-day	2.00E-05	mg/kg-day	5.20E-02	5.20E-02
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	2.00E-07	2.00E-07	mg/kg-day	6.00E-02	mg/kg-day	3.33E-06	3.33E-06
	ACENAPHTHYLENE	3.45E-01	mg/kg	1.11E-06	1.11E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	1.11E-06	1.11E-06	mg/kg-day	3.00E-01	mg/kg-day	3.71E-06	3.71E-06
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	1.45E-06	1.45E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	4.31E-01	mg/kg	1.39E-06	1.39E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	8.30E-07	8.30E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	2.17E-01	mg/kg	7.01E-07	7.01E-07	mg/kg-day	4.00E-02	mg/kg-day	1.75E-05	1.75E-05
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	1.35E-06	1.35E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.20E+00	mg/kg	3.87E-06	3.87E-06	mg/kg-day	4.00E+00	mg/kg-day	9.69E-07	9.69E-07
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	1.11E-06	1.11E-06	mg/kg-day	2.00E-02	mg/kg-day	5.57E-05	5.57E-05
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	1.22E-07	1.22E-07	mg/kg-day	2.00E-01	mg/kg-day	6.10E-07	6.10E-07
	CARBAZOLE	6.18E-02	mg/kg	2.00E-07	2.00E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	2.66E-01	mg/kg	8.59E-07	8.59E-07	mg/kg-day	4.00E-03	mg/kg-day	2.15E-04	2.15E-04
	CHRYSENE	4.73E-01	mg/kg	1.53E-06	1.53E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	1.50E-06	1.50E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	1.06E-06	1.06E-06	mg/kg-day	1.00E-03	mg/kg-day	1.06E-03	1.06E-03
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	5.97E-07	5.97E-07	mg/kg-day	1.00E-01	mg/kg-day	5.97E-06	5.97E-06
	FLUORANTHENE	5.13E-01	mg/kg	1.66E-06	1.66E-06	mg/kg-day	4.00E-02	mg/kg-day	4.14E-05	4.14E-05
	FLUORENE	3.77E-01	mg/kg	1.22E-06	1.22E-06	mg/kg-day	4.00E-02	mg/kg-day	3.04E-05	3.04E-05
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	1.17E-06	1.17E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	1.40E-06	1.40E-06	mg/kg-day	4.00E-03	mg/kg-day	3.50E-04	3.50E-04
	NAPHTHALENE	3.53E-01	mg/kg	1.14E-06	1.14E-06	mg/kg-day	2.00E-02	mg/kg-day	5.70E-05	5.70E-05
	PENTACHLOROPHENOL	1.20E+00	mg/kg	3.87E-06	3.87E-06	mg/kg-day	3.00E-02	mg/kg-day	1.29E-04	1.29E-04
	PHENANTHRENE	3.85E-01	mg/kg	1.24E-06	1.24E-06	mg/kg-day	3.00E-01	mg/kg-day	4.14E-06	4.14E-06
	PHENOL	4.81E-01	mg/kg	1.55E-06	1.55E-06	mg/kg-day	6.00E-01	mg/kg-day	2.59E-06	2.59E-06
	PYRENE	7.05E-01	mg/kg	2.28E-06	2.28E-06	mg/kg-day	3.00E-02	mg/kg-day	7.59E-05	7.59E-05

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**TPH**									
	TPH AS DIESEL	1.81E+02	mg/kg	5.84E-04	5.84E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	1.58E-04	1.58E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	7.36E-04	7.36E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3.54E+03	mg/kg	1.14E-02	1.14E-02	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	1.41E-07	1.41E-07	mg/kg-day	9.00E-01	mg/kg-day	1.57E-07	1.57E-07
	BENZENE	2.54E-02	mg/kg	8.20E-08	8.20E-08	mg/kg-day	4.00E-03	mg/kg-day	2.05E-05	2.05E-05
	2- BUTANONE	2.03E-02	mg/kg	6.55E-08	6.55E-08	mg/kg-day	6.00E-01	mg/kg-day	1.09E-07	1.09E-07
	BROMOMETHANE	4.30E-03	mg/kg	1.39E-08	1.39E-08	mg/kg-day	1.40E-03	mg/kg-day	9.92E-06	9.92E-06
	CARBON DISULFIDE	4.96E-03	mg/kg	1.60E-08	1.60E-08	mg/kg-day	1.00E-01	mg/kg-day	1.60E-07	1.60E-07
	CHLOROBENZENE	2.96E-03	mg/kg	9.56E-09	9.56E-09	mg/kg-day	2.00E-02	mg/kg-day	4.78E-07	4.78E-07
	CHLOROFORM	6.96E-03	mg/kg	2.25E-08	2.25E-08	mg/kg-day	1.00E-02	mg/kg-day	2.25E-06	2.25E-06
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	6.64E-08	6.64E-08	mg/kg-day	1.00E-02	mg/kg-day	6.64E-06	6.64E-06
	ETHYLBENZENE	3.10E-02	mg/kg	1.00E-07	1.00E-07	mg/kg-day	1.00E-01	mg/kg-day	1.00E-06	1.00E-06
	METHYLENE CHLORIDE	5.90E-02	mg/kg	1.90E-07	1.90E-07	mg/kg-day	6.00E-02	mg/kg-day	3.17E-06	3.17E-06
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	2.42E-08	2.42E-08	mg/kg-day	8.00E-02	mg/kg-day	3.03E-07	3.03E-07
	NAPHTHALENE	3.18E-02	mg/kg	1.03E-07	1.03E-07	mg/kg-day	2.00E-02	mg/kg-day	5.13E-06	5.13E-06
	TETRACHLOROETHENE	1.66E-02	mg/kg	5.35E-08	5.35E-08	mg/kg-day	1.00E-02	mg/kg-day	5.35E-06	5.35E-06
	TOLUENE	2.46E-02	mg/kg	7.93E-08	7.93E-08	mg/kg-day	2.00E-01	mg/kg-day	3.97E-07	3.97E-07
	TRICHLOROETHENE	8.56E-03	mg/kg	2.76E-08	2.76E-08	mg/kg-day	3.00E-04	mg/kg-day	9.21E-05	9.21E-05
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	4.06E-08	4.06E-08	mg/kg-day	5.00E-02	mg/kg-day	8.11E-07	8.11E-07
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	1.45E-08	1.45E-08	mg/kg-day	5.00E-02	mg/kg-day	2.89E-07	2.89E-07
	XYLENE (TOTAL)	9.63E-02	mg/kg	3.11E-07	3.11E-07	mg/kg-day	2.00E-01	mg/kg-day	1.55E-06	1.55E-06
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	1.80E-08	1.80E-08	mg/kg-day	1.00E-02	mg/kg-day	1.80E-06	1.80E-06
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	NA	NA	mg/kg-day	1.00E+00	mg/kg-day	NA	NA
	ANTIMONY	4.34E+00	mg/kg	NA	NA	mg/kg-day	6.00E-05	mg/kg-day	NA	NA
	ARSENIC	1.36E+01	mg/kg	3.95E-06	3.95E-06	mg/kg-day	3.00E-04	mg/kg-day	1.32E-02	1.32E-02
	BARIUM	1.63E+02	mg/kg	NA	NA	mg/kg-day	4.90E-03	mg/kg-day	NA	NA
	BERYLLIUM	6.24E-01	mg/kg	NA	NA	mg/kg-day	1.40E-05	mg/kg-day	NA	NA
	CADMIUM	3.00E+00	mg/kg	2.91E-08	2.91E-08	mg/kg-day	1.25E-05	mg/kg-day	2.33E-03	2.33E-03
	CHROMIUM	1.16E+02	mg/kg	NA	NA	mg/kg-day	1.95E-02	mg/kg-day	NA	NA
	COBALT	1.44E+01	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	COPPER	2.01E+02	mg/kg	NA	NA	mg/kg-day	4.00E-02	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	NA	NA	mg/kg-day	7.50E-05	mg/kg-day	NA	NA
	LEAD	1.13E+02	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	7.32E+02	mg/kg	NA	NA	mg/kg-day	5.60E-03	mg/kg-day	NA	NA
	MERCURY	1.90E+00	mg/kg	NA	NA	mg/kg-day	2.10E-05	mg/kg-day	NA	NA
	MOLYBDENUM	7.24E+01	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	NICKEL	9.68E+01	mg/kg	NA	NA	mg/kg-day	8.00E-04	mg/kg-day	NA	NA
	SELENIUM	7.04E-01	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	SILVER	3.08E+00	mg/kg	NA	NA	mg/kg-day	2.00E-04	mg/kg-day	NA	NA
	THALLIUM	1.37E+00	mg/kg	NA	NA	mg/kg-day	6.60E-05	mg/kg-day	NA	NA

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*TIN*	3.20E+01	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	VANADIUM	9.58E+01	mg/kg	NA	NA	mg/kg-day	1.82E-04	mg/kg-day	NA	NA
	ZINC	2.41E+02	mg/kg	NA	NA	mg/kg-day	3.00E-01	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	8.10E-03	mg/kg	7.85E-09	7.85E-09	mg/kg-day	3.00E-05	mg/kg-day	2.62E-04	2.62E-04
	ALPHA-CHLORDANE	1.93E-02	mg/kg	7.48E-09	7.48E-09	mg/kg-day	5.00E-04	mg/kg-day	1.50E-05	1.50E-05
	BETA BHC	7.14E-02	mg/kg	2.77E-08	2.77E-08	mg/kg-day	2.00E-04	mg/kg-day	1.38E-04	1.38E-04
	4,4- DDD	1.77E-02	mg/kg	5.14E-09	5.14E-09	mg/kg-day	5.00E-04	mg/kg-day	1.03E-05	1.03E-05
	4,4- DDE	1.53E-02	mg/kg	4.45E-09	4.45E-09	mg/kg-day	5.00E-04	mg/kg-day	8.89E-06	8.89E-06
	4,4- DDT	8.01E-02	mg/kg	2.33E-08	2.33E-08	mg/kg-day	5.00E-04	mg/kg-day	4.66E-05	4.66E-05
	DIELDRIN	3.13E-02	mg/kg	3.03E-08	3.03E-08	mg/kg-day	5.00E-05	mg/kg-day	6.06E-04	6.06E-04
	ENDOSULFAN I	2.50E-03	mg/kg	2.42E-09	2.42E-09	mg/kg-day	6.00E-03	mg/kg-day	4.04E-07	4.04E-07
	ENDOSULFAN II	4.10E-03	mg/kg	3.97E-09	3.97E-09	mg/kg-day	6.00E-03	mg/kg-day	6.62E-07	6.62E-07
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	7.85E-09	7.85E-09	mg/kg-day	6.00E-03	mg/kg-day	1.31E-06	1.31E-06
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	7.85E-09	7.85E-09	mg/kg-day	3.00E-04	mg/kg-day	2.62E-05	2.62E-05
	ENRIN KETONE	9.70E-03	mg/kg	9.40E-09	9.40E-09	mg/kg-day	3.00E-04	mg/kg-day	3.13E-05	3.13E-05
	GAMMA-BHC	1.20E-01	mg/kg	4.65E-08	4.65E-08	mg/kg-day	3.00E-04	mg/kg-day	1.55E-04	1.55E-04
	GAMMA-CHLORDANE	1.85E-02	mg/kg	7.17E-09	7.17E-09	mg/kg-day	5.00E-04	mg/kg-day	1.43E-05	1.43E-05
	HEPTACHLOR	4.01E-02	mg/kg	3.88E-08	3.88E-08	mg/kg-day	5.00E-04	mg/kg-day	7.77E-05	7.77E-05
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	1.24E-08	1.24E-08	mg/kg-day	1.30E-05	mg/kg-day	9.56E-04	9.56E-04
	HEXACHLOROBENZENE	3.38E-02	mg/kg	3.27E-08	3.27E-08	mg/kg-day	8.00E-04	mg/kg-day	4.09E-05	4.09E-05
	METHOXYCHLOR	4.36E-02	mg/kg	1.69E-08	1.69E-08	mg/kg-day	5.00E-03	mg/kg-day	3.38E-06	3.38E-06
	MIREX	1.00E-03	mg/kg	9.69E-10	9.69E-10	mg/kg-day	2.00E-04	mg/kg-day	4.84E-06	4.84E-06
	TRANS NONACHLOR	8.00E-04	mg/kg	3.10E-10	3.10E-10	mg/kg-day	5.00E-04	mg/kg-day	6.20E-07	6.20E-07
	PCBs									
	PCBs (TOTAL)	3.22E-01	mg/kg	4.37E-07	4.37E-07	mg/kg-day	2.00E-05	mg/kg-day	2.18E-02	2.18E-02
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	7.78E-08	7.78E-08	mg/kg-day	6.00E-02	mg/kg-day	1.30E-06	1.30E-06
	ACENAPHTHYLENE	3.45E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	4.34E-07	4.34E-07	mg/kg-day	3.00E-01	mg/kg-day	1.45E-06	1.45E-06
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*BENZO(A)PYRENE*	4.31E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	2.17E-01	mg/kg	2.73E-07	2.73E-07	mg/kg-day	4.00E-02	mg/kg-day	6.83E-06	6.83E-06
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.20E+00	mg/kg	1.16E-06	1.16E-06	mg/kg-day	4.00E+00	mg/kg-day	2.91E-07	2.91E-07
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	3.34E-07	3.34E-07	mg/kg-day	2.00E-02	mg/kg-day	1.67E-05	1.67E-05
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	3.66E-08	3.66E-08	mg/kg-day	2.00E-01	mg/kg-day	1.83E-07	1.83E-07
	CARBAZOLE	6.18E-02	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	2.66E-01	mg/kg	2.58E-07	2.58E-07	mg/kg-day	4.00E-03	mg/kg-day	6.44E-05	6.44E-05
	CHRYSENE	4.73E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	3.19E-07	3.19E-07	mg/kg-day	1.00E-03	mg/kg-day	3.19E-04	3.19E-04
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	1.79E-07	1.79E-07	mg/kg-day	1.00E-01	mg/kg-day	1.79E-06	1.79E-06
	FLUORANTHENE	5.13E-01	mg/kg	6.46E-07	6.46E-07	mg/kg-day	4.00E-02	mg/kg-day	1.62E-05	1.62E-05
	FLUORENE	3.77E-01	mg/kg	4.75E-07	4.75E-07	mg/kg-day	4.00E-02	mg/kg-day	1.19E-05	1.19E-05
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	5.45E-07	5.45E-07	mg/kg-day	4.00E-03	mg/kg-day	1.36E-04	1.36E-04
	NAPHTHALENE	3.53E-01	mg/kg	4.45E-07	4.45E-07	mg/kg-day	2.00E-02	mg/kg-day	2.22E-05	2.22E-05
	PENTACHLOROPHENOL	1.20E+00	mg/kg	1.16E-06	1.16E-06	mg/kg-day	3.00E-02	mg/kg-day	3.87E-05	3.87E-05
	PHENANTHRENE	3.85E-01	mg/kg	4.85E-07	4.85E-07	mg/kg-day	3.00E-01	mg/kg-day	1.62E-06	1.62E-06
	PHENOL	4.81E-01	mg/kg	6.05E-07	6.05E-07	mg/kg-day	6.00E-01	mg/kg-day	1.01E-06	1.01E-06
	PYRENE	7.05E-01	mg/kg	8.88E-07	8.88E-07	mg/kg-day	3.00E-02	mg/kg-day	2.96E-05	2.96E-05
	TPH									
	TPH AS DIESEL	1.81E+02	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3.54E+03	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	NA	NA	mg/kg-day	9.00E-01	mg/kg-day	NA	NA
	BENZENE	2.54E-02	mg/kg	NA	NA	mg/kg-day	4.00E-03	mg/kg-day	NA	NA

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	2- BUTANONE	2.03E-02	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	BROMOMETHANE	4.30E-03	mg/kg	NA	NA	mg/kg-day	1.40E-03	mg/kg-day	NA	NA
	CARBON DISULFIDE	4.96E-03	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	CHLOROBENZENE	2.96E-03	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	CHLOROFORM	6.96E-03	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	ETHYLBENZENE	3.10E-02	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	METHYLENE CHLORIDE	5.90E-02	mg/kg	NA	NA	mg/kg-day	6.00E-02	mg/kg-day	NA	NA
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	NA	NA	mg/kg-day	8.00E-02	mg/kg-day	NA	NA
	NAPHTHALENE	3.18E-02	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	TETRACHLOROETHENE	1.66E-02	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	TOLUENE	2.46E-02	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
	TRICHLOROETHENE	8.56E-03	mg/kg	NA	NA	mg/kg-day	3.00E-04	mg/kg-day	NA	NA
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	XYLENE (TOTAL)	9.63E-02	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	5.18E-12	2.69E-12	mg/kg-day	1.14E-08	mg/kg-day	4.53E-04	2.36E-04
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	7.94E-13	4.13E-13	mg/kg-day	1.14E-08	mg/kg-day	6.95E-05	3.61E-05
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	7.70E-14	4.00E-14	mg/kg-day	1.14E-08	mg/kg-day	6.74E-06	3.50E-06
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	7.16E-14	3.72E-14	mg/kg-day	1.14E-08	mg/kg-day	6.27E-06	3.26E-06
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	2.15E-13	1.12E-13	mg/kg-day	1.14E-08	mg/kg-day	1.88E-05	9.78E-06
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	1.75E-13	9.12E-14	mg/kg-day	1.14E-08	mg/kg-day	1.54E-05	7.99E-06
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.02E-13	5.31E-14	mg/kg-day	1.14E-08	mg/kg-day	8.93E-06	4.65E-06
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	5.73E-14	2.98E-14	mg/kg-day	1.14E-08	mg/kg-day	5.02E-06	2.61E-06
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	8.89E-14	4.62E-14	mg/kg-day	1.14E-08	mg/kg-day	7.78E-06	4.05E-06
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	4.46E-11	2.32E-11	mg/kg-day	1.14E-08	mg/kg-day	3.91E-03	2.03E-03
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	9.19E-13	4.78E-13	mg/kg-day	1.14E-08	mg/kg-day	8.05E-05	4.18E-05
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	3.88E-14	2.02E-14	mg/kg-day	1.14E-08	mg/kg-day	3.40E-06	1.77E-06
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	2.57E-15	1.33E-15	mg/kg-day	1.14E-08	mg/kg-day	2.25E-07	1.17E-07
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	3.52E-14	1.83E-14	mg/kg-day	1.14E-08	mg/kg-day	3.08E-06	1.60E-06

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	2,3,7,8- TCDF	4.10E-06	mg/kg	2.45E-14	1.27E-14	mg/kg-day	1.14E-08	mg/kg-day	2.14E-06	1.11E-06
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	2.22E-10	1.15E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	1.41E-04	7.34E-05	mg/kg-day	1.40E-03	mg/kg-day	1.01E-01	5.24E-02
	ANTIMONY	4.34E+00	mg/kg	2.59E-08	1.35E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	ARSENIC	1.36E+01	mg/kg	8.11E-08	4.22E-08	mg/kg-day	8.57E-06	mg/kg-day	9.47E-03	4.92E-03
	BARIUM	1.63E+02	mg/kg	9.74E-07	5.06E-07	mg/kg-day	1.43E-04	mg/kg-day	6.81E-03	3.54E-03
	BERYLLIUM	6.24E-01	mg/kg	3.72E-09	1.94E-09	mg/kg-day	2.00E-06	mg/kg-day	1.86E-03	9.68E-04
	CADMIUM	3.00E+00	mg/kg	1.79E-08	9.32E-09	mg/kg-day	5.71E-06	mg/kg-day	3.14E-03	1.63E-03
	CHROMIUM	1.16E+02	mg/kg	6.90E-07	3.59E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	COBALT	1.44E+01	mg/kg	8.60E-08	4.47E-08	mg/kg-day	5.70E-06	mg/kg-day	1.51E-02	7.84E-03
	COPPER	2.01E+02	mg/kg	1.20E-06	6.24E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	5.37E-10	2.79E-10	mg/kg-day	2.86E-05	mg/kg-day	1.88E-05	9.76E-06
	LEAD	1.13E+02	mg/kg	6.76E-07	3.51E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	7.32E+02	mg/kg	4.37E-06	2.27E-06	mg/kg-day	1.43E-05	mg/kg-day	3.06E-01	1.59E-01
	MERCURY	1.90E+00	mg/kg	1.14E-08	5.91E-09	mg/kg-day	2.57E-05	mg/kg-day	4.42E-04	2.30E-04
	MOLYBDENUM	7.24E+01	mg/kg	4.32E-07	2.25E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	NICKEL	9.68E+01	mg/kg	5.77E-07	3.00E-07	mg/kg-day	1.43E-05	mg/kg-day	4.04E-02	2.10E-02
	SELENIUM	7.04E-01	mg/kg	4.20E-09	2.18E-09	mg/kg-day	5.71E-03	mg/kg-day	7.36E-07	3.83E-07
	SILVER	3.08E+00	mg/kg	1.84E-08	9.57E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	THALLIUM	1.37E+00	mg/kg	8.19E-09	4.26E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	TIN	3.20E+01	mg/kg	1.91E-07	9.93E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	VANADIUM	9.58E+01	mg/kg	5.71E-07	2.97E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	ZINC	2.41E+02	mg/kg	1.44E-06	7.47E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	8.10E-03	mg/kg	4.83E-11	2.51E-11	mg/kg-day	3.00E-05	mg/kg-day	1.61E-06	8.38E-07
	ALPHA-CHLORDANE	1.93E-02	mg/kg	1.15E-10	5.99E-11	mg/kg-day	2.00E-04	mg/kg-day	5.76E-07	2.99E-07
	BETA BHC	7.14E-02	mg/kg	4.26E-10	2.21E-10	mg/kg-day	2.00E-04	mg/kg-day	2.13E-06	1.11E-06
	4,4- DDD	1.77E-02	mg/kg	1.06E-10	5.49E-11	mg/kg-day	5.00E-04	mg/kg-day	2.11E-07	1.10E-07
	4,4- DDE	1.53E-02	mg/kg	9.13E-11	4.75E-11	mg/kg-day	5.00E-04	mg/kg-day	1.83E-07	9.49E-08

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	4,4- DDT	8.01E-02	mg/kg	4.78E-10	2.49E-10	mg/kg-day	5.00E-04	mg/kg-day	9.56E-07	4.97E-07
	DIELDRIN	3.13E-02	mg/kg	1.87E-10	9.71E-11	mg/kg-day	5.00E-05	mg/kg-day	3.73E-06	1.94E-06
	ENDOSULFAN I	2.50E-03	mg/kg	1.49E-11	7.76E-12	mg/kg-day	6.00E-03	mg/kg-day	2.49E-09	1.29E-09
	ENDOSULFAN II	4.10E-03	mg/kg	2.45E-11	1.27E-11	mg/kg-day	6.00E-03	mg/kg-day	4.08E-09	2.12E-09
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	4.83E-11	2.51E-11	mg/kg-day	6.00E-03	mg/kg-day	8.05E-09	4.19E-09
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	4.83E-11	2.51E-11	mg/kg-day	3.00E-04	mg/kg-day	1.61E-07	8.38E-08
	ENRIN KETONE	9.70E-03	mg/kg	5.79E-11	3.01E-11	mg/kg-day	3.00E-04	mg/kg-day	1.93E-07	1.00E-07
	GAMMA-BHC	1.20E-01	mg/kg	7.17E-10	3.73E-10	mg/kg-day	3.00E-04	mg/kg-day	2.39E-06	1.24E-06
	GAMMA-CHLORDANE	1.85E-02	mg/kg	1.10E-10	5.74E-11	mg/kg-day	2.00E-04	mg/kg-day	5.52E-07	2.87E-07
	HEPTACHLOR	4.01E-02	mg/kg	2.39E-10	1.24E-10	mg/kg-day	5.00E-04	mg/kg-day	4.78E-07	2.49E-07
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	7.66E-11	3.98E-11	mg/kg-day	1.30E-05	mg/kg-day	5.89E-06	3.06E-06
	HEXACHLOROBENZENE	3.38E-02	mg/kg	2.02E-10	1.05E-10	mg/kg-day	3.00E-04	mg/kg-day	6.72E-07	3.50E-07
	METHOXYCHLOR	4.36E-02	mg/kg	2.60E-10	1.35E-10	mg/kg-day	5.00E-03	mg/kg-day	5.20E-08	2.71E-08
	MIREX	1.00E-03	mg/kg	5.97E-12	3.10E-12	mg/kg-day	2.00E-04	mg/kg-day	2.98E-08	1.55E-08
	TRANS NONACHLOR	8.00E-04	mg/kg	4.77E-12	2.48E-12	mg/kg-day	2.00E-04	mg/kg-day	2.39E-08	1.24E-08
	PCBs									
	PCBs (TOTAL)	3.22E-01	mg/kg	1.92E-09	9.99E-10	mg/kg-day	2.00E-05	mg/kg-day	9.61E-05	4.99E-05
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	6.72E-08	3.49E-08	mg/kg-day	6.00E-02	mg/kg-day	1.12E-06	5.82E-07
	ACENAPHTHYLENE	3.45E-01	mg/kg	2.06E-09	1.07E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	9.64E-08	5.02E-08	mg/kg-day	3.00E-01	mg/kg-day	3.21E-07	1.67E-07
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	2.68E-09	1.39E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	4.31E-01	mg/kg	2.57E-09	1.34E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	1.53E-09	7.97E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	2.17E-01	mg/kg	1.29E-09	6.73E-10	mg/kg-day	4.00E-02	mg/kg-day	3.24E-08	1.68E-08
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	2.49E-09	1.29E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.20E+00	mg/kg	7.16E-09	3.72E-09	mg/kg-day	4.00E+00	mg/kg-day	1.79E-09	9.31E-10
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	2.06E-09	1.07E-09	mg/kg-day	2.00E-02	mg/kg-day	1.03E-07	5.35E-08
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	2.26E-10	1.17E-10	mg/kg-day	2.00E-01	mg/kg-day	1.13E-09	5.86E-10
	CARBAZOLE	6.18E-02	mg/kg	3.69E-10	1.92E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	2.66E-01	mg/kg	1.59E-09	8.25E-10	mg/kg-day	4.00E-03	mg/kg-day	3.97E-07	2.06E-07

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*CHRYSENE*	4.73E-01	mg/kg	3.43E-08	1.78E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	2.77E-09	1.44E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	1.96E-09	1.02E-09	mg/kg-day	1.00E-03	mg/kg-day	1.96E-06	1.02E-06
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	1.10E-09	5.74E-10	mg/kg-day	1.00E-01	mg/kg-day	1.10E-08	5.74E-09
	FLUORANTHENE	5.13E-01	mg/kg	3.06E-09	1.59E-09	mg/kg-day	4.00E-02	mg/kg-day	7.65E-08	3.98E-08
	FLUORENE	3.77E-01	mg/kg	2.05E-07	1.07E-07	mg/kg-day	4.00E-02	mg/kg-day	5.12E-06	2.66E-06
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	2.15E-09	1.12E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	2.58E-09	1.34E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	NAPHTHALENE	3.53E-01	mg/kg	1.61E-06	8.35E-07	mg/kg-day	8.57E-04	mg/kg-day	1.87E-03	9.75E-04
	PENTACHLOROPHENOL	1.20E+00	mg/kg	7.16E-09	3.72E-09	mg/kg-day	3.00E-02	mg/kg-day	2.39E-07	1.24E-07
	PHENANTHRENE	3.85E-01	mg/kg	2.30E-09	1.19E-09	mg/kg-day	3.00E-01	mg/kg-day	7.66E-09	3.98E-09
	PHENOL	4.81E-01	mg/kg	2.87E-09	1.49E-09	mg/kg-day	5.71E-02	mg/kg-day	5.02E-08	2.61E-08
	PYRENE	7.05E-01	mg/kg	3.63E-08	1.89E-08	mg/kg-day	3.00E-02	mg/kg-day	1.21E-06	6.29E-07
	TPH									
	TPH AS DIESEL	1.81E+02	mg/kg	1.08E-06	5.61E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	2.91E-07	1.51E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	1.36E-06	7.08E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3.54E+03	mg/kg	2.11E-05	1.10E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	6.83E-07	3.55E-07	mg/kg-day	9.00E-01	mg/kg-day	7.59E-07	3.95E-07
	BENZENE	2.54E-02	mg/kg	1.82E-06	9.45E-07	mg/kg-day	8.57E-03	mg/kg-day	2.12E-04	1.10E-04
	2- BUTANONE	2.03E-02	mg/kg	2.09E-07	1.09E-07	mg/kg-day	2.86E-01	mg/kg-day	7.31E-07	3.80E-07
	BROMOMETHANE	4.30E-03	mg/kg	4.67E-07	2.43E-07	mg/kg-day	1.43E+00	mg/kg-day	3.27E-07	1.70E-07
	CARBON DISULFIDE	4.96E-03	mg/kg	8.09E-07	4.21E-07	mg/kg-day	2.00E-01	mg/kg-day	4.04E-06	2.10E-06
	CHLOROBENZENE	2.96E-03	mg/kg	9.19E-08	4.78E-08	mg/kg-day	5.71E-03	mg/kg-day	1.61E-05	8.37E-06
	CHLOROFORM	6.96E-03	mg/kg	5.04E-07	2.62E-07	mg/kg-day	8.57E-02	mg/kg-day	5.89E-06	3.06E-06
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	1.39E-06	7.21E-07	mg/kg-day	1.00E-02	mg/kg-day	1.39E-04	7.21E-05
	ETHYLBENZENE	3.10E-02	mg/kg	1.12E-06	5.83E-07	mg/kg-day	2.86E-01	mg/kg-day	3.92E-06	2.04E-06
	METHYLENE CHLORIDE	5.90E-02	mg/kg	4.62E-06	2.40E-06	mg/kg-day	1.14E-01	mg/kg-day	4.04E-05	2.10E-05
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	NA	NA	mg/kg-day	8.57E-01	mg/kg-day	NA	NA

Table C1-3b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	NAPHTHALENE	3.18E-02	mg/kg	1.45E-07	7.52E-08	mg/kg-day	8.57E-04	mg/kg-day	1.69E-04	8.77E-05
	TETRACHLOROETHENE	1.66E-02	mg/kg	1.25E-06	6.48E-07	mg/kg-day	1.00E-02	mg/kg-day	1.25E-04	6.48E-05
	TOLUENE	2.46E-02	mg/kg	1.20E-06	6.25E-07	mg/kg-day	8.57E-02	mg/kg-day	1.40E-05	7.29E-06
	TRICHLOROETHENE	8.56E-03	mg/kg	5.08E-07	2.64E-07	mg/kg-day	1.00E-02	mg/kg-day	5.08E-05	2.64E-05
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	1.23E-07	6.39E-08	mg/kg-day	1.70E-03	mg/kg-day	7.23E-05	3.76E-05
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	1.10E-07	5.70E-08	mg/kg-day	1.70E-03	mg/kg-day	6.45E-05	3.35E-05
	XYLENE (TOTAL)	9.63E-02	mg/kg	3.09E-06	1.61E-06	mg/kg-day	2.86E-02	mg/kg-day	1.08E-04	5.63E-05

Notes:
The HQ for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
HQ = Hazard Quotient
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RfD = Reference Dose
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	2.30E-10	9.60E-11	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	2.99E-07	1.25E-07
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	3.53E-11	1.47E-11	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	4.59E-08	1.91E-08
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	3.42E-12	1.43E-12	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	4.45E-09	1.85E-09
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	3.18E-12	1.33E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	4.14E-08	1.73E-08
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	9.55E-12	3.98E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.24E-07	5.18E-08
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	7.80E-12	3.25E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.01E-07	4.23E-08
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	4.54E-12	1.89E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.90E-08	2.46E-08
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	2.55E-12	1.06E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	3.31E-08	1.38E-08
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	3.95E-12	1.65E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.14E-08	2.14E-08
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	1.99E-09	8.27E-10	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	2.58E-08	1.08E-08
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	4.09E-11	1.70E-11	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	5.31E-10	2.21E-10
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	1.73E-12	7.19E-13	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	2.24E-07	9.34E-08
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.14E-13	4.76E-14	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	7.42E-10	3.09E-10
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	1.57E-12	6.52E-13	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	1.02E-07	4.24E-08
	2,3,7,8- TCDF	4.10E-06	mg/kg	1.09E-12	4.53E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.41E-08	5.89E-09
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	9.87E-09	4.11E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	6.28E-03	2.62E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.34E+00	mg/kg	1.15E-06	4.80E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	1.36E+01	mg/kg	3.61E-06	1.50E-06	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	3.41E-05	1.42E-05
	BARIUM	1.63E+02	mg/kg	4.33E-05	1.81E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	6.24E-01	mg/kg	1.66E-07	6.90E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00E+00	mg/kg	7.97E-07	3.32E-07	mg/kg-day	3.80E-01	$(mg/kg\text{-}day)^{-1}$	3.03E-07	1.26E-07
	CHROMIUM	1.16E+02	mg/kg	3.07E-05	1.28E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	1.44E+01	mg/kg	3.82E-06	1.59E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	2.01E+02	mg/kg	5.33E-05	2.22E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	2.39E-08	9.95E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	1.13E+02	mg/kg	3.01E-05	1.25E-05	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	2.55E-07	1.06E-07

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*MANGANESE*	7.32E+02	mg/kg	1.94E-04	8.10E-05	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	MERCURY	1.90E+00	mg/kg	5.06E-07	2.11E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	MOLYBDENUM	7.24E+01	mg/kg	1.92E-05	8.01E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	NICKEL	9.68E+01	mg/kg	2.57E-05	1.07E-05	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	SELENIUM	7.04E-01	mg/kg	1.87E-07	7.79E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	SILVER	3.08E+00	mg/kg	8.19E-07	3.41E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	THALLIUM	1.37E+00	mg/kg	3.64E-07	1.52E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TIN	3.20E+01	mg/kg	8.49E-06	3.54E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	VANADIUM	9.58E+01	mg/kg	2.54E-05	1.06E-05	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ZINC	2.41E+02	mg/kg	6.39E-05	2.66E-05	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	8.10E-03	mg/kg	2.15E-09	8.96E-10	mg/kg-day	1.70E+01	(mg/kg-day)$^{-1}$	3.65E-08	1.52E-08
	ALPHA-CHLORDANE	1.93E-02	mg/kg	5.12E-09	2.13E-09	mg/kg-day	1.30E+00	(mg/kg-day)$^{-1}$	6.66E-09	2.77E-09
	BETA BHC	7.14E-02	mg/kg	1.89E-08	7.89E-09	mg/kg-day	1.80E+00	(mg/kg-day)$^{-1}$	3.41E-08	1.42E-08
	4,4- DDD	1.77E-02	mg/kg	4.70E-09	1.96E-09	mg/kg-day	2.40E-01	(mg/kg-day)$^{-1}$	1.13E-09	4.70E-10
	4,4- DDE	1.53E-02	mg/kg	4.06E-09	1.69E-09	mg/kg-day	3.40E-01	(mg/kg-day)$^{-1}$	1.38E-09	5.75E-10
	4,4- DDT	8.01E-02	mg/kg	2.13E-08	8.86E-09	mg/kg-day	3.40E-01	(mg/kg-day)$^{-1}$	7.23E-09	3.01E-09
	DIELDRIN	3.13E-02	mg/kg	8.31E-09	3.46E-09	mg/kg-day	1.60E+01	(mg/kg-day)$^{-1}$	1.33E-07	5.54E-08
	ENDOSULFAN I	2.50E-03	mg/kg	6.64E-10	2.76E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ENDOSULFAN II	4.10E-03	mg/kg	1.09E-09	4.53E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	2.15E-09	8.96E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	2.15E-09	8.96E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ENRIN KETONE	9.70E-03	mg/kg	2.57E-09	1.07E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	GAMMA-BHC	1.20E-01	mg/kg	3.19E-08	1.33E-08	mg/kg-day	1.10E+00	(mg/kg-day)$^{-1}$	3.51E-08	1.46E-08
	GAMMA-CHLORDANE	1.85E-02	mg/kg	4.91E-09	2.05E-09	mg/kg-day	1.30E+00	(mg/kg-day)$^{-1}$	6.38E-09	2.66E-09
	HEPTACHLOR	4.01E-02	mg/kg	1.06E-08	4.43E-09	mg/kg-day	4.50E+00	(mg/kg-day)$^{-1}$	4.79E-08	2.00E-08
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	3.41E-09	1.42E-09	mg/kg-day	9.10E+00	(mg/kg-day)$^{-1}$	3.10E-08	1.29E-08
	HEXACHLOROBENZENE	3.38E-02	mg/kg	8.97E-09	3.74E-09	mg/kg-day	1.80E+00	(mg/kg-day)$^{-1}$	1.61E-08	6.73E-09
	METHOXYCHLOR	4.36E-02	mg/kg	1.16E-08	4.82E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	MIREX	1.00E-03	mg/kg	2.65E-10	1.11E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	TRANS NONACHLOR	8.00E-04	mg/kg	2.12E-10	8.85E-11	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	2.76E-10	1.15E-10
	PCBs									
	PCBs (TOTAL)	3.22E-01	mg/kg	8.55E-08	3.56E-08	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	4.27E-07	1.78E-07
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	1.64E-08	6.83E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	3.45E-01	mg/kg	9.16E-08	3.82E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	9.16E-08	3.82E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	1.19E-07	4.97E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	1.43E-07	5.96E-08
	BENZO(A)PYRENE	4.31E-01	mg/kg	1.14E-07	4.77E-08	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	1.37E-06	5.72E-07
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	6.82E-08	2.84E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	8.19E-08	3.41E-08
	BENZO(G,H,I)PERYLENE	2.17E-01	mg/kg	5.76E-08	2.40E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	1.11E-07	4.61E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	1.33E-07	5.53E-08
	BENZOIC ACID	1.20E+00	mg/kg	3.18E-07	1.33E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	9.16E-08	3.82E-08	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	1.28E-09	5.34E-10
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	1.00E-08	4.18E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	6.18E-02	mg/kg	1.64E-08	6.83E-09	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	3.28E-10	1.37E-10
	4- CHLOROANILINE	2.66E-01	mg/kg	7.06E-08	2.94E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	4.73E-01	mg/kg	1.26E-07	5.23E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.51E-08	6.28E-09
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	1.23E-07	5.14E-08	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	5.06E-07	2.11E-07
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	8.73E-08	3.64E-08	mg/kg-day	6.10E-01	$(mg/kg\text{-}day)^{-1}$	5.33E-08	2.22E-08
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	4.91E-08	2.05E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	5.13E-01	mg/kg	1.36E-07	5.67E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	3.77E-01	mg/kg	1.00E-07	4.17E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	9.58E-08	3.99E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	1.15E-07	4.79E-08
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	1.15E-07	4.79E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	3.53E-01	mg/kg	9.37E-08	3.90E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.20E+00	mg/kg	3.18E-07	1.33E-07	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	3.82E-08	1.59E-08
	PHENANTHRENE	3.85E-01	mg/kg	1.02E-07	4.26E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	4.81E-01	mg/kg	1.28E-07	5.31E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*PYRENE*	7.05E-01	mg/kg	1.87E-07	7.80E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	1.81E+02	mg/kg	4.80E-05	2.00E-05	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	1.30E-05	5.40E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	6.05E-05	2.52E-05	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TRPH	3.54E+03	mg/kg	9.40E-04	3.92E-04	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	1.16E-08	4.84E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BENZENE	2.54E-02	mg/kg	6.74E-09	2.81E-09	mg/kg-day	1.00E-01	(mg/kg-day)$^{-1}$	6.74E-10	2.81E-10
	2- BUTANONE	2.03E-02	mg/kg	5.39E-09	2.24E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BROMOMETHANE	4.30E-03	mg/kg	1.14E-09	4.76E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CARBON DISULFIDE	4.96E-03	mg/kg	1.32E-09	5.49E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHLOROBENZENE	2.96E-03	mg/kg	7.86E-10	3.27E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHLOROFORM	6.96E-03	mg/kg	1.85E-09	7.70E-10	mg/kg-day	3.10E-02	(mg/kg-day)$^{-1}$	5.73E-11	2.39E-11
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	5.46E-09	2.27E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ETHYLBENZENE	3.10E-02	mg/kg	8.22E-09	3.42E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	METHYLENE CHLORIDE	5.90E-02	mg/kg	1.57E-08	6.52E-09	mg/kg-day	1.40E-02	(mg/kg-day)$^{-1}$	2.19E-10	9.13E-11
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	1.99E-09	8.29E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	NAPHTHALENE	3.18E-02	mg/kg	8.43E-09	3.51E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TETRACHLOROETHENE	1.66E-02	mg/kg	4.40E-09	1.83E-09	mg/kg-day	5.40E-01	(mg/kg-day)$^{-1}$	2.37E-09	9.89E-10
	TOLUENE	2.46E-02	mg/kg	6.52E-09	2.72E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TRICHLOROETHENE	8.56E-03	mg/kg	2.27E-09	9.47E-10	mg/kg-day	4.10E-01	(mg/kg-day)$^{-1}$	9.31E-10	3.88E-10
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	3.33E-09	1.39E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	1.19E-09	4.95E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	XYLENE (TOTAL)	9.63E-02	mg/kg	2.56E-08	1.07E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	NA	NA

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	2.27E-09	9.44E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.34E+00	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	1.36E+01	mg/kg	4.97E-07	2.07E-07	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	4.70E-06	1.96E-06
	BARIUM	1.63E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	6.24E-01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00E+00	mg/kg	3.66E-09	1.52E-09	mg/kg-day	1.52E+01	$(mg/kg\text{-}day)^{-1}$	5.56E-08	2.32E-08
	CHROMIUM	1.16E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	1.44E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	2.01E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	1.13E+02	mg/kg	NA	NA	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MANGANESE	7.32E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.90E+00	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	7.24E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	9.68E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	7.04E-01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*SILVER*	3.08E+00	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37E+00	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	3.20E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	9.58E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	2.41E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	8.10E-03	mg/kg	9.87E-10	4.11E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	1.68E-08	6.99E-09
	ALPHA-CHLORDANE	1.93E-02	mg/kg	9.40E-10	3.92E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.22E-09	5.09E-10
	BETA BHC	7.14E-02	mg/kg	3.48E-09	1.45E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	6.26E-09	2.61E-09
	4,4- DDD	1.77E-02	mg/kg	6.47E-10	2.70E-10	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.55E-10	6.47E-11
	4,4- DDE	1.53E-02	mg/kg	5.59E-10	2.33E-10	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.90E-10	7.92E-11
	4,4- DDT	8.01E-02	mg/kg	2.93E-09	1.22E-09	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	9.95E-10	4.15E-10
	DIELDRIN	3.13E-02	mg/kg	3.81E-09	1.59E-09	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	6.10E-08	2.54E-08
	ENDOSULFAN I	2.50E-03	mg/kg	3.05E-10	1.27E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	4.10E-03	mg/kg	4.99E-10	2.08E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	9.87E-10	4.11E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	9.87E-10	4.11E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	9.70E-03	mg/kg	1.18E-09	4.92E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	1.20E-01	mg/kg	5.85E-09	2.44E-09	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	6.44E-09	2.68E-09
	GAMMA-CHLORDANE	1.85E-02	mg/kg	9.01E-10	3.76E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.17E-09	4.88E-10
	HEPTACHLOR	4.01E-02	mg/kg	4.89E-09	2.04E-09	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	2.20E-08	9.16E-09
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	1.56E-09	6.51E-10	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	1.42E-08	5.93E-09
	HEXACHLOROBENZENE	3.38E-02	mg/kg	4.12E-09	1.72E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	7.41E-09	3.09E-09
	METHOXYCHLOR	4.36E-02	mg/kg	2.12E-09	8.85E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	1.00E-03	mg/kg	1.22E-10	5.08E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	8.00E-04	mg/kg	3.90E-11	1.62E-11	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	5.07E-11	2.11E-11
	PCBs									
	PCBs (TOTAL)	3.22E-01	mg/kg	5.49E-08	2.29E-08	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	2.75E-07	1.14E-07
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	9.79E-09	4.08E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*ACENAPHTHYLENE*	3.45E-01	mg/kg	5.46E-08	2.28E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	5.46E-08	2.28E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	7.11E-08	2.96E-08	mg/kg-day	1.20E+00	(mg/kg-day)$^{-1}$	8.53E-08	3.56E-08
	BENZO(A)PYRENE	4.31E-01	mg/kg	6.83E-08	2.85E-08	mg/kg-day	1.20E+01	(mg/kg-day)$^{-1}$	8.20E-07	3.42E-07
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	4.07E-08	1.70E-08	mg/kg-day	1.20E+00	(mg/kg-day)$^{-1}$	4.88E-08	2.04E-08
	BENZO(G,H,I)PERYLENE	2.17E-01	mg/kg	3.44E-08	1.43E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	6.60E-08	2.75E-08	mg/kg-day	1.20E+00	(mg/kg-day)$^{-1}$	7.92E-08	3.30E-08
	BENZOIC ACID	1.20E+00	mg/kg	1.46E-07	6.09E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	4.20E-08	1.75E-08	mg/kg-day	1.40E-02	(mg/kg-day)$^{-1}$	5.88E-10	2.45E-10
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	4.60E-09	1.92E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CARBAZOLE	6.18E-02	mg/kg	7.53E-09	3.14E-09	mg/kg-day	2.00E-02	(mg/kg-day)$^{-1}$	1.51E-10	6.27E-11
	4- CHLOROANILINE	2.66E-01	mg/kg	3.24E-08	1.35E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHRYSENE	4.73E-01	mg/kg	7.49E-08	3.12E-08	mg/kg-day	1.20E-01	(mg/kg-day)$^{-1}$	8.99E-09	3.75E-09
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	7.36E-08	3.07E-08	mg/kg-day	4.10E+00	(mg/kg-day)$^{-1}$	3.02E-07	1.26E-07
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	4.01E-08	1.67E-08	mg/kg-day	6.10E-01	(mg/kg-day)$^{-1}$	2.44E-08	1.02E-08
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	2.25E-08	9.39E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	FLUORANTHENE	5.13E-01	mg/kg	8.12E-08	3.39E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	FLUORENE	3.77E-01	mg/kg	5.97E-08	2.49E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	5.72E-08	2.38E-08	mg/kg-day	1.20E+00	(mg/kg-day)$^{-1}$	6.86E-08	2.86E-08
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	6.86E-08	2.86E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	NAPHTHALENE	3.53E-01	mg/kg	5.59E-08	2.33E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.20E+00	mg/kg	1.46E-07	6.09E-08	mg/kg-day	1.20E-01	(mg/kg-day)$^{-1}$	1.75E-08	7.31E-09
	PHENANTHRENE	3.85E-01	mg/kg	6.10E-08	2.54E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	PHENOL	4.81E-01	mg/kg	7.61E-08	3.17E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	PYRENE	7.05E-01	mg/kg	1.12E-07	4.65E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	1.81E+02	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	TRPH	3.54E+03	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BENZENE	2.54E-02	mg/kg	NA	NA	mg/kg-day	1.00E-01	(mg/kg-day)$^{-1}$	NA	NA
	2- BUTANONE	2.03E-02	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BROMOMETHANE	4.30E-03	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CARBON DISULFIDE	4.96E-03	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHLOROBENZENE	2.96E-03	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHLOROFORM	6.96E-03	mg/kg	NA	NA	mg/kg-day	3.10E-02	(mg/kg-day)$^{-1}$	NA	NA
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ETHYLBENZENE	3.10E-02	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	METHYLENE CHLORIDE	5.90E-02	mg/kg	NA	NA	mg/kg-day	1.40E-02	(mg/kg-day)$^{-1}$	NA	NA
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	NAPHTHALENE	3.18E-02	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TETRACHLOROETHENE	1.66E-02	mg/kg	NA	NA	mg/kg-day	5.40E-01	(mg/kg-day)$^{-1}$	NA	NA
	TOLUENE	2.46E-02	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TRICHLOROETHENE	8.56E-03	mg/kg	NA	NA	mg/kg-day	4.10E-01	(mg/kg-day)$^{-1}$	NA	NA
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	XYLENE (TOTAL)	9.63E-02	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	9.69E-15	4.04E-15	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	1.26E-11	5.25E-12
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	1.48E-15	6.18E-16	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	1.93E-12	8.04E-13
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	1.44E-16	6.00E-17	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	1.87E-13	7.80E-14
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	1.34E-16	5.58E-17	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	1.74E-12	7.25E-13
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	4.02E-16	1.67E-16	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	5.22E-12	2.18E-12
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	3.28E-16	1.37E-16	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	4.27E-12	1.78E-12
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.91E-16	7.95E-17	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	2.48E-12	1.03E-12
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	1.07E-16	4.46E-17	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	1.39E-12	5.80E-13
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	1.66E-16	6.93E-17	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	2.16E-12	9.01E-13

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	8.35E-14	3.48E-14	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	1.09E-12	4.52E-13
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	1.72E-15	7.16E-16	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	2.23E-14	9.31E-15
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	7.25E-17	3.02E-17	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	9.43E-12	3.93E-12
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	4.80E-18	2.00E-18	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	3.12E-14	1.30E-14
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	6.58E-17	2.74E-17	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	4.28E-12	1.78E-12
	2,3,7,8- TCDF	4.10E-06	mg/kg	4.58E-17	1.91E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.95E-13	2.48E-13
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	4.15E-13	1.73E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	2.64E-07	1.10E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.34E+00	mg/kg	4.84E-11	2.02E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	1.36E+01	mg/kg	1.52E-10	6.32E-11	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	1.82E-09	7.59E-10
	BARIUM	1.63E+02	mg/kg	1.82E-09	7.59E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	6.24E-01	mg/kg	6.96E-12	2.90E-12	mg/kg-day	8.40E+00	$(mg/kg\text{-}day)^{-1}$	5.85E-11	2.44E-11
	CADMIUM	3.00E+00	mg/kg	3.35E-11	1.40E-11	mg/kg-day	1.50E+01	$(mg/kg\text{-}day)^{-1}$	5.03E-10	2.09E-10
	CHROMIUM	1.16E+02	mg/kg	1.29E-09	5.38E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	1.44E+01	mg/kg	1.61E-10	6.70E-11	mg/kg-day	9.80E+00	$(mg/kg\text{-}day)^{-1}$	1.58E-09	6.57E-10
	COPPER	2.01E+02	mg/kg	2.24E-09	9.35E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	1.00E-12	4.18E-13	mg/kg-day	5.10E+02	$(mg/kg\text{-}day)^{-1}$	5.12E-10	2.13E-10
	LEAD	1.13E+02	mg/kg	1.26E-09	5.27E-10	mg/kg-day	4.20E-02	$(mg/kg\text{-}day)^{-1}$	5.31E-11	2.21E-11
	MANGANESE	7.32E+02	mg/kg	8.17E-09	3.40E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.90E+00	mg/kg	2.13E-11	8.86E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	7.24E+01	mg/kg	8.08E-10	3.37E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	9.68E+01	mg/kg	1.08E-09	4.50E-10	mg/kg-day	9.10E-01	$(mg/kg\text{-}day)^{-1}$	9.83E-10	4.09E-10
	SELENIUM	7.04E-01	mg/kg	7.86E-12	3.27E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	3.08E+00	mg/kg	3.44E-11	1.43E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37E+00	mg/kg	1.53E-11	6.38E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	3.20E+01	mg/kg	3.57E-10	1.49E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	9.58E+01	mg/kg	1.07E-09	4.45E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	2.41E+02	mg/kg	2.69E-09	1.12E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	**PESTICIDES**									
	ALDRIN	8.10E-03	mg/kg	9.04E-14	3.77E-14	mg/kg-day	1.72E+01	$(mg/kg\text{-}day)^{-1}$	1.55E-12	6.48E-13
	ALPHA-CHLORDANE	1.93E-02	mg/kg	2.15E-13	8.97E-14	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	7.54E-14	3.14E-14
	BETA BHC	7.14E-02	mg/kg	7.97E-13	3.32E-13	mg/kg-day	1.86E+00	$(mg/kg\text{-}day)^{-1}$	1.48E-12	6.17E-13
	4,4- DDD	1.77E-02	mg/kg	1.98E-13	8.23E-14	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	4.74E-14	1.98E-14
	4,4- DDE	1.53E-02	mg/kg	1.71E-13	7.11E-14	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	5.81E-14	2.42E-14
	4,4- DDT	8.01E-02	mg/kg	8.94E-13	3.72E-13	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	3.04E-13	1.27E-13
	DIELDRIN	3.13E-02	mg/kg	3.49E-13	1.46E-13	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	5.59E-12	2.33E-12
	ENDOSULFAN I	2.50E-03	mg/kg	2.79E-14	1.16E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	4.10E-03	mg/kg	4.58E-14	1.91E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	9.04E-14	3.77E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	9.04E-14	3.77E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	9.70E-03	mg/kg	1.08E-13	4.51E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	1.20E-01	mg/kg	1.34E-12	5.58E-13	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	1.47E-12	6.14E-13
	GAMMA-CHLORDANE	1.85E-02	mg/kg	2.06E-13	8.60E-14	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	7.23E-14	3.01E-14
	HEPTACHLOR	4.01E-02	mg/kg	4.47E-13	1.86E-13	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	2.01E-12	8.39E-13
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	1.43E-13	5.97E-14	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	1.30E-12	5.43E-13
	HEXACHLOROBENZENE	3.38E-02	mg/kg	3.77E-13	1.57E-13	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	6.79E-13	2.83E-13
	METHOXYCHLOR	4.36E-02	mg/kg	4.87E-13	2.03E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	1.00E-03	mg/kg	1.12E-14	4.65E-15	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	8.00E-04	mg/kg	8.93E-15	3.72E-15	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	3.12E-15	1.30E-15
	PCBs									
	PCBs (TOTAL)	3.22E-01	mg/kg	3.59E-12	1.50E-12	mg/kg-day	2.00E+00	$(mg/kg\text{-}day)^{-1}$	7.19E-12	2.99E-12
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	5.06E-09	2.11E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	3.45E-01	mg/kg	3.85E-12	1.60E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	7.26E-09	3.02E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	5.01E-12	2.09E-12	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.95E-12	8.14E-13
	BENZO(A)PYRENE	4.31E-01	mg/kg	4.81E-12	2.01E-12	mg/kg-day	3.90E+00	$(mg/kg\text{-}day)^{-1}$	1.88E-11	7.82E-12
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	2.87E-12	1.19E-12	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.12E-12	4.66E-13

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*BENZO(G,H,I)PERYLENE*	2.17E-01	mg/kg	2.42E-12	1.01E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	4.65E-12	1.94E-12	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.81E-12	7.56E-13
	BENZOIC ACID	1.20E+00	mg/kg	1.34E-11	5.58E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	3.85E-12	1.60E-12	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	5.39E-14	2.25E-14
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	4.22E-13	1.76E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	6.18E-02	mg/kg	6.90E-13	2.87E-13	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	1.38E-14	5.75E-15
	4- CHLOROANILINE	2.66E-01	mg/kg	2.97E-12	1.24E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	4.73E-01	mg/kg	2.58E-09	1.08E-09	mg/kg-day	3.90E-02	$(mg/kg\text{-}day)^{-1}$	1.01E-10	4.19E-11
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	5.19E-12	2.16E-12	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	2.13E-11	8.86E-12
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	3.67E-12	1.53E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	2.06E-12	8.60E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	5.13E-01	mg/kg	5.72E-12	2.39E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	3.77E-01	mg/kg	1.54E-08	6.43E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	4.03E-12	1.68E-12	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.57E-12	6.55E-13
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	4.83E-12	2.01E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	3.53E-01	mg/kg	1.21E-07	5.04E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.20E+00	mg/kg	1.34E-11	5.58E-12	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.61E-12	6.70E-13
	PHENANTHRENE	3.85E-01	mg/kg	4.30E-12	1.79E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	4.81E-01	mg/kg	5.36E-12	2.23E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PYRENE	7.05E-01	mg/kg	2.73E-09	1.14E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	1.81E+02	mg/kg	2.02E-09	8.42E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	5.45E-10	2.27E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	2.55E-09	1.06E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRPH	3.54E+03	mg/kg	3.95E-08	1.65E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	5.14E-08	2.14E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	2.54E-02	mg/kg	1.37E-07	5.70E-08	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	1.37E-08	5.70E-09
	2- BUTANONE	2.03E-02	mg/kg	1.57E-08	6.56E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3c
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	BROMOMETHANE	4.30E-03	mg/kg	3.52E-08	1.47E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	4.96E-03	mg/kg	6.09E-08	2.54E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	2.96E-03	mg/kg	6.92E-09	2.88E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	6.96E-03	mg/kg	3.80E-08	1.58E-08	mg/kg-day	1.90E-02	$(mg/kg\text{-}day)^{-1}$	7.21E-10	3.01E-10
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	1.04E-07	4.35E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	3.10E-02	mg/kg	8.45E-08	3.52E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	5.90E-02	mg/kg	3.48E-07	1.45E-07	mg/kg-day	3.50E-03	$(mg/kg\text{-}day)^{-1}$	1.22E-09	5.07E-10
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	3.18E-02	mg/kg	1.09E-08	4.53E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	1.66E-02	mg/kg	9.38E-08	3.91E-08	mg/kg-day	2.10E-02	$(mg/kg\text{-}day)^{-1}$	1.97E-09	8.21E-10
	TOLUENE	2.46E-02	mg/kg	9.04E-08	3.77E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	8.56E-03	mg/kg	3.82E-08	1.59E-08	mg/kg-day	7.00E-03	$(mg/kg\text{-}day)^{-1}$	2.67E-10	1.11E-10
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	9.25E-09	3.85E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	8.25E-09	3.44E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	9.63E-02	mg/kg	2.33E-07	9.69E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Notes:
The cancer risk for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	4.00E-11	4.00E-11	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	5.21E-08	5.21E-08
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	6.14E-12	6.14E-12	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	7.98E-09	7.98E-09
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	5.95E-13	5.95E-13	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	7.74E-10	7.74E-10
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	5.54E-13	5.54E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	7.20E-09	7.20E-09
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	1.66E-12	1.66E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	2.16E-08	2.16E-08
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	1.36E-12	1.36E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.76E-08	1.76E-08
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	7.89E-13	7.89E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.03E-08	1.03E-08
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	4.43E-13	4.43E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.76E-09	5.76E-09
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	6.87E-13	6.87E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	8.94E-09	8.94E-09
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	3.45E-10	3.45E-10	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	4.49E-09	4.49E-09
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	7.10E-12	7.10E-12	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	9.23E-11	9.23E-11
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	3.00E-13	3.00E-13	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	3.90E-08	3.90E-08
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.98E-14	1.98E-14	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	1.29E-10	1.29E-10
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	2.72E-13	2.72E-13	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	1.77E-08	1.77E-08
	2,3,7,8- TCDF	4.10E-06	mg/kg	1.89E-13	1.89E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	2.46E-09	2.46E-09
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	1.72E-09	1.72E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	1.09E-03	1.09E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.34E+00	mg/kg	2.00E-07	2.00E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	1.36E+01	mg/kg	6.27E-07	6.27E-07	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	5.93E-06	5.93E-06
	BARIUM	1.63E+02	mg/kg	7.53E-06	7.53E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	6.24E-01	mg/kg	2.88E-08	2.88E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00E+00	mg/kg	1.39E-07	1.39E-07	mg/kg-day	3.80E-01	$(mg/kg\text{-}day)^{-1}$	5.26E-08	5.26E-08
	CHROMIUM	1.16E+02	mg/kg	5.34E-06	5.34E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	1.44E+01	mg/kg	6.65E-07	6.65E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	2.01E+02	mg/kg	9.27E-06	9.27E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	4.15E-09	4.15E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	1.13E+02	mg/kg	5.22E-06	5.22E-06	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	4.44E-08	4.44E-08

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*MANGANESE*	7.32E+02	mg/kg	3.38E-05	3.38E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.90E+00	mg/kg	8.79E-08	8.79E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	7.24E+01	mg/kg	3.34E-06	3.34E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	9.68E+01	mg/kg	4.46E-06	4.46E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	7.04E-01	mg/kg	3.25E-08	3.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	3.08E+00	mg/kg	1.42E-07	1.42E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37E+00	mg/kg	6.33E-08	6.33E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	3.20E+01	mg/kg	1.48E-06	1.48E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	9.58E+01	mg/kg	4.42E-06	4.42E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	2.41E+02	mg/kg	1.11E-05	1.11E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	8.10E-03	mg/kg	3.74E-10	3.74E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	6.35E-09	6.35E-09
	ALPHA-CHLORDANE	1.93E-02	mg/kg	8.90E-10	8.90E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.16E-09	1.16E-09
	BETA BHC	7.14E-02	mg/kg	3.29E-09	3.29E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	5.93E-09	5.93E-09
	4,4- DDD	1.77E-02	mg/kg	8.16E-10	8.16E-10	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.96E-10	1.96E-10
	4,4- DDE	1.53E-02	mg/kg	7.06E-10	7.06E-10	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	2.40E-10	2.40E-10
	4,4- DDT	8.01E-02	mg/kg	3.69E-09	3.69E-09	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.26E-09	1.26E-09
	DIELDRIN	3.13E-02	mg/kg	1.44E-09	1.44E-09	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	2.31E-08	2.31E-08
	ENDOSULFAN I	2.50E-03	mg/kg	1.15E-10	1.15E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	4.10E-03	mg/kg	1.89E-10	1.89E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	3.74E-10	3.74E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	3.74E-10	3.74E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	9.70E-03	mg/kg	4.47E-10	4.47E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	1.20E-01	mg/kg	5.54E-09	5.54E-09	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	6.09E-09	6.09E-09
	GAMMA-CHLORDANE	1.85E-02	mg/kg	8.53E-10	8.53E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.11E-09	1.11E-09
	HEPTACHLOR	4.01E-02	mg/kg	1.85E-09	1.85E-09	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	8.32E-09	8.32E-09
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	5.92E-10	5.92E-10	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	5.39E-09	5.39E-09
	HEXACHLOROBENZENE	3.38E-02	mg/kg	1.56E-09	1.56E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	2.81E-09	2.81E-09
	METHOXYCHLOR	4.36E-02	mg/kg	2.01E-09	2.01E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	1.00E-03	mg/kg	4.61E-11	4.61E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	TRANS NONACHLOR	8.00E-04	mg/kg	3.69E-11	3.69E-11	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	4.80E-11	4.80E-11
	PCBs									
	PCBs (TOTAL)	3.22E-01	mg/kg	1.49E-08	1.49E-08	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	7.43E-08	7.43E-08
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	2.85E-09	2.85E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	3.45E-01	mg/kg	1.59E-08	1.59E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	1.59E-08	1.59E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	2.07E-08	2.07E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	2.49E-08	2.49E-08
	BENZO(A)PYRENE	4.31E-01	mg/kg	1.99E-08	1.99E-08	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	2.39E-07	2.39E-07
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	1.19E-08	1.19E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	1.42E-08	1.42E-08
	BENZO(G,H,I)PERYLENE	2.17E-01	mg/kg	1.00E-08	1.00E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	1.92E-08	1.92E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	2.31E-08	2.31E-08
	BENZOIC ACID	1.20E+00	mg/kg	5.54E-08	5.54E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	1.59E-08	1.59E-08	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	2.23E-10	2.23E-10
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	1.74E-09	1.74E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	6.18E-02	mg/kg	2.85E-09	2.85E-09	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	5.70E-11	5.70E-11
	4- CHLOROANILINE	2.66E-01	mg/kg	1.23E-08	1.23E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	4.73E-01	mg/kg	2.18E-08	2.18E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	2.62E-09	2.62E-09
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	2.14E-08	2.14E-08	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	8.79E-08	8.79E-08
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	1.52E-08	1.52E-08	mg/kg-day	6.10E-01	$(mg/kg\text{-}day)^{-1}$	9.26E-09	9.26E-09
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	8.53E-09	8.53E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	5.13E-01	mg/kg	2.37E-08	2.37E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	3.77E-01	mg/kg	1.74E-08	1.74E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	1.67E-08	1.67E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	2.00E-08	2.00E-08
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	2.00E-08	2.00E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	3.53E-01	mg/kg	1.63E-08	1.63E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.20E+00	mg/kg	5.54E-08	5.54E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	6.64E-09	6.64E-09
	PHENANTHRENE	3.85E-01	mg/kg	1.78E-08	1.78E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	4.81E-01	mg/kg	2.22E-08	2.22E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*PYRENE*	7.05E-01	mg/kg	3.25E-08	3.25E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	1.81E+02	mg/kg	8.35E-06	8.35E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	2.25E-06	2.25E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	1.05E-05	1.05E-05	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TRPH	3.54E+03	mg/kg	1.63E-04	1.63E-04	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	2.02E-09	2.02E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BENZENE	2.54E-02	mg/kg	1.17E-09	1.17E-09	mg/kg-day	1.00E-01	(mg/kg-day)$^{-1}$	1.17E-10	1.17E-10
	2- BUTANONE	2.03E-02	mg/kg	9.36E-10	9.36E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BROMOMETHANE	4.30E-03	mg/kg	1.98E-10	1.98E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CARBON DISULFIDE	4.96E-03	mg/kg	2.29E-10	2.29E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHLOROBENZENE	2.96E-03	mg/kg	1.37E-10	1.37E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHLOROFORM	6.96E-03	mg/kg	3.21E-10	3.21E-10	mg/kg-day	3.10E-02	(mg/kg-day)$^{-1}$	9.95E-12	9.95E-12
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	9.48E-10	9.48E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ETHYLBENZENE	3.10E-02	mg/kg	1.43E-09	1.43E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	METHYLENE CHLORIDE	5.90E-02	mg/kg	2.72E-09	2.72E-09	mg/kg-day	1.40E-02	(mg/kg-day)$^{-1}$	3.81E-11	3.81E-11
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	3.46E-10	3.46E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	NAPHTHALENE	3.18E-02	mg/kg	1.47E-09	1.47E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TETRACHLOROETHENE	1.66E-02	mg/kg	7.64E-10	7.64E-10	mg/kg-day	5.40E-01	(mg/kg-day)$^{-1}$	4.12E-10	4.12E-10
	TOLUENE	2.46E-02	mg/kg	1.13E-09	1.13E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TRICHLOROETHENE	8.56E-03	mg/kg	3.95E-10	3.95E-10	mg/kg-day	4.10E-01	(mg/kg-day)$^{-1}$	1.62E-10	1.62E-10
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	5.79E-10	5.79E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	2.07E-10	2.07E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	XYLENE (TOTAL)	9.63E-02	mg/kg	4.44E-09	4.44E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	NA	NA

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	2.57E-10	2.57E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.34E+00	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	1.36E+01	mg/kg	5.64E-08	5.64E-08	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	5.33E-07	5.33E-07
	BARIUM	1.63E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	6.24E-01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00E+00	mg/kg	4.16E-10	4.16E-10	mg/kg-day	1.52E+01	$(mg/kg\text{-}day)^{-1}$	6.32E-09	6.32E-09
	CHROMIUM	1.16E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	1.44E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	2.01E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	1.13E+02	mg/kg	NA	NA	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MANGANESE	7.32E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.90E+00	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	7.24E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	9.68E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	7.04E-01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*SILVER*	3.08E+00	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37E+00	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	3.20E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	9.58E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	2.41E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	8.10E-03	mg/kg	1.12E-10	1.12E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	1.91E-09	1.91E-09
	ALPHA-CHLORDANE	1.93E-02	mg/kg	1.07E-10	1.07E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.39E-10	1.39E-10
	BETA BHC	7.14E-02	mg/kg	3.95E-10	3.95E-10	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	7.11E-10	7.11E-10
	4,4- DDD	1.77E-02	mg/kg	7.35E-11	7.35E-11	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.76E-11	1.76E-11
	4,4- DDE	1.53E-02	mg/kg	6.35E-11	6.35E-11	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	2.16E-11	2.16E-11
	4,4- DDT	8.01E-02	mg/kg	3.33E-10	3.33E-10	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.13E-10	1.13E-10
	DIELDRIN	3.13E-02	mg/kg	4.33E-10	4.33E-10	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	6.93E-09	6.93E-09
	ENDOSULFAN I	2.50E-03	mg/kg	3.46E-11	3.46E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	4.10E-03	mg/kg	5.67E-11	5.67E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	1.12E-10	1.12E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	1.12E-10	1.12E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	9.70E-03	mg/kg	1.34E-10	1.34E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	1.20E-01	mg/kg	6.65E-10	6.65E-10	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	7.31E-10	7.31E-10
	GAMMA-CHLORDANE	1.85E-02	mg/kg	1.02E-10	1.02E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.33E-10	1.33E-10
	HEPTACHLOR	4.01E-02	mg/kg	5.55E-10	5.55E-10	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	2.50E-09	2.50E-09
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	1.78E-10	1.78E-10	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	1.62E-09	1.62E-09
	HEXACHLOROBENZENE	3.38E-02	mg/kg	4.68E-10	4.68E-10	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	8.42E-10	8.42E-10
	METHOXYCHLOR	4.36E-02	mg/kg	2.41E-10	2.41E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	1.00E-03	mg/kg	1.38E-11	1.38E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	8.00E-04	mg/kg	4.43E-12	4.43E-12	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	5.76E-12	5.76E-12
	PCBs									
	PCBs (TOTAL)	3.22E-01	mg/kg	6.24E-09	6.24E-09	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	3.12E-08	3.12E-08
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	1.11E-09	1.11E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*ACENAPHTHYLENE*	3.45E-01	mg/kg	6.21E-09	6.21E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	6.21E-09	6.21E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	8.08E-09	8.08E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	9.69E-09	9.69E-09
	BENZO(A)PYRENE	4.31E-01	mg/kg	7.76E-09	7.76E-09	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	9.31E-08	9.31E-08
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	4.62E-09	4.62E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	5.55E-09	5.55E-09
	BENZO(G,H,I)PERYLENE	2.17E-01	mg/kg	3.90E-09	3.90E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	7.50E-09	7.50E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	9.00E-09	9.00E-09
	BENZOIC ACID	1.20E+00	mg/kg	1.66E-08	1.66E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	4.77E-09	4.77E-09	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	6.68E-11	6.68E-11
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	5.23E-10	5.23E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	6.18E-02	mg/kg	8.55E-10	8.55E-10	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	1.71E-11	1.71E-11
	4- CHLOROANILINE	2.66E-01	mg/kg	3.68E-09	3.68E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	4.73E-01	mg/kg	8.51E-09	8.51E-09	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.02E-09	1.02E-09
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	8.37E-09	8.37E-09	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	3.43E-08	3.43E-08
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	4.55E-09	4.55E-09	mg/kg-day	6.10E-01	$(mg/kg\text{-}day)^{-1}$	2.78E-09	2.78E-09
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	2.56E-09	2.56E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	5.13E-01	mg/kg	9.23E-09	9.23E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	3.77E-01	mg/kg	6.78E-09	6.78E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	6.49E-09	6.49E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	7.79E-09	7.79E-09
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	7.79E-09	7.79E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	3.53E-01	mg/kg	6.35E-09	6.35E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.20E+00	mg/kg	1.66E-08	1.66E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.99E-09	1.99E-09
	PHENANTHRENE	3.85E-01	mg/kg	6.93E-09	6.93E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	4.81E-01	mg/kg	8.65E-09	8.65E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PYRENE	7.05E-01	mg/kg	1.27E-08	1.27E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	1.81E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	TRPH	3.54E+03	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	2.54E-02	mg/kg	NA	NA	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2- BUTANONE	2.03E-02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BROMOMETHANE	4.30E-03	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	4.96E-03	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	2.96E-03	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	6.96E-03	mg/kg	NA	NA	mg/kg-day	3.10E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	3.10E-02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	5.90E-02	mg/kg	NA	NA	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	3.18E-02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	1.66E-02	mg/kg	NA	NA	mg/kg-day	5.40E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TOLUENE	2.46E-02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	8.56E-03	mg/kg	NA	NA	mg/kg-day	4.10E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	9.63E-02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	7.40E-14	3.85E-14	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	9.62E-11	5.00E-11
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	1.13E-14	5.89E-15	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.47E-11	7.66E-12
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	1.10E-15	5.72E-16	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.43E-12	7.43E-13
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	1.02E-15	5.32E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.33E-11	6.91E-12
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	3.07E-15	1.60E-15	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	3.99E-11	2.07E-11
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	2.51E-15	1.30E-15	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	3.26E-11	1.69E-11
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.46E-15	7.58E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.89E-11	9.85E-12
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	8.18E-16	4.25E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.06E-11	5.53E-12
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	1.27E-15	6.60E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.65E-11	8.58E-12

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
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Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	6.38E-13	3.32E-13	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	8.29E-12	4.31E-12
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	1.31E-14	6.83E-15	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	1.71E-13	8.87E-14
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	5.54E-16	2.88E-16	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	7.20E-11	3.75E-11
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	3.67E-17	1.91E-17	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	2.38E-13	1.24E-13
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	5.03E-16	2.61E-16	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	3.27E-11	1.70E-11
	2,3,7,8- TCDF	4.10E-06	mg/kg	3.49E-16	1.82E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	4.54E-12	2.36E-12
	HERBICIDES									
	2,4- D	3.72E-02	mg/kg	3.17E-12	1.65E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	2.36E+04	mg/kg	2.02E-06	1.05E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.34E+00	mg/kg	3.70E-10	1.92E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	1.36E+01	mg/kg	1.16E-09	6.03E-10	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	1.39E-08	7.23E-09
	BARIUM	1.63E+02	mg/kg	1.39E-08	7.24E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	6.24E-01	mg/kg	5.32E-11	2.76E-11	mg/kg-day	8.40E+00	$(mg/kg\text{-}day)^{-1}$	4.47E-10	2.32E-10
	CADMIUM	3.00E+00	mg/kg	2.56E-10	1.33E-10	mg/kg-day	1.50E+01	$(mg/kg\text{-}day)^{-1}$	3.84E-09	2.00E-09
	CHROMIUM	1.16E+02	mg/kg	9.86E-09	5.13E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	1.44E+01	mg/kg	1.23E-09	6.39E-10	mg/kg-day	9.80E+00	$(mg/kg\text{-}day)^{-1}$	1.20E-08	6.26E-09
	COPPER	2.01E+02	mg/kg	1.71E-08	8.91E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	9.00E-02	mg/kg	7.67E-12	3.99E-12	mg/kg-day	5.10E+02	$(mg/kg\text{-}day)^{-1}$	3.91E-09	2.03E-09
	LEAD	1.13E+02	mg/kg	9.65E-09	5.02E-09	mg/kg-day	4.20E-02	$(mg/kg\text{-}day)^{-1}$	4.05E-10	2.11E-10
	MANGANESE	7.32E+02	mg/kg	6.24E-08	3.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.90E+00	mg/kg	1.62E-10	8.44E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	7.24E+01	mg/kg	6.17E-09	3.21E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	9.68E+01	mg/kg	8.25E-09	4.29E-09	mg/kg-day	9.10E-01	$(mg/kg\text{-}day)^{-1}$	7.51E-09	3.90E-09
	SELENIUM	7.04E-01	mg/kg	6.00E-11	3.12E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	3.08E+00	mg/kg	2.63E-10	1.37E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37E+00	mg/kg	1.17E-10	6.08E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	3.20E+01	mg/kg	2.73E-09	1.42E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	9.58E+01	mg/kg	8.16E-09	4.24E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	2.41E+02	mg/kg	2.05E-08	1.07E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	**PESTICIDES**									
	ALDRIN	8.10E-03	mg/kg	6.90E-13	3.59E-13	mg/kg-day	1.72E+01	$(mg/kg\text{-}day)^{-1}$	1.19E-11	6.17E-12
	ALPHA-CHLORDANE	1.93E-02	mg/kg	1.64E-12	8.55E-13	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	5.76E-13	2.99E-13
	BETA BHC	7.14E-02	mg/kg	6.08E-12	3.16E-12	mg/kg-day	1.86E+00	$(mg/kg\text{-}day)^{-1}$	1.13E-11	5.88E-12
	4,4- DDD	1.77E-02	mg/kg	1.51E-12	7.84E-13	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	3.62E-13	1.88E-13
	4,4- DDE	1.53E-02	mg/kg	1.30E-12	6.78E-13	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	4.43E-13	2.31E-13
	4,4- DDT	8.01E-02	mg/kg	6.83E-12	3.55E-12	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	2.32E-12	1.21E-12
	DIELDRIN	3.13E-02	mg/kg	2.67E-12	1.39E-12	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	4.27E-11	2.22E-11
	ENDOSULFAN I	2.50E-03	mg/kg	2.13E-13	1.11E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	4.10E-03	mg/kg	3.49E-13	1.82E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	8.10E-03	mg/kg	6.90E-13	3.59E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	8.10E-03	mg/kg	6.90E-13	3.59E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	9.70E-03	mg/kg	8.27E-13	4.30E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	1.20E-01	mg/kg	1.02E-11	5.32E-12	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	1.13E-11	5.86E-12
	GAMMA-CHLORDANE	1.85E-02	mg/kg	1.58E-12	8.20E-13	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	5.52E-13	2.87E-13
	HEPTACHLOR	4.01E-02	mg/kg	3.42E-12	1.78E-12	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	1.54E-11	8.00E-12
	HEPTACHLOR EPOXIDE	1.28E-02	mg/kg	1.09E-12	5.69E-13	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	9.95E-12	5.18E-12
	HEXACHLOROBENZENE	3.38E-02	mg/kg	2.88E-12	1.50E-12	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	5.19E-12	2.70E-12
	METHOXYCHLOR	4.36E-02	mg/kg	3.72E-12	1.93E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	1.00E-03	mg/kg	8.52E-14	4.43E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	8.00E-04	mg/kg	6.82E-14	3.55E-14	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	2.39E-14	1.24E-14
	PCBs									
	PCBs (TOTAL)	3.22E-01	mg/kg	2.74E-11	1.43E-11	mg/kg-day	2.00E+00	$(mg/kg\text{-}day)^{-1}$	5.49E-11	2.85E-11
	SVOCs									
	ACENAPHTHENE	6.18E-02	mg/kg	9.60E-10	4.99E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	3.45E-01	mg/kg	2.94E-11	1.53E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	3.45E-01	mg/kg	1.38E-09	7.16E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	4.49E-01	mg/kg	3.83E-11	1.99E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.49E-11	7.76E-12
	BENZO(A)PYRENE	4.31E-01	mg/kg	3.68E-11	1.91E-11	mg/kg-day	3.90E+00	$(mg/kg\text{-}day)^{-1}$	1.43E-10	7.46E-11
	BENZO(B)FLUORANTHENE	2.57E-01	mg/kg	2.19E-11	1.14E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	8.54E-12	4.44E-12

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*BENZO(G,H,I)PERYLENE*	2.17E-01	mg/kg	1.85E-11	9.62E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	4.17E-01	mg/kg	3.55E-11	1.85E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.39E-11	7.21E-12
	BENZOIC ACID	1.20E+00	mg/kg	1.02E-10	5.32E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	3.45E-01	mg/kg	2.94E-11	1.53E-11	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	4.12E-13	2.14E-13
	BUTYLBENZYLPHTHALATE	3.78E-02	mg/kg	3.22E-12	1.68E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	6.18E-02	mg/kg	5.27E-12	2.74E-12	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	1.05E-13	5.48E-14
	4- CHLOROANILINE	2.66E-01	mg/kg	2.27E-11	1.18E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	4.73E-01	mg/kg	4.90E-10	2.55E-10	mg/kg-day	3.90E-02	$(mg/kg\text{-}day)^{-1}$	1.91E-11	9.93E-12
	DIBENZ(A,H)ANTHRACENE	4.65E-01	mg/kg	3.96E-11	2.06E-11	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	1.62E-10	8.45E-11
	2,6- DINITROTOLUENE	3.29E-01	mg/kg	2.80E-11	1.46E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	DI-N-BUTYLPHTHALATE	1.85E-01	mg/kg	1.58E-11	8.20E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	5.13E-01	mg/kg	4.37E-11	2.27E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	3.77E-01	mg/kg	2.93E-09	1.52E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	3.61E-01	mg/kg	3.08E-11	1.60E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.20E-11	6.24E-12
	2- METHYLNAPHTHALENE	4.33E-01	mg/kg	3.69E-11	1.92E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	3.53E-01	mg/kg	2.30E-08	1.19E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.20E+00	mg/kg	1.02E-10	5.32E-11	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.23E-11	6.38E-12
	PHENANTHRENE	3.85E-01	mg/kg	3.28E-11	1.71E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	4.81E-01	mg/kg	4.10E-11	2.13E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PYRENE	7.05E-01	mg/kg	5.19E-10	2.70E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	1.81E+02	mg/kg	1.54E-08	8.02E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	4.88E+01	mg/kg	4.16E-09	2.16E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	2.28E+02	mg/kg	1.94E-08	1.01E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRPH	3.54E+03	mg/kg	3.02E-07	1.57E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	4.38E-02	mg/kg	9.75E-09	5.07E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	2.54E-02	mg/kg	2.60E-08	1.35E-08	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	2.60E-09	1.35E-09
	2- BUTANONE	2.03E-02	mg/kg	2.99E-09	1.55E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-3d
Calculation of Cancer Risks
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	BROMOMETHANE	4.30E-03	mg/kg	6.68E-09	3.47E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	4.96E-03	mg/kg	1.16E-08	6.01E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	2.96E-03	mg/kg	1.31E-09	6.83E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	6.96E-03	mg/kg	7.21E-09	3.75E-09	mg/kg-day	1.90E-02	$(mg/kg\text{-}day)^{-1}$	1.37E-10	7.12E-11
	CIS-1,2- DICHLOROETHENE	2.06E-02	mg/kg	1.98E-08	1.03E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	3.10E-02	mg/kg	1.60E-08	8.33E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	5.90E-02	mg/kg	6.60E-08	3.43E-08	mg/kg-day	3.50E-03	$(mg/kg\text{-}day)^{-1}$	2.31E-10	1.20E-10
	4- METHYL-2-PENTANONE	7.50E-03	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	3.18E-02	mg/kg	2.06E-09	1.07E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	1.66E-02	mg/kg	1.78E-08	9.26E-09	mg/kg-day	2.10E-02	$(mg/kg\text{-}day)^{-1}$	3.74E-10	1.94E-10
	TOLUENE	2.46E-02	mg/kg	1.72E-08	8.93E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	8.56E-03	mg/kg	7.25E-09	3.77E-09	mg/kg-day	7.00E-03	$(mg/kg\text{-}day)^{-1}$	5.08E-11	2.64E-11
	1,2,4- TRIMETHYLYBENZENE	1.26E-02	mg/kg	1.76E-09	9.13E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	4.48E-03	mg/kg	1.57E-09	8.14E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	9.63E-02	mg/kg	4.41E-08	2.30E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Notes:
The cancer risk for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-3e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
Soil (0 to 10 feet)	Soil	On-Site Soil	**DIOXINS/FURANS (mg/kg)**					**DIOXINS/FURANS (mg/kg)**					
			1,2,3,4,6,7,8- HPCDD	2.99E-07	NA	1.26E-11	2.99E-07	1,2,3,4,6,7,8- HPCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.49E-06	3.49E-06
			1,2,3,4,6,7,8- HPCDF	4.59E-08	NA	1.93E-12	4.59E-08	1,2,3,4,6,7,8- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	5.35E-07	5.35E-07
			1,2,3,4,7,8,9- HPCDF	4.45E-09	NA	1.87E-13	4.45E-09	1,2,3,4,7,8,9- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	5.19E-08	5.19E-08
			1,2,3,4,7,8- HXCDD	4.14E-08	NA	1.74E-12	4.14E-08	1,2,3,4,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	4.83E-08	4.83E-08
			1,2,3,6,7,8- HXCDD	1.24E-07	NA	5.22E-12	1.24E-07	1,2,3,6,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.45E-07	1.45E-07
			1,2,3,7,8,9- HXCDD	1.01E-07	NA	4.27E-12	1.01E-07	1,2,3,7,8,9- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.18E-07	1.18E-07
			1,2,3,4,7,8- HXCDF	5.90E-08	NA	2.48E-12	5.90E-08	1,2,3,4,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.88E-08	6.88E-08
			1,2,3,6,7,8- HXCDF	3.31E-08	NA	1.39E-12	3.31E-08	1,2,3,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.86E-08	3.86E-08
			2,3,4,6,7,8- HXCDF	5.14E-08	NA	2.16E-12	5.14E-08	2,3,4,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.00E-08	6.00E-08
			1,2,3,4,6,7,8,9- OCDD	2.58E-08	NA	1.09E-12	2.58E-08	1,2,3,4,6,7,8,9- OCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.01E-05	3.01E-05
			1,2,3,4,6,7,8,9- OCDF	5.31E-10	NA	2.23E-14	5.31E-10	1,2,3,4,6,7,8,9- OCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.20E-07	6.20E-07
			1,2,3,7,8- PECDD	2.24E-07	NA	9.43E-12	2.24E-07	1,2,3,7,8- PECDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.62E-08	2.62E-08
			1,2,3,7,8- PECDF	7.42E-10	NA	3.12E-14	7.42E-10	1,2,3,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.73E-09	1.73E-09
			2,3,4,7,8- PECDF	1.02E-07	NA	4.28E-12	1.02E-07	2,3,4,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.37E-08	2.37E-08
			2,3,7,8- TCDF	1.41E-08	NA	5.95E-13	1.41E-08	2,3,7,8- TCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.65E-08	1.65E-08

Table C1-3e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			HERBICIDES (mg/kg)					**HERBICIDES (mg/kg)**					
			2,4- D	NA	NA	NA	NA	2,4- D	Circulatory System; Kidney; Liver	4.07E-06	9.33E-07	NA	5.00E-06
			INORGANICS (mg/kg)					**INORGANICS (mg/kg)**					
			ALUMINUM	NA	NA	NA	NA	ALUMINUM	Body Weight	2.58E-02	NA	7.76E-04	2.66E-02
			ANTIMONY	NA	NA	NA	NA	ANTIMONY	Blood; Whole Body	1.19E-02	NA	NA	1.19E-02
			ARSENIC	3.41E-05	4.70E-06	1.82E-09	3.88E-05	ARSENIC	Cardiovascular System; Fetal; Nervous System; Skin	4.95E-02	6.82E-03	7.29E-05	5.64E-02
			BARIUM	NA	NA	NA	NA	BARIUM	Cardiovascular System; Fetal; Kidney; NOEL	2.55E-03	NA	5.25E-05	2.60E-03
			BERYLLIUM	NA	NA	5.85E-11	5.85E-11	BERYLLIUM	GI System; Immune System; Respiratory	3.41E-04	NA	1.43E-05	3.55E-04
			CADMIUM	3.03E-07	5.56E-08	5.03E-10	3.59E-07	CADMIUM	Kidney; Respiratory	6.56E-03	1.21E-03	2.42E-05	7.79E-03
			CHROMIUM	NA	NA	NA	NA	CHROMIUM	NOEL	8.43E-05	NA	NA	8.43E-05
			COBALT	NA	NA	1.58E-09	1.58E-09	COBALT	Cardiovascular System; Respiratory	7.87E-04	NA	1.16E-04	9.04E-04
			COPPER	NA	NA	NA	NA	COPPER	GI System	5.49E-03	NA	NA	5.49E-03
			HEXAVALENT CHROMIUM	NA	NA	5.12E-10	5.12E-10	HEXAVALENT CHROMIUM	NOEL	3.28E-05	NA	1.45E-07	3.29E-05
			LEAD	2.55E-07	NA	5.31E-11	2.56E-07	LEAD	NA	NA	NA	NA	NA
			MANGANESE	NA	NA	NA	NA	MANGANESE	Nervous System	5.72E-03	NA	2.35E-03	8.07E-03
			MERCURY	NA	NA	NA	NA	MERCURY	Nervous System	6.94E-03	NA	3.41E-06	6.94E-03
			MOLYBDENUM	NA	NA	NA	NA	MOLYBDENUM	Kidney	1.58E-02	NA	NA	1.58E-02
			NICKEL	NA	NA	9.83E-10	9.83E-10	NICKEL	Body Weight; Respiratory	5.29E-03	NA	3.12E-04	5.60E-03
			SELENIUM	NA	NA	NA	NA	SELENIUM	Cardiovascular System; Liver; Nervous System; Skin	1.54E-04	NA	5.67E-09	1.54E-04
			SILVER	NA	NA	NA	NA	SILVER	Skin	6.74E-04	NA	NA	6.74E-04
			THALLIUM	NA	NA	NA	NA	THALLIUM	Blood; Liver	2.27E-02	NA	NA	2.27E-02
			TIN	NA	NA	NA	NA	TIN	Kidney; Liver	5.83E-05	NA	NA	5.83E-05
			VANADIUM	NA	NA	NA	NA	VANADIUM	NOEL	1.50E-02	NA	NA	1.50E-02
			ZINC	NA	NA	NA	NA	ZINC	Blood	8.77E-04	NA	NA	8.77E-04
			PESTICIDES (mg/kg)					**PESTICIDES (mg/kg)**					
			ALDRIN	3.65E-08	1.68E-08	1.55E-12	5.33E-08	ALDRIN	Liver	2.95E-04	1.35E-04	1.24E-08	4.31E-04
			ALPHA-CHLORDANE	6.66E-09	1.22E-09	7.54E-14	7.88E-09	ALPHA-CHLORDANE	Liver	4.22E-05	7.75E-06	4.43E-09	4.99E-05
			BETA BHC	3.41E-08	6.26E-09	1.48E-12	4.04E-08	BETA BHC	Liver	3.90E-04	7.16E-05	1.64E-08	4.62E-04
			4,4- DDD	1.13E-09	1.55E-10	4.74E-14	1.28E-09	4,4- DDD	Liver	3.87E-05	5.33E-06	1.63E-09	4.40E-05
			4,4- DDE	1.38E-09	1.90E-10	5.81E-14	1.57E-09	4,4- DDE	Liver	3.34E-05	4.60E-06	1.41E-09	3.80E-05
			4,4- DDT	7.23E-09	9.95E-10	3.04E-13	8.22E-09	4,4- DDT	Liver	1.75E-04	2.41E-05	7.36E-09	1.99E-04
			DIELDRIN	1.33E-07	6.10E-08	5.59E-12	1.94E-07	DIELDRIN	Liver	6.84E-04	3.14E-04	2.88E-08	9.98E-04
			ENDOSULFAN I	NA	NA	NA	NA	ENDOSULFAN I	Body Weight; Kidney; Nervous System	4.55E-07	2.09E-07	1.91E-11	6.64E-07
			ENDOSULFAN II	NA	NA	NA	NA	ENDOSULFAN II	Body Weight; Kidney; Nervous System	7.47E-07	3.43E-07	3.14E-11	1.09E-06

Table C1-3e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			ENDOSULFAN SULFATE	NA	NA	NA	NA	ENDOSULFAN SULFATE	Body Weight; Kidney; Nervous System	1.48E-06	6.77E-07	6.20E-11	2.15E-06
			ENDRIN ALDEHYDE	NA	NA	NA	NA	ENDRIN ALDEHYDE	Liver; Kidney; Nervous System	2.95E-05	1.35E-05	1.24E-09	4.31E-05
			ENDRIN KETONE	NA	NA	NA	NA	ENDRIN KETONE	Liver; Kidney; Nervous System	3.53E-05	1.62E-05	1.49E-09	5.16E-05
			GAMMA-BHC	3.51E-08	6.44E-09	1.47E-12	4.15E-08	GAMMA-BHC	Kidney; Liver	4.38E-04	8.03E-05	1.84E-08	5.18E-04
			GAMMA-CHLORDANE	6.38E-09	1.17E-09	7.23E-14	7.56E-09	GAMMA-CHLORDANE	Liver	4.04E-05	7.42E-06	4.25E-09	4.79E-05
			HEPTACHLOR	4.79E-08	2.20E-08	2.01E-12	6.99E-08	HEPTACHLOR	Liver	8.76E-05	4.02E-05	3.69E-09	1.28E-04
			HEPTACHLOR EPOXIDE	3.10E-08	1.42E-08	1.30E-12	4.52E-08	HEPTACHLOR EPOXIDE	Liver	1.08E-03	4.95E-04	4.54E-08	1.57E-03
			HEXACHLOROBENZENE	1.61E-08	7.41E-09	6.79E-13	2.36E-08	HEXACHLOROBENZENE	Liver	4.62E-05	2.12E-05	5.18E-09	6.74E-05
			METHOXYCHLOR	NA	NA	NA	NA	METHOXYCHLOR	Fetal	9.53E-06	1.75E-06	4.01E-10	1.13E-05
			MIREX	NA	NA	NA	NA	MIREX	Liver	5.46E-06	2.51E-06	2.30E-10	7.97E-06
			TRANS NONACHLOR	2.76E-10	5.07E-11	3.12E-15	3.27E-10	TRANS NONACHLOR	Liver	1.75E-06	3.21E-07	1.84E-10	2.07E-06
			PCBs (mg/kg)					**PCBs (mg/kg)**					
			PCBs (TOTAL)	4.27E-07	2.75E-07	7.19E-12	7.02E-07	PCBs (TOTAL)	Immune System	1.76E-02	1.13E-02	7.40E-07	2.89E-02
			SVOCs (mg/kg)					**SVOCs (mg/kg)**					
			ACENAPHTHENE	NA	NA	NA	NA	ACENAPHTHENE	Liver	1.13E-06	6.72E-07	3.47E-07	2.14E-06
			ACENAPHTHYLENE	NA	NA	NA	NA	ACENAPHTHYLENE	NA	NA	NA	NA	NA
			ANTHRACENE	NA	NA	NA	NA	ANTHRACENE	NOEL	1.26E-06	7.50E-07	9.96E-08	2.11E-06
			BENZO(A)ANTHRACENE	1.43E-07	8.53E-08	1.95E-12	2.28E-07	BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA
			BENZO(A)PYRENE	1.37E-06	8.20E-07	1.88E-11	2.19E-06	BENZO(A)PYRENE	NA	NA	NA	NA	NA
			BENZO(B)FLUORANTHENE	8.19E-08	4.88E-08	1.12E-12	1.31E-07	BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	BENZO(G,H,I)PERYLENE	Kidney; Nervous System	5.93E-06	3.54E-06	2.49E-10	9.47E-06
			BENZO(K)FLUORANTHENE	1.33E-07	7.92E-08	1.81E-12	2.12E-07	BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZOIC ACID	NA	NA	NA	NA	BENZOIC ACID	NOEL	3.28E-07	1.50E-07	1.38E-11	4.78E-07
			BIS(2-ETHYLHEXYL)PHTHAL	1.28E-09	5.88E-10	5.39E-14	1.87E-09	BIS(2-ETHYLHEXYL)PHTHAL	Liver	1.89E-05	8.65E-06	7.93E-10	2.75E-05
			BUTYLBENZYLPHTHALATE	NA	NA	NA	NA	BUTYLBENZYLPHTHALATE	Liver	2.07E-07	9.48E-08	8.68E-12	3.01E-07
			CARBAZOLE	3.28E-10	1.51E-10	1.38E-14	4.79E-10	CARBAZOLE	NA	NA	NA	NA	NA
			4- CHLOROANILINE	NA	NA	NA	NA	4- CHLOROANILINE	Spleen	7.27E-05	3.34E-05	3.06E-09	1.06E-04
			CHRYSENE	1.51E-08	8.99E-09	1.01E-10	2.42E-08	CHRYSENE	NA	NA	NA	NA	NA
			DIBENZ(A,H)ANTHRACENE	5.06E-07	3.02E-07	2.13E-11	8.08E-07	DIBENZ(A,H)ANTHRACENE	NA	NA	NA	NA	NA
			2,6- DINITROTOLUENE	5.33E-08	2.44E-08	NA	7.77E-08	2,6- DINITROTOLUENE	NA	3.60E-04	1.65E-04	1.51E-08	5.25E-04
			DI-N-BUTYLPHTHALATE	NA	NA	NA	NA	DI-N-BUTYLPHTHALATE	Whole Body	2.02E-06	9.28E-07	8.50E-11	2.95E-06
			FLUORANTHENE	NA	NA	NA	NA	FLUORANTHENE	Blood; Kidney; Liver	1.40E-05	8.36E-06	5.89E-10	2.24E-05
			FLUORENE	NA	NA	NA	NA	FLUORENE	Blood	1.03E-05	6.15E-06	1.59E-06	1.80E-05
			INDENO(1,2,3-CD)PYRENE	1.15E-07	6.86E-08	1.57E-12	1.84E-07	INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA
			2- METHYLNAPHTHALENE	NA	NA	NA	NA	2- METHYLNAPHTHALENE	Body Weight; Respiratory	1.18E-04	7.06E-05	NA	1.89E-04
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	1.93E-05	1.15E-05	5.81E-04	6.12E-04
			PENTACHLOROPHENOL	3.82E-08	1.75E-08	1.61E-12	5.58E-08	PENTACHLOROPHENOL	Liver; Kidney	4.37E-05	2.01E-05	1.84E-09	6.38E-05

Table C1-3e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

				Carcinogenic Risk						Non-Carconogenic Hazard Index			
Medium	**Exposure Medium**	**Exposure Point**	**Chemical**	**Ingestion**	**Dermal**	**Inhalation (Outdoor)**	**Exposure Routes Total**	**Chemical**	**Primary Target Organ**	**Ingestion HQ**	**Dermal HQ**	**Inhalation (Outdoor) HQ**	**Total HI**
			PHENANTHRENE	NA	NA	NA	NA	PHENANTHRENE	NOEL	1.40E-06	8.37E-07	5.90E-11	2.24E-06
			PHENOL	NA	NA	NA	NA	PHENOL	Cardiovascular System; Fetal; Kidney; Liver; Nervous System	8.75E-07	5.22E-07	3.87E-10	1.40E-06
			PYRENE	NA	NA	NA	NA	PYRENE	Kidney	2.57E-05	1.53E-05	3.75E-07	4.14E-05
			TPH (mg/kg)					**TPH (mg/kg)**					
			TPH AS DIESEL	NA	NA	NA	NA	TPH AS DIESEL	NA	NA	NA	NA	NA
			TPH AS GASOLINE	NA	NA	NA	NA	TPH AS GASOLINE	NA	NA	NA	NA	NA
			TPH AS MOTOR OIL	NA	NA	NA	NA	TPH AS MOTOR OIL	NA	NA	NA	NA	NA
			TRPH	NA	NA	NA	NA	TRPH	NA	NA	NA	NA	NA
			VOCs (mg/kg)					**VOCs (mg/kg)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	5.32E-08	NA	2.35E-07	2.88E-07
			BENZENE	6.74E-10	NA	1.37E-08	1.44E-08	BENZENE	Fetal; Immune System; Nervous System; Respiratory	6.94E-06	NA	6.58E-05	7.27E-05
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	3.70E-08	NA	2.27E-07	2.64E-07
			BROMOMETHANE	NA	NA	NA	NA	BROMOMETHANE	GI System	3.36E-06	NA	1.01E-07	3.46E-06
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	5.42E-08	NA	1.25E-06	1.31E-06
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver	1.62E-07	NA	4.99E-06	5.15E-06
			CHLOROFORM	5.73E-11	NA	7.21E-10	7.79E-10	CHLOROFORM	Fetal; Kidney; Liver	7.61E-07	NA	1.83E-06	2.59E-06
			CIS-1,2- DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2- DICHLOROETHENE	Blood	2.25E-06	NA	4.30E-05	4.52E-05
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	3.38E-07	NA	1.22E-06	1.55E-06
			METHYLENE CHLORIDE	2.19E-10	NA	1.22E-09	1.44E-09	METHYLENE CHLORIDE	Cardiovascular System; Liver; Nervous System	1.07E-06	NA	1.25E-05	1.36E-05
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Kidney; Liver	1.02E-07	NA	NA	1.02E-07
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	1.74E-06	NA	5.23E-05	5.40E-05
			TETRACHLOROETHENE	2.37E-09	NA	1.97E-09	4.34E-09	TETRACHLOROETHENE	Kidney; Liver	1.81E-06	NA	3.86E-05	4.05E-05
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	1.34E-07	NA	4.35E-06	4.48E-06
			TRICHLOROETHENE	9.31E-10	NA	2.67E-10	1.20E-09	TRICHLOROETHENE	Eyes; Nervous System	3.12E-05	NA	1.57E-05	4.69E-05
			1,2,4- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLYBENZENE	NA	2.75E-07	NA	2.24E-05	2.27E-05
			1,3,5- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLYBENZENE	NA	9.79E-08	NA	2.00E-05	2.01E-05
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	5.26E-07	NA	3.35E-05	3.41E-05
Groundwater	Shallow Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	5.63E-04	5.63E-04
			BENZENE	NA	NA	9.57E-07	9.57E-07	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	4.60E-03	4.60E-03
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	3.82E-03	3.82E-03
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	3.55E-04	3.55E-04
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	2.66E-03	2.66E-03

Table C1-3e
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Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			CHLOROMETHANE	NA	NA	6.50E-08	6.50E-08	CHLOROMETHANE	NA	NA	NA	4.94E-04	4.94E-04
			CIS-1,2-DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2-DICHLOROETHENE	Blood	NA	NA	6.98E-03	6.98E-03
			1,3- DICHLOROBENZENE	NA	NA	NA	NA	1,3- DICHLOROBENZENE	NA	NA	NA	3.84E-04	3.84E-04
			1,2- DICHLOROETHENE (TOTAL)	NA	NA	NA	NA	1,2- DICHLOROETHENE (TOTAL)	Blood, Liver	NA	NA	3.28E-02	3.28E-02
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	NA	NA	7.42E-05	7.42E-05
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	NA	NA	2.12E-04	2.12E-04
			TRANS-1,2-DICHLOROETHEN	NA	NA	NA	NA	TRANS-1,2-DICHLOROETHEN	Blood; Liver	NA	NA	6.52E-04	6.52E-04
			1,2,4- TRIMETHYLBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLBENZENE	NA	NA	NA	6.60E-03	6.60E-03
			1,3,5- TRIMETHYLBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLBENZENE	NA	NA	NA	4.99E-03	4.99E-03
			VINYL CHLORIDE	NA	NA	9.07E-08	9.07E-08	VINYL CHLORIDE	GI System; Liver; Nervous System	NA	NA	8.48E-04	8.48E-04
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	NA	NA	1.49E-03	1.49E-03
Groundwater	Intermediate and Deep Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	1.25E-04	1.25E-04
			BENZENE	NA	NA	1.40E-06	1.40E-06	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	6.73E-03	6.73E-03
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	5.83E-04	5.83E-04
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	5.61E-04	5.61E-04
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	1.01E-02	1.01E-02
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Fetal; Kidney; Liver	NA	NA	2.12E-04	2.12E-04

Cancer Risk Across Soil:	4.6E-05
Cancer Risk Across Groundwater:	2.5E-06
Total Cancer Risk:	4.8E-05

HI Across Soil:	2.2E-01
HI Across Groundwater:	8.6E-02
Total HI:	3.1E-01
Total Blood HI:	7.6E-02
Total Body Weight HI:	3.5E-02
Total Cardiovascular System HI:	6.0E-02
Total Fetal/Reproductive System HI:	8.1E-02
Total GI System HI:	6.7E-03
Total Immune System HI:	4.1E-02
Total Kidney HI:	4.1E-02
Total Liver HI:	7.6E-02
Total Nervous System HI:	8.7E-02
Total NOEL HI:	1.8E-02
Total Respiratory HI:	2.9E-02
Total Skin HI:	5.7E-02
Total Whole Body HI:	1.2E-02

Notes:
EPC = Exposure point concentration
GI = Gastrointestinal
HQ = Hazard Quotient
HI = Hazard Index
mg/kg = milligrams per kilogram
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
ug/L = microgram per liter

Table C1-3f
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

				Carcinogenic Risk						Non-Carconogenic Hazard Index			
Medium	**Exposure Medium**	**Exposure Point**	**Chemical**	**Ingestion**	**Dermal**	**Inhalation (Outdoor)**	**Exposure Routes Total**	**Chemical**	**Primary Target Organ**	**Ingestion HQ**	**Dermal HQ**	**Inhalation (Outdoor) HQ**	**Total HI**
Soil (0 to 10 feet)	Soil	On-Site Soil	**DIOXINS/FURANS (mg/kg)**					**DIOXINS/FURANS (mg/kg)**					
			1,2,3,4,6,7,8- HPCDD	5.21E-08	NA	9.62E-11	5.21E-08	1,2,3,4,6,7,8- HPCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	4.53E-04	4.53E-04
			1,2,3,4,6,7,8- HPCDF	7.98E-09	NA	1.47E-11	7.99E-09	1,2,3,4,6,7,8- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.95E-05	6.95E-05
			1,2,3,4,7,8,9- HPCDF	7.74E-10	NA	1.43E-12	7.75E-10	1,2,3,4,7,8,9- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.74E-06	6.74E-06
			1,2,3,4,7,8- HXCDD	7.20E-09	NA	1.33E-11	7.21E-09	1,2,3,4,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.27E-06	6.27E-06
			1,2,3,6,7,8- HXCDD	2.16E-08	NA	3.99E-11	2.16E-08	1,2,3,6,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.88E-05	1.88E-05
			1,2,3,7,8,9- HXCDD	1.76E-08	NA	3.26E-11	1.77E-08	1,2,3,7,8,9- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.54E-05	1.54E-05
			1,2,3,4,7,8- HXCDF	1.03E-08	NA	1.89E-11	1.03E-08	1,2,3,4,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	8.93E-06	8.93E-06
			1,2,3,6,7,8- HXCDF	5.76E-09	NA	1.06E-11	5.77E-09	1,2,3,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	5.02E-06	5.02E-06
			2,3,4,6,7,8- HXCDF	8.94E-09	NA	1.65E-11	8.95E-09	2,3,4,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	7.78E-06	7.78E-06
			1,2,3,4,6,7,8,9- OCDD	4.49E-09	NA	8.29E-12	4.49E-09	1,2,3,4,6,7,8,9- OCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.91E-03	3.91E-03
			1,2,3,4,6,7,8,9- OCDF	9.23E-11	NA	1.71E-13	9.25E-11	1,2,3,4,6,7,8,9- OCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	8.05E-05	8.05E-05
			1,2,3,7,8- PECDD	3.90E-08	NA	7.20E-11	3.91E-08	1,2,3,7,8- PECDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.40E-06	3.40E-06
			1,2,3,7,8- PECDF	1.29E-10	NA	2.38E-13	1.29E-10	1,2,3,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.25E-07	2.25E-07
			2,3,4,7,8- PECDF	1.77E-08	NA	3.27E-11	1.77E-08	2,3,4,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.08E-06	3.08E-06
			2,3,7,8- TCDF	2.46E-09	NA	4.54E-12	2.46E-09	2,3,7,8- TCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.14E-06	2.14E-06

Table C1-3f
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Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			HERBICIDES (mg/kg)					**HERBICIDES (mg/kg)**					
			2,4- D	NA	NA	NA	NA	2,4- D	Circulatory System; Kidney; Liver	1.20E-05	1.80E-06	NA	1.38E-05
			INORGANICS (mg/kg)					**INORGANICS (mg/kg)**					
			ALUMINUM	NA	NA	NA	NA	ALUMINUM	Body Weight	7.64E-02	NA	1.01E-01	1.77E-01
			ANTIMONY	NA	NA	NA	NA	ANTIMONY	Blood; Whole Body	3.50E-02	NA	NA	3.50E-02
			ARSENIC	5.93E-06	5.33E-07	1.39E-08	6.47E-06	ARSENIC	Cardiovascular System; Fetal; Nervous System; Skin	1.46E-01	1.32E-02	9.47E-03	1.69E-01
			BARIUM	NA	NA	NA	NA	BARIUM	Cardiovascular System; Fetal; Kidney; NOEL	7.53E-03	NA	6.81E-03	1.43E-02
			BERYLLIUM	NA	NA	4.47E-10	4.47E-10	BERYLLIUM	GI System; Immune System; Respiratory	1.01E-03	NA	1.86E-03	2.87E-03
			CADMIUM	5.26E-08	6.32E-09	3.84E-09	6.28E-08	CADMIUM	Kidney; Respiratory	1.94E-02	2.33E-03	3.14E-03	2.49E-02
			CHROMIUM	NA	NA	NA	NA	CHROMIUM	NOEL	2.49E-04	NA	NA	2.49E-04
			COBALT	NA	NA	1.20E-08	1.20E-08	COBALT	Cardiovascular System; Respiratory	2.33E-03	NA	1.51E-02	1.74E-02
			COPPER	NA	NA	NA	NA	COPPER	GI System	1.62E-02	NA	NA	1.62E-02
			HEXAVALENT CHROMIUM	NA	NA	3.91E-09	3.91E-09	HEXAVALENT CHROMIUM	NOEL	9.69E-05	NA	1.88E-05	1.16E-04
			LEAD	4.44E-08	NA	4.05E-10	4.48E-08	LEAD	NA	NA	NA	NA	NA
			MANGANESE	NA	NA	NA	NA	MANGANESE	Nervous System	1.69E-02	NA	3.06E-01	3.22E-01
			MERCURY	NA	NA	NA	NA	MERCURY	Nervous System	2.05E-02	NA	4.42E-04	2.09E-02
			MOLYBDENUM	NA	NA	NA	NA	MOLYBDENUM	Kidney	4.68E-02	NA	NA	4.68E-02
			NICKEL	NA	NA	7.51E-09	7.51E-09	NICKEL	Body Weight; Respiratory	1.56E-02	NA	4.04E-02	5.61E-02
			SELENIUM	NA	NA	NA	NA	SELENIUM	Cardiovascular System; Liver; Nervous System; Skin	4.55E-04	NA	7.36E-07	4.55E-04
			SILVER	NA	NA	NA	NA	SILVER	Skin	1.99E-03	NA	NA	1.99E-03
			THALLIUM	NA	NA	NA	NA	THALLIUM	Blood; Liver	6.72E-02	NA	NA	6.72E-02
			TIN	NA	NA	NA	NA	TIN	Kidney; Liver	1.72E-04	NA	NA	1.72E-04
			VANADIUM	NA	NA	NA	NA	VANADIUM	NOEL	4.42E-02	NA	NA	4.42E-02
			ZINC	NA	NA	NA	NA	ZINC	Blood	2.59E-03	NA	NA	2.59E-03
			PESTICIDES (mg/kg)					**PESTICIDES (mg/kg)**					
			ALDRIN	6.35E-09	1.91E-09	1.19E-11	8.27E-09	ALDRIN	Liver	8.72E-04	2.62E-04	1.61E-06	1.13E-03
			ALPHA-CHLORDANE	1.16E-09	1.39E-10	5.76E-13	1.30E-09	ALPHA-CHLORDANE	Liver	1.25E-04	1.50E-05	5.76E-07	1.40E-04
			BETA BHC	5.93E-09	7.11E-10	1.13E-11	6.65E-09	BETA BHC	Liver	1.15E-03	1.38E-04	2.13E-06	1.29E-03
			4,4- DDD	1.96E-10	1.76E-11	3.62E-13	2.14E-10	4,4- DDD	Liver	1.14E-04	1.03E-05	2.11E-07	1.25E-04
			4,4- DDE	2.40E-10	2.16E-11	4.43E-13	2.62E-10	4,4- DDE	Liver	9.88E-05	8.89E-06	1.83E-07	1.08E-04
			4,4- DDT	1.26E-09	1.13E-10	2.32E-12	1.37E-09	4,4- DDT	Liver	5.17E-04	4.66E-05	9.56E-07	5.65E-04
			DIELDRIN	2.31E-08	6.93E-09	4.27E-11	3.01E-08	DIELDRIN	Liver	2.02E-03	6.06E-04	3.73E-06	2.63E-03
			ENDOSULFAN I	NA	NA	NA	NA	ENDOSULFAN I	Body Weight; Kidney; Nervous System	1.35E-06	4.04E-07	2.49E-09	1.75E-06
			ENDOSULFAN II	NA	NA	NA	NA	ENDOSULFAN II	Body Weight; Kidney; Nervous System	2.21E-06	6.62E-07	4.08E-09	2.87E-06

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Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			ENDOSULFAN SULFATE	NA	NA	NA	NA	ENDOSULFAN SULFATE	Body Weight; Kidney; Nervous System	4.36E-06	1.31E-06	8.05E-09	5.67E-06
			ENDRIN ALDEHYDE	NA	NA	NA	NA	ENDRIN ALDEHYDE	Liver; Kidney; Nervous System	8.72E-05	2.62E-05	1.61E-07	1.13E-04
			ENDRIN KETONE	NA	NA	NA	NA	ENDRIN KETONE	Liver; Kidney; Nervous System	1.04E-04	3.13E-05	1.93E-07	1.36E-04
			GAMMA-BHC	6.09E-09	7.31E-10	1.13E-11	6.84E-09	GAMMA-BHC	Kidney; Liver	1.29E-03	1.55E-04	2.39E-06	1.45E-03
			GAMMA-CHLORDANE	1.11E-09	1.33E-10	5.52E-13	1.24E-09	GAMMA-CHLORDANE	Liver	1.19E-04	1.43E-05	5.52E-07	1.34E-04
			HEPTACHLOR	8.32E-09	2.50E-09	1.54E-11	1.08E-08	HEPTACHLOR	Liver	2.59E-04	7.77E-05	4.78E-07	3.37E-04
			HEPTACHLOR EPOXIDE	5.39E-09	1.62E-09	9.95E-12	7.01E-09	HEPTACHLOR EPOXIDE	Liver	3.19E-03	9.56E-04	5.89E-06	4.15E-03
			HEXACHLOROBENZENE	2.81E-09	8.42E-10	5.19E-12	3.65E-09	HEXACHLOROBENZENE	Liver	1.36E-04	4.09E-05	6.72E-07	1.78E-04
			METHOXYCHLOR	NA	NA	NA	NA	METHOXYCHLOR	Fetal	2.82E-05	3.38E-06	5.20E-08	3.16E-05
			MIREX	NA	NA	NA	NA	MIREX	Liver	1.61E-05	4.84E-06	2.98E-08	2.10E-05
			TRANS NONACHLOR	4.80E-11	5.76E-12	2.39E-14	5.38E-11	TRANS NONACHLOR	Liver	5.17E-06	6.20E-07	2.39E-08	5.81E-06
			PCBs (mg/kg)					**PCBs (mg/kg)**					
			PCBs (TOTAL)	7.43E-08	3.12E-08	5.49E-11	1.06E-07	PCBs (TOTAL)	Immune System	5.20E-02	2.18E-02	9.61E-05	7.39E-02
			SVOCs (mg/kg)					**SVOCs (mg/kg)**					
			ACENAPHTHENE	NA	NA	NA	NA	ACENAPHTHENE	Liver	3.33E-06	1.30E-06	1.12E-06	5.74E-06
			ACENAPHTHYLENE	NA	NA	NA	NA	ACENAPHTHYLENE	NA	NA	NA	NA	NA
			ANTHRACENE	NA	NA	NA	NA	ANTHRACENE	NOEL	3.71E-06	1.45E-06	3.21E-07	5.48E-06
			BENZO(A)ANTHRACENE	2.49E-08	9.69E-09	1.49E-11	3.46E-08	BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA
			BENZO(A)PYRENE	2.39E-07	9.31E-08	1.43E-10	3.32E-07	BENZO(A)PYRENE	NA	NA	NA	NA	NA
			BENZO(B)FLUORANTHENE	1.42E-08	5.55E-09	8.54E-12	1.98E-08	BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	BENZO(G,H,I)PERYLENE	Kidney; Nervous System	1.75E-05	6.83E-06	3.24E-08	2.44E-05
			BENZO(K)FLUORANTHENE	2.31E-08	9.00E-09	1.39E-11	3.21E-08	BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZOIC ACID	NA	NA	NA	NA	BENZOIC ACID	NOEL	9.69E-07	2.91E-07	1.79E-09	1.26E-06
			BIS(2-ETHYLHEXYL)PHTHA	2.23E-10	6.68E-11	4.12E-13	2.90E-10	BIS(2-ETHYLHEXYL)PHTHA	Liver	5.57E-05	1.67E-05	1.03E-07	7.25E-05
			BUTYLBENZYLPHTHALATE	NA	NA	NA	NA	BUTYLBENZYLPHTHALATE	Liver	6.10E-07	1.83E-07	1.13E-09	7.94E-07
			CARBAZOLE	5.70E-11	1.71E-11	1.05E-13	7.42E-11	CARBAZOLE	NA	NA	NA	NA	NA
			4- CHLOROANILINE	NA	NA	NA	NA	4- CHLOROANILINE	Spleen	2.15E-04	6.44E-05	3.97E-07	2.80E-04
			CHRYSENE	2.62E-09	1.02E-09	1.91E-11	3.66E-09	CHRYSENE	NA	NA	NA	NA	NA
			DIBENZ(A,H)ANTHRACENE	8.79E-08	3.43E-08	1.62E-10	1.22E-07	DIBENZ(A,H)ANTHRACENE	NA	NA	NA	NA	NA
			2,6- DINITROTOLUENE	9.26E-09	2.78E-09	NA	1.20E-08	2,6- DINITROTOLUENE	NA	1.06E-03	3.19E-04	1.96E-06	1.38E-03
			DI-N-BUTYLPHTHALATE	NA	NA	NA	NA	DI-N-BUTYLPHTHALATE	Whole Body	5.97E-06	1.79E-06	1.10E-08	7.78E-06
			FLUORANTHENE	NA	NA	NA	NA	FLUORANTHENE	Blood; Kidney; Liver	4.14E-05	1.62E-05	7.65E-08	5.76E-05
			FLUORENE	NA	NA	NA	NA	FLUORENE	Blood	3.04E-05	1.19E-05	5.12E-06	4.74E-05
			INDENO(1,2,3-CD)PYRENE	2.00E-08	7.79E-09	1.20E-11	2.78E-08	INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA
			2- METHYLNAPHTHALENE	NA	NA	NA	NA	2- METHYLNAPHTHALENE	Body Weight; Respiratory	3.50E-04	1.36E-04	NA	4.86E-04
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	5.70E-05	2.22E-05	1.87E-03	1.95E-03
			PENTACHLOROPHENOL	6.64E-09	1.99E-09	1.23E-11	8.65E-09	PENTACHLOROPHENOL	Liver; Kidney	1.29E-04	3.87E-05	2.39E-07	1.68E-04
			PHENANTHRENE	NA	NA	NA	NA	PHENANTHRENE	NOEL	4.14E-06	1.62E-06	7.66E-09	5.77E-06

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Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			PHENOL	NA	NA	NA	NA	PHENOL	Cardiovascular System; Fetal; Kidney; Liver; Nervous System	2.59E-06	1.01E-06	5.02E-08	3.65E-06
			PYRENE	NA	NA	NA	NA	PYRENE	Kidney	7.59E-05	2.96E-05	1.21E-06	1.07E-04
			TPH (mg/kg)					**TPH (mg/kg)**					
			TPH AS DIESEL	NA	NA	NA	NA	TPH AS DIESEL	NA	NA	NA	NA	NA
			TPH AS GASOLINE	NA	NA	NA	NA	TPH AS GASOLINE	NA	NA	NA	NA	NA
			TPH AS MOTOR OIL	NA	NA	NA	NA	TPH AS MOTOR OIL	NA	NA	NA	NA	NA
			TRPH	NA	NA	NA	NA	TRPH	NA	NA	NA	NA	NA
			VOCs (mg/kg)					**VOCs (mg/kg)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	1.57E-07	NA	7.59E-07	9.16E-07
			BENZENE	1.17E-10	NA	2.60E-09	2.71E-09	BENZENE	Fetal; Immune System; Nervous System; Respiratory	2.05E-05	NA	2.12E-04	2.33E-04
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	1.09E-07	NA	7.31E-07	8.40E-07
			BROMOMETHANE	NA	NA	NA	NA	BROMOMETHANE	GI System	9.92E-06	NA	3.27E-07	1.02E-05
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	1.60E-07	NA	4.04E-06	4.20E-06
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver	4.78E-07	NA	1.61E-05	1.66E-05
			CHLOROFORM	9.95E-12	NA	1.37E-10	1.47E-10	CHLOROFORM	Fetal; Kidney; Liver	2.25E-06	NA	5.89E-06	8.14E-06
			CIS-1,2- DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2- DICHLOROETHENE	Blood	6.64E-06	NA	1.39E-04	1.45E-04
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	1.00E-06	NA	3.92E-06	4.92E-06
			METHYLENE CHLORIDE	3.81E-11	NA	2.31E-10	2.69E-10	METHYLENE CHLORIDE	Cardiovascular System; Liver; Nervous System	3.17E-06	NA	4.04E-05	4.36E-05
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Kidney; Liver	3.03E-07	NA	NA	3.03E-07
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	5.13E-06	NA	1.69E-04	1.74E-04
			TETRACHLOROETHENE	4.12E-10	NA	3.74E-10	7.86E-10	TETRACHLOROETHENE	Kidney; Liver	5.35E-06	NA	1.25E-04	1.30E-04
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	3.97E-07	NA	1.40E-05	1.44E-05
			TRICHLOROETHENE	1.62E-10	NA	5.08E-11	2.13E-10	TRICHLOROETHENE	Eyes; Nervous System	9.21E-05	NA	5.08E-05	1.43E-04
			1,2,4- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLYBENZENE	NA	8.11E-07	NA	7.23E-05	7.31E-05
			1,3,5- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLYBENZENE	NA	2.89E-07	NA	6.45E-05	6.48E-05
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	1.55E-06	NA	1.08E-04	1.10E-04
Groundwater	Shallow Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	1.82E-03	1.82E-03
			BENZENE	NA	NA	1.82E-07	1.82E-07	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	1.49E-02	1.49E-02
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	1.23E-02	1.23E-02
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	1.14E-03	1.14E-03
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	8.57E-03	8.57E-03
			CHLOROMETHANE	NA	NA	1.23E-08	1.23E-08	CHLOROMETHANE	NA	NA	NA	1.59E-03	1.59E-03

Table C1-3f
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			CIS-1,2-DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2-DICHLOROETHENE	Blood	NA	NA	2.25E-02	2.25E-02
			1,3- DICHLOROBENZENE	NA	NA	NA	NA	1,3- DICHLOROBENZENE	NA	NA	NA	1.24E-03	1.24E-03
			1,2- DICHLOROETHENE (TOTAL)	NA	NA	NA	NA	1,2- DICHLOROETHENE (TOTAL)	Blood, Liver	NA	NA	1.06E-01	1.06E-01
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	NA	NA	2.39E-04	2.39E-04
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	NA	NA	6.85E-04	6.85E-04
			TRANS-1,2-DICHLOROETHEN	NA	NA	NA	NA	TRANS-1,2-DICHLOROETHEN	Blood; Liver	NA	NA	2.10E-03	2.10E-03
			1,2,4- TRIMETHYLBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLBENZENE	NA	NA	NA	2.13E-02	2.13E-02
			1,3,5- TRIMETHYLBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLBENZENE	NA	NA	NA	1.61E-02	1.61E-02
			VINYL CHLORIDE	NA	NA	1.72E-08	1.72E-08	VINYL CHLORIDE	GI System; Liver; Nervous System	NA	NA	2.74E-03	2.74E-03
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	NA	NA	4.80E-03	4.80E-03
Groundwater	Intermediate and Deep Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	4.02E-04	4.02E-04
			BENZENE	NA	NA	2.66E-07	2.66E-07	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	2.17E-02	2.17E-02
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	1.88E-03	1.88E-03
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	1.81E-03	1.81E-03
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	3.26E-02	3.26E-02
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Fetal; Kidney; Liver	NA	NA	6.85E-04	6.85E-04

Cancer Risk Across Soil:	7.6E-06
Cancer Risk Across Groundwater:	4.8E-07
Total Cancer Risk:	8.1E-06

HI Across Soil:	1.1E+00
HI Across Groundwater:	2.8E-01
Total HI:	1.4E+00
Total Blood HI:	2.4E-01
Total Body Weight HI:	2.4E-01
Total Cardiovascular System HI:	2.0E-01
Total Fetal/Reproductive System HI:	2.6E-01
Total GI System HI:	2.2E-02
Total Immune System HI:	1.1E-01
Total Kidney HI:	1.3E-01
Total Liver HI:	2.4E-01
Total Nervous System HI:	5.6E-01
Total NOEL HI:	5.9E-02
Total Respiratory HI:	1.5E-01
Total Skin HI:	1.7E-01
Total Whole Body HI:	3.5E-02

Notes:
EPC = Exposure point concentration
GI = Gastrointestinal
HQ = Hazard Quotient
HI = Hazard Index
mg/kg = milligrams per kilogram
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
ug/L = microgram per liter

Table C1-3g
Summary of Estimated Cancer Risks and Hazard Indices for Soil
Upland Areas - Mixed Zone HQ = 10
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	RME Result			
	Baseline Cancer Risk*	**Baseline Hazard Index***	**Residual Cancer Risk**	**Residual Hazard Index**
Recreational User - Future				
Total Risk Across Soil	5.3E-05	2.7E-01	4.6E-05	2.2E-01
Total Risk Across Soil (without arsenic)	6.7E-06	2.0E-01	6.9E-06	1.7E-01
Construction Worker - Future				
Total Risk Across Soil	8.8E-06	1.2E+00	7.6E-06	1.1E+00
Total Risk Across Soil (without arsenic)	1.1E-06	1.0E+00	1.1E-06	9.5E-01

Notes:

RME = Reasonable Maximum Exposure

* - Baseline HHRA did not include full data set; outlier concentrations were excluded.

Table C1-3h

Comparison of EPCs, Cancer Risk Estimates, and Hazard Indices from Baseline Risk Assessment

Upland Areas - Mixed Zone HQ = 10

Investigation Area H1 Feasibility Study

Mare Island, Vallejo, California

	Baseline Risk Estimates					Mixed Zone (HQ = 10)				
		Recreational User		Construction Worker			Recreational User		Construction Worker	
Chemical of Potential Concern	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**
INORGANICS (mg/kg)										
ALUMINUM	21171	NA	2.38E-02	NA	1.59E-01	23649	NA	2.66E-02	NA	1.77E-01
ANTIMONY	5.2	NA	1.42E-02	NA	4.20E-02	4.34	NA	1.19E-02	NA	3.50E-02
ARSENIC	16.1	4.59E-05	6.68E-02	7.67E-06	2.00E-01	13.6	3.88E-05	5.64E-02	6.47E-06	1.69E-01
BARIUM	169	NA	2.69E-03	NA	1.48E-02	163	NA	2.60E-03	NA	1.43E-02
BERYLLIUM	0.72	6.75E-11	4.10E-04	5.15E-10	3.31E-03	0.62	5.85E-11	3.55E-04	4.47E-10	2.87E-03
CADMIUM	3.39	4.05E-07	8.80E-03	7.09E-08	2.81E-02	3.00	3.59E-07	7.79E-03	6.28E-08	2.49E-02
CHROMIUM	137	NA	9.98E-05	NA	2.95E-04	116	NA	8.43E-05	NA	2.49E-04
COBALT	13.1	1.43E-09	8.21E-04	1.09E-08	1.58E-02	14.4	1.58E-09	9.04E-04	1.20E-08	1.74E-02
COPPER	189	NA	5.16E-03	NA	1.53E-02	201	NA	5.49E-03	NA	1.62E-02
HEXAVALENT CHROMIUM	0.09	5.12E-10	3.29E-05	3.91E-09	1.16E-04	0.09	5.12E-10	3.29E-05	3.91E-09	1.16E-04
LEAD	169	3.81E-07	NA	6.69E-08	NA	113	2.56E-07	NA	4.48E-08	NA
MANGANESE	726	NA	8.00E-03	NA	3.20E-01	732	NA	8.07E-03	NA	3.22E-01
MERCURY	2.4	NA	8.75E-03	NA	2.64E-02	1.90	NA	6.94E-03	NA	2.09E-02
MOLYBDENUM	7.6	NA	1.66E-03	NA	4.91E-03	72	NA	1.58E-02	NA	4.68E-02
NICKEL	115	1.17E-09	6.65E-03	8.92E-09	6.66E-02	97	9.83E-10	5.60E-03	7.51E-09	5.61E-02
SELENIUM	0.7	NA	1.62E-04	NA	4.79E-04	0.70	NA	1.54E-04	NA	4.55E-04
SILVER	3.9	NA	8.52E-04	NA	2.52E-03	3.08	NA	6.74E-04	NA	1.99E-03
THALLIUM	0.60	NA	9.94E-03	NA	2.94E-02	1.37	NA	2.27E-02	NA	6.72E-02
TIN	25	NA	4.55E-05	NA	1.35E-04	32	NA	5.83E-05	NA	1.72E-04
VANADIUM	106	NA	1.65E-02	NA	4.89E-02	96	NA	1.50E-02	NA	4.42E-02
ZINC	296	NA	1.08E-03	NA	3.19E-03	241	NA	8.77E-04	NA	2.59E-03
PCBs (mg/kg)										
PCBs (TOTAL)	0.97	2.11E-06	8.71E-02	3.18E-07	2.23E-01	0.32	7.02E-07	2.89E-02	1.06E-07	7.39E-02
SVOCs (mg/kg)										
ACENAPHTHENE	0.1	NA	3.47E-06	NA	9.29E-06	0.06	NA	2.14E-06	NA	5.74E-06
ACENAPHTHYLENE	0.20	NA	NA	NA	NA	0.35	NA	NA	NA	NA
ANTHRACENE	0.21	NA	1.28E-06	NA	3.34E-06	0.35	NA	2.11E-06	NA	5.48E-06
BENZO(A)ANTHRACENE	0.24	1.22E-07	NA	1.85E-08	NA	0.45	2.28E-07	NA	3.46E-08	NA
BENZO(A)PYRENE	0.23	1.17E-06	NA	1.77E-07	NA	0.43	2.19E-06	NA	3.32E-07	NA
BENZO(B)FLUORANTHENE	0.28	1.42E-07	NA	2.16E-08	NA	0.26	1.31E-07	NA	1.98E-08	NA
BENZO(G,H,I)PERYLENE	0.24	NA	1.05E-05	NA	2.70E-05	0.22	NA	9.47E-06	NA	2.44E-05
BENZO(K)FLUORANTHENE	0.21	1.07E-07	NA	1.62E-08	NA	0.42	2.12E-07	NA	3.21E-08	NA
CHRYSENE	0.46	2.35E-08	NA	3.56E-09	NA	0.47	2.42E-08	NA	3.66E-09	NA
DIBENZ(A,H)ANTHRACENE	0.15	2.61E-07	NA	3.95E-08	NA	0.47	8.08E-07	NA	1.22E-07	NA

Table C1-3h

Comparison of EPCs, Cancer Risk Estimates, and Hazard Indices from Baseline Risk Assessment

Upland Areas - Mixed Zone HQ = 10

Investigation Area H1 Feasibility Study

Mare Island, Vallejo, California

	Baseline Risk Estimates					Mixed Zone (HQ = 10)				
		Recreational User		Construction Worker			Recreational User		Construction Worker	
Chemical of Potential Concern	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**
FLUORANTHENE	0.52	NA	2.27E-05	NA	5.84E-05	0.51	NA	2.24E-05	NA	5.76E-05
FLUORENE	0.26	NA	1.24E-05	NA	3.27E-05	0.38	NA	1.80E-05	NA	4.74E-05
INDENO(1,2,3-CD)PYRENE	0.24	1.22E-07	NA	1.85E-08	NA	0.36	1.84E-07	NA	2.78E-08	NA
NAPHTHALENE	0.22	NA	3.81E-04	NA	1.22E-03	0.35	NA	6.12E-04	NA	1.95E-03
PHENANTHRENE	0.36	NA	2.09E-06	NA	5.39E-06	0.39	NA	2.24E-06	NA	5.77E-06
PYRENE	0.78	NA	4.58E-05	NA	1.18E-04	0.71	NA	4.14E-05	NA	1.07E-04
TPH (mg/kg)										
TPH AS DIESEL	974	NA	NA	NA	NA	180.98	NA	NA	NA	NA
TPH AS GASOLINE	136	NA	NA	NA	NA	48.81	NA	NA	NA	NA
TPH AS MOTOR OIL	317	NA	NA	NA	NA	228.08	NA	NA	NA	NA
SOIL TOTALS:		**5.1E-05**	**2.6E-01**	**8.4E-06**	**1.2E+00**		**4.4E-05**	**2.2E-01**	**7.3E-06**	**1.1E+00**
SOIL TOTALS (EXCLUDING ARSENIC):		**4.9E-06**	**2.0E-01**	**7.7E-07**	**1.0E+00**		**5.1E-06**	**1.6E-01**	**8.1E-07**	**9.3E-01**

Reduction of Cancer Risk (%):

Recreational User: **14**

Construction Worker: **13**

TABLE C1-3i
Post-Remediation Gray Fox Risk Calculations
Upland Mixed Zone (HQ = 10)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	Exposure Concentrations				Intake (mg/kg BW-day)					Hazard Quotient (HQ) - Low					Hazard Quotient (HQ) - High			
COPEC[a]	Surface Water (mg/L)[b]	Soils[c]	Small Mammal BAF[d]	Small mammal Tissue[d]	Surface Water	Soils	Small mammal	Total Intake (mg/kg/day)	Low TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake		High TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake
Dioxins/Furans (mg/kg)																			
2,3,7,8-TCDD TEQ		3.27E-05		0		1.04E-08		1.04E-08	0.000001		1.0E-02		1.0E-02		0.00001		1.0E-03		1.0E-03
PCB Congener TEQ	0.0000001	5.01E-05		0	2.16E-09	1.60E-08		1.82E-08	0.000001	2.2E-03	1.6E-02		1.8E-02		0.00001	2.2E-04	1.6E-03		1.8E-03
Metals (mg/kg)																			
Aluminum	12.6	2.36E+04	1.11E-02	262	2.72E-01	7.55E+00	2.98E+00	1.08E+01	1.93	1.4E-01	3.9E+00	1.5E+00	5.6E+00	>1	19.3	1.4E-02	3.9E-01	1.5E-01	5.6E-01
Antimony	0.003	4.34E+00	1.22E+00	5	6.48E-05	1.39E-03	6.03E-02	6.18E-02	0.059	1.1E-03	2.3E-02	1.0E+00	1.0E+00		23.4	2.8E-06	5.9E-05	2.6E-03	2.6E-03
Arsenic	0.0436	1.36E+01	--	0	9.42E-04	4.34E-03	0.00E+00	5.28E-03	0.32	2.9E-03	1.4E-02	0.0E+00	1.7E-02		4.7	2.0E-04	9.2E-04	0.0E+00	1.1E-03
Barium	0.24	1.63E+02	9.41E-02	15.4	5.10E-03	5.21E-02	1.75E-01	2.33E-01	51.8	9.8E-05	1.0E-03	3.4E-03	4.5E-03		119.0	4.3E-05	4.4E-04	1.5E-03	2.0E-03
Beryllium		6.24E-01	--	0		1.99E-04	0.00E+00	1.99E-04	0.532		3.7E-04	0.0E+00	3.7E-04		0.554		3.6E-04	0.0E+00	3.6E-04
Cadmium	0.0016	3.00E+00	--	0	3.46E-05	9.59E-04	0.00E+00	9.94E-04	0.06	5.8E-04	1.6E-02	0.0E+00	1.7E-02		2.64	1.3E-05	3.6E-04	0.0E+00	3.8E-04
Chromium +3	0.0263	1.16E+02	2.60E-02	3	5.68E-04	3.69E-02	3.44E-02	7.19E-02	2.4	2.4E-04	1.5E-02	1.4E-02	3.0E-02		23.1	2.5E-05	1.6E-03	1.5E-03	3.1E-03
Chromium +6	0.0263	1.44E+01	2.60E-02	0	5.68E-04	4.60E-03	4.28E-03	9.45E-03	5.66	1.0E-04	8.1E-04	7.6E-04	1.7E-03		35.1	1.6E-05	1.3E-04	1.2E-04	2.7E-04
Cobalt	0.0164	2.01E+02	--	0	3.54E-04	6.42E-02	0.00E+00	6.45E-02	1.2	3.0E-04	5.3E-02	0.0E+00	5.4E-02		20	1.8E-05	3.2E-03	0.0E+00	3.2E-03
Copper	0.233	9.00E-02	3.45E-01	0	5.04E-03	2.87E-05	3.55E-04	5.42E-03	2.67	1.9E-03	1.1E-05	1.3E-04	2.0E-03		632	8.0E-06	4.5E-08	5.6E-07	8.6E-06
Lead	0.0031	1.13E+02	6.10E-01	69.1	6.70E-05	3.62E-02	7.88E-01	8.25E-01	1.0	6.7E-05	3.6E-02	7.9E-01	8.2E-01		241	2.8E-07	1.5E-04	3.3E-03	3.4E-03
Manganese	7.42	7.32E+02	--	0	1.60E-01	2.34E-01	0.00E+00	3.94E-01	13.7	1.2E-02	1.7E-02	0.0E+00	2.9E-02		159	1.0E-03	1.5E-03	0.0E+00	2.5E-03
Mercury	0.00029	1.90E+00	--	0	6.27E-06	6.08E-04	0.00E+00	6.15E-04	0.25	2.5E-05	2.4E-03	0.0E+00	2.5E-03		4.0	1.6E-06	1.5E-04	0.0E+00	1.5E-04
Molybdenum	0.0312	7.24E+01	--	0	6.74E-04	2.31E-02	0.00E+00	2.38E-02	0.26	2.6E-03	8.9E-02	0.0E+00	9.2E-02		2.60	2.6E-04	8.9E-03	0.0E+00	9.2E-03
Nickel	0.166	9.68E+01	--	0	3.59E-03	3.09E-02	0.00E+00	3.45E-02	0.133	2.7E-02	2.3E-01	0.0E+00	2.6E-01		31.6	1.1E-04	9.8E-04	0.0E+00	1.1E-03
Selenium	0.029	7.04E-01	6.12E+00	4.31	6.27E-04	2.25E-04	4.91E-02	5.00E-02	0.05	1.3E-02	4.5E-03	9.8E-01	1.0E+00		1.21	5.2E-04	1.9E-04	4.1E-02	4.1E-02
Silver	0.0019	3.08E+00	--	0	4.11E-05	9.85E-04	0.00E+00	1.03E-03	0.375	1.1E-04	2.6E-03	0.0E+00	2.7E-03		3.75	1.1E-05	2.6E-04	0.0E+00	2.7E-04
Thallium		1.37E+00	1.01E+00	1.38		4.38E-04	1.58E-02	1.62E-02	0.48		9.1E-04	3.3E-02	3.4E-02		1.43		3.1E-04	1.1E-02	1.1E-02
Tin		3.20E+01	--	0		1.02E-02	0.00E+00	1.02E-02	23.40		4.4E-04	0.0E+00	4.4E-04		35.00		2.9E-04	0.0E+00	2.9E-04
Vanadium	0.05	9.58E+01	--	0	1.08E-03	3.06E-02	0.00E+00	3.17E-02	0.21	5.1E-03	1.5E-01	0.0E+00	1.5E-01		2.1	5.1E-04	1.5E-02	0.0E+00	1.5E-02
Zinc	0.042	2.41E+02	1.11E+00	267	9.08E-04	7.68E-02	3.04E+00	3.12E+00	9.6	9.5E-05	8.0E-03	3.2E-01	3.2E-01		411	2.2E-06	1.9E-04	7.4E-03	7.6E-03
Volatile Organics (mg/kg)																			
Acetone		4.38E-02		0		1.40E-05		1.40E-05	10		1.4E-06		1.4E-06		50		2.8E-07		2.8E-07
Benzene		2.54E-02		0		8.11E-06		8.11E-06	26.4		3.1E-07		3.1E-07		263.6		3.1E-08		3.1E-08
2-Butanone		2.03E-02		0		6.48E-06		6.48E-06	1771		3.7E-09		3.7E-09		4571		1.4E-09		1.4E-09
Bromomethane		4.30E-03		0		1.37E-06		1.37E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
sec-Butylbenzene		6.96E-03		0		2.22E-06		2.22E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Carbon disulfide		4.96E-03		0		1.58E-06		1.58E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Chlorobenzene		2.96E-03		0		9.45E-07		9.45E-07	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
cis-12-Dichloroethene		2.06E-02		0		6.57E-06		6.57E-06	45.2		1.5E-07		1.5E-07		452		1.5E-08		1.5E-08
Ethylbenzene		3.10E-02		0		9.89E-06		9.89E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Methylene chloride		5.90E-02		0		1.88E-05		1.88E-05	5.9		3.2E-06		3.2E-06		50		3.8E-07		3.8E-07
4-Methyl-2-pentanone		7.50E-03		0		2.39E-06		2.39E-06	25		9.6E-08		9.6E-08		250		9.6E-09		9.6E-09
Naphthalene		3.18E-02		0		1.01E-05		1.01E-05	50		2.0E-07		2.0E-07		150		6.8E-08		6.8E-08
Tetrachloroethene		1.66E-02		0		5.29E-06		5.29E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Toluene		2.46E-02		0		7.84E-06		7.84E-06	26		3.0E-07		3.0E-07		260		3.0E-08		3.0E-08
Trichloroethene		8.56E-03		0		2.73E-06		2.73E-06	0.7		3.9E-06		3.9E-06		7		3.9E-07		3.9E-07
124-Trimethylbenzene		1.26E-02		0		4.01E-06		4.01E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
135-Trimethylbenzene		4.48E-03		0		1.43E-06		1.43E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Xylene (total)		9.63E-02		0		3.08E-05		3.08E-05	2.1		1.5E-05		1.5E-05		2.6		1.2E-05		1.2E-05
Pesticides (mg/kg)																			
Aldrin		8.10E-03		0		2.59E-06		2.59E-06	0.1		2.6E-05		2.6E-05		1.0		2.6E-06		2.6E-06
alpha-Chlordane		1.93E-02		0		6.16E-06		6.16E-06	4.6		1.3E-06		1.3E-06		9.2		6.7E-07		6.7E-07
gamma Chlordane		1.85E-02		0		5.91E-06		5.91E-06	4.6		1.3E-06		1.3E-06		9.2		6.4E-07		6.4E-07
Trans nonachlor		8.00E-04		0		2.55E-07		2.55E-07	4.6		5.6E-08		5.6E-08		9.2		2.8E-08		2.8E-08
Beta BHC		7.14E-02		0		2.28E-05		2.28E-05	1.6		1.4E-05		1.4E-05		3.2		7.1E-06		7.1E-06
Gamma BHC	0.000011	1.20E-01		0	2.38E-07	3.84E-05		3.86E-05	0.05	4.8E-06	7.7E-04		7.7E-04		3.75	6.3E-08	1.0E-05		1.0E-05

TABLE C1-3i
Post-Remediation Gray Fox Risk Calculations
Upland Mixed Zone (HQ = 10)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	Exposure Concentrations				Intake (mg/kg BW-day)					Hazard Quotient (HQ) - Low					Hazard Quotient (HQ) - High			
COPEC[a]	Surface Water (mg/L)[b]	Soils[c]	Small Mammal BAF[d]	Small mammal Tissue[d]	Surface Water	Soils	Small mammal	Total Intake (mg/kg/day)	Low TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake	High TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake
2,4-D		3.72E-02		0		1.19E-05		1.19E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
DDD		1.77E-02		0		5.65E-06		5.65E-06	0.8		7.1E-06		7.1E-06	16		3.5E-07		3.5E-07
DDE	0.0000027	1.53E-02		0	5.84E-08	4.89E-06		4.94E-06	0.8	7.3E-08	6.1E-06		6.2E-06	16	3.6E-09	3.1E-07		3.1E-07
DDTs	0.00014	8.01E-02	1.04	0.083	3.03E-06	2.56E-05	9.50E-04	9.79E-04	0.8	3.8E-06	3.2E-05	1.2E-03	1.2E-03	16	1.9E-07	1.6E-06	5.9E-05	6.1E-05
Dieldrin		3.13E-02		0		1.00E-05		1.00E-05	0.02		5.0E-04		5.0E-04	0.2		5.0E-05		5.0E-05
Endosulfan I		2.50E-03		0		7.98E-07		7.98E-07	0.15		5.3E-06		5.3E-06	1.50		5.3E-07		5.3E-07
Endosulfan II		4.10E-03		0		1.31E-06		1.31E-06	0.15		8.7E-06		8.7E-06	1.50		8.7E-07		8.7E-07
Endosulfan sulfate	0.00012	8.10E-03		0	2.59E-06	2.59E-06		5.18E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Endrin aldehyde		8.10E-03		0		2.59E-06		2.59E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Endrin ketone		9.70E-03		0		3.10E-06		3.10E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Heptachlor	0.0000028	4.01E-02		0	6.05E-08	1.28E-05		1.29E-05	0.13	4.7E-07	9.9E-05		9.9E-05	6.8	8.9E-09	1.9E-06		1.9E-06
Heptachlor epoxide		1.28E-02		0		4.10E-06		4.10E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Hexachlorobenzene		3.38E-02		0		1.08E-05		1.08E-05	1.6		6.7E-06		6.7E-06	16		6.7E-07		6.7E-07
Methoxychlor		4.36E-02		0		1.39E-05		1.39E-05	2.5		5.6E-06		5.6E-06	50		2.8E-07		2.8E-07
Mirex		1.00E-03		0		3.19E-07		3.19E-07	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
SVOCs (mg/kg)				0														
Acenaphthene		6.18E-02		0		1.97E-05		1.97E-05	1.31		1.5E-05		1.5E-05	32.8		6.0E-07		6.0E-07
Acenaphthylene		3.45E-01		0		1.10E-04		1.10E-04	1.31		8.4E-05		8.4E-05	32.8		3.4E-06		3.4E-06
Anthracene		3.45E-01		0		1.10E-04		1.10E-04	1.31		8.4E-05		8.4E-05	32.8		3.4E-06		3.4E-06
Benzo(a)anthracene		4.49E-01		0		1.43E-04		1.43E-04	1.31		1.1E-04		1.1E-04	32.8		4.4E-06		4.4E-06
Benzo(a)pyrene		4.31E-01		0		1.38E-04		1.38E-04	1.31		1.1E-04		1.1E-04	32.8		4.2E-06		4.2E-06
Benzo(b)fluoranthene		2.57E-01		0		8.21E-05		8.21E-05	1.31		6.3E-05		6.3E-05	32.8		2.5E-06		2.5E-06
Benzo(g,h,i)perylene		2.17E-01		0		6.93E-05		6.93E-05	1.31		5.3E-05		5.3E-05	32.8		2.1E-06		2.1E-06
Benzo(k)fluoranthene		4.17E-01		0		1.33E-04		1.33E-04	1.31		1.0E-04		1.0E-04	32.8		4.1E-06		4.1E-06
Benzoic acid		*1.20E+00*		0		3.83E-04		3.83E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Bis(2-ethylhexyl)phthalate	0.027	3.45E-01		0	5.84E-04	1.10E-04		6.94E-04	18.3	3.2E-05	6.0E-06		3.8E-05	183	3.2E-06	6.0E-07		3.8E-06
Butylbenzylphthalate		3.78E-02		0		1.21E-05		1.21E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Carbazole		6.18E-02		0		1.97E-05		1.97E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
4-Chloroaniline		2.66E-01		0		8.49E-05		8.49E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Chrysene	0.0002	4.73E-01		0	4.32E-06	1.51E-04		1.55E-04	1.31	3.3E-06	1.2E-04		1.2E-04	32.8	1.3E-07	4.6E-06		4.7E-06
Dibenz(a,h)anthracene		4.65E-01		0		1.48E-04		1.48E-04	1.31		1.1E-04		1.1E-04	32.8		4.5E-06		4.5E-06
2,6-Dinitrotoluene		3.29E-01		0		1.05E-04		1.05E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Di-n-butylphthalate	0.009	1.85E-01		0	1.95E-04	5.91E-05		2.54E-04	550.00	3.5E-07	1.1E-07		4.6E-07	1833	1.1E-07	3.2E-08		1.4E-07
Fluoranthene		5.13E-01		0		1.64E-04		1.64E-04	1.31		1.3E-04		1.3E-04	32.8		5.0E-06		5.0E-06
Fluorene		3.77E-01		0		1.20E-04		1.20E-04	1.31		9.2E-05		9.2E-05	32.8		3.7E-06		3.7E-06
Indeno(1,2,3-cd)pyrene		3.61E-01		0		1.15E-04		1.15E-04	1.31		8.8E-05		8.8E-05	32.8		3.5E-06		3.5E-06
2-Methylnaphthalene		4.33E-01		0		1.38E-04		1.38E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Naphthalene		3.53E-01		0		1.13E-04		1.13E-04	50		2.3E-06		2.3E-06	150		7.5E-07		7.5E-07
Pentachlorophenol		1.20E+00		0		3.83E-04		3.83E-04	8.42		4.6E-05		4.6E-05	27.4		1.4E-05		1.4E-05
Phenanthrene		3.85E-01		0		1.23E-04		1.23E-04	1.31		9.4E-05		9.4E-05	32.8		3.7E-06		3.7E-06
Pyrene		7.05E-01		0		2.25E-04		2.25E-04	1.31		1.7E-04		1.7E-04	32.8		6.9E-06		6.9E-06
Phenol		4.81E-01		0		1.53E-04		1.53E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
PCBs (mg/kg)																		
PCBs (Total Congeners)	0.000016	3.22E-01	18	6	3.46E-07	1.03E-04	6.65E-02	6.66E-02	0.36	9.6E-07	2.9E-04	1.8E-01	1.8E-01	1.28	2.7E-07	8.0E-05	5.2E-02	5.2E-02
>1 = The calculated hazard quotient exceeds 1 (i.e., > 1.5)																		

Exposure Assumptions and Equation:[e]

	Value	Units
IRprey(dry wt.) =	0.177	kg/day (dry weight)
IRmammal(dry wt.) =	0.177	kg/day (dry weight)
IRsoil (dry wt.)[f] =	0.00496	kg-day (dry weight)

Intake Equation = [IRmammal(dry wt) x Cprey(mammal, dry wt) x DCF x SUF]/BW + [(IRsoil x Csoil x DCF x SUF)]/BW + [(IRsurface water x Csurface water x DCF x SUF)]/BW

Risk (hazard quotient) = Intake / TRV

Prey tissue(dry wt) = Prey tissue (wet wt.) / (1-Tissue Moisture)

TABLE C1-3i
Post-Remediation Gray Fox Risk Calculations
Upland Mixed Zone (HQ = 10)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	Exposure Concentrations				Intake (mg/kg BW-day)					Hazard Quotient (HQ) - Low					Hazard Quotient (HQ) - High			
COPEC[a]	Surface Water (mg/L)[b]	Soils[c]	Small Mammal BAF[d]	Small mammal Tissue[d]	Surface Water	Soils	Small mammal	Total Intake (mg/kg/day)	Low TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake	High TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake

IRsurface water[g]	=	0.335	L/day
Cprey	=	chem-specific	mg/kg or µg/kg
Csoil	=	chem-specific	mg/kg or µg/kg
Csurface water	=	chem-specific	mg/L or µg/L
Tissue Moisture (small mammal)	=	68%	percent
Dietary Composition Factor[h]	=	100%	percent
Site Use Factor[i]	=	25%	percent
Body Weight	=	3.88	kg

NTV = No toxicity data available.

NA = Not applicable.

Blank cell indicates COPEC was not detected in this medium.

Notes:

a Chemical of potential ecological concern; all constituents detected in soil are COPEC.
b All concentrations of constituents in surface water are based on the maximum concentration.
c All concentrations of constituents in soil are based on the maximum concentration expressed in dry weight.
d Site-specific BAFs (dry weight basis). Calculated small mammal tissue concentrations (soil concentration x BAF). Tissue concentrations are on a dry weight basis.
e Exposure parameters used to calculate risk are discussed in detail in Section 4.2 of RI (WESTON, 2006).
f Ingestion rate of soil based on 2.8 percent of of the prey ingestion rate (dry weight); based on a red fox (Beyer et al. (1994).
g Based on equation for mammals: Water intake (L/day) = $0.099Wt(kg)^{0.90}$ (EPA 1993)
h Dietary composition factor was based on a conservative assumption of 100% dietary intake of small mammals from the site.
i Site use factor was based on a conservative 100% use of the site for the fox's foraging range.

Table C1-3j
Gray Fox Risk Comparison (0 - 10 ft bgs; mixed zone)
Upland Area (HQ = 10) - Alternative 3
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

COPEC[a]	SLERA			Mixed Zone (HQ = 10)		
	EPC - Soil	HQ-TRV-low	HQ-TRV-High	EPC - Soil	HQ-TRV-low	HQ-TRV-High
Dioxins/Furans (mg/kg)						
2,3,7,8-TCDD TEQ	3.27E-05	1.58E+00 >1	1.58E-01	3.27E-05	1.04E-02	1.04E-03
PCB Congener TEQ	5.01E-05	5.91E+01 >1	5.91E+00 >1	5.01E-05	1.82E-02	1.82E-03
Metals (mg/kg)						
Aluminum	48900	4.33E+01 >1	4.33E+00 >1	2.36E+04	5.60E+00 >1	5.60E-01
Antimony	57	1.24E+00	3.12E-03	4.34E+00	1.05E+00	2.64E-03
Arsenic	59	2.47E-01	1.68E-02	1.36E+01	1.65E-02	1.12E-03
Barium	893	2.90E-02	1.26E-02	1.63E+02	4.49E-03	1.95E-03
Beryllium	4.8	1.15E-02	1.11E-02	6.24E-01	3.74E-04	3.60E-04
Cadmium	31.6	6.75E-01	1.53E-02	3.00E+00	1.66E-02	3.76E-04
Chromium +3	942	5.02E-01	5.22E-02	1.16E+02	3.00E-02	3.11E-03
Chromium +6	0.09	4.22E-04	6.80E-05	1.44E+01	1.67E-03	2.69E-04
Cobalt	110	1.18E-01	7.10E-03	2.01E+02	5.38E-02	3.23E-03
Copper	1380	1.08E+00	4.56E-03	9.00E-02	2.03E-03	8.57E-06
Lead	2010	3.47E+00 >1	1.44E-02	1.13E+02	8.25E-01	3.42E-03
Manganese	5300	5.41E-01	4.66E-02	7.32E+02	2.88E-02	2.48E-03
Mercury	30	1.53E-01	9.59E-03	1.90E+00	2.46E-03	1.54E-04
Molybdenum	90.2	4.54E-01	4.54E-02	7.24E+01	9.15E-02	9.15E-03
Nickel	1440	1.39E+01 >1	5.87E-02	9.68E+01	2.59E-01	1.09E-03
Selenium	2.9	6.11E+00 >1	2.53E-01	7.04E-01	9.99E-01	4.13E-02
Silver	57.5	1.96E-01	1.96E-02	3.08E+00	2.74E-03	2.74E-04
Thallium	2.9	3.74E-02	1.26E-02	1.37E+00	3.38E-02	1.13E-02
Tin	168	9.17E-03	6.13E-03	3.20E+01	4.37E-04	2.92E-04
Vanadium	203	1.26E+00	1.26E-01	9.58E+01	1.51E-01	1.51E-02
Zinc	1900	1.12E+00	2.62E-02	2.41E+02	3.25E-01	7.58E-03
Volatile Organics (mg/kg)						
Acetone	0.4	5.11E-05	1.02E-05	4.38E-02	1.40E-06	2.80E-07
Benzene	0.4	1.94E-05	1.94E-06	2.54E-02	3.07E-07	3.08E-08
2-Butanone	0.024	1.73E-08	6.71E-09	2.03E-02	3.66E-09	1.42E-09
Bromomethane	0.004	NTV	NTV	4.30E-03	NTV	NTV
sec-Butylbenzene	0.01	NTV	NTV	6.96E-03	NTV	NTV
Carbon disulfide	0.02	NTV	NTV	4.96E-03	NTV	NTV
Chlorobenzene	0.003	NTV	NTV	2.96E-03	NTV	NTV
cis-12-Dichloroethene	0.025	7.06E-07	7.06E-08	2.06E-02	1.45E-07	1.45E-08
Ethylbenzene	0.5	NTV	NTV	3.10E-02	NTV	NTV
Methylene chloride	0.073	1.58E-05	1.86E-06	5.90E-02	3.19E-06	3.77E-07
4-Methyl-2-pentanone	0.008	4.09E-07	4.09E-08	7.50E-03	9.58E-08	9.58E-09
Naphthalene	0.039	9.96E-07	3.32E-07	3.18E-02	2.03E-07	6.76E-08
Tetrachloroethene	0.02	NTV	NTV	1.66E-02	NTV	NTV
Toluene	0.4	1.97E-05	1.97E-06	2.46E-02	3.02E-07	3.02E-08
Trichloroethene	0.01	1.82E-05	1.82E-06	8.56E-03	3.90E-06	3.90E-07
124-Trimethylbenzene	0.086	NTV	NTV	1.26E-02	NTV	NTV
135-Trimethylbenzene	0.013	NTV	NTV	4.48E-03	NTV	NTV
Xylene (total)	2	1.22E-03	9.83E-04	9.63E-02	1.46E-05	1.18E-05

Table C1-3j
Gray Fox Risk Comparison (0 - 10 ft bgs; mixed zone)
Upland Area (HQ = 10) - Alternative 3
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

COPEC[a]	SLERA			Mixed Zone (HQ = 10)		
	EPC - Soil	HQ-TRV-low	HQ-TRV-High	EPC - Soil	HQ-TRV-low	HQ-TRV-High
Pesticides (mg/kg)						
Aldrin	0.01	1.28E-04	1.28E-05	8.10E-03	2.59E-05	2.59E-06
alpha-Chlordane	0.2	5.55E-05	2.78E-05	1.93E-02	1.34E-06	6.70E-07
gamma Chlordane	0.2	5.55E-05	2.78E-05	1.85E-02	1.28E-06	6.42E-07
Trans nonachlor	0.0008	6.42E-06	3.21E-06	8.00E-04	5.55E-08	2.78E-08
Beta BHC	0.089	7.11E-05	3.55E-05	7.14E-02	1.42E-05	7.12E-06
Gamma BHC	0.15	3.85E-03	5.13E-05	1.20E-01	7.72E-04	1.03E-05
2,4-D	0.11	NTV	NTV	3.72E-02	NTV	NTV
DDD	0.2	3.19E-04	1.60E-05	1.77E-02	7.07E-06	3.53E-07
DDE	0.15	3.47E-04	1.73E-05	1.53E-02	6.18E-06	3.09E-07
DDTs	1.8	3.03E-03	1.52E-04	8.01E-02	1.22E-03	6.12E-05
Dieldrin	0.67	4.71E-02	4.71E-03	3.13E-02	5.00E-04	5.00E-05
Endosulfan I	0.003	*2.55E-05*	*2.55E-06*	2.50E-03	5.32E-06	5.32E-07
Endosulfan II	0.005	4.26E-05	4.26E-06	4.10E-03	8.73E-06	8.73E-07
Endosulfan sulfate	0.01	NTV	NTV	8.10E-03	NTV	NTV
Endrin aldehyde	0.01	NTV	NTV	8.10E-03	NTV	NTV
Endrin ketone	0.09	NTV	NTV	9.70E-03	NTV	NTV
Heptachlor	0.05	4.93E-04	9.43E-06	4.01E-02	9.90E-05	1.89E-06
Heptachlor epoxide	0.24	NTV	NTV	1.28E-02	NTV	NTV
Hexachlorobenzene	0.001	7.98E-07	7.98E-08	3.38E-02	6.75E-06	6.75E-07
Methoxychlor	0.2	1.02E-04	5.11E-06	4.36E-02	5.57E-06	2.78E-07
Mirex	0.001	NTV	NTV	1.00E-03	NTV	NTV
SVOCs (mg/kg)						
Acenaphthene	0.10	9.75E-05	3.89E-06	6.18E-02	1.51E-05	6.02E-07
Acenaphthylene	0.86	8.39E-04	3.35E-05	3.45E-01	8.41E-05	3.36E-06
Anthracene	0.87	8.48E-04	3.39E-05	3.45E-01	8.41E-05	3.36E-06
Benzo(a)anthracene	1.4	1.37E-03	5.45E-05	4.49E-01	1.09E-04	4.37E-06
Benzo(a)pyrene	1.4	1.37E-03	5.45E-05	4.31E-01	1.05E-04	4.20E-06
Benzo(b)fluoranthene	2.7	2.63E-03	1.05E-04	2.57E-01	6.26E-05	2.50E-06
Benzo(g,h,i)perylene	2.3	2.24E-03	8.96E-05	2.17E-01	5.29E-05	2.11E-06
Benzo(k)fluoranthene	1.5	1.46E-03	5.84E-05	4.17E-01	1.02E-04	4.06E-06
Benzoic acid	1.5	NTV	NTV	1.20E+00	NTV	NTV
Bis(2-ethylhexyl)phthalate	5.7	5.25E-04	5.25E-05	3.45E-01	3.79E-05	3.79E-06
Butylbenzylphthalate	0.006	NTV	NTV	3.78E-02	NTV	NTV
Carbazole	0.036	NTV	NTV	6.18E-02	NTV	NTV
4-Chloroaniline	1.3	NTV	NTV	2.66E-01	NTV	NTV
Chrysene	7.8	7.62E-03	3.04E-04	4.73E-01	1.19E-04	4.74E-06
Dibenz(a,h)anthracene	0.54	5.27E-04	2.10E-05	4.65E-01	1.13E-04	4.53E-06
2,6-Dinitrotoluene	0.37	NTV	NTV	3.29E-01	NTV	NTV
Di-n-butylphthalate	0.19	1.86E-06	5.57E-07	1.85E-01	4.61E-07	1.38E-07
Fluoranthene	10	9.75E-03	3.89E-04	5.13E-01	1.25E-04	4.99E-06
Fluorene	3.1	3.02E-03	1.21E-04	3.77E-01	9.19E-05	3.67E-06
Indeno(1,2,3-cd)pyrene	2.2	2.15E-03	8.57E-05	3.61E-01	8.80E-05	3.51E-06
2-Methylnaphthalene	13	NTV	NTV	4.33E-01	NTV	NTV
Naphthalene	0.18	NTV	NTV	3.53E-01	2.25E-06	7.51E-07
Pentachlorophenol	1.7	4.34E-05	1.45E-05	1.20E+00	4.55E-05	1.40E-05
Phenanthrene	1.3	1.97E-04	6.06E-05	3.85E-01	9.38E-05	3.75E-06

Table C1-3j
Gray Fox Risk Comparison (0 - 10 ft bgs; mixed zone)
Upland Area (HQ = 10) - Alternative 3
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

COPEC[a]	SLERA			Mixed Zone (HQ = 10)		
	EPC - Soil	HQ-TRV-low	HQ-TRV-High	EPC - Soil	HQ-TRV-low	HQ-TRV-High
Pyrene	4.4	4.29E-03	1.71E-04	7.05E-01	1.72E-04	6.86E-06
Phenol	17	1.66E-02	6.62E-04	4.81E-01	NTV	NTV
PCBs (mg/kg)	3.3	NTV	NTV			
PCBs (Total Congeners)	14	1.33E-01	3.75E-02	3.22E-01	1.85E-01	5.20E-02

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	9.49E-10	3.95E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	1.45E-10	6.06E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	1.41E-11	5.87E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	1.31E-11	5.46E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	3.93E-11	1.64E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	3.21E-11	1.34E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.87E-11	7.79E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	1.05E-11	4.37E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	1.63E-11	6.78E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	8.17E-09	3.41E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	1.68E-10	7.01E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	7.10E-12	2.96E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	4.70E-13	1.96E-13	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	6.45E-12	2.69E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	4.48E-12	1.87E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	4.07E-08	1.69E-08	mg/kg-day	1.00E-02	mg/kg-day	4.07E-06	1.69E-06
	INORGANICS									
	ALUMINUM	23,656	mg/kg	2.59E-02	1.08E-02	mg/kg-day	1.00E+00	mg/kg-day	2.59E-02	1.08E-02
	ANTIMONY	4.3	mg/kg	4.66E-06	1.94E-06	mg/kg-day	4.00E-04	mg/kg-day	1.16E-02	4.85E-03
	ARSENIC	13.6	mg/kg	1.49E-05	6.19E-06	mg/kg-day	3.00E-04	mg/kg-day	4.95E-02	2.06E-02
	BARIUM	163	mg/kg	1.78E-04	7.43E-05	mg/kg-day	7.00E-02	mg/kg-day	2.55E-03	1.06E-03
	BERYLLIUM	0.62	mg/kg	6.82E-07	2.84E-07	mg/kg-day	2.00E-03	mg/kg-day	3.41E-04	1.42E-04
	CADMIUM	3.00	mg/kg	3.28E-06	1.37E-06	mg/kg-day	5.00E-04	mg/kg-day	6.56E-03	2.74E-03
	CHROMIUM	115	mg/kg	1.26E-04	5.23E-05	mg/kg-day	1.50E+00	mg/kg-day	8.37E-05	3.49E-05
	COBALT	14.7	mg/kg	1.60E-05	6.67E-06	mg/kg-day	2.00E-02	mg/kg-day	8.01E-04	3.34E-04
	COPPER	198	mg/kg	2.17E-04	9.03E-05	mg/kg-day	4.00E-02	mg/kg-day	5.42E-03	2.26E-03
	HEXAVALENT CHROMIUM	0.09	mg/kg	9.84E-08	4.10E-08	mg/kg-day	3.00E-03	mg/kg-day	3.28E-05	1.37E-05
	LEAD	111	mg/kg	1.21E-04	5.06E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	732	mg/kg	8.00E-04	3.33E-04	mg/kg-day	1.40E-01	mg/kg-day	5.72E-03	2.38E-03

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	*MERCURY*	1.9	mg/kg	2.08E-06	8.67E-07	mg/kg-day	3.00E-04	mg/kg-day	6.94E-03	2.89E-03
	MOLYBDENUM	72.4	mg/kg	7.91E-05	3.30E-05	mg/kg-day	5.00E-03	mg/kg-day	1.58E-02	6.60E-03
	NICKEL	97	mg/kg	1.06E-04	4.41E-05	mg/kg-day	2.00E-02	mg/kg-day	5.29E-03	2.20E-03
	SELENIUM	0.7	mg/kg	7.69E-07	3.21E-07	mg/kg-day	5.00E-03	mg/kg-day	1.54E-04	6.41E-05
	SILVER	3.1	mg/kg	3.37E-06	1.40E-06	mg/kg-day	5.00E-03	mg/kg-day	6.74E-04	2.81E-04
	THALLIUM	1.37	mg/kg	1.50E-06	6.25E-07	mg/kg-day	6.60E-05	mg/kg-day	2.27E-02	9.47E-03
	TIN	32	mg/kg	3.50E-05	1.46E-05	mg/kg-day	6.00E-01	mg/kg-day	5.83E-05	2.43E-05
	VANADIUM	96	mg/kg	1.05E-04	4.36E-05	mg/kg-day	7.00E-03	mg/kg-day	1.50E-02	6.23E-03
	ZINC	239	mg/kg	2.61E-04	1.09E-04	mg/kg-day	3.00E-01	mg/kg-day	8.70E-04	3.63E-04
	PESTICIDES									
	ALDRIN	0.01	mg/kg	8.85E-09	3.69E-09	mg/kg-day	3.00E-05	mg/kg-day	2.95E-04	1.23E-04
	ALPHA-CHLORDANE	0.019	mg/kg	2.11E-08	8.79E-09	mg/kg-day	5.00E-04	mg/kg-day	4.22E-05	1.76E-05
	BETA BHC	0.071	mg/kg	7.80E-08	3.25E-08	mg/kg-day	2.00E-04	mg/kg-day	3.90E-04	1.63E-04
	4,4- DDD	0.018	mg/kg	1.93E-08	8.06E-09	mg/kg-day	5.00E-04	mg/kg-day	3.87E-05	1.61E-05
	4,4- DDE	0.015	mg/kg	1.67E-08	6.97E-09	mg/kg-day	5.00E-04	mg/kg-day	3.34E-05	1.39E-05
	4,4- DDT	0.08	mg/kg	8.75E-08	3.65E-08	mg/kg-day	5.00E-04	mg/kg-day	1.75E-04	7.29E-05
	DIELDRIN	0.031	mg/kg	3.42E-08	1.43E-08	mg/kg-day	5.00E-05	mg/kg-day	6.84E-04	2.85E-04
	ENDOSULFAN I	0.003	mg/kg	2.73E-09	1.14E-09	mg/kg-day	6.00E-03	mg/kg-day	4.55E-07	1.90E-07
	ENDOSULFAN II	0.004	mg/kg	4.48E-09	1.87E-09	mg/kg-day	6.00E-03	mg/kg-day	7.47E-07	3.11E-07
	ENDOSULFAN SULFATE	0.01	mg/kg	8.85E-09	3.69E-09	mg/kg-day	6.00E-03	mg/kg-day	1.48E-06	6.15E-07
	ENDRIN ALDEHYDE	0.01	mg/kg	8.85E-09	3.69E-09	mg/kg-day	3.00E-04	mg/kg-day	2.95E-05	1.23E-05
	ENRIN KETONE	0.010	mg/kg	1.06E-08	4.42E-09	mg/kg-day	3.00E-04	mg/kg-day	3.53E-05	1.47E-05
	GAMMA-BHC	0.12	mg/kg	1.31E-07	5.47E-08	mg/kg-day	3.00E-04	mg/kg-day	4.38E-04	1.82E-04
	GAMMA-CHLORDANE	0.019	mg/kg	2.02E-08	8.42E-09	mg/kg-day	5.00E-04	mg/kg-day	4.04E-05	1.68E-05
	HEPTACHLOR	0.04	mg/kg	4.38E-08	1.83E-08	mg/kg-day	5.00E-04	mg/kg-day	8.76E-05	3.65E-05
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.40E-08	5.84E-09	mg/kg-day	1.30E-05	mg/kg-day	1.08E-03	4.49E-04
	HEXACHLOROBENZENE	0.034	mg/kg	3.69E-08	1.54E-08	mg/kg-day	8.00E-04	mg/kg-day	4.62E-05	1.92E-05
	METHOXYCHLOR	0.044	mg/kg	4.76E-08	1.99E-08	mg/kg-day	5.00E-03	mg/kg-day	9.53E-06	3.97E-06
	MIREX	0.001	mg/kg	1.09E-09	4.55E-10	mg/kg-day	2.00E-04	mg/kg-day	5.46E-06	2.28E-06
	TRANS NONACHLOR	0.0008	mg/kg	8.74E-10	3.64E-10	mg/kg-day	5.00E-04	mg/kg-day	1.75E-06	7.29E-07

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**PCBs**									
	PCBs (TOTAL)	0.27	mg/kg	2.91E-07	1.21E-07	mg/kg-day	2.00E-05	mg/kg-day	1.45E-02	6.06E-03
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	6.75E-08	2.81E-08	mg/kg-day	6.00E-02	mg/kg-day	1.13E-06	4.69E-07
	ACENAPHTHYLENE	0.35	mg/kg	3.77E-07	1.57E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.35	mg/kg	3.77E-07	1.57E-07	mg/kg-day	3.00E-01	mg/kg-day	1.26E-06	5.24E-07
	BENZO(A)ANTHRACENE	0.46	mg/kg	4.99E-07	2.08E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	0.43	mg/kg	4.73E-07	1.97E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.40	mg/kg	4.38E-07	1.83E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.36	mg/kg	3.95E-07	1.64E-07	mg/kg-day	4.00E-02	mg/kg-day	9.86E-06	4.11E-06
	BENZO(K)FLUORANTHENE	0.43	mg/kg	4.64E-07	1.94E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	1.35E-06	5.61E-07	mg/kg-day	4.00E+00	mg/kg-day	3.37E-07	1.40E-07
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	3.77E-07	1.57E-07	mg/kg-day	2.00E-02	mg/kg-day	1.89E-05	7.85E-06
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	4.13E-08	1.72E-08	mg/kg-day	2.00E-01	mg/kg-day	2.07E-07	8.61E-08
	CARBAZOLE	0.062	mg/kg	6.75E-08	2.81E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	2.91E-07	1.21E-07	mg/kg-day	4.00E-03	mg/kg-day	7.27E-05	3.03E-05
	CHRYSENE	0.47	mg/kg	5.17E-07	2.15E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	5.08E-07	2.12E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	3.60E-07	1.50E-07	mg/kg-day	1.00E-03	mg/kg-day	3.60E-04	1.50E-04
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	2.02E-07	8.42E-08	mg/kg-day	1.00E-01	mg/kg-day	2.02E-06	8.42E-07
	FLUORANTHENE	0.51	mg/kg	5.61E-07	2.34E-07	mg/kg-day	4.00E-02	mg/kg-day	1.40E-05	5.84E-06
	FLUORENE	0.38	mg/kg	4.12E-07	1.72E-07	mg/kg-day	4.00E-02	mg/kg-day	1.03E-05	4.29E-06
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	3.95E-07	1.64E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	4.73E-07	1.97E-07	mg/kg-day	4.00E-03	mg/kg-day	1.18E-04	4.93E-05
	NAPHTHALENE	0.35	mg/kg	3.86E-07	1.61E-07	mg/kg-day	2.00E-02	mg/kg-day	1.93E-05	8.04E-06
	PENTACHLOROPHENOL	1.2	mg/kg	1.31E-06	5.46E-07	mg/kg-day	3.00E-02	mg/kg-day	4.37E-05	1.82E-05
	PHENANTHRENE	0.39	mg/kg	4.21E-07	1.75E-07	mg/kg-day	3.00E-01	mg/kg-day	1.40E-06	5.84E-07
	PHENOL	0.48	mg/kg	5.25E-07	2.19E-07	mg/kg-day	6.00E-01	mg/kg-day	8.75E-07	3.65E-07
	PYRENE	0.71	mg/kg	7.70E-07	3.21E-07	mg/kg-day	3.00E-02	mg/kg-day	2.57E-05	1.07E-05

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**TPH**									
	TPH AS DIESEL	184	mg/kg	2.01E-04	8.38E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	50	mg/kg	5.42E-05	2.26E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	2.50E-04	1.04E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	3.87E-03	1.61E-03	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	4.79E-08	1.99E-08	mg/kg-day	9.00E-01	mg/kg-day	5.32E-08	2.22E-08
	BENZENE	0.025	mg/kg	2.78E-08	1.16E-08	mg/kg-day	4.00E-03	mg/kg-day	6.94E-06	2.89E-06
	2- BUTANONE	0.020	mg/kg	2.22E-08	9.24E-09	mg/kg-day	6.00E-01	mg/kg-day	3.70E-08	1.54E-08
	BROMOMETHANE	0.004	mg/kg	4.70E-09	1.96E-09	mg/kg-day	1.40E-03	mg/kg-day	3.36E-06	1.40E-06
	CARBON DISULFIDE	0.005	mg/kg	5.42E-09	2.26E-09	mg/kg-day	1.00E-01	mg/kg-day	5.42E-08	2.26E-08
	CHLOROBENZENE	0.003	mg/kg	3.23E-09	1.35E-09	mg/kg-day	2.00E-02	mg/kg-day	1.62E-07	6.74E-08
	CHLOROFORM	0.007	mg/kg	7.61E-09	3.17E-09	mg/kg-day	1.00E-02	mg/kg-day	7.61E-07	3.17E-07
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	2.25E-08	9.36E-09	mg/kg-day	1.00E-02	mg/kg-day	2.25E-06	9.36E-07
	ETHYLBENZENE	0.031	mg/kg	3.38E-08	1.41E-08	mg/kg-day	1.00E-01	mg/kg-day	3.38E-07	1.41E-07
	METHYLENE CHLORIDE	0.059	mg/kg	6.45E-08	2.69E-08	mg/kg-day	6.00E-02	mg/kg-day	1.07E-06	4.48E-07
	4- METHYL-2-PENTANONE	0.008	mg/kg	8.20E-09	3.42E-09	mg/kg-day	8.00E-02	mg/kg-day	1.02E-07	4.27E-08
	NAPHTHALENE	0.032	mg/kg	3.47E-08	1.45E-08	mg/kg-day	2.00E-02	mg/kg-day	1.74E-06	7.23E-07
	TETRACHLOROETHENE	0.02	mg/kg	1.81E-08	7.54E-09	mg/kg-day	1.00E-02	mg/kg-day	1.81E-06	7.54E-07
	TOLUENE	0.02	mg/kg	2.68E-08	1.12E-08	mg/kg-day	2.00E-01	mg/kg-day	1.34E-07	5.59E-08
	TRICHLOROETHENE	0.01	mg/kg	9.35E-09	3.90E-09	mg/kg-day	3.00E-04	mg/kg-day	3.12E-05	1.30E-05
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	1.37E-08	5.72E-09	mg/kg-day	5.00E-02	mg/kg-day	2.75E-07	1.14E-07
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	4.90E-09	2.04E-09	mg/kg-day	5.00E-02	mg/kg-day	9.79E-08	4.08E-08
	XYLENE (TOTAL)	0.10	mg/kg	1.05E-07	4.39E-08	mg/kg-day	2.00E-01	mg/kg-day	5.26E-07	2.19E-07
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	9.33E-09	3.89E-09	mg/kg-day	1.00E-02	mg/kg-day	9.33E-07	3.89E-07
	INORGANICS									
	ALUMINUM	23,656	mg/kg	NA	NA	mg/kg-day	1.00E+00	mg/kg-day	NA	NA
	ANTIMONY	4.3	mg/kg	NA	NA	mg/kg-day	6.00E-05	mg/kg-day	NA	NA
	ARSENIC	13.6	mg/kg	2.05E-06	8.52E-07	mg/kg-day	3.00E-04	mg/kg-day	6.82E-03	2.84E-03
	BARIUM	163	mg/kg	NA	NA	mg/kg-day	4.90E-03	mg/kg-day	NA	NA
	BERYLLIUM	0.62	mg/kg	NA	NA	mg/kg-day	1.40E-05	mg/kg-day	NA	NA
	CADMIUM	3.00	mg/kg	1.51E-08	6.28E-09	mg/kg-day	1.25E-05	mg/kg-day	1.21E-03	5.02E-04
	CHROMIUM	115	mg/kg	NA	NA	mg/kg-day	1.95E-02	mg/kg-day	NA	NA
	COBALT	14.7	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	COPPER	198	mg/kg	NA	NA	mg/kg-day	4.00E-02	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	NA	NA	mg/kg-day	7.50E-05	mg/kg-day	NA	NA
	LEAD	111	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	732	mg/kg	NA	NA	mg/kg-day	5.60E-03	mg/kg-day	NA	NA
	MERCURY	1.9	mg/kg	NA	NA	mg/kg-day	2.10E-05	mg/kg-day	NA	NA
	MOLYBDENUM	72.4	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	NICKEL	97	mg/kg	NA	NA	mg/kg-day	8.00E-04	mg/kg-day	NA	NA
	SELENIUM	0.7	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	SILVER	3.1	mg/kg	NA	NA	mg/kg-day	2.00E-04	mg/kg-day	NA	NA
	THALLIUM	1.37	mg/kg	NA	NA	mg/kg-day	6.60E-05	mg/kg-day	NA	NA

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*TIN*	32	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	VANADIUM	96	mg/kg	NA	NA	mg/kg-day	1.82E-04	mg/kg-day	NA	NA
	ZINC	239	mg/kg	NA	NA	mg/kg-day	3.00E-01	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	4.06E-09	1.69E-09	mg/kg-day	3.00E-05	mg/kg-day	1.35E-04	5.64E-05
	ALPHA-CHLORDANE	0.019	mg/kg	3.87E-09	1.61E-09	mg/kg-day	5.00E-04	mg/kg-day	7.75E-06	3.23E-06
	BETA BHC	0.071	mg/kg	1.43E-08	5.97E-09	mg/kg-day	2.00E-04	mg/kg-day	7.16E-05	2.98E-05
	4,4- DDD	0.018	mg/kg	2.66E-09	1.11E-09	mg/kg-day	5.00E-04	mg/kg-day	5.33E-06	2.22E-06
	4,4- DDE	0.015	mg/kg	2.30E-09	9.59E-10	mg/kg-day	5.00E-04	mg/kg-day	4.60E-06	1.92E-06
	4,4- DDT	0.08	mg/kg	1.21E-08	5.02E-09	mg/kg-day	5.00E-04	mg/kg-day	2.41E-05	1.00E-05
	DIELDRIN	0.031	mg/kg	1.57E-08	6.54E-09	mg/kg-day	5.00E-05	mg/kg-day	3.14E-04	1.31E-04
	ENDOSULFAN I	0.003	mg/kg	1.25E-09	5.23E-10	mg/kg-day	6.00E-03	mg/kg-day	2.09E-07	8.71E-08
	ENDOSULFAN II	0.004	mg/kg	2.06E-09	8.57E-10	mg/kg-day	6.00E-03	mg/kg-day	3.43E-07	1.43E-07
	ENDOSULFAN SULFATE	0.01	mg/kg	4.06E-09	1.69E-09	mg/kg-day	6.00E-03	mg/kg-day	6.77E-07	2.82E-07
	ENDRIN ALDEHYDE	0.01	mg/kg	4.06E-09	1.69E-09	mg/kg-day	3.00E-04	mg/kg-day	1.35E-05	5.64E-06
	ENRIN KETONE	0.010	mg/kg	4.87E-09	2.03E-09	mg/kg-day	3.00E-04	mg/kg-day	1.62E-05	6.76E-06
	GAMMA-BHC	0.12	mg/kg	2.41E-08	1.00E-08	mg/kg-day	3.00E-04	mg/kg-day	8.03E-05	3.35E-05
	GAMMA-CHLORDANE	0.019	mg/kg	3.71E-09	1.55E-09	mg/kg-day	5.00E-04	mg/kg-day	7.42E-06	3.09E-06
	HEPTACHLOR	0.04	mg/kg	2.01E-08	8.38E-09	mg/kg-day	5.00E-04	mg/kg-day	4.02E-05	1.68E-05
	HEPTACHLOR EPOXIDE	0.013	mg/kg	6.44E-09	2.68E-09	mg/kg-day	1.30E-05	mg/kg-day	4.95E-04	2.06E-04
	HEXACHLOROBENZENE	0.034	mg/kg	1.70E-08	7.06E-09	mg/kg-day	8.00E-04	mg/kg-day	2.12E-05	8.83E-06
	METHOXYCHLOR	0.044	mg/kg	8.75E-09	3.65E-09	mg/kg-day	5.00E-03	mg/kg-day	1.75E-06	7.29E-07
	MIREX	0.001	mg/kg	5.02E-10	2.09E-10	mg/kg-day	2.00E-04	mg/kg-day	2.51E-06	1.05E-06
	TRANS NONACHLOR	0.0008	mg/kg	1.61E-10	6.69E-11	mg/kg-day	5.00E-04	mg/kg-day	3.21E-07	1.34E-07
	PCBs									
	PCBs (TOTAL)	0.27	mg/kg	1.87E-07	7.78E-08	mg/kg-day	2.00E-05	mg/kg-day	9.34E-03	3.89E-03
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	4.03E-08	1.68E-08	mg/kg-day	6.00E-02	mg/kg-day	6.72E-07	2.80E-07
	ACENAPHTHYLENE	0.35	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.35	mg/kg	2.25E-07	9.37E-08	mg/kg-day	3.00E-01	mg/kg-day	7.50E-07	3.12E-07
	BENZO(A)ANTHRACENE	0.46	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*BENZO(A)PYRENE*	0.43	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.40	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.36	mg/kg	2.35E-07	9.81E-08	mg/kg-day	4.00E-02	mg/kg-day	5.89E-06	2.45E-06
	BENZO(K)FLUORANTHENE	0.43	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	6.18E-07	2.57E-07	mg/kg-day	4.00E+00	mg/kg-day	1.54E-07	6.44E-08
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	1.73E-07	7.21E-08	mg/kg-day	2.00E-02	mg/kg-day	8.65E-06	3.61E-06
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	1.90E-08	7.90E-09	mg/kg-day	2.00E-01	mg/kg-day	9.48E-08	3.95E-08
	CARBAZOLE	0.062	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	1.33E-07	5.56E-08	mg/kg-day	4.00E-03	mg/kg-day	3.34E-05	1.39E-05
	CHRYSENE	0.47	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	1.65E-07	6.88E-08	mg/kg-day	1.00E-03	mg/kg-day	1.65E-04	6.88E-05
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	9.28E-08	3.87E-08	mg/kg-day	1.00E-01	mg/kg-day	9.28E-07	3.87E-07
	FLUORANTHENE	0.51	mg/kg	3.35E-07	1.39E-07	mg/kg-day	4.00E-02	mg/kg-day	8.36E-06	3.48E-06
	FLUORENE	0.38	mg/kg	2.46E-07	1.02E-07	mg/kg-day	4.00E-02	mg/kg-day	6.15E-06	2.56E-06
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	2.82E-07	1.18E-07	mg/kg-day	4.00E-03	mg/kg-day	7.06E-05	2.94E-05
	NAPHTHALENE	0.35	mg/kg	2.30E-07	9.59E-08	mg/kg-day	2.00E-02	mg/kg-day	1.15E-05	4.80E-06
	PENTACHLOROPHENOL	1.2	mg/kg	6.02E-07	2.51E-07	mg/kg-day	3.00E-02	mg/kg-day	2.01E-05	8.36E-06
	PHENANTHRENE	0.39	mg/kg	2.51E-07	1.05E-07	mg/kg-day	3.00E-01	mg/kg-day	8.37E-07	3.49E-07
	PHENOL	0.48	mg/kg	3.13E-07	1.31E-07	mg/kg-day	6.00E-01	mg/kg-day	5.22E-07	2.18E-07
	PYRENE	0.71	mg/kg	4.60E-07	1.92E-07	mg/kg-day	3.00E-02	mg/kg-day	1.53E-05	6.39E-06
	TPH									
	TPH AS DIESEL	184	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	50	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	NA	NA	mg/kg-day	9.00E-01	mg/kg-day	NA	NA
	BENZENE	0.025	mg/kg	NA	NA	mg/kg-day	4.00E-03	mg/kg-day	NA	NA

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	2- BUTANONE	0.020	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	BROMOMETHANE	0.004	mg/kg	NA	NA	mg/kg-day	1.40E-03	mg/kg-day	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	CHLOROBENZENE	0.003	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	CHLOROFORM	0.007	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	ETHYLBENZENE	0.031	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	NA	NA	mg/kg-day	6.00E-02	mg/kg-day	NA	NA
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	8.00E-02	mg/kg-day	NA	NA
	NAPHTHALENE	0.032	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	TOLUENE	0.02	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	NA	NA	mg/kg-day	3.00E-04	mg/kg-day	NA	NA
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	3.99E-14	1.66E-14	mg/kg-day	1.14E-08	mg/kg-day	3.49E-06	1.46E-06
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	6.11E-15	2.55E-15	mg/kg-day	1.14E-08	mg/kg-day	5.35E-07	2.23E-07
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	5.93E-16	2.47E-16	mg/kg-day	1.14E-08	mg/kg-day	5.19E-08	2.16E-08
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	5.51E-16	2.30E-16	mg/kg-day	1.14E-08	mg/kg-day	4.83E-08	2.01E-08
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	1.65E-15	6.89E-16	mg/kg-day	1.14E-08	mg/kg-day	1.45E-07	6.04E-08
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	1.35E-15	5.63E-16	mg/kg-day	1.14E-08	mg/kg-day	1.18E-07	4.93E-08
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	7.86E-16	3.27E-16	mg/kg-day	1.14E-08	mg/kg-day	6.88E-08	2.87E-08
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	4.41E-16	1.84E-16	mg/kg-day	1.14E-08	mg/kg-day	3.86E-08	1.61E-08
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	6.85E-16	2.85E-16	mg/kg-day	1.14E-08	mg/kg-day	6.00E-08	2.50E-08
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	3.44E-13	1.43E-13	mg/kg-day	1.14E-08	mg/kg-day	3.01E-05	1.25E-05
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	7.08E-15	2.95E-15	mg/kg-day	1.14E-08	mg/kg-day	6.20E-07	2.58E-07
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	2.99E-16	1.24E-16	mg/kg-day	1.14E-08	mg/kg-day	2.62E-08	1.09E-08
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.98E-17	8.23E-18	mg/kg-day	1.14E-08	mg/kg-day	1.73E-09	7.21E-10
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	2.71E-16	1.13E-16	mg/kg-day	1.14E-08	mg/kg-day	2.37E-08	9.89E-09

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	2,3,7,8- TCDF	4.10E-06	mg/kg	1.88E-16	7.85E-17	mg/kg-day	1.14E-08	mg/kg-day	1.65E-08	6.87E-09
	HERBICIDES									
	2,4- D	0.037	mg/kg	1.71E-12	7.12E-13	mg/kg-day	NA	mg/kg-day	NA	NA
	INORGANICS									
	ALUMINUM	23,656	mg/kg	1.09E-06	4.53E-07	mg/kg-day	1.40E-03	mg/kg-day	7.76E-04	3.24E-04
	ANTIMONY	4.3	mg/kg	1.96E-10	8.16E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	ARSENIC	13.6	mg/kg	6.25E-10	2.60E-10	mg/kg-day	8.57E-06	mg/kg-day	7.29E-05	3.04E-05
	BARIUM	163	mg/kg	7.49E-09	3.12E-09	mg/kg-day	1.43E-04	mg/kg-day	5.24E-05	2.18E-05
	BERYLLIUM	0.62	mg/kg	2.87E-11	1.19E-11	mg/kg-day	2.00E-06	mg/kg-day	1.43E-05	5.98E-06
	CADMIUM	3.00	mg/kg	1.38E-10	5.75E-11	mg/kg-day	5.71E-06	mg/kg-day	2.42E-05	1.01E-05
	CHROMIUM	115	mg/kg	5.28E-09	2.20E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	COBALT	14.7	mg/kg	6.73E-10	2.80E-10	mg/kg-day	5.70E-06	mg/kg-day	1.18E-04	4.92E-05
	COPPER	198	mg/kg	9.11E-09	3.80E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	4.14E-12	1.72E-12	mg/kg-day	2.86E-05	mg/kg-day	1.45E-07	6.02E-08
	LEAD	111	mg/kg	5.11E-09	2.13E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	732	mg/kg	3.36E-08	1.40E-08	mg/kg-day	1.43E-05	mg/kg-day	2.35E-03	9.80E-04
	MERCURY	1.9	mg/kg	8.75E-11	3.65E-11	mg/kg-day	2.57E-05	mg/kg-day	3.41E-06	1.42E-06
	MOLYBDENUM	72.4	mg/kg	3.33E-09	1.39E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	NICKEL	97	mg/kg	4.45E-09	1.85E-09	mg/kg-day	1.43E-05	mg/kg-day	3.12E-04	1.30E-04
	SELENIUM	0.7	mg/kg	3.23E-11	1.35E-11	mg/kg-day	5.71E-03	mg/kg-day	5.67E-09	2.36E-09
	SILVER	3.1	mg/kg	1.42E-10	5.90E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	THALLIUM	1.37	mg/kg	6.31E-11	2.63E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	TIN	32	mg/kg	1.47E-09	6.13E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	VANADIUM	96	mg/kg	4.40E-09	1.83E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	ZINC	239	mg/kg	1.10E-08	4.57E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	3.72E-13	1.55E-13	mg/kg-day	3.00E-05	mg/kg-day	1.24E-08	5.17E-09
	ALPHA-CHLORDANE	0.019	mg/kg	8.87E-13	3.70E-13	mg/kg-day	2.00E-04	mg/kg-day	4.43E-09	1.85E-09
	BETA BHC	0.071	mg/kg	3.28E-12	1.37E-12	mg/kg-day	2.00E-04	mg/kg-day	1.64E-08	6.83E-09
	4,4- DDD	0.018	mg/kg	8.13E-13	3.39E-13	mg/kg-day	5.00E-04	mg/kg-day	1.63E-09	6.78E-10
	4,4- DDE	0.015	mg/kg	7.03E-13	2.93E-13	mg/kg-day	5.00E-04	mg/kg-day	1.41E-09	5.86E-10

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	4,4- DDT	0.08	mg/kg	3.68E-12	1.53E-12	mg/kg-day	5.00E-04	mg/kg-day	7.36E-09	3.07E-09
	DIELDRIN	0.031	mg/kg	1.44E-12	5.99E-13	mg/kg-day	5.00E-05	mg/kg-day	2.88E-08	1.20E-08
	ENDOSULFAN I	0.003	mg/kg	1.15E-13	4.79E-14	mg/kg-day	6.00E-03	mg/kg-day	1.91E-11	7.98E-12
	ENDOSULFAN II	0.004	mg/kg	1.88E-13	7.85E-14	mg/kg-day	6.00E-03	mg/kg-day	3.14E-11	1.31E-11
	ENDOSULFAN SULFATE	0.01	mg/kg	3.72E-13	1.55E-13	mg/kg-day	6.00E-03	mg/kg-day	6.20E-11	2.58E-11
	ENDRIN ALDEHYDE	0.01	mg/kg	3.72E-13	1.55E-13	mg/kg-day	3.00E-04	mg/kg-day	1.24E-09	5.17E-10
	ENRIN KETONE	0.010	mg/kg	4.46E-13	1.86E-13	mg/kg-day	3.00E-04	mg/kg-day	1.49E-09	6.19E-10
	GAMMA-BHC	0.12	mg/kg	5.52E-12	2.30E-12	mg/kg-day	3.00E-04	mg/kg-day	1.84E-08	7.66E-09
	GAMMA-CHLORDANE	0.019	mg/kg	8.50E-13	3.54E-13	mg/kg-day	2.00E-04	mg/kg-day	4.25E-09	1.77E-09
	HEPTACHLOR	0.04	mg/kg	1.84E-12	7.68E-13	mg/kg-day	5.00E-04	mg/kg-day	3.69E-09	1.54E-09
	HEPTACHLOR EPOXIDE	0.013	mg/kg	5.90E-13	2.46E-13	mg/kg-day	1.30E-05	mg/kg-day	4.54E-08	1.89E-08
	HEXACHLOROBENZENE	0.034	mg/kg	1.55E-12	6.47E-13	mg/kg-day	3.00E-04	mg/kg-day	5.18E-09	2.16E-09
	METHOXYCHLOR	0.044	mg/kg	2.00E-12	8.35E-13	mg/kg-day	5.00E-03	mg/kg-day	4.01E-10	1.67E-10
	MIREX	0.001	mg/kg	4.59E-14	1.91E-14	mg/kg-day	2.00E-04	mg/kg-day	2.30E-10	9.57E-11
	TRANS NONACHLOR	0.0008	mg/kg	3.68E-14	1.53E-14	mg/kg-day	2.00E-04	mg/kg-day	1.84E-10	7.66E-11
	PCBs									
	PCBs (TOTAL)	0.27	mg/kg	1.22E-11	5.09E-12	mg/kg-day	2.00E-05	mg/kg-day	6.11E-07	2.55E-07
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	2.08E-08	8.68E-09	mg/kg-day	6.00E-02	mg/kg-day	3.47E-07	1.45E-07
	ACENAPHTHYLENE	0.35	mg/kg	1.59E-11	6.61E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.35	mg/kg	2.99E-08	1.25E-08	mg/kg-day	3.00E-01	mg/kg-day	9.96E-08	4.15E-08
	BENZO(A)ANTHRACENE	0.46	mg/kg	2.10E-11	8.75E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	0.43	mg/kg	1.99E-11	8.29E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.40	mg/kg	1.84E-11	7.68E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.36	mg/kg	1.66E-11	6.91E-12	mg/kg-day	4.00E-02	mg/kg-day	4.15E-10	1.73E-10
	BENZO(K)FLUORANTHENE	0.43	mg/kg	1.95E-11	8.14E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	5.66E-11	2.36E-11	mg/kg-day	4.00E+00	mg/kg-day	1.42E-11	5.90E-12
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	1.59E-11	6.61E-12	mg/kg-day	2.00E-02	mg/kg-day	7.93E-10	3.30E-10
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	1.74E-12	7.24E-13	mg/kg-day	2.00E-01	mg/kg-day	8.68E-12	3.62E-12
	CARBAZOLE	0.062	mg/kg	2.84E-12	1.18E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	1.22E-11	5.09E-12	mg/kg-day	4.00E-03	mg/kg-day	3.06E-09	1.27E-09

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*CHRYSENE*	0.47	mg/kg	1.06E-08	4.43E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	2.14E-11	8.90E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	1.51E-11	6.30E-12	mg/kg-day	1.00E-03	mg/kg-day	1.51E-08	6.30E-09
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	8.50E-12	3.54E-12	mg/kg-day	1.00E-01	mg/kg-day	8.50E-11	3.54E-11
	FLUORANTHENE	0.51	mg/kg	2.36E-11	9.82E-12	mg/kg-day	4.00E-02	mg/kg-day	5.89E-10	2.46E-10
	FLUORENE	0.38	mg/kg	6.35E-08	2.65E-08	mg/kg-day	4.00E-02	mg/kg-day	1.59E-06	6.62E-07
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	1.66E-11	6.91E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	1.99E-11	8.29E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	NAPHTHALENE	0.35	mg/kg	4.98E-07	2.07E-07	mg/kg-day	8.57E-04	mg/kg-day	5.81E-04	2.42E-04
	PENTACHLOROPHENOL	1.2	mg/kg	5.51E-11	2.30E-11	mg/kg-day	3.00E-02	mg/kg-day	1.84E-09	7.66E-10
	PHENANTHRENE	0.39	mg/kg	1.77E-11	7.37E-12	mg/kg-day	3.00E-01	mg/kg-day	5.90E-11	2.46E-11
	PHENOL	0.48	mg/kg	2.21E-11	9.20E-12	mg/kg-day	5.71E-02	mg/kg-day	3.87E-10	1.61E-10
	PYRENE	0.71	mg/kg	1.13E-08	4.69E-09	mg/kg-day	3.00E-02	mg/kg-day	3.75E-07	1.56E-07
	TPH									
	TPH AS DIESEL	184	mg/kg	8.46E-09	3.52E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	50	mg/kg	2.28E-09	9.50E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	1.05E-08	4.38E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	1.63E-07	6.78E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	2.12E-07	8.82E-08	mg/kg-day	9.00E-01	mg/kg-day	2.35E-07	9.80E-08
	BENZENE	0.025	mg/kg	5.63E-07	2.35E-07	mg/kg-day	8.57E-03	mg/kg-day	6.58E-05	2.74E-05
	2- BUTANONE	0.020	mg/kg	6.48E-08	2.70E-08	mg/kg-day	2.86E-01	mg/kg-day	2.27E-07	9.44E-08
	BROMOMETHANE	0.004	mg/kg	1.45E-07	6.04E-08	mg/kg-day	1.43E+00	mg/kg-day	1.01E-07	4.22E-08
	CARBON DISULFIDE	0.005	mg/kg	2.51E-07	1.04E-07	mg/kg-day	2.00E-01	mg/kg-day	1.25E-06	5.22E-07
	CHLOROBENZENE	0.003	mg/kg	2.85E-08	1.19E-08	mg/kg-day	5.71E-03	mg/kg-day	4.99E-06	2.08E-06
	CHLOROFORM	0.007	mg/kg	1.56E-07	6.51E-08	mg/kg-day	8.57E-02	mg/kg-day	1.83E-06	7.61E-07
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	4.30E-07	1.79E-07	mg/kg-day	1.00E-02	mg/kg-day	4.30E-05	1.79E-05
	ETHYLBENZENE	0.031	mg/kg	3.48E-07	1.45E-07	mg/kg-day	2.86E-01	mg/kg-day	1.22E-06	5.07E-07
	METHYLENE CHLORIDE	0.059	mg/kg	1.43E-06	5.96E-07	mg/kg-day	1.14E-01	mg/kg-day	1.25E-05	5.22E-06
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	8.57E-01	mg/kg-day	NA	NA

Table C1-4a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	NAPHTHALENE	0.032	mg/kg	4.48E-08	1.87E-08	mg/kg-day	8.57E-04	mg/kg-day	5.23E-05	2.18E-05
	TETRACHLOROETHENE	0.02	mg/kg	3.86E-07	1.61E-07	mg/kg-day	1.00E-02	mg/kg-day	3.86E-05	1.61E-05
	TOLUENE	0.02	mg/kg	3.72E-07	1.55E-07	mg/kg-day	8.57E-02	mg/kg-day	4.35E-06	1.81E-06
	TRICHLOROETHENE	0.01	mg/kg	1.57E-07	6.56E-08	mg/kg-day	1.00E-02	mg/kg-day	1.57E-05	6.56E-06
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	3.81E-08	1.59E-08	mg/kg-day	1.70E-03	mg/kg-day	2.24E-05	9.34E-06
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	3.40E-08	1.42E-08	mg/kg-day	1.70E-03	mg/kg-day	2.00E-05	8.32E-06
	XYLENE (TOTAL)	0.10	mg/kg	9.58E-07	3.99E-07	mg/kg-day	2.86E-02	mg/kg-day	3.35E-05	1.40E-05

Notes:
The HQ for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
HQ = Hazard Quotient
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RfD = Reference Dose
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	2.80E-09	2.80E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	4.29E-10	4.29E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	4.17E-11	4.17E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	3.87E-11	3.87E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	1.16E-10	1.16E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	9.49E-11	9.49E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	5.52E-11	5.52E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	3.10E-11	3.10E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	4.81E-11	4.81E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	2.42E-08	2.42E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	4.97E-10	4.97E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	2.10E-11	2.10E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.39E-12	1.39E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	1.91E-11	1.91E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	1.32E-11	1.32E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	1.20E-07	1.20E-07	mg/kg-day	1.00E-02	mg/kg-day	1.20E-05	1.20E-05
	INORGANICS									
	ALUMINUM	23,656	mg/kg	7.64E-02	7.64E-02	mg/kg-day	1.00E+00	mg/kg-day	7.64E-02	7.64E-02
	ANTIMONY	4.3	mg/kg	1.38E-05	1.38E-05	mg/kg-day	4.00E-04	mg/kg-day	3.44E-02	3.44E-02
	ARSENIC	13.6	mg/kg	4.39E-05	4.39E-05	mg/kg-day	3.00E-04	mg/kg-day	1.46E-01	1.46E-01
	BARIUM	163	mg/kg	5.27E-04	5.27E-04	mg/kg-day	7.00E-02	mg/kg-day	7.52E-03	7.52E-03
	BERYLLIUM	0.62	mg/kg	2.01E-06	2.01E-06	mg/kg-day	2.00E-03	mg/kg-day	1.01E-03	1.01E-03
	CADMIUM	3.00	mg/kg	9.70E-06	9.70E-06	mg/kg-day	5.00E-04	mg/kg-day	1.94E-02	1.94E-02
	CHROMIUM	115	mg/kg	3.71E-04	3.71E-04	mg/kg-day	1.50E+00	mg/kg-day	2.47E-04	2.47E-04
	COBALT	14.7	mg/kg	4.73E-05	4.73E-05	mg/kg-day	2.00E-02	mg/kg-day	2.37E-03	2.37E-03
	COPPER	198	mg/kg	6.41E-04	6.41E-04	mg/kg-day	4.00E-02	mg/kg-day	1.60E-02	1.60E-02
	HEXAVALENT CHROMIUM	0.09	mg/kg	2.91E-07	2.91E-07	mg/kg-day	3.00E-03	mg/kg-day	9.69E-05	9.69E-05
	LEAD	111	mg/kg	3.59E-04	3.59E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	732	mg/kg	2.36E-03	2.36E-03	mg/kg-day	1.40E-01	mg/kg-day	1.69E-02	1.69E-02

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	*MERCURY*	1.9	mg/kg	6.15E-06	6.15E-06	mg/kg-day	3.00E-04	mg/kg-day	2.05E-02	2.05E-02
	MOLYBDENUM	72.4	mg/kg	2.34E-04	2.34E-04	mg/kg-day	5.00E-03	mg/kg-day	4.68E-02	4.68E-02
	NICKEL	97	mg/kg	3.12E-04	3.12E-04	mg/kg-day	2.00E-02	mg/kg-day	1.56E-02	1.56E-02
	SELENIUM	0.7	mg/kg	2.27E-06	2.27E-06	mg/kg-day	5.00E-03	mg/kg-day	4.55E-04	4.55E-04
	SILVER	3.1	mg/kg	9.96E-06	9.96E-06	mg/kg-day	5.00E-03	mg/kg-day	1.99E-03	1.99E-03
	THALLIUM	1.37	mg/kg	4.43E-06	4.43E-06	mg/kg-day	6.60E-05	mg/kg-day	6.72E-02	6.72E-02
	TIN	32	mg/kg	1.03E-04	1.03E-04	mg/kg-day	6.00E-01	mg/kg-day	1.72E-04	1.72E-04
	VANADIUM	96	mg/kg	3.09E-04	3.09E-04	mg/kg-day	7.00E-03	mg/kg-day	4.42E-02	4.42E-02
	ZINC	239	mg/kg	7.71E-04	7.71E-04	mg/kg-day	3.00E-01	mg/kg-day	2.57E-03	2.57E-03
	PESTICIDES									
	ALDRIN	0.01	mg/kg	2.62E-08	2.62E-08	mg/kg-day	3.00E-05	mg/kg-day	8.72E-04	8.72E-04
	ALPHA-CHLORDANE	0.019	mg/kg	6.23E-08	6.23E-08	mg/kg-day	5.00E-04	mg/kg-day	1.25E-04	1.25E-04
	BETA BHC	0.071	mg/kg	2.30E-07	2.30E-07	mg/kg-day	2.00E-04	mg/kg-day	1.15E-03	1.15E-03
	4,4- DDD	0.018	mg/kg	5.72E-08	5.72E-08	mg/kg-day	5.00E-04	mg/kg-day	1.14E-04	1.14E-04
	4,4- DDE	0.015	mg/kg	4.94E-08	4.94E-08	mg/kg-day	5.00E-04	mg/kg-day	9.88E-05	9.88E-05
	4,4- DDT	0.08	mg/kg	2.59E-07	2.59E-07	mg/kg-day	5.00E-04	mg/kg-day	5.17E-04	5.17E-04
	DIELDRIN	0.031	mg/kg	1.01E-07	1.01E-07	mg/kg-day	5.00E-05	mg/kg-day	2.02E-03	2.02E-03
	ENDOSULFAN I	0.003	mg/kg	8.07E-09	8.07E-09	mg/kg-day	6.00E-03	mg/kg-day	1.35E-06	1.35E-06
	ENDOSULFAN II	0.004	mg/kg	1.32E-08	1.32E-08	mg/kg-day	6.00E-03	mg/kg-day	2.21E-06	2.21E-06
	ENDOSULFAN SULFATE	0.01	mg/kg	2.62E-08	2.62E-08	mg/kg-day	6.00E-03	mg/kg-day	4.36E-06	4.36E-06
	ENDRIN ALDEHYDE	0.01	mg/kg	2.62E-08	2.62E-08	mg/kg-day	3.00E-04	mg/kg-day	8.72E-05	8.72E-05
	ENRIN KETONE	0.010	mg/kg	3.13E-08	3.13E-08	mg/kg-day	3.00E-04	mg/kg-day	1.04E-04	1.04E-04
	GAMMA-BHC	0.12	mg/kg	3.88E-07	3.88E-07	mg/kg-day	3.00E-04	mg/kg-day	1.29E-03	1.29E-03
	GAMMA-CHLORDANE	0.019	mg/kg	5.97E-08	5.97E-08	mg/kg-day	5.00E-04	mg/kg-day	1.19E-04	1.19E-04
	HEPTACHLOR	0.04	mg/kg	1.29E-07	1.29E-07	mg/kg-day	5.00E-04	mg/kg-day	2.59E-04	2.59E-04
	HEPTACHLOR EPOXIDE	0.013	mg/kg	4.14E-08	4.14E-08	mg/kg-day	1.30E-05	mg/kg-day	3.19E-03	3.19E-03
	HEXACHLOROBENZENE	0.034	mg/kg	1.09E-07	1.09E-07	mg/kg-day	8.00E-04	mg/kg-day	1.36E-04	1.36E-04
	METHOXYCHLOR	0.044	mg/kg	1.41E-07	1.41E-07	mg/kg-day	5.00E-03	mg/kg-day	2.82E-05	2.82E-05
	MIREX	0.001	mg/kg	3.23E-09	3.23E-09	mg/kg-day	2.00E-04	mg/kg-day	1.61E-05	1.61E-05
	TRANS NONACHLOR	0.0008	mg/kg	2.58E-09	2.58E-09	mg/kg-day	5.00E-04	mg/kg-day	5.17E-06	5.17E-06

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**PCBs**									
	PCBs (TOTAL)	0.27	mg/kg	8.59E-07	8.59E-07	mg/kg-day	2.00E-05	mg/kg-day	4.29E-02	4.29E-02
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	2.00E-07	2.00E-07	mg/kg-day	6.00E-02	mg/kg-day	3.33E-06	3.33E-06
	ACENAPHTHYLENE	0.35	mg/kg	1.11E-06	1.11E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.35	mg/kg	1.11E-06	1.11E-06	mg/kg-day	3.00E-01	mg/kg-day	3.71E-06	3.71E-06
	BENZO(A)ANTHRACENE	0.46	mg/kg	1.48E-06	1.48E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	0.43	mg/kg	1.40E-06	1.40E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.40	mg/kg	1.29E-06	1.29E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.36	mg/kg	1.17E-06	1.17E-06	mg/kg-day	4.00E-02	mg/kg-day	2.91E-05	2.91E-05
	BENZO(K)FLUORANTHENE	0.43	mg/kg	1.37E-06	1.37E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	3.98E-06	3.98E-06	mg/kg-day	4.00E+00	mg/kg-day	9.95E-07	9.95E-07
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	1.11E-06	1.11E-06	mg/kg-day	2.00E-02	mg/kg-day	5.57E-05	5.57E-05
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	1.22E-07	1.22E-07	mg/kg-day	2.00E-01	mg/kg-day	6.10E-07	6.10E-07
	CARBAZOLE	0.062	mg/kg	2.00E-07	2.00E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	8.59E-07	8.59E-07	mg/kg-day	4.00E-03	mg/kg-day	2.15E-04	2.15E-04
	CHRYSENE	0.47	mg/kg	1.53E-06	1.53E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	1.50E-06	1.50E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	1.06E-06	1.06E-06	mg/kg-day	1.00E-03	mg/kg-day	1.06E-03	1.06E-03
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	5.97E-07	5.97E-07	mg/kg-day	1.00E-01	mg/kg-day	5.97E-06	5.97E-06
	FLUORANTHENE	0.51	mg/kg	1.66E-06	1.66E-06	mg/kg-day	4.00E-02	mg/kg-day	4.14E-05	4.14E-05
	FLUORENE	0.38	mg/kg	1.22E-06	1.22E-06	mg/kg-day	4.00E-02	mg/kg-day	3.04E-05	3.04E-05
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	1.17E-06	1.17E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	1.40E-06	1.40E-06	mg/kg-day	4.00E-03	mg/kg-day	3.50E-04	3.50E-04
	NAPHTHALENE	0.35	mg/kg	1.14E-06	1.14E-06	mg/kg-day	2.00E-02	mg/kg-day	5.70E-05	5.70E-05
	PENTACHLOROPHENOL	1.2	mg/kg	3.87E-06	3.87E-06	mg/kg-day	3.00E-02	mg/kg-day	1.29E-04	1.29E-04
	PHENANTHRENE	0.39	mg/kg	1.24E-06	1.24E-06	mg/kg-day	3.00E-01	mg/kg-day	4.14E-06	4.14E-06
	PHENOL	0.48	mg/kg	1.55E-06	1.55E-06	mg/kg-day	6.00E-01	mg/kg-day	2.59E-06	2.59E-06
	PYRENE	0.71	mg/kg	2.28E-06	2.28E-06	mg/kg-day	3.00E-02	mg/kg-day	7.59E-05	7.59E-05

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**TPH**									
	TPH AS DIESEL	184	mg/kg	5.94E-04	5.94E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	50	mg/kg	1.60E-04	1.60E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	7.39E-04	7.39E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	1.14E-02	1.14E-02	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	1.41E-07	1.41E-07	mg/kg-day	9.00E-01	mg/kg-day	1.57E-07	1.57E-07
	BENZENE	0.025	mg/kg	8.20E-08	8.20E-08	mg/kg-day	4.00E-03	mg/kg-day	2.05E-05	2.05E-05
	2- BUTANONE	0.020	mg/kg	6.55E-08	6.55E-08	mg/kg-day	6.00E-01	mg/kg-day	1.09E-07	1.09E-07
	BROMOMETHANE	0.004	mg/kg	1.39E-08	1.39E-08	mg/kg-day	1.40E-03	mg/kg-day	9.92E-06	9.92E-06
	CARBON DISULFIDE	0.005	mg/kg	1.60E-08	1.60E-08	mg/kg-day	1.00E-01	mg/kg-day	1.60E-07	1.60E-07
	CHLOROBENZENE	0.003	mg/kg	9.56E-09	9.56E-09	mg/kg-day	2.00E-02	mg/kg-day	4.78E-07	4.78E-07
	CHLOROFORM	0.007	mg/kg	2.25E-08	2.25E-08	mg/kg-day	1.00E-02	mg/kg-day	2.25E-06	2.25E-06
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	6.64E-08	6.64E-08	mg/kg-day	1.00E-02	mg/kg-day	6.64E-06	6.64E-06
	ETHYLBENZENE	0.031	mg/kg	1.00E-07	1.00E-07	mg/kg-day	1.00E-01	mg/kg-day	1.00E-06	1.00E-06
	METHYLENE CHLORIDE	0.059	mg/kg	1.90E-07	1.90E-07	mg/kg-day	6.00E-02	mg/kg-day	3.17E-06	3.17E-06
	4- METHYL-2-PENTANONE	0.008	mg/kg	2.42E-08	2.42E-08	mg/kg-day	8.00E-02	mg/kg-day	3.03E-07	3.03E-07
	NAPHTHALENE	0.032	mg/kg	1.03E-07	1.03E-07	mg/kg-day	2.00E-02	mg/kg-day	5.13E-06	5.13E-06
	TETRACHLOROETHENE	0.02	mg/kg	5.35E-08	5.35E-08	mg/kg-day	1.00E-02	mg/kg-day	5.35E-06	5.35E-06
	TOLUENE	0.02	mg/kg	7.93E-08	7.93E-08	mg/kg-day	2.00E-01	mg/kg-day	3.97E-07	3.97E-07
	TRICHLOROETHENE	0.01	mg/kg	2.76E-08	2.76E-08	mg/kg-day	3.00E-04	mg/kg-day	9.21E-05	9.21E-05
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	4.06E-08	4.06E-08	mg/kg-day	5.00E-02	mg/kg-day	8.11E-07	8.11E-07
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	1.45E-08	1.45E-08	mg/kg-day	5.00E-02	mg/kg-day	2.89E-07	2.89E-07
	XYLENE (TOTAL)	0.10	mg/kg	3.11E-07	3.11E-07	mg/kg-day	2.00E-01	mg/kg-day	1.55E-06	1.55E-06
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	1.80E-08	1.80E-08	mg/kg-day	1.00E-02	mg/kg-day	1.80E-06	1.80E-06
	INORGANICS									
	ALUMINUM	23,656	mg/kg	NA	NA	mg/kg-day	1.00E+00	mg/kg-day	NA	NA
	ANTIMONY	4.3	mg/kg	NA	NA	mg/kg-day	6.00E-05	mg/kg-day	NA	NA
	ARSENIC	13.6	mg/kg	3.95E-06	3.95E-06	mg/kg-day	3.00E-04	mg/kg-day	1.32E-02	1.32E-02
	BARIUM	163	mg/kg	NA	NA	mg/kg-day	4.90E-03	mg/kg-day	NA	NA
	BERYLLIUM	0.62	mg/kg	NA	NA	mg/kg-day	1.40E-05	mg/kg-day	NA	NA
	CADMIUM	3.00	mg/kg	2.91E-08	2.91E-08	mg/kg-day	1.25E-05	mg/kg-day	2.33E-03	2.33E-03
	CHROMIUM	115	mg/kg	NA	NA	mg/kg-day	1.95E-02	mg/kg-day	NA	NA
	COBALT	14.7	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	COPPER	198	mg/kg	NA	NA	mg/kg-day	4.00E-02	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	NA	NA	mg/kg-day	7.50E-05	mg/kg-day	NA	NA
	LEAD	111	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	732	mg/kg	NA	NA	mg/kg-day	5.60E-03	mg/kg-day	NA	NA
	MERCURY	1.9	mg/kg	NA	NA	mg/kg-day	2.10E-05	mg/kg-day	NA	NA
	MOLYBDENUM	72.4	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	NICKEL	97	mg/kg	NA	NA	mg/kg-day	8.00E-04	mg/kg-day	NA	NA
	SELENIUM	0.7	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	SILVER	3.1	mg/kg	NA	NA	mg/kg-day	2.00E-04	mg/kg-day	NA	NA
	THALLIUM	1.37	mg/kg	NA	NA	mg/kg-day	6.60E-05	mg/kg-day	NA	NA

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*TIN*	32	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	VANADIUM	96	mg/kg	NA	NA	mg/kg-day	1.82E-04	mg/kg-day	NA	NA
	ZINC	239	mg/kg	NA	NA	mg/kg-day	3.00E-01	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	7.85E-09	7.85E-09	mg/kg-day	3.00E-05	mg/kg-day	2.62E-04	2.62E-04
	ALPHA-CHLORDANE	0.019	mg/kg	7.48E-09	7.48E-09	mg/kg-day	5.00E-04	mg/kg-day	1.50E-05	1.50E-05
	BETA BHC	0.071	mg/kg	2.77E-08	2.77E-08	mg/kg-day	2.00E-04	mg/kg-day	1.38E-04	1.38E-04
	4,4- DDD	0.018	mg/kg	5.14E-09	5.14E-09	mg/kg-day	5.00E-04	mg/kg-day	1.03E-05	1.03E-05
	4,4- DDE	0.015	mg/kg	4.45E-09	4.45E-09	mg/kg-day	5.00E-04	mg/kg-day	8.89E-06	8.89E-06
	4,4- DDT	0.08	mg/kg	2.33E-08	2.33E-08	mg/kg-day	5.00E-04	mg/kg-day	4.66E-05	4.66E-05
	DIELDRIN	0.031	mg/kg	3.03E-08	3.03E-08	mg/kg-day	5.00E-05	mg/kg-day	6.06E-04	6.06E-04
	ENDOSULFAN I	0.003	mg/kg	2.42E-09	2.42E-09	mg/kg-day	6.00E-03	mg/kg-day	4.04E-07	4.04E-07
	ENDOSULFAN II	0.004	mg/kg	3.97E-09	3.97E-09	mg/kg-day	6.00E-03	mg/kg-day	6.62E-07	6.62E-07
	ENDOSULFAN SULFATE	0.01	mg/kg	7.85E-09	7.85E-09	mg/kg-day	6.00E-03	mg/kg-day	1.31E-06	1.31E-06
	ENDRIN ALDEHYDE	0.01	mg/kg	7.85E-09	7.85E-09	mg/kg-day	3.00E-04	mg/kg-day	2.62E-05	2.62E-05
	ENRIN KETONE	0.010	mg/kg	9.40E-09	9.40E-09	mg/kg-day	3.00E-04	mg/kg-day	3.13E-05	3.13E-05
	GAMMA-BHC	0.12	mg/kg	4.65E-08	4.65E-08	mg/kg-day	3.00E-04	mg/kg-day	1.55E-04	1.55E-04
	GAMMA-CHLORDANE	0.019	mg/kg	7.17E-09	7.17E-09	mg/kg-day	5.00E-04	mg/kg-day	1.43E-05	1.43E-05
	HEPTACHLOR	0.04	mg/kg	3.88E-08	3.88E-08	mg/kg-day	5.00E-04	mg/kg-day	7.77E-05	7.77E-05
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.24E-08	1.24E-08	mg/kg-day	1.30E-05	mg/kg-day	9.56E-04	9.56E-04
	HEXACHLOROBENZENE	0.034	mg/kg	3.27E-08	3.27E-08	mg/kg-day	8.00E-04	mg/kg-day	4.09E-05	4.09E-05
	METHOXYCHLOR	0.044	mg/kg	1.69E-08	1.69E-08	mg/kg-day	5.00E-03	mg/kg-day	3.38E-06	3.38E-06
	MIREX	0.001	mg/kg	9.69E-10	9.69E-10	mg/kg-day	2.00E-04	mg/kg-day	4.84E-06	4.84E-06
	TRANS NONACHLOR	0.0008	mg/kg	3.10E-10	3.10E-10	mg/kg-day	5.00E-04	mg/kg-day	6.20E-07	6.20E-07
	PCBs									
	PCBs (TOTAL)	0.27	mg/kg	3.61E-07	3.61E-07	mg/kg-day	2.00E-05	mg/kg-day	1.80E-02	1.80E-02
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	7.78E-08	7.78E-08	mg/kg-day	6.00E-02	mg/kg-day	1.30E-06	1.30E-06
	ACENAPHTHYLENE	0.35	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.35	mg/kg	4.34E-07	4.34E-07	mg/kg-day	3.00E-01	mg/kg-day	1.45E-06	1.45E-06
	BENZO(A)ANTHRACENE	0.46	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*BENZO(A)PYRENE*	0.43	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.40	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.36	mg/kg	4.55E-07	4.55E-07	mg/kg-day	4.00E-02	mg/kg-day	1.14E-05	1.14E-05
	BENZO(K)FLUORANTHENE	0.43	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	1.19E-06	1.19E-06	mg/kg-day	4.00E+00	mg/kg-day	2.98E-07	2.98E-07
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	3.34E-07	3.34E-07	mg/kg-day	2.00E-02	mg/kg-day	1.67E-05	1.67E-05
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	3.66E-08	3.66E-08	mg/kg-day	2.00E-01	mg/kg-day	1.83E-07	1.83E-07
	CARBAZOLE	0.062	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	2.58E-07	2.58E-07	mg/kg-day	4.00E-03	mg/kg-day	6.44E-05	6.44E-05
	CHRYSENE	0.47	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	3.19E-07	3.19E-07	mg/kg-day	1.00E-03	mg/kg-day	3.19E-04	3.19E-04
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	1.79E-07	1.79E-07	mg/kg-day	1.00E-01	mg/kg-day	1.79E-06	1.79E-06
	FLUORANTHENE	0.51	mg/kg	6.46E-07	6.46E-07	mg/kg-day	4.00E-02	mg/kg-day	1.62E-05	1.62E-05
	FLUORENE	0.38	mg/kg	4.75E-07	4.75E-07	mg/kg-day	4.00E-02	mg/kg-day	1.19E-05	1.19E-05
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	5.45E-07	5.45E-07	mg/kg-day	4.00E-03	mg/kg-day	1.36E-04	1.36E-04
	NAPHTHALENE	0.35	mg/kg	4.45E-07	4.45E-07	mg/kg-day	2.00E-02	mg/kg-day	2.22E-05	2.22E-05
	PENTACHLOROPHENOL	1.2	mg/kg	1.16E-06	1.16E-06	mg/kg-day	3.00E-02	mg/kg-day	3.87E-05	3.87E-05
	PHENANTHRENE	0.39	mg/kg	4.85E-07	4.85E-07	mg/kg-day	3.00E-01	mg/kg-day	1.62E-06	1.62E-06
	PHENOL	0.48	mg/kg	6.05E-07	6.05E-07	mg/kg-day	6.00E-01	mg/kg-day	1.01E-06	1.01E-06
	PYRENE	0.71	mg/kg	8.88E-07	8.88E-07	mg/kg-day	3.00E-02	mg/kg-day	2.96E-05	2.96E-05
	TPH									
	TPH AS DIESEL	184	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	50	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	NA	NA	mg/kg-day	9.00E-01	mg/kg-day	NA	NA
	BENZENE	0.025	mg/kg	NA	NA	mg/kg-day	4.00E-03	mg/kg-day	NA	NA

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	2- BUTANONE	0.020	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	BROMOMETHANE	0.004	mg/kg	NA	NA	mg/kg-day	1.40E-03	mg/kg-day	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	CHLOROBENZENE	0.003	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	CHLOROFORM	0.007	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	ETHYLBENZENE	0.031	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	NA	NA	mg/kg-day	6.00E-02	mg/kg-day	NA	NA
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	8.00E-02	mg/kg-day	NA	NA
	NAPHTHALENE	0.032	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	TOLUENE	0.02	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	NA	NA	mg/kg-day	3.00E-04	mg/kg-day	NA	NA
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	5.18E-12	2.69E-12	mg/kg-day	1.14E-08	mg/kg-day	4.53E-04	2.36E-04
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	7.94E-13	4.13E-13	mg/kg-day	1.14E-08	mg/kg-day	6.95E-05	3.61E-05
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	7.70E-14	4.00E-14	mg/kg-day	1.14E-08	mg/kg-day	6.74E-06	3.50E-06
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	7.16E-14	3.72E-14	mg/kg-day	1.14E-08	mg/kg-day	6.27E-06	3.26E-06
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	2.15E-13	1.12E-13	mg/kg-day	1.14E-08	mg/kg-day	1.88E-05	9.78E-06
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	1.75E-13	9.12E-14	mg/kg-day	1.14E-08	mg/kg-day	1.54E-05	7.99E-06
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.02E-13	5.31E-14	mg/kg-day	1.14E-08	mg/kg-day	8.93E-06	4.65E-06
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	5.73E-14	2.98E-14	mg/kg-day	1.14E-08	mg/kg-day	5.02E-06	2.61E-06
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	8.89E-14	4.62E-14	mg/kg-day	1.14E-08	mg/kg-day	7.78E-06	4.05E-06
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	4.46E-11	2.32E-11	mg/kg-day	1.14E-08	mg/kg-day	3.91E-03	2.03E-03
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	9.19E-13	4.78E-13	mg/kg-day	1.14E-08	mg/kg-day	8.05E-05	4.18E-05
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	3.88E-14	2.02E-14	mg/kg-day	1.14E-08	mg/kg-day	3.40E-06	1.77E-06
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	2.57E-15	1.33E-15	mg/kg-day	1.14E-08	mg/kg-day	2.25E-07	1.17E-07
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	3.52E-14	1.83E-14	mg/kg-day	1.14E-08	mg/kg-day	3.08E-06	1.60E-06

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	2,3,7,8- TCDF	4.10E-06	mg/kg	2.45E-14	1.27E-14	mg/kg-day	1.14E-08	mg/kg-day	2.14E-06	1.11E-06
	HERBICIDES									
	2,4- D	0.037	mg/kg	2.22E-10	1.15E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	INORGANICS									
	ALUMINUM	23,656	mg/kg	1.41E-04	7.34E-05	mg/kg-day	1.40E-03	mg/kg-day	1.01E-01	5.24E-02
	ANTIMONY	4.3	mg/kg	2.54E-08	1.32E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	ARSENIC	13.6	mg/kg	8.11E-08	4.22E-08	mg/kg-day	8.57E-06	mg/kg-day	9.47E-03	4.92E-03
	BARIUM	163	mg/kg	9.73E-07	5.06E-07	mg/kg-day	1.43E-04	mg/kg-day	6.80E-03	3.54E-03
	BERYLLIUM	0.62	mg/kg	3.72E-09	1.94E-09	mg/kg-day	2.00E-06	mg/kg-day	1.86E-03	9.68E-04
	CADMIUM	3.00	mg/kg	1.79E-08	9.32E-09	mg/kg-day	5.71E-06	mg/kg-day	3.14E-03	1.63E-03
	CHROMIUM	115	mg/kg	6.85E-07	3.56E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	COBALT	14.7	mg/kg	8.74E-08	4.55E-08	mg/kg-day	5.70E-06	mg/kg-day	1.53E-02	7.97E-03
	COPPER	198	mg/kg	1.18E-06	6.15E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	5.37E-10	2.79E-10	mg/kg-day	2.86E-05	mg/kg-day	1.88E-05	9.76E-06
	LEAD	111	mg/kg	6.63E-07	3.45E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	732	mg/kg	4.37E-06	2.27E-06	mg/kg-day	1.43E-05	mg/kg-day	3.06E-01	1.59E-01
	MERCURY	1.9	mg/kg	1.14E-08	5.91E-09	mg/kg-day	2.57E-05	mg/kg-day	4.42E-04	2.30E-04
	MOLYBDENUM	72.4	mg/kg	4.32E-07	2.25E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	NICKEL	97	mg/kg	5.77E-07	3.00E-07	mg/kg-day	1.43E-05	mg/kg-day	4.04E-02	2.10E-02
	SELENIUM	0.7	mg/kg	4.20E-09	2.18E-09	mg/kg-day	5.71E-03	mg/kg-day	7.36E-07	3.83E-07
	SILVER	3.1	mg/kg	1.84E-08	9.57E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	THALLIUM	1.37	mg/kg	8.19E-09	4.26E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	TIN	32	mg/kg	1.91E-07	9.93E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	VANADIUM	96	mg/kg	5.71E-07	2.97E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	ZINC	239	mg/kg	1.43E-06	7.41E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	4.83E-11	2.51E-11	mg/kg-day	3.00E-05	mg/kg-day	1.61E-06	8.38E-07
	ALPHA-CHLORDANE	0.019	mg/kg	1.15E-10	5.99E-11	mg/kg-day	2.00E-04	mg/kg-day	5.76E-07	2.99E-07
	BETA BHC	0.071	mg/kg	4.26E-10	2.21E-10	mg/kg-day	2.00E-04	mg/kg-day	2.13E-06	1.11E-06
	4,4- DDD	0.018	mg/kg	1.06E-10	5.49E-11	mg/kg-day	5.00E-04	mg/kg-day	2.11E-07	1.10E-07
	4,4- DDE	0.015	mg/kg	9.13E-11	4.75E-11	mg/kg-day	5.00E-04	mg/kg-day	1.83E-07	9.49E-08

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	4,4- DDT	0.08	mg/kg	4.78E-10	2.49E-10	mg/kg-day	5.00E-04	mg/kg-day	9.56E-07	4.97E-07
	DIELDRIN	0.031	mg/kg	1.87E-10	9.71E-11	mg/kg-day	5.00E-05	mg/kg-day	3.73E-06	1.94E-06
	ENDOSULFAN I	0.003	mg/kg	1.49E-11	7.76E-12	mg/kg-day	6.00E-03	mg/kg-day	2.49E-09	1.29E-09
	ENDOSULFAN II	0.004	mg/kg	2.45E-11	1.27E-11	mg/kg-day	6.00E-03	mg/kg-day	4.08E-09	2.12E-09
	ENDOSULFAN SULFATE	0.01	mg/kg	4.83E-11	2.51E-11	mg/kg-day	6.00E-03	mg/kg-day	8.05E-09	4.19E-09
	ENDRIN ALDEHYDE	0.01	mg/kg	4.83E-11	2.51E-11	mg/kg-day	3.00E-04	mg/kg-day	1.61E-07	8.38E-08
	ENRIN KETONE	0.010	mg/kg	5.79E-11	3.01E-11	mg/kg-day	3.00E-04	mg/kg-day	1.93E-07	1.00E-07
	GAMMA-BHC	0.12	mg/kg	7.17E-10	3.73E-10	mg/kg-day	3.00E-04	mg/kg-day	2.39E-06	1.24E-06
	GAMMA-CHLORDANE	0.019	mg/kg	1.10E-10	5.74E-11	mg/kg-day	2.00E-04	mg/kg-day	5.52E-07	2.87E-07
	HEPTACHLOR	0.04	mg/kg	2.39E-10	1.24E-10	mg/kg-day	5.00E-04	mg/kg-day	4.78E-07	2.49E-07
	HEPTACHLOR EPOXIDE	0.013	mg/kg	7.66E-11	3.98E-11	mg/kg-day	1.30E-05	mg/kg-day	5.89E-06	3.06E-06
	HEXACHLOROBENZENE	0.034	mg/kg	2.02E-10	1.05E-10	mg/kg-day	3.00E-04	mg/kg-day	6.72E-07	3.50E-07
	METHOXYCHLOR	0.044	mg/kg	2.60E-10	1.35E-10	mg/kg-day	5.00E-03	mg/kg-day	5.20E-08	2.71E-08
	MIREX	0.001	mg/kg	5.97E-12	3.10E-12	mg/kg-day	2.00E-04	mg/kg-day	2.98E-08	1.55E-08
	TRANS NONACHLOR	0.0008	mg/kg	4.77E-12	2.48E-12	mg/kg-day	2.00E-04	mg/kg-day	2.39E-08	1.24E-08
	PCBs									
	PCBs (TOTAL)	0.27	mg/kg	1.59E-09	8.25E-10	mg/kg-day	2.00E-05	mg/kg-day	7.94E-05	4.13E-05
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	6.72E-08	3.49E-08	mg/kg-day	6.00E-02	mg/kg-day	1.12E-06	5.82E-07
	ACENAPHTHYLENE	0.35	mg/kg	2.06E-09	1.07E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.35	mg/kg	9.64E-08	5.02E-08	mg/kg-day	3.00E-01	mg/kg-day	3.21E-07	1.67E-07
	BENZO(A)ANTHRACENE	0.46	mg/kg	2.73E-09	1.42E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	0.43	mg/kg	2.58E-09	1.34E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.40	mg/kg	2.39E-09	1.24E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.36	mg/kg	2.15E-09	1.12E-09	mg/kg-day	4.00E-02	mg/kg-day	5.38E-08	2.80E-08
	BENZO(K)FLUORANTHENE	0.43	mg/kg	2.54E-09	1.32E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	7.35E-09	3.82E-09	mg/kg-day	4.00E+00	mg/kg-day	1.84E-09	9.56E-10
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	2.06E-09	1.07E-09	mg/kg-day	2.00E-02	mg/kg-day	1.03E-07	5.35E-08
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	2.26E-10	1.17E-10	mg/kg-day	2.00E-01	mg/kg-day	1.13E-09	5.86E-10
	CARBAZOLE	0.062	mg/kg	3.69E-10	1.92E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	1.59E-09	8.25E-10	mg/kg-day	4.00E-03	mg/kg-day	3.97E-07	2.06E-07

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*CHRYSENE*	0.47	mg/kg	3.43E-08	1.78E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	2.77E-09	1.44E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	1.96E-09	1.02E-09	mg/kg-day	1.00E-03	mg/kg-day	1.96E-06	1.02E-06
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	1.10E-09	5.74E-10	mg/kg-day	1.00E-01	mg/kg-day	1.10E-08	5.74E-09
	FLUORANTHENE	0.51	mg/kg	3.06E-09	1.59E-09	mg/kg-day	4.00E-02	mg/kg-day	7.65E-08	3.98E-08
	FLUORENE	0.38	mg/kg	2.05E-07	1.07E-07	mg/kg-day	4.00E-02	mg/kg-day	5.12E-06	2.66E-06
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	2.15E-09	1.12E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	2.58E-09	1.34E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	NAPHTHALENE	0.35	mg/kg	1.61E-06	8.35E-07	mg/kg-day	8.57E-04	mg/kg-day	1.87E-03	9.75E-04
	PENTACHLOROPHENOL	1.2	mg/kg	7.16E-09	3.72E-09	mg/kg-day	3.00E-02	mg/kg-day	2.39E-07	1.24E-07
	PHENANTHRENE	0.39	mg/kg	2.30E-09	1.19E-09	mg/kg-day	3.00E-01	mg/kg-day	7.66E-09	3.98E-09
	PHENOL	0.48	mg/kg	2.87E-09	1.49E-09	mg/kg-day	5.71E-02	mg/kg-day	5.02E-08	2.61E-08
	PYRENE	0.71	mg/kg	3.63E-08	1.89E-08	mg/kg-day	3.00E-02	mg/kg-day	1.21E-06	6.29E-07
	TPH									
	TPH AS DIESEL	184	mg/kg	1.10E-06	5.71E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	50	mg/kg	2.96E-07	1.54E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	1.37E-06	7.11E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	2.11E-05	1.10E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	6.83E-07	3.55E-07	mg/kg-day	9.00E-01	mg/kg-day	7.59E-07	3.95E-07
	BENZENE	0.025	mg/kg	1.82E-06	9.45E-07	mg/kg-day	8.57E-03	mg/kg-day	2.12E-04	1.10E-04
	2- BUTANONE	0.020	mg/kg	2.09E-07	1.09E-07	mg/kg-day	2.86E-01	mg/kg-day	7.31E-07	3.80E-07
	BROMOMETHANE	0.004	mg/kg	4.67E-07	2.43E-07	mg/kg-day	1.43E+00	mg/kg-day	3.27E-07	1.70E-07
	CARBON DISULFIDE	0.005	mg/kg	8.09E-07	4.21E-07	mg/kg-day	2.00E-01	mg/kg-day	4.04E-06	2.10E-06
	CHLOROBENZENE	0.003	mg/kg	9.19E-08	4.78E-08	mg/kg-day	5.71E-03	mg/kg-day	1.61E-05	8.37E-06
	CHLOROFORM	0.007	mg/kg	5.04E-07	2.62E-07	mg/kg-day	8.57E-02	mg/kg-day	5.89E-06	3.06E-06
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	1.39E-06	7.21E-07	mg/kg-day	1.00E-02	mg/kg-day	1.39E-04	7.21E-05
	ETHYLBENZENE	0.031	mg/kg	1.12E-06	5.83E-07	mg/kg-day	2.86E-01	mg/kg-day	3.92E-06	2.04E-06
	METHYLENE CHLORIDE	0.059	mg/kg	4.62E-06	2.40E-06	mg/kg-day	1.14E-01	mg/kg-day	4.04E-05	2.10E-05
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	8.57E-01	mg/kg-day	NA	NA

Table C1-4b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	NAPHTHALENE	0.032	mg/kg	1.45E-07	7.52E-08	mg/kg-day	8.57E-04	mg/kg-day	1.69E-04	8.77E-05
	TETRACHLOROETHENE	0.02	mg/kg	1.25E-06	6.48E-07	mg/kg-day	1.00E-02	mg/kg-day	1.25E-04	6.48E-05
	TOLUENE	0.02	mg/kg	1.20E-06	6.25E-07	mg/kg-day	8.57E-02	mg/kg-day	1.40E-05	7.29E-06
	TRICHLOROETHENE	0.01	mg/kg	5.08E-07	2.64E-07	mg/kg-day	1.00E-02	mg/kg-day	5.08E-05	2.64E-05
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	1.23E-07	6.39E-08	mg/kg-day	1.70E-03	mg/kg-day	7.23E-05	3.76E-05
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	1.10E-07	5.70E-08	mg/kg-day	1.70E-03	mg/kg-day	6.45E-05	3.35E-05
	XYLENE (TOTAL)	0.10	mg/kg	3.09E-06	1.61E-06	mg/kg-day	2.86E-02	mg/kg-day	1.08E-04	5.63E-05

Notes:
The HQ for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
HQ = Hazard Quotient
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RfD = Reference Dose
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	2.30E-10	9.60E-11	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	2.99E-07	1.25E-07
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	3.53E-11	1.47E-11	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	4.59E-08	1.91E-08
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	3.42E-12	1.43E-12	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	4.45E-09	1.85E-09
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	3.18E-12	1.33E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	4.14E-08	1.73E-08
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	9.55E-12	3.98E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.24E-07	5.18E-08
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	7.80E-12	3.25E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.01E-07	4.23E-08
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	4.54E-12	1.89E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.90E-08	2.46E-08
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	2.55E-12	1.06E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	3.31E-08	1.38E-08
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	3.95E-12	1.65E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.14E-08	2.14E-08
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	1.99E-09	8.27E-10	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	2.58E-08	1.08E-08
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	4.09E-11	1.70E-11	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	5.31E-10	2.21E-10
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	1.73E-12	7.19E-13	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	2.24E-07	9.34E-08
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.14E-13	4.76E-14	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	7.42E-10	3.09E-10
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	1.57E-12	6.52E-13	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	1.02E-07	4.24E-08
	2,3,7,8- TCDF	4.10E-06	mg/kg	1.09E-12	4.53E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.41E-08	5.89E-09
	HERBICIDES									
	2,4- D	0.037	mg/kg	9.87E-09	4.11E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,656	mg/kg	6.28E-03	2.62E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.3	mg/kg	1.13E-06	4.71E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	3.61E-06	1.50E-06	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	3.41E-05	1.42E-05
	BARIUM	163	mg/kg	4.33E-05	1.80E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.62	mg/kg	1.66E-07	6.90E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00	mg/kg	7.97E-07	3.32E-07	mg/kg-day	3.80E-01	$(mg/kg\text{-}day)^{-1}$	3.03E-07	1.26E-07
	CHROMIUM	115	mg/kg	3.05E-05	1.27E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.7	mg/kg	3.89E-06	1.62E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	198	mg/kg	5.26E-05	2.19E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	2.39E-08	9.95E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	111	mg/kg	2.95E-05	1.23E-05	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	2.51E-07	1.04E-07

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*MANGANESE*	732	mg/kg	1.94E-04	8.10E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	5.06E-07	2.11E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	1.92E-05	8.01E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	97	mg/kg	2.57E-05	1.07E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.7	mg/kg	1.87E-07	7.79E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	3.1	mg/kg	8.19E-07	3.41E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37	mg/kg	3.64E-07	1.52E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	32	mg/kg	8.49E-06	3.54E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	96	mg/kg	2.54E-05	1.06E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	239	mg/kg	6.34E-05	2.64E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	2.15E-09	8.96E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	3.65E-08	1.52E-08
	ALPHA-CHLORDANE	0.019	mg/kg	5.12E-09	2.13E-09	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	6.66E-09	2.77E-09
	BETA BHC	0.071	mg/kg	1.89E-08	7.89E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	3.41E-08	1.42E-08
	4,4- DDD	0.018	mg/kg	4.70E-09	1.96E-09	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.13E-09	4.70E-10
	4,4- DDE	0.015	mg/kg	4.06E-09	1.69E-09	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.38E-09	5.75E-10
	4,4- DDT	0.08	mg/kg	2.13E-08	8.86E-09	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	7.23E-09	3.01E-09
	DIELDRIN	0.031	mg/kg	8.31E-09	3.46E-09	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	1.33E-07	5.54E-08
	ENDOSULFAN I	0.003	mg/kg	6.64E-10	2.76E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	1.09E-09	4.53E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	2.15E-09	8.96E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	2.15E-09	8.96E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	2.57E-09	1.07E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	3.19E-08	1.33E-08	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	3.51E-08	1.46E-08
	GAMMA-CHLORDANE	0.019	mg/kg	4.91E-09	2.05E-09	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	6.38E-09	2.66E-09
	HEPTACHLOR	0.04	mg/kg	1.06E-08	4.43E-09	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	4.79E-08	2.00E-08
	HEPTACHLOR EPOXIDE	0.013	mg/kg	3.41E-09	1.42E-09	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	3.10E-08	1.29E-08
	HEXACHLOROBENZENE	0.034	mg/kg	8.97E-09	3.74E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	1.61E-08	6.73E-09
	METHOXYCHLOR	0.044	mg/kg	1.16E-08	4.82E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	2.65E-10	1.11E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	TRANS NONACHLOR	0.0008	mg/kg	2.12E-10	8.85E-11	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	2.76E-10	1.15E-10
	PCBs									
	PCBs (TOTAL)	0.27	mg/kg	7.06E-08	2.94E-08	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	3.53E-07	1.47E-07
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	1.64E-08	6.83E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	0.35	mg/kg	9.16E-08	3.82E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.35	mg/kg	9.16E-08	3.82E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	1.21E-07	5.05E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	1.46E-07	6.06E-08
	BENZO(A)PYRENE	0.43	mg/kg	1.15E-07	4.79E-08	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	1.38E-06	5.75E-07
	BENZO(B)FLUORANTHENE	0.40	mg/kg	1.06E-07	4.43E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	1.28E-07	5.32E-08
	BENZO(G,H,I)PERYLENE	0.36	mg/kg	9.58E-08	3.99E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.43	mg/kg	1.13E-07	4.70E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	1.35E-07	5.64E-08
	BENZOIC ACID	1.2	mg/kg	3.27E-07	1.36E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	9.16E-08	3.82E-08	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	1.28E-09	5.34E-10
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	1.00E-08	4.18E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	1.64E-08	6.83E-09	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	3.28E-10	1.37E-10
	4- CHLOROANILINE	0.27	mg/kg	7.06E-08	2.94E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	1.26E-07	5.23E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.51E-08	6.28E-09
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	1.23E-07	5.14E-08	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	5.06E-07	2.11E-07
	2,6- DINITROTOLUENE	0.33	mg/kg	8.73E-08	3.64E-08	mg/kg-day	6.10E-01	$(mg/kg\text{-}day)^{-1}$	5.33E-08	2.22E-08
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	4.91E-08	2.05E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	1.36E-07	5.67E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	0.38	mg/kg	1.00E-07	4.17E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	9.58E-08	3.99E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	1.15E-07	4.79E-08
	2- METHYLNAPHTHALENE	0.43	mg/kg	1.15E-07	4.79E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.35	mg/kg	9.37E-08	3.90E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	3.18E-07	1.33E-07	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	3.82E-08	1.59E-08
	PHENANTHRENE	0.39	mg/kg	1.02E-07	4.26E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	1.28E-07	5.31E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*PYRENE*	0.71	mg/kg	1.87E-07	7.80E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	184	mg/kg	4.88E-05	2.04E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	50	mg/kg	1.32E-05	5.49E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	6.08E-05	2.53E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRPH	3,542	mg/kg	9.40E-04	3.92E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	1.16E-08	4.84E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	6.74E-09	2.81E-09	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	6.74E-10	2.81E-10
	2- BUTANONE	0.020	mg/kg	5.39E-09	2.24E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BROMOMETHANE	0.004	mg/kg	1.14E-09	4.76E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	1.32E-09	5.49E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	7.86E-10	3.27E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	1.85E-09	7.70E-10	mg/kg-day	3.10E-02	$(mg/kg\text{-}day)^{-1}$	5.73E-11	2.39E-11
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	5.46E-09	2.27E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	8.22E-09	3.42E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	1.57E-08	6.52E-09	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	2.19E-10	9.13E-11
	4- METHYL-2-PENTANONE	0.008	mg/kg	1.99E-09	8.29E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	8.43E-09	3.51E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	4.40E-09	1.83E-09	mg/kg-day	5.40E-01	$(mg/kg\text{-}day)^{-1}$	2.37E-09	9.89E-10
	TOLUENE	0.02	mg/kg	6.52E-09	2.72E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	2.27E-09	9.47E-10	mg/kg-day	4.10E-01	$(mg/kg\text{-}day)^{-1}$	9.31E-10	3.88E-10
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	3.33E-09	1.39E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	1.19E-09	4.95E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	2.56E-08	1.07E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	2.27E-09	9.44E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,656	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.3	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	4.97E-07	2.07E-07	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	4.70E-06	1.96E-06
	BARIUM	163	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.62	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00	mg/kg	3.66E-09	1.52E-09	mg/kg-day	1.52E+01	$(mg/kg\text{-}day)^{-1}$	5.56E-08	2.32E-08
	CHROMIUM	115	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.7	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	198	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	111	mg/kg	NA	NA	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MANGANESE	732	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	97	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.7	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*SILVER*	3.1	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	32	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	96	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	239	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	9.87E-10	4.11E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	1.68E-08	6.99E-09
	ALPHA-CHLORDANE	0.019	mg/kg	9.40E-10	3.92E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.22E-09	5.09E-10
	BETA BHC	0.071	mg/kg	3.48E-09	1.45E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	6.26E-09	2.61E-09
	4,4- DDD	0.018	mg/kg	6.47E-10	2.70E-10	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.55E-10	6.47E-11
	4,4- DDE	0.015	mg/kg	5.59E-10	2.33E-10	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.90E-10	7.92E-11
	4,4- DDT	0.08	mg/kg	2.93E-09	1.22E-09	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	9.95E-10	4.15E-10
	DIELDRIN	0.031	mg/kg	3.81E-09	1.59E-09	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	6.10E-08	2.54E-08
	ENDOSULFAN I	0.003	mg/kg	3.05E-10	1.27E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	4.99E-10	2.08E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	9.87E-10	4.11E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	9.87E-10	4.11E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	1.18E-09	4.92E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	5.85E-09	2.44E-09	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	6.44E-09	2.68E-09
	GAMMA-CHLORDANE	0.019	mg/kg	9.01E-10	3.76E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.17E-09	4.88E-10
	HEPTACHLOR	0.04	mg/kg	4.89E-09	2.04E-09	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	2.20E-08	9.16E-09
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.56E-09	6.51E-10	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	1.42E-08	5.93E-09
	HEXACHLOROBENZENE	0.034	mg/kg	4.12E-09	1.72E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	7.41E-09	3.09E-09
	METHOXYCHLOR	0.044	mg/kg	2.12E-09	8.85E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	1.22E-10	5.08E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	0.0008	mg/kg	3.90E-11	1.62E-11	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	5.07E-11	2.11E-11
	PCBs									
	PCBs (TOTAL)	0.27	mg/kg	4.54E-08	1.89E-08	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	2.27E-07	9.45E-08
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	9.79E-09	4.08E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*ACENAPHTHYLENE*	0.35	mg/kg	5.46E-08	2.28E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.35	mg/kg	5.46E-08	2.28E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	7.24E-08	3.02E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	8.68E-08	3.62E-08
	BENZO(A)PYRENE	0.43	mg/kg	6.86E-08	2.86E-08	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	8.23E-07	3.43E-07
	BENZO(B)FLUORANTHENE	0.40	mg/kg	6.35E-08	2.65E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	7.62E-08	3.18E-08
	BENZO(G,H,I)PERYLENE	0.36	mg/kg	5.72E-08	2.38E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.43	mg/kg	6.73E-08	2.80E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	8.08E-08	3.37E-08
	BENZOIC ACID	1.2	mg/kg	1.50E-07	6.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	4.20E-08	1.75E-08	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	5.88E-10	2.45E-10
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	4.60E-09	1.92E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	7.53E-09	3.14E-09	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	1.51E-10	6.27E-11
	4- CHLOROANILINE	0.27	mg/kg	3.24E-08	1.35E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	7.49E-08	3.12E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	8.99E-09	3.75E-09
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	7.36E-08	3.07E-08	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	3.02E-07	1.26E-07
	2,6- DINITROTOLUENE	0.33	mg/kg	4.01E-08	1.67E-08	mg/kg-day	6.10E-01	$(mg/kg\text{-}day)^{-1}$	2.44E-08	1.02E-08
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	2.25E-08	9.39E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	8.12E-08	3.39E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	0.38	mg/kg	5.97E-08	2.49E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	5.72E-08	2.38E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	6.86E-08	2.86E-08
	2- METHYLNAPHTHALENE	0.43	mg/kg	6.86E-08	2.86E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.35	mg/kg	5.59E-08	2.33E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	1.46E-07	6.09E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.75E-08	7.31E-09
	PHENANTHRENE	0.39	mg/kg	6.10E-08	2.54E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	7.61E-08	3.17E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PYRENE	0.71	mg/kg	1.12E-07	4.65E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	184	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	50	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	TRPH	3,542	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	NA	NA	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2- BUTANONE	0.020	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BROMOMETHANE	0.004	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	NA	NA	mg/kg-day	3.10E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	NA	NA	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	NA	NA	mg/kg-day	5.40E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TOLUENE	0.02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	NA	NA	mg/kg-day	4.10E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	9.69E-15	4.04E-15	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.26E-11	5.25E-12
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	1.48E-15	6.18E-16	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.93E-12	8.04E-13
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	1.44E-16	6.00E-17	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.87E-13	7.80E-14
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	1.34E-16	5.58E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.74E-12	7.25E-13
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	4.02E-16	1.67E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.22E-12	2.18E-12
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	3.28E-16	1.37E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	4.27E-12	1.78E-12
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.91E-16	7.95E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	2.48E-12	1.03E-12
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	1.07E-16	4.46E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.39E-12	5.80E-13
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	1.66E-16	6.93E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	2.16E-12	9.01E-13

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	8.35E-14	3.48E-14	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	1.09E-12	4.52E-13
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	1.72E-15	7.16E-16	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	2.23E-14	9.31E-15
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	7.25E-17	3.02E-17	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	9.43E-12	3.93E-12
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	4.80E-18	2.00E-18	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	3.12E-14	1.30E-14
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	6.58E-17	2.74E-17	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	4.28E-12	1.78E-12
	2,3,7,8- TCDF	4.10E-06	mg/kg	4.58E-17	1.91E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.95E-13	2.48E-13
	HERBICIDES									
	2,4- D	0.037	mg/kg	4.15E-13	1.73E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,656	mg/kg	2.64E-07	1.10E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.3	mg/kg	4.76E-11	1.98E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	1.52E-10	6.32E-11	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	1.82E-09	7.59E-10
	BARIUM	163	mg/kg	1.82E-09	7.58E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.62	mg/kg	6.96E-12	2.90E-12	mg/kg-day	8.40E+00	$(mg/kg\text{-}day)^{-1}$	5.85E-11	2.44E-11
	CADMIUM	3.00	mg/kg	3.35E-11	1.40E-11	mg/kg-day	1.50E+01	$(mg/kg\text{-}day)^{-1}$	5.03E-10	2.09E-10
	CHROMIUM	115	mg/kg	1.28E-09	5.34E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.7	mg/kg	1.63E-10	6.81E-11	mg/kg-day	9.80E+00	$(mg/kg\text{-}day)^{-1}$	1.60E-09	6.68E-10
	COPPER	198	mg/kg	2.21E-09	9.22E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	1.00E-12	4.18E-13	mg/kg-day	5.10E+02	$(mg/kg\text{-}day)^{-1}$	5.12E-10	2.13E-10
	LEAD	111	mg/kg	1.24E-09	5.17E-10	mg/kg-day	4.20E-02	$(mg/kg\text{-}day)^{-1}$	5.21E-11	2.17E-11
	MANGANESE	732	mg/kg	8.17E-09	3.40E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	2.13E-11	8.86E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	8.08E-10	3.37E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	97	mg/kg	1.08E-09	4.50E-10	mg/kg-day	9.10E-01	$(mg/kg\text{-}day)^{-1}$	9.83E-10	4.09E-10
	SELENIUM	0.7	mg/kg	7.86E-12	3.27E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	3.1	mg/kg	3.44E-11	1.43E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37	mg/kg	1.53E-11	6.38E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	32	mg/kg	3.57E-10	1.49E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	96	mg/kg	1.07E-09	4.45E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	239	mg/kg	2.67E-09	1.11E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	**PESTICIDES**									
	ALDRIN	0.01	mg/kg	9.04E-14	3.77E-14	mg/kg-day	1.72E+01	$(mg/kg\text{-}day)^{-1}$	1.55E-12	6.48E-13
	ALPHA-CHLORDANE	0.019	mg/kg	2.15E-13	8.97E-14	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	7.54E-14	3.14E-14
	BETA BHC	0.071	mg/kg	7.97E-13	3.32E-13	mg/kg-day	1.86E+00	$(mg/kg\text{-}day)^{-1}$	1.48E-12	6.17E-13
	4,4- DDD	0.018	mg/kg	1.98E-13	8.23E-14	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	4.74E-14	1.98E-14
	4,4- DDE	0.015	mg/kg	1.71E-13	7.11E-14	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	5.81E-14	2.42E-14
	4,4- DDT	0.08	mg/kg	8.94E-13	3.72E-13	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	3.04E-13	1.27E-13
	DIELDRIN	0.031	mg/kg	3.49E-13	1.46E-13	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	5.59E-12	2.33E-12
	ENDOSULFAN I	0.003	mg/kg	2.79E-14	1.16E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	4.58E-14	1.91E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	9.04E-14	3.77E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	9.04E-14	3.77E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	1.08E-13	4.51E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	1.34E-12	5.58E-13	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	1.47E-12	6.14E-13
	GAMMA-CHLORDANE	0.019	mg/kg	2.06E-13	8.60E-14	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	7.23E-14	3.01E-14
	HEPTACHLOR	0.04	mg/kg	4.47E-13	1.86E-13	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	2.01E-12	8.39E-13
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.43E-13	5.97E-14	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	1.30E-12	5.43E-13
	HEXACHLOROBENZENE	0.034	mg/kg	3.77E-13	1.57E-13	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	6.79E-13	2.83E-13
	METHOXYCHLOR	0.044	mg/kg	4.87E-13	2.03E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	1.12E-14	4.65E-15	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	0.0008	mg/kg	8.93E-15	3.72E-15	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	3.12E-15	1.30E-15
	PCBs									
	PCBs (TOTAL)	0.27	mg/kg	2.97E-12	1.24E-12	mg/kg-day	2.00E+00	$(mg/kg\text{-}day)^{-1}$	5.94E-12	2.47E-12
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	5.06E-09	2.11E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	0.35	mg/kg	3.85E-12	1.60E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.35	mg/kg	7.26E-09	3.02E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	5.10E-12	2.12E-12	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.99E-12	8.29E-13
	BENZO(A)PYRENE	0.43	mg/kg	4.83E-12	2.01E-12	mg/kg-day	3.90E+00	$(mg/kg\text{-}day)^{-1}$	1.88E-11	7.85E-12
	BENZO(B)FLUORANTHENE	0.40	mg/kg	4.47E-12	1.86E-12	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.75E-12	7.27E-13

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*BENZO(G,H,I)PERYLENE*	0.36	mg/kg	4.03E-12	1.68E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.43	mg/kg	4.74E-12	1.98E-12	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.85E-12	7.71E-13
	BENZOIC ACID	1.2	mg/kg	1.37E-11	5.73E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	3.85E-12	1.60E-12	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	5.39E-14	2.25E-14
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	4.22E-13	1.76E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	6.90E-13	2.87E-13	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	1.38E-14	5.75E-15
	4- CHLOROANILINE	0.27	mg/kg	2.97E-12	1.24E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	2.58E-09	1.08E-09	mg/kg-day	3.90E-02	$(mg/kg\text{-}day)^{-1}$	1.01E-10	4.19E-11
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	5.19E-12	2.16E-12	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	2.13E-11	8.86E-12
	2,6- DINITROTOLUENE	0.33	mg/kg	3.67E-12	1.53E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	2.06E-12	8.60E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	5.72E-12	2.39E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	0.38	mg/kg	1.54E-08	6.43E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	4.03E-12	1.68E-12	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.57E-12	6.55E-13
	2- METHYLNAPHTHALENE	0.43	mg/kg	4.83E-12	2.01E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.35	mg/kg	1.21E-07	5.04E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	1.34E-11	5.58E-12	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.61E-12	6.70E-13
	PHENANTHRENE	0.39	mg/kg	4.30E-12	1.79E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	5.36E-12	2.23E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PYRENE	0.71	mg/kg	2.73E-09	1.14E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	184	mg/kg	2.05E-09	8.56E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	50	mg/kg	5.54E-10	2.31E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	2.56E-09	1.06E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRPH	3,542	mg/kg	3.95E-08	1.65E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	5.14E-08	2.14E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	1.37E-07	5.70E-08	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	1.37E-08	5.70E-09
	2- BUTANONE	0.020	mg/kg	1.57E-08	6.56E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	BROMOMETHANE	0.004	mg/kg	3.52E-08	1.47E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	6.09E-08	2.54E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	6.92E-09	2.88E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	3.80E-08	1.58E-08	mg/kg-day	1.90E-02	$(mg/kg\text{-}day)^{-1}$	7.21E-10	3.01E-10
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	1.04E-07	4.35E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	8.45E-08	3.52E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	3.48E-07	1.45E-07	mg/kg-day	3.50E-03	$(mg/kg\text{-}day)^{-1}$	1.22E-09	5.07E-10
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	1.09E-08	4.53E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	9.38E-08	3.91E-08	mg/kg-day	2.10E-02	$(mg/kg\text{-}day)^{-1}$	1.97E-09	8.21E-10
	TOLUENE	0.02	mg/kg	9.04E-08	3.77E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	3.82E-08	1.59E-08	mg/kg-day	7.00E-03	$(mg/kg\text{-}day)^{-1}$	2.67E-10	1.11E-10
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	9.25E-09	3.85E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	8.25E-09	3.44E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	2.33E-07	9.69E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Notes:
The cancer risk for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	4.00E-11	4.00E-11	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	5.21E-08	5.21E-08
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	6.14E-12	6.14E-12	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	7.98E-09	7.98E-09
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	5.95E-13	5.95E-13	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	7.74E-10	7.74E-10
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	5.54E-13	5.54E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	7.20E-09	7.20E-09
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	1.66E-12	1.66E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	2.16E-08	2.16E-08
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	1.36E-12	1.36E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.76E-08	1.76E-08
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	7.89E-13	7.89E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.03E-08	1.03E-08
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	4.43E-13	4.43E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.76E-09	5.76E-09
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	6.87E-13	6.87E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	8.94E-09	8.94E-09
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	3.45E-10	3.45E-10	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	4.49E-09	4.49E-09
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	7.10E-12	7.10E-12	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	9.23E-11	9.23E-11
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	3.00E-13	3.00E-13	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	3.90E-08	3.90E-08
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.98E-14	1.98E-14	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	1.29E-10	1.29E-10
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	2.72E-13	2.72E-13	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	1.77E-08	1.77E-08
	2,3,7,8- TCDF	4.10E-06	mg/kg	1.89E-13	1.89E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	2.46E-09	2.46E-09
	HERBICIDES									
	2,4- D	0.037	mg/kg	1.72E-09	1.72E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,656	mg/kg	1.09E-03	1.09E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.3	mg/kg	1.97E-07	1.97E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	6.27E-07	6.27E-07	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	5.93E-06	5.93E-06
	BARIUM	163	mg/kg	7.52E-06	7.52E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.62	mg/kg	2.88E-08	2.88E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00	mg/kg	1.39E-07	1.39E-07	mg/kg-day	3.80E-01	$(mg/kg\text{-}day)^{-1}$	5.26E-08	5.26E-08
	CHROMIUM	115	mg/kg	5.30E-06	5.30E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.7	mg/kg	6.76E-07	6.76E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	198	mg/kg	9.15E-06	9.15E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	4.15E-09	4.15E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	111	mg/kg	5.13E-06	5.13E-06	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	4.36E-08	4.36E-08

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*MANGANESE*	732	mg/kg	3.38E-05	3.38E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	8.79E-08	8.79E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	3.34E-06	3.34E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	97	mg/kg	4.46E-06	4.46E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.7	mg/kg	3.25E-08	3.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	3.1	mg/kg	1.42E-07	1.42E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37	mg/kg	6.33E-08	6.33E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	32	mg/kg	1.48E-06	1.48E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	96	mg/kg	4.42E-06	4.42E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	239	mg/kg	1.10E-05	1.10E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	3.74E-10	3.74E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	6.35E-09	6.35E-09
	ALPHA-CHLORDANE	0.019	mg/kg	8.90E-10	8.90E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.16E-09	1.16E-09
	BETA BHC	0.071	mg/kg	3.29E-09	3.29E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	5.93E-09	5.93E-09
	4,4- DDD	0.018	mg/kg	8.16E-10	8.16E-10	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.96E-10	1.96E-10
	4,4- DDE	0.015	mg/kg	7.06E-10	7.06E-10	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	2.40E-10	2.40E-10
	4,4- DDT	0.08	mg/kg	3.69E-09	3.69E-09	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.26E-09	1.26E-09
	DIELDRIN	0.031	mg/kg	1.44E-09	1.44E-09	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	2.31E-08	2.31E-08
	ENDOSULFAN I	0.003	mg/kg	1.15E-10	1.15E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	1.89E-10	1.89E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	3.74E-10	3.74E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	3.74E-10	3.74E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	4.47E-10	4.47E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	5.54E-09	5.54E-09	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	6.09E-09	6.09E-09
	GAMMA-CHLORDANE	0.019	mg/kg	8.53E-10	8.53E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.11E-09	1.11E-09
	HEPTACHLOR	0.04	mg/kg	1.85E-09	1.85E-09	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	8.32E-09	8.32E-09
	HEPTACHLOR EPOXIDE	0.013	mg/kg	5.92E-10	5.92E-10	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	5.39E-09	5.39E-09
	HEXACHLOROBENZENE	0.034	mg/kg	1.56E-09	1.56E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	2.81E-09	2.81E-09
	METHOXYCHLOR	0.044	mg/kg	2.01E-09	2.01E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	4.61E-11	4.61E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	TRANS NONACHLOR	0.0008	mg/kg	3.69E-11	3.69E-11	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	4.80E-11	4.80E-11
	PCBs									
	PCBs (TOTAL)	0.27	mg/kg	1.23E-08	1.23E-08	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	6.14E-08	6.14E-08
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	2.85E-09	2.85E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	0.35	mg/kg	1.59E-08	1.59E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.35	mg/kg	1.59E-08	1.59E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	2.11E-08	2.11E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	2.53E-08	2.53E-08
	BENZO(A)PYRENE	0.43	mg/kg	2.00E-08	2.00E-08	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	2.40E-07	2.40E-07
	BENZO(B)FLUORANTHENE	0.40	mg/kg	1.85E-08	1.85E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	2.22E-08	2.22E-08
	BENZO(G,H,I)PERYLENE	0.36	mg/kg	1.67E-08	1.67E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.43	mg/kg	1.96E-08	1.96E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	2.35E-08	2.35E-08
	BENZOIC ACID	1.2	mg/kg	5.68E-08	5.68E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	1.59E-08	1.59E-08	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	2.23E-10	2.23E-10
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	1.74E-09	1.74E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	2.85E-09	2.85E-09	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	5.70E-11	5.70E-11
	4- CHLOROANILINE	0.27	mg/kg	1.23E-08	1.23E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	2.18E-08	2.18E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	2.62E-09	2.62E-09
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	2.14E-08	2.14E-08	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	8.79E-08	8.79E-08
	2,6- DINITROTOLUENE	0.33	mg/kg	1.52E-08	1.52E-08	mg/kg-day	6.10E-01	$(mg/kg\text{-}day)^{-1}$	9.26E-09	9.26E-09
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	8.53E-09	8.53E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	2.37E-08	2.37E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	0.38	mg/kg	1.74E-08	1.74E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	1.67E-08	1.67E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	2.00E-08	2.00E-08
	2- METHYLNAPHTHALENE	0.43	mg/kg	2.00E-08	2.00E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.35	mg/kg	1.63E-08	1.63E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	5.54E-08	5.54E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	6.64E-09	6.64E-09
	PHENANTHRENE	0.39	mg/kg	1.78E-08	1.78E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	2.22E-08	2.22E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*PYRENE*	0.71	mg/kg	3.25E-08	3.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	184	mg/kg	8.49E-06	8.49E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	50	mg/kg	2.29E-06	2.29E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	1.06E-05	1.06E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRPH	3,542	mg/kg	1.63E-04	1.63E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	2.02E-09	2.02E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	1.17E-09	1.17E-09	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	1.17E-10	1.17E-10
	2- BUTANONE	0.020	mg/kg	9.36E-10	9.36E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BROMOMETHANE	0.004	mg/kg	1.98E-10	1.98E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	2.29E-10	2.29E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	1.37E-10	1.37E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	3.21E-10	3.21E-10	mg/kg-day	3.10E-02	$(mg/kg\text{-}day)^{-1}$	9.95E-12	9.95E-12
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	9.48E-10	9.48E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	1.43E-09	1.43E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	2.72E-09	2.72E-09	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	3.81E-11	3.81E-11
	4- METHYL-2-PENTANONE	0.008	mg/kg	3.46E-10	3.46E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	1.47E-09	1.47E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	7.64E-10	7.64E-10	mg/kg-day	5.40E-01	$(mg/kg\text{-}day)^{-1}$	4.12E-10	4.12E-10
	TOLUENE	0.02	mg/kg	1.13E-09	1.13E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	3.95E-10	3.95E-10	mg/kg-day	4.10E-01	$(mg/kg\text{-}day)^{-1}$	1.62E-10	1.62E-10
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	5.79E-10	5.79E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	2.07E-10	2.07E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	4.44E-09	4.44E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	2.57E-10	2.57E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,656	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.3	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	5.64E-08	5.64E-08	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	5.33E-07	5.33E-07
	BARIUM	163	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.62	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00	mg/kg	4.16E-10	4.16E-10	mg/kg-day	1.52E+01	$(mg/kg\text{-}day)^{-1}$	6.32E-09	6.32E-09
	CHROMIUM	115	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.7	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	198	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	111	mg/kg	NA	NA	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MANGANESE	732	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	97	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.7	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*SILVER*	3.1	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	32	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	96	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	239	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	1.12E-10	1.12E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	1.91E-09	1.91E-09
	ALPHA-CHLORDANE	0.019	mg/kg	1.07E-10	1.07E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.39E-10	1.39E-10
	BETA BHC	0.071	mg/kg	3.95E-10	3.95E-10	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	7.11E-10	7.11E-10
	4,4- DDD	0.018	mg/kg	7.35E-11	7.35E-11	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.76E-11	1.76E-11
	4,4- DDE	0.015	mg/kg	6.35E-11	6.35E-11	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	2.16E-11	2.16E-11
	4,4- DDT	0.08	mg/kg	3.33E-10	3.33E-10	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.13E-10	1.13E-10
	DIELDRIN	0.031	mg/kg	4.33E-10	4.33E-10	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	6.93E-09	6.93E-09
	ENDOSULFAN I	0.003	mg/kg	3.46E-11	3.46E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	5.67E-11	5.67E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	1.12E-10	1.12E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	1.12E-10	1.12E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	1.34E-10	1.34E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	6.65E-10	6.65E-10	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	7.31E-10	7.31E-10
	GAMMA-CHLORDANE	0.019	mg/kg	1.02E-10	1.02E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.33E-10	1.33E-10
	HEPTACHLOR	0.04	mg/kg	5.55E-10	5.55E-10	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	2.50E-09	2.50E-09
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.78E-10	1.78E-10	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	1.62E-09	1.62E-09
	HEXACHLOROBENZENE	0.034	mg/kg	4.68E-10	4.68E-10	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	8.42E-10	8.42E-10
	METHOXYCHLOR	0.044	mg/kg	2.41E-10	2.41E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	1.38E-11	1.38E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	0.0008	mg/kg	4.43E-12	4.43E-12	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	5.76E-12	5.76E-12
	PCBs									
	PCBs (TOTAL)	0.27	mg/kg	5.15E-09	5.15E-09	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	2.58E-08	2.58E-08
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	1.11E-09	1.11E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*ACENAPHTHYLENE*	0.35	mg/kg	6.21E-09	6.21E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.35	mg/kg	6.21E-09	6.21E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	8.22E-09	8.22E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	9.87E-09	9.87E-09
	BENZO(A)PYRENE	0.43	mg/kg	7.79E-09	7.79E-09	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	9.35E-08	9.35E-08
	BENZO(B)FLUORANTHENE	0.40	mg/kg	7.21E-09	7.21E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	8.66E-09	8.66E-09
	BENZO(G,H,I)PERYLENE	0.36	mg/kg	6.49E-09	6.49E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.43	mg/kg	7.65E-09	7.65E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	9.17E-09	9.17E-09
	BENZOIC ACID	1.2	mg/kg	1.70E-08	1.70E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	4.77E-09	4.77E-09	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	6.68E-11	6.68E-11
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	5.23E-10	5.23E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	8.55E-10	8.55E-10	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	1.71E-11	1.71E-11
	4- CHLOROANILINE	0.27	mg/kg	3.68E-09	3.68E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	8.51E-09	8.51E-09	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.02E-09	1.02E-09
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	8.37E-09	8.37E-09	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	3.43E-08	3.43E-08
	2,6- DINITROTOLUENE	0.33	mg/kg	4.55E-09	4.55E-09	mg/kg-day	6.10E-01	$(mg/kg\text{-}day)^{-1}$	2.78E-09	2.78E-09
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	2.56E-09	2.56E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	9.23E-09	9.23E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	0.38	mg/kg	6.78E-09	6.78E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	6.49E-09	6.49E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	7.79E-09	7.79E-09
	2- METHYLNAPHTHALENE	0.43	mg/kg	7.79E-09	7.79E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.35	mg/kg	6.35E-09	6.35E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	1.66E-08	1.66E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.99E-09	1.99E-09
	PHENANTHRENE	0.39	mg/kg	6.93E-09	6.93E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	8.65E-09	8.65E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PYRENE	0.71	mg/kg	1.27E-08	1.27E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	184	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	50	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	TRPH	3,542	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	NA	NA	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2- BUTANONE	0.020	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BROMOMETHANE	0.004	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	NA	NA	mg/kg-day	3.10E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	NA	NA	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	NA	NA	mg/kg-day	5.40E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TOLUENE	0.02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	NA	NA	mg/kg-day	4.10E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	7.40E-14	3.85E-14	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	9.62E-11	5.00E-11
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	1.13E-14	5.89E-15	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.47E-11	7.66E-12
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	1.10E-15	5.72E-16	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.43E-12	7.43E-13
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	1.02E-15	5.32E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.33E-11	6.91E-12
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	3.07E-15	1.60E-15	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	3.99E-11	2.07E-11
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	2.51E-15	1.30E-15	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	3.26E-11	1.69E-11
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.46E-15	7.58E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.89E-11	9.85E-12
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	8.18E-16	4.25E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.06E-11	5.53E-12
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	1.27E-15	6.60E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.65E-11	8.58E-12

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	6.38E-13	3.32E-13	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	8.29E-12	4.31E-12
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	1.31E-14	6.83E-15	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	1.71E-13	8.87E-14
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	5.54E-16	2.88E-16	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	7.20E-11	3.75E-11
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	3.67E-17	1.91E-17	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	2.38E-13	1.24E-13
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	5.03E-16	2.61E-16	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	3.27E-11	1.70E-11
	2,3,7,8- TCDF	4.10E-06	mg/kg	3.49E-16	1.82E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	4.54E-12	2.36E-12
	HERBICIDES									
	2,4- D	0.037	mg/kg	3.17E-12	1.65E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,656	mg/kg	2.02E-06	1.05E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.3	mg/kg	3.63E-10	1.89E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	1.16E-09	6.03E-10	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	1.39E-08	7.23E-09
	BARIUM	163	mg/kg	1.39E-08	7.23E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.62	mg/kg	5.32E-11	2.76E-11	mg/kg-day	8.40E+00	$(mg/kg\text{-}day)^{-1}$	4.47E-10	2.32E-10
	CADMIUM	3.00	mg/kg	2.56E-10	1.33E-10	mg/kg-day	1.50E+01	$(mg/kg\text{-}day)^{-1}$	3.84E-09	2.00E-09
	CHROMIUM	115	mg/kg	9.79E-09	5.09E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.7	mg/kg	1.25E-09	6.49E-10	mg/kg-day	9.80E+00	$(mg/kg\text{-}day)^{-1}$	1.22E-08	6.36E-09
	COPPER	198	mg/kg	1.69E-08	8.79E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	7.67E-12	3.99E-12	mg/kg-day	5.10E+02	$(mg/kg\text{-}day)^{-1}$	3.91E-09	2.03E-09
	LEAD	111	mg/kg	9.47E-09	4.93E-09	mg/kg-day	4.20E-02	$(mg/kg\text{-}day)^{-1}$	3.98E-10	2.07E-10
	MANGANESE	732	mg/kg	6.24E-08	3.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	1.62E-10	8.44E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	6.17E-09	3.21E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	97	mg/kg	8.25E-09	4.29E-09	mg/kg-day	9.10E-01	$(mg/kg\text{-}day)^{-1}$	7.51E-09	3.90E-09
	SELENIUM	0.7	mg/kg	6.00E-11	3.12E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	3.1	mg/kg	2.63E-10	1.37E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.37	mg/kg	1.17E-10	6.08E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	32	mg/kg	2.73E-09	1.42E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	96	mg/kg	8.16E-09	4.24E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	239	mg/kg	2.04E-08	1.06E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	**PESTICIDES**									
	ALDRIN	0.01	mg/kg	6.90E-13	3.59E-13	mg/kg-day	1.72E+01	$(mg/kg\text{-}day)^{-1}$	1.19E-11	6.17E-12
	ALPHA-CHLORDANE	0.019	mg/kg	1.64E-12	8.55E-13	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	5.76E-13	2.99E-13
	BETA BHC	0.071	mg/kg	6.08E-12	3.16E-12	mg/kg-day	1.86E+00	$(mg/kg\text{-}day)^{-1}$	1.13E-11	5.88E-12
	4,4- DDD	0.018	mg/kg	1.51E-12	7.84E-13	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	3.62E-13	1.88E-13
	4,4- DDE	0.015	mg/kg	1.30E-12	6.78E-13	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	4.43E-13	2.31E-13
	4,4- DDT	0.08	mg/kg	6.83E-12	3.55E-12	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	2.32E-12	1.21E-12
	DIELDRIN	0.031	mg/kg	2.67E-12	1.39E-12	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	4.27E-11	2.22E-11
	ENDOSULFAN I	0.003	mg/kg	2.13E-13	1.11E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	3.49E-13	1.82E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	6.90E-13	3.59E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	6.90E-13	3.59E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	8.27E-13	4.30E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	1.02E-11	5.32E-12	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	1.13E-11	5.86E-12
	GAMMA-CHLORDANE	0.019	mg/kg	1.58E-12	8.20E-13	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	5.52E-13	2.87E-13
	HEPTACHLOR	0.04	mg/kg	3.42E-12	1.78E-12	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	1.54E-11	8.00E-12
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.09E-12	5.69E-13	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	9.95E-12	5.18E-12
	HEXACHLOROBENZENE	0.034	mg/kg	2.88E-12	1.50E-12	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	5.19E-12	2.70E-12
	METHOXYCHLOR	0.044	mg/kg	3.72E-12	1.93E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	8.52E-14	4.43E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	0.0008	mg/kg	6.82E-14	3.55E-14	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	2.39E-14	1.24E-14
	PCBs									
	PCBs (TOTAL)	0.27	mg/kg	2.27E-11	1.18E-11	mg/kg-day	2.00E+00	$(mg/kg\text{-}day)^{-1}$	4.53E-11	2.36E-11
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	9.60E-10	4.99E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	0.35	mg/kg	2.94E-11	1.53E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.35	mg/kg	1.38E-09	7.16E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	3.90E-11	2.03E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.52E-11	7.90E-12
	BENZO(A)PYRENE	0.43	mg/kg	3.69E-11	1.92E-11	mg/kg-day	3.90E+00	$(mg/kg\text{-}day)^{-1}$	1.44E-10	7.48E-11
	BENZO(B)FLUORANTHENE	0.40	mg/kg	3.42E-11	1.78E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.33E-11	6.93E-12

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*BENZO(G,H,I)PERYLENE*	0.36	mg/kg	3.08E-11	1.60E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.43	mg/kg	3.62E-11	1.88E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.41E-11	7.35E-12
	BENZOIC ACID	1.2	mg/kg	1.05E-10	5.46E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	2.94E-11	1.53E-11	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	4.12E-13	2.14E-13
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	3.22E-12	1.68E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	5.27E-12	2.74E-12	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	1.05E-13	5.48E-14
	4- CHLOROANILINE	0.27	mg/kg	2.27E-11	1.18E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	4.90E-10	2.55E-10	mg/kg-day	3.90E-02	$(mg/kg\text{-}day)^{-1}$	1.91E-11	9.93E-12
	DIBENZ(A,H)ANTHRACENE	0.47	mg/kg	3.96E-11	2.06E-11	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	1.62E-10	8.45E-11
	2,6- DINITROTOLUENE	0.33	mg/kg	2.80E-11	1.46E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	1.58E-11	8.20E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	4.37E-11	2.27E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	0.38	mg/kg	2.93E-09	1.52E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.36	mg/kg	3.08E-11	1.60E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.20E-11	6.24E-12
	2- METHYLNAPHTHALENE	0.43	mg/kg	3.69E-11	1.92E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.35	mg/kg	2.30E-08	1.19E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	1.02E-10	5.32E-11	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.23E-11	6.38E-12
	PHENANTHRENE	0.39	mg/kg	3.28E-11	1.71E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	4.10E-11	2.13E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PYRENE	0.71	mg/kg	5.19E-10	2.70E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	184	mg/kg	1.57E-08	8.16E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	50	mg/kg	4.23E-09	2.20E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	229	mg/kg	1.95E-08	1.02E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRPH	3,542	mg/kg	3.02E-07	1.57E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	9.75E-09	5.07E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	2.60E-08	1.35E-08	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	2.60E-09	1.35E-09
	2- BUTANONE	0.020	mg/kg	2.99E-09	1.55E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-4d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	BROMOMETHANE	0.004	mg/kg	6.68E-09	3.47E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	1.16E-08	6.01E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	1.31E-09	6.83E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	7.21E-09	3.75E-09	mg/kg-day	1.90E-02	$(mg/kg\text{-}day)^{-1}$	1.37E-10	7.12E-11
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	1.98E-08	1.03E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	1.60E-08	8.33E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	6.60E-08	3.43E-08	mg/kg-day	3.50E-03	$(mg/kg\text{-}day)^{-1}$	2.31E-10	1.20E-10
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	2.06E-09	1.07E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	1.78E-08	9.26E-09	mg/kg-day	2.10E-02	$(mg/kg\text{-}day)^{-1}$	3.74E-10	1.94E-10
	TOLUENE	0.02	mg/kg	1.72E-08	8.93E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	7.25E-09	3.77E-09	mg/kg-day	7.00E-03	$(mg/kg\text{-}day)^{-1}$	5.08E-11	2.64E-11
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	1.76E-09	9.13E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	1.57E-09	8.14E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	4.41E-08	2.30E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Notes:
The cancer risk for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-4e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
Soil (0 to 10 feet)	Soil	On-Site Soil	**DIOXINS/FURANS (mg/kg)**					**DIOXINS/FURANS (mg/kg)**					
			1,2,3,4,6,7,8- HPCDD	2.99E-07	NA	1.26E-11	2.99E-07	1,2,3,4,6,7,8- HPCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.49E-06	3.49E-06
			1,2,3,4,6,7,8- HPCDF	4.59E-08	NA	1.93E-12	4.59E-08	1,2,3,4,6,7,8- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	5.35E-07	5.35E-07
			1,2,3,4,7,8,9- HPCDF	4.45E-09	NA	1.87E-13	4.45E-09	1,2,3,4,7,8,9- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	5.19E-08	5.19E-08
			1,2,3,4,7,8- HXCDD	4.14E-08	NA	1.74E-12	4.14E-08	1,2,3,4,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	4.83E-08	4.83E-08
			1,2,3,6,7,8- HXCDD	1.24E-07	NA	5.22E-12	1.24E-07	1,2,3,6,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.45E-07	1.45E-07
			1,2,3,7,8,9- HXCDD	1.01E-07	NA	4.27E-12	1.01E-07	1,2,3,7,8,9- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.18E-07	1.18E-07
			1,2,3,4,7,8- HXCDF	5.90E-08	NA	2.48E-12	5.90E-08	1,2,3,4,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.88E-08	6.88E-08
			1,2,3,6,7,8- HXCDF	3.31E-08	NA	1.39E-12	3.31E-08	1,2,3,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.86E-08	3.86E-08
			2,3,4,6,7,8- HXCDF	5.14E-08	NA	2.16E-12	5.14E-08	2,3,4,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.00E-08	6.00E-08
			1,2,3,4,6,7,8,9- OCDD	2.58E-08	NA	1.09E-12	2.58E-08	1,2,3,4,6,7,8,9- OCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.01E-05	3.01E-05
			1,2,3,4,6,7,8,9- OCDF	5.31E-10	NA	2.23E-14	5.31E-10	1,2,3,4,6,7,8,9- OCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.20E-07	6.20E-07
			1,2,3,7,8- PECDD	2.24E-07	NA	9.43E-12	2.24E-07	1,2,3,7,8- PECDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.62E-08	2.62E-08
			1,2,3,7,8- PECDF	7.42E-10	NA	3.12E-14	7.42E-10	1,2,3,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.73E-09	1.73E-09
			2,3,4,7,8- PECDF	1.02E-07	NA	4.28E-12	1.02E-07	2,3,4,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.37E-08	2.37E-08
			2,3,7,8- TCDF	1.41E-08	NA	5.95E-13	1.41E-08	2,3,7,8- TCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.65E-08	1.65E-08

Table C1-4e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			HERBICIDES (mg/kg)					**HERBICIDES (mg/kg)**					
			2,4- D	NA	NA	NA	NA	2,4- D	Circulatory System; Kidney; Liver	4.07E-06	9.33E-07	NA	5.00E-06
			INORGANICS (mg/kg)					**INORGANICS (mg/kg)**					
			ALUMINUM	NA	NA	NA	NA	ALUMINUM	Body Weight	2.59E-02	NA	7.76E-04	2.66E-02
			ANTIMONY	NA	NA	NA	NA	ANTIMONY	Blood; Whole Body	1.16E-02	NA	NA	1.16E-02
			ARSENIC	3.41E-05	4.70E-06	1.82E-09	3.88E-05	ARSENIC	Cardiovascular System; Fetal; Nervous System; Skin	4.95E-02	6.82E-03	7.29E-05	5.64E-02
			BARIUM	NA	NA	NA	NA	BARIUM	Cardiovascular System; Fetal; Kidney; NOEL	2.55E-03	NA	5.24E-05	2.60E-03
			BERYLLIUM	NA	NA	5.85E-11	5.85E-11	BERYLLIUM	GI System; Immune System; Respiratory	3.41E-04	NA	1.43E-05	3.55E-04
			CADMIUM	3.03E-07	5.56E-08	5.03E-10	3.59E-07	CADMIUM	Kidney; Respiratory	6.56E-03	1.21E-03	2.42E-05	7.79E-03
			CHROMIUM	NA	NA	NA	NA	CHROMIUM	NOEL	8.37E-05	NA	NA	8.37E-05
			COBALT	NA	NA	1.60E-09	1.60E-09	COBALT	Cardiovascular System; Respiratory	8.01E-04	NA	1.18E-04	9.19E-04
			COPPER	NA	NA	NA	NA	COPPER	GI System	5.42E-03	NA	NA	5.42E-03
			HEXAVALENT CHROMIUM	NA	NA	5.12E-10	5.12E-10	HEXAVALENT CHROMIUM	NOEL	3.28E-05	NA	1.45E-07	3.29E-05
			LEAD	2.51E-07	NA	5.21E-11	2.51E-07	LEAD	NA	NA	NA	NA	NA
			MANGANESE	NA	NA	NA	NA	MANGANESE	Nervous System	5.72E-03	NA	2.35E-03	8.07E-03
			MERCURY	NA	NA	NA	NA	MERCURY	Nervous System	6.94E-03	NA	3.41E-06	6.94E-03
			MOLYBDENUM	NA	NA	NA	NA	MOLYBDENUM	Kidney	1.58E-02	NA	NA	1.58E-02
			NICKEL	NA	NA	9.83E-10	9.83E-10	NICKEL	Body Weight; Respiratory	5.29E-03	NA	3.12E-04	5.60E-03
			SELENIUM	NA	NA	NA	NA	SELENIUM	Cardiovascular System; Liver; Nervous System; Skin	1.54E-04	NA	5.67E-09	1.54E-04
			SILVER	NA	NA	NA	NA	SILVER	Skin	6.74E-04	NA	NA	6.74E-04
			THALLIUM	NA	NA	NA	NA	THALLIUM	Blood; Liver	2.27E-02	NA	NA	2.27E-02
			TIN	NA	NA	NA	NA	TIN	Kidney; Liver	5.83E-05	NA	NA	5.83E-05
			VANADIUM	NA	NA	NA	NA	VANADIUM	NOEL	1.50E-02	NA	NA	1.50E-02
			ZINC	NA	NA	NA	NA	ZINC	Blood	8.70E-04	NA	NA	8.70E-04
			PESTICIDES (mg/kg)					**PESTICIDES (mg/kg)**					
			ALDRIN	3.65E-08	1.68E-08	1.55E-12	5.33E-08	ALDRIN	Liver	2.95E-04	1.35E-04	1.24E-08	4.31E-04
			ALPHA-CHLORDANE	6.66E-09	1.22E-09	7.54E-14	7.88E-09	ALPHA-CHLORDANE	Liver	4.22E-05	7.75E-06	4.43E-09	4.99E-05
			BETA BHC	3.41E-08	6.26E-09	1.48E-12	4.04E-08	BETA BHC	Liver	3.90E-04	7.16E-05	1.64E-08	4.62E-04
			4,4- DDD	1.13E-09	1.55E-10	4.74E-14	1.28E-09	4,4- DDD	Liver	3.87E-05	5.33E-06	1.63E-09	4.40E-05
			4,4- DDE	1.38E-09	1.90E-10	5.81E-14	1.57E-09	4,4- DDE	Liver	3.34E-05	4.60E-06	1.41E-09	3.80E-05
			4,4- DDT	7.23E-09	9.95E-10	3.04E-13	8.22E-09	4,4- DDT	Liver	1.75E-04	2.41E-05	7.36E-09	1.99E-04
			DIELDRIN	1.33E-07	6.10E-08	5.59E-12	1.94E-07	DIELDRIN	Liver	6.84E-04	3.14E-04	2.88E-08	9.98E-04
			ENDOSULFAN I	NA	NA	NA	NA	ENDOSULFAN I	Body Weight; Kidney; Nervous System	4.55E-07	2.09E-07	1.91E-11	6.64E-07
			ENDOSULFAN II	NA	NA	NA	NA	ENDOSULFAN II	Body Weight; Kidney; Nervous System	7.47E-07	3.43E-07	3.14E-11	1.09E-06

Table C1-4e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			ENDOSULFAN SULFATE	NA	NA	NA	NA	ENDOSULFAN SULFATE	Body Weight; Kidney; Nervous System	1.48E-06	6.77E-07	6.20E-11	2.15E-06
			ENDRIN ALDEHYDE	NA	NA	NA	NA	ENDRIN ALDEHYDE	Liver; Kidney; Nervous System	2.95E-05	1.35E-05	1.24E-09	4.31E-05
			ENDRIN KETONE	NA	NA	NA	NA	ENDRIN KETONE	Liver; Kidney; Nervous System	3.53E-05	1.62E-05	1.49E-09	5.16E-05
			GAMMA-BHC	3.51E-08	6.44E-09	1.47E-12	4.15E-08	GAMMA-BHC	Kidney; Liver	4.38E-04	8.03E-05	1.84E-08	5.18E-04
			GAMMA-CHLORDANE	6.38E-09	1.17E-09	7.23E-14	7.56E-09	GAMMA-CHLORDANE	Liver	4.04E-05	7.42E-06	4.25E-09	4.79E-05
			HEPTACHLOR	4.79E-08	2.20E-08	2.01E-12	6.99E-08	HEPTACHLOR	Liver	8.76E-05	4.02E-05	3.69E-09	1.28E-04
			HEPTACHLOR EPOXIDE	3.10E-08	1.42E-08	1.30E-12	4.52E-08	HEPTACHLOR EPOXIDE	Liver	1.08E-03	4.95E-04	4.54E-08	1.57E-03
			HEXACHLOROBENZENE	1.61E-08	7.41E-09	6.79E-13	2.36E-08	HEXACHLOROBENZENE	Liver	4.62E-05	2.12E-05	5.18E-09	6.74E-05
			METHOXYCHLOR	NA	NA	NA	NA	METHOXYCHLOR	Fetal	9.53E-06	1.75E-06	4.01E-10	1.13E-05
			MIREX	NA	NA	NA	NA	MIREX	Liver	5.46E-06	2.51E-06	2.30E-10	7.97E-06
			TRANS NONACHLOR	2.76E-10	5.07E-11	3.12E-15	3.27E-10	TRANS NONACHLOR	Liver	1.75E-06	3.21E-07	1.84E-10	2.07E-06
			PCBs (mg/kg)					**PCBs (mg/kg)**					
			PCBs (TOTAL)	3.53E-07	2.27E-07	5.94E-12	5.80E-07	PCBs (TOTAL)	Immune System	1.45E-02	9.34E-03	6.11E-07	2.39E-02
			SVOCs (mg/kg)					**SVOCs (mg/kg)**					
			ACENAPHTHENE	NA	NA	NA	NA	ACENAPHTHENE	Liver	1.13E-06	6.72E-07	3.47E-07	2.14E-06
			ACENAPHTHYLENE	NA	NA	NA	NA	ACENAPHTHYLENE	NA	NA	NA	NA	NA
			ANTHRACENE	NA	NA	NA	NA	ANTHRACENE	NOEL	1.26E-06	7.50E-07	9.96E-08	2.11E-06
			BENZO(A)ANTHRACENE	1.46E-07	8.68E-08	1.99E-12	2.32E-07	BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA
			BENZO(A)PYRENE	1.38E-06	8.23E-07	1.88E-11	2.20E-06	BENZO(A)PYRENE	NA	NA	NA	NA	NA
			BENZO(B)FLUORANTHENE	1.28E-07	7.62E-08	1.75E-12	2.04E-07	BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	BENZO(G,H,I)PERYLENE	Kidney; Nervous System	9.86E-06	5.89E-06	4.15E-10	1.57E-05
			BENZO(K)FLUORANTHENE	1.35E-07	8.08E-08	1.85E-12	2.16E-07	BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZOIC ACID	NA	NA	NA	NA	BENZOIC ACID	NOEL	3.37E-07	1.54E-07	1.42E-11	4.91E-07
			BIS(2-ETHYLHEXYL)PHTHAL	1.28E-09	5.88E-10	5.39E-14	1.87E-09	BIS(2-ETHYLHEXYL)PHTHAL	Liver	1.89E-05	8.65E-06	7.93E-10	2.75E-05
			BUTYLBENZYLPHTHALATE	NA	NA	NA	NA	BUTYLBENZYLPHTHALATE	Liver	2.07E-07	9.48E-08	8.68E-12	3.01E-07
			CARBAZOLE	3.28E-10	1.51E-10	1.38E-14	4.79E-10	CARBAZOLE	NA	NA	NA	NA	NA
			4- CHLOROANILINE	NA	NA	NA	NA	4- CHLOROANILINE	Spleen	7.27E-05	3.34E-05	3.06E-09	1.06E-04
			CHRYSENE	1.51E-08	8.99E-09	1.01E-10	2.42E-08	CHRYSENE	NA	NA	NA	NA	NA
			DIBENZ(A,H)ANTHRACENE	5.06E-07	3.02E-07	2.13E-11	8.08E-07	DIBENZ(A,H)ANTHRACENE	NA	NA	NA	NA	NA
			2,6- DINITROTOLUENE	5.33E-08	2.44E-08	NA	7.77E-08	2,6- DINITROTOLUENE	NA	3.60E-04	1.65E-04	1.51E-08	5.25E-04
			DI-N-BUTYLPHTHALATE	NA	NA	NA	NA	DI-N-BUTYLPHTHALATE	Whole Body	2.02E-06	9.28E-07	8.50E-11	2.95E-06
			FLUORANTHENE	NA	NA	NA	NA	FLUORANTHENE	Blood; Kidney; Liver	1.40E-05	8.36E-06	5.89E-10	2.24E-05
			FLUORENE	NA	NA	NA	NA	FLUORENE	Blood	1.03E-05	6.15E-06	1.59E-06	1.80E-05
			INDENO(1,2,3-CD)PYRENE	1.15E-07	6.86E-08	1.57E-12	1.84E-07	INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA
			2- METHYLNAPHTHALENE	NA	NA	NA	NA	2- METHYLNAPHTHALENE	Body Weight; Respiratory	1.18E-04	7.06E-05	NA	1.89E-04
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	1.93E-05	1.15E-05	5.81E-04	6.12E-04
			PENTACHLOROPHENOL	3.82E-08	1.75E-08	1.61E-12	5.58E-08	PENTACHLOROPHENOL	Liver; Kidney	4.37E-05	2.01E-05	1.84E-09	6.38E-05

Table C1-4e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

				Carcinogenic Risk						Non-Carconogenic Hazard Index			
Medium	**Exposure Medium**	**Exposure Point**	**Chemical**	**Ingestion**	**Dermal**	**Inhalation (Outdoor)**	**Exposure Routes Total**	**Chemical**	**Primary Target Organ**	**Ingestion HQ**	**Dermal HQ**	**Inhalation (Outdoor) HQ**	**Total HI**
			PHENANTHRENE	NA	NA	NA	NA	PHENANTHRENE	NOEL	1.40E-06	8.37E-07	5.90E-11	2.24E-06
			PHENOL	NA	NA	NA	NA	PHENOL	Cardiovascular System; Fetal; Kidney; Liver; Nervous System	8.75E-07	5.22E-07	3.87E-10	1.40E-06
			PYRENE	NA	NA	NA	NA	PYRENE	Kidney	2.57E-05	1.53E-05	3.75E-07	4.14E-05
			TPH (mg/kg)					**TPH (mg/kg)**					
			TPH AS DIESEL	NA	NA	NA	NA	TPH AS DIESEL	NA	NA	NA	NA	NA
			TPH AS GASOLINE	NA	NA	NA	NA	TPH AS GASOLINE	NA	NA	NA	NA	NA
			TPH AS MOTOR OIL	NA	NA	NA	NA	TPH AS MOTOR OIL	NA	NA	NA	NA	NA
			TRPH	NA	NA	NA	NA	TRPH	NA	NA	NA	NA	NA
			VOCs (mg/kg)					**VOCs (mg/kg)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Livei	5.32E-08	NA	2.35E-07	2.88E-07
			BENZENE	6.74E-10	NA	1.37E-08	1.44E-08	BENZENE	Fetal; Immune System; Nervous System; Respiratory	6.94E-06	NA	6.58E-05	7.27E-05
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	3.70E-08	NA	2.27E-07	2.64E-07
			BROMOMETHANE	NA	NA	NA	NA	BROMOMETHANE	GI System	3.36E-06	NA	1.01E-07	3.46E-06
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	5.42E-08	NA	1.25E-06	1.31E-06
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Livei	1.62E-07	NA	4.99E-06	5.15E-06
			CHLOROFORM	5.73E-11	NA	7.21E-10	7.79E-10	CHLOROFORM	Fetal; Kidney; Livei	7.61E-07	NA	1.83E-06	2.59E-06
			CIS-1,2- DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2- DICHLOROETHENE	Blood	2.25E-06	NA	4.30E-05	4.52E-05
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Livei	3.38E-07	NA	1.22E-06	1.55E-06
			METHYLENE CHLORIDE	2.19E-10	NA	1.22E-09	1.44E-09	METHYLENE CHLORIDE	Cardiovascular System; Liver; Nervous System	1.07E-06	NA	1.25E-05	1.36E-05
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Kidney; Liver	1.02E-07	NA	NA	1.02E-07
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	1.74E-06	NA	5.23E-05	5.40E-05
			TETRACHLOROETHENE	2.37E-09	NA	1.97E-09	4.34E-09	TETRACHLOROETHENE	Kidney; Livei	1.81E-06	NA	3.86E-05	4.05E-05
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	1.34E-07	NA	4.35E-06	4.48E-06
			TRICHLOROETHENE	9.31E-10	NA	2.67E-10	1.20E-09	TRICHLOROETHENE	Eyes; Nervous System	3.12E-05	NA	1.57E-05	4.69E-05
			1,2,4- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLYBENZENE	NA	2.75E-07	NA	2.24E-05	2.27E-05
			1,3,5- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLYBENZENE	NA	9.79E-08	NA	2.00E-05	2.01E-05
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	5.26E-07	NA	3.35E-05	3.41E-05
Groundwater	Shallow Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	5.63E-04	5.63E-04
			BENZENE	NA	NA	9.57E-07	9.57E-07	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	4.60E-03	4.60E-03
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	3.82E-03	3.82E-03
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	3.55E-04	3.55E-04
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	2.66E-03	2.66E-03

Table C1-4e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			CHLOROMETHANE	NA	NA	6.50E-08	6.50E-08	CHLOROMETHANE	NA	NA	NA	4.94E-04	4.94E-04
			CIS-1,2-DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2-DICHLOROETHENE	Blood	NA	NA	6.98E-03	6.98E-03
			1,3- DICHLOROBENZENE	NA	NA	NA	NA	1,3- DICHLOROBENZENE	NA	NA	NA	3.84E-04	3.84E-04
			1,2- DICHLOROETHENE (TOTAL)	NA	NA	NA	NA	1,2- DICHLOROETHENE (TOTAL)	Blood, Liver	NA	NA	3.28E-02	3.28E-02
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	NA	NA	7.42E-05	7.42E-05
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	NA	NA	2.12E-04	2.12E-04
			TRANS-1,2-DICHLOROETHEN	NA	NA	NA	NA	TRANS-1,2-DICHLOROETHEN	Blood; Liver	NA	NA	6.52E-04	6.52E-04
			1,2,4- TRIMETHYLBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLBENZENE	NA	NA	NA	6.60E-03	6.60E-03
			1,3,5- TRIMETHYLBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLBENZENE	NA	NA	NA	4.99E-03	4.99E-03
			VINYL CHLORIDE	NA	NA	9.07E-08	9.07E-08	VINYL CHLORIDE	GI System; Liver; Nervous System	NA	NA	8.48E-04	8.48E-04
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	NA	NA	1.49E-03	1.49E-03
Groundwater	Intermediate and Deep Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	1.25E-04	1.25E-04
			BENZENE	NA	NA	1.40E-06	1.40E-06	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	6.73E-03	6.73E-03
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	5.83E-04	5.83E-04
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	5.61E-04	5.61E-04
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	1.01E-02	1.01E-02
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Fetal; Kidney; Liver	NA	NA	2.12E-04	2.12E-04

Cancer Risk Across Soil:	4.6E-05
Cancer Risk Across Groundwater:	2.5E-06
Total Cancer Risk:	4.8E-05

HI Across Soil:	2.2E-01
HI Across Groundwater:	8.6E-02
Total HI:	3.0E-01
Total Blood HI:	7.6E-02
Total Body Weight HI:	3.5E-02
Total Cardiovascular System HI:	6.0E-02
Total Fetal/Reproductive System HI:	8.1E-02
Total GI System HI:	6.6E-03
Total Immune System HI:	3.6E-02
Total Kidney HI:	4.1E-02
Total Liver HI:	7.6E-02
Total Nervous System HI:	8.7E-02
Total NOEL HI:	1.8E-02
Total Respiratory HI:	2.9E-02
Total Skin HI:	5.7E-02
Total Whole Body HI:	1.2E-02

Notes:
EPC = Exposure point concentration
GI = Gastrointestinal
HQ = Hazard Quotient
HI = Hazard Index
mg/kg = milligrams per kilogram
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
ug/L = microgram per liter

Table C1-4f
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
Soil (0 to 10 feet)	Soil	On-Site Soil	**DIOXINS/FURANS (mg/kg)**					**DIOXINS/FURANS (mg/kg)**					
			1,2,3,4,6,7,8- HPCDD	5.21E-08	NA	9.62E-11	5.21E-08	1,2,3,4,6,7,8- HPCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	4.53E-04	4.53E-04
			1,2,3,4,6,7,8- HPCDF	7.98E-09	NA	1.47E-11	7.99E-09	1,2,3,4,6,7,8- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.95E-05	6.95E-05
			1,2,3,4,7,8,9- HPCDF	7.74E-10	NA	1.43E-12	7.75E-10	1,2,3,4,7,8,9- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.74E-06	6.74E-06
			1,2,3,4,7,8- HXCDD	7.20E-09	NA	1.33E-11	7.21E-09	1,2,3,4,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.27E-06	6.27E-06
			1,2,3,6,7,8- HXCDD	2.16E-08	NA	3.99E-11	2.16E-08	1,2,3,6,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.88E-05	1.88E-05
			1,2,3,7,8,9- HXCDD	1.76E-08	NA	3.26E-11	1.77E-08	1,2,3,7,8,9- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.54E-05	1.54E-05
			1,2,3,4,7,8- HXCDF	1.03E-08	NA	1.89E-11	1.03E-08	1,2,3,4,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	8.93E-06	8.93E-06
			1,2,3,6,7,8- HXCDF	5.76E-09	NA	1.06E-11	5.77E-09	1,2,3,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	5.02E-06	5.02E-06
			2,3,4,6,7,8- HXCDF	8.94E-09	NA	1.65E-11	8.95E-09	2,3,4,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	7.78E-06	7.78E-06
			1,2,3,4,6,7,8,9- OCDD	4.49E-09	NA	8.29E-12	4.49E-09	1,2,3,4,6,7,8,9- OCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.91E-03	3.91E-03
			1,2,3,4,6,7,8,9- OCDF	9.23E-11	NA	1.71E-13	9.25E-11	1,2,3,4,6,7,8,9- OCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	8.05E-05	8.05E-05
			1,2,3,7,8- PECDD	3.90E-08	NA	7.20E-11	3.91E-08	1,2,3,7,8- PECDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.40E-06	3.40E-06
			1,2,3,7,8- PECDF	1.29E-10	NA	2.38E-13	1.29E-10	1,2,3,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.25E-07	2.25E-07
			2,3,4,7,8- PECDF	1.77E-08	NA	3.27E-11	1.77E-08	2,3,4,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.08E-06	3.08E-06
			2,3,7,8- TCDF	2.46E-09	NA	4.54E-12	2.46E-09	2,3,7,8- TCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.14E-06	2.14E-06

Table C1-4f
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			HERBICIDES (mg/kg)					**HERBICIDES (mg/kg)**					
			2,4- D	NA	NA	NA	NA	2,4- D	Circulatory System; Kidney; Liver	1.20E-05	1.80E-06	NA	1.38E-05
			INORGANICS (mg/kg)					**INORGANICS (mg/kg)**					
			ALUMINUM	NA	NA	NA	NA	ALUMINUM	Body Weight	7.64E-02	NA	1.01E-01	1.77E-01
			ANTIMONY	NA	NA	NA	NA	ANTIMONY	Blood; Whole Body	3.44E-02	NA	NA	3.44E-02
			ARSENIC	5.93E-06	5.33E-07	1.39E-08	6.47E-06	ARSENIC	Cardiovascular System; Fetal; Nervous System; Skin	1.46E-01	1.32E-02	9.47E-03	1.69E-01
			BARIUM	NA	NA	NA	NA	BARIUM	Cardiovascular System; Fetal; Kidney; NOEL	7.52E-03	NA	6.80E-03	1.43E-02
			BERYLLIUM	NA	NA	4.47E-10	4.47E-10	BERYLLIUM	GI System; Immune System; Respiratory	1.01E-03	NA	1.86E-03	2.87E-03
			CADMIUM	5.26E-08	6.32E-09	3.84E-09	6.28E-08	CADMIUM	Kidney; Respiratory	1.94E-02	2.33E-03	3.14E-03	2.49E-02
			CHROMIUM	NA	NA	NA	NA	CHROMIUM	NOEL	2.47E-04	NA	NA	2.47E-04
			COBALT	NA	NA	1.22E-08	1.22E-08	COBALT	Cardiovascular System; Respiratory	2.37E-03	NA	1.53E-02	1.77E-02
			COPPER	NA	NA	NA	NA	COPPER	GI System	1.60E-02	NA	NA	1.60E-02
			HEXAVALENT CHROMIUM	NA	NA	3.91E-09	3.91E-09	HEXAVALENT CHROMIUM	NOEL	9.69E-05	NA	1.88E-05	1.16E-04
			LEAD	4.36E-08	NA	3.98E-10	4.40E-08	LEAD	NA	NA	NA	NA	NA
			MANGANESE	NA	NA	NA	NA	MANGANESE	Nervous System	1.69E-02	NA	3.06E-01	3.22E-01
			MERCURY	NA	NA	NA	NA	MERCURY	Nervous System	2.05E-02	NA	4.42E-04	2.09E-02
			MOLYBDENUM	NA	NA	NA	NA	MOLYBDENUM	Kidney	4.68E-02	NA	NA	4.68E-02
			NICKEL	NA	NA	7.51E-09	7.51E-09	NICKEL	Body Weight; Respiratory	1.56E-02	NA	4.04E-02	5.61E-02
			SELENIUM	NA	NA	NA	NA	SELENIUM	Cardiovascular System; Liver; Nervous System; Skin	4.55E-04	NA	7.36E-07	4.55E-04
			SILVER	NA	NA	NA	NA	SILVER	Skin	1.99E-03	NA	NA	1.99E-03
			THALLIUM	NA	NA	NA	NA	THALLIUM	Blood; Liver	6.72E-02	NA	NA	6.72E-02
			TIN	NA	NA	NA	NA	TIN	Kidney; Liver	1.72E-04	NA	NA	1.72E-04
			VANADIUM	NA	NA	NA	NA	VANADIUM	NOEL	4.42E-02	NA	NA	4.42E-02
			ZINC	NA	NA	NA	NA	ZINC	Blood	2.57E-03	NA	NA	2.57E-03
			PESTICIDES (mg/kg)					**PESTICIDES (mg/kg)**					
			ALDRIN	6.35E-09	1.91E-09	1.19E-11	8.27E-09	ALDRIN	Liver	8.72E-04	2.62E-04	1.61E-06	1.13E-03
			ALPHA-CHLORDANE	1.16E-09	1.39E-10	5.76E-13	1.30E-09	ALPHA-CHLORDANE	Liver	1.25E-04	1.50E-05	5.76E-07	1.40E-04
			BETA BHC	5.93E-09	7.11E-10	1.13E-11	6.65E-09	BETA BHC	Liver	1.15E-03	1.38E-04	2.13E-06	1.29E-03
			4,4- DDD	1.96E-10	1.76E-11	3.62E-13	2.14E-10	4,4- DDD	Liver	1.14E-04	1.03E-05	2.11E-07	1.25E-04
			4,4- DDE	2.40E-10	2.16E-11	4.43E-13	2.62E-10	4,4- DDE	Liver	9.88E-05	8.89E-06	1.83E-07	1.08E-04
			4,4- DDT	1.26E-09	1.13E-10	2.32E-12	1.37E-09	4,4- DDT	Liver	5.17E-04	4.66E-05	9.56E-07	5.65E-04
			DIELDRIN	2.31E-08	6.93E-09	4.27E-11	3.01E-08	DIELDRIN	Liver	2.02E-03	6.06E-04	3.73E-06	2.63E-03
			ENDOSULFAN I	NA	NA	NA	NA	ENDOSULFAN I	Body Weight; Kidney; Nervous System	1.35E-06	4.04E-07	2.49E-09	1.75E-06
			ENDOSULFAN II	NA	NA	NA	NA	ENDOSULFAN II	Body Weight; Kidney; Nervous System	2.21E-06	6.62E-07	4.08E-09	2.87E-06

Table C1-4f
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			ENDOSULFAN SULFATE	NA	NA	NA	NA	ENDOSULFAN SULFATE	Body Weight; Kidney; Nervous System	4.36E-06	1.31E-06	8.05E-09	5.67E-06
			ENDRIN ALDEHYDE	NA	NA	NA	NA	ENDRIN ALDEHYDE	Liver; Kidney; Nervous System	8.72E-05	2.62E-05	1.61E-07	1.13E-04
			ENDRIN KETONE	NA	NA	NA	NA	ENDRIN KETONE	Liver; Kidney; Nervous System	1.04E-04	3.13E-05	1.93E-07	1.36E-04
			GAMMA-BHC	6.09E-09	7.31E-10	1.13E-11	6.84E-09	GAMMA-BHC	Kidney; Liver	1.29E-03	1.55E-04	2.39E-06	1.45E-03
			GAMMA-CHLORDANE	1.11E-09	1.33E-10	5.52E-13	1.24E-09	GAMMA-CHLORDANE	Liver	1.19E-04	1.43E-05	5.52E-07	1.34E-04
			HEPTACHLOR	8.32E-09	2.50E-09	1.54E-11	1.08E-08	HEPTACHLOR	Liver	2.59E-04	7.77E-05	4.78E-07	3.37E-04
			HEPTACHLOR EPOXIDE	5.39E-09	1.62E-09	9.95E-12	7.01E-09	HEPTACHLOR EPOXIDE	Liver	3.19E-03	9.56E-04	5.89E-06	4.15E-03
			HEXACHLOROBENZENE	2.81E-09	8.42E-10	5.19E-12	3.65E-09	HEXACHLOROBENZENE	Liver	1.36E-04	4.09E-05	6.72E-07	1.78E-04
			METHOXYCHLOR	NA	NA	NA	NA	METHOXYCHLOR	Fetal	2.82E-05	3.38E-06	5.20E-08	3.16E-05
			MIREX	NA	NA	NA	NA	MIREX	Liver	1.61E-05	4.84E-06	2.98E-08	2.10E-05
			TRANS NONACHLOR	4.80E-11	5.76E-12	2.39E-14	5.38E-11	TRANS NONACHLOR	Liver	5.17E-06	6.20E-07	2.39E-08	5.81E-06
			PCBs (mg/kg)					**PCBs (mg/kg)**					
			PCBs (TOTAL)	6.14E-08	2.58E-08	4.53E-11	8.72E-08	PCBs (TOTAL)	Immune System	4.29E-02	1.80E-02	7.94E-05	6.11E-02
			SVOCs (mg/kg)					**SVOCs (mg/kg)**					
			ACENAPHTHENE	NA	NA	NA	NA	ACENAPHTHENE	Liver	3.33E-06	1.30E-06	1.12E-06	5.74E-06
			ACENAPHTHYLENE	NA	NA	NA	NA	ACENAPHTHYLENE	NA	NA	NA	NA	NA
			ANTHRACENE	NA	NA	NA	NA	ANTHRACENE	NOEL	3.71E-06	1.45E-06	3.21E-07	5.48E-06
			BENZO(A)ANTHRACENE	2.53E-08	9.87E-09	1.52E-11	3.52E-08	BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA
			BENZO(A)PYRENE	2.40E-07	9.35E-08	1.44E-10	3.33E-07	BENZO(A)PYRENE	NA	NA	NA	NA	NA
			BENZO(B)FLUORANTHENE	2.22E-08	8.66E-09	1.33E-11	3.09E-08	BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	BENZO(G,H,I)PERYLENE	Kidney; Nervous System	2.91E-05	1.14E-05	5.38E-08	4.06E-05
			BENZO(K)FLUORANTHENE	2.35E-08	9.17E-09	1.41E-11	3.27E-08	BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZOIC ACID	NA	NA	NA	NA	BENZOIC ACID	NOEL	9.95E-07	2.98E-07	1.84E-09	1.29E-06
			BIS(2-ETHYLHEXYL)PHTHAL	2.23E-10	6.68E-11	4.12E-13	2.90E-10	BIS(2-ETHYLHEXYL)PHTHAL	Liver	5.57E-05	1.67E-05	1.03E-07	7.25E-05
			BUTYLBENZYLPHTHALATE	NA	NA	NA	NA	BUTYLBENZYLPHTHALATE	Liver	6.10E-07	1.83E-07	1.13E-09	7.94E-07
			CARBAZOLE	5.70E-11	1.71E-11	1.05E-13	7.42E-11	CARBAZOLE	NA	NA	NA	NA	NA
			4- CHLOROANILINE	NA	NA	NA	NA	4- CHLOROANILINE	Spleen	2.15E-04	6.44E-05	3.97E-07	2.80E-04
			CHRYSENE	2.62E-09	1.02E-09	1.91E-11	3.66E-09	CHRYSENE	NA	NA	NA	NA	NA
			DIBENZ(A,H)ANTHRACENE	8.79E-08	3.43E-08	1.62E-10	1.22E-07	DIBENZ(A,H)ANTHRACENE	NA	NA	NA	NA	NA
			2,6- DINITROTOLUENE	9.26E-09	2.78E-09	NA	1.20E-08	2,6- DINITROTOLUENE	NA	1.06E-03	3.19E-04	1.96E-06	1.38E-03
			DI-N-BUTYLPHTHALATE	NA	NA	NA	NA	DI-N-BUTYLPHTHALATE	Whole Body	5.97E-06	1.79E-06	1.10E-08	7.78E-06
			FLUORANTHENE	NA	NA	NA	NA	FLUORANTHENE	Blood; Kidney; Liver	4.14E-05	1.62E-05	7.65E-08	5.76E-05
			FLUORENE	NA	NA	NA	NA	FLUORENE	Blood	3.04E-05	1.19E-05	5.12E-06	4.74E-05
			INDENO(1,2,3-CD)PYRENE	2.00E-08	7.79E-09	1.20E-11	2.78E-08	INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA
			2- METHYLNAPHTHALENE	NA	NA	NA	NA	2- METHYLNAPHTHALENE	Body Weight; Respiratory	3.50E-04	1.36E-04	NA	4.86E-04
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	5.70E-05	2.22E-05	1.87E-03	1.95E-03
			PENTACHLOROPHENOL	6.64E-09	1.99E-09	1.23E-11	8.65E-09	PENTACHLOROPHENOL	Liver; Kidney	1.29E-04	3.87E-05	2.39E-07	1.68E-04
			PHENANTHRENE	NA	NA	NA	NA	PHENANTHRENE	NOEL	4.14E-06	1.62E-06	7.66E-09	5.77E-06

Table C1-4f
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

				Carcinogenic Risk						Non-Carconogenic Hazard Index			
Medium	**Exposure Medium**	**Exposure Point**	**Chemical**	**Ingestion**	**Dermal**	**Inhalation (Outdoor)**	**Exposure Routes Total**	**Chemical**	**Primary Target Organ**	**Ingestion HQ**	**Dermal HQ**	**Inhalation (Outdoor) HQ**	**Total HI**
			PHENOL	NA	NA	NA	NA	PHENOL	Cardiovascular System; Fetal; Kidney; Liver; Nervous System	2.59E-06	1.01E-06	5.02E-08	3.65E-06
			PYRENE	NA	NA	NA	NA	PYRENE	Kidney	7.59E-05	2.96E-05	1.21E-06	1.07E-04
			TPH (mg/kg)					**TPH (mg/kg)**					
			TPH AS DIESEL	NA	NA	NA	NA	TPH AS DIESEL	NA	NA	NA	NA	NA
			TPH AS GASOLINE	NA	NA	NA	NA	TPH AS GASOLINE	NA	NA	NA	NA	NA
			TPH AS MOTOR OIL	NA	NA	NA	NA	TPH AS MOTOR OIL	NA	NA	NA	NA	NA
			TRPH	NA	NA	NA	NA	TRPH	NA	NA	NA	NA	NA
			VOCs (mg/kg)					**VOCs (mg/kg)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	1.57E-07	NA	7.59E-07	9.16E-07
			BENZENE	1.17E-10	NA	2.60E-09	2.71E-09	BENZENE	Fetal; Immune System; Nervous System; Respiratory	2.05E-05	NA	2.12E-04	2.33E-04
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	1.09E-07	NA	7.31E-07	8.40E-07
			BROMOMETHANE	NA	NA	NA	NA	BROMOMETHANE	GI System	9.92E-06	NA	3.27E-07	1.02E-05
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	1.60E-07	NA	4.04E-06	4.20E-06
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver	4.78E-07	NA	1.61E-05	1.66E-05
			CHLOROFORM	9.95E-12	NA	1.37E-10	1.47E-10	CHLOROFORM	Fetal; Kidney; Liver	2.25E-06	NA	5.89E-06	8.14E-06
			CIS-1,2- DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2- DICHLOROETHENE	Blood	6.64E-06	NA	1.39E-04	1.45E-04
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	1.00E-06	NA	3.92E-06	4.92E-06
			METHYLENE CHLORIDE	3.81E-11	NA	2.31E-10	2.69E-10	METHYLENE CHLORIDE	Cardiovascular System; Liver; Nervous System	3.17E-06	NA	4.04E-05	4.36E-05
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Kidney; Liver	3.03E-07	NA	NA	3.03E-07
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	5.13E-06	NA	1.69E-04	1.74E-04
			TETRACHLOROETHENE	4.12E-10	NA	3.74E-10	7.86E-10	TETRACHLOROETHENE	Kidney; Liver	5.35E-06	NA	1.25E-04	1.30E-04
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	3.97E-07	NA	1.40E-05	1.44E-05
			TRICHLOROETHENE	1.62E-10	NA	5.08E-11	2.13E-10	TRICHLOROETHENE	Eyes; Nervous System	9.21E-05	NA	5.08E-05	1.43E-04
			1,2,4- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLYBENZENE	NA	8.11E-07	NA	7.23E-05	7.31E-05
			1,3,5- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLYBENZENE	NA	2.89E-07	NA	6.45E-05	6.48E-05
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	1.55E-06	NA	1.08E-04	1.10E-04
Groundwater	Shallow Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	1.82E-03	1.82E-03
			BENZENE	NA	NA	1.82E-07	1.82E-07	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	1.49E-02	1.49E-02
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	1.23E-02	1.23E-02
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	1.14E-03	1.14E-03
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	8.57E-03	8.57E-03
			CHLOROMETHANE	NA	NA	1.23E-08	1.23E-08	CHLOROMETHANE	NA	NA	NA	1.59E-03	1.59E-03

Table C1-4f
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			CIS-1,2-DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2-DICHLOROETHENE	Blood	NA	NA	2.25E-02	2.25E-02
			1,3- DICHLOROBENZENE	NA	NA	NA	NA	1,3- DICHLOROBENZENE	NA	NA	NA	1.24E-03	1.24E-03
			1,2- DICHLOROETHENE (TOTAL)	NA	NA	NA	NA	1,2- DICHLOROETHENE (TOTAL)	Blood, Liver	NA	NA	1.06E-01	1.06E-01
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	NA	NA	2.39E-04	2.39E-04
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	NA	NA	6.85E-04	6.85E-04
			TRANS-1,2-DICHLOROETHEN	NA	NA	NA	NA	TRANS-1,2-DICHLOROETHEN	Blood; Liver	NA	NA	2.10E-03	2.10E-03
			1,2,4- TRIMETHYLBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLBENZENE	NA	NA	NA	2.13E-02	2.13E-02
			1,3,5- TRIMETHYLBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLBENZENE	NA	NA	NA	1.61E-02	1.61E-02
			VINYL CHLORIDE	NA	NA	1.72E-08	1.72E-08	VINYL CHLORIDE	GI System; Liver; Nervous System	NA	NA	2.74E-03	2.74E-03
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	NA	NA	4.80E-03	4.80E-03
Groundwater	Intermediate and Deep Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	4.02E-04	4.02E-04
			BENZENE	NA	NA	2.66E-07	2.66E-07	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	2.17E-02	2.17E-02
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	1.88E-03	1.88E-03
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	1.81E-03	1.81E-03
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	3.26E-02	3.26E-02
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Fetal; Kidney; Liver	NA	NA	6.85E-04	6.85E-04

Cancer Risk Across Soil:	7.6E-06
Cancer Risk Across Groundwater:	4.8E-07
Total Cancer Risk:	8.1E-06

HI Across Soil:	1.1E+00
HI Across Groundwater:	2.8E-01
Total HI:	1.4E+00
Total Blood HI:	2.3E-01
Total Body Weight HI:	2.4E-01
Total Cardiovascular System HI:	2.0E-01
Total Fetal/Reproductive System HI:	2.6E-01
Total GI System HI:	2.2E-02
Total Immune System HI:	1.0E-01
Total Kidney HI:	1.3E-01
Total Liver HI:	2.4E-01
Total Nervous System HI:	5.6E-01
Total NOEL HI:	5.9E-02
Total Respiratory HI:	1.5E-01
Total Skin HI:	1.7E-01
Total Whole Body HI:	3.4E-02

Notes:
EPC = Exposure point concentration
GI = Gastrointestinal
HQ = Hazard Quotient
HI = Hazard Index
mg/kg = milligrams per kilogram
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
ug/L = microgram per liter

Table C1-4g
Summary of Estimated Cancer Risks and Hazard Indices for Soil
Upland Areas Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	RME Result			
	Baseline Cancer Risk*	**Baseline Hazard Index***	**Residual Cancer Risk**	**Residual Hazard Index**
Recreational User - Future				
Total Risk Across Soil	5.3E-05	2.7E-01	4.4E-05	2.1E-01
Total Risk Across Soil (without arsenic)	6.7E-06	2.0E-01	5.1E-06	1.6E-01
Construction Worker - Future				
Total Risk Across Soil	8.8E-06	1.2E+00	7.2E-07	1.1E+00
Total Risk Across Soil (without arsenic)	1.1E-06	1.0E+00	7.0E-07	9.1E-01

Notes:

RME = Reasonable Maximum Exposure

* - Baseline HHRA did not include full data set; outlier concentrations were excluded.

Table C1-4h

Comparison of EPCs, Cancer Risk Estimates, and Hazard Indices from Baseline Risk Assessment

Upland Areas Mixed Zone (HQ = 5)

Investigation Area H1 Feasibility Study

Mare Island, Vallejo, California

	Baseline Risk Estimates					Mixed Zone (HQ = 5)				
		Recreational User		Construction Worker			Recreational User		Construction Worker	
Chemical of Potential Concern	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**
INORGANICS (mg/kg)										
ALUMINUM	21171	NA	2.38E-02	NA	1.59E-01	23,656	NA	2.66E-02	NA	1.77E-01
ANTIMONY	5.2	NA	1.42E-02	NA	4.20E-02	4.3	NA	1.16E-02	NA	3.44E-02
ARSENIC	16.1	4.59E-05	6.68E-02	7.67E-06	2.00E-01	13.6	3.88E-05	5.64E-02	1.39E-08	1.69E-01
BARIUM	169	NA	2.69E-03	NA	1.48E-02	163	NA	2.60E-03	NA	1.43E-02
BERYLLIUM	0.72	6.75E-11	4.10E-04	5.15E-10	3.31E-03	0.62	5.85E-11	3.55E-04	4.47E-10	2.87E-03
CADMIUM	3.39	4.05E-07	8.80E-03	7.09E-08	2.81E-02	3.00	3.59E-07	7.79E-03	3.84E-09	2.49E-02
CHROMIUM	137	NA	9.98E-05	NA	2.95E-04	115	NA	8.37E-05	NA	2.47E-04
COBALT	13.1	1.43E-09	8.21E-04	1.09E-08	1.58E-02	14.7	1.60E-09	9.19E-04	1.22E-08	1.77E-02
COPPER	189	NA	5.16E-03	NA	1.53E-02	198	NA	5.42E-03	NA	1.60E-02
HEXAVALENT CHROMIUM	0.09	5.12E-10	3.29E-05	3.91E-09	1.16E-04	0.09	5.12E-10	3.29E-05	3.91E-09	1.16E-04
LEAD	169	3.81E-07	NA	6.69E-08	NA	111	2.51E-07	NA	3.98E-10	NA
MANGANESE	726	NA	8.00E-03	NA	3.20E-01	732	NA	8.07E-03	NA	3.22E-01
MERCURY	2.4	NA	8.75E-03	NA	2.64E-02	1.9	NA	6.94E-03	NA	2.09E-02
MOLYBDENUM	7.6	NA	1.66E-03	NA	4.91E-03	72.4	NA	1.58E-02	NA	4.68E-02
NICKEL	115	1.17E-09	6.65E-03	8.92E-09	6.66E-02	97	9.83E-10	5.60E-03	7.51E-09	5.61E-02
SELENIUM	0.7	NA	1.62E-04	NA	4.79E-04	0.7	NA	1.54E-04	NA	4.55E-04
SILVER	3.9	NA	8.52E-04	NA	2.52E-03	3.1	NA	6.74E-04	NA	1.99E-03
THALLIUM	0.60	NA	9.94E-03	NA	2.94E-02	1.37	NA	2.27E-02	NA	6.72E-02
TIN	25	NA	4.55E-05	NA	1.35E-04	32	NA	5.83E-05	NA	1.72E-04
VANADIUM	106	NA	1.65E-02	NA	4.89E-02	96	NA	1.50E-02	NA	4.42E-02
ZINC	296	NA	1.08E-03	NA	3.19E-03	239	NA	8.70E-04	NA	2.57E-03
PCBs (mg/kg)										
PCBs (TOTAL)	0.97	2.11E-06	8.71E-02	3.18E-07	2.23E-01	0.27	5.80E-07	2.39E-02	8.72E-08	6.11E-02
SVOCs (mg/kg)										
ACENAPHTHENE	0.1	NA	3.47E-06	NA	9.29E-06	0.06	NA	2.14E-06	NA	5.74E-06
ACENAPHTHYLENE	0.20	NA	NA	NA	NA	0.35	NA	NA	NA	NA
ANTHRACENE	0.21	NA	1.28E-06	NA	3.34E-06	0.35	NA	2.11E-06	NA	5.48E-06
BENZO(A)ANTHRACENE	0.24	1.22E-07	NA	1.85E-08	NA	0.46	2.32E-07	NA	3.52E-08	NA
BENZO(A)PYRENE	0.23	1.17E-06	NA	1.77E-07	NA	0.43	2.20E-06	NA	3.33E-07	NA
BENZO(B)FLUORANTHENE	0.28	1.42E-07	NA	2.16E-08	NA	0.40	2.04E-07	NA	3.09E-08	NA
BENZO(G,H,I)PERYLENE	0.24	NA	1.05E-05	NA	2.70E-05	0.36	NA	1.57E-05	NA	4.06E-05
BENZO(K)FLUORANTHENE	0.21	1.07E-07	NA	1.62E-08	NA	0.43	2.16E-07	NA	3.27E-08	NA
CHRYSENE	0.46	2.35E-08	NA	3.56E-09	NA	0.47	2.42E-08	NA	3.66E-09	NA
DIBENZ(A,H)ANTHRACENE	0.15	2.61E-07	NA	3.95E-08	NA	0.47	8.08E-07	NA	1.22E-07	NA

Table C1-4h

Comparison of EPCs, Cancer Risk Estimates, and Hazard Indices from Baseline Risk Assessment

Upland Areas Mixed Zone (HQ = 5)

Investigation Area H1 Feasibility Study

Mare Island, Vallejo, California

	Baseline Risk Estimates					Mixed Zone (HQ = 5)				
		Recreational User		Construction Worker			Recreational User		Construction Worker	
Chemical of Potential Concern	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**
FLUORANTHENE	0.52	NA	2.27E-05	NA	5.84E-05	0.51	NA	2.24E-05	NA	5.76E-05
FLUORENE	0.26	NA	1.24E-05	NA	3.27E-05	0.38	NA	1.80E-05	NA	4.74E-05
INDENO(1,2,3-CD)PYRENE	0.24	1.22E-07	NA	1.85E-08	NA	0.36	1.84E-07	NA	2.78E-08	NA
NAPHTHALENE	0.22	NA	3.81E-04	NA	1.22E-03	0.35	NA	6.12E-04	NA	5.77E-06
PHENANTHRENE	0.36	NA	2.09E-06	NA	5.39E-06	0.39	NA	2.24E-06	NA	5.77E-06
PYRENE	0.78	NA	4.58E-05	NA	1.18E-04	0.71	NA	4.14E-05	NA	1.07E-04
TPH (mg/kg)										
TPH AS DIESEL	974	NA	NA	NA	NA	184	NA	NA	NA	NA
TPH AS GASOLINE	136	NA	NA	NA	NA	50	NA	NA	NA	NA
TPH AS MOTOR OIL	317	NA	NA	NA	NA	229	NA	NA	NA	NA
SOIL TOTALS:		**5.1E-05**	**2.6E-01**	**8.4E-06**	**1.2E+00**		**4.4E-05**	**2.1E-01**	**7.2E-07**	**1.1E+00**
SOIL TOTALS (EXCLUDING ARSENIC):		**4.9E-06**	**2.0E-01**	**7.7E-07**	**1.0E+00**		**5.1E-06**	**1.6E-01**	**7.0E-07**	**9.1E-01**

Reduction of Cancer Risk (%):

Recreational User: **14**

Construction Worker: **14**

TABLE C1-4i
Post-Remediation Gray Fox Risk Calculations
Upland Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	Exposure Concentrations				Intake (mg/kg BW-day)					Hazard Quotient (HQ) - Low					Hazard Quotient (HQ) - High			
COPEC[a]	Surface Water (mg/L)[b]	Soils[c]	Small Mammal BAF[d]	Small mammal Tissue[d]	Surface Water	Soils	Small mammal	Total Intake (mg/kg/day)	Low TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake	High TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake
2,4-D		3.72E-02		0		1.19E-05		1.19E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
DDD		1.77E-02		0		5.65E-06		5.65E-06	0.8		7.1E-06		7.1E-06	16		3.5E-07		3.5E-07
DDE	0.0000027	1.53E-02		0	5.84E-08	4.89E-06		4.94E-06	0.8	7.3E-08	6.1E-06		6.2E-06	16	3.6E-09	3.1E-07		3.1E-07
DDTs	0.00014	8.01E-02	1.04	0.083	3.03E-06	2.56E-05	9.50E-04	9.79E-04	0.8	3.8E-06	3.2E-05	1.2E-03	1.2E-03	16	1.9E-07	1.6E-06	5.9E-05	6.1E-05
Dieldrin		3.13E-02		0		1.00E-05		1.00E-05	0.02		5.0E-04		5.0E-04	0.2		5.0E-05		5.0E-05
Endosulfan I		2.50E-03		0		7.98E-07		7.98E-07	0.15		5.3E-06		5.3E-06	1.50		5.3E-07		5.3E-07
Endosulfan II		4.10E-03		0		1.31E-06		1.31E-06	0.15		8.7E-06		8.7E-06	1.50		8.7E-07		8.7E-07
Endosulfan sulfate	0.00012	8.10E-03		0	2.59E-06	2.59E-06		5.18E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Endrin aldehyde		8.10E-03		0		2.59E-06		2.59E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Endrin ketone		9.70E-03		0		3.10E-06		3.10E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Heptachlor	0.0000028	4.01E-02		0	6.05E-08	1.28E-05		1.29E-05	0.13	4.7E-07	9.9E-05		9.9E-05	6.8	8.9E-09	1.9E-06		1.9E-06
Heptachlor epoxide		1.28E-02		0		4.10E-06		4.10E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Hexachlorobenzene		3.38E-02		0		1.08E-05		1.08E-05	1.6		6.7E-06		6.7E-06	16		6.7E-07		6.7E-07
Methoxychlor		4.36E-02		0		1.39E-05		1.39E-05	2.5		5.6E-06		5.6E-06	50		2.8E-07		2.8E-07
Mirex		1.00E-03		0		3.19E-07		3.19E-07	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
SVOCs (mg/kg)				0														
Acenaphthene		6.18E-02		0		1.97E-05		1.97E-05	1.31		1.5E-05		1.5E-05	32.8		6.0E-07		6.0E-07
Acenaphthylene		3.45E-01		0		1.10E-04		1.10E-04	1.31		8.4E-05		8.4E-05	32.8		3.4E-06		3.4E-06
Anthracene		3.45E-01		0		1.10E-04		1.10E-04	1.31		8.4E-05		8.4E-05	32.8		3.4E-06		3.4E-06
Benzo(a)anthracene		4.57E-01		0		1.46E-04		1.46E-04	1.31		1.1E-04		1.1E-04	32.8		4.4E-06		4.4E-06
Benzo(a)pyrene		4.33E-01		0		1.38E-04		1.38E-04	1.31		1.1E-04		1.1E-04	32.8		4.2E-06		4.2E-06
Benzo(b)fluoranthene		4.01E-01		0		1.28E-04		1.28E-04	1.31		9.8E-05		9.8E-05	32.8		3.9E-06		3.9E-06
Benzo(g,h,i)perylene		3.61E-01		0		1.15E-04		1.15E-04	1.31		8.8E-05		8.8E-05	32.8		3.5E-06		3.5E-06
Benzo(k)fluoranthene		4.25E-01		0		1.36E-04		1.36E-04	1.31		1.0E-04		1.0E-04	32.8		4.1E-06		4.1E-06
Benzoic acid		1.23E+00		0		3.93E-04		3.93E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Bis(2-ethylhexyl)phthalate	0.027	3.45E-01		0	5.84E-04	1.10E-04		6.94E-04	18.3	3.2E-05	6.0E-06		3.8E-05	183	3.2E-06	6.0E-07		3.8E-06
Butylbenzylphthalate		3.78E-02		0		1.21E-05		1.21E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Carbazole		6.18E-02		0		1.97E-05		1.97E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
4-Chloroaniline		2.66E-01		0		8.49E-05		8.49E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Chrysene	0.0002	4.73E-01		0	4.32E-06	1.51E-04		1.55E-04	1.31	3.3E-06	1.2E-04		1.2E-04	32.8	1.3E-07	4.6E-06		4.7E-06
Dibenz(a,h)anthracene		4.65E-01		0		1.48E-04		1.48E-04	1.31		1.1E-04		1.1E-04	32.8		4.5E-06		4.5E-06
2,6-Dinitrotoluene		3.29E-01		0		1.05E-04		1.05E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Di-n-butylphthalate	0.009	1.85E-01		0	1.95E-04	5.91E-05		2.54E-04	550.00	3.5E-07	1.1E-07		4.6E-07	1833	1.1E-07	3.2E-08		1.4E-07
Fluoranthene		5.13E-01		0		1.64E-04		1.64E-04	1.31		1.3E-04		1.3E-04	32.8		5.0E-06		5.0E-06
Fluorene		3.77E-01		0		1.20E-04		1.20E-04	1.31		9.2E-05		9.2E-05	32.8		3.7E-06		3.7E-06
Indeno(1,2,3-cd)pyrene		3.61E-01		0		1.15E-04		1.15E-04	1.31		8.8E-05		8.8E-05	32.8		3.5E-06		3.5E-06
2-Methylnaphthalene		4.33E-01		0		1.38E-04		1.38E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Naphthalene		3.53E-01		0		1.13E-04		1.13E-04	50		2.3E-06		2.3E-06	150		7.5E-07		7.5E-07
Pentachlorophenol		1.20E+00		0		3.83E-04		3.83E-04	8.42		4.6E-05		4.6E-05	27.4		1.4E-05		1.4E-05
Phenanthrene		3.85E-01		0		1.23E-04		1.23E-04	1.31		9.4E-05		9.4E-05	32.8		3.7E-06		3.7E-06
Pyrene		7.05E-01		0		2.25E-04		2.25E-04	1.31		1.7E-04		1.7E-04	32.8		6.9E-06		6.9E-06
Phenol		4.81E-01		0		1.53E-04		1.53E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
PCBs (mg/kg)																		
PCBs (Total Congeners)	0.000016	2.66E-01	18	5	3.46E-07	8.49E-05	5.49E-02	5.50E-02	0.36	9.6E-07	2.4E-04	1.5E-01	1.5E-01	1.28	2.7E-07	6.6E-05	4.3E-02	4.3E-02
>1 = The calculated hazard quotient exceeds 1 (i.e., > 1.5)																		

Exposure Assumptions and Equation:[e]

	Value	Units
IRprey(dry wt.) =	0.177	kg/day (dry weight)
IRmammal(dry wt.) =	0.177	kg/day (dry weight)
IRsoil (dry wt.)[f] =	0.00496	kg-day (dry weight)

Intake Equation = [IRmammal(dry wt) x Cprey(mammal, dry wt) x DCF x SUF]/BW + [(IRsoil x Csoil x DCF x SUF)]/BW + [(IRsurface water x Csurface water x DCF x SUF)]/BW

Risk (hazard quotient) = Intake / TRV

Prey tissue(dry wt) = Prey tissue (wet wt.) / (1-Tissue Moisture)

TABLE C1-4i
Post-Remediation Gray Fox Risk Calculations
Upland Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	Exposure Concentrations				Intake (mg/kg BW-day)					Hazard Quotient (HQ) - Low					Hazard Quotient (HQ) - High			
COPEC[a]	Surface Water (mg/L)[b]	Soils[c]	Small Mammal BAF[d]	Small mammal Tissue[d]	Surface Water	Soils	Small mammal	Total Intake (mg/kg/day)	Low TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake		High TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake
Dioxins/Furans (mg/kg)																			
2,3,7,8-TCDD TEQ		3.27E-05		0		1.04E-08		1.04E-08	0.000001		1.0E-02		1.0E-02		0.00001		1.0E-03		1.0E-03
PCB Congener TEQ	0.0000001	5.01E-05		0	2.16E-09	1.60E-08		1.82E-08	0.000001	2.2E-03	1.6E-02		1.8E-02		0.00001	2.2E-04	1.6E-03		1.8E-03
Metals (mg/kg)																			
Aluminum	12.6	2.37E+04	1.11E-02	262	2.72E-01	7.55E+00	2.98E+00	1.08E+01	1.93	1.4E-01	3.9E+00	1.5E+00	5.6E+00	>1	19.3	1.4E-02	3.9E-01	1.5E-01	5.6E-01
Antimony	0.003	4.26E+00	1.22E+00	5	6.48E-05	1.36E-03	5.92E-02	6.06E-02	0.059	1.1E-03	2.3E-02	1.0E+00	1.0E+00		23.4	2.8E-06	5.8E-05	2.5E-03	2.6E-03
Arsenic	0.0436	1.36E+01	--	0	9.42E-04	4.34E-03	0.00E+00	5.28E-03	0.32	2.9E-03	1.4E-02	0.0E+00	1.7E-02		4.7	2.0E-04	9.2E-04	0.0E+00	1.1E-03
Barium	0.24	1.63E+02	9.41E-02	15.4	5.10E-03	5.21E-02	1.75E-01	2.32E-01	51.8	9.8E-05	1.0E-03	3.4E-03	4.5E-03		119.0	4.3E-05	4.4E-04	1.5E-03	2.0E-03
Beryllium		6.24E-01	--	0		1.99E-04	0.00E+00	1.99E-04	0.532		3.7E-04	0.0E+00	3.7E-04		0.554		3.6E-04	0.0E+00	3.6E-04
Cadmium	0.0016	3.00E+00	--	0	3.46E-05	9.59E-04	0.00E+00	9.94E-04	0.06	5.8E-04	1.6E-02	0.0E+00	1.7E-02		2.64	1.3E-05	3.6E-04	0.0E+00	3.8E-04
Chromium +3	0.0263	1.15E+02	2.60E-02	3	5.68E-04	3.67E-02	3.41E-02	7.14E-02	2.4	2.4E-04	1.5E-02	1.4E-02	3.0E-02		23.1	2.5E-05	1.6E-03	1.5E-03	3.1E-03
Chromium +6	0.0263	1.47E+01	2.60E-02	0	5.68E-04	4.68E-03	4.35E-03	9.60E-03	5.66	1.0E-04	8.3E-04	7.7E-04	1.7E-03		35.1	1.6E-05	1.3E-04	1.2E-04	2.7E-04
Cobalt	0.0164	1.98E+02	--	0	3.54E-04	6.33E-02	0.00E+00	6.37E-02	1.2	3.0E-04	5.3E-02	0.0E+00	5.3E-02		20	1.8E-05	3.2E-03	0.0E+00	3.2E-03
Copper	0.233	9.00E-02	3.45E-01	0	5.04E-03	2.87E-05	3.55E-04	5.42E-03	2.67	1.9E-03	1.1E-05	1.3E-04	2.0E-03		632	8.0E-06	4.5E-08	5.6E-07	8.6E-06
Lead	0.0031	1.11E+02	6.10E-01	67.9	6.70E-05	3.55E-02	7.74E-01	8.09E-01	1.0	6.7E-05	3.5E-02	7.7E-01	8.1E-01		241	2.8E-07	1.5E-04	3.2E-03	3.4E-03
Manganese	7.42	7.32E+02	--	0	1.60E-01	2.34E-01	0.00E+00	3.94E-01	13.7	1.2E-02	1.7E-02	0.0E+00	2.9E-02		159	1.0E-03	1.5E-03	0.0E+00	2.5E-03
Mercury	0.00029	1.90E+00	--	0	6.27E-06	6.08E-04	0.00E+00	6.15E-04	0.25	2.5E-05	2.4E-03	0.0E+00	2.5E-03		4.0	1.6E-06	1.5E-04	0.0E+00	1.5E-04
Molybdenum	0.0312	7.24E+01	--	0	6.74E-04	2.31E-02	0.00E+00	2.38E-02	0.26	2.6E-03	8.9E-02	0.0E+00	9.2E-02		2.60	2.6E-04	8.9E-03	0.0E+00	9.2E-03
Nickel	0.166	9.68E+01	--	0	3.59E-03	3.09E-02	0.00E+00	3.45E-02	0.133	2.7E-02	2.3E-01	0.0E+00	2.6E-01		31.6	1.1E-04	9.8E-04	0.0E+00	1.1E-03
Selenium	0.029	7.04E-01	6.12E+00	4.31	6.27E-04	2.25E-04	4.91E-02	5.00E-02	0.05	1.3E-02	4.5E-03	9.8E-01	1.0E+00		1.21	5.2E-04	1.9E-04	4.1E-02	4.1E-02
Silver	0.0019	3.08E+00	--	0	4.11E-05	9.85E-04	0.00E+00	1.03E-03	0.375	1.1E-04	2.6E-03	0.0E+00	2.7E-03		3.75	1.1E-05	2.6E-04	0.0E+00	2.7E-04
Thallium		1.37E+00	1.01E+00	1.38		4.38E-04	1.58E-02	1.62E-02	0.48		9.1E-04	3.3E-02	3.4E-02		1.43		3.1E-04	1.1E-02	1.1E-02
Tin		3.20E+01	--	0		1.02E-02	0.00E+00	1.02E-02	23.40		4.4E-04	0.0E+00	4.4E-04		35.00		2.9E-04	0.0E+00	2.9E-04
Vanadium	0.05	9.58E+01	--	0	1.08E-03	3.06E-02	0.00E+00	3.17E-02	0.21	5.1E-03	1.5E-01	0.0E+00	1.5E-01		2.1	5.1E-04	1.5E-02	0.0E+00	1.5E-02
Zinc	0.042	2.39E+02	1.11E+00	265	9.08E-04	7.63E-02	3.02E+00	3.10E+00	9.6	9.5E-05	7.9E-03	3.1E-01	3.2E-01		411	2.2E-06	1.9E-04	7.3E-03	7.5E-03
Volatile Organics (mg/kg)																			
Acetone		4.38E-02		0		1.40E-05		1.40E-05	10		1.4E-06		1.4E-06		50		2.8E-07		2.8E-07
Benzene		2.54E-02		0		8.11E-06		8.11E-06	26.4		3.1E-07		3.1E-07		263.6		3.1E-08		3.1E-08
2-Butanone		2.03E-02		0		6.48E-06		6.48E-06	1771		3.7E-09		3.7E-09		4571		1.4E-09		1.4E-09
Bromomethane		4.30E-03		0		1.37E-06		1.37E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
sec-Butylbenzene		6.96E-03		0		2.22E-06		2.22E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Carbon disulfide		4.96E-03		0		1.58E-06		1.58E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Chlorobenzene		2.96E-03		0		9.45E-07		9.45E-07	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
cis-12-Dichloroethene		2.06E-02		0		6.57E-06		6.57E-06	45.2		1.5E-07		1.5E-07		452		1.5E-08		1.5E-08
Ethylbenzene		3.10E-02		0		9.89E-06		9.89E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Methylene chloride		5.90E-02		0		1.88E-05		1.88E-05	5.9		3.2E-06		3.2E-06		50		3.8E-07		3.8E-07
4-Methyl-2-pentanone		7.50E-03		0		2.39E-06		2.39E-06	25		9.6E-08		9.6E-08		250		9.6E-09		9.6E-09
Naphthalene		3.18E-02		0		1.01E-05		1.01E-05	50		2.0E-07		2.0E-07		150		6.8E-08		6.8E-08
Tetrachloroethene		1.66E-02		0		5.29E-06		5.29E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Toluene		2.46E-02		0		7.84E-06		7.84E-06	26		3.0E-07		3.0E-07		260		3.0E-08		3.0E-08
Trichloroethene		8.56E-03		0		2.73E-06		2.73E-06	0.7		3.9E-06		3.9E-06		7		3.9E-07		3.9E-07
124-Trimethylbenzene		1.26E-02		0		4.01E-06		4.01E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
135-Trimethylbenzene		4.48E-03		0		1.43E-06		1.43E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Xylene (total)		9.63E-02		0		3.08E-05		3.08E-05	2.1		1.5E-05		1.5E-05		2.6		1.2E-05		1.2E-05
Pesticides (mg/kg)																			
Aldrin		8.10E-03		0		2.59E-06		2.59E-06	0.1		2.6E-05		2.6E-05		1.0		2.6E-06		2.6E-06
alpha-Chlordane		1.93E-02		0		6.16E-06		6.16E-06	4.6		1.3E-06		1.3E-06		9.2		6.7E-07		6.7E-07
gamma Chlordane		1.85E-02		0		5.91E-06		5.91E-06	4.6		1.3E-06		1.3E-06		9.2		6.4E-07		6.4E-07
Trans nonachlor		8.00E-04		0		2.55E-07		2.55E-07	4.6		5.6E-08		5.6E-08		9.2		2.8E-08		2.8E-08
Beta BHC		7.14E-02		0		2.28E-05		2.28E-05	1.6		1.4E-05		1.4E-05		3.2		7.1E-06		7.1E-06
Gamma BHC	0.000011	1.20E-01		0	2.38E-07	3.84E-05		3.86E-05	0.05	4.8E-06	7.7E-04		7.7E-04		3.75	6.3E-08	1.0E-05		1.0E-05

TABLE C1-4i
Post-Remediation Gray Fox Risk Calculations
Upland Mixed Zone (HQ = 5)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	Exposure Concentrations				Intake (mg/kg BW-day)					Hazard Quotient (HQ) - Low					Hazard Quotient (HQ) - High			
COPEC[a]	Surface Water (mg/L)[b]	Soils[c]	Small Mammal BAF[d]	Small mammal Tissue[d]	Surface Water	Soils	Small mammal	Total Intake (mg/kg/day)	Low TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake	High TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake

IRsurface water[g]	=	0.335	L/day
Cprey	=	chem-specific	mg/kg or µg/kg
Csoil	=	chem-specific	mg/kg or µg/kg
Csurface water	=	chem-specific	mg/L or µg/L
Tissue Moisture (small mammal)	=	68%	percent
Dietary Composition Factor[h]	=	100%	percent
Site Use Factor[i]	=	25%	percent
Body Weight	=	3.88	kg

NTV = No toxicity data available.

NA = Not applicable.

Blank cell indicates COPEC was not detected in this medium.

Notes:

a Chemical of potential ecological concern; all constituents detected in soil are COPEC.
b All concentrations of constituents in surface water are based on the maximum concentration.
c All concentrations of constituents in soil are based on the maximum concentration expressed in dry weight.
d Site-specific BAFs (dry weight basis). Calculated small mammal tissue concentrations (soil concentration x BAF). Tissue concentrations are on a dry weight basis.
e Exposure parameters used to calculate risk are discussed in detail in Section 4.2 of RI (WESTON, 2006).
f Ingestion rate of soil based on 2.8 percent of of the prey ingestion rate (dry weight); based on a red fox (Beyer et al. (1994).
g Based on equation for mammals: Water intake (L/day) = $0.099Wt(kg)^{0.90}$ (EPA 1993)
h Dietary composition factor was based on a conservative assumption of 100% dietary intake of small mammals from the site.
i Site use factor was based on a conservative 100% use of the site for the fox's foraging range.

Table C1-4j
Gray Fox Risk Comparison (0 - 10 ft bgs; mixed zone)
Upland Area (HQ = 5) - Alternative 4
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

COPEC[a]	SLERA			Mixed Zone (HQ = 5)		
	EPC - Soil	HQ-TRV-low	HQ-TRV-High	EPC - Soil	HQ-TRV-low	HQ-TRV-High
Dioxins/Furans (mg/kg)						
2,3,7,8-TCDD TEQ	3.27E-05	1.58E+00 >1	1.58E-01	3.27E-05	1.04E-02	1.04E-03
PCB Congener TEQ	5.01E-05	5.91E+01 >1	5.91E+00 >1	5.01E-05	1.82E-02	1.82E-03
Metals (mg/kg)						
Aluminum	48900	4.33E+01 >1	4.33E+00 >1	2.37E+04	5.60E+00 >1	5.60E-01
Antimony	57	1.24E+00	3.12E-03	4.26E+00	1.03E+00	2.59E-03
Arsenic	59	2.47E-01	1.68E-02	1.36E+01	1.65E-02	1.12E-03
Barium	893	2.90E-02	1.26E-02	1.63E+02	4.48E-03	1.95E-03
Beryllium	4.8	1.15E-02	1.11E-02	6.24E-01	3.74E-04	3.60E-04
Cadmium	31.6	6.75E-01	1.53E-02	3.00E+00	1.66E-02	3.76E-04
Chromium +3	942	5.02E-01	5.22E-02	1.15E+02	2.97E-02	3.09E-03
Chromium +6	0.09	4.22E-04	6.80E-05	1.47E+01	1.70E-03	2.73E-04
Cobalt	110	1.18E-01	7.10E-03	1.98E+02	5.31E-02	3.18E-03
Copper	1380	1.08E+00	4.56E-03	9.00E-02	2.03E-03	8.57E-06
Lead	2010	3.47E+00 >1	1.44E-02	1.11E+02	8.09E-01	3.36E-03
Manganese	5300	5.41E-01	4.66E-02	7.32E+02	2.88E-02	2.48E-03
Mercury	30	1.53E-01	9.59E-03	1.90E+00	2.46E-03	1.54E-04
Molybdenum	90.2	4.54E-01	4.54E-02	7.24E+01	9.15E-02	9.15E-03
Nickel	1440	1.39E+01 >1	5.87E-02	9.68E+01	2.59E-01	1.09E-03
Selenium	2.9	6.11E+00 >1	2.53E-01	7.04E-01	9.99E-01	4.13E-02
Silver	57.5	1.96E-01	1.96E-02	3.08E+00	2.74E-03	2.74E-04
Thallium	2.9	3.74E-02	1.26E-02	1.37E+00	3.38E-02	1.13E-02
Tin	168	9.17E-03	6.13E-03	3.20E+01	4.37E-04	2.92E-04
Vanadium	203	1.26E+00	1.26E-01	9.58E+01	1.51E-01	1.51E-02
Zinc	1900	1.12E+00	2.62E-02	2.39E+02	3.22E-01	7.52E-03
Volatile Organics (mg/kg)						
Acetone	0.4	5.11E-05	1.02E-05	4.38E-02	1.40E-06	2.80E-07
Benzene	0.4	1.94E-05	1.94E-06	2.54E-02	3.07E-07	3.08E-08
2-Butanone	0.024	1.73E-08	6.71E-09	2.03E-02	3.66E-09	1.42E-09
Bromomethane	0.004	NTV	NTV	4.30E-03	NTV	NTV
sec-Butylbenzene	0.01	NTV	NTV	6.96E-03	NTV	NTV
Carbon disulfide	0.02	NTV	NTV	4.96E-03	NTV	NTV
Chlorobenzene	0.003	NTV	NTV	2.96E-03	NTV	NTV
cis-12-Dichloroethene	0.025	7.06E-07	7.06E-08	2.06E-02	1.45E-07	1.45E-08
Ethylbenzene	0.5	NTV	NTV	3.10E-02	NTV	NTV
Methylene chloride	0.073	1.58E-05	1.86E-06	5.90E-02	3.19E-06	3.77E-07
4-Methyl-2-pentanone	0.008	4.09E-07	4.09E-08	7.50E-03	9.58E-08	9.58E-09
Naphthalene	0.039	9.96E-07	3.32E-07	3.18E-02	2.03E-07	6.76E-08
Tetrachloroethene	0.02	NTV	NTV	1.66E-02	NTV	NTV
Toluene	0.4	1.97E-05	1.97E-06	2.46E-02	3.02E-07	3.02E-08
Trichloroethene	0.01	1.82E-05	1.82E-06	8.56E-03	3.90E-06	3.90E-07
124-Trimethylbenzene	0.086	NTV	NTV	1.26E-02	NTV	NTV
135-Trimethylbenzene	0.013	NTV	NTV	4.48E-03	NTV	NTV
Xylene (total)	2	1.22E-03	9.83E-04	9.63E-02	1.46E-05	1.18E-05

Table C1-4j
Gray Fox Risk Comparison (0 - 10 ft bgs; mixed zone)
Upland Area (HQ = 5) - Alternative 4
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

COPEC[a]	SLERA			Mixed Zone (HQ = 5)		
	EPC - Soil	HQ-TRV-low	HQ-TRV-High	EPC - Soil	HQ-TRV-low	HQ-TRV-High
Pesticides (mg/kg)						
Aldrin	0.01	1.28E-04	1.28E-05	8.10E-03	2.59E-05	2.59E-06
alpha-Chlordane	0.2	5.55E-05	2.78E-05	1.93E-02	1.34E-06	6.70E-07
gamma Chlordane	0.2	5.55E-05	2.78E-05	1.85E-02	1.28E-06	6.42E-07
Trans nonachlor	0.0008	6.42E-06	3.21E-06	8.00E-04	5.55E-08	2.78E-08
Beta BHC	0.089	7.11E-05	3.55E-05	7.14E-02	1.42E-05	7.12E-06
Gamma BHC	0.15	3.85E-03	5.13E-05	1.20E-01	7.72E-04	1.03E-05
2,4-D	0.11	NTV	NTV	3.72E-02	NTV	NTV
DDD	0.2	3.19E-04	1.60E-05	1.77E-02	7.07E-06	3.53E-07
DDE	0.15	3.47E-04	1.73E-05	1.53E-02	6.18E-06	3.09E-07
DDTs	1.8	3.03E-03	1.52E-04	8.01E-02	1.22E-03	6.12E-05
Dieldrin	0.67	4.71E-02	4.71E-03	3.13E-02	5.00E-04	5.00E-05
Endosulfan I	0.003	*2.55E-05*	*2.55E-06*	2.50E-03	5.32E-06	5.32E-07
Endosulfan II	0.005	4.26E-05	4.26E-06	4.10E-03	8.73E-06	8.73E-07
Endosulfan sulfate	0.01	NTV	NTV	8.10E-03	NTV	NTV
Endrin aldehyde	0.01	NTV	NTV	8.10E-03	NTV	NTV
Endrin ketone	0.09	NTV	NTV	9.70E-03	NTV	NTV
Heptachlor	0.05	4.93E-04	9.43E-06	4.01E-02	9.90E-05	1.89E-06
Heptachlor epoxide	0.24	NTV	NTV	1.28E-02	NTV	NTV
Hexachlorobenzene	0.001	7.98E-07	7.98E-08	3.38E-02	6.75E-06	6.75E-07
Methoxychlor	0.2	1.02E-04	5.11E-06	4.36E-02	5.57E-06	2.78E-07
Mirex	0.001	NTV	NTV	1.00E-03	NTV	NTV
SVOCs (mg/kg)						
Acenaphthene	0.10	9.75E-05	3.89E-06	6.18E-02	1.51E-05	6.02E-07
Acenaphthylene	0.86	8.39E-04	3.35E-05	3.45E-01	8.41E-05	3.36E-06
Anthracene	0.87	8.48E-04	3.39E-05	3.45E-01	8.41E-05	3.36E-06
Benzo(a)anthracene	1.4	1.37E-03	5.45E-05	4.57E-01	1.11E-04	4.45E-06
Benzo(a)pyrene	1.4	1.37E-03	5.45E-05	4.33E-01	1.06E-04	4.22E-06
Benzo(b)fluoranthene	2.7	2.63E-03	1.05E-04	4.01E-01	9.77E-05	3.90E-06
Benzo(g,h,i)perylene	2.3	2.24E-03	8.96E-05	3.61E-01	8.80E-05	3.51E-06
Benzo(k)fluoranthene	1.5	1.46E-03	5.84E-05	4.25E-01	1.04E-04	4.14E-06
Benzoic acid	1.5	NTV	NTV	1.23E+00	NTV	NTV
Bis(2-ethylhexyl)phthalate	5.7	5.25E-04	5.25E-05	3.45E-01	3.79E-05	3.79E-06
Butylbenzylphthalate	0.006	NTV	NTV	3.78E-02	NTV	NTV
Carbazole	0.036	NTV	NTV	6.18E-02	NTV	NTV
4-Chloroaniline	1.3	NTV	NTV	2.66E-01	NTV	NTV
Chrysene	7.8	7.62E-03	3.04E-04	4.73E-01	1.19E-04	4.74E-06
Dibenz(a,h)anthracene	0.54	5.27E-04	2.10E-05	4.65E-01	1.13E-04	4.53E-06
2,6-Dinitrotoluene	0.37	NTV	NTV	3.29E-01	NTV	NTV
Di-n-butylphthalate	0.19	1.86E-06	5.57E-07	1.85E-01	4.61E-07	1.38E-07
Fluoranthene	10	9.75E-03	3.89E-04	5.13E-01	1.25E-04	4.99E-06
Fluorene	3.1	3.02E-03	1.21E-04	3.77E-01	9.19E-05	3.67E-06
Indeno(1,2,3-cd)pyrene	2.2	2.15E-03	8.57E-05	3.61E-01	8.80E-05	3.51E-06
2-Methylnaphthalene	13	NTV	NTV	4.33E-01	NTV	NTV
Naphthalene	0.18	NTV	NTV	3.53E-01	2.25E-06	7.51E-07
Pentachlorophenol	1.7	4.34E-05	1.45E-05	1.20E+00	4.55E-05	1.40E-05
Phenanthrene	1.3	1.97E-04	6.06E-05	3.85E-01	9.38E-05	3.75E-06

Table C1-4j
Gray Fox Risk Comparison (0 - 10 ft bgs; mixed zone)
Upland Area (HQ = 5) - Alternative 4
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

COPEC[a]	SLERA			Mixed Zone (HQ = 5)		
	EPC - Soil	HQ-TRV-low	HQ-TRV-High	EPC - Soil	HQ-TRV-low	HQ-TRV-High
Pyrene	4.4	4.29E-03	1.71E-04	7.05E-01	1.72E-04	6.86E-06
Phenol	17	1.66E-02	6.62E-04	4.81E-01	NTV	NTV
PCBs (mg/kg)	3.3	NTV	NTV			
PCBs (Total Congeners)	14	1.33E-01	3.75E-02	2.66E-01	1.53E-01	4.30E-02

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	9.49E-10	3.95E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	1.45E-10	6.06E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	1.41E-11	5.87E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	1.31E-11	5.46E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	3.93E-11	1.64E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	3.21E-11	1.34E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.87E-11	7.79E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	1.05E-11	4.37E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	1.63E-11	6.78E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	8.17E-09	3.41E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	1.68E-10	7.01E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	7.10E-12	2.96E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	4.70E-13	1.96E-13	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	6.45E-12	2.69E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	4.48E-12	1.87E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	4.07E-08	1.69E-08	mg/kg-day	1.00E-02	mg/kg-day	4.07E-06	1.69E-06
	INORGANICS									
	ALUMINUM	23,900	mg/kg	2.61E-02	1.09E-02	mg/kg-day	1.00E+00	mg/kg-day	2.61E-02	1.09E-02
	ANTIMONY	4.2	mg/kg	4.61E-06	1.92E-06	mg/kg-day	4.00E-04	mg/kg-day	1.15E-02	4.81E-03
	ARSENIC	13.6	mg/kg	1.49E-05	6.19E-06	mg/kg-day	3.00E-04	mg/kg-day	4.95E-02	2.06E-02
	BARIUM	163	mg/kg	1.78E-04	7.41E-05	mg/kg-day	7.00E-02	mg/kg-day	2.54E-03	1.06E-03
	BERYLLIUM	0.63	mg/kg	6.90E-07	2.88E-07	mg/kg-day	2.00E-03	mg/kg-day	3.45E-04	1.44E-04
	CADMIUM	3.00	mg/kg	3.28E-06	1.37E-06	mg/kg-day	5.00E-04	mg/kg-day	6.56E-03	2.74E-03
	CHROMIUM	116	mg/kg	1.27E-04	5.27E-05	mg/kg-day	1.50E+00	mg/kg-day	8.44E-05	3.52E-05
	COBALT	14.8	mg/kg	1.62E-05	6.76E-06	mg/kg-day	2.00E-02	mg/kg-day	8.11E-04	3.38E-04
	COPPER	199	mg/kg	2.17E-04	9.04E-05	mg/kg-day	4.00E-02	mg/kg-day	5.43E-03	2.26E-03
	HEXAVALENT CHROMIUM	0.09	mg/kg	9.84E-08	4.10E-08	mg/kg-day	3.00E-03	mg/kg-day	3.28E-05	1.37E-05
	LEAD	84	mg/kg	9.17E-05	3.82E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	734	mg/kg	8.02E-04	3.34E-04	mg/kg-day	1.40E-01	mg/kg-day	5.73E-03	2.39E-03

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	*MERCURY*	1.9	mg/kg	2.10E-06	8.75E-07	mg/kg-day	3.00E-04	mg/kg-day	7.00E-03	2.92E-03
	MOLYBDENUM	72.4	mg/kg	7.91E-05	3.30E-05	mg/kg-day	5.00E-03	mg/kg-day	1.58E-02	6.60E-03
	NICKEL	99	mg/kg	1.08E-04	4.49E-05	mg/kg-day	2.00E-02	mg/kg-day	5.39E-03	2.25E-03
	SELENIUM	0.7	mg/kg	8.04E-07	3.35E-07	mg/kg-day	5.00E-03	mg/kg-day	1.61E-04	6.70E-05
	SILVER	2.6	mg/kg	2.88E-06	1.20E-06	mg/kg-day	5.00E-03	mg/kg-day	5.76E-04	2.40E-04
	THALLIUM	1.33	mg/kg	1.46E-06	6.07E-07	mg/kg-day	6.60E-05	mg/kg-day	2.21E-02	9.20E-03
	TIN	31	mg/kg	3.35E-05	1.39E-05	mg/kg-day	6.00E-01	mg/kg-day	5.58E-05	2.32E-05
	VANADIUM	97	mg/kg	1.06E-04	4.41E-05	mg/kg-day	7.00E-03	mg/kg-day	1.51E-02	6.30E-03
	ZINC	225	mg/kg	2.46E-04	1.03E-04	mg/kg-day	3.00E-01	mg/kg-day	8.21E-04	3.42E-04
	PESTICIDES									
	ALDRIN	0.01	mg/kg	8.85E-09	3.69E-09	mg/kg-day	3.00E-05	mg/kg-day	2.95E-04	1.23E-04
	ALPHA-CHLORDANE	0.019	mg/kg	2.11E-08	8.79E-09	mg/kg-day	5.00E-04	mg/kg-day	4.22E-05	1.76E-05
	BETA BHC	0.071	mg/kg	7.80E-08	3.25E-08	mg/kg-day	2.00E-04	mg/kg-day	3.90E-04	1.63E-04
	4,4- DDD	0.018	mg/kg	1.93E-08	8.06E-09	mg/kg-day	5.00E-04	mg/kg-day	3.87E-05	1.61E-05
	4,4- DDE	0.015	mg/kg	1.67E-08	6.97E-09	mg/kg-day	5.00E-04	mg/kg-day	3.34E-05	1.39E-05
	4,4- DDT	0.08	mg/kg	8.75E-08	3.65E-08	mg/kg-day	5.00E-04	mg/kg-day	1.75E-04	7.29E-05
	DIELDRIN	0.031	mg/kg	3.42E-08	1.43E-08	mg/kg-day	5.00E-05	mg/kg-day	6.84E-04	2.85E-04
	ENDOSULFAN I	0.003	mg/kg	2.73E-09	1.14E-09	mg/kg-day	6.00E-03	mg/kg-day	4.55E-07	1.90E-07
	ENDOSULFAN II	0.004	mg/kg	4.48E-09	1.87E-09	mg/kg-day	6.00E-03	mg/kg-day	7.47E-07	3.11E-07
	ENDOSULFAN SULFATE	0.01	mg/kg	8.85E-09	3.69E-09	mg/kg-day	6.00E-03	mg/kg-day	1.48E-06	6.15E-07
	ENDRIN ALDEHYDE	0.01	mg/kg	8.85E-09	3.69E-09	mg/kg-day	3.00E-04	mg/kg-day	2.95E-05	1.23E-05
	ENRIN KETONE	0.010	mg/kg	1.06E-08	4.42E-09	mg/kg-day	3.00E-04	mg/kg-day	3.53E-05	1.47E-05
	GAMMA-BHC	0.12	mg/kg	1.31E-07	5.47E-08	mg/kg-day	3.00E-04	mg/kg-day	4.38E-04	1.82E-04
	GAMMA-CHLORDANE	0.019	mg/kg	2.02E-08	8.42E-09	mg/kg-day	5.00E-04	mg/kg-day	4.04E-05	1.68E-05
	HEPTACHLOR	0.04	mg/kg	4.38E-08	1.83E-08	mg/kg-day	5.00E-04	mg/kg-day	8.76E-05	3.65E-05
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.40E-08	5.84E-09	mg/kg-day	1.30E-05	mg/kg-day	1.08E-03	4.49E-04
	HEXACHLOROBENZENE	0.034	mg/kg	3.69E-08	1.54E-08	mg/kg-day	8.00E-04	mg/kg-day	4.62E-05	1.92E-05
	METHOXYCHLOR	0.044	mg/kg	4.76E-08	1.99E-08	mg/kg-day	5.00E-03	mg/kg-day	9.53E-06	3.97E-06
	MIREX	0.001	mg/kg	1.09E-09	4.55E-10	mg/kg-day	2.00E-04	mg/kg-day	5.46E-06	2.28E-06
	TRANS NONACHLOR	0.0008	mg/kg	8.74E-10	3.64E-10	mg/kg-day	5.00E-04	mg/kg-day	1.75E-06	7.29E-07

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**PCBs**									
	PCBs (TOTAL)	0.25	mg/kg	2.73E-07	1.14E-07	mg/kg-day	2.00E-05	mg/kg-day	1.37E-02	5.69E-03
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	6.75E-08	2.81E-08	mg/kg-day	6.00E-02	mg/kg-day	1.13E-06	4.69E-07
	ACENAPHTHYLENE	0.31	mg/kg	3.33E-07	1.39E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.31	mg/kg	3.33E-07	1.39E-07	mg/kg-day	3.00E-01	mg/kg-day	1.11E-06	4.63E-07
	BENZO(A)ANTHRACENE	0.46	mg/kg	4.99E-07	2.08E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	0.41	mg/kg	4.47E-07	1.86E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.35	mg/kg	3.77E-07	1.57E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.32	mg/kg	3.51E-07	1.46E-07	mg/kg-day	4.00E-02	mg/kg-day	8.77E-06	3.65E-06
	BENZO(K)FLUORANTHENE	0.41	mg/kg	4.47E-07	1.86E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	1.35E-06	5.61E-07	mg/kg-day	4.00E+00	mg/kg-day	3.37E-07	1.40E-07
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	3.77E-07	1.57E-07	mg/kg-day	2.00E-02	mg/kg-day	1.89E-05	7.85E-06
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	4.13E-08	1.72E-08	mg/kg-day	2.00E-01	mg/kg-day	2.07E-07	8.61E-08
	CARBAZOLE	0.062	mg/kg	6.75E-08	2.81E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	2.91E-07	1.21E-07	mg/kg-day	4.00E-03	mg/kg-day	7.27E-05	3.03E-05
	CHRYSENE	0.47	mg/kg	5.17E-07	2.15E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	2.37E-07	9.88E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	3.60E-07	1.50E-07	mg/kg-day	1.00E-03	mg/kg-day	3.60E-04	1.50E-04
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	2.02E-07	8.42E-08	mg/kg-day	1.00E-01	mg/kg-day	2.02E-06	8.42E-07
	FLUORANTHENE	0.51	mg/kg	5.61E-07	2.34E-07	mg/kg-day	4.00E-02	mg/kg-day	1.40E-05	5.84E-06
	FLUORENE	0.34	mg/kg	3.68E-07	1.53E-07	mg/kg-day	4.00E-02	mg/kg-day	9.21E-06	3.84E-06
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	3.51E-07	1.46E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	4.73E-07	1.97E-07	mg/kg-day	4.00E-03	mg/kg-day	1.18E-04	4.93E-05
	NAPHTHALENE	0.31	mg/kg	3.42E-07	1.43E-07	mg/kg-day	2.00E-02	mg/kg-day	1.71E-05	7.13E-06
	PENTACHLOROPHENOL	1.2	mg/kg	1.31E-06	5.46E-07	mg/kg-day	3.00E-02	mg/kg-day	4.37E-05	1.82E-05
	PHENANTHRENE	0.38	mg/kg	4.12E-07	1.72E-07	mg/kg-day	3.00E-01	mg/kg-day	1.37E-06	5.72E-07
	PHENOL	0.48	mg/kg	5.25E-07	2.19E-07	mg/kg-day	6.00E-01	mg/kg-day	8.75E-07	3.65E-07
	PYRENE	0.71	mg/kg	7.70E-07	3.21E-07	mg/kg-day	3.00E-02	mg/kg-day	2.57E-05	1.07E-05

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**TPH**									
	TPH AS DIESEL	190	mg/kg	2.08E-04	8.67E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	51	mg/kg	5.59E-05	2.33E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	2.53E-04	1.06E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	3.87E-03	1.61E-03	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	4.79E-08	1.99E-08	mg/kg-day	9.00E-01	mg/kg-day	5.32E-08	2.22E-08
	BENZENE	0.025	mg/kg	2.78E-08	1.16E-08	mg/kg-day	4.00E-03	mg/kg-day	6.94E-06	2.89E-06
	2- BUTANONE	0.020	mg/kg	2.22E-08	9.24E-09	mg/kg-day	6.00E-01	mg/kg-day	3.70E-08	1.54E-08
	BROMOMETHANE	0.004	mg/kg	4.70E-09	1.96E-09	mg/kg-day	1.40E-03	mg/kg-day	3.36E-06	1.40E-06
	CARBON DISULFIDE	0.005	mg/kg	5.42E-09	2.26E-09	mg/kg-day	1.00E-01	mg/kg-day	5.42E-08	2.26E-08
	CHLOROBENZENE	0.003	mg/kg	3.23E-09	1.35E-09	mg/kg-day	2.00E-02	mg/kg-day	1.62E-07	6.74E-08
	CHLOROFORM	0.007	mg/kg	7.61E-09	3.17E-09	mg/kg-day	1.00E-02	mg/kg-day	7.61E-07	3.17E-07
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	2.25E-08	9.36E-09	mg/kg-day	1.00E-02	mg/kg-day	2.25E-06	9.36E-07
	ETHYLBENZENE	0.031	mg/kg	3.38E-08	1.41E-08	mg/kg-day	1.00E-01	mg/kg-day	3.38E-07	1.41E-07
	METHYLENE CHLORIDE	0.059	mg/kg	6.45E-08	2.69E-08	mg/kg-day	6.00E-02	mg/kg-day	1.07E-06	4.48E-07
	4- METHYL-2-PENTANONE	0.008	mg/kg	8.20E-09	3.42E-09	mg/kg-day	8.00E-02	mg/kg-day	1.02E-07	4.27E-08
	NAPHTHALENE	0.032	mg/kg	3.47E-08	1.45E-08	mg/kg-day	2.00E-02	mg/kg-day	1.74E-06	7.23E-07
	TETRACHLOROETHENE	0.02	mg/kg	1.81E-08	7.54E-09	mg/kg-day	1.00E-02	mg/kg-day	1.81E-06	7.54E-07
	TOLUENE	0.02	mg/kg	2.68E-08	1.12E-08	mg/kg-day	2.00E-01	mg/kg-day	1.34E-07	5.59E-08
	TRICHLOROETHENE	0.01	mg/kg	9.35E-09	3.90E-09	mg/kg-day	3.00E-04	mg/kg-day	3.12E-05	1.30E-05
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	1.37E-08	5.72E-09	mg/kg-day	5.00E-02	mg/kg-day	2.75E-07	1.14E-07
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	4.90E-09	2.04E-09	mg/kg-day	5.00E-02	mg/kg-day	9.79E-08	4.08E-08
	XYLENE (TOTAL)	0.10	mg/kg	1.05E-07	4.39E-08	mg/kg-day	2.00E-01	mg/kg-day	5.26E-07	2.19E-07
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	9.33E-09	3.89E-09	mg/kg-day	1.00E-02	mg/kg-day	9.33E-07	3.89E-07
	INORGANICS									
	ALUMINUM	23,900	mg/kg	NA	NA	mg/kg-day	1.00E+00	mg/kg-day	NA	NA
	ANTIMONY	4.2	mg/kg	NA	NA	mg/kg-day	6.00E-05	mg/kg-day	NA	NA
	ARSENIC	13.6	mg/kg	2.05E-06	8.52E-07	mg/kg-day	3.00E-04	mg/kg-day	6.82E-03	2.84E-03
	BARIUM	163	mg/kg	NA	NA	mg/kg-day	4.90E-03	mg/kg-day	NA	NA
	BERYLLIUM	0.63	mg/kg	NA	NA	mg/kg-day	1.40E-05	mg/kg-day	NA	NA
	CADMIUM	3.00	mg/kg	1.51E-08	6.28E-09	mg/kg-day	1.25E-05	mg/kg-day	1.21E-03	5.02E-04
	CHROMIUM	116	mg/kg	NA	NA	mg/kg-day	1.95E-02	mg/kg-day	NA	NA
	COBALT	14.8	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	COPPER	199	mg/kg	NA	NA	mg/kg-day	4.00E-02	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	NA	NA	mg/kg-day	7.50E-05	mg/kg-day	NA	NA
	LEAD	84	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	734	mg/kg	NA	NA	mg/kg-day	5.60E-03	mg/kg-day	NA	NA
	MERCURY	1.9	mg/kg	NA	NA	mg/kg-day	2.10E-05	mg/kg-day	NA	NA
	MOLYBDENUM	72.4	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	NICKEL	99	mg/kg	NA	NA	mg/kg-day	8.00E-04	mg/kg-day	NA	NA
	SELENIUM	0.7	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	SILVER	2.6	mg/kg	NA	NA	mg/kg-day	2.00E-04	mg/kg-day	NA	NA
	THALLIUM	1.33	mg/kg	NA	NA	mg/kg-day	6.60E-05	mg/kg-day	NA	NA

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*TIN*	31	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	VANADIUM	97	mg/kg	NA	NA	mg/kg-day	1.82E-04	mg/kg-day	NA	NA
	ZINC	225	mg/kg	NA	NA	mg/kg-day	3.00E-01	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	4.06E-09	1.69E-09	mg/kg-day	3.00E-05	mg/kg-day	1.35E-04	5.64E-05
	ALPHA-CHLORDANE	0.019	mg/kg	3.87E-09	1.61E-09	mg/kg-day	5.00E-04	mg/kg-day	7.75E-06	3.23E-06
	BETA BHC	0.071	mg/kg	1.43E-08	5.97E-09	mg/kg-day	2.00E-04	mg/kg-day	7.16E-05	2.98E-05
	4,4- DDD	0.018	mg/kg	2.66E-09	1.11E-09	mg/kg-day	5.00E-04	mg/kg-day	5.33E-06	2.22E-06
	4,4- DDE	0.015	mg/kg	2.30E-09	9.59E-10	mg/kg-day	5.00E-04	mg/kg-day	4.60E-06	1.92E-06
	4,4- DDT	0.08	mg/kg	1.21E-08	5.02E-09	mg/kg-day	5.00E-04	mg/kg-day	2.41E-05	1.00E-05
	DIELDRIN	0.031	mg/kg	1.57E-08	6.54E-09	mg/kg-day	5.00E-05	mg/kg-day	3.14E-04	1.31E-04
	ENDOSULFAN I	0.003	mg/kg	1.25E-09	5.23E-10	mg/kg-day	6.00E-03	mg/kg-day	2.09E-07	8.71E-08
	ENDOSULFAN II	0.004	mg/kg	2.06E-09	8.57E-10	mg/kg-day	6.00E-03	mg/kg-day	3.43E-07	1.43E-07
	ENDOSULFAN SULFATE	0.01	mg/kg	4.06E-09	1.69E-09	mg/kg-day	6.00E-03	mg/kg-day	6.77E-07	2.82E-07
	ENDRIN ALDEHYDE	0.01	mg/kg	4.06E-09	1.69E-09	mg/kg-day	3.00E-04	mg/kg-day	1.35E-05	5.64E-06
	ENRIN KETONE	0.010	mg/kg	4.87E-09	2.03E-09	mg/kg-day	3.00E-04	mg/kg-day	1.62E-05	6.76E-06
	GAMMA-BHC	0.12	mg/kg	2.41E-08	1.00E-08	mg/kg-day	3.00E-04	mg/kg-day	8.03E-05	3.35E-05
	GAMMA-CHLORDANE	0.019	mg/kg	3.71E-09	1.55E-09	mg/kg-day	5.00E-04	mg/kg-day	7.42E-06	3.09E-06
	HEPTACHLOR	0.04	mg/kg	2.01E-08	8.38E-09	mg/kg-day	5.00E-04	mg/kg-day	4.02E-05	1.68E-05
	HEPTACHLOR EPOXIDE	0.013	mg/kg	6.44E-09	2.68E-09	mg/kg-day	1.30E-05	mg/kg-day	4.95E-04	2.06E-04
	HEXACHLOROBENZENE	0.034	mg/kg	1.70E-08	7.06E-09	mg/kg-day	8.00E-04	mg/kg-day	2.12E-05	8.83E-06
	METHOXYCHLOR	0.044	mg/kg	8.75E-09	3.65E-09	mg/kg-day	5.00E-03	mg/kg-day	1.75E-06	7.29E-07
	MIREX	0.001	mg/kg	5.02E-10	2.09E-10	mg/kg-day	2.00E-04	mg/kg-day	2.51E-06	1.05E-06
	TRANS NONACHLOR	0.0008	mg/kg	1.61E-10	6.69E-11	mg/kg-day	5.00E-04	mg/kg-day	3.21E-07	1.34E-07
	PCBs									
	PCBs (TOTAL)	0.25	mg/kg	1.76E-07	7.32E-08	mg/kg-day	2.00E-05	mg/kg-day	8.78E-03	3.66E-03
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	4.03E-08	1.68E-08	mg/kg-day	6.00E-02	mg/kg-day	6.72E-07	2.80E-07
	ACENAPHTHYLENE	0.31	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.31	mg/kg	1.99E-07	8.29E-08	mg/kg-day	3.00E-01	mg/kg-day	6.63E-07	2.76E-07
	BENZO(A)ANTHRACENE	0.46	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*BENZO(A)PYRENE*	0.41	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.35	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.32	mg/kg	2.09E-07	8.72E-08	mg/kg-day	4.00E-02	mg/kg-day	5.23E-06	2.18E-06
	BENZO(K)FLUORANTHENE	0.41	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	6.18E-07	2.57E-07	mg/kg-day	4.00E+00	mg/kg-day	1.54E-07	6.44E-08
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	1.73E-07	7.21E-08	mg/kg-day	2.00E-02	mg/kg-day	8.65E-06	3.61E-06
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	1.90E-08	7.90E-09	mg/kg-day	2.00E-01	mg/kg-day	9.48E-08	3.95E-08
	CARBAZOLE	0.062	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	1.33E-07	5.56E-08	mg/kg-day	4.00E-03	mg/kg-day	3.34E-05	1.39E-05
	CHRYSENE	0.47	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	1.65E-07	6.88E-08	mg/kg-day	1.00E-03	mg/kg-day	1.65E-04	6.88E-05
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	9.28E-08	3.87E-08	mg/kg-day	1.00E-01	mg/kg-day	9.28E-07	3.87E-07
	FLUORANTHENE	0.51	mg/kg	3.35E-07	1.39E-07	mg/kg-day	4.00E-02	mg/kg-day	8.36E-06	3.48E-06
	FLUORENE	0.34	mg/kg	2.20E-07	9.16E-08	mg/kg-day	4.00E-02	mg/kg-day	5.49E-06	2.29E-06
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	2.82E-07	1.18E-07	mg/kg-day	4.00E-03	mg/kg-day	7.06E-05	2.94E-05
	NAPHTHALENE	0.31	mg/kg	2.04E-07	8.50E-08	mg/kg-day	2.00E-02	mg/kg-day	1.02E-05	4.25E-06
	PENTACHLOROPHENOL	1.2	mg/kg	6.02E-07	2.51E-07	mg/kg-day	3.00E-02	mg/kg-day	2.01E-05	8.36E-06
	PHENANTHRENE	0.38	mg/kg	2.46E-07	1.02E-07	mg/kg-day	3.00E-01	mg/kg-day	8.19E-07	3.41E-07
	PHENOL	0.48	mg/kg	3.13E-07	1.31E-07	mg/kg-day	6.00E-01	mg/kg-day	5.22E-07	2.18E-07
	PYRENE	0.71	mg/kg	4.60E-07	1.92E-07	mg/kg-day	3.00E-02	mg/kg-day	1.53E-05	6.39E-06
	TPH									
	TPH AS DIESEL	190	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	51	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	NA	NA	mg/kg-day	9.00E-01	mg/kg-day	NA	NA
	BENZENE	0.025	mg/kg	NA	NA	mg/kg-day	4.00E-03	mg/kg-day	NA	NA

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	2- BUTANONE	0.020	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	BROMOMETHANE	0.004	mg/kg	NA	NA	mg/kg-day	1.40E-03	mg/kg-day	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	CHLOROBENZENE	0.003	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	CHLOROFORM	0.007	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	ETHYLBENZENE	0.031	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	NA	NA	mg/kg-day	6.00E-02	mg/kg-day	NA	NA
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	8.00E-02	mg/kg-day	NA	NA
	NAPHTHALENE	0.032	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	TOLUENE	0.02	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	NA	NA	mg/kg-day	3.00E-04	mg/kg-day	NA	NA
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	3.99E-14	1.66E-14	mg/kg-day	1.14E-08	mg/kg-day	3.49E-06	1.46E-06
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	6.11E-15	2.55E-15	mg/kg-day	1.14E-08	mg/kg-day	5.35E-07	2.23E-07
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	5.93E-16	2.47E-16	mg/kg-day	1.14E-08	mg/kg-day	5.19E-08	2.16E-08
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	5.51E-16	2.30E-16	mg/kg-day	1.14E-08	mg/kg-day	4.83E-08	2.01E-08
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	1.65E-15	6.89E-16	mg/kg-day	1.14E-08	mg/kg-day	1.45E-07	6.04E-08
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	1.35E-15	5.63E-16	mg/kg-day	1.14E-08	mg/kg-day	1.18E-07	4.93E-08
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	7.86E-16	3.27E-16	mg/kg-day	1.14E-08	mg/kg-day	6.88E-08	2.87E-08
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	4.41E-16	1.84E-16	mg/kg-day	1.14E-08	mg/kg-day	3.86E-08	1.61E-08
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	6.85E-16	2.85E-16	mg/kg-day	1.14E-08	mg/kg-day	6.00E-08	2.50E-08
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	3.44E-13	1.43E-13	mg/kg-day	1.14E-08	mg/kg-day	3.01E-05	1.25E-05
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	7.08E-15	2.95E-15	mg/kg-day	1.14E-08	mg/kg-day	6.20E-07	2.58E-07
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	2.99E-16	1.24E-16	mg/kg-day	1.14E-08	mg/kg-day	2.62E-08	1.09E-08
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.98E-17	8.23E-18	mg/kg-day	1.14E-08	mg/kg-day	1.73E-09	7.21E-10
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	2.71E-16	1.13E-16	mg/kg-day	1.14E-08	mg/kg-day	2.37E-08	9.89E-09

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	2,3,7,8- TCDF	4.10E-06	mg/kg	1.88E-16	7.85E-17	mg/kg-day	1.14E-08	mg/kg-day	1.65E-08	6.87E-09
	HERBICIDES									
	2,4- D	0.037	mg/kg	1.71E-12	7.12E-13	mg/kg-day	NA	mg/kg-day	NA	NA
	INORGANICS									
	ALUMINUM	23,900	mg/kg	1.10E-06	4.58E-07	mg/kg-day	1.40E-03	mg/kg-day	7.84E-04	3.27E-04
	ANTIMONY	4.2	mg/kg	1.94E-10	8.08E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	ARSENIC	13.6	mg/kg	6.25E-10	2.60E-10	mg/kg-day	8.57E-06	mg/kg-day	7.29E-05	3.04E-05
	BARIUM	163	mg/kg	7.48E-09	3.12E-09	mg/kg-day	1.43E-04	mg/kg-day	5.23E-05	2.18E-05
	BERYLLIUM	0.63	mg/kg	2.90E-11	1.21E-11	mg/kg-day	2.00E-06	mg/kg-day	1.45E-05	6.05E-06
	CADMIUM	3.00	mg/kg	1.38E-10	5.75E-11	mg/kg-day	5.71E-06	mg/kg-day	2.42E-05	1.01E-05
	CHROMIUM	116	mg/kg	5.32E-09	2.22E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	COBALT	14.8	mg/kg	6.82E-10	2.84E-10	mg/kg-day	5.70E-06	mg/kg-day	1.20E-04	4.99E-05
	COPPER	199	mg/kg	9.13E-09	3.80E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	4.14E-12	1.72E-12	mg/kg-day	2.86E-05	mg/kg-day	1.45E-07	6.02E-08
	LEAD	84	mg/kg	3.86E-09	1.61E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	734	mg/kg	3.37E-08	1.41E-08	mg/kg-day	1.43E-05	mg/kg-day	2.36E-03	9.83E-04
	MERCURY	1.9	mg/kg	8.83E-11	3.68E-11	mg/kg-day	2.57E-05	mg/kg-day	3.43E-06	1.43E-06
	MOLYBDENUM	72.4	mg/kg	3.33E-09	1.39E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	NICKEL	99	mg/kg	4.53E-09	1.89E-09	mg/kg-day	1.43E-05	mg/kg-day	3.18E-04	1.32E-04
	SELENIUM	0.7	mg/kg	3.38E-11	1.41E-11	mg/kg-day	5.71E-03	mg/kg-day	5.92E-09	2.47E-09
	SILVER	2.6	mg/kg	1.21E-10	5.05E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	THALLIUM	1.33	mg/kg	6.12E-11	2.55E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	TIN	31	mg/kg	1.41E-09	5.86E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	VANADIUM	97	mg/kg	4.45E-09	1.86E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	ZINC	225	mg/kg	1.04E-08	4.31E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	3.72E-13	1.55E-13	mg/kg-day	3.00E-05	mg/kg-day	1.24E-08	5.17E-09
	ALPHA-CHLORDANE	0.019	mg/kg	8.87E-13	3.70E-13	mg/kg-day	2.00E-04	mg/kg-day	4.43E-09	1.85E-09
	BETA BHC	0.071	mg/kg	3.28E-12	1.37E-12	mg/kg-day	2.00E-04	mg/kg-day	1.64E-08	6.83E-09
	4,4- DDD	0.018	mg/kg	8.13E-13	3.39E-13	mg/kg-day	5.00E-04	mg/kg-day	1.63E-09	6.78E-10
	4,4- DDE	0.015	mg/kg	7.03E-13	2.93E-13	mg/kg-day	5.00E-04	mg/kg-day	1.41E-09	5.86E-10

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	4,4- DDT	0.08	mg/kg	3.68E-12	1.53E-12	mg/kg-day	5.00E-04	mg/kg-day	7.36E-09	3.07E-09
	DIELDRIN	0.031	mg/kg	1.44E-12	5.99E-13	mg/kg-day	5.00E-05	mg/kg-day	2.88E-08	1.20E-08
	ENDOSULFAN I	0.003	mg/kg	1.15E-13	4.79E-14	mg/kg-day	6.00E-03	mg/kg-day	1.91E-11	7.98E-12
	ENDOSULFAN II	0.004	mg/kg	1.88E-13	7.85E-14	mg/kg-day	6.00E-03	mg/kg-day	3.14E-11	1.31E-11
	ENDOSULFAN SULFATE	0.01	mg/kg	3.72E-13	1.55E-13	mg/kg-day	6.00E-03	mg/kg-day	6.20E-11	2.58E-11
	ENDRIN ALDEHYDE	0.01	mg/kg	3.72E-13	1.55E-13	mg/kg-day	3.00E-04	mg/kg-day	1.24E-09	5.17E-10
	ENRIN KETONE	0.010	mg/kg	4.46E-13	1.86E-13	mg/kg-day	3.00E-04	mg/kg-day	1.49E-09	6.19E-10
	GAMMA-BHC	0.12	mg/kg	5.52E-12	2.30E-12	mg/kg-day	3.00E-04	mg/kg-day	1.84E-08	7.66E-09
	GAMMA-CHLORDANE	0.019	mg/kg	8.50E-13	3.54E-13	mg/kg-day	2.00E-04	mg/kg-day	4.25E-09	1.77E-09
	HEPTACHLOR	0.04	mg/kg	1.84E-12	7.68E-13	mg/kg-day	5.00E-04	mg/kg-day	3.69E-09	1.54E-09
	HEPTACHLOR EPOXIDE	0.013	mg/kg	5.90E-13	2.46E-13	mg/kg-day	1.30E-05	mg/kg-day	4.54E-08	1.89E-08
	HEXACHLOROBENZENE	0.034	mg/kg	1.55E-12	6.47E-13	mg/kg-day	3.00E-04	mg/kg-day	5.18E-09	2.16E-09
	METHOXYCHLOR	0.044	mg/kg	2.00E-12	8.35E-13	mg/kg-day	5.00E-03	mg/kg-day	4.01E-10	1.67E-10
	MIREX	0.001	mg/kg	4.59E-14	1.91E-14	mg/kg-day	2.00E-04	mg/kg-day	2.30E-10	9.57E-11
	TRANS NONACHLOR	0.0008	mg/kg	3.68E-14	1.53E-14	mg/kg-day	2.00E-04	mg/kg-day	1.84E-10	7.66E-11
	PCBs									
	PCBs (TOTAL)	0.25	mg/kg	1.15E-11	4.79E-12	mg/kg-day	2.00E-05	mg/kg-day	5.74E-07	2.39E-07
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	2.08E-08	8.68E-09	mg/kg-day	6.00E-02	mg/kg-day	3.47E-07	1.45E-07
	ACENAPHTHYLENE	0.31	mg/kg	1.40E-11	5.84E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.31	mg/kg	2.64E-08	1.10E-08	mg/kg-day	3.00E-01	mg/kg-day	8.81E-08	3.67E-08
	BENZO(A)ANTHRACENE	0.46	mg/kg	2.10E-11	8.75E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	0.41	mg/kg	1.88E-11	7.83E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.35	mg/kg	1.59E-11	6.61E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.32	mg/kg	1.47E-11	6.15E-12	mg/kg-day	4.00E-02	mg/kg-day	3.69E-10	1.54E-10
	BENZO(K)FLUORANTHENE	0.41	mg/kg	1.88E-11	7.83E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	5.66E-11	2.36E-11	mg/kg-day	4.00E+00	mg/kg-day	1.42E-11	5.90E-12
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	1.59E-11	6.61E-12	mg/kg-day	2.00E-02	mg/kg-day	7.93E-10	3.30E-10
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	1.74E-12	7.24E-13	mg/kg-day	2.00E-01	mg/kg-day	8.68E-12	3.62E-12
	CARBAZOLE	0.062	mg/kg	2.84E-12	1.18E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	1.22E-11	5.09E-12	mg/kg-day	4.00E-03	mg/kg-day	3.06E-09	1.27E-09

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*CHRYSENE*	0.47	mg/kg	1.06E-08	4.43E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	9.97E-12	4.15E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	1.51E-11	6.30E-12	mg/kg-day	1.00E-03	mg/kg-day	1.51E-08	6.30E-09
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	8.50E-12	3.54E-12	mg/kg-day	1.00E-01	mg/kg-day	8.50E-11	3.54E-11
	FLUORANTHENE	0.51	mg/kg	2.36E-11	9.82E-12	mg/kg-day	4.00E-02	mg/kg-day	5.89E-10	2.46E-10
	FLUORENE	0.34	mg/kg	5.68E-08	2.37E-08	mg/kg-day	4.00E-02	mg/kg-day	1.42E-06	5.91E-07
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	1.47E-11	6.15E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	1.99E-11	8.29E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	NAPHTHALENE	0.31	mg/kg	4.42E-07	1.84E-07	mg/kg-day	8.57E-04	mg/kg-day	5.15E-04	2.15E-04
	PENTACHLOROPHENOL	1.2	mg/kg	5.51E-11	2.30E-11	mg/kg-day	3.00E-02	mg/kg-day	1.84E-09	7.66E-10
	PHENANTHRENE	0.38	mg/kg	1.73E-11	7.22E-12	mg/kg-day	3.00E-01	mg/kg-day	5.77E-11	2.41E-11
	PHENOL	0.48	mg/kg	2.21E-11	9.20E-12	mg/kg-day	5.71E-02	mg/kg-day	3.87E-10	1.61E-10
	PYRENE	0.71	mg/kg	1.13E-08	4.69E-09	mg/kg-day	3.00E-02	mg/kg-day	3.75E-07	1.56E-07
	TPH									
	TPH AS DIESEL	190	mg/kg	8.75E-09	3.65E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	51	mg/kg	2.35E-09	9.80E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	1.07E-08	4.44E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	1.63E-07	6.78E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	2.12E-07	8.82E-08	mg/kg-day	9.00E-01	mg/kg-day	2.35E-07	9.80E-08
	BENZENE	0.025	mg/kg	5.63E-07	2.35E-07	mg/kg-day	8.57E-03	mg/kg-day	6.58E-05	2.74E-05
	2- BUTANONE	0.020	mg/kg	6.48E-08	2.70E-08	mg/kg-day	2.86E-01	mg/kg-day	2.27E-07	9.44E-08
	BROMOMETHANE	0.004	mg/kg	1.45E-07	6.04E-08	mg/kg-day	1.43E+00	mg/kg-day	1.01E-07	4.22E-08
	CARBON DISULFIDE	0.005	mg/kg	2.51E-07	1.04E-07	mg/kg-day	2.00E-01	mg/kg-day	1.25E-06	5.22E-07
	CHLOROBENZENE	0.003	mg/kg	2.85E-08	1.19E-08	mg/kg-day	5.71E-03	mg/kg-day	4.99E-06	2.08E-06
	CHLOROFORM	0.007	mg/kg	1.56E-07	6.51E-08	mg/kg-day	8.57E-02	mg/kg-day	1.83E-06	7.61E-07
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	4.30E-07	1.79E-07	mg/kg-day	1.00E-02	mg/kg-day	4.30E-05	1.79E-05
	ETHYLBENZENE	0.031	mg/kg	3.48E-07	1.45E-07	mg/kg-day	2.86E-01	mg/kg-day	1.22E-06	5.07E-07
	METHYLENE CHLORIDE	0.059	mg/kg	1.43E-06	5.96E-07	mg/kg-day	1.14E-01	mg/kg-day	1.25E-05	5.22E-06
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	8.57E-01	mg/kg-day	NA	NA

Table C1-5a
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	NAPHTHALENE	0.032	mg/kg	4.48E-08	1.87E-08	mg/kg-day	8.57E-04	mg/kg-day	5.23E-05	2.18E-05
	TETRACHLOROETHENE	0.02	mg/kg	3.86E-07	1.61E-07	mg/kg-day	1.00E-02	mg/kg-day	3.86E-05	1.61E-05
	TOLUENE	0.02	mg/kg	3.72E-07	1.55E-07	mg/kg-day	8.57E-02	mg/kg-day	4.35E-06	1.81E-06
	TRICHLOROETHENE	0.01	mg/kg	1.57E-07	6.56E-08	mg/kg-day	1.00E-02	mg/kg-day	1.57E-05	6.56E-06
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	3.81E-08	1.59E-08	mg/kg-day	1.70E-03	mg/kg-day	2.24E-05	9.34E-06
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	3.40E-08	1.42E-08	mg/kg-day	1.70E-03	mg/kg-day	2.00E-05	8.32E-06
	XYLENE (TOTAL)	0.10	mg/kg	9.58E-07	3.99E-07	mg/kg-day	2.86E-02	mg/kg-day	3.35E-05	1.40E-05

Notes:
The HQ for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
HQ = Hazard Quotient
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RfD = Reference Dose
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	2.80E-09	2.80E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	4.29E-10	4.29E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	4.17E-11	4.17E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	3.87E-11	3.87E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	1.16E-10	1.16E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	9.49E-11	9.49E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	5.52E-11	5.52E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	3.10E-11	3.10E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	4.81E-11	4.81E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	2.42E-08	2.42E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	4.97E-10	4.97E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	2.10E-11	2.10E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.39E-12	1.39E-12	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	1.91E-11	1.91E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	1.32E-11	1.32E-11	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	1.20E-07	1.20E-07	mg/kg-day	1.00E-02	mg/kg-day	1.20E-05	1.20E-05
	INORGANICS									
	ALUMINUM	23,900	mg/kg	7.72E-02	7.72E-02	mg/kg-day	1.00E+00	mg/kg-day	7.72E-02	7.72E-02
	ANTIMONY	4.2	mg/kg	1.36E-05	1.36E-05	mg/kg-day	4.00E-04	mg/kg-day	3.41E-02	3.41E-02
	ARSENIC	13.6	mg/kg	4.39E-05	4.39E-05	mg/kg-day	3.00E-04	mg/kg-day	1.46E-01	1.46E-01
	BARIUM	163	mg/kg	5.26E-04	5.26E-04	mg/kg-day	7.00E-02	mg/kg-day	7.51E-03	7.51E-03
	BERYLLIUM	0.63	mg/kg	2.04E-06	2.04E-06	mg/kg-day	2.00E-03	mg/kg-day	1.02E-03	1.02E-03
	CADMIUM	3.00	mg/kg	9.70E-06	9.70E-06	mg/kg-day	5.00E-04	mg/kg-day	1.94E-02	1.94E-02
	CHROMIUM	116	mg/kg	3.74E-04	3.74E-04	mg/kg-day	1.50E+00	mg/kg-day	2.49E-04	2.49E-04
	COBALT	14.8	mg/kg	4.79E-05	4.79E-05	mg/kg-day	2.00E-02	mg/kg-day	2.40E-03	2.40E-03
	COPPER	199	mg/kg	6.41E-04	6.41E-04	mg/kg-day	4.00E-02	mg/kg-day	1.60E-02	1.60E-02
	HEXAVALENT CHROMIUM	0.09	mg/kg	2.91E-07	2.91E-07	mg/kg-day	3.00E-03	mg/kg-day	9.69E-05	9.69E-05
	LEAD	84	mg/kg	2.71E-04	2.71E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	734	mg/kg	2.37E-03	2.37E-03	mg/kg-day	1.40E-01	mg/kg-day	1.69E-02	1.69E-02

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	*MERCURY*	1.9	mg/kg	6.20E-06	6.20E-06	mg/kg-day	3.00E-04	mg/kg-day	2.07E-02	2.07E-02
	MOLYBDENUM	72.4	mg/kg	2.34E-04	2.34E-04	mg/kg-day	5.00E-03	mg/kg-day	4.68E-02	4.68E-02
	NICKEL	99	mg/kg	3.19E-04	3.19E-04	mg/kg-day	2.00E-02	mg/kg-day	1.59E-02	1.59E-02
	SELENIUM	0.7	mg/kg	2.38E-06	2.38E-06	mg/kg-day	5.00E-03	mg/kg-day	4.75E-04	4.75E-04
	SILVER	2.6	mg/kg	8.51E-06	8.51E-06	mg/kg-day	5.00E-03	mg/kg-day	1.70E-03	1.70E-03
	THALLIUM	1.33	mg/kg	4.30E-06	4.30E-06	mg/kg-day	6.60E-05	mg/kg-day	6.52E-02	6.52E-02
	TIN	31	mg/kg	9.88E-05	9.88E-05	mg/kg-day	6.00E-01	mg/kg-day	1.65E-04	1.65E-04
	VANADIUM	97	mg/kg	3.13E-04	3.13E-04	mg/kg-day	7.00E-03	mg/kg-day	4.47E-02	4.47E-02
	ZINC	225	mg/kg	7.28E-04	7.28E-04	mg/kg-day	3.00E-01	mg/kg-day	2.43E-03	2.43E-03
	PESTICIDES									
	ALDRIN	0.01	mg/kg	2.62E-08	2.62E-08	mg/kg-day	3.00E-05	mg/kg-day	8.72E-04	8.72E-04
	ALPHA-CHLORDANE	0.019	mg/kg	6.23E-08	6.23E-08	mg/kg-day	5.00E-04	mg/kg-day	1.25E-04	1.25E-04
	BETA BHC	0.071	mg/kg	2.30E-07	2.30E-07	mg/kg-day	2.00E-04	mg/kg-day	1.15E-03	1.15E-03
	4,4- DDD	0.018	mg/kg	5.72E-08	5.72E-08	mg/kg-day	5.00E-04	mg/kg-day	1.14E-04	1.14E-04
	4,4- DDE	0.015	mg/kg	4.94E-08	4.94E-08	mg/kg-day	5.00E-04	mg/kg-day	9.88E-05	9.88E-05
	4,4- DDT	0.08	mg/kg	2.59E-07	2.59E-07	mg/kg-day	5.00E-04	mg/kg-day	5.17E-04	5.17E-04
	DIELDRIN	0.031	mg/kg	1.01E-07	1.01E-07	mg/kg-day	5.00E-05	mg/kg-day	2.02E-03	2.02E-03
	ENDOSULFAN I	0.003	mg/kg	8.07E-09	8.07E-09	mg/kg-day	6.00E-03	mg/kg-day	1.35E-06	1.35E-06
	ENDOSULFAN II	0.004	mg/kg	1.32E-08	1.32E-08	mg/kg-day	6.00E-03	mg/kg-day	2.21E-06	2.21E-06
	ENDOSULFAN SULFATE	0.01	mg/kg	2.62E-08	2.62E-08	mg/kg-day	6.00E-03	mg/kg-day	4.36E-06	4.36E-06
	ENDRIN ALDEHYDE	0.01	mg/kg	2.62E-08	2.62E-08	mg/kg-day	3.00E-04	mg/kg-day	8.72E-05	8.72E-05
	ENRIN KETONE	0.010	mg/kg	3.13E-08	3.13E-08	mg/kg-day	3.00E-04	mg/kg-day	1.04E-04	1.04E-04
	GAMMA-BHC	0.12	mg/kg	3.88E-07	3.88E-07	mg/kg-day	3.00E-04	mg/kg-day	1.29E-03	1.29E-03
	GAMMA-CHLORDANE	0.019	mg/kg	5.97E-08	5.97E-08	mg/kg-day	5.00E-04	mg/kg-day	1.19E-04	1.19E-04
	HEPTACHLOR	0.04	mg/kg	1.29E-07	1.29E-07	mg/kg-day	5.00E-04	mg/kg-day	2.59E-04	2.59E-04
	HEPTACHLOR EPOXIDE	0.013	mg/kg	4.14E-08	4.14E-08	mg/kg-day	1.30E-05	mg/kg-day	3.19E-03	3.19E-03
	HEXACHLOROBENZENE	0.034	mg/kg	1.09E-07	1.09E-07	mg/kg-day	8.00E-04	mg/kg-day	1.36E-04	1.36E-04
	METHOXYCHLOR	0.044	mg/kg	1.41E-07	1.41E-07	mg/kg-day	5.00E-03	mg/kg-day	2.82E-05	2.82E-05
	MIREX	0.001	mg/kg	3.23E-09	3.23E-09	mg/kg-day	2.00E-04	mg/kg-day	1.61E-05	1.61E-05
	TRANS NONACHLOR	0.0008	mg/kg	2.58E-09	2.58E-09	mg/kg-day	5.00E-04	mg/kg-day	5.17E-06	5.17E-06

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**PCBs**									
	PCBs (TOTAL)	0.25	mg/kg	8.07E-07	8.07E-07	mg/kg-day	2.00E-05	mg/kg-day	4.04E-02	4.04E-02
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	2.00E-07	2.00E-07	mg/kg-day	6.00E-02	mg/kg-day	3.33E-06	3.33E-06
	ACENAPHTHYLENE	0.31	mg/kg	9.85E-07	9.85E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.31	mg/kg	9.85E-07	9.85E-07	mg/kg-day	3.00E-01	mg/kg-day	3.28E-06	3.28E-06
	BENZO(A)ANTHRACENE	0.46	mg/kg	1.48E-06	1.48E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	0.41	mg/kg	1.32E-06	1.32E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.35	mg/kg	1.11E-06	1.11E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.32	mg/kg	1.04E-06	1.04E-06	mg/kg-day	4.00E-02	mg/kg-day	2.59E-05	2.59E-05
	BENZO(K)FLUORANTHENE	0.41	mg/kg	1.32E-06	1.32E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	3.98E-06	3.98E-06	mg/kg-day	4.00E+00	mg/kg-day	9.95E-07	9.95E-07
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	1.11E-06	1.11E-06	mg/kg-day	2.00E-02	mg/kg-day	5.57E-05	5.57E-05
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	1.22E-07	1.22E-07	mg/kg-day	2.00E-01	mg/kg-day	6.10E-07	6.10E-07
	CARBAZOLE	0.062	mg/kg	2.00E-07	2.00E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	8.59E-07	8.59E-07	mg/kg-day	4.00E-03	mg/kg-day	2.15E-04	2.15E-04
	CHRYSENE	0.47	mg/kg	1.53E-06	1.53E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	7.01E-07	7.01E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	1.06E-06	1.06E-06	mg/kg-day	1.00E-03	mg/kg-day	1.06E-03	1.06E-03
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	5.97E-07	5.97E-07	mg/kg-day	1.00E-01	mg/kg-day	5.97E-06	5.97E-06
	FLUORANTHENE	0.51	mg/kg	1.66E-06	1.66E-06	mg/kg-day	4.00E-02	mg/kg-day	4.14E-05	4.14E-05
	FLUORENE	0.34	mg/kg	1.09E-06	1.09E-06	mg/kg-day	4.00E-02	mg/kg-day	2.72E-05	2.72E-05
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	1.04E-06	1.04E-06	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	1.40E-06	1.40E-06	mg/kg-day	4.00E-03	mg/kg-day	3.50E-04	3.50E-04
	NAPHTHALENE	0.31	mg/kg	1.01E-06	1.01E-06	mg/kg-day	2.00E-02	mg/kg-day	5.05E-05	5.05E-05
	PENTACHLOROPHENOL	1.2	mg/kg	3.87E-06	3.87E-06	mg/kg-day	3.00E-02	mg/kg-day	1.29E-04	1.29E-04
	PHENANTHRENE	0.38	mg/kg	1.22E-06	1.22E-06	mg/kg-day	3.00E-01	mg/kg-day	4.06E-06	4.06E-06
	PHENOL	0.48	mg/kg	1.55E-06	1.55E-06	mg/kg-day	6.00E-01	mg/kg-day	2.59E-06	2.59E-06
	PYRENE	0.71	mg/kg	2.28E-06	2.28E-06	mg/kg-day	3.00E-02	mg/kg-day	7.59E-05	7.59E-05

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INGESTION (CONTINUED)	**TPH**									
	TPH AS DIESEL	190	mg/kg	6.15E-04	6.15E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	51	mg/kg	1.65E-04	1.65E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	7.49E-04	7.49E-04	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	1.14E-02	1.14E-02	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	1.41E-07	1.41E-07	mg/kg-day	9.00E-01	mg/kg-day	1.57E-07	1.57E-07
	BENZENE	0.025	mg/kg	8.20E-08	8.20E-08	mg/kg-day	4.00E-03	mg/kg-day	2.05E-05	2.05E-05
	2- BUTANONE	0.020	mg/kg	6.55E-08	6.55E-08	mg/kg-day	6.00E-01	mg/kg-day	1.09E-07	1.09E-07
	BROMOMETHANE	0.004	mg/kg	1.39E-08	1.39E-08	mg/kg-day	1.40E-03	mg/kg-day	9.92E-06	9.92E-06
	CARBON DISULFIDE	0.005	mg/kg	1.60E-08	1.60E-08	mg/kg-day	1.00E-01	mg/kg-day	1.60E-07	1.60E-07
	CHLOROBENZENE	0.003	mg/kg	9.56E-09	9.56E-09	mg/kg-day	2.00E-02	mg/kg-day	4.78E-07	4.78E-07
	CHLOROFORM	0.007	mg/kg	2.25E-08	2.25E-08	mg/kg-day	1.00E-02	mg/kg-day	2.25E-06	2.25E-06
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	6.64E-08	6.64E-08	mg/kg-day	1.00E-02	mg/kg-day	6.64E-06	6.64E-06
	ETHYLBENZENE	0.031	mg/kg	1.00E-07	1.00E-07	mg/kg-day	1.00E-01	mg/kg-day	1.00E-06	1.00E-06
	METHYLENE CHLORIDE	0.059	mg/kg	1.90E-07	1.90E-07	mg/kg-day	6.00E-02	mg/kg-day	3.17E-06	3.17E-06
	4- METHYL-2-PENTANONE	0.008	mg/kg	2.42E-08	2.42E-08	mg/kg-day	8.00E-02	mg/kg-day	3.03E-07	3.03E-07
	NAPHTHALENE	0.032	mg/kg	1.03E-07	1.03E-07	mg/kg-day	2.00E-02	mg/kg-day	5.13E-06	5.13E-06
	TETRACHLOROETHENE	0.02	mg/kg	5.35E-08	5.35E-08	mg/kg-day	1.00E-02	mg/kg-day	5.35E-06	5.35E-06
	TOLUENE	0.02	mg/kg	7.93E-08	7.93E-08	mg/kg-day	2.00E-01	mg/kg-day	3.97E-07	3.97E-07
	TRICHLOROETHENE	0.01	mg/kg	2.76E-08	2.76E-08	mg/kg-day	3.00E-04	mg/kg-day	9.21E-05	9.21E-05
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	4.06E-08	4.06E-08	mg/kg-day	5.00E-02	mg/kg-day	8.11E-07	8.11E-07
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	1.45E-08	1.45E-08	mg/kg-day	5.00E-02	mg/kg-day	2.89E-07	2.89E-07
	XYLENE (TOTAL)	0.10	mg/kg	3.11E-07	3.11E-07	mg/kg-day	2.00E-01	mg/kg-day	1.55E-06	1.55E-06
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	1.80E-08	1.80E-08	mg/kg-day	1.00E-02	mg/kg-day	1.80E-06	1.80E-06
	INORGANICS									
	ALUMINUM	23,900	mg/kg	NA	NA	mg/kg-day	1.00E+00	mg/kg-day	NA	NA
	ANTIMONY	4.2	mg/kg	NA	NA	mg/kg-day	6.00E-05	mg/kg-day	NA	NA
	ARSENIC	13.6	mg/kg	3.95E-06	3.95E-06	mg/kg-day	3.00E-04	mg/kg-day	1.32E-02	1.32E-02
	BARIUM	163	mg/kg	NA	NA	mg/kg-day	4.90E-03	mg/kg-day	NA	NA
	BERYLLIUM	0.63	mg/kg	NA	NA	mg/kg-day	1.40E-05	mg/kg-day	NA	NA
	CADMIUM	3.00	mg/kg	2.91E-08	2.91E-08	mg/kg-day	1.25E-05	mg/kg-day	2.33E-03	2.33E-03
	CHROMIUM	116	mg/kg	NA	NA	mg/kg-day	1.95E-02	mg/kg-day	NA	NA
	COBALT	14.8	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	COPPER	199	mg/kg	NA	NA	mg/kg-day	4.00E-02	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	NA	NA	mg/kg-day	7.50E-05	mg/kg-day	NA	NA
	LEAD	84	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	734	mg/kg	NA	NA	mg/kg-day	5.60E-03	mg/kg-day	NA	NA
	MERCURY	1.9	mg/kg	NA	NA	mg/kg-day	2.10E-05	mg/kg-day	NA	NA
	MOLYBDENUM	72.4	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	NICKEL	99	mg/kg	NA	NA	mg/kg-day	8.00E-04	mg/kg-day	NA	NA
	SELENIUM	0.7	mg/kg	NA	NA	mg/kg-day	5.00E-03	mg/kg-day	NA	NA
	SILVER	2.6	mg/kg	NA	NA	mg/kg-day	2.00E-04	mg/kg-day	NA	NA
	THALLIUM	1.33	mg/kg	NA	NA	mg/kg-day	6.60E-05	mg/kg-day	NA	NA

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*TIN*	31	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	VANADIUM	97	mg/kg	NA	NA	mg/kg-day	1.82E-04	mg/kg-day	NA	NA
	ZINC	225	mg/kg	NA	NA	mg/kg-day	3.00E-01	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	7.85E-09	7.85E-09	mg/kg-day	3.00E-05	mg/kg-day	2.62E-04	2.62E-04
	ALPHA-CHLORDANE	0.019	mg/kg	7.48E-09	7.48E-09	mg/kg-day	5.00E-04	mg/kg-day	1.50E-05	1.50E-05
	BETA BHC	0.071	mg/kg	2.77E-08	2.77E-08	mg/kg-day	2.00E-04	mg/kg-day	1.38E-04	1.38E-04
	4,4- DDD	0.018	mg/kg	5.14E-09	5.14E-09	mg/kg-day	5.00E-04	mg/kg-day	1.03E-05	1.03E-05
	4,4- DDE	0.015	mg/kg	4.45E-09	4.45E-09	mg/kg-day	5.00E-04	mg/kg-day	8.89E-06	8.89E-06
	4,4- DDT	0.08	mg/kg	2.33E-08	2.33E-08	mg/kg-day	5.00E-04	mg/kg-day	4.66E-05	4.66E-05
	DIELDRIN	0.031	mg/kg	3.03E-08	3.03E-08	mg/kg-day	5.00E-05	mg/kg-day	6.06E-04	6.06E-04
	ENDOSULFAN I	0.003	mg/kg	2.42E-09	2.42E-09	mg/kg-day	6.00E-03	mg/kg-day	4.04E-07	4.04E-07
	ENDOSULFAN II	0.004	mg/kg	3.97E-09	3.97E-09	mg/kg-day	6.00E-03	mg/kg-day	6.62E-07	6.62E-07
	ENDOSULFAN SULFATE	0.01	mg/kg	7.85E-09	7.85E-09	mg/kg-day	6.00E-03	mg/kg-day	1.31E-06	1.31E-06
	ENDRIN ALDEHYDE	0.01	mg/kg	7.85E-09	7.85E-09	mg/kg-day	3.00E-04	mg/kg-day	2.62E-05	2.62E-05
	ENRIN KETONE	0.010	mg/kg	9.40E-09	9.40E-09	mg/kg-day	3.00E-04	mg/kg-day	3.13E-05	3.13E-05
	GAMMA-BHC	0.12	mg/kg	4.65E-08	4.65E-08	mg/kg-day	3.00E-04	mg/kg-day	1.55E-04	1.55E-04
	GAMMA-CHLORDANE	0.019	mg/kg	7.17E-09	7.17E-09	mg/kg-day	5.00E-04	mg/kg-day	1.43E-05	1.43E-05
	HEPTACHLOR	0.04	mg/kg	3.88E-08	3.88E-08	mg/kg-day	5.00E-04	mg/kg-day	7.77E-05	7.77E-05
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.24E-08	1.24E-08	mg/kg-day	1.30E-05	mg/kg-day	9.56E-04	9.56E-04
	HEXACHLOROBENZENE	0.034	mg/kg	3.27E-08	3.27E-08	mg/kg-day	8.00E-04	mg/kg-day	4.09E-05	4.09E-05
	METHOXYCHLOR	0.044	mg/kg	1.69E-08	1.69E-08	mg/kg-day	5.00E-03	mg/kg-day	3.38E-06	3.38E-06
	MIREX	0.001	mg/kg	9.69E-10	9.69E-10	mg/kg-day	2.00E-04	mg/kg-day	4.84E-06	4.84E-06
	TRANS NONACHLOR	0.0008	mg/kg	3.10E-10	3.10E-10	mg/kg-day	5.00E-04	mg/kg-day	6.20E-07	6.20E-07
	PCBs									
	PCBs (TOTAL)	0.25	mg/kg	3.39E-07	3.39E-07	mg/kg-day	2.00E-05	mg/kg-day	1.70E-02	1.70E-02
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	7.78E-08	7.78E-08	mg/kg-day	6.00E-02	mg/kg-day	1.30E-06	1.30E-06
	ACENAPHTHYLENE	0.31	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.31	mg/kg	3.84E-07	3.84E-07	mg/kg-day	3.00E-01	mg/kg-day	1.28E-06	1.28E-06
	BENZO(A)ANTHRACENE	0.46	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	*BENZO(A)PYRENE*	0.41	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.35	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.32	mg/kg	4.04E-07	4.04E-07	mg/kg-day	4.00E-02	mg/kg-day	1.01E-05	1.01E-05
	BENZO(K)FLUORANTHENE	0.41	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	1.19E-06	1.19E-06	mg/kg-day	4.00E+00	mg/kg-day	2.98E-07	2.98E-07
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	3.34E-07	3.34E-07	mg/kg-day	2.00E-02	mg/kg-day	1.67E-05	1.67E-05
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	3.66E-08	3.66E-08	mg/kg-day	2.00E-01	mg/kg-day	1.83E-07	1.83E-07
	CARBAZOLE	0.062	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	2.58E-07	2.58E-07	mg/kg-day	4.00E-03	mg/kg-day	6.44E-05	6.44E-05
	CHRYSENE	0.47	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	3.19E-07	3.19E-07	mg/kg-day	1.00E-03	mg/kg-day	3.19E-04	3.19E-04
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	1.79E-07	1.79E-07	mg/kg-day	1.00E-01	mg/kg-day	1.79E-06	1.79E-06
	FLUORANTHENE	0.51	mg/kg	6.46E-07	6.46E-07	mg/kg-day	4.00E-02	mg/kg-day	1.62E-05	1.62E-05
	FLUORENE	0.34	mg/kg	4.24E-07	4.24E-07	mg/kg-day	4.00E-02	mg/kg-day	1.06E-05	1.06E-05
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	5.45E-07	5.45E-07	mg/kg-day	4.00E-03	mg/kg-day	1.36E-04	1.36E-04
	NAPHTHALENE	0.31	mg/kg	3.94E-07	3.94E-07	mg/kg-day	2.00E-02	mg/kg-day	1.97E-05	1.97E-05
	PENTACHLOROPHENOL	1.2	mg/kg	1.16E-06	1.16E-06	mg/kg-day	3.00E-02	mg/kg-day	3.87E-05	3.87E-05
	PHENANTHRENE	0.38	mg/kg	4.75E-07	4.75E-07	mg/kg-day	3.00E-01	mg/kg-day	1.58E-06	1.58E-06
	PHENOL	0.48	mg/kg	6.05E-07	6.05E-07	mg/kg-day	6.00E-01	mg/kg-day	1.01E-06	1.01E-06
	PYRENE	0.71	mg/kg	8.88E-07	8.88E-07	mg/kg-day	3.00E-02	mg/kg-day	2.96E-05	2.96E-05
	TPH									
	TPH AS DIESEL	190	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	51	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	NA	NA	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	NA	NA	mg/kg-day	9.00E-01	mg/kg-day	NA	NA
	BENZENE	0.025	mg/kg	NA	NA	mg/kg-day	4.00E-03	mg/kg-day	NA	NA

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
DERMAL CONTACT (CONTINUED)	2- BUTANONE	0.020	mg/kg	NA	NA	mg/kg-day	6.00E-01	mg/kg-day	NA	NA
	BROMOMETHANE	0.004	mg/kg	NA	NA	mg/kg-day	1.40E-03	mg/kg-day	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	CHLOROBENZENE	0.003	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	CHLOROFORM	0.007	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	ETHYLBENZENE	0.031	mg/kg	NA	NA	mg/kg-day	1.00E-01	mg/kg-day	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	NA	NA	mg/kg-day	6.00E-02	mg/kg-day	NA	NA
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	8.00E-02	mg/kg-day	NA	NA
	NAPHTHALENE	0.032	mg/kg	NA	NA	mg/kg-day	2.00E-02	mg/kg-day	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	NA	NA	mg/kg-day	1.00E-02	mg/kg-day	NA	NA
	TOLUENE	0.02	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	NA	NA	mg/kg-day	3.00E-04	mg/kg-day	NA	NA
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	NA	NA	mg/kg-day	5.00E-02	mg/kg-day	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	NA	NA	mg/kg-day	2.00E-01	mg/kg-day	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	5.18E-12	2.69E-12	mg/kg-day	1.14E-08	mg/kg-day	4.53E-04	2.36E-04
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	7.94E-13	4.13E-13	mg/kg-day	1.14E-08	mg/kg-day	6.95E-05	3.61E-05
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	7.70E-14	4.00E-14	mg/kg-day	1.14E-08	mg/kg-day	6.74E-06	3.50E-06
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	7.16E-14	3.72E-14	mg/kg-day	1.14E-08	mg/kg-day	6.27E-06	3.26E-06
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	2.15E-13	1.12E-13	mg/kg-day	1.14E-08	mg/kg-day	1.88E-05	9.78E-06
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	1.75E-13	9.12E-14	mg/kg-day	1.14E-08	mg/kg-day	1.54E-05	7.99E-06
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.02E-13	5.31E-14	mg/kg-day	1.14E-08	mg/kg-day	8.93E-06	4.65E-06
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	5.73E-14	2.98E-14	mg/kg-day	1.14E-08	mg/kg-day	5.02E-06	2.61E-06
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	8.89E-14	4.62E-14	mg/kg-day	1.14E-08	mg/kg-day	7.78E-06	4.05E-06
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	4.46E-11	2.32E-11	mg/kg-day	1.14E-08	mg/kg-day	3.91E-03	2.03E-03
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	9.19E-13	4.78E-13	mg/kg-day	1.14E-08	mg/kg-day	8.05E-05	4.18E-05
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	3.88E-14	2.02E-14	mg/kg-day	1.14E-08	mg/kg-day	3.40E-06	1.77E-06
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	2.57E-15	1.33E-15	mg/kg-day	1.14E-08	mg/kg-day	2.25E-07	1.17E-07
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	3.52E-14	1.83E-14	mg/kg-day	1.14E-08	mg/kg-day	3.08E-06	1.60E-06

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	2,3,7,8- TCDF	4.10E-06	mg/kg	2.45E-14	1.27E-14	mg/kg-day	1.14E-08	mg/kg-day	2.14E-06	1.11E-06
	HERBICIDES									
	2,4- D	0.037	mg/kg	2.22E-10	1.15E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	INORGANICS									
	ALUMINUM	23,900	mg/kg	1.43E-04	7.41E-05	mg/kg-day	1.40E-03	mg/kg-day	1.02E-01	5.30E-02
	ANTIMONY	4.2	mg/kg	2.52E-08	1.31E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	ARSENIC	13.6	mg/kg	8.11E-08	4.22E-08	mg/kg-day	8.57E-06	mg/kg-day	9.47E-03	4.92E-03
	BARIUM	163	mg/kg	9.71E-07	5.05E-07	mg/kg-day	1.43E-04	mg/kg-day	6.79E-03	3.53E-03
	BERYLLIUM	0.63	mg/kg	3.77E-09	1.96E-09	mg/kg-day	2.00E-06	mg/kg-day	1.89E-03	9.81E-04
	CADMIUM	3.00	mg/kg	1.79E-08	9.32E-09	mg/kg-day	5.71E-06	mg/kg-day	3.14E-03	1.63E-03
	CHROMIUM	116	mg/kg	6.91E-07	3.59E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	COBALT	14.8	mg/kg	8.86E-08	4.60E-08	mg/kg-day	5.70E-06	mg/kg-day	1.55E-02	8.08E-03
	COPPER	199	mg/kg	1.19E-06	6.16E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	5.37E-10	2.79E-10	mg/kg-day	2.86E-05	mg/kg-day	1.88E-05	9.76E-06
	LEAD	84	mg/kg	5.01E-07	2.60E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	MANGANESE	734	mg/kg	4.38E-06	2.28E-06	mg/kg-day	1.43E-05	mg/kg-day	3.06E-01	1.59E-01
	MERCURY	1.9	mg/kg	1.15E-08	5.96E-09	mg/kg-day	2.57E-05	mg/kg-day	4.46E-04	2.32E-04
	MOLYBDENUM	72.4	mg/kg	4.32E-07	2.25E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	NICKEL	99	mg/kg	5.89E-07	3.06E-07	mg/kg-day	1.43E-05	mg/kg-day	4.12E-02	2.14E-02
	SELENIUM	0.7	mg/kg	4.39E-09	2.28E-09	mg/kg-day	5.71E-03	mg/kg-day	7.69E-07	4.00E-07
	SILVER	2.6	mg/kg	1.57E-08	8.18E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	THALLIUM	1.33	mg/kg	7.95E-09	4.14E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	TIN	31	mg/kg	1.83E-07	9.50E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	VANADIUM	97	mg/kg	5.78E-07	3.01E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	ZINC	225	mg/kg	1.34E-06	6.99E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	4.83E-11	2.51E-11	mg/kg-day	3.00E-05	mg/kg-day	1.61E-06	8.38E-07
	ALPHA-CHLORDANE	0.019	mg/kg	1.15E-10	5.99E-11	mg/kg-day	2.00E-04	mg/kg-day	5.76E-07	2.99E-07
	BETA BHC	0.071	mg/kg	4.26E-10	2.21E-10	mg/kg-day	2.00E-04	mg/kg-day	2.13E-06	1.11E-06
	4,4- DDD	0.018	mg/kg	1.06E-10	5.49E-11	mg/kg-day	5.00E-04	mg/kg-day	2.11E-07	1.10E-07
	4,4- DDE	0.015	mg/kg	9.13E-11	4.75E-11	mg/kg-day	5.00E-04	mg/kg-day	1.83E-07	9.49E-08

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	4,4- DDT	0.08	mg/kg	4.78E-10	2.49E-10	mg/kg-day	5.00E-04	mg/kg-day	9.56E-07	4.97E-07
	DIELDRIN	0.031	mg/kg	1.87E-10	9.71E-11	mg/kg-day	5.00E-05	mg/kg-day	3.73E-06	1.94E-06
	ENDOSULFAN I	0.003	mg/kg	1.49E-11	7.76E-12	mg/kg-day	6.00E-03	mg/kg-day	2.49E-09	1.29E-09
	ENDOSULFAN II	0.004	mg/kg	2.45E-11	1.27E-11	mg/kg-day	6.00E-03	mg/kg-day	4.08E-09	2.12E-09
	ENDOSULFAN SULFATE	0.01	mg/kg	4.83E-11	2.51E-11	mg/kg-day	6.00E-03	mg/kg-day	8.05E-09	4.19E-09
	ENDRIN ALDEHYDE	0.01	mg/kg	4.83E-11	2.51E-11	mg/kg-day	3.00E-04	mg/kg-day	1.61E-07	8.38E-08
	ENRIN KETONE	0.010	mg/kg	5.79E-11	3.01E-11	mg/kg-day	3.00E-04	mg/kg-day	1.93E-07	1.00E-07
	GAMMA-BHC	0.12	mg/kg	7.17E-10	3.73E-10	mg/kg-day	3.00E-04	mg/kg-day	2.39E-06	1.24E-06
	GAMMA-CHLORDANE	0.019	mg/kg	1.10E-10	5.74E-11	mg/kg-day	2.00E-04	mg/kg-day	5.52E-07	2.87E-07
	HEPTACHLOR	0.04	mg/kg	2.39E-10	1.24E-10	mg/kg-day	5.00E-04	mg/kg-day	4.78E-07	2.49E-07
	HEPTACHLOR EPOXIDE	0.013	mg/kg	7.66E-11	3.98E-11	mg/kg-day	1.30E-05	mg/kg-day	5.89E-06	3.06E-06
	HEXACHLOROBENZENE	0.034	mg/kg	2.02E-10	1.05E-10	mg/kg-day	3.00E-04	mg/kg-day	6.72E-07	3.50E-07
	METHOXYCHLOR	0.044	mg/kg	2.60E-10	1.35E-10	mg/kg-day	5.00E-03	mg/kg-day	5.20E-08	2.71E-08
	MIREX	0.001	mg/kg	5.97E-12	3.10E-12	mg/kg-day	2.00E-04	mg/kg-day	2.98E-08	1.55E-08
	TRANS NONACHLOR	0.0008	mg/kg	4.77E-12	2.48E-12	mg/kg-day	2.00E-04	mg/kg-day	2.39E-08	1.24E-08
	PCBs									
	PCBs (TOTAL)	0.25	mg/kg	1.49E-09	7.76E-10	mg/kg-day	2.00E-05	mg/kg-day	7.46E-05	3.88E-05
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	6.72E-08	3.49E-08	mg/kg-day	6.00E-02	mg/kg-day	1.12E-06	5.82E-07
	ACENAPHTHYLENE	0.31	mg/kg	1.82E-09	9.46E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	ANTHRACENE	0.31	mg/kg	8.53E-08	4.43E-08	mg/kg-day	3.00E-01	mg/kg-day	2.84E-07	1.48E-07
	BENZO(A)ANTHRACENE	0.46	mg/kg	2.73E-09	1.42E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(A)PYRENE	0.41	mg/kg	2.44E-09	1.27E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(B)FLUORANTHENE	0.35	mg/kg	2.06E-09	1.07E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZO(G,H,I)PERYLENE	0.32	mg/kg	1.92E-09	9.96E-10	mg/kg-day	4.00E-02	mg/kg-day	4.79E-08	2.49E-08
	BENZO(K)FLUORANTHENE	0.41	mg/kg	2.44E-09	1.27E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	BENZOIC ACID	1.2	mg/kg	7.35E-09	3.82E-09	mg/kg-day	4.00E+00	mg/kg-day	1.84E-09	9.56E-10
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	2.06E-09	1.07E-09	mg/kg-day	2.00E-02	mg/kg-day	1.03E-07	5.35E-08
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	2.26E-10	1.17E-10	mg/kg-day	2.00E-01	mg/kg-day	1.13E-09	5.86E-10
	CARBAZOLE	0.062	mg/kg	3.69E-10	1.92E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	4- CHLOROANILINE	0.27	mg/kg	1.59E-09	8.25E-10	mg/kg-day	4.00E-03	mg/kg-day	3.97E-07	2.06E-07

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*CHRYSENE*	0.47	mg/kg	3.43E-08	1.78E-08	mg/kg-day	NA	mg/kg-day	NA	NA
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	1.29E-09	6.73E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	2,6- DINITROTOLUENE	0.33	mg/kg	1.96E-09	1.02E-09	mg/kg-day	1.00E-03	mg/kg-day	1.96E-06	1.02E-06
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	1.10E-09	5.74E-10	mg/kg-day	1.00E-01	mg/kg-day	1.10E-08	5.74E-09
	FLUORANTHENE	0.51	mg/kg	3.06E-09	1.59E-09	mg/kg-day	4.00E-02	mg/kg-day	7.65E-08	3.98E-08
	FLUORENE	0.34	mg/kg	1.83E-07	9.53E-08	mg/kg-day	4.00E-02	mg/kg-day	4.58E-06	2.38E-06
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	1.92E-09	9.96E-10	mg/kg-day	NA	mg/kg-day	NA	NA
	2- METHYLNAPHTHALENE	0.43	mg/kg	2.58E-09	1.34E-09	mg/kg-day	NA	mg/kg-day	NA	NA
	NAPHTHALENE	0.31	mg/kg	1.42E-06	7.41E-07	mg/kg-day	8.57E-04	mg/kg-day	1.66E-03	8.64E-04
	PENTACHLOROPHENOL	1.2	mg/kg	7.16E-09	3.72E-09	mg/kg-day	3.00E-02	mg/kg-day	2.39E-07	1.24E-07
	PHENANTHRENE	0.38	mg/kg	2.25E-09	1.17E-09	mg/kg-day	3.00E-01	mg/kg-day	7.50E-09	3.90E-09
	PHENOL	0.48	mg/kg	2.87E-09	1.49E-09	mg/kg-day	5.71E-02	mg/kg-day	5.02E-08	2.61E-08
	PYRENE	0.71	mg/kg	3.63E-08	1.89E-08	mg/kg-day	3.00E-02	mg/kg-day	1.21E-06	6.29E-07
	TPH									
	TPH AS DIESEL	190	mg/kg	1.14E-06	5.91E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS GASOLINE	51	mg/kg	3.05E-07	1.59E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	1.38E-06	7.19E-07	mg/kg-day	NA	mg/kg-day	NA	NA
	TRPH	3,542	mg/kg	2.11E-05	1.10E-05	mg/kg-day	NA	mg/kg-day	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	6.83E-07	3.55E-07	mg/kg-day	9.00E-01	mg/kg-day	7.59E-07	3.95E-07
	BENZENE	0.025	mg/kg	1.82E-06	9.45E-07	mg/kg-day	8.57E-03	mg/kg-day	2.12E-04	1.10E-04
	2- BUTANONE	0.020	mg/kg	2.09E-07	1.09E-07	mg/kg-day	2.86E-01	mg/kg-day	7.31E-07	3.80E-07
	BROMOMETHANE	0.004	mg/kg	4.67E-07	2.43E-07	mg/kg-day	1.43E+00	mg/kg-day	3.27E-07	1.70E-07
	CARBON DISULFIDE	0.005	mg/kg	8.09E-07	4.21E-07	mg/kg-day	2.00E-01	mg/kg-day	4.04E-06	2.10E-06
	CHLOROBENZENE	0.003	mg/kg	9.19E-08	4.78E-08	mg/kg-day	5.71E-03	mg/kg-day	1.61E-05	8.37E-06
	CHLOROFORM	0.007	mg/kg	5.04E-07	2.62E-07	mg/kg-day	8.57E-02	mg/kg-day	5.89E-06	3.06E-06
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	1.39E-06	7.21E-07	mg/kg-day	1.00E-02	mg/kg-day	1.39E-04	7.21E-05
	ETHYLBENZENE	0.031	mg/kg	1.12E-06	5.83E-07	mg/kg-day	2.86E-01	mg/kg-day	3.92E-06	2.04E-06
	METHYLENE CHLORIDE	0.059	mg/kg	4.62E-06	2.40E-06	mg/kg-day	1.14E-01	mg/kg-day	4.04E-05	2.10E-05
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	8.57E-01	mg/kg-day	NA	NA

Table C1-5b
Calculation of Noncarcinogenic Hazard Quotients
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	RfD	RfD Units	HQ (RME)	HQ (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	NAPHTHALENE	0.032	mg/kg	1.45E-07	7.52E-08	mg/kg-day	8.57E-04	mg/kg-day	1.69E-04	8.77E-05
	TETRACHLOROETHENE	0.02	mg/kg	1.25E-06	6.48E-07	mg/kg-day	1.00E-02	mg/kg-day	1.25E-04	6.48E-05
	TOLUENE	0.02	mg/kg	1.20E-06	6.25E-07	mg/kg-day	8.57E-02	mg/kg-day	1.40E-05	7.29E-06
	TRICHLOROETHENE	0.01	mg/kg	5.08E-07	2.64E-07	mg/kg-day	1.00E-02	mg/kg-day	5.08E-05	2.64E-05
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	1.23E-07	6.39E-08	mg/kg-day	1.70E-03	mg/kg-day	7.23E-05	3.76E-05
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	1.10E-07	5.70E-08	mg/kg-day	1.70E-03	mg/kg-day	6.45E-05	3.35E-05
	XYLENE (TOTAL)	0.10	mg/kg	3.09E-06	1.61E-06	mg/kg-day	2.86E-02	mg/kg-day	1.08E-04	5.63E-05

Notes:
The HQ for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
HQ = Hazard Quotient
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RfD = Reference Dose
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	2.30E-10	9.60E-11	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	2.99E-07	1.25E-07
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	3.53E-11	1.47E-11	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	4.59E-08	1.91E-08
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	3.42E-12	1.43E-12	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	4.45E-09	1.85E-09
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	3.18E-12	1.33E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	4.14E-08	1.73E-08
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	9.55E-12	3.98E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.24E-07	5.18E-08
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	7.80E-12	3.25E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.01E-07	4.23E-08
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	4.54E-12	1.89E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.90E-08	2.46E-08
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	2.55E-12	1.06E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	3.31E-08	1.38E-08
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	3.95E-12	1.65E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.14E-08	2.14E-08
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	1.99E-09	8.27E-10	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	2.58E-08	1.08E-08
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	4.09E-11	1.70E-11	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	5.31E-10	2.21E-10
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	1.73E-12	7.19E-13	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	2.24E-07	9.34E-08
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.14E-13	4.76E-14	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	7.42E-10	3.09E-10
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	1.57E-12	6.52E-13	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	1.02E-07	4.24E-08
	2,3,7,8- TCDF	4.10E-06	mg/kg	1.09E-12	4.53E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.41E-08	5.89E-09
	HERBICIDES									
	2,4- D	0.037	mg/kg	9.87E-09	4.11E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,900	mg/kg	6.34E-03	2.64E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.2	mg/kg	1.12E-06	4.67E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	3.61E-06	1.50E-06	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	3.41E-05	1.42E-05
	BARIUM	163	mg/kg	4.32E-05	1.80E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.63	mg/kg	1.68E-07	6.99E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00	mg/kg	7.97E-07	3.32E-07	mg/kg-day	3.80E-01	$(mg/kg\text{-}day)^{-1}$	3.03E-07	1.26E-07
	CHROMIUM	116	mg/kg	3.07E-05	1.28E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.8	mg/kg	3.94E-06	1.64E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	199	mg/kg	5.27E-05	2.20E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	2.39E-08	9.95E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	84	mg/kg	2.23E-05	9.28E-06	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	1.89E-07	7.89E-08

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*MANGANESE*	734	mg/kg	1.95E-04	8.12E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	5.10E-07	2.12E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	1.92E-05	8.01E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	99	mg/kg	2.62E-05	1.09E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.7	mg/kg	1.95E-07	8.14E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	2.6	mg/kg	7.00E-07	2.92E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.33	mg/kg	3.54E-07	1.47E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	31	mg/kg	8.12E-06	3.39E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	97	mg/kg	2.57E-05	1.07E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	225	mg/kg	5.98E-05	2.49E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	2.15E-09	8.96E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	3.65E-08	1.52E-08
	ALPHA-CHLORDANE	0.019	mg/kg	5.12E-09	2.13E-09	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	6.66E-09	2.77E-09
	BETA BHC	0.071	mg/kg	1.89E-08	7.89E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	3.41E-08	1.42E-08
	4,4- DDD	0.018	mg/kg	4.70E-09	1.96E-09	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.13E-09	4.70E-10
	4,4- DDE	0.015	mg/kg	4.06E-09	1.69E-09	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.38E-09	5.75E-10
	4,4- DDT	0.08	mg/kg	2.13E-08	8.86E-09	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	7.23E-09	3.01E-09
	DIELDRIN	0.031	mg/kg	8.31E-09	3.46E-09	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	1.33E-07	5.54E-08
	ENDOSULFAN I	0.003	mg/kg	6.64E-10	2.76E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	1.09E-09	4.53E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	2.15E-09	8.96E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	2.15E-09	8.96E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	2.57E-09	1.07E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	3.19E-08	1.33E-08	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	3.51E-08	1.46E-08
	GAMMA-CHLORDANE	0.019	mg/kg	4.91E-09	2.05E-09	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	6.38E-09	2.66E-09
	HEPTACHLOR	0.04	mg/kg	1.06E-08	4.43E-09	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	4.79E-08	2.00E-08
	HEPTACHLOR EPOXIDE	0.013	mg/kg	3.41E-09	1.42E-09	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	3.10E-08	1.29E-08
	HEXACHLOROBENZENE	0.034	mg/kg	8.97E-09	3.74E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	1.61E-08	6.73E-09
	METHOXYCHLOR	0.044	mg/kg	1.16E-08	4.82E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	2.65E-10	1.11E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	TRANS NONACHLOR	0.0008	mg/kg	2.12E-10	8.85E-11	mg/kg-day	1.30E+00	(mg/kg-day)$^{-1}$	2.76E-10	1.15E-10
	PCBs									
	PCBs (TOTAL)	0.25	mg/kg	6.64E-08	2.76E-08	mg/kg-day	5.00E+00	(mg/kg-day)$^{-1}$	3.32E-07	1.38E-07
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	1.64E-08	6.83E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ACENAPHTHYLENE	0.31	mg/kg	8.09E-08	3.37E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ANTHRACENE	0.31	mg/kg	8.09E-08	3.37E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	1.21E-07	5.05E-08	mg/kg-day	1.20E+00	(mg/kg-day)$^{-1}$	1.46E-07	6.06E-08
	BENZO(A)PYRENE	0.41	mg/kg	1.09E-07	4.52E-08	mg/kg-day	1.20E+01	(mg/kg-day)$^{-1}$	1.30E-06	5.43E-07
	BENZO(B)FLUORANTHENE	0.35	mg/kg	9.16E-08	3.82E-08	mg/kg-day	1.20E+00	(mg/kg-day)$^{-1}$	1.10E-07	4.58E-08
	BENZO(G,H,I)PERYLENE	0.32	mg/kg	8.52E-08	3.55E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.41	mg/kg	1.09E-07	4.52E-08	mg/kg-day	1.20E+00	(mg/kg-day)$^{-1}$	1.30E-07	5.43E-08
	BENZOIC ACID	1.2	mg/kg	3.27E-07	1.36E-07	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	9.16E-08	3.82E-08	mg/kg-day	1.40E-02	(mg/kg-day)$^{-1}$	1.28E-09	5.34E-10
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	1.00E-08	4.18E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	1.64E-08	6.83E-09	mg/kg-day	2.00E-02	(mg/kg-day)$^{-1}$	3.28E-10	1.37E-10
	4- CHLOROANILINE	0.27	mg/kg	7.06E-08	2.94E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	1.26E-07	5.23E-08	mg/kg-day	1.20E-01	(mg/kg-day)$^{-1}$	1.51E-08	6.28E-09
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	5.76E-08	2.40E-08	mg/kg-day	4.10E+00	(mg/kg-day)$^{-1}$	2.36E-07	9.84E-08
	2,6- DINITROTOLUENE	0.33	mg/kg	8.73E-08	3.64E-08	mg/kg-day	6.10E-01	(mg/kg-day)$^{-1}$	5.33E-08	2.22E-08
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	4.91E-08	2.05E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	1.36E-07	5.67E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	FLUORENE	0.34	mg/kg	8.94E-08	3.73E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	8.52E-08	3.55E-08	mg/kg-day	1.20E+00	(mg/kg-day)$^{-1}$	1.02E-07	4.26E-08
	2- METHYLNAPHTHALENE	0.43	mg/kg	1.15E-07	4.79E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	NAPHTHALENE	0.31	mg/kg	8.31E-08	3.46E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	3.18E-07	1.33E-07	mg/kg-day	1.20E-01	(mg/kg-day)$^{-1}$	3.82E-08	1.59E-08
	PHENANTHRENE	0.38	mg/kg	1.00E-07	4.17E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	1.28E-07	5.31E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*PYRENE*	0.71	mg/kg	1.87E-07	7.80E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	190	mg/kg	5.05E-05	2.11E-05	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH AS GASOLINE	51	mg/kg	1.36E-05	5.66E-06	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	6.15E-05	2.56E-05	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TRPH	3,542	mg/kg	9.40E-04	3.92E-04	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	1.16E-08	4.84E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	6.74E-09	2.81E-09	mg/kg-day	1.00E-01	(mg/kg-day)$^{-1}$	6.74E-10	2.81E-10
	2- BUTANONE	0.020	mg/kg	5.39E-09	2.24E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BROMOMETHANE	0.004	mg/kg	1.14E-09	4.76E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	1.32E-09	5.49E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	7.86E-10	3.27E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	1.85E-09	7.70E-10	mg/kg-day	3.10E-02	(mg/kg-day)$^{-1}$	5.73E-11	2.39E-11
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	5.46E-09	2.27E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	8.22E-09	3.42E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	1.57E-08	6.52E-09	mg/kg-day	1.40E-02	(mg/kg-day)$^{-1}$	2.19E-10	9.13E-11
	4- METHYL-2-PENTANONE	0.008	mg/kg	1.99E-09	8.29E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	8.43E-09	3.51E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	4.40E-09	1.83E-09	mg/kg-day	5.40E-01	(mg/kg-day)$^{-1}$	2.37E-09	9.89E-10
	TOLUENE	0.02	mg/kg	6.52E-09	2.72E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	2.27E-09	9.47E-10	mg/kg-day	4.10E-01	(mg/kg-day)$^{-1}$	9.31E-10	3.88E-10
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	3.33E-09	1.39E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	1.19E-09	4.95E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	2.56E-08	1.07E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	1.30E+03	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	NA	NA

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	1.30E+01	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	1.30E+01	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	1.30E+05	(mg/kg-day)$^{-1}$	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	6.50E+03	(mg/kg-day)$^{-1}$	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	6.50E+04	(mg/kg-day)$^{-1}$	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	(mg/kg-day)$^{-1}$	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	2.27E-09	9.44E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,900	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ANTIMONY	4.2	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	4.97E-07	2.07E-07	mg/kg-day	9.45E+00	(mg/kg-day)$^{-1}$	4.70E-06	1.96E-06
	BARIUM	163	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BERYLLIUM	0.63	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CADMIUM	3.00	mg/kg	3.66E-09	1.52E-09	mg/kg-day	1.52E+01	(mg/kg-day)$^{-1}$	5.56E-08	2.32E-08
	CHROMIUM	116	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	COBALT	14.8	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	COPPER	199	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	LEAD	84	mg/kg	NA	NA	mg/kg-day	8.50E-03	(mg/kg-day)$^{-1}$	NA	NA
	MANGANESE	734	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	NICKEL	99	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	SELENIUM	0.7	mg/kg	NA	NA	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*SILVER*	2.6	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.33	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	31	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	97	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	225	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	9.87E-10	4.11E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	1.68E-08	6.99E-09
	ALPHA-CHLORDANE	0.019	mg/kg	9.40E-10	3.92E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.22E-09	5.09E-10
	BETA BHC	0.071	mg/kg	3.48E-09	1.45E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	6.26E-09	2.61E-09
	4,4- DDD	0.018	mg/kg	6.47E-10	2.70E-10	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.55E-10	6.47E-11
	4,4- DDE	0.015	mg/kg	5.59E-10	2.33E-10	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.90E-10	7.92E-11
	4,4- DDT	0.08	mg/kg	2.93E-09	1.22E-09	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	9.95E-10	4.15E-10
	DIELDRIN	0.031	mg/kg	3.81E-09	1.59E-09	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	6.10E-08	2.54E-08
	ENDOSULFAN I	0.003	mg/kg	3.05E-10	1.27E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	4.99E-10	2.08E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	9.87E-10	4.11E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	9.87E-10	4.11E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	1.18E-09	4.92E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	5.85E-09	2.44E-09	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	6.44E-09	2.68E-09
	GAMMA-CHLORDANE	0.019	mg/kg	9.01E-10	3.76E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.17E-09	4.88E-10
	HEPTACHLOR	0.04	mg/kg	4.89E-09	2.04E-09	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	2.20E-08	9.16E-09
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.56E-09	6.51E-10	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	1.42E-08	5.93E-09
	HEXACHLOROBENZENE	0.034	mg/kg	4.12E-09	1.72E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	7.41E-09	3.09E-09
	METHOXYCHLOR	0.044	mg/kg	2.12E-09	8.85E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	1.22E-10	5.08E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	0.0008	mg/kg	3.90E-11	1.62E-11	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	5.07E-11	2.11E-11
	PCBs									
	PCBs (TOTAL)	0.25	mg/kg	4.26E-08	1.78E-08	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	2.13E-07	8.88E-08
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	9.79E-09	4.08E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*ACENAPHTHYLENE*	0.31	mg/kg	4.83E-08	2.01E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.31	mg/kg	4.83E-08	2.01E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	7.24E-08	3.02E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	8.68E-08	3.62E-08
	BENZO(A)PYRENE	0.41	mg/kg	6.48E-08	2.70E-08	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	7.77E-07	3.24E-07
	BENZO(B)FLUORANTHENE	0.35	mg/kg	5.46E-08	2.28E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	6.56E-08	2.73E-08
	BENZO(G,H,I)PERYLENE	0.32	mg/kg	5.08E-08	2.12E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.41	mg/kg	6.48E-08	2.70E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	7.77E-08	3.24E-08
	BENZOIC ACID	1.2	mg/kg	1.50E-07	6.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	4.20E-08	1.75E-08	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	5.88E-10	2.45E-10
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	4.60E-09	1.92E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	7.53E-09	3.14E-09	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	1.51E-10	6.27E-11
	4- CHLOROANILINE	0.27	mg/kg	3.24E-08	1.35E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	7.49E-08	3.12E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	8.99E-09	3.75E-09
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	3.44E-08	1.43E-08	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	1.41E-07	5.87E-08
	2,6- DINITROTOLUENE	0.33	mg/kg	4.01E-08	1.67E-08	mg/kg-day	6.10E-01	$(mg/kg\text{-}day)^{-1}$	2.44E-08	1.02E-08
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	2.25E-08	9.39E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	8.12E-08	3.39E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	0.34	mg/kg	5.34E-08	2.22E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	5.08E-08	2.12E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	6.10E-08	2.54E-08
	2- METHYLNAPHTHALENE	0.43	mg/kg	6.86E-08	2.86E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.31	mg/kg	4.96E-08	2.07E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	1.46E-07	6.09E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.75E-08	7.31E-09
	PHENANTHRENE	0.38	mg/kg	5.97E-08	2.49E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	7.61E-08	3.17E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PYRENE	0.71	mg/kg	1.12E-07	4.65E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	190	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	51	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	TRPH	3,542	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	NA	NA	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2- BUTANONE	0.020	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BROMOMETHANE	0.004	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	NA	NA	mg/kg-day	3.10E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	NA	NA	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	NA	NA	mg/kg-day	5.40E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TOLUENE	0.02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	NA	NA	mg/kg-day	4.10E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	9.69E-15	4.04E-15	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.26E-11	5.25E-12
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	1.48E-15	6.18E-16	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.93E-12	8.04E-13
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	1.44E-16	6.00E-17	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.87E-13	7.80E-14
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	1.34E-16	5.58E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.74E-12	7.25E-13
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	4.02E-16	1.67E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.22E-12	2.18E-12
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	3.28E-16	1.37E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	4.27E-12	1.78E-12
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.91E-16	7.95E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	2.48E-12	1.03E-12
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	1.07E-16	4.46E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.39E-12	5.80E-13
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	1.66E-16	6.93E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	2.16E-12	9.01E-13

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	8.35E-14	3.48E-14	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	1.09E-12	4.52E-13
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	1.72E-15	7.16E-16	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	2.23E-14	9.31E-15
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	7.25E-17	3.02E-17	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	9.43E-12	3.93E-12
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	4.80E-18	2.00E-18	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	3.12E-14	1.30E-14
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	6.58E-17	2.74E-17	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	4.28E-12	1.78E-12
	2,3,7,8- TCDF	4.10E-06	mg/kg	4.58E-17	1.91E-17	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.95E-13	2.48E-13
	HERBICIDES									
	2,4- D	0.037	mg/kg	4.15E-13	1.73E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,900	mg/kg	2.67E-07	1.11E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.2	mg/kg	4.71E-11	1.96E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	1.52E-10	6.32E-11	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	1.82E-09	7.59E-10
	BARIUM	163	mg/kg	1.82E-09	7.57E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.63	mg/kg	7.05E-12	2.94E-12	mg/kg-day	8.40E+00	$(mg/kg\text{-}day)^{-1}$	5.92E-11	2.47E-11
	CADMIUM	3.00	mg/kg	3.35E-11	1.40E-11	mg/kg-day	1.50E+01	$(mg/kg\text{-}day)^{-1}$	5.03E-10	2.09E-10
	CHROMIUM	116	mg/kg	1.29E-09	5.38E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.8	mg/kg	1.66E-10	6.90E-11	mg/kg-day	9.80E+00	$(mg/kg\text{-}day)^{-1}$	1.62E-09	6.76E-10
	COPPER	199	mg/kg	2.22E-09	9.24E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	1.00E-12	4.18E-13	mg/kg-day	5.10E+02	$(mg/kg\text{-}day)^{-1}$	5.12E-10	2.13E-10
	LEAD	84	mg/kg	9.37E-10	3.90E-10	mg/kg-day	4.20E-02	$(mg/kg\text{-}day)^{-1}$	3.93E-11	1.64E-11
	MANGANESE	734	mg/kg	8.19E-09	3.41E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	2.14E-11	8.93E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	8.08E-10	3.37E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	99	mg/kg	1.10E-09	4.59E-10	mg/kg-day	9.10E-01	$(mg/kg\text{-}day)^{-1}$	1.00E-09	4.18E-10
	SELENIUM	0.7	mg/kg	8.21E-12	3.42E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	2.6	mg/kg	2.94E-11	1.23E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.33	mg/kg	1.49E-11	6.20E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	31	mg/kg	3.42E-10	1.42E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	97	mg/kg	1.08E-09	4.51E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	225	mg/kg	2.52E-09	1.05E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	**PESTICIDES**									
	ALDRIN	0.01	mg/kg	9.04E-14	3.77E-14	mg/kg-day	1.72E+01	$(mg/kg\text{-}day)^{-1}$	1.55E-12	6.48E-13
	ALPHA-CHLORDANE	0.019	mg/kg	2.15E-13	8.97E-14	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	7.54E-14	3.14E-14
	BETA BHC	0.071	mg/kg	7.97E-13	3.32E-13	mg/kg-day	1.86E+00	$(mg/kg\text{-}day)^{-1}$	1.48E-12	6.17E-13
	4,4- DDD	0.018	mg/kg	1.98E-13	8.23E-14	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	4.74E-14	1.98E-14
	4,4- DDE	0.015	mg/kg	1.71E-13	7.11E-14	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	5.81E-14	2.42E-14
	4,4- DDT	0.08	mg/kg	8.94E-13	3.72E-13	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	3.04E-13	1.27E-13
	DIELDRIN	0.031	mg/kg	3.49E-13	1.46E-13	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	5.59E-12	2.33E-12
	ENDOSULFAN I	0.003	mg/kg	2.79E-14	1.16E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	4.58E-14	1.91E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	9.04E-14	3.77E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	9.04E-14	3.77E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	1.08E-13	4.51E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	1.34E-12	5.58E-13	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	1.47E-12	6.14E-13
	GAMMA-CHLORDANE	0.019	mg/kg	2.06E-13	8.60E-14	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	7.23E-14	3.01E-14
	HEPTACHLOR	0.04	mg/kg	4.47E-13	1.86E-13	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	2.01E-12	8.39E-13
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.43E-13	5.97E-14	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	1.30E-12	5.43E-13
	HEXACHLOROBENZENE	0.034	mg/kg	3.77E-13	1.57E-13	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	6.79E-13	2.83E-13
	METHOXYCHLOR	0.044	mg/kg	4.87E-13	2.03E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	1.12E-14	4.65E-15	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	0.0008	mg/kg	8.93E-15	3.72E-15	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	3.12E-15	1.30E-15
	PCBs									
	PCBs (TOTAL)	0.25	mg/kg	2.79E-12	1.16E-12	mg/kg-day	2.00E+00	$(mg/kg\text{-}day)^{-1}$	5.58E-12	2.32E-12
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	5.06E-09	2.11E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	0.31	mg/kg	3.40E-12	1.42E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.31	mg/kg	6.42E-09	2.67E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	5.10E-12	2.12E-12	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.99E-12	8.29E-13
	BENZO(A)PYRENE	0.41	mg/kg	4.56E-12	1.90E-12	mg/kg-day	3.90E+00	$(mg/kg\text{-}day)^{-1}$	1.78E-11	7.42E-12
	BENZO(B)FLUORANTHENE	0.35	mg/kg	3.85E-12	1.60E-12	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.50E-12	6.26E-13

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*BENZO(G,H,I)PERYLENE*	0.32	mg/kg	3.58E-12	1.49E-12	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.41	mg/kg	4.56E-12	1.90E-12	mg/kg-day	3.90E-01	(mg/kg-day)$^{-1}$	1.78E-12	7.42E-13
	BENZOIC ACID	1.2	mg/kg	1.37E-11	5.73E-12	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	3.85E-12	1.60E-12	mg/kg-day	1.40E-02	(mg/kg-day)$^{-1}$	5.39E-14	2.25E-14
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	4.22E-13	1.76E-13	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	6.90E-13	2.87E-13	mg/kg-day	2.00E-02	(mg/kg-day)$^{-1}$	1.38E-14	5.75E-15
	4- CHLOROANILINE	0.27	mg/kg	2.97E-12	1.24E-12	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	2.58E-09	1.08E-09	mg/kg-day	3.90E-02	(mg/kg-day)$^{-1}$	1.01E-10	4.19E-11
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	2.42E-12	1.01E-12	mg/kg-day	4.10E+00	(mg/kg-day)$^{-1}$	9.93E-12	4.14E-12
	2,6- DINITROTOLUENE	0.33	mg/kg	3.67E-12	1.53E-12	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	2.06E-12	8.60E-13	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	5.72E-12	2.39E-12	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	FLUORENE	0.34	mg/kg	1.38E-08	5.75E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	3.58E-12	1.49E-12	mg/kg-day	3.90E-01	(mg/kg-day)$^{-1}$	1.40E-12	5.82E-13
	2- METHYLNAPHTHALENE	0.43	mg/kg	4.83E-12	2.01E-12	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	NAPHTHALENE	0.31	mg/kg	1.07E-07	4.47E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	1.34E-11	5.58E-12	mg/kg-day	1.20E-01	(mg/kg-day)$^{-1}$	1.61E-12	6.70E-13
	PHENANTHRENE	0.38	mg/kg	4.21E-12	1.75E-12	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	5.36E-12	2.23E-12	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	PYRENE	0.71	mg/kg	2.73E-09	1.14E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	190	mg/kg	2.12E-09	8.85E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH AS GASOLINE	51	mg/kg	5.71E-10	2.38E-10	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	2.59E-09	1.08E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	TRPH	3,542	mg/kg	3.95E-08	1.65E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	5.14E-08	2.14E-08	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	1.37E-07	5.70E-08	mg/kg-day	1.00E-01	(mg/kg-day)$^{-1}$	1.37E-08	5.70E-09
	2- BUTANONE	0.020	mg/kg	1.57E-08	6.56E-09	mg/kg-day	NA	(mg/kg-day)$^{-1}$	NA	NA

Table C1-5c
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Recreational
Receptor Age:	Child (1 to 17 years old)

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	BROMOMETHANE	0.004	mg/kg	3.52E-08	1.47E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	6.09E-08	2.54E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	6.92E-09	2.88E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	3.80E-08	1.58E-08	mg/kg-day	1.90E-02	$(mg/kg\text{-}day)^{-1}$	7.21E-10	3.01E-10
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	1.04E-07	4.35E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	8.45E-08	3.52E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	3.48E-07	1.45E-07	mg/kg-day	3.50E-03	$(mg/kg\text{-}day)^{-1}$	1.22E-09	5.07E-10
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	1.09E-08	4.53E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	9.38E-08	3.91E-08	mg/kg-day	2.10E-02	$(mg/kg\text{-}day)^{-1}$	1.97E-09	8.21E-10
	TOLUENE	0.02	mg/kg	9.04E-08	3.77E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	3.82E-08	1.59E-08	mg/kg-day	7.00E-03	$(mg/kg\text{-}day)^{-1}$	2.67E-10	1.11E-10
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	9.25E-09	3.85E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	8.25E-09	3.44E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	2.33E-07	9.69E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Notes:
The cancer risk for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	4.00E-11	4.00E-11	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	5.21E-08	5.21E-08
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	6.14E-12	6.14E-12	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	7.98E-09	7.98E-09
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	5.95E-13	5.95E-13	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	7.74E-10	7.74E-10
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	5.54E-13	5.54E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	7.20E-09	7.20E-09
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	1.66E-12	1.66E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	2.16E-08	2.16E-08
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	1.36E-12	1.36E-12	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.76E-08	1.76E-08
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	7.89E-13	7.89E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.03E-08	1.03E-08
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	4.43E-13	4.43E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	5.76E-09	5.76E-09
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	6.87E-13	6.87E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	8.94E-09	8.94E-09
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	3.45E-10	3.45E-10	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	4.49E-09	4.49E-09
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	7.10E-12	7.10E-12	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	9.23E-11	9.23E-11
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	3.00E-13	3.00E-13	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	3.90E-08	3.90E-08
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	1.98E-14	1.98E-14	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	1.29E-10	1.29E-10
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	2.72E-13	2.72E-13	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	1.77E-08	1.77E-08
	2,3,7,8- TCDF	4.10E-06	mg/kg	1.89E-13	1.89E-13	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	2.46E-09	2.46E-09
	HERBICIDES									
	2,4- D	0.037	mg/kg	1.72E-09	1.72E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,900	mg/kg	1.10E-03	1.10E-03	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.2	mg/kg	1.95E-07	1.95E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	6.27E-07	6.27E-07	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	5.93E-06	5.93E-06
	BARIUM	163	mg/kg	7.51E-06	7.51E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.63	mg/kg	2.91E-08	2.91E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00	mg/kg	1.39E-07	1.39E-07	mg/kg-day	3.80E-01	$(mg/kg\text{-}day)^{-1}$	5.26E-08	5.26E-08
	CHROMIUM	116	mg/kg	5.34E-06	5.34E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.8	mg/kg	6.85E-07	6.85E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	199	mg/kg	9.16E-06	9.16E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	4.15E-09	4.15E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	84	mg/kg	3.87E-06	3.87E-06	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	3.29E-08	3.29E-08

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*MANGANESE*	734	mg/kg	3.39E-05	3.39E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	8.86E-08	8.86E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	3.34E-06	3.34E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	99	mg/kg	4.55E-06	4.55E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.7	mg/kg	3.40E-08	3.40E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	2.6	mg/kg	1.22E-07	1.22E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.33	mg/kg	6.15E-08	6.15E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	31	mg/kg	1.41E-06	1.41E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	97	mg/kg	4.47E-06	4.47E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	225	mg/kg	1.04E-05	1.04E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	3.74E-10	3.74E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	6.35E-09	6.35E-09
	ALPHA-CHLORDANE	0.019	mg/kg	8.90E-10	8.90E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.16E-09	1.16E-09
	BETA BHC	0.071	mg/kg	3.29E-09	3.29E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	5.93E-09	5.93E-09
	4,4- DDD	0.018	mg/kg	8.16E-10	8.16E-10	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.96E-10	1.96E-10
	4,4- DDE	0.015	mg/kg	7.06E-10	7.06E-10	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	2.40E-10	2.40E-10
	4,4- DDT	0.08	mg/kg	3.69E-09	3.69E-09	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.26E-09	1.26E-09
	DIELDRIN	0.031	mg/kg	1.44E-09	1.44E-09	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	2.31E-08	2.31E-08
	ENDOSULFAN I	0.003	mg/kg	1.15E-10	1.15E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	1.89E-10	1.89E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	3.74E-10	3.74E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	3.74E-10	3.74E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	4.47E-10	4.47E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	5.54E-09	5.54E-09	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	6.09E-09	6.09E-09
	GAMMA-CHLORDANE	0.019	mg/kg	8.53E-10	8.53E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.11E-09	1.11E-09
	HEPTACHLOR	0.04	mg/kg	1.85E-09	1.85E-09	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	8.32E-09	8.32E-09
	HEPTACHLOR EPOXIDE	0.013	mg/kg	5.92E-10	5.92E-10	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	5.39E-09	5.39E-09
	HEXACHLOROBENZENE	0.034	mg/kg	1.56E-09	1.56E-09	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	2.81E-09	2.81E-09
	METHOXYCHLOR	0.044	mg/kg	2.01E-09	2.01E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	4.61E-11	4.61E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	TRANS NONACHLOR	0.0008	mg/kg	3.69E-11	3.69E-11	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	4.80E-11	4.80E-11
	PCBs									
	PCBs (TOTAL)	0.25	mg/kg	1.15E-08	1.15E-08	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	5.77E-08	5.77E-08
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	2.85E-09	2.85E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	0.31	mg/kg	1.41E-08	1.41E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.31	mg/kg	1.41E-08	1.41E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	2.11E-08	2.11E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	2.53E-08	2.53E-08
	BENZO(A)PYRENE	0.41	mg/kg	1.89E-08	1.89E-08	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	2.26E-07	2.26E-07
	BENZO(B)FLUORANTHENE	0.35	mg/kg	1.59E-08	1.59E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	1.91E-08	1.91E-08
	BENZO(G,H,I)PERYLENE	0.32	mg/kg	1.48E-08	1.48E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.41	mg/kg	1.89E-08	1.89E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	2.26E-08	2.26E-08
	BENZOIC ACID	1.2	mg/kg	5.68E-08	5.68E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	1.59E-08	1.59E-08	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	2.23E-10	2.23E-10
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	1.74E-09	1.74E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	2.85E-09	2.85E-09	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	5.70E-11	5.70E-11
	4- CHLOROANILINE	0.27	mg/kg	1.23E-08	1.23E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	2.18E-08	2.18E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	2.62E-09	2.62E-09
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	1.00E-08	1.00E-08	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	4.10E-08	4.10E-08
	2,6- DINITROTOLUENE	0.33	mg/kg	1.52E-08	1.52E-08	mg/kg-day	6.10E-01	$(mg/kg\text{-}day)^{-1}$	9.26E-09	9.26E-09
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	8.53E-09	8.53E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	2.37E-08	2.37E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	0.34	mg/kg	1.55E-08	1.55E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	1.48E-08	1.48E-08	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	1.78E-08	1.78E-08
	2- METHYLNAPHTHALENE	0.43	mg/kg	2.00E-08	2.00E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.31	mg/kg	1.44E-08	1.44E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	5.54E-08	5.54E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	6.64E-09	6.64E-09
	PHENANTHRENE	0.38	mg/kg	1.74E-08	1.74E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	2.22E-08	2.22E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INGESTION (CONTINUED)	*PYRENE*	0.71	mg/kg	3.25E-08	3.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	190	mg/kg	8.78E-06	8.78E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	51	mg/kg	2.36E-06	2.36E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	1.07E-05	1.07E-05	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRPH	3,542	mg/kg	1.63E-04	1.63E-04	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	2.02E-09	2.02E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	1.17E-09	1.17E-09	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	1.17E-10	1.17E-10
	2- BUTANONE	0.020	mg/kg	9.36E-10	9.36E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BROMOMETHANE	0.004	mg/kg	1.98E-10	1.98E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	2.29E-10	2.29E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	1.37E-10	1.37E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	3.21E-10	3.21E-10	mg/kg-day	3.10E-02	$(mg/kg\text{-}day)^{-1}$	9.95E-12	9.95E-12
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	9.48E-10	9.48E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	1.43E-09	1.43E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	2.72E-09	2.72E-09	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	3.81E-11	3.81E-11
	4- METHYL-2-PENTANONE	0.008	mg/kg	3.46E-10	3.46E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	1.47E-09	1.47E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	7.64E-10	7.64E-10	mg/kg-day	5.40E-01	$(mg/kg\text{-}day)^{-1}$	4.12E-10	4.12E-10
	TOLUENE	0.02	mg/kg	1.13E-09	1.13E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	3.95E-10	3.95E-10	mg/kg-day	4.10E-01	$(mg/kg\text{-}day)^{-1}$	1.62E-10	1.62E-10
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	5.79E-10	5.79E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	2.07E-10	2.07E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	4.44E-09	4.44E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
DERMAL CONTACT	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	NA	NA	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	NA	NA	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	NA	NA	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	NA	NA	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	NA	NA	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	NA	NA	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	NA	NA	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2,3,7,8- TCDF	4.10E-06	mg/kg	NA	NA	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HERBICIDES									
	2,4- D	0.037	mg/kg	2.57E-10	2.57E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,900	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.2	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	5.64E-08	5.64E-08	mg/kg-day	9.45E+00	$(mg/kg\text{-}day)^{-1}$	5.33E-07	5.33E-07
	BARIUM	163	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.63	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CADMIUM	3.00	mg/kg	4.16E-10	4.16E-10	mg/kg-day	1.52E+01	$(mg/kg\text{-}day)^{-1}$	6.32E-09	6.32E-09
	CHROMIUM	116	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.8	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COPPER	199	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	LEAD	84	mg/kg	NA	NA	mg/kg-day	8.50E-03	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MANGANESE	734	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	99	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SELENIUM	0.7	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*SILVER*	2.6	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.33	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	31	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	97	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	225	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PESTICIDES									
	ALDRIN	0.01	mg/kg	1.12E-10	1.12E-10	mg/kg-day	1.70E+01	$(mg/kg\text{-}day)^{-1}$	1.91E-09	1.91E-09
	ALPHA-CHLORDANE	0.019	mg/kg	1.07E-10	1.07E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.39E-10	1.39E-10
	BETA BHC	0.071	mg/kg	3.95E-10	3.95E-10	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	7.11E-10	7.11E-10
	4,4- DDD	0.018	mg/kg	7.35E-11	7.35E-11	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	1.76E-11	1.76E-11
	4,4- DDE	0.015	mg/kg	6.35E-11	6.35E-11	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	2.16E-11	2.16E-11
	4,4- DDT	0.08	mg/kg	3.33E-10	3.33E-10	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	1.13E-10	1.13E-10
	DIELDRIN	0.031	mg/kg	4.33E-10	4.33E-10	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	6.93E-09	6.93E-09
	ENDOSULFAN I	0.003	mg/kg	3.46E-11	3.46E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	5.67E-11	5.67E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	1.12E-10	1.12E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	1.12E-10	1.12E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	1.34E-10	1.34E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	6.65E-10	6.65E-10	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	7.31E-10	7.31E-10
	GAMMA-CHLORDANE	0.019	mg/kg	1.02E-10	1.02E-10	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	1.33E-10	1.33E-10
	HEPTACHLOR	0.04	mg/kg	5.55E-10	5.55E-10	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	2.50E-09	2.50E-09
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.78E-10	1.78E-10	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	1.62E-09	1.62E-09
	HEXACHLOROBENZENE	0.034	mg/kg	4.68E-10	4.68E-10	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	8.42E-10	8.42E-10
	METHOXYCHLOR	0.044	mg/kg	2.41E-10	2.41E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	1.38E-11	1.38E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	0.0008	mg/kg	4.43E-12	4.43E-12	mg/kg-day	1.30E+00	$(mg/kg\text{-}day)^{-1}$	5.76E-12	5.76E-12
	PCBs									
	PCBs (TOTAL)	0.25	mg/kg	4.84E-09	4.84E-09	mg/kg-day	5.00E+00	$(mg/kg\text{-}day)^{-1}$	2.42E-08	2.42E-08
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	1.11E-09	1.11E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	*ACENAPHTHYLENE*	0.31	mg/kg	5.49E-09	5.49E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.31	mg/kg	5.49E-09	5.49E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	8.22E-09	8.22E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	9.87E-09	9.87E-09
	BENZO(A)PYRENE	0.41	mg/kg	7.36E-09	7.36E-09	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	8.83E-08	8.83E-08
	BENZO(B)FLUORANTHENE	0.35	mg/kg	6.21E-09	6.21E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	7.45E-09	7.45E-09
	BENZO(G,H,I)PERYLENE	0.32	mg/kg	5.77E-09	5.77E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.41	mg/kg	7.36E-09	7.36E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	8.83E-09	8.83E-09
	BENZOIC ACID	1.2	mg/kg	1.70E-08	1.70E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	4.77E-09	4.77E-09	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	6.68E-11	6.68E-11
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	5.23E-10	5.23E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	8.55E-10	8.55E-10	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	1.71E-11	1.71E-11
	4- CHLOROANILINE	0.27	mg/kg	3.68E-09	3.68E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	8.51E-09	8.51E-09	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.02E-09	1.02E-09
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	3.90E-09	3.90E-09	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	1.60E-08	1.60E-08
	2,6- DINITROTOLUENE	0.33	mg/kg	4.55E-09	4.55E-09	mg/kg-day	6.10E-01	$(mg/kg\text{-}day)^{-1}$	2.78E-09	2.78E-09
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	2.56E-09	2.56E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	9.23E-09	9.23E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	0.34	mg/kg	6.06E-09	6.06E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	5.77E-09	5.77E-09	mg/kg-day	1.20E+00	$(mg/kg\text{-}day)^{-1}$	6.93E-09	6.93E-09
	2- METHYLNAPHTHALENE	0.43	mg/kg	7.79E-09	7.79E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.31	mg/kg	5.63E-09	5.63E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	1.66E-08	1.66E-08	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.99E-09	1.99E-09
	PHENANTHRENE	0.38	mg/kg	6.78E-09	6.78E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	8.65E-09	8.65E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PYRENE	0.71	mg/kg	1.27E-08	1.27E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	190	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	51	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
DERMAL CONTACT (CONTINUED)	TRPH	3,542	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	NA	NA	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	2- BUTANONE	0.020	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BROMOMETHANE	0.004	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	NA	NA	mg/kg-day	3.10E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	NA	NA	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	NA	NA
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	NA	NA	mg/kg-day	5.40E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TOLUENE	0.02	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	NA	NA	mg/kg-day	4.10E-01	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
INHALATION OF PARTICULATES AND VAPORS	**DIOXINS/FURANS**									
	1,2,3,4,6,7,8- HPCDD	8.68E-04	mg/kg	7.40E-14	3.85E-14	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	9.62E-11	5.00E-11
	1,2,3,4,6,7,8- HPCDF	1.33E-04	mg/kg	1.13E-14	5.89E-15	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.47E-11	7.66E-12
	1,2,3,4,7,8,9- HPCDF	1.29E-05	mg/kg	1.10E-15	5.72E-16	mg/kg-day	1.30E+03	$(mg/kg\text{-}day)^{-1}$	1.43E-12	7.43E-13
	1,2,3,4,7,8- HXCDD	1.20E-05	mg/kg	1.02E-15	5.32E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.33E-11	6.91E-12
	1,2,3,6,7,8- HXCDD	3.60E-05	mg/kg	3.07E-15	1.60E-15	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	3.99E-11	2.07E-11
	1,2,3,7,8,9- HXCDD	2.94E-05	mg/kg	2.51E-15	1.30E-15	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	3.26E-11	1.69E-11
	1,2,3,4,7,8- HXCDF	1.71E-05	mg/kg	1.46E-15	7.58E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.89E-11	9.85E-12
	1,2,3,6,7,8- HXCDF	9.60E-06	mg/kg	8.18E-16	4.25E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.06E-11	5.53E-12
	2,3,4,6,7,8- HXCDF	1.49E-05	mg/kg	1.27E-15	6.60E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	1.65E-11	8.58E-12

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	1,2,3,4,6,7,8,9- OCDD	7.48E-03	mg/kg	6.38E-13	3.32E-13	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	8.29E-12	4.31E-12
	1,2,3,4,6,7,8,9- OCDF	1.54E-04	mg/kg	1.31E-14	6.83E-15	mg/kg-day	1.30E+01	$(mg/kg\text{-}day)^{-1}$	1.71E-13	8.87E-14
	1,2,3,7,8- PECDD	6.50E-06	mg/kg	5.54E-16	2.88E-16	mg/kg-day	1.30E+05	$(mg/kg\text{-}day)^{-1}$	7.20E-11	3.75E-11
	1,2,3,7,8- PECDF	4.30E-07	mg/kg	3.67E-17	1.91E-17	mg/kg-day	6.50E+03	$(mg/kg\text{-}day)^{-1}$	2.38E-13	1.24E-13
	2,3,4,7,8- PECDF	5.90E-06	mg/kg	5.03E-16	2.61E-16	mg/kg-day	6.50E+04	$(mg/kg\text{-}day)^{-1}$	3.27E-11	1.70E-11
	2,3,7,8- TCDF	4.10E-06	mg/kg	3.49E-16	1.82E-16	mg/kg-day	1.30E+04	$(mg/kg\text{-}day)^{-1}$	4.54E-12	2.36E-12
	HERBICIDES									
	2,4- D	0.037	mg/kg	3.17E-12	1.65E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INORGANICS									
	ALUMINUM	23,900	mg/kg	2.04E-06	1.06E-06	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTIMONY	4.2	mg/kg	3.60E-10	1.87E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ARSENIC	13.6	mg/kg	1.16E-09	6.03E-10	mg/kg-day	1.20E+01	$(mg/kg\text{-}day)^{-1}$	1.39E-08	7.23E-09
	BARIUM	163	mg/kg	1.39E-08	7.22E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BERYLLIUM	0.63	mg/kg	5.38E-11	2.80E-11	mg/kg-day	8.40E+00	$(mg/kg\text{-}day)^{-1}$	4.52E-10	2.35E-10
	CADMIUM	3.00	mg/kg	2.56E-10	1.33E-10	mg/kg-day	1.50E+01	$(mg/kg\text{-}day)^{-1}$	3.84E-09	2.00E-09
	CHROMIUM	116	mg/kg	9.87E-09	5.13E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	COBALT	14.8	mg/kg	1.27E-09	6.58E-10	mg/kg-day	9.80E+00	$(mg/kg\text{-}day)^{-1}$	1.24E-08	6.45E-09
	COPPER	199	mg/kg	1.69E-08	8.80E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	HEXAVALENT CHROMIUM	0.09	mg/kg	7.67E-12	3.99E-12	mg/kg-day	5.10E+02	$(mg/kg\text{-}day)^{-1}$	3.91E-09	2.03E-09
	LEAD	84	mg/kg	7.16E-09	3.72E-09	mg/kg-day	4.20E-02	$(mg/kg\text{-}day)^{-1}$	3.01E-10	1.56E-10
	MANGANESE	734	mg/kg	6.26E-08	3.25E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MERCURY	1.9	mg/kg	1.64E-10	8.51E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MOLYBDENUM	72.4	mg/kg	6.17E-09	3.21E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NICKEL	99	mg/kg	8.41E-09	4.37E-09	mg/kg-day	9.10E-01	$(mg/kg\text{-}day)^{-1}$	7.65E-09	3.98E-09
	SELENIUM	0.7	mg/kg	6.27E-11	3.26E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	SILVER	2.6	mg/kg	2.25E-10	1.17E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	THALLIUM	1.33	mg/kg	1.14E-10	5.91E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TIN	31	mg/kg	2.61E-09	1.36E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VANADIUM	97	mg/kg	8.26E-09	4.30E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ZINC	225	mg/kg	1.92E-08	9.99E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	**PESTICIDES**									
	ALDRIN	0.01	mg/kg	6.90E-13	3.59E-13	mg/kg-day	1.72E+01	$(mg/kg\text{-}day)^{-1}$	1.19E-11	6.17E-12
	ALPHA-CHLORDANE	0.019	mg/kg	1.64E-12	8.55E-13	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	5.76E-13	2.99E-13
	BETA BHC	0.071	mg/kg	6.08E-12	3.16E-12	mg/kg-day	1.86E+00	$(mg/kg\text{-}day)^{-1}$	1.13E-11	5.88E-12
	4,4- DDD	0.018	mg/kg	1.51E-12	7.84E-13	mg/kg-day	2.40E-01	$(mg/kg\text{-}day)^{-1}$	3.62E-13	1.88E-13
	4,4- DDE	0.015	mg/kg	1.30E-12	6.78E-13	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	4.43E-13	2.31E-13
	4,4- DDT	0.08	mg/kg	6.83E-12	3.55E-12	mg/kg-day	3.40E-01	$(mg/kg\text{-}day)^{-1}$	2.32E-12	1.21E-12
	DIELDRIN	0.031	mg/kg	2.67E-12	1.39E-12	mg/kg-day	1.60E+01	$(mg/kg\text{-}day)^{-1}$	4.27E-11	2.22E-11
	ENDOSULFAN I	0.003	mg/kg	2.13E-13	1.11E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN II	0.004	mg/kg	3.49E-13	1.82E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDOSULFAN SULFATE	0.01	mg/kg	6.90E-13	3.59E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENDRIN ALDEHYDE	0.01	mg/kg	6.90E-13	3.59E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ENRIN KETONE	0.010	mg/kg	8.27E-13	4.30E-13	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	GAMMA-BHC	0.12	mg/kg	1.02E-11	5.32E-12	mg/kg-day	1.10E+00	$(mg/kg\text{-}day)^{-1}$	1.13E-11	5.86E-12
	GAMMA-CHLORDANE	0.019	mg/kg	1.58E-12	8.20E-13	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	5.52E-13	2.87E-13
	HEPTACHLOR	0.04	mg/kg	3.42E-12	1.78E-12	mg/kg-day	4.50E+00	$(mg/kg\text{-}day)^{-1}$	1.54E-11	8.00E-12
	HEPTACHLOR EPOXIDE	0.013	mg/kg	1.09E-12	5.69E-13	mg/kg-day	9.10E+00	$(mg/kg\text{-}day)^{-1}$	9.95E-12	5.18E-12
	HEXACHLOROBENZENE	0.034	mg/kg	2.88E-12	1.50E-12	mg/kg-day	1.80E+00	$(mg/kg\text{-}day)^{-1}$	5.19E-12	2.70E-12
	METHOXYCHLOR	0.044	mg/kg	3.72E-12	1.93E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	MIREX	0.001	mg/kg	8.52E-14	4.43E-14	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRANS NONACHLOR	0.0008	mg/kg	6.82E-14	3.55E-14	mg/kg-day	3.50E-01	$(mg/kg\text{-}day)^{-1}$	2.39E-14	1.24E-14
	PCBs									
	PCBs (TOTAL)	0.25	mg/kg	2.13E-11	1.11E-11	mg/kg-day	2.00E+00	$(mg/kg\text{-}day)^{-1}$	4.26E-11	2.22E-11
	SVOCs									
	ACENAPHTHENE	0.06	mg/kg	9.60E-10	4.99E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ACENAPHTHYLENE	0.31	mg/kg	2.60E-11	1.35E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ANTHRACENE	0.31	mg/kg	1.22E-09	6.33E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(A)ANTHRACENE	0.46	mg/kg	3.90E-11	2.03E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.52E-11	7.90E-12
	BENZO(A)PYRENE	0.41	mg/kg	3.49E-11	1.81E-11	mg/kg-day	3.90E+00	$(mg/kg\text{-}day)^{-1}$	1.36E-10	7.07E-11
	BENZO(B)FLUORANTHENE	0.35	mg/kg	2.94E-11	1.53E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.15E-11	5.96E-12

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	*BENZO(G,H,I)PERYLENE*	0.32	mg/kg	2.74E-11	1.42E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZO(K)FLUORANTHENE	0.41	mg/kg	3.49E-11	1.81E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.36E-11	7.07E-12
	BENZOIC ACID	1.2	mg/kg	1.05E-10	5.46E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BIS(2-ETHYLHEXYL)PHTHALATE	0.35	mg/kg	2.94E-11	1.53E-11	mg/kg-day	1.40E-02	$(mg/kg\text{-}day)^{-1}$	4.12E-13	2.14E-13
	BUTYLBENZYLPHTHALATE	0.038	mg/kg	3.22E-12	1.68E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBAZOLE	0.062	mg/kg	5.27E-12	2.74E-12	mg/kg-day	2.00E-02	$(mg/kg\text{-}day)^{-1}$	1.05E-13	5.48E-14
	4- CHLOROANILINE	0.27	mg/kg	2.27E-11	1.18E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHRYSENE	0.47	mg/kg	4.90E-10	2.55E-10	mg/kg-day	3.90E-02	$(mg/kg\text{-}day)^{-1}$	1.91E-11	9.93E-12
	DIBENZ(A,H)ANTHRACENE	0.22	mg/kg	1.85E-11	9.62E-12	mg/kg-day	4.10E+00	$(mg/kg\text{-}day)^{-1}$	7.58E-11	3.94E-11
	2,6- DINITROTOLUENE	0.33	mg/kg	2.80E-11	1.46E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	DI-N-BUTYLPHTHALATE	0.19	mg/kg	1.58E-11	8.20E-12	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORANTHENE	0.51	mg/kg	4.37E-11	2.27E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	FLUORENE	0.34	mg/kg	2.62E-09	1.36E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	INDENO(1,2,3-CD)PYRENE	0.32	mg/kg	2.74E-11	1.42E-11	mg/kg-day	3.90E-01	$(mg/kg\text{-}day)^{-1}$	1.07E-11	5.55E-12
	2- METHYLNAPHTHALENE	0.43	mg/kg	3.69E-11	1.92E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.31	mg/kg	2.03E-08	1.06E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PENTACHLOROPHENOL	1.2	mg/kg	1.02E-10	5.32E-11	mg/kg-day	1.20E-01	$(mg/kg\text{-}day)^{-1}$	1.23E-11	6.38E-12
	PHENANTHRENE	0.38	mg/kg	3.21E-11	1.67E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PHENOL	0.48	mg/kg	4.10E-11	2.13E-11	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	PYRENE	0.71	mg/kg	5.19E-10	2.70E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH									
	TPH AS DIESEL	190	mg/kg	1.62E-08	8.44E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS GASOLINE	51	mg/kg	4.36E-09	2.27E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TPH AS MOTOR OIL	232	mg/kg	1.98E-08	1.03E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRPH	3,542	mg/kg	3.02E-07	1.57E-07	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	VOCs									
	ACETONE	0.044	mg/kg	9.75E-09	5.07E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	BENZENE	0.025	mg/kg	2.60E-08	1.35E-08	mg/kg-day	1.00E-01	$(mg/kg\text{-}day)^{-1}$	2.60E-09	1.35E-09
	2- BUTANONE	0.020	mg/kg	2.99E-09	1.55E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Table C1-5d
Calculation of Cancer Risks
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Medium:	Soil
Exposure Medium:	Mixed Zone Soil (0 to 10 feet)
Exposure Point:	Mixed Zone Soil (0 to 10 feet)
Receptor Population:	Construction Worker
Receptor Age:	Adult

Exposure Route	Chemical	EPC	EPC Units	Intake (RME)	Intake (CTE)	Intake Units	Cancer Slope Factor	Cancer Slope Factor Units	Cancer Risk (RME)	Cancer Risk (CTE)
INHALATION OF PARTICULATES AND VAPORS (CONTINUED)	BROMOMETHANE	0.004	mg/kg	6.68E-09	3.47E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CARBON DISULFIDE	0.005	mg/kg	1.16E-08	6.01E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROBENZENE	0.003	mg/kg	1.31E-09	6.83E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	CHLOROFORM	0.007	mg/kg	7.21E-09	3.75E-09	mg/kg-day	1.90E-02	$(mg/kg\text{-}day)^{-1}$	1.37E-10	7.12E-11
	CIS-1,2- DICHLOROETHENE	0.021	mg/kg	1.98E-08	1.03E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	ETHYLBENZENE	0.031	mg/kg	1.60E-08	8.33E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	METHYLENE CHLORIDE	0.059	mg/kg	6.60E-08	3.43E-08	mg/kg-day	3.50E-03	$(mg/kg\text{-}day)^{-1}$	2.31E-10	1.20E-10
	4- METHYL-2-PENTANONE	0.008	mg/kg	NA	NA	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	NAPHTHALENE	0.032	mg/kg	2.06E-09	1.07E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TETRACHLOROETHENE	0.02	mg/kg	1.78E-08	9.26E-09	mg/kg-day	2.10E-02	$(mg/kg\text{-}day)^{-1}$	3.74E-10	1.94E-10
	TOLUENE	0.02	mg/kg	1.72E-08	8.93E-09	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	TRICHLOROETHENE	0.01	mg/kg	7.25E-09	3.77E-09	mg/kg-day	7.00E-03	$(mg/kg\text{-}day)^{-1}$	5.08E-11	2.64E-11
	1,2,4- TRIMETHYLYBENZENE	0.013	mg/kg	1.76E-09	9.13E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	1,3,5- TRIMETHYLYBENZENE	0.004	mg/kg	1.57E-09	8.14E-10	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA
	XYLENE (TOTAL)	0.10	mg/kg	4.41E-08	2.30E-08	mg/kg-day	NA	$(mg/kg\text{-}day)^{-1}$	NA	NA

Notes:
The cancer risk for chemicals that are italicized and underlined have been modified for post remediation residual risk.
CTE = Central Tendency Exposure
EPC = Exposure point concentration
mg/kg = milligrams per kilogram
mg/kg-day = milligrams per kilogram per day
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds

Table C1-5e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
Soil (0 to 10 feet)	Soil	On-Site Soil	**DIOXINS/FURANS (mg/kg)**					**DIOXINS/FURANS (mg/kg)**					
			1,2,3,4,6,7,8- HPCDD	2.99E-07	NA	1.26E-11	2.99E-07	1,2,3,4,6,7,8- HPCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.49E-06	3.49E-06
			1,2,3,4,6,7,8- HPCDF	4.59E-08	NA	1.93E-12	4.59E-08	1,2,3,4,6,7,8- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	5.35E-07	5.35E-07
			1,2,3,4,7,8,9- HPCDF	4.45E-09	NA	1.87E-13	4.45E-09	1,2,3,4,7,8,9- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	5.19E-08	5.19E-08
			1,2,3,4,7,8- HXCDD	4.14E-08	NA	1.74E-12	4.14E-08	1,2,3,4,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	4.83E-08	4.83E-08
			1,2,3,6,7,8- HXCDD	1.24E-07	NA	5.22E-12	1.24E-07	1,2,3,6,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.45E-07	1.45E-07
			1,2,3,7,8,9- HXCDD	1.01E-07	NA	4.27E-12	1.01E-07	1,2,3,7,8,9- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.18E-07	1.18E-07
			1,2,3,4,7,8- HXCDF	5.90E-08	NA	2.48E-12	5.90E-08	1,2,3,4,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.88E-08	6.88E-08
			1,2,3,6,7,8- HXCDF	3.31E-08	NA	1.39E-12	3.31E-08	1,2,3,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.86E-08	3.86E-08
			2,3,4,6,7,8- HXCDF	5.14E-08	NA	2.16E-12	5.14E-08	2,3,4,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.00E-08	6.00E-08
			1,2,3,4,6,7,8,9- OCDD	2.58E-08	NA	1.09E-12	2.58E-08	1,2,3,4,6,7,8,9- OCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.01E-05	3.01E-05
			1,2,3,4,6,7,8,9- OCDF	5.31E-10	NA	2.23E-14	5.31E-10	1,2,3,4,6,7,8,9- OCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.20E-07	6.20E-07
			1,2,3,7,8- PECDD	2.24E-07	NA	9.43E-12	2.24E-07	1,2,3,7,8- PECDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.62E-08	2.62E-08
			1,2,3,7,8- PECDF	7.42E-10	NA	3.12E-14	7.42E-10	1,2,3,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.73E-09	1.73E-09
			2,3,4,7,8- PECDF	1.02E-07	NA	4.28E-12	1.02E-07	2,3,4,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.37E-08	2.37E-08
			2,3,7,8- TCDF	1.41E-08	NA	5.95E-13	1.41E-08	2,3,7,8- TCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.65E-08	1.65E-08

Table C1-5e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			HERBICIDES (mg/kg)					**HERBICIDES (mg/kg)**					
			2,4- D	NA	NA	NA	NA	2,4- D	Circulatory System; Kidney; Liver	4.07E-06	9.33E-07	NA	5.00E-06
			INORGANICS (mg/kg)					**INORGANICS (mg/kg)**					
			ALUMINUM	NA	NA	NA	NA	ALUMINUM	Body Weight	2.61E-02	NA	7.84E-04	2.69E-02
			ANTIMONY	NA	NA	NA	NA	ANTIMONY	Blood; Whole Body	1.15E-02	NA	NA	1.15E-02
			ARSENIC	3.41E-05	4.70E-06	1.82E-09	3.88E-05	ARSENIC	Cardiovascular System; Fetal; Nervous System; Skin	4.95E-02	6.82E-03	7.29E-05	5.64E-02
			BARIUM	NA	NA	NA	NA	BARIUM	Cardiovascular System; Fetal; Kidney; NOEL	2.54E-03	NA	5.23E-05	2.59E-03
			BERYLLIUM	NA	NA	5.92E-11	5.92E-11	BERYLLIUM	GI System; Immune System; Respiratory	3.45E-04	NA	1.45E-05	3.60E-04
			CADMIUM	3.03E-07	5.56E-08	5.03E-10	3.59E-07	CADMIUM	Kidney; Respiratory	6.56E-03	1.21E-03	2.42E-05	7.79E-03
			CHROMIUM	NA	NA	NA	NA	CHROMIUM	NOEL	8.44E-05	NA	NA	8.44E-05
			COBALT	NA	NA	1.62E-09	1.62E-09	COBALT	Cardiovascular System; Respiratory	8.11E-04	NA	1.20E-04	9.31E-04
			COPPER	NA	NA	NA	NA	COPPER	GI System	5.43E-03	NA	NA	5.43E-03
			HEXAVALENT CHROMIUM	NA	NA	5.12E-10	5.12E-10	HEXAVALENT CHROMIUM	NOEL	3.28E-05	NA	1.45E-07	3.29E-05
			LEAD	1.89E-07	NA	3.93E-11	1.89E-07	LEAD	NA	NA	NA	NA	NA
			MANGANESE	NA	NA	NA	NA	MANGANESE	Nervous System	5.73E-03	NA	2.36E-03	8.09E-03
			MERCURY	NA	NA	NA	NA	MERCURY	Nervous System	7.00E-03	NA	3.43E-06	7.00E-03
			MOLYBDENUM	NA	NA	NA	NA	MOLYBDENUM	Kidney	1.58E-02	NA	NA	1.58E-02
			NICKEL	NA	NA	1.00E-09	1.00E-09	NICKEL	Body Weight; Respiratory	5.39E-03	NA	3.18E-04	5.71E-03
			SELENIUM	NA	NA	NA	NA	SELENIUM	Cardiovascular System; Liver; Nervous System; Skin	1.61E-04	NA	5.92E-09	1.61E-04
			SILVER	NA	NA	NA	NA	SILVER	Skin	5.76E-04	NA	NA	5.76E-04
			THALLIUM	NA	NA	NA	NA	THALLIUM	Blood; Liver	2.21E-02	NA	NA	2.21E-02
			TIN	NA	NA	NA	NA	TIN	Kidney; Liver	5.58E-05	NA	NA	5.58E-05
			VANADIUM	NA	NA	NA	NA	VANADIUM	NOEL	1.51E-02	NA	NA	1.51E-02
			ZINC	NA	NA	NA	NA	ZINC	Blood	8.21E-04	NA	NA	8.21E-04
			PESTICIDES (mg/kg)					**PESTICIDES (mg/kg)**					
			ALDRIN	3.65E-08	1.68E-08	1.55E-12	5.33E-08	ALDRIN	Liver	2.95E-04	1.35E-04	1.24E-08	4.31E-04
			ALPHA-CHLORDANE	6.66E-09	1.22E-09	7.54E-14	7.88E-09	ALPHA-CHLORDANE	Liver	4.22E-05	7.75E-06	4.43E-09	4.99E-05
			BETA BHC	3.41E-08	6.26E-09	1.48E-12	4.04E-08	BETA BHC	Liver	3.90E-04	7.16E-05	1.64E-08	4.62E-04
			4,4- DDD	1.13E-09	1.55E-10	4.74E-14	1.28E-09	4,4- DDD	Liver	3.87E-05	5.33E-06	1.63E-09	4.40E-05
			4,4- DDE	1.38E-09	1.90E-10	5.81E-14	1.57E-09	4,4- DDE	Liver	3.34E-05	4.60E-06	1.41E-09	3.80E-05
			4,4- DDT	7.23E-09	9.95E-10	3.04E-13	8.22E-09	4,4- DDT	Liver	1.75E-04	2.41E-05	7.36E-09	1.99E-04
			DIELDRIN	1.33E-07	6.10E-08	5.59E-12	1.94E-07	DIELDRIN	Liver	6.84E-04	3.14E-04	2.88E-08	9.98E-04
			ENDOSULFAN I	NA	NA	NA	NA	ENDOSULFAN I	Body Weight; Kidney; Nervous System	4.55E-07	2.09E-07	1.91E-11	6.64E-07
			ENDOSULFAN II	NA	NA	NA	NA	ENDOSULFAN II	Body Weight; Kidney; Nervous System	7.47E-07	3.43E-07	3.14E-11	1.09E-06

Table C1-5e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			ENDOSULFAN SULFATE	NA	NA	NA	NA	ENDOSULFAN SULFATE	Body Weight; Kidney; Nervous System	1.48E-06	6.77E-07	6.20E-11	2.15E-06
			ENDRIN ALDEHYDE	NA	NA	NA	NA	ENDRIN ALDEHYDE	Liver; Kidney; Nervous System	2.95E-05	1.35E-05	1.24E-09	4.31E-05
			ENDRIN KETONE	NA	NA	NA	NA	ENDRIN KETONE	Liver; Kidney; Nervous System	3.53E-05	1.62E-05	1.49E-09	5.16E-05
			GAMMA-BHC	3.51E-08	6.44E-09	1.47E-12	4.15E-08	GAMMA-BHC	Kidney; Liver	4.38E-04	8.03E-05	1.84E-08	5.18E-04
			GAMMA-CHLORDANE	6.38E-09	1.17E-09	7.23E-14	7.56E-09	GAMMA-CHLORDANE	Liver	4.04E-05	7.42E-06	4.25E-09	4.79E-05
			HEPTACHLOR	4.79E-08	2.20E-08	2.01E-12	6.99E-08	HEPTACHLOR	Liver	8.76E-05	4.02E-05	3.69E-09	1.28E-04
			HEPTACHLOR EPOXIDE	3.10E-08	1.42E-08	1.30E-12	4.52E-08	HEPTACHLOR EPOXIDE	Liver	1.08E-03	4.95E-04	4.54E-08	1.57E-03
			HEXACHLOROBENZENE	1.61E-08	7.41E-09	6.79E-13	2.36E-08	HEXACHLOROBENZENE	Liver	4.62E-05	2.12E-05	5.18E-09	6.74E-05
			METHOXYCHLOR	NA	NA	NA	NA	METHOXYCHLOR	Fetal	9.53E-06	1.75E-06	4.01E-10	1.13E-05
			MIREX	NA	NA	NA	NA	MIREX	Liver	5.46E-06	2.51E-06	2.30E-10	7.97E-06
			TRANS NONACHLOR	2.76E-10	5.07E-11	3.12E-15	3.27E-10	TRANS NONACHLOR	Liver	1.75E-06	3.21E-07	1.84E-10	2.07E-06
			PCBs (mg/kg)					**PCBs (mg/kg)**					
			PCBs (TOTAL)	3.32E-07	2.13E-07	5.58E-12	5.45E-07	PCBs (TOTAL)	Immune System	1.37E-02	8.78E-03	5.74E-07	2.24E-02
			SVOCs (mg/kg)					**SVOCs (mg/kg)**					
			ACENAPHTHENE	NA	NA	NA	NA	ACENAPHTHENE	Liver	1.13E-06	6.72E-07	3.47E-07	2.14E-06
			ACENAPHTHYLENE	NA	NA	NA	NA	ACENAPHTHYLENE	NA	NA	NA	NA	NA
			ANTHRACENE	NA	NA	NA	NA	ANTHRACENE	NOEL	1.11E-06	6.63E-07	8.81E-08	1.86E-06
			BENZO(A)ANTHRACENE	1.46E-07	8.68E-08	1.99E-12	2.32E-07	BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA
			BENZO(A)PYRENE	1.30E-06	7.77E-07	1.78E-11	2.08E-06	BENZO(A)PYRENE	NA	NA	NA	NA	NA
			BENZO(B)FLUORANTHENE	1.10E-07	6.56E-08	1.50E-12	1.75E-07	BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	BENZO(G,H,I)PERYLENE	Kidney; Nervous System	8.77E-06	5.23E-06	3.69E-10	1.40E-05
			BENZO(K)FLUORANTHENE	1.30E-07	7.77E-08	1.78E-12	2.08E-07	BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZOIC ACID	NA	NA	NA	NA	BENZOIC ACID	NOEL	3.37E-07	1.54E-07	1.42E-11	4.91E-07
			BIS(2-ETHYLHEXYL)PHTHAL	1.28E-09	5.88E-10	5.39E-14	1.87E-09	BIS(2-ETHYLHEXYL)PHTHAL	Liver	1.89E-05	8.65E-06	7.93E-10	2.75E-05
			BUTYLBENZYLPHTHALATE	NA	NA	NA	NA	BUTYLBENZYLPHTHALATE	Liver	2.07E-07	9.48E-08	8.68E-12	3.01E-07
			CARBAZOLE	3.28E-10	1.51E-10	1.38E-14	4.79E-10	CARBAZOLE	NA	NA	NA	NA	NA
			4- CHLOROANILINE	NA	NA	NA	NA	4- CHLOROANILINE	Spleen	7.27E-05	3.34E-05	3.06E-09	1.06E-04
			CHRYSENE	1.51E-08	8.99E-09	1.01E-10	2.42E-08	CHRYSENE	NA	NA	NA	NA	NA
			DIBENZ(A,H)ANTHRACENE	2.36E-07	1.41E-07	9.93E-12	3.77E-07	DIBENZ(A,H)ANTHRACENE	NA	NA	NA	NA	NA
			2,6- DINITROTOLUENE	5.33E-08	2.44E-08	NA	7.77E-08	2,6- DINITROTOLUENE	NA	3.60E-04	1.65E-04	1.51E-08	5.25E-04
			DI-N-BUTYLPHTHALATE	NA	NA	NA	NA	DI-N-BUTYLPHTHALATE	Whole Body	2.02E-06	9.28E-07	8.50E-11	2.95E-06
			FLUORANTHENE	NA	NA	NA	NA	FLUORANTHENE	Blood; Kidney; Liver	1.40E-05	8.36E-06	5.89E-10	2.24E-05
			FLUORENE	NA	NA	NA	NA	FLUORENE	Blood	9.21E-06	5.49E-06	1.42E-06	1.61E-05
			INDENO(1,2,3-CD)PYRENE	1.02E-07	6.10E-08	1.40E-12	1.63E-07	INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA
			2- METHYLNAPHTHALENE	NA	NA	NA	NA	2- METHYLNAPHTHALENE	Body Weight; Respiratory	1.18E-04	7.06E-05	NA	1.89E-04
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	1.71E-05	1.02E-05	5.15E-04	5.42E-04
			PENTACHLOROPHENOL	3.82E-08	1.75E-08	1.61E-12	5.58E-08	PENTACHLOROPHENOL	Liver; Kidney	4.37E-05	2.01E-05	1.84E-09	6.38E-05

Table C1-5e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			PHENANTHRENE	NA	NA	NA	NA	PHENANTHRENE	NOEL	1.37E-06	8.19E-07	5.77E-11	2.19E-06
			PHENOL	NA	NA	NA	NA	PHENOL	Cardiovascular System; Fetal; Kidney; Liver; Nervous System	8.75E-07	5.22E-07	3.87E-10	1.40E-06
			PYRENE	NA	NA	NA	NA	PYRENE	Kidney	2.57E-05	1.53E-05	3.75E-07	4.14E-05
			TPH (mg/kg)					**TPH (mg/kg)**					
			TPH AS DIESEL	NA	NA	NA	NA	TPH AS DIESEL	NA	NA	NA	NA	NA
			TPH AS GASOLINE	NA	NA	NA	NA	TPH AS GASOLINE	NA	NA	NA	NA	NA
			TPH AS MOTOR OIL	NA	NA	NA	NA	TPH AS MOTOR OIL	NA	NA	NA	NA	NA
			TRPH	NA	NA	NA	NA	TRPH	NA	NA	NA	NA	NA
			VOCs (mg/kg)					**VOCs (mg/kg)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	5.32E-08	NA	2.35E-07	2.88E-07
			BENZENE	6.74E-10	NA	1.37E-08	1.44E-08	BENZENE	Fetal; Immune System; Nervous System; Respiratory	6.94E-06	NA	6.58E-05	7.27E-05
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	3.70E-08	NA	2.27E-07	2.64E-07
			BROMOMETHANE	NA	NA	NA	NA	BROMOMETHANE	GI System	3.36E-06	NA	1.01E-07	3.46E-06
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	5.42E-08	NA	1.25E-06	1.31E-06
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver	1.62E-07	NA	4.99E-06	5.15E-06
			CHLOROFORM	5.73E-11	NA	7.21E-10	7.79E-10	CHLOROFORM	Fetal; Kidney; Liver	7.61E-07	NA	1.83E-06	2.59E-06
			CIS-1,2- DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2- DICHLOROETHENE	Blood	2.25E-06	NA	4.30E-05	4.52E-05
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	3.38E-07	NA	1.22E-06	1.55E-06
			METHYLENE CHLORIDE	2.19E-10	NA	1.22E-09	1.44E-09	METHYLENE CHLORIDE	Cardiovascular System; Liver; Nervous System	1.07E-06	NA	1.25E-05	1.36E-05
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Kidney; Liver	1.02E-07	NA	NA	1.02E-07
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	1.74E-06	NA	5.23E-05	5.40E-05
			TETRACHLOROETHENE	2.37E-09	NA	1.97E-09	4.34E-09	TETRACHLOROETHENE	Kidney; Liver	1.81E-06	NA	3.86E-05	4.05E-05
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	1.34E-07	NA	4.35E-06	4.48E-06
			TRICHLOROETHENE	9.31E-10	NA	2.67E-10	1.20E-09	TRICHLOROETHENE	Eyes; Nervous System	3.12E-05	NA	1.57E-05	4.69E-05
			1,2,4- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLYBENZENE	NA	2.75E-07	NA	2.24E-05	2.27E-05
			1,3,5- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLYBENZENE	NA	9.79E-08	NA	2.00E-05	2.01E-05
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	5.26E-07	NA	3.35E-05	3.41E-05
Groundwater	Shallow Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	5.63E-04	5.63E-04
			BENZENE	NA	NA	9.57E-07	9.57E-07	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	4.60E-03	4.60E-03
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	3.82E-03	3.82E-03
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	3.55E-04	3.55E-04
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	2.66E-03	2.66E-03

Table C1-5e
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Recreational User
Receptor Age:	Child (1 to 17 years)

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			CHLOROMETHANE	NA	NA	6.50E-08	6.50E-08	CHLOROMETHANE	NA	NA	NA	4.94E-04	4.94E-04
			CIS-1,2-DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2-DICHLOROETHENE	Blood	NA	NA	6.98E-03	6.98E-03
			1,3- DICHLOROBENZENE	NA	NA	NA	NA	1,3- DICHLOROBENZENE	NA	NA	NA	3.84E-04	3.84E-04
			1,2- DICHLOROETHENE (TOTAL)	NA	NA	NA	NA	1,2- DICHLOROETHENE (TOTAL)	Blood, Liver	NA	NA	3.28E-02	3.28E-02
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	NA	NA	7.42E-05	7.42E-05
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	NA	NA	2.12E-04	2.12E-04
			TRANS-1,2-DICHLOROETHEN	NA	NA	NA	NA	TRANS-1,2-DICHLOROETHEN	Blood; Liver	NA	NA	6.52E-04	6.52E-04
			1,2,4- TRIMETHYLBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLBENZENE	NA	NA	NA	6.60E-03	6.60E-03
			1,3,5- TRIMETHYLBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLBENZENE	NA	NA	NA	4.99E-03	4.99E-03
			VINYL CHLORIDE	NA	NA	9.07E-08	9.07E-08	VINYL CHLORIDE	GI System; Liver; Nervous System	NA	NA	8.48E-04	8.48E-04
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	NA	NA	1.49E-03	1.49E-03
Groundwater	Intermediate and Deep Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	1.25E-04	1.25E-04
			BENZENE	NA	NA	1.40E-06	1.40E-06	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	6.73E-03	6.73E-03
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	5.83E-04	5.83E-04
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	5.61E-04	5.61E-04
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	1.01E-02	1.01E-02
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Fetal; Kidney; Liver	NA	NA	2.12E-04	2.12E-04

Cancer Risk Across Soil:	4.5E-05
Cancer Risk Across Groundwater:	2.5E-06
Total Cancer Risk:	4.7E-05

HI Across Soil:	2.2E-01
HI Across Groundwater:	8.6E-02
Total HI:	3.0E-01
Total Blood HI:	7.5E-02
Total Body Weight HI:	3.5E-02
Total Cardiovascular System HI:	6.0E-02
Total Fetal/Reproductive System HI:	8.1E-02
Total GI System HI:	6.6E-03
Total Immune System HI:	3.4E-02
Total Kidney HI:	4.1E-02
Total Liver HI:	7.5E-02
Total Nervous System HI:	8.7E-02
Total NOEL HI:	1.8E-02
Total Respiratory HI:	2.9E-02
Total Skin HI:	5.7E-02
Total Whole Body HI:	1.2E-02

Notes:
EPC = Exposure point concentration
GI = Gastrointestinal
HQ = Hazard Quotient
HI = Hazard Index
mg/kg = milligrams per kilogram
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
ug/L = microgram per liter

Table C1-5f
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

				Carcinogenic Risk						Non-Carconogenic Hazard Index			
Medium	**Exposure Medium**	**Exposure Point**	**Chemical**	**Ingestion**	**Dermal**	**Inhalation (Outdoor)**	**Exposure Routes Total**	**Chemical**	**Primary Target Organ**	**Ingestion HQ**	**Dermal HQ**	**Inhalation (Outdoor) HQ**	**Total HI**
Soil (0 to 10 feet)	Soil	On-Site Soil	**DIOXINS/FURANS (mg/kg)**					**DIOXINS/FURANS (mg/kg)**					
			1,2,3,4,6,7,8- HPCDD	5.21E-08	NA	9.62E-11	5.21E-08	1,2,3,4,6,7,8- HPCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	4.53E-04	4.53E-04
			1,2,3,4,6,7,8- HPCDF	7.98E-09	NA	1.47E-11	7.99E-09	1,2,3,4,6,7,8- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.95E-05	6.95E-05
			1,2,3,4,7,8,9- HPCDF	7.74E-10	NA	1.43E-12	7.75E-10	1,2,3,4,7,8,9- HPCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.74E-06	6.74E-06
			1,2,3,4,7,8- HXCDD	7.20E-09	NA	1.33E-11	7.21E-09	1,2,3,4,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	6.27E-06	6.27E-06
			1,2,3,6,7,8- HXCDD	2.16E-08	NA	3.99E-11	2.16E-08	1,2,3,6,7,8- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.88E-05	1.88E-05
			1,2,3,7,8,9- HXCDD	1.76E-08	NA	3.26E-11	1.77E-08	1,2,3,7,8,9- HXCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	1.54E-05	1.54E-05
			1,2,3,4,7,8- HXCDF	1.03E-08	NA	1.89E-11	1.03E-08	1,2,3,4,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	8.93E-06	8.93E-06
			1,2,3,6,7,8- HXCDF	5.76E-09	NA	1.06E-11	5.77E-09	1,2,3,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	5.02E-06	5.02E-06
			2,3,4,6,7,8- HXCDF	8.94E-09	NA	1.65E-11	8.95E-09	2,3,4,6,7,8- HXCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	7.78E-06	7.78E-06
			1,2,3,4,6,7,8,9- OCDD	4.49E-09	NA	8.29E-12	4.49E-09	1,2,3,4,6,7,8,9- OCDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.91E-03	3.91E-03
			1,2,3,4,6,7,8,9- OCDF	9.23E-11	NA	1.71E-13	9.25E-11	1,2,3,4,6,7,8,9- OCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	8.05E-05	8.05E-05
			1,2,3,7,8- PECDD	3.90E-08	NA	7.20E-11	3.91E-08	1,2,3,7,8- PECDD	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.40E-06	3.40E-06
			1,2,3,7,8- PECDF	1.29E-10	NA	2.38E-13	1.29E-10	1,2,3,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.25E-07	2.25E-07
			2,3,4,7,8- PECDF	1.77E-08	NA	3.27E-11	1.77E-08	2,3,4,7,8- PECDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	3.08E-06	3.08E-06
			2,3,7,8- TCDF	2.46E-09	NA	4.54E-12	2.46E-09	2,3,7,8- TCDF	Liver; Reproductive System; Fetal; Respiratory	NA	NA	2.14E-06	2.14E-06

Table C1-5f
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			HERBICIDES (mg/kg)					**HERBICIDES (mg/kg)**					
			2,4- D	NA	NA	NA	NA	2,4- D	Circulatory System; Kidney; Liver	1.20E-05	1.80E-06	NA	1.38E-05
			INORGANICS (mg/kg)					**INORGANICS (mg/kg)**					
			ALUMINUM	NA	NA	NA	NA	ALUMINUM	Body Weight	7.72E-02	NA	1.02E-01	1.79E-01
			ANTIMONY	NA	NA	NA	NA	ANTIMONY	Blood; Whole Body	3.41E-02	NA	NA	3.41E-02
			ARSENIC	5.93E-06	5.33E-07	1.39E-08	6.47E-06	ARSENIC	Cardiovascular System; Fetal; Nervous System; Skin	1.46E-01	1.32E-02	9.47E-03	1.69E-01
			BARIUM	NA	NA	NA	NA	BARIUM	Cardiovascular System; Fetal; Kidney; NOEL	7.51E-03	NA	6.79E-03	1.43E-02
			BERYLLIUM	NA	NA	4.52E-10	4.52E-10	BERYLLIUM	GI System; Immune System; Respiratory	1.02E-03	NA	1.89E-03	2.91E-03
			CADMIUM	5.26E-08	6.32E-09	3.84E-09	6.28E-08	CADMIUM	Kidney; Respiratory	1.94E-02	2.33E-03	3.14E-03	2.49E-02
			CHROMIUM	NA	NA	NA	NA	CHROMIUM	NOEL	2.49E-04	NA	NA	2.49E-04
			COBALT	NA	NA	1.24E-08	1.24E-08	COBALT	Cardiovascular System; Respiratory	2.40E-03	NA	1.55E-02	1.79E-02
			COPPER	NA	NA	NA	NA	COPPER	GI System	1.60E-02	NA	NA	1.60E-02
			HEXAVALENT CHROMIUM	NA	NA	3.91E-09	3.91E-09	HEXAVALENT CHROMIUM	NOEL	9.69E-05	NA	1.88E-05	1.16E-04
			LEAD	3.29E-08	NA	3.01E-10	3.32E-08	LEAD	NA	NA	NA	NA	NA
			MANGANESE	NA	NA	NA	NA	MANGANESE	Nervous System	1.69E-02	NA	3.06E-01	3.23E-01
			MERCURY	NA	NA	NA	NA	MERCURY	Nervous System	2.07E-02	NA	4.46E-04	2.11E-02
			MOLYBDENUM	NA	NA	NA	NA	MOLYBDENUM	Kidney	4.68E-02	NA	NA	4.68E-02
			NICKEL	NA	NA	7.65E-09	7.65E-09	NICKEL	Body Weight; Respiratory	1.59E-02	NA	4.12E-02	5.72E-02
			SELENIUM	NA	NA	NA	NA	SELENIUM	Cardiovascular System; Liver; Nervous System; Skin	4.75E-04	NA	7.69E-07	4.76E-04
			SILVER	NA	NA	NA	NA	SILVER	Skin	1.70E-03	NA	NA	1.70E-03
			THALLIUM	NA	NA	NA	NA	THALLIUM	Blood; Liver	6.52E-02	NA	NA	6.52E-02
			TIN	NA	NA	NA	NA	TIN	Kidney; Liver	1.65E-04	NA	NA	1.65E-04
			VANADIUM	NA	NA	NA	NA	VANADIUM	NOEL	4.47E-02	NA	NA	4.47E-02
			ZINC	NA	NA	NA	NA	ZINC	Blood	2.43E-03	NA	NA	2.43E-03
			PESTICIDES (mg/kg)					**PESTICIDES (mg/kg)**					
			ALDRIN	6.35E-09	1.91E-09	1.19E-11	8.27E-09	ALDRIN	Liver	8.72E-04	2.62E-04	1.61E-06	1.13E-03
			ALPHA-CHLORDANE	1.16E-09	1.39E-10	5.76E-13	1.30E-09	ALPHA-CHLORDANE	Liver	1.25E-04	1.50E-05	5.76E-07	1.40E-04
			BETA BHC	5.93E-09	7.11E-10	1.13E-11	6.65E-09	BETA BHC	Liver	1.15E-03	1.38E-04	2.13E-06	1.29E-03
			4,4- DDD	1.96E-10	1.76E-11	3.62E-13	2.14E-10	4,4- DDD	Liver	1.14E-04	1.03E-05	2.11E-07	1.25E-04
			4,4- DDE	2.40E-10	2.16E-11	4.43E-13	2.62E-10	4,4- DDE	Liver	9.88E-05	8.89E-06	1.83E-07	1.08E-04
			4,4- DDT	1.26E-09	1.13E-10	2.32E-12	1.37E-09	4,4- DDT	Liver	5.17E-04	4.66E-05	9.56E-07	5.65E-04
			DIELDRIN	2.31E-08	6.93E-09	4.27E-11	3.01E-08	DIELDRIN	Liver	2.02E-03	6.06E-04	3.73E-06	2.63E-03
			ENDOSULFAN I	NA	NA	NA	NA	ENDOSULFAN I	Body Weight; Kidney; Nervous System	1.35E-06	4.04E-07	2.49E-09	1.75E-06
			ENDOSULFAN II	NA	NA	NA	NA	ENDOSULFAN II	Body Weight; Kidney; Nervous System	2.21E-06	6.62E-07	4.08E-09	2.87E-06

Table C1-5f
Summary of Future Receptor RME Cancer Risks and Noncarcinogenic Hazard Indices
Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			ENDOSULFAN SULFATE	NA	NA	NA	NA	ENDOSULFAN SULFATE	Body Weight; Kidney; Nervous System	4.36E-06	1.31E-06	8.05E-09	5.67E-06
			ENDRIN ALDEHYDE	NA	NA	NA	NA	ENDRIN ALDEHYDE	Liver; Kidney; Nervous System	8.72E-05	2.62E-05	1.61E-07	1.13E-04
			ENDRIN KETONE	NA	NA	NA	NA	ENDRIN KETONE	Liver; Kidney; Nervous System	1.04E-04	3.13E-05	1.93E-07	1.36E-04
			GAMMA-BHC	6.09E-09	7.31E-10	1.13E-11	6.84E-09	GAMMA-BHC	Kidney; Liver	1.29E-03	1.55E-04	2.39E-06	1.45E-03
			GAMMA-CHLORDANE	1.11E-09	1.33E-10	5.52E-13	1.24E-09	GAMMA-CHLORDANE	Liver	1.19E-04	1.43E-05	5.52E-07	1.34E-04
			HEPTACHLOR	8.32E-09	2.50E-09	1.54E-11	1.08E-08	HEPTACHLOR	Liver	2.59E-04	7.77E-05	4.78E-07	3.37E-04
			HEPTACHLOR EPOXIDE	5.39E-09	1.62E-09	9.95E-12	7.01E-09	HEPTACHLOR EPOXIDE	Liver	3.19E-03	9.56E-04	5.89E-06	4.15E-03
			HEXACHLOROBENZENE	2.81E-09	8.42E-10	5.19E-12	3.65E-09	HEXACHLOROBENZENE	Liver	1.36E-04	4.09E-05	6.72E-07	1.78E-04
			METHOXYCHLOR	NA	NA	NA	NA	METHOXYCHLOR	Fetal	2.82E-05	3.38E-06	5.20E-08	3.16E-05
			MIREX	NA	NA	NA	NA	MIREX	Liver	1.61E-05	4.84E-06	2.98E-08	2.10E-05
			TRANS NONACHLOR	4.80E-11	5.76E-12	2.39E-14	5.38E-11	TRANS NONACHLOR	Liver	5.17E-06	6.20E-07	2.39E-08	5.81E-06
			PCBs (mg/kg)					**PCBs (mg/kg)**					
			PCBs (TOTAL)	5.77E-08	2.42E-08	4.26E-11	8.19E-08	PCBs (TOTAL)	Immune System	4.04E-02	1.70E-02	7.46E-05	5.74E-02
			SVOCs (mg/kg)					**SVOCs (mg/kg)**					
			ACENAPHTHENE	NA	NA	NA	NA	ACENAPHTHENE	Liver	3.33E-06	1.30E-06	1.12E-06	5.74E-06
			ACENAPHTHYLENE	NA	NA	NA	NA	ACENAPHTHYLENE	NA	NA	NA	NA	NA
			ANTHRACENE	NA	NA	NA	NA	ANTHRACENE	NOEL	3.28E-06	1.28E-06	2.84E-07	4.85E-06
			BENZO(A)ANTHRACENE	2.53E-08	9.87E-09	1.52E-11	3.52E-08	BENZO(A)ANTHRACENE	NA	NA	NA	NA	NA
			BENZO(A)PYRENE	2.26E-07	8.83E-08	1.36E-10	3.15E-07	BENZO(A)PYRENE	NA	NA	NA	NA	NA
			BENZO(B)FLUORANTHENE	1.91E-08	7.45E-09	1.15E-11	2.66E-08	BENZO(B)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZO(G,H,I)PERYLENE	NA	NA	NA	NA	BENZO(G,H,I)PERYLENE	Kidney; Nervous System	2.59E-05	1.01E-05	4.79E-08	3.61E-05
			BENZO(K)FLUORANTHENE	2.26E-08	8.83E-09	1.36E-11	3.15E-08	BENZO(K)FLUORANTHENE	NA	NA	NA	NA	NA
			BENZOIC ACID	NA	NA	NA	NA	BENZOIC ACID	NOEL	9.95E-07	2.98E-07	1.84E-09	1.29E-06
			BIS(2-ETHYLHEXYL)PHTHAL	2.23E-10	6.68E-11	4.12E-13	2.90E-10	BIS(2-ETHYLHEXYL)PHTHAL	Liver	5.57E-05	1.67E-05	1.03E-07	7.25E-05
			BUTYLBENZYLPHTHALATE	NA	NA	NA	NA	BUTYLBENZYLPHTHALATE	Liver	6.10E-07	1.83E-07	1.13E-09	7.94E-07
			CARBAZOLE	5.70E-11	1.71E-11	1.05E-13	7.42E-11	CARBAZOLE	NA	NA	NA	NA	NA
			4- CHLOROANILINE	NA	NA	NA	NA	4- CHLOROANILINE	Spleen	2.15E-04	6.44E-05	3.97E-07	2.80E-04
			CHRYSENE	2.62E-09	1.02E-09	1.91E-11	3.66E-09	CHRYSENE	NA	NA	NA	NA	NA
			DIBENZ(A,H)ANTHRACENE	4.10E-08	1.60E-08	7.58E-11	5.71E-08	DIBENZ(A,H)ANTHRACENE	NA	NA	NA	NA	NA
			2,6- DINITROTOLUENE	9.26E-09	2.78E-09	NA	1.20E-08	2,6- DINITROTOLUENE	NA	1.06E-03	3.19E-04	1.96E-06	1.38E-03
			DI-N-BUTYLPHTHALATE	NA	NA	NA	NA	DI-N-BUTYLPHTHALATE	Whole Body	5.97E-06	1.79E-06	1.10E-08	7.78E-06
			FLUORANTHENE	NA	NA	NA	NA	FLUORANTHENE	Blood; Kidney; Liver	4.14E-05	1.62E-05	7.65E-08	5.76E-05
			FLUORENE	NA	NA	NA	NA	FLUORENE	Blood	2.72E-05	1.06E-05	4.58E-06	4.24E-05
			INDENO(1,2,3-CD)PYRENE	1.78E-08	6.93E-09	1.07E-11	2.47E-08	INDENO(1,2,3-CD)PYRENE	NA	NA	NA	NA	NA
			2- METHYLNAPHTHALENE	NA	NA	NA	NA	2- METHYLNAPHTHALENE	Body Weight; Respiratory	3.50E-04	1.36E-04	NA	4.86E-04
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	5.05E-05	1.97E-05	1.66E-03	1.73E-03
			PENTACHLOROPHENOL	6.64E-09	1.99E-09	1.23E-11	8.65E-09	PENTACHLOROPHENOL	Liver; Kidney	1.29E-04	3.87E-05	2.39E-07	1.68E-04
			PHENANTHRENE	NA	NA	NA	NA	PHENANTHRENE	NOEL	4.06E-06	1.58E-06	7.50E-09	5.65E-06

Table C1-5f
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Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			PHENOL	NA	NA	NA	NA	PHENOL	Cardiovascular System; Fetal; Kidney; Liver; Nervous System	2.59E-06	1.01E-06	5.02E-08	3.65E-06
			PYRENE	NA	NA	NA	NA	PYRENE	Kidney	7.59E-05	2.96E-05	1.21E-06	1.07E-04
			TPH (mg/kg)					**TPH (mg/kg)**					
			TPH AS DIESEL	NA	NA	NA	NA	TPH AS DIESEL	NA	NA	NA	NA	NA
			TPH AS GASOLINE	NA	NA	NA	NA	TPH AS GASOLINE	NA	NA	NA	NA	NA
			TPH AS MOTOR OIL	NA	NA	NA	NA	TPH AS MOTOR OIL	NA	NA	NA	NA	NA
			TRPH	NA	NA	NA	NA	TRPH	NA	NA	NA	NA	NA
			VOCs (mg/kg)					**VOCs (mg/kg)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	1.57E-07	NA	7.59E-07	9.16E-07
			BENZENE	1.17E-10	NA	2.60E-09	2.71E-09	BENZENE	Fetal; Immune System; Nervous System; Respiratory	2.05E-05	NA	2.12E-04	2.33E-04
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	1.09E-07	NA	7.31E-07	8.40E-07
			BROMOMETHANE	NA	NA	NA	NA	BROMOMETHANE	GI System	9.92E-06	NA	3.27E-07	1.02E-05
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	1.60E-07	NA	4.04E-06	4.20E-06
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver	4.78E-07	NA	1.61E-05	1.66E-05
			CHLOROFORM	9.95E-12	NA	1.37E-10	1.47E-10	CHLOROFORM	Fetal; Kidney; Liver	2.25E-06	NA	5.89E-06	8.14E-06
			CIS-1,2- DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2- DICHLOROETHENE	Blood	6.64E-06	NA	1.39E-04	1.45E-04
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	1.00E-06	NA	3.92E-06	4.92E-06
			METHYLENE CHLORIDE	3.81E-11	NA	2.31E-10	2.69E-10	METHYLENE CHLORIDE	Cardiovascular System; Liver; Nervous System	3.17E-06	NA	4.04E-05	4.36E-05
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Kidney; Liver	3.03E-07	NA	NA	3.03E-07
			NAPHTHALENE	NA	NA	NA	NA	NAPHTHALENE	Body Weight; Respiratory	5.13E-06	NA	1.69E-04	1.74E-04
			TETRACHLOROETHENE	4.12E-10	NA	3.74E-10	7.86E-10	TETRACHLOROETHENE	Kidney; Liver	5.35E-06	NA	1.25E-04	1.30E-04
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	3.97E-07	NA	1.40E-05	1.44E-05
			TRICHLOROETHENE	1.62E-10	NA	5.08E-11	2.13E-10	TRICHLOROETHENE	Eyes; Nervous System	9.21E-05	NA	5.08E-05	1.43E-04
			1,2,4- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLYBENZENE	NA	8.11E-07	NA	7.23E-05	7.31E-05
			1,3,5- TRIMETHYLYBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLYBENZENE	NA	2.89E-07	NA	6.45E-05	6.48E-05
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	1.55E-06	NA	1.08E-04	1.10E-04
Groundwater	Shallow Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	1.82E-03	1.82E-03
			BENZENE	NA	NA	1.82E-07	1.82E-07	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	1.49E-02	1.49E-02
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	1.23E-02	1.23E-02
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	1.14E-03	1.14E-03
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	8.57E-03	8.57E-03
			CHLOROMETHANE	NA	NA	1.23E-08	1.23E-08	CHLOROMETHANE	NA	NA	NA	1.59E-03	1.59E-03

Table C1-5f
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Upland Areas Mixed Zone (HQ=3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

Scenario Timeframe:	Future
Receptor Population:	Construction Worker
Receptor Age:	Adult

Medium	Exposure Medium	Exposure Point	Chemical	Carcinogenic Risk				Chemical	Primary Target Organ	Non-Carconogenic Hazard Index			
				Ingestion	Dermal	Inhalation (Outdoor)	Exposure Routes Total			Ingestion HQ	Dermal HQ	Inhalation (Outdoor) HQ	Total HI
			CIS-1,2-DICHLOROETHENE	NA	NA	NA	NA	CIS-1,2-DICHLOROETHENE	Blood	NA	NA	2.25E-02	2.25E-02
			1,3- DICHLOROBENZENE	NA	NA	NA	NA	1,3- DICHLOROBENZENE	NA	NA	NA	1.24E-03	1.24E-03
			1,2- DICHLOROETHENE (TOTAL)	NA	NA	NA	NA	1,2- DICHLOROETHENE (TOTAL)	Blood, Liver	NA	NA	1.06E-01	1.06E-01
			ETHYLBENZENE	NA	NA	NA	NA	ETHYLBENZENE	Fetal; Kidney; Liver	NA	NA	2.39E-04	2.39E-04
			TOLUENE	NA	NA	NA	NA	TOLUENE	Fetal; Kidney; Liver; Nervous System; Respiratory	NA	NA	6.85E-04	6.85E-04
			TRANS-1,2-DICHLOROETHEN	NA	NA	NA	NA	TRANS-1,2-DICHLOROETHEN	Blood; Liver	NA	NA	2.10E-03	2.10E-03
			1,2,4- TRIMETHYLBENZENE	NA	NA	NA	NA	1,2,4- TRIMETHYLBENZENE	NA	NA	NA	2.13E-02	2.13E-02
			1,3,5- TRIMETHYLBENZENE	NA	NA	NA	NA	1,3,5- TRIMETHYLBENZENE	NA	NA	NA	1.61E-02	1.61E-02
			VINYL CHLORIDE	NA	NA	1.72E-08	1.72E-08	VINYL CHLORIDE	GI System; Liver; Nervous System	NA	NA	2.74E-03	2.74E-03
			XYLENE (TOTAL)	NA	NA	NA	NA	XYLENE (TOTAL)	Body Weight; Fetal; Nervous System; Respiratory	NA	NA	4.80E-03	4.80E-03
Groundwater	Intermediate and Deep Groundwater	Vapors	**VOCs (ug/L)**					**VOCs (ug/L)**					
			ACETONE	NA	NA	NA	NA	ACETONE	Kidney; Liver	NA	NA	4.02E-04	4.02E-04
			BENZENE	NA	NA	2.66E-07	2.66E-07	BENZENE	Fetal; Immune System; Nervous System; Respiratory	NA	NA	2.17E-02	2.17E-02
			2- BUTANONE	NA	NA	NA	NA	2- BUTANONE	Fetal	NA	NA	1.88E-03	1.88E-03
			CARBON DISULFIDE	NA	NA	NA	NA	CARBON DISULFIDE	Fetal; Nervous System	NA	NA	1.81E-03	1.81E-03
			CHLOROBENZENE	NA	NA	NA	NA	CHLOROBENZENE	Kidney; Liver; Reproductive System	NA	NA	3.26E-02	3.26E-02
			4- METHYL-2-PENTANONE	NA	NA	NA	NA	4- METHYL-2-PENTANONE	Fetal; Kidney; Liver	NA	NA	6.85E-04	6.85E-04

Cancer Risk Across Soil:	7.5E-06
Cancer Risk Across Groundwater:	4.8E-07
Total Cancer Risk:	7.9E-06

HI Across Soil:	1.1E+00
HI Across Groundwater:	2.8E-01
Total HI:	1.4E+00
Total Blood HI:	2.3E-01
Total Body Weight HI:	2.4E-01
Total Cardiovascular System HI:	2.0E-01
Total Fetal/Reproductive System HI:	2.6E-01
Total GI System HI:	2.2E-02
Total Immune System HI:	9.7E-02
Total Kidney HI:	1.3E-01
Total Liver HI:	2.4E-01
Total Nervous System HI:	5.6E-01
Total NOEL HI:	5.9E-02
Total Respiratory HI:	1.5E-01
Total Skin HI:	1.7E-01
Total Whole Body HI:	3.4E-02

Notes:
EPC = Exposure point concentration
GI = Gastrointestinal
HQ = Hazard Quotient
HI = Hazard Index
mg/kg = milligrams per kilogram
NA = Not Applicable
PCBs = Polychlorinated Biphenyls
RME = Reasonable Maximum Exposure
SVOCs = Semivolatile Organic Compounds
TPH = Total Petroleum Hydrocarbons
VOCs = Volatile Organic Compounds
ug/L = microgram per liter

Table C1-5g
Summary of Estimated Cancer Risks and Hazard Indices for Soil
Upland Area Mixed Zone HQ =3
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	RME Result			
	Baseline Cancer Risk*	**Baseline Hazard Index***	**Residual Cancer Risk HQ=3**	**Residual Hazard Index HQ=3**
Recreational User - Future				
Total Risk Across Soil	5.3E-05	2.7E-01	4.3E-05	2.1E-01
Total Risk Across Soil (without arsenic)	6.7E-06	2.0E-01	4.4E-06	1.5E-01
Construction Worker - Future				
Total Risk Across Soil	8.8E-06	2.1E-01	7.2E-06	1.1E+00
Total Risk Across Soil (without arsenic)	1.1E-06	1.5E-01	7.0E-07	9.1E-01

Notes:

RME = Reasonable Maximum Exposure

* - Baseline HHRA did not include full data set; outlier concentrations were excluded.

Table C1-5h

Comparison of EPCs, Cancer Risk Estimates, and Hazard Indices from Baseline Risk Assessment

Upland Area Mixed Zone HQ = 3

Investigation Area H1 Feasibility Study

Mare Island, Vallejo, California

	Baseline Risk Estimates					Mixed Zone HQ = 3				
		Recreational User		Construction Worker			Recreational User		Construction Worker	
Chemical of Potential Concern	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**
INORGANICS (mg/kg)										
ALUMINUM	21171	NA	2.38E-02	NA	1.59E-01	23,900	NA	2.69E-02	NA	1.79E-01
ANTIMONY	5.2	NA	1.42E-02	NA	4.20E-02	4.2	NA	1.15E-02	NA	3.41E-02
ARSENIC	16.1	4.59E-05	6.68E-02	7.67E-06	2.00E-01	13.6	3.88E-05	5.64E-02	6.47E-06	1.69E-01
BARIUM	169	NA	2.69E-03	NA	1.48E-02	163	NA	2.59E-03	NA	1.43E-02
BERYLLIUM	0.72	6.75E-11	4.10E-04	5.15E-10	3.31E-03	0.63	5.92E-11	3.60E-04	4.52E-10	2.91E-03
CADMIUM	3.39	4.05E-07	8.80E-03	7.09E-08	2.81E-02	3.00	3.59E-07	7.79E-03	6.28E-08	2.49E-02
CHROMIUM	137	NA	9.98E-05	NA	2.95E-04	116	NA	8.44E-05	NA	2.49E-04
COBALT	13.1	1.43E-09	8.21E-04	1.09E-08	1.58E-02	14.8	1.62E-09	9.31E-04	1.24E-08	1.79E-02
COPPER	189	NA	5.16E-03	NA	1.53E-02	199	NA	5.43E-03	NA	1.60E-02
HEXAVALENT CHROMIUM	0.09	5.12E-10	3.29E-05	3.91E-09	1.16E-04	0.09	5.12E-10	3.29E-05	3.91E-09	1.16E-04
LEAD	169	3.81E-07	NA	6.69E-08	NA	84	1.89E-07	NA	3.32E-08	NA
MANGANESE	726	NA	8.00E-03	NA	3.20E-01	734	NA	8.09E-03	NA	3.23E-01
MERCURY	2.4	NA	8.75E-03	NA	2.64E-02	1.9	NA	7.00E-03	NA	2.11E-02
MOLYBDENUM	7.6	NA	1.66E-03	NA	4.91E-03	72.4	NA	1.58E-02	NA	4.68E-02
NICKEL	115	1.17E-09	6.65E-03	8.92E-09	6.66E-02	99	1.00E-09	5.71E-03	7.65E-09	5.72E-02
SELENIUM	0.7	NA	1.62E-04	NA	4.79E-04	0.7	NA	1.61E-04	NA	4.76E-04
SILVER	3.9	NA	8.52E-04	NA	2.52E-03	2.6	NA	5.76E-04	NA	1.70E-03
THALLIUM	0.60	NA	9.94E-03	NA	2.94E-02	1.33	NA	2.21E-02	NA	6.52E-02
TIN	25	NA	4.55E-05	NA	1.35E-04	31	NA	5.58E-05	NA	1.65E-04
VANADIUM	106	NA	1.65E-02	NA	4.89E-02	97	NA	1.51E-02	NA	4.47E-02
ZINC	296	NA	1.08E-03	NA	3.19E-03	225	NA	8.21E-04	NA	2.43E-03
PCBs (mg/kg)										
PCBs (TOTAL)	0.97	2.11E-06	8.71E-02	3.18E-07	2.23E-01	0.25	5.45E-07	2.24E-02	8.19E-08	5.74E-02
SVOCs (mg/kg)										
ACENAPHTHENE	0.1	NA	3.47E-06	NA	9.29E-06	0.06	NA	2.14E-06	NA	5.74E-06
ACENAPHTHYLENE	0.20	NA	NA	NA	NA	0.31	NA	NA	NA	NA
ANTHRACENE	0.21	NA	1.28E-06	NA	3.34E-06	0.31	NA	1.86E-06	NA	4.85E-06
BENZO(A)ANTHRACENE	0.24	1.22E-07	NA	1.85E-08	NA	0.46	2.32E-07	NA	3.52E-08	NA
BENZO(A)PYRENE	0.23	1.17E-06	NA	1.77E-07	NA	0.41	2.08E-06	NA	3.15E-07	NA
BENZO(B)FLUORANTHENE	0.28	1.42E-07	NA	2.16E-08	NA	0.35	1.75E-07	NA	2.66E-08	NA
BENZO(G,H,I)PERYLENE	0.24	NA	1.05E-05	NA	2.70E-05	0.32	NA	1.40E-05	NA	3.61E-05
BENZO(K)FLUORANTHENE	0.21	1.07E-07	NA	1.62E-08	NA	0.41	2.08E-07	NA	3.15E-08	NA
CHRYSENE	0.46	2.35E-08	NA	3.56E-09	NA	0.47	2.42E-08	NA	3.66E-09	NA
DIBENZ(A,H)ANTHRACENE	0.15	2.61E-07	NA	3.95E-08	NA	0.22	3.77E-07	NA	5.71E-08	NA

Table C1-5h

Comparison of EPCs, Cancer Risk Estimates, and Hazard Indices from Baseline Risk Assessment

Upland Area Mixed Zone HQ = 3

Investigation Area H1 Feasibility Study

Mare Island, Vallejo, California

	Baseline Risk Estimates					Mixed Zone HQ = 3				
		Recreational User		Construction Worker			Recreational User		Construction Worker	
Chemical of Potential Concern	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**	**Medium EPC Value**	**RME Carcinogenic Risk**	**RME Total HI**	**RME Carcinogenic Risk**	**RME Total HI**
FLUORANTHENE	0.52	NA	2.27E-05	NA	5.84E-05	0.51	NA	2.24E-05	NA	5.76E-05
FLUORENE	0.26	NA	1.24E-05	NA	3.27E-05	0.34	NA	1.61E-05	NA	4.24E-05
INDENO(1,2,3-CD)PYRENE	0.24	1.22E-07	NA	1.85E-08	NA	0.32	1.63E-07	NA	2.47E-08	NA
NAPHTHALENE	0.22	NA	3.81E-04	NA	1.22E-03	0.31	NA	5.42E-04	NA	1.73E-03
PHENANTHRENE	0.36	NA	2.09E-06	NA	5.39E-06	0.38	NA	2.19E-06	NA	5.65E-06
PYRENE	0.78	NA	4.58E-05	NA	1.18E-04	0.71	NA	4.14E-05	NA	1.07E-04
TPH (mg/kg)										
TPH AS DIESEL	974	NA	NA	NA	NA	190	NA	NA	NA	NA
TPH AS GASOLINE	136	NA	NA	NA	NA	51	NA	NA	NA	NA
TPH AS MOTOR OIL	317	NA	NA	NA	NA	232	NA	NA	NA	NA
SOIL TOTALS:		**5.1E-05**	**2.6E-01**	**8.4E-06**	**1.2E+00**		**4.3E-05**	**2.1E-01**	**7.2E-06**	**1.1E+00**
SOIL TOTALS (EXCLUDING ARSENIC):		**4.9E-06**	**2.0E-01**	**7.7E-07**	**1.0E+00**		**4.4E-06**	**1.5E-01**	**7.0E-07**	**9.1E-01**

Reduction of Cancer Risk (%):

Recreational User: **16**

Construction Worker: **14**

TABLE C1-5i
Post-Remediation Gray Fox Risk Calculations
Upland Mixed Zone (HQ = 3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	Exposure Concentrations				Intake (mg/kg BW-day)					Hazard Quotient (HQ) - Low					Hazard Quotient (HQ) - High			
COPEC[a]	Surface Water (mg/L)[b]	Soils[c]	Small Mammal BAF[d]	Small mammal Tissue[d]	Surface Water	Soils	Small mammal	Total Intake (mg/kg/day)	Low TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake		High TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake
Dioxins/Furans (mg/kg)																			
2,3,7,8-TCDD TEQ		3.27E-05		0		1.04E-08		1.04E-08	0.000001		1.0E-02		1.0E-02		0.00001		1.0E-03		1.0E-03
PCB Congener TEQ	0.0000001	5.01E-05		0	2.16E-09	1.60E-08		1.82E-08	0.000001	2.2E-03	1.6E-02		1.8E-02		0.00001	2.2E-04	1.6E-03		1.8E-03
Metals (mg/kg)																			
Aluminum	12.6	2.39E+04	1.11E-02	264	2.72E-01	7.63E+00	3.01E+00	1.09E+01	1.93	1.4E-01	4.0E+00	1.6E+00	5.7E+00	>1	19.3	1.4E-02	4.0E-01	1.6E-01	5.7E-01
Antimony	0.003	4.22E+00	1.22E+00	5	6.48E-05	1.35E-03	5.87E-02	6.01E-02	0.059	1.1E-03	2.3E-02	9.9E-01	1.0E+00		23.4	2.8E-06	5.8E-05	2.5E-03	2.6E-03
Arsenic	0.0436	1.36E+01	--	0	9.42E-04	4.34E-03	0.00E+00	5.28E-03	0.32	2.9E-03	1.4E-02	0.0E+00	1.7E-02		4.7	2.0E-04	9.2E-04	0.0E+00	1.1E-03
Barium	0.24	1.63E+02	9.41E-02	15.3	5.10E-03	5.20E-02	1.75E-01	2.32E-01	51.8	9.8E-05	1.0E-03	3.4E-03	4.5E-03		119.0	4.3E-05	4.4E-04	1.5E-03	1.9E-03
Beryllium		6.32E-01	--	0		2.02E-04	0.00E+00	2.02E-04	0.532		3.8E-04	0.0E+00	3.8E-04		0.554		3.6E-04	0.0E+00	3.6E-04
Cadmium	0.0016	3.00E+00	--	0	3.46E-05	9.59E-04	0.00E+00	9.94E-04	0.06	5.8E-04	1.6E-02	0.0E+00	1.7E-02		2.64	1.3E-05	3.6E-04	0.0E+00	3.8E-04
Chromium +3	0.0263	1.16E+02	2.60E-02	3	5.68E-04	3.70E-02	3.44E-02	7.19E-02	2.4	2.4E-04	1.5E-02	1.4E-02	3.0E-02		23.1	2.5E-05	1.6E-03	1.5E-03	3.1E-03
Chromium +6	0.0263	1.48E+01	2.60E-02	0	5.68E-04	4.74E-03	4.41E-03	9.72E-03	5.66	1.0E-04	8.4E-04	7.8E-04	1.7E-03		35.1	1.6E-05	1.4E-04	1.3E-04	2.8E-04
Cobalt	0.0164	1.99E+02	--	0	3.54E-04	6.34E-02	0.00E+00	6.38E-02	1.2	3.0E-04	5.3E-02	0.0E+00	5.3E-02		20	1.8E-05	3.2E-03	0.0E+00	3.2E-03
Copper	0.233	9.00E-02	3.45E-01	0	5.04E-03	2.87E-05	3.55E-04	5.42E-03	2.67	1.9E-03	1.1E-05	1.3E-04	2.0E-03		632	8.0E-06	4.5E-08	5.6E-07	8.6E-06
Lead	0.0031	8.39E+01	6.10E-01	51.2	6.70E-05	2.68E-02	5.84E-01	6.11E-01	1.0	6.7E-05	2.7E-02	5.8E-01	6.1E-01		241	2.8E-07	1.1E-04	2.4E-03	2.5E-03
Manganese	7.42	7.34E+02	--	0	1.60E-01	2.34E-01	0.00E+00	3.95E-01	13.7	1.2E-02	1.7E-02	0.0E+00	2.9E-02		159	1.0E-03	1.5E-03	0.0E+00	2.5E-03
Mercury	0.00029	1.92E+00	--	0	6.27E-06	6.13E-04	0.00E+00	6.20E-04	0.25	2.5E-05	2.5E-03	0.0E+00	2.5E-03		4.0	1.6E-06	1.5E-04	0.0E+00	1.5E-04
Molybdenum	0.0312	7.24E+01	--	0	6.74E-04	2.31E-02	0.00E+00	2.38E-02	0.26	2.6E-03	8.9E-02	0.0E+00	9.2E-02		2.60	2.6E-04	8.9E-03	0.0E+00	9.2E-03
Nickel	0.166	9.87E+01	--	0	3.59E-03	3.15E-02	0.00E+00	3.51E-02	0.133	2.7E-02	2.4E-01	0.0E+00	2.6E-01		31.6	1.1E-04	1.0E-03	0.0E+00	1.1E-03
Selenium	0.029	7.36E-01	6.12E+00	4.50	6.27E-04	2.35E-04	5.13E-02	5.22E-02	0.05	1.3E-02	4.7E-03	1.0E+00	1.0E+00		1.21	5.2E-04	1.9E-04	4.2E-02	4.3E-02
Silver	0.0019	2.64E+00	--	0	4.11E-05	8.42E-04	0.00E+00	8.83E-04	0.375	1.1E-04	2.2E-03	0.0E+00	2.4E-03		3.75	1.1E-05	2.2E-04	0.0E+00	2.4E-04
Thallium		1.33E+00	1.01E+00	1.34		4.26E-04	1.53E-02	1.57E-02	0.48		8.9E-04	3.2E-02	3.3E-02		1.43		3.0E-04	1.1E-02	1.1E-02
Tin		3.06E+01	--	0		9.77E-03	0.00E+00	9.77E-03	23.40		4.2E-04	0.0E+00	4.2E-04		35.00		2.8E-04	0.0E+00	2.8E-04
Vanadium	0.05	9.69E+01	--	0	1.08E-03	3.09E-02	0.00E+00	3.20E-02	0.21	5.1E-03	1.5E-01	0.0E+00	1.5E-01		2.1	5.1E-04	1.5E-02	0.0E+00	1.5E-02
Zinc	0.042	2.25E+02	1.11E+00	250	9.08E-04	7.20E-02	2.85E+00	2.92E+00	9.6	9.5E-05	7.5E-03	3.0E-01	3.0E-01		411	2.2E-06	1.7E-04	6.9E-03	7.1E-03
Volatile Organics (mg/kg)																			
Acetone		4.38E-02		0		1.40E-05		1.40E-05	10		1.4E-06		1.4E-06		50		2.8E-07		2.8E-07
Benzene		2.54E-02		0		8.11E-06		8.11E-06	26.4		3.1E-07		3.1E-07		263.6		3.1E-08		3.1E-08
2-Butanone		2.03E-02		0		6.48E-06		6.48E-06	1771		3.7E-09		3.7E-09		4571		1.4E-09		1.4E-09
Bromomethane		4.30E-03		0		1.37E-06		1.37E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
sec-Butylbenzene		6.96E-03		0		2.22E-06		2.22E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Carbon disulfide		4.96E-03		0		1.58E-06		1.58E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Chlorobenzene		2.96E-03		0		9.45E-07		9.45E-07	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
cis-12-Dichloroethene		2.06E-02		0		6.57E-06		6.57E-06	45.2		1.5E-07		1.5E-07		452		1.5E-08		1.5E-08
Ethylbenzene		3.10E-02		0		9.89E-06		9.89E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Methylene chloride		5.90E-02		0		1.88E-05		1.88E-05	5.9		3.2E-06		3.2E-06		50		3.8E-07		3.8E-07
4-Methyl-2-pentanone		7.50E-03		0		2.39E-06		2.39E-06	25		9.6E-08		9.6E-08		250		9.6E-09		9.6E-09
Naphthalene		3.18E-02		0		1.01E-05		1.01E-05	50		2.0E-07		2.0E-07		150		6.8E-08		6.8E-08
Tetrachloroethene		1.66E-02		0		5.29E-06		5.29E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Toluene		2.46E-02		0		7.84E-06		7.84E-06	26		3.0E-07		3.0E-07		260		3.0E-08		3.0E-08
Trichloroethene		8.56E-03		0		2.73E-06		2.73E-06	0.7		3.9E-06		3.9E-06		7		3.9E-07		3.9E-07
124-Trimethylbenzene		1.26E-02		0		4.01E-06		4.01E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
135-Trimethylbenzene		4.48E-03		0		1.43E-06		1.43E-06	NTV	NTV	NTV	NTV	NTV		NTV	NTV	NTV	NTV	NTV
Xylene (total)		9.63E-02		0		3.08E-05		3.08E-05	2.1		1.5E-05		1.5E-05		2.6		1.2E-05		1.2E-05
Pesticides (mg/kg)																			
Aldrin		8.10E-03		0		2.59E-06		2.59E-06	0.1		2.6E-05		2.6E-05		1.0		2.6E-06		2.6E-06
alpha-Chlordane		1.93E-02		0		6.16E-06		6.16E-06	4.6		1.3E-06		1.3E-06		9.2		6.7E-07		6.7E-07
gamma Chlordane		1.85E-02		0		5.91E-06		5.91E-06	4.6		1.3E-06		1.3E-06		9.2		6.4E-07		6.4E-07
Trans nonachlor		8.00E-04		0		2.55E-07		2.55E-07	4.6		5.6E-08		5.6E-08		9.2		2.8E-08		2.8E-08
Beta BHC		7.14E-02		0		2.28E-05		2.28E-05	1.6		1.4E-05		1.4E-05		3.2		7.1E-06		7.1E-06
Gamma BHC	0.000011	1.20E-01		0	2.38E-07	3.84E-05		3.86E-05	0.05	4.8E-06	7.7E-04		7.7E-04		3.75	6.3E-08	1.0E-05		1.0E-05

TABLE C1-5i
Post-Remediation Gray Fox Risk Calculations
Upland Mixed Zone (HQ = 3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	Exposure Concentrations				Intake (mg/kg BW-day)					Hazard Quotient (HQ) - Low					Hazard Quotient (HQ) - High			
COPEC[a]	Surface Water (mg/L)[b]	Soils[c]	Small Mammal BAF[d]	Small mammal Tissue[d]	Surface Water	Soils	Small mammal	Total Intake (mg/kg/day)	Low TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake	High TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake
2,4-D		3.72E-02		0		1.19E-05		1.19E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
DDD		1.77E-02		0		5.65E-06		5.65E-06	0.8		7.1E-06		7.1E-06	16		3.5E-07		3.5E-07
DDE	0.0000027	1.53E-02		0	5.84E-08	4.89E-06		4.94E-06	0.8	7.3E-08	6.1E-06		6.2E-06	16	3.6E-09	3.1E-07		3.1E-07
DDTs	0.00014	8.01E-02	1.04	0.083	3.03E-06	2.56E-05	9.50E-04	9.79E-04	0.8	3.8E-06	3.2E-05	1.2E-03	1.2E-03	16	1.9E-07	1.6E-06	5.9E-05	6.1E-05
Dieldrin		3.13E-02		0		1.00E-05		1.00E-05	0.02		5.0E-04		5.0E-04	0.2		5.0E-05		5.0E-05
Endosulfan I		2.50E-03		0		7.98E-07		7.98E-07	0.15		5.3E-06		5.3E-06	1.50		5.3E-07		5.3E-07
Endosulfan II		4.10E-03		0		1.31E-06		1.31E-06	0.15		8.7E-06		8.7E-06	1.50		8.7E-07		8.7E-07
Endosulfan sulfate	0.00012	8.10E-03		0	2.59E-06	2.59E-06		5.18E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Endrin aldehyde		8.10E-03		0		2.59E-06		2.59E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Endrin ketone		9.70E-03		0		3.10E-06		3.10E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Heptachlor	0.0000028	4.01E-02		0	6.05E-08	1.28E-05		1.29E-05	0.13	4.7E-07	9.9E-05		9.9E-05	6.8	8.9E-09	1.9E-06		1.9E-06
Heptachlor epoxide		1.28E-02		0		4.10E-06		4.10E-06	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Hexachlorobenzene		3.38E-02		0		1.08E-05		1.08E-05	1.6		6.7E-06		6.7E-06	16		6.7E-07		6.7E-07
Methoxychlor		4.36E-02		0		1.39E-05		1.39E-05	2.5		5.6E-06		5.6E-06	50		2.8E-07		2.8E-07
Mirex		1.00E-03		0		3.19E-07		3.19E-07	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
SVOCs (mg/kg)				0														
Acenaphthene		6.18E-02		0		1.97E-05		1.97E-05	1.31		1.5E-05		1.5E-05	32.8		6.0E-07		6.0E-07
Acenaphthylene		3.05E-01		0		9.74E-05		9.74E-05	1.31		7.4E-05		7.4E-05	32.8		3.0E-06		3.0E-06
Anthracene		3.05E-01		0		9.74E-05		9.74E-05	1.31		7.4E-05		7.4E-05	32.8		3.0E-06		3.0E-06
Benzo(a)anthracene		4.57E-01		0		1.46E-04		1.46E-04	1.31		1.1E-04		1.1E-04	32.8		4.4E-06		4.4E-06
Benzo(a)pyrene		4.09E-01		0		1.31E-04		1.31E-04	1.31		1.0E-04		1.0E-04	32.8		4.0E-06		4.0E-06
Benzo(b)fluoranthene		3.45E-01		0		1.10E-04		1.10E-04	1.31		8.4E-05		8.4E-05	32.8		3.4E-06		3.4E-06
Benzo(g,h,i)perylene		3.21E-01		0		1.03E-04		1.03E-04	1.31		7.8E-05		7.8E-05	32.8		3.1E-06		3.1E-06
Benzo(k)fluoranthene		4.09E-01		0		1.31E-04		1.31E-04	1.31		1.0E-04		1.0E-04	32.8		4.0E-06		4.0E-06
Benzoic acid		1.23E+00		0		3.93E-04		3.93E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Bis(2-ethylhexyl)phthalate	0.027	3.45E-01		0	5.84E-04	1.10E-04		6.94E-04	18.3	3.2E-05	6.0E-06		3.8E-05	183	3.2E-06	6.0E-07		3.8E-06
Butylbenzylphthalate		3.78E-02		0		1.21E-05		1.21E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Carbazole		6.18E-02		0		1.97E-05		1.97E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
4-Chloroaniline		2.66E-01		0		8.49E-05		8.49E-05	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Chrysene	0.0002	4.73E-01		0	4.32E-06	1.51E-04		1.55E-04	1.31	3.3E-06	1.2E-04		1.2E-04	32.8	1.3E-07	4.6E-06		4.7E-06
Dibenz(a,h)anthracene		2.17E-01		0		6.93E-05		6.93E-05	1.31		5.3E-05		5.3E-05	32.8		2.1E-06		2.1E-06
2,6-Dinitrotoluene		3.29E-01		0		1.05E-04		1.05E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Di-n-butylphthalate	0.009	1.85E-01		0	1.95E-04	5.91E-05		2.54E-04	550.00	3.5E-07	1.1E-07		4.6E-07	1833	1.1E-07	3.2E-08		1.4E-07
Fluoranthene		5.13E-01		0		1.64E-04		1.64E-04	1.31		1.3E-04		1.3E-04	32.8		5.0E-06		5.0E-06
Fluorene		3.37E-01		0		1.08E-04		1.08E-04	1.31		8.2E-05		8.2E-05	32.8		3.3E-06		3.3E-06
Indeno(1,2,3-cd)pyrene		3.21E-01		0		1.03E-04		1.03E-04	1.31		7.8E-05		7.8E-05	32.8		3.1E-06		3.1E-06
2-Methylnaphthalene		4.33E-01		0		1.38E-04		1.38E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
Naphthalene		3.13E-01		0		1.00E-04		1.00E-04	50		2.0E-06		2.0E-06	150		6.7E-07		6.7E-07
Pentachlorophenol		1.20E+00		0		3.83E-04		3.83E-04	8.42		4.6E-05		4.6E-05	27.4		1.4E-05		1.4E-05
Phenanthrene		3.77E-01		0		1.20E-04		1.20E-04	1.31		9.2E-05		9.2E-05	32.8		3.7E-06		3.7E-06
Pyrene		7.05E-01		0		2.25E-04		2.25E-04	1.31		1.7E-04		1.7E-04	32.8		6.9E-06		6.9E-06
Phenol		4.81E-01		0		1.53E-04		1.53E-04	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV	NTV
PCBs (mg/kg)																		
PCBs (Total Congeners)	0.000016	2.50E-01	18	5	3.46E-07	7.98E-05	5.16E-02	5.17E-02	0.36	9.6E-07	2.2E-04	1.4E-01	1.4E-01	1.28	2.7E-07	6.2E-05	4.0E-02	4.0E-02
>1 = The calculated hazard quotient exceeds 1 (i.e., > 1.5)																		

Exposure Assumptions and Equation:[e]

	Value	Units
IRprey(dry wt.) =	0.177	kg/day (dry weight)
IRmammal(dry wt.) =	0.177	kg/day (dry weight)
IRsoil (dry wt.)[f] =	0.00496	kg-day (dry weight)

Intake Equation = [IRmammal(dry wt) x Cprey(mammal, dry wt) x DCF x SUF]/BW + [(IRsoil x Csoil x DCF x SUF)]/BW + [(IRsurface water x Csurface water x DCF x SUF)]/BW

Risk (hazard quotient) = Intake / TRV

Prey tissue(dry wt) = Prey tissue (wet wt.) / (1-Tissue Moisture)

TABLE C1-5i
Post-Remediation Gray Fox Risk Calculations
Upland Mixed Zone (HQ = 3)
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

	Exposure Concentrations				Intake (mg/kg BW-day)					Hazard Quotient (HQ) - Low					Hazard Quotient (HQ) - High			
COPEC[a]	Surface Water (mg/L)[b]	Soils[c]	Small Mammal BAF[d]	Small mammal Tissue[d]	Surface Water	Soils	Small mammal	Total Intake (mg/kg/day)	Low TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake	High TRV (mg/kg BW-day)	Surface Water	Soils	Small mammal	Total Intake

IRsurface water[g]	=	0.335	L/day
Cprey	=	chem-specific	mg/kg or µg/kg
Csoil	=	chem-specific	mg/kg or µg/kg
Csurface water	=	chem-specific	mg/L or µg/L
Tissue Moisture (small mammal)	=	68%	percent
Dietary Composition Factor[h]	=	100%	percent
Site Use Factor[i]	=	25%	percent
Body Weight	=	3.88	kg

NTV = No toxicity data available.

NA = Not applicable.

Blank cell indicates COPEC was not detected in this medium.

Notes:

a Chemical of potential ecological concern; all constituents detected in soil are COPEC.
b All concentrations of constituents in surface water are based on the maximum concentration.
c All concentrations of constituents in soil are based on the maximum concentration expressed in dry weight.
d Site-specific BAFs (dry weight basis). Calculated small mammal tissue concentrations (soil concentration x BAF). Tissue concentrations are on a dry weight basis.
e Exposure parameters used to calculate risk are discussed in detail in Section 4.2 of RI (WESTON, 2006).
f Ingestion rate of soil based on 2.8 percent of of the prey ingestion rate (dry weight); based on a red fox (Beyer et al. (1994).
g Based on equation for mammals: Water intake (L/day) = $0.099Wt(kg)^{0.90}$ (EPA 1993)
h Dietary composition factor was based on a conservative assumption of 100% dietary intake of small mammals from the site.
i Site use factor was based on a conservative 100% use of the site for the fox's foraging range.

Table C1-5j
Gray Fox Risk Comparison (0 - 10 ft bgs; mixed zone)
Upland Area (HQ = 3) - Alternative 5
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

COPEC[a]	SLERA			Mixed Zone (HQ = 3)		
	EPC - Soil	HQ-TRV-low	HQ-TRV-High	EPC - Soil	HQ-TRV-low	HQ-TRV-High
Dioxins/Furans (mg/kg)						
2,3,7,8-TCDD TEQ	3.27E-05	1.58E+00 >1	1.58E-01	3.27E-05	1.04E-02	1.04E-03
PCB Congener TEQ	5.01E-05	5.91E+01 >1	5.91E+00 >1	5.01E-05	1.82E-02	1.82E-03
Metals (mg/kg)						
Aluminum	48900	4.33E+01 >1	4.33E+00 >1	2.39E+04	5.66E+00 >1	5.66E-01
Antimony	57	1.24E+00	3.12E-03	4.22E+00	1.02E+00	2.57E-03
Arsenic	59	2.47E-01	1.68E-02	1.36E+01	1.65E-02	1.12E-03
Barium	893	2.90E-02	1.26E-02	1.63E+02	4.48E-03	1.95E-03
Beryllium	4.8	1.15E-02	1.11E-02	6.32E-01	3.79E-04	3.64E-04
Cadmium	31.6	6.75E-01	1.53E-02	3.00E+00	1.66E-02	3.76E-04
Chromium +3	942	5.02E-01	5.22E-02	1.16E+02	3.00E-02	3.11E-03
Chromium +6	0.09	4.22E-04	6.80E-05	1.48E+01	1.72E-03	2.77E-04
Cobalt	110	1.18E-01	7.10E-03	1.99E+02	5.31E-02	3.19E-03
Copper	1380	1.08E+00	4.56E-03	9.00E-02	2.03E-03	8.57E-06
Lead	2010	3.47E+00 >1	1.44E-02	8.39E+01	6.11E-01	2.54E-03
Manganese	5300	5.41E-01	4.66E-02	7.34E+02	2.88E-02	2.48E-03
Mercury	30	1.53E-01	9.59E-03	1.92E+00	2.48E-03	1.55E-04
Molybdenum	90.2	4.54E-01	4.54E-02	7.24E+01	9.15E-02	9.15E-03
Nickel	1440	1.39E+01 >1	5.87E-02	9.87E+01	2.64E-01	1.11E-03
Selenium	2.9	6.11E+00 >1	2.53E-01	7.36E-01	1.04E+00	4.31E-02
Silver	57.5	1.96E-01	1.96E-02	2.64E+00	2.35E-03	2.35E-04
Thallium	2.9	3.74E-02	1.26E-02	1.33E+00	3.28E-02	1.10E-02
Tin	168	9.17E-03	6.13E-03	3.06E+01	4.18E-04	2.79E-04
Vanadium	203	1.26E+00	1.26E-01	9.69E+01	1.53E-01	1.53E-02
Zinc	1900	1.12E+00	2.62E-02	2.25E+02	3.04E-01	7.10E-03
Volatile Organics (mg/kg)						
Acetone	0.4	5.11E-05	1.02E-05	4.38E-02	1.40E-06	2.80E-07
Benzene	0.4	1.94E-05	1.94E-06	2.54E-02	3.07E-07	3.08E-08
2-Butanone	0.024	1.73E-08	6.71E-09	2.03E-02	3.66E-09	1.42E-09
Bromomethane	0.004	NTV	NTV	4.30E-03	NTV	NTV
sec-Butylbenzene	0.01	NTV	NTV	6.96E-03	NTV	NTV
Carbon disulfide	0.02	NTV	NTV	4.96E-03	NTV	NTV
Chlorobenzene	0.003	NTV	NTV	2.96E-03	NTV	NTV
cis-12-Dichloroethene	0.025	7.06E-07	7.06E-08	2.06E-02	1.45E-07	1.45E-08
Ethylbenzene	0.5	NTV	NTV	3.10E-02	NTV	NTV
Methylene chloride	0.073	1.58E-05	1.86E-06	5.90E-02	3.19E-06	3.77E-07
4-Methyl-2-pentanone	0.008	4.09E-07	4.09E-08	7.50E-03	9.58E-08	9.58E-09
Naphthalene	0.039	9.96E-07	3.32E-07	3.18E-02	2.03E-07	6.76E-08
Tetrachloroethene	0.02	NTV	NTV	1.66E-02	NTV	NTV
Toluene	0.4	1.97E-05	1.97E-06	2.46E-02	3.02E-07	3.02E-08
Trichloroethene	0.01	1.82E-05	1.82E-06	8.56E-03	3.90E-06	3.90E-07
124-Trimethylbenzene	0.086	NTV	NTV	1.26E-02	NTV	NTV
135-Trimethylbenzene	0.013	NTV	NTV	4.48E-03	NTV	NTV
Xylene (total)	2	1.22E-03	9.83E-04	9.63E-02	1.46E-05	1.18E-05

Table C1-5j
Gray Fox Risk Comparison (0 - 10 ft bgs; mixed zone)
Upland Area (HQ = 3) - Alternative 5
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

COPEC[a]	SLERA			Mixed Zone (HQ = 3)		
	EPC - Soil	HQ-TRV-low	HQ-TRV-High	EPC - Soil	HQ-TRV-low	HQ-TRV-High
Pesticides (mg/kg)						
Aldrin	0.01	1.28E-04	1.28E-05	8.10E-03	2.59E-05	2.59E-06
alpha-Chlordane	0.2	5.55E-05	2.78E-05	1.93E-02	1.34E-06	6.70E-07
gamma Chlordane	0.2	5.55E-05	2.78E-05	1.85E-02	1.28E-06	6.42E-07
Trans nonachlor	0.0008	6.42E-06	3.21E-06	8.00E-04	5.55E-08	2.78E-08
Beta BHC	0.089	7.11E-05	3.55E-05	7.14E-02	1.42E-05	7.12E-06
Gamma BHC	0.15	3.85E-03	5.13E-05	1.20E-01	7.72E-04	1.03E-05
2,4-D	0.11	NTV	NTV	3.72E-02	NTV	NTV
DDD	0.2	3.19E-04	1.60E-05	1.77E-02	7.07E-06	3.53E-07
DDE	0.15	3.47E-04	1.73E-05	1.53E-02	6.18E-06	3.09E-07
DDTs	1.8	3.03E-03	1.52E-04	8.01E-02	1.22E-03	6.12E-05
Dieldrin	0.67	4.71E-02	4.71E-03	3.13E-02	5.00E-04	5.00E-05
Endosulfan I	0.003	*2.55E-05*	*2.55E-06*	2.50E-03	5.32E-06	5.32E-07
Endosulfan II	0.005	4.26E-05	4.26E-06	4.10E-03	8.73E-06	8.73E-07
Endosulfan sulfate	0.01	NTV	NTV	8.10E-03	NTV	NTV
Endrin aldehyde	0.01	NTV	NTV	8.10E-03	NTV	NTV
Endrin ketone	0.09	NTV	NTV	9.70E-03	NTV	NTV
Heptachlor	0.05	4.93E-04	9.43E-06	4.01E-02	9.90E-05	1.89E-06
Heptachlor epoxide	0.24	NTV	NTV	1.28E-02	NTV	NTV
Hexachlorobenzene	0.001	7.98E-07	7.98E-08	3.38E-02	6.75E-06	6.75E-07
Methoxychlor	0.2	1.02E-04	5.11E-06	4.36E-02	5.57E-06	2.78E-07
Mirex	0.001	NTV	NTV	1.00E-03	NTV	NTV
SVOCs (mg/kg)						
Acenaphthene	0.10	9.75E-05	3.89E-06	6.18E-02	1.51E-05	6.02E-07
Acenaphthylene	0.86	8.39E-04	3.35E-05	3.05E-01	7.43E-05	2.97E-06
Anthracene	0.87	8.48E-04	3.39E-05	3.05E-01	7.43E-05	2.97E-06
Benzo(a)anthracene	1.4	1.37E-03	5.45E-05	4.57E-01	1.11E-04	4.45E-06
Benzo(a)pyrene	1.4	1.37E-03	5.45E-05	4.09E-01	9.97E-05	3.98E-06
Benzo(b)fluoranthene	2.7	2.63E-03	1.05E-04	3.45E-01	8.41E-05	3.36E-06
Benzo(g,h,i)perylene	2.3	2.24E-03	8.96E-05	3.21E-01	7.82E-05	3.13E-06
Benzo(k)fluoranthene	1.5	1.46E-03	5.84E-05	4.09E-01	9.97E-05	3.98E-06
Benzoic acid	1.5	NTV	NTV	1.23E+00	NTV	NTV
Bis(2-ethylhexyl)phthalate	5.7	5.25E-04	5.25E-05	3.45E-01	3.79E-05	3.79E-06
Butylbenzylphthalate	0.006	NTV	NTV	3.78E-02	NTV	NTV
Carbazole	0.036	NTV	NTV	6.18E-02	NTV	NTV
4-Chloroaniline	1.3	NTV	NTV	2.66E-01	NTV	NTV
Chrysene	7.8	7.62E-03	3.04E-04	4.73E-01	1.19E-04	4.74E-06
Dibenz(a,h)anthracene	0.54	5.27E-04	2.10E-05	2.17E-01	5.29E-05	2.11E-06
2,6-Dinitrotoluene	0.37	NTV	NTV	3.29E-01	NTV	NTV
Di-n-butylphthalate	0.19	1.86E-06	5.57E-07	1.85E-01	4.61E-07	1.38E-07
Fluoranthene	10	9.75E-03	3.89E-04	5.13E-01	1.25E-04	4.99E-06
Fluorene	3.1	3.02E-03	1.21E-04	3.37E-01	8.21E-05	3.28E-06
Indeno(1,2,3-cd)pyrene	2.2	2.15E-03	8.57E-05	3.21E-01	7.82E-05	3.13E-06
2-Methylnaphthalene	13	NTV	NTV	4.33E-01	NTV	NTV
Naphthalene	0.18	NTV	NTV	3.13E-01	2.00E-06	6.66E-07
Pentachlorophenol	1.7	4.34E-05	1.45E-05	1.20E+00	4.55E-05	1.40E-05
Phenanthrene	1.3	1.97E-04	6.06E-05	3.77E-01	9.19E-05	3.67E-06

Table C1-5j
Gray Fox Risk Comparison (0 - 10 ft bgs; mixed zone)
Upland Area (HQ = 3) - Alternative 5
Investigation Area H1 Feasibility Study
Mare Island, Vallejo, California

COPEC[a]	SLERA			Mixed Zone (HQ = 3)		
	EPC - Soil	HQ-TRV-low	HQ-TRV-High	EPC - Soil	HQ-TRV-low	HQ-TRV-High
Pyrene	4.4	4.29E-03	1.71E-04	7.05E-01	1.72E-04	6.86E-06
Phenol	17	1.66E-02	6.62E-04	4.81E-01	NTV	NTV
PCBs (mg/kg)	3.3	NTV	NTV			
PCBs (Total Congeners)	14	1.33E-01	3.75E-02	2.50E-01	1.44E-01	4.04E-02