# CERTIFICATION REPORT FOR AREA 6 GENERAL AREA WEST

## FERNALD CLOSURE PROJECT
## FERNALD, OHIO

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**U.S. DEPARTMENT OF ENERGY**

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and Liability Act (CERCLA) Quality Assurance Project Plan (SCQ, DOE 2003). The data were subjected to the required validation and verification process.

After the initial certification samples were collected, analyzed and validated, CUs 16, 20 and 21 failed the statistical and/or hotspot criteria for radium-226. Additional excavation and sampling were required to remove the radium contamination and pass the certification criteria. The excavation and sampling details are provided in Section 3.2 of this document.

Additionally, a single utility trench CU had failing conditions for arsenic due to both the hot spot criterion and the UCL on the mean being above-FRL. Once detected, this area had already been backfilled according to the approved trenching methodology. Therefore a risk assessment was performed to evaluate any residual impact due to this condition. This is discussed in Section 5 of this document. PCN 1

On the basis of this reported information and supporting project files, DOE has determined that no additional remedial actions are required in this portion of the site. The area will be considered certified when the U.S. Environmental Protection Agency and Ohio Environmental Protection Agency concur that certification criteria have been met. At that time, DOE intends to proceed with final land use activities as outlined in the Natural Resource Restoration Plan (DOE 2002).

DOE has restricted access to certified areas in order to maintain their integrity prior to final land use development. FCP procedure EP-0008 has been developed to implement the process that protects certified areas from becoming re-contaminated.

## 1.6 REPORT FORMAT

This certification report is presented in five sections with supporting data and documentation in Appendices A and B. The sections of this report are as follows:

| | |
|---|---|
| Section 1.0 | Introduction: Purpose, background, area description, scope, and objectives of the report |
| Section 2.0 | Certification Approach: The CU design and approach to sampling and analysis used for certification |
| Section 3.0 | Overview of Field Activities: Area preparation/survey, sampling and changes to work scope |
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## 1.7 FCP CONTROLLED CERTIFICATION MAP

In order to track the status of certification at the FCP, DOE includes a site map showing the status of the soil remediation areas with all Certification Reports. This map is included as Figure 1-2, and it has been updated to reflect the status of the areas included in this document.

# 5.0 CERTIFICATION EVALUATION AND CONCLUSIONS

Certification success or failure is based on comparing sample data from the CU against criteria discussed in Section 2.2.4. Subsequent to the evaluation of preliminary data, full statistical analysis and evaluation are performed on all validated data that exceed the FRL. Final certification data are presented in Appendix A.

## 5.1 CERTIFICATION RESULTS AND EVALUATION

Below is a summary of the analytical results and statistical analyses of the data for each CU in Area 6 General Area West.

A6GAW-C04 through A6GAW-C15, A6GAW-C17, A6GAW-C17A, A6GAW-C18, A6GAW-C19, A6GAW-C22, A6GAW-C23, A6GAW-C23P, A6GAW-C24, and BSL-C01 through BSL-C04,
All of the above-listed CUs passed the certification criteria as outlined in Section 2.2.4. Final certification data are presented in Appendix A.1.

A6GAW-C16, A6GAW-C20 and A6GAW-C21
Certification results for radium-226 failed the 95 percent UCL criterion for these three CUs, and the hotspot criterion was also exceeded for A6GAW-C21. Additional remedial actions were implemented to remove the contamination and new certification samples were collected. (Section 3.2) Using the new radium-226 results, all the CUs passed the certification process (Appendix A.2 and Appendix A.3)

UTILITIES PCN 1
During utility removal, samples were collected from the bottom of the trenches to certify the soil footprint under the utilities. The data were partitioned into nine CUs, as shown on Figures 2 7 through 2 10 and Figure 2-12.

Two Utility CUs, CU02 and CU03, did not have any FRL exceedences. Seven Utility CUs, CU01 and CU04 through CU09, had FRL exceedences; CU01 had exceedences for total uranium and arsenic, CU04 had a radium 226 exceedence, CU05 had exceedences for radium-226 and arsenic, CU06 had a total uranium exceedence, CU07 had exceedences for radium-226 and arsenic, CU08 had exceedences for arsenic and beryllium, and CU09 had exceedences for arsenic.

All of the CUs pass certification with the exception of arsenic in utility trench CU01. The secondary COC arsenic in CU01 fails the hotspot criterion, the a posteriori test, and the 90 percent UCL on the mean criterion. However, the failing condition relative to the UCL on the mean is due to the contribution from the single hot-spot sample value of 40.4 mg/kg. Without the contribution of this sample point, the

90% UCL on the mean is 10.1 mg/kg where the FRL is 12 mg/kg, which allows for the consideration to remove this hot-spot. However, the hot-spot sample point is located at the base of a backfilled utility trench, which significantly diminishes the exposure scenarios as utility trenches were at least 2 to 3-feet deep prior to backfill. The utility trenching process is described in the approved V/FCN to the Project Specific Plan Guidelines for General Characterization For Sitewide Soil Remediation (variance 20300-PSP-0011-03) that was submitted in December 2005. Based on this variance, the overburden soil associated with the utilities that was below the designed contamination grade was precertified by scanning the surface above the utility along with an adjacent area that is wide enough to stage the overburden soil. Once precertified, the overburden was excavated down to the top of the utility and staged on the adjacent precertified footprint. After the utility was removed, the bedding was scanned and removed as well. The native soil beneath the bedding was scanned and demonstrated to be within acceptable limits. Subsequently, the native soil at the base of the trench was sampled and the trench was backfilled-at-risk with the precertified overburden soil that was staged adjacent to the trench. The real time scan was used to show that there was no radiological contamination present, therefore it was unlikely that any non-radiological contamination was present. However, in this case, a single arsenic value was reported at a value greater then twice it's FRL. PCN 1

A risk assessment was performed to verify that leaving this hot-spot un-remediated does not increase the risk beyond the acceptable levels. The results of this assessment indicated that the ILCR results are less than 10-4. This risk assessment is further explained in Section 5.2 and Appendix E.

Furthermore, based on the Addendum to the CERCLA/RCRA Background Soil Study, arsenic levels in the subsurface are typically higher than at the surface in this area. Therefore, as described in the addendum to the SEP, the subsurface utility trench data were compared, on a population-to-population basis, to background levels established in the Addendum to the CERCLA/RCRA Background Soil Study. These statistics, which produced a 95% Confidence Interval on the Mean for the utility trench samples of 6.878 through 8.261 mg/kg and a 95% Confidence Interval on the Mean for the background samples of 6.733 through 7.875 mg/kg, show nearly a complete overlap and demonstrate that the levels of arsenic in the subsurface utility trenches are consistent with the area background conditions

Based on this information, the elevated condition relative to arsenic in the certification unit does not warrant further remediation. This approach is consistent with SEP protocols, specifically Section 3.4.6 Implementation Strategy for the Hot Spot Criteria where it states, "In general a decision on the need for further excavation of secondary COCs will be made with regulatory concurrence on a case-by-case basis."

The data and statistical evaluations are presented in Appendix B.

## 5.2 RISK EVALUATION FOR CU 05

PCN 1

Sampling of subsurface soil associated with a utility trench resulted in the identification of an arsenic hot spot (40.4 mg/kg). Results from this sampling event were received after the trench was backfilled, which significantly decreases the probability of exposure to this local elevated arsenic concentration. However, for this special case, a risk assessment was performed for CU 05 (Figure 5-2) to demonstrate that if this residual subsurface arsenic hot spot were present on the surface, the elevated concentration is still protective of human health and the environment.

CU 05 is the exposure area where the undeveloped park user or groundskeeper/sampler spends 100 percent of their time, which is a conservative assumption because these receptors are likely to traverse a much larger area where arsenic concentrations are lower. Additionally, the hot spot has been covered with a minimum of two feet of soil, but the risk calculation assumes the hot spot is on the surface.

### Undeveloped Park User

The exposure parameters for the undeveloped park user evaluated in this assessment apply to a child, youth, adult and senior adult that visit the park to hike, picnic, and observe birds. These individuals inhale air that contains radon and soil particulate suspended by the wind, and they contact soil and surface water while hiking trails and sitting on the ground for a picnic. Contact with soil and surface water results in dermal exposure as well as incidental ingestion. The receptor is also exposed to external radiation from radioactive isotopes present in the environmental media. Exposure pathways and parameters are summarized in Table 5-1. The rationale and reference for each exposure parameter are discussed below.

Exposure Frequency (EF): The number of days per year (d/yr) that a receptor visits the site is the EF. EF is assumed to be 20 d/yr, about every other week, for the child and adult. A higher frequency of 40 d/yr is assumed for the youth and senior adult to account for extra recreation time available to these age receptors. For example, the youth who can drive will be able to spend additional time at the park after school, relative to a working adult and young child.

Exposure Duration (ED): The ED is the number of years over which an individual will visit the park. EPA (1989a) notes that national trends show individuals do not live in a region of the country for more than 30 years. Therefore, 30 years is used as the sum across the age groups, with the years partitioned into 3 years for child, 6 for youth, 14 for adult and 7 for senior adult.

TABLE 5-1
EXPOSURE PARAMETERS FOR THE UNDEVELOPED PARK USER

| Parameter (units) | Child (1 to 6 yr) | Youth (7 to 18 yr) | Adult (19 to 55 yr) | Senior Adult (56 to 70 yr) |
|---|---|---|---|---|
| Parameters applicable to all pathways, unless otherwise specified | | | | |
| EF (day/yr) | 20 | 40 | 20 | 40 |
| ED (yr) | 3 | 6 | 14 | 7 |
| BW (kg) | 15 | 47 | 70 | 70 |
| $AT_{nc}$ (day) | 1095 | 2190 | 5110 | 2555 |
| $AT_c$ (day) | 25550 | 25550 | 25550 | 25550 |
| Pathway: inhalation of dust, volatiles & radon | | | | |
| IR ($m^3$/hr) | 1.0 | 1.0 | 1.0 | 1.0 |
| ET (hr/day) | 2 | 2 | 2 | 2 |
| Pathway: incidental ingestion of soil | | | | |
| IR (g/day) | 0.2 | 0.1 | 0.1 | 0.1 |
| FI (unitless) | 1 | 1 | 1 | 1 |
| Pathway: dermal contact with soil | | | | |
| SA ($cm^2$) | 2800 | 4370 | 5700 | 5700 |
| AF ($mg/cm^2$) | 0.2 | 0.2 | 0.07 | 0.07 |
| ABS (unitless) | CSV | CSV | CSV | CSV |
| Pathway: external radiation | | | | |
| $ET_{outdoors}$ (hr/day) | 2 | 2 | 2 | 2 |
| $ET_{indoors}$ (hr/day) | NA | NA | NA | NA |
| $SH_{outdoors}$ (unitless) | 0.25 | 0.25 | 0.25 | 0.25 |
| $SH_{indoors}$ (unitless) | NA | NA | NA | NA |
| Pathway: incidental ingestion of surface water | | | | |
| IR (L/day) | .035 | .035 | .015 | .015 |
| EF (day/yr) | 12 | 12 | 12 | 12 |
| Pathway: dermal contact with surface water | | | | |
| SA ($cm^2$) | 2180 | 4470 | 6070 | 6070 |
| DA ($mg/cm^2$/event) | CSV | CSV | CSV | CSV |
| EF (day/yr) | 12 | 12 | 12 | 12 |
| ET (hr/day) | 1 | 1 | 1 | 1 |

EF = exposure frequency
ED = exposure duration
BW = body weight
$AT_{nc}$ = averaging time for noncarcinogens
$AT_c$ = averaging time for carcinogens
IR = inhalation or ingestion rate
ET = exposure time
FI = fraction of ingested soil that is contaminated
SA = surface area of skin
AF = adherence factor for skin
ABS = absorption factor
SH = shielding factor
DA = dose absorbed per event
CSV = chemical specific value

Exposure Frequency (EF): The number of days per year (d/yr) that a receptor visits the site is the EF. EF is assumed to be 20 d/yr, about every other week, for the child and adult. A higher frequency of 40 d/yr is assumed for the youth and senior adult to account for extra recreation time available to these age receptors. For example, the youth who can drive will be able to spend additional time at the park after school, relative to a working adult and young child. PCN 1

Exposure Duration (ED): The ED is the number of years over which an individual will visit the park. EPA (1989a) notes that national trends show individuals do not live in a region of the country for more than 30 years. Therefore, 30 years is used as the sum across the age groups, with the years partitioned into 3 years for child, 6 for youth, 14 for adult and 7 for senior adult.

Body Weight (BW): EPA (1997) has tabulated BW for individuals. The adult and senior adult are equated to the mean BW in EPA Table 7-11, which is rounded to 70 kg. An average of mean values reported for ages 7 to 18 (EPA Table 7-3) is rounded to 47 kg for the youth. The child mean values reported for ages 0 to 6 (EPA Table 7-3) are used to derive an average weight of 15 kg.

Averaging Time for non-carcinogens ($AT_{nc}$): Averaging time refers to the number of days over which the toxin acts on the body. EPA (1989a) defines the averaging time for non-carcinogen chemicals as the exposure duration multiplied by 365 days/yr.

Averaging Time for carcinogens ($AT_c$): For carcinogenic compounds and radioactive isotopes, EPA (1989a) assumes the carcinogen acts over a 70-yr lifetime for the individual. Therefore, averaging time (days) for carcinogens is 70 yrs multiplied by 365 days/yr.

Inhalation Rate (IR): The volume of air which an individual breathes each hour is the IR. EPA (1997) reports the same value (1.0 $m^3$/hr) for the child and adult receptors for short term exposure and light activities (EPA Table 5-23). Therefore, this value is used for all age groups. Short term exposure and light activities are applicable to a park visitor that spends an hour or two hiking trails and watching birds.

Exposure Time (ET) for Air: The amount of time the receptor spends at the park each visit. As the park is undeveloped, the assumption is made that the receptor will spend a fraction of a normal day (two hours) inhaling dust and radon gas on each day they visit the undeveloped park.

Ingestion Rate (IR) for Soil: The mass of soil that is ingested incidentally each day is the IR.

EPA (1989b & 1997) estimates that a residential child will ingest 0.2 g/d, which is lowered to 0.1 g/d for the adult. The IR for the youth and senior adult is assumed to be similar to the adult. PCN 1

Fraction of Ingested Soil that is Contaminated (FI): In some risk exposure scenarios, a receptor may pass in and out of contaminated soil zones, and only a fraction of the ingested soil will contain contaminants. For the IRRA, the receptor is assumed to spend 100 percent of their park time in a contamination zone, and FI is set equal to 1.0.

Surface Area (SA), Dermal Contact with Soil: The skin SA exposed to soil is assumed to be the head, hands, forearms and lower legs. All SA values for body parts are obtained from EPA (2004, Exhibit C-1), and the sum for these body parts appears in Table 5-1.

Adherence Factor (AF): The AF for soil to skin is taken from EPA (2004). For a residential scenario, the AF value is 0.2 for child and youth, and 0.07 for adult and senior.

Shielding Factor (SH): The SH accounts for material between the receptor and radiation source that can attenuate the external radiation received by an individual. For outdoor conditions on the site, the SH is taken as 0.25 to account for substantial surface-water coverage (water shields radiation emitted from the soil below the water) and the placement of clean topsoil over the remedial footprint (clean topsoil shields radiation emitted from soil below the topsoil).

Ingestion Rate (IR) for Surface Water: The 1997 EPA Exposure Factors Handbook does not contain guidance on the surface-water pathway. An older version of the handbook (EPA 1989) assigned 0.05 liter per hour (L/hr) for an adult swimmer. As swimming in the ponds on site is not allowed, the incidental ingestion is attributed to illegal wading and splashing in the water. This transient activity is assumed to generate an ingestion rate of 0.035 L/hr for the child and youth. The adult and senior adult receptors are assumed to receive approximately half this dose, or 0.015 L/hr.

Exposure Time (ET) for Surface Water: As swimming is not allowed in the ponds on the site, contact with water will be a transient activity of short duration. It is assumed that the receptor will spend one hour wading and splashing on each summer day spent at the undeveloped park.

Exposure Frequency (EF) for Surface Water: It is assumed that illegal wading in the surface water will take place only during the summer months. Therefore, the all receptors are assumed to spend

one day each weekend of the 12 summer weeks (12 d/yr) contacting the water. PCN 1

Surface Area (SA), Dermal Contact with Surface Water: The skin SA exposed to soil is assumed to be the face, hands, forearms, feet and lower legs. All SA values for body parts are obtained from EPA (2004, Exhibit C-1), and the sum for these body parts appears in Table 5-1.

Dose Absorbed (DA) per Event, Dermal Contact with Surface Water: This is a chemical specific value that is calculated from the permeability constant and chemical concentration in the water. All constants and chemical concentrations used in this calculation are tabulated in Appendix C.

Groundskeeper/Sampler

A groundskeeper/sampler is an adult receptor that is assumed to work 2 days/wk mowing, landscaping and collecting soil and water samples. As the site is designated as an undeveloped park, mowing and sample collection are infrequent events. The entire work day is spent outdoors (8 hrs/day) performing strenuous activities that result in an elevated inhalation rate. Activities involve soil contact with the head, hands, forearms and lower legs, and surface water contact with the hands, forearms, lower legs and feet. Incidental ingestion of soil is elevated due to labor activities that involve soil disturbance. Surface water contact and ingestion is limited to sampling events at the site ponds. Exposure pathways and parameters are summarized in Table 5-2. The rationale and reference for each exposure parameter are discussed below.

Exposure Frequency (EF): The groundskeeper/sampler is assumed to work 2 days/wk (100 days/yr) mowing, landscaping and collecting soil and water samples.

Exposure Duration (ED): Per EPA (1991) protocol for workers, the groundskeeper/sampler ED is taken as 25 years.

Body Weight (BW): The adult mean BW in Table 7-11 of EPA (1997) is rounded to 70 kg.

Averaging Time for non-carcinogens ($AT_{nc}$): Averaging time refers to the number of days over which the toxin acts on the body. EPA (1989a) defines the averaging time for non-carcinogen chemicals as the exposure duration multiplied by 365 days/yr.

TABLE 5-2

EXPOSURE PARAMETERS FOR THE GROUNDSKEEPER/SAMPLER

| Parameter (units) | Adult (19 to 55) |
|---|---|
| Parameters applicable to all pathways, unless otherwise specified | |
| EF (day/yr) | 100 |
| ED (yr) | 25 |
| BW (kg) | 70 |
| $AT_{nc}$ (day) | 9125 |
| $AT_c$ (day) | 25550 |
| Pathway: inhalation of dust, volatiles & radon | |
| IR ($m^3$/hr) | 2.5 |
| ET (hr/day) | 8 |
| Pathway: incidental ingestion of soil | |
| IR (g/day) | 0.1 |
| FI (unitless) | 1 |
| Pathway: dermal contact with soil | |
| SA ($cm^2$) | 3300 |
| AF (mg/$cm^2$) | 0.3 |
| ABS (unitless) | CSV |
| Pathway: external radiation | |
| $ET_{outdoors}$ (hr/day) | 8 |
| $ET_{indoors}$ (hr/day) | 0 |
| $SH_{outdoors}$ (unitless) | 0.25 |
| $SH_{indoors}$ (unitless) | 0.5 |
| Pathway: incidental ingestion of surface water | |
| IR (L/day) | 0.01 |
| EF (day/yr) | 12 |
| Pathway: dermal contact with surface water | |
| SA ($cm^2$) | 5670 |
| DA (mg/$cm^2$/event) | CSV |
| EF (day/yr) | 12 |
| ET (hr/day) | 1 |

EF = exposure frequency
ED = exposure duration
BW = body weight
$AT_{nc}$ = averaging time for noncarcinogens
$AT_c$ = averaging time for carcinogens
IR = inhalation/ingestion rate
ET = exposure time
FI = fraction of ingested soil that is contaminated
SA = surface area of skin exposed to soil or water
AF = adherence factor for skin
ABS = absorption factor
SH = shielding factor
DA = dose absorbed per event
CSV = chemical specific value

Averaging Time for carcinogens ($AT_c$): For carcinogenic compounds and radioactive isotopes, EPA (1989a) assumes the carcinogen acts over a 70-yr lifetime for the individual. Therefore, averaging time (days) for carcinogens is 70 yrs multiplied by 365 days/yr. PCN 1

Inhalation Rate (IR): Short-term exposures for outdoor workers are taken from Table 5-23 in EPA (1997). The groundskeeper/sampler performs heavy activities at an elevated rate of 2.5 $m^3$/hr.

Exposure Time (ET) for Air: The groundskeeper/sampler spends the entire work day outdoors (8 hrs/day).

Ingestion Rate (IR) for Soil: The EPA (2002) standard industrial rate of 0.1 g/d for groundskeeper/sampler is applied to the calculations.

Fraction of Ingested Soil that is Contaminated (FI): Workers are assumed to spend 100 percent of their time in a contamination zone, and FI is set equal to 1.0.

Surface Area (SA), Dermal Contact with Soil: EPA's (2002) published standard industrial values for the groundskeeper/sampler are used in the calculations.

Adherence Factor (AF) for Soil: The groundskeeper/sampler has an elevated AF due to work performed in soil (EPA 2002).

Shielding Factor (SH): The SH accounts for material between the receptor and radiation source that can attenuate the external radiation received by an individual. For outdoor conditions on the site, the SH is taken as 0.25 to account for substantial surface-water coverage (water shields radiation emitted from the soil below the water) and the placement of clean topsoil over the remedial footprint (clean topsoil shields radiation emitted from soil below the topsoil).

Ingestion Rate (IR) for Surface Water: The 1997 EPA Exposure Factors Handbook does not contain guidance on the surface water pathway. An older version of the handbook (EPA 1989) assigned 0.05 L/hr for an adult swimmer, but swimming is not pertinent to the workers. The incidental ingestion to the groundskeeper/sampler is attributed to placing hands and arms in the water, and repetitive touching of hands to the mouth is assumed to result in a rate of 0.01 L/hr.

Exposure Time (ET) for Surface Water: It is assumed that the groundskeeper/sampler spends one hour wading and collecting surface water samples each day that samples are collected. PCN 1

Exposure Frequency (EF) for Surface Water: The groundskeeper/sampler is assumed to collect samples once per month, or 12 days/yr.

Surface Area (SA), Dermal Contact with Surface Water: EPA (2004, Exhibit C-1) has compiled SA values for body parts. A groundskeeper/sampler and construction worker are assumed to contact surface water with the hands, forearms, feet and lower legs. It is assumed that the building maintenance worker will not touch the water.

Risk Calculations

Risk calculations were performed using the equations in the Comprehensive Response Action Risk Evaluation (CRARE; Appendix H of the Feasibility Study Report for OU5, DOE 1995c), which reflect the equations in EPA's Risk Assessment Guidance, Part A (EPA 1989b), the exposure parameters in Tables 5-1 and 5-2, and the November 2006 cancer slope factors and reference doses obtained from the EPA website (radionuclide tables and the Integrated Risk Information System database) and the Oak Ridge Risk Assessment Information System (RAIS). The affected target receptors for these calculations are the undeveloped park user and a groundskeeper/sampler. All equations, slope factors, reference doses, and contaminant concentrations are provided in Appendix E.

In general, conservative assumptions were used in the calculations. First, the soil contaminant concentrations in CU 05 represent the 95 percent UCL or maximum value (if 95% UCL was unavailable) of each contaminant evaluated in CU 05 and the maximum subsurface arsenic value of 40.4 mg/kg. Surface-water contaminant concentrations (Appendix E) represent the average value derived from pond samples collected in November of 2006. The soil arsenic value is conservative because the trench footprint where it originates is covered with a minimum of 2 feet of soil, which makes it unlikely that a receptor would ever be exposed to this arsenic hot spot. Second, if all soil sample results were below the detection limit for a given contaminant, the detection limit value was used, rather than one-half of the limit. However, if the average value for a non-radiological surface-water contaminant corresponded to a detection limit value (i.e., all results were at the detection limit) one-half of the detection limit was used in the risk calculation, due to the sensitive of dermal exposure in the surface-water pathway. Third, the receptors are assumed to spend 100 percent of their time in CU 05. Lastly, cancer slope factors reflect short-lived radioactive daughters in equilibrium with their parent isotope.

Risk calculations for every contaminant and each pathway are presented in Appendix E and a summary of the cumulative results are presented in Table 5-3 in terms of the hazard quotient (HQ) and incremental lifetime cancer risk (ILCR) for each pathway and the sum of all pathways. Non-cancer health risks, due to exposure to non-radiological chemicals, are evaluated by application of a reference dose for oral and inhalation exposure routes. A reference dose estimates the upper bound chronic dose of a chemical that a human receptor can be exposed to without suffering ill effects. The contaminant intake for a receptor is divided by the appropriate reference dose factor to yield the HQ. If the HQ is greater than 1, a negative health impact to the receptor is anticipated. Cancer slope factors are published values that specify a cancer morbidity value (risk) to a receptor for a given quantity of contaminant intake, referred to as an ILCR. The resulting value determines whether post-remedial concentrations of contaminants will result in a cancer risk that is in compliance with CERCLA guidance and the OU5 ROD. PCN 1

For the undeveloped park user (Table 5-3), the results for total risk (i.e., no background subtracted) indicate the exposure for this receptor is in compliance with the CERCLA guidance and OU5 ROD (i.e., cumulative sum for HI is less than 1 and ILCR is less than $10^{-4}$). The pathway contributing the most to the sum HQ value is ingestion of soil, with arsenic and uranium the primary contaminants responsible for the HQ soil ingestion value. Total ILCR for the undeveloped park user is driven primarily by radon inhalation and the ingestion of arsenic via the soil pathway. The HQ result for inhalation is zero because there are no assigned inhalation reference doses for the contaminants evaluated in this CU. Details for each pathway and contaminant are provided in Appendix E.

Table 5-4 summarizes the results for the groundskeeper/worker. For the total risk case (i.e., no background subtracted), the ILCR value exceeds $10^{-4}$. Therefore, the risk to this receptor was re-evaluated by removing the background risk contribution attributed to radioactive isotopes. Per the regulatory guidance discussed in Section H.3.2.4 of the CRARE (DOE 1995c), protective requirements for human exposure to radioactive isotopes pertains only to the incremental concentration of the radionuclide above its background value. In accordance with this guidance, background levels may be subtracted from the residual radionuclide levels to determine if the risk is acceptable, and results in Table 5-4 indicate the ILCR is less than $10^{-4}$ when the radionuclide background is removed.

TABLE 5-3
SUMMARY OF RISK TO THE UNDEVELOPED PARK USER

| PATHWAY | Total Risk | |
|---|---|---|
| | HQ | ILCR |
| Inhale | 0.00E+00 | 9.89E-06 |
| Dermal Soil | 9.10E-03 | 1.72E-06 |
| Ingest Soil | 4.25E-02 | 6.12E-06 |
| Dermal Surface Water | 1.99E-04 | 7.29E-09 |
| Ingest Surface Water | 3.34E-04 | 1.69E-08 |
| External Radiation | NA | 4.12E-06 |
| SUM OF ALL PATHS | **5.21E-02** | **2.19E-05** |

NA = calculation not applicable for indicated pathway

TABLE 5-4
SUMMARY OF RISK TO GROUNDSKEEPER/SAMPLER

| PATHWAY | Total Risk | | Total Risk Minus Radionuclide Background | |
|---|---|---|---|---|
| | HQ | ILCR | HQ | ILCR |
| Inhale | 0.00E+00 | 2.87E-04 | 0.00E+00 | 9.80E-07 |
| Dermal Soil | 3.90E-02 | 6.14E-06 | 3.90E-02 | 6.14E-06 |
| Ingest Soil | 8.62E-02 | 1.15E-05 | 8.62E-02 | 1.01E-05 |
| Dermal Surface Water | 1.71E-04 | 5.22E-09 | 1.71E-04 | 5.22E-09 |
| Ingest Surface Water | 8.98E-05 | 2.12E-08 | 8.98E-05 | 1.54E-08 |
| External Radiation | NA | 4.74E-05 | NA | 4.03E-06 |
| SUM OF ALL PATHS | **1.26E-01** | **3.52E-04** | **1.26E-01** | **2.12E-05** |

NA = calculation not applicable for indicated pathway

The total risk calculation for the groundskeeper/sampler fails the ILCR criterion due to the inhalation of radon. For this receptor, higher inhalation rates and longer hours spent at the site result in a much greater inhalation risk, relative to the undeveloped park user (note that both receptors use the same radon air concentration to evaluate the inhalation risk, but it is the difference in exposure parameters that produces the initial unacceptable result for the groundskeeper/sampler). Based on current EPA cancer slope factors for radon and its daughters, background levels of radon-222 measured at air monitoring station AMS-12, as reported in the 2005 Site Environmental Report (DOE 2006), result in an ILCR that exceeds $10^{-4}$ for the groundskeeper/sampler. For comparative purposes, the radon-222 air concentration calculated for CU 05 is 320 pCi/m$^3$, and the average background value from 2005 data collected at location AMS-12 is 400 pCi/m$^3$. Therefore, when background radon is subtracted from the radon concentration above CU 05, the radon-222 air concentration used in the background corrected calculation goes to zero. PCN 1

The Table 5-4 results for total risk minus radionuclide background indicate the exposure for this receptor is in compliance with the CERCLA guidance and OU5 ROD (i.e., cumulative sum for HI is less than 1 and ILCR is less than $10^{-4}$). The pathway contributing the most to the sum HQ value is ingestion of soil, with arsenic and uranium the primary contaminants responsible for the HQ soil ingestion value. Total ILCR for the groundskeeper/sampler is driven primarily by the ingestion of arsenic via the soil pathway, as the background radon has been removed from the calculation (note that approximately one-half of the risk calculated for the undeveloped park user is due to background radon). The HQ result for inhalation is zero because there are no assigned inhalation reference doses for the contaminants evaluated in this CU. Details for each pathway and contaminant are provided in Appendix E.

## 5.3 CERTIFICATION CONCLUSIONS PCN 1

Based on the certification analytical results, precertification data, statistical analysis, and risk assessment calculations, DOE has determined that the remedial objectives in the OU5 ROD have been achieved for Area 6 West CU 05. Using the most conservative analysis for arsenic, where the subsurface concentration of 40.4 mg/kg is assumed to be on the surface, results in acceptable risk the undeveloped park user and groundskeeper/sampler. Therefore, no further remedial actions are required and this portion of the FCP will be released for restoration and final land use upon EPA and OEPA concurrence.

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# APPENDIX E

# RISK ASSESSMENT CALCULATIONS

# Appendix E

## Risk Assessment Calculations

This appendix provides risk calculations for two receptors exposed to contaminants in Area 6 West (CU 05) via the pathways of inhalation, dermal contact (soil and surface water), ingestion (soil and surface water) and external radiation. The basis for this assessment is the high arsenic concentration (40.4 mg/kg) reported for subsurface soil beneath this CU. Receptors evaluated included the undeveloped park user (child, youth, adult, senior adult) and a site worker defined as a groundskeeper/sampler (adult), and exposure parameters for these receptors are discussed in Section 5.2.

Soil contaminant concentrations used in the risk assessment reflect the 95 percent UCL of the mean (if statistical calculations were performed) or the maximum value for results reported for CU 05 (Appendix A). Only the contaminants evaluated for CU 05 were used in the risk calculation, with the exception of arsenic. For arsenic, a maximum subsurface value of 40.4 mg/kg was used to demonstrate that this residual arsenic concentration does not pose a threat to human health. Surface-water contaminants were obtained from reported results for ponds in the former waste pit area (Table E-1). Air concentrations (ug/m$^3$) used in the risk assessment are calculated by multiplying the soil contaminant concentration (ug/g) by a conversion factor of 26E-6 g/m3 (the conversion factor is the particulate value obtained from air-monitoring results at background location AMS-12, 2005 Sitewide Environmental Report, DOE 2006). The radon-222 activity (pCi/m$^3$) is obtained by multiplying the soil radium-226 activity (pCi/g) by a conversion factor of 267 g/m$^3$. The conversion factor is derived by dividing the background radon value (400 pCi//m$^3$) reported in the 2005 SER (DOE 2006) by the background radium-226 value (1.5 pCi/g) reported in the Addendum to the CERCLA/RCRA Background Soil Study (DOE 2001). Slope factors and reference doses reflect the November 2006 values found on the EPA and Oak Ridge RAIS web sites, as discussed in Section 5.2.

There are 10 calculation sheets for each receptor: inhalation of chemicals, dermal soil for chemicals, ingest soil for chemicals, dermal surface water for chemicals, ingest surface water for chemicals, inhalation of radionuclides, ingest soil for radionuclides, ingest surface water for radionuclides, external radiation, and a summation page. Data are not available to evaluate the dermal exposure routes for radionuclides. Each page contains the intake equation and defined parameters, exposure parameters, COC concentrations, slope factors, reference doses, HQ and

ILCR values, and a summation result for the pathway. The summation page tabulates the total HQ and ILCR for each pathway, the sum across all pathways and the total HQ and ILCR for each COC for all pathways.

The calculation for the undeveloped park user (Table E-2) represents total risk (no background subtracted), and the HQ and ILCR totals comply with the regulatory guidance (i.e., less than one and less than $10^{-4}$). However, there are two calculations (Tables E-3 and E-4) for the groundskeeper/sampler receptor. The initial calculation of total risk (no background subtracted, Table E-3) shows the ILCR exceeds the allowable limit of $10^{-4}$. As discussed in Section 5.2, this is due to the inhalation of radon at background levels and the higher inhalation rate for this receptor relative to the undeveloped park user. Per the regulatory guidance discussed in Section H.3.2.4 of the CRARE (DOE 1995), protective requirements for human exposure to radioactive isotopes pertains only to the incremental concentration of the radionuclide above its background value. Therefore, background levels may be subtracted from the residual radionuclide levels to determine if the risk is acceptable. Table E-4 shows that the risk to the Groundkeeper/Sampler is acceptable (i.e., ILCR less than $10^{-4}$) when the background radionuclide levels are removed from the calculations presented in Table E-3.

TABLE E-1

**Surface Water Contaminants Used in Risk Calculations for Area 6 West CU05**

| | A6W-SW16 mg/L |
|---|---|
| 1,1,2-Trichloroethane | NA |
| 1,1-Dichloroethylene | NA |
| 1,2-dichloroethane | NA |
| 2-Butanone | NA |
| 3,3-Dichlorobenzidine | NA |
| 4-Methylphenol | NA |
| 4-Nitroanaline | NA |
| Acetone | NA |
| Antimony | 2.50E-04 |
| Aroclor-1254 | NA |
| Aroclor-1260 | NA |
| Arsenic | 1.50E-03 |
| Barium | NA |
| Benzene | NA |
| Benzo(a)anthracene | NA |
| Benzo(a)pyrene | NA |
| Benzo(b)fluoranthene | NA |
| Benzo(k)fluoranthene | NA |
| Beryllium | NA |
| Bis(2-chloroisopropyl)ether | NA |
| Bis(2-ethylhexyl)phthalate | NA |
| Boron | NA |
| Bromodichloromethane | NA |
| Bromoform | NA |
| Bromomethane | NA |
| Cadmium | 5.00E-05 |
| Carbazole | NA |
| Carbon disulfide | NA |
| Carbon tetrachloride | NA |
| Chlordane | NA |
| Chlorobenzene | NA |
| Chloroform | NA |
| Chromium (VI) | NA |
| Chrysene | NA |
| Cobalt | NA |
| Copper | NA |
| Cyanide | NA |
| Cyclohexanone | NA |

| | A6W-SW16 mg/L |
|---|---|
| Dibenzo(a,h)anthracene | NA |
| Dieldrin | NA |
| Di-n-octylphthalate | NA |
| Ethyl ether | NA |
| Ethylbenzene | NA |
| Fluoride | NA |
| Heptachlorodibenzofuran | NA |
| Heptachlorodibenzo-p-dioxin | NA |
| Hexachlorodibenzofuran | NA |
| Hexachlorodibenzo-p-dioxin | NA |
| Indeno(1,2,3-cd)pyrene | NA |
| Lead | NA |
| Manganese | NA |
| Mercury | NA |
| Methanol | NA |
| Methyl-2-pentanone | NA |
| Methylene chloride | NA |
| Molybdenum | NA |
| Nickel | NA |
| N-nitrosodiphenylamine | NA |
| N-nitrosodipropylamine | NA |
| Octachlorodibenzofuran | NA |
| Octochlorodibenzo-p-dioxin | NA |
| Pentachlorodibenzofuran | NA |
| Pentachlorodibenzo-p-dioxin | NA |
| Pentachlorophenol | NA |
| Phenanthrene | NA |
| Selenium | NA |
| Silver | 1.00E-04 |
| Tetrachlorodibenzofuran | NA |
| Tetrachlorodibenzo-p-dioxin | NA |
| Tetrachloroethylene | NA |
| Thallium | NA |
| Toluene | NA |
| Tributyl phosphate | NA |
| Trichloroethylene | NA |
| Trifluorochloromethane | NA |
| Uranium | 8.05E-03 |
| Vanadium | NA |
| Vinyl chloride | NA |
| Xylenes | NA |
| Zinc | NA |

| | A6W-SW16 pCi/L |
|---|---|
| Cesium-137 | NA |
| Lead-210 | NA |
| Neptunium-237 | NA |
| Plutonium-238 | NA |
| Plutonium-239/240 | NA |
| Radium-226 | 1.96E-01 |
| Radium-228 | 3.65E+00 |
| Strontium-90 | NA |
| Technetium-99 | 6.20E+00 |
| Thorium-228 | 3.65E+00 |
| Thorium-230 | 6.30E-02 |
| Thorium-232 | 3.65E+00 |
| Uranium-234 | 2.75E+00 |
| Uranium-235 | 1.25E-01 |
| Uranium-238 | 2.68E+00 |

For A6W-SW16, COCs matched to soil COCs. If soil COC not present in SW, SW-COC obtained from max value observed in other ponds in waste pit area.

TABLE E-2 - InhaleChem

**Undeveloped Park User - Inhalation of Gases & Particulates**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|---|
| | | | | child | youth | adult | senior |
| | CDI = | (CS*EF*ED*IR*ET)/(BW*AT) | | | | | |
| | CDI = | Chronic Daily Intake | mg/kgday | | | | |
| | CA = | Concentration of chemical in air | mg/m³ | see table of COCs below | | | |
| | EF = | Exposure frequency | days/yr | 20 | 40 | 20 | 40 |
| | ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| | IR = | Inhalation rate | m³/hr | 1 | 1 | 1 | 1 |
| | ET = | Exposure time | hrs/day | 2 | 2 | 2 | 2 |
| | BW = | Body weight | kg | 15 | 47 | 70 | 70 |
| | ATc = | Average time for carcinogens | days | 25550 | 25550 | 25550 | 25550 |
| | ATn = | Average time for non-carcinogens | days | 1095 | 2190 | 5110 | 2555 |

| COC | conc | RfDi | CSFI | CHILD | | | | YOUTH | | | | ADULT | | | | SENIOR | | | | SUM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR |
| | mg/m³ | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| 1,1,2-Trichloroethane | NA | NA | 5.60E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 5.71E-02 | 1.75E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | NA | 9.10E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Butanone | NA | 1.43E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methylphenol | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 1.14E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acetone | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Antimony | 1.96E-08 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Aroclor-1254 | NA | NA | 2.00E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Aroclor-1260 | NA | NA | 2.00E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Arsenic | 1.05E-06 | NA | 1.51E+01 | NA | NA | 3.289E-10 | 4.97E-09 | NA | NA | 4.199E-10 | 6.34E-09 | NA | NA | 3.289E-10 | 4.97E-09 | NA | NA | 3.289E-10 | 4.97E-09 | NA | NA | 1.41E-09 | 2.12E-08 |
| Barium | NA | 1.43E-04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzene | NA | 8.57E-03 | 2.73E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | NA | 3.08E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | NA | 3.08E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | NA | 3.08E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | NA | 3.08E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beryllium | NA | 5.71E-06 | 8.40E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Boron | NA | 5.71E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromoform | NA | NA | 3.85E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromomethane | NA | 1.43E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cadmium | 6.42E-09 | NA | 6.30E+00 | NA | NA | 2.011E-12 | 1.27E-11 | NA | NA | 2.567E-12 | 1.62E-11 | NA | NA | 2.011E-12 | 1.27E-11 | NA | NA | 2.011E-12 | 1.27E-11 | NA | NA | 8.60E-12 | 5.42E-11 |
| Carbazole | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon disulfide | NA | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | NA | 5.25E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlordane | NA | 2.00E-04 | 3.50E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorobenzene | NA | 1.43E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroform | NA | NA | 8.05E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium (VI) | NA | 2.86E-05 | 4.20E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | NA | NA | 3.08E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cobalt | NA | 5.71E-06 | 9.80E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Copper | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | NA | 3.08E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dieldrin | NA | NA | 1.61E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

TABLE E-2 - InhaleChem

**Undeveloped Park User - Inhalation of Gases & Particulates**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*ET)/(BW*AT) | | | | | |
| | CDI = | Chronic Daily Intake | mg/kgday | child | youth | adult | senior |
| | CA = | Concentration of chemical in air | mg/m³ | see table of COCs below | | | |
| | EF = | Exposure frequency | days/yr | 20 | 40 | 20 | 40 |
| | ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| | IR = | Inhalation rate | m³/hr | 1 | 1 | 1 | 1 |
| | ET = | Exposure time | hrs/day | 2 | 2 | 2 | 2 |
| | BW = | Body weight | kg | 15 | 47 | 70 | 70 |
| | ATc = | Average time for carcinogens | days | 25550 | 25550 | 25550 | 25550 |
| | ATn = | Average time for non-carcinogens | days | 1095 | 2190 | 5110 | 2555 |

| | | | | CHILD | | | | YOUTH | | | | ADULT | | | | SENIOR | | | | SUM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| COC | conc | RfDi | CSFi | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR |
| Ethyl ether | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 2.86E-01 | 3.85E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoride | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | NA | 1.16E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | NA | 1.16E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | NA | 1.16E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | NA | 1.16E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | NA | 3.08E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.43E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mercury | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methanol | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methyl-2-pentanone | NA | 8.57E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 8.57E-01 | 1.65E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Molybdenum | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nickel | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Octochlorodibenzofuran | NA | NA | 1.16E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | NA | 1.16E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | NA | 5.78E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | NA | 5.78E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorophenol | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Silver | 6.76E-09 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachlorodibenzofuran | NA | NA | 1.16E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | NA | 1.16E+05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.71E-01 | 2.07E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Thallium | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | NA | 1.43E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trichloroethylene | NA | 1.14E-02 | 4.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 1.30E-06 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Vanadium | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 2.86E-02 | 3.08E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes | NA | 2.86E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Zinc | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | | | | | | | | | | | | | | | | | | | | total = | 0.00E+00 | total = | 2.13E-08 |

Air particulate is 26 ug/m3, the 2005 SER background average from monitor AMS-12.

TABLE E-2 - DermalSoilChem

**Undeveloped Park User - Dermal Contact with Soil/Sediment**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|---|
| | | | | child | youth | adult | senior |
| | CDI = | (CS*AB*SA*EF*ED*AF*CF)/(BW*AT) | | | | | |
| | CDI = | Chronic Daily Intake | mg/kgday | | | | |
| | CS = | Concentration of chemical in soil | mg/kg | see table of COCs below | | | |
| | AB | Absorption factor | -- | see table of COCs below | | | |
| | SA | Surface area of exposed skin | $cm^2$/day | 2800 | 4370 | 5700 | 5700 |
| | EF = | Exposure frequency | days/yr | 20 | 40 | 20 | 40 |
| | ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| | AF = | Adherence factor | mg/$cm^2$ | 0.2 | 0.2 | 0.07 | 0.07 |
| | CF = | Conversion factor | kg/mg | 1.00E-06 | 1.00E-06 | 1.00E-06 | 1.00E-06 |
| | BW = | Body weight | kg | 15 | 47 | 70 | 70 |
| | ATc = | Average time for carcinogens | days | 25550 | 25550 | 25550 | 25550 |
| | ATn = | Average time for non-carcinogens | days | 1095 | 2190 | 5110 | 2555 |

| COC | conc | AB | RfDd | CSFd | CHILD | | | | YOUTH | | | | ADULT | | | | SENIOR | | | | SUM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR |
| | mg/kg | unitless | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| 1,1,2-Trichloroethane | NA | 1.00E-02 | 3.24E-03 | 7.04E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 1.00E-02 | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 1.00E-02 | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Butanone | NA | 1.00E-02 | 4.80E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | 1.00E-02 | NA | 9.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methylphenol | NA | 1.00E-02 | 3.25E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 1.00E-02 | 2.40E-03 | 2.63E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acetone | NA | 1.00E-02 | 7.47E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Antimony | 7.53E-01 | 1.00E-03 | 8.00E-06 | NA | 1.54E-09 | 1.93E-04 | 6.602E-11 | NA | 1.535E-09 | 1.92E-04 | NA | NA | 2.352E-10 | 2.94E-05 | NA | NA | 4.704E-10 | 5.88E-05 | NA | NA | 6.80E-10 | 8.51E-05 | NA | NA |
| Aroclor-1254 | NA | 1.40E-01 | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Aroclor-1260 | NA | 1.40E-01 | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Arsenic | 4.04E+01 | 3.00E-02 | 1.23E-04 | 3.66E+00 | 2.479E-06 | 2.02E-02 | 1.063E-07 | 3.89E-07 | 2.47E-06 | 2.01E-02 | 2.117E-07 | 7.75E-07 | 3.785E-07 | 3.08E-03 | 7.571E-08 | 2.77E-07 | 7.571E-07 | 6.16E-03 | 7.571E-08 | 2.77E-07 | 1.10E-06 | 8.90E-03 | 4.69E-07 | 1.72E-06 |
| Barium | NA | 1.00E-03 | 1.40E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzene | NA | 1.00E-02 | 3.88E-03 | 5.67E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | 1.30E-01 | NA | 2.35E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | 1.30E-01 | NA | 2.35E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | 1.30E-01 | NA | 2.35E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | 1.30E-01 | NA | 2.35E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beryllium | NA | 1.00E-03 | 2.00E-05 | 4.30E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 1.00E-02 | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 1.00E-02 | 3.80E-03 | 7.37E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Boron | NA | 1.00E-03 | 1.80E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 1.00E-02 | 1.96E-02 | 6.33E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromoform | NA | 1.00E-02 | 1.20E-02 | 1.32E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromomethane | NA | 1.00E-02 | 1.12E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cadmium | 2.47E-01 | 1.00E-03 | 1.00E-05 | NA | 5.053E-10 | 5.05E-05 | NA | NA | 5.034E-10 | 5.03E-05 | NA | NA | 7.715E-11 | 7.71E-06 | NA | NA | 1.543E-10 | 1.54E-05 | NA | NA | 2.23E-10 | 2.23E-05 | NA | NA |
| Carbazole | NA | 1.00E-02 | NA | 2.86E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon disulfide | NA | 2.50E-01 | 6.30E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 1.00E-02 | 4.55E-04 | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlordane | NA | 4.00E-02 | 2.50E-04 | 7.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorobenzene | NA | 1.00E-02 | 6.20E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroform | NA | 1.00E-02 | 2.00E-03 | 3.05E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium (VI) | NA | 1.00E-03 | 6.00E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | NA | 1.30E-01 | NA | 2.35E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cobalt | NA | 1.00E-03 | 1.60E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Copper | NA | 1.00E-03 | 1.20E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | NA | 1.00E-02 | 3.40E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 1.00E-02 | 4.00E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | 1.30E-01 | NA | 2.35E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dieldrin | NA | 1.00E-02 | 2.50E-05 | 3.20E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 1.00E-02 | 3.60E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

TABLE E-2 - DermalSoilChem

**Undeveloped Park User - Dermal Contact with Soil/Sediment**
**Risk calculation for A6W-CU5**

Intake Equation:

| | | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|---|
| | | | | child | youth | adult | senior |
| CDI = | (CS*AB*SA*EF*ED*AF*CF)/(BW*AT) | | | | | | |
| CDI = | Chronic Daily Intake | | mg/kgday | | | | |
| CS = | Concentration of chemical in soil | | mg/kg | see table of COCs below | | | |
| AB | Absorption factor | | -- | see table of COCs below | | | |
| SA | Surface area of exposed skin | | $cm^2$/day | 2800 | 4370 | 5700 | 5700 |
| EF = | Exposure frequency | | days/yr | 20 | 40 | 20 | 40 |
| ED = | Exposure duration | | yrs | 3 | 6 | 14 | 7 |
| AF = | Adherence factor | | mg/$cm^2$ | 0.2 | 0.2 | 0.07 | 0.07 |
| CF = | Conversion factor | | kg/mg | 1.00E-06 | 1.00E-06 | 1.00E-06 | 1.00E-06 |
| BW = | Body weight | | kg | 15 | 47 | 70 | 70 |
| ATc = | Average time for carcinogens | | days | 25550 | 25550 | 25550 | 25550 |
| ATn = | Average time for non-carcinogens | | days | 1095 | 2190 | 5110 | 2555 |

| COC | conc | AB | RfDd | CSFd | CHILD | | | | YOUTH | | | | ADULT | | | | SENIOR | | | | SUM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR |
| | mg/kg | unitless | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| Ethyl ether | NA | 1.00E-02 | 1.60E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 1.00E-02 | 9.70E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoride | NA | 1.00E-03 | 5.82E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | 1.30E-01 | NA | 2.35E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead | NA | 1.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.00E-03 | 5.60E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mercury | NA | 1.00E-03 | 2.10E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methanol | NA | 1.00E-02 | 4.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methyl-2-pentanone | NA | 1.00E-02 | 6.40E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 1.00E-02 | 5.70E-02 | 7.89E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Molybdenum | NA | 1.00E-03 | 1.90E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nickel | NA | 1.00E-03 | 5.40E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 1.00E-02 | 5.00E-03 | 1.96E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | 1.00E-02 | NA | 2.80E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | 1.00E-02 | NA | 1.50E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 1.50E+05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorophenol | NA | 2.50E-01 | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NA | 1.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 1.00E-03 | 2.20E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Silver | 2.60E-01 | 1.00E-03 | 9.00E-04 | NA | 5.319E-10 | 5.91E-07 | NA | NA | 5.299E-10 | 5.89E-07 | NA | NA | 8.121E-11 | 9.02E-08 | NA | NA | 1.624E-10 | 1.80E-07 | NA | NA | 2.35E-10 | 2.61E-07 | NA | NA |
| Tetrachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.00E-02 | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Thallium | NA | 1.00E-03 | 1.80E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | NA | 1.00E-02 | 6.40E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 1.00E-02 | 1.00E-01 | 1.08E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trichloroethylene | NA | 1.00E-02 | 4.50E-05 | 2.67E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 5.01E+01 | 1.00E-03 | 5.10E-04 | NA | 1.025E-07 | 2.01E-04 | NA | NA | 1.021E-07 | 2.00E-04 | NA | NA | 1.565E-08 | 3.07E-05 | NA | NA | 3.13E-08 | 6.14E-05 | NA | NA | 4.53E-08 | 8.88E-05 | NA | NA |
| Vanadium | NA | 1.00E-03 | 7.00E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 1.00E-02 | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes | NA | 1.00E-02 | 1.84E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Zinc | NA | 1.00E-03 | 6.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | | | | | | | | | | | | | | | | | | | | | total = | 9.10E-03 | total = | 1.72E-06 |

TABLE E-2 - IngestSoilChem

**Undeveloped Park User - Ingestion of Soil**
**Risk calculation for A6W-CU5**

Intake Equation:

| | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|
| | | | child | youth | adult | senior |
| CDI = | (CS*EF*ED*IR*FI*CF)/(BW*AT) | mg/kgday | | | | |
| CDI = | Chronic Daily Intake | mg/kgday | | | | |
| CS = | Concentration of chemical in soil | mg/kg | see table of COCs below | | | |
| EF = | Exposure frequency | days/yr | 20 | 40 | 20 | 40 |
| ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| IR = | Ingestion rate | mg/day | 200 | 100 | 100 | 100 |
| FI = | Fraction of contaminated soil | unitless | 1 | 1 | 1 | 1 |
| CF = | Conversion factor | kg/mg | 1.00E-06 | 1.00E-06 | 1.00E-06 | 1.00E-06 |
| BW = | Body weight | kg | 15 | 47 | 70 | 70 |
| ATc = | Average time for carcinogens | days | 25550 | 25550 | 25550 | 25550 |
| ATn = | Average time for non-carcinogens | days | 1095 | 2190 | 5110 | 2555 |

| COC | conc | RfDo | CSFo | CHILD | | | | YOUTH | | | | ADULT | | | | SENIOR | | | | SUM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR |
| | mg/kg | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| 1,1,2-Trichloroethane | NA | 4.00E-03 | 5.70E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Butanone | NA | 6.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | NA | 4.50E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methylphenol | NA | 5.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 3.00E-03 | 2.10E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acetone | NA | 9.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Antimony | 7.53E-01 | 4.00E-04 | NA | 5.50E-07 | 1.38E-03 | NA | NA | 1.756E-07 | 4.39E-04 | NA | NA | 5.89E-08 | 1.47E-04 | NA | NA | 1.18E-07 | 2.95E-04 | NA | NA | 1.45E-07 | 3.63E-04 | NA | NA |
| Aroclor-1254 | NA | 2.00E-05 | 2.00E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Aroclor-1260 | NA | 2.00E-05 | 2.00E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Arsenic | 4.04E+01 | 3.00E-04 | 1.50E+00 | 2.95E-05 | 9.84E-02 | 1.26E-06 | 1.90E-06 | 9.42E-06 | 3.14E-02 | 8.07E-07 | 1.21E-06 | 3.16E-06 | 1.05E-02 | 6.32E-07 | 9.49E-07 | 6.32E-06 | 2.11E-02 | 6.32E-07 | 9.49E-07 | 7.79E-06 | 2.60E-02 | 3.34E-06 | 5.01E-06 |
| Barium | NA | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzene | NA | 4.00E-03 | 5.50E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | NA | 7.30E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | NA | 7.30E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | NA | 7.30E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | NA | 7.30E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beryllium | NA | 2.00E-03 | 4.30E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 4.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 2.00E-02 | 1.40E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Boron | NA | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 2.00E-02 | 6.20E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromoform | NA | 2.00E-02 | 7.90E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromomethane | NA | 1.40E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cadmium | 2.47E-01 | 1.00E-03 | NA | 1.80E-07 | 1.80E-04 | NA | NA | 5.759E-08 | 5.76E-05 | NA | NA | 1.93E-08 | 1.93E-05 | NA | NA | 3.87E-08 | 3.87E-05 | NA | NA | 4.76E-08 | 4.76E-05 | NA | NA |
| Carbazole | NA | NA | 2.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon disulfide | NA | 1.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 7.00E-04 | 1.30E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlordane | NA | 5.00E-04 | 3.50E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorobenzene | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroform | NA | 1.00E-02 | 6.10E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium (VI) | NA | 3.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | NA | NA | 7.30E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cobalt | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Copper | NA | 4.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 5.00E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | NA | 7.30E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dieldrin | NA | 5.00E-05 | 1.60E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 4.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

TABLE E-2 - IngestSoilChem

**Undeveloped Park User - Ingestion of Soil**
**Risk calculation for A6W-CU5**

Intake Equation:

| | | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|---|
| | | | | child | youth | adult | senior |
| CDI = | (CS*EF*ED*IR*FI*CF)/(BW*AT) | | | | | | |
| CDI = | Chronic Daily Intake | | mg/kgday | | | | |
| CS = | Concentration of chemical in soil | | mg/kg | see table of COCs below | | | |
| EF = | Exposure frequency | | days/yr | 20 | 40 | 20 | 40 |
| ED = | Exposure duration | | yrs | 3 | 6 | 14 | 7 |
| IR = | Ingestion rate | | mg/day | 200 | 100 | 100 | 100 |
| FI = | Fraction of contaminated soil | | unitless | 1 | 1 | 1 | 1 |
| CF = | Conversion factor | | kg/mg | 1.00E-06 | 1.00E-06 | 1.00E-06 | 1.00E-06 |
| BW = | Body weight | | kg | 15 | 47 | 70 | 70 |
| ATc = | Average time for carcinogens | | days | 25550 | 25550 | 25550 | 25550 |
| ATn = | Average time for non-carcinogens | | days | 1095 | 2190 | 5110 | 2555 |

| COC | conc | RfDo | CSFo | CHILD | | | | YOUTH | | | | ADULT | | | | SENIOR | | | | SUM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR |
| | mg/kg | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| Ethyl ether | NA | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 1.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoride | NA | 6.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | NA | 1.50E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | NA | 1.50E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | NA | 7.30E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.40E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mercury | NA | 3.00E-04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methanol | NA | 5.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methyl-2-pentanone | NA | 8.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 6.00E-02 | 7.50E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Molybdenum | NA | 5.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nickel | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 2.00E-02 | 4.90E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | NA | 7.00E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | NA | 1.50E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | NA | 1.50E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | NA | 7.50E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | NA | 7.50E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorophenol | NA | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 5.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Silver | 2.60E-01 | 5.00E-03 | NA | 1.90E-07 | 3.80E-05 | NA | NA | 6.062E-08 | 1.21E-05 | NA | NA | 2.04E-08 | 4.07E-06 | NA | NA | 4.07E-08 | 8.14E-06 | NA | NA | 5.01E-08 | 1.00E-05 | NA | NA |
| Tetrachlorodibenzofuran | NA | NA | 1.50E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | NA | 1.50E+05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Thallium | NA | 9.00E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | NA | 8.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 2.00E-01 | 5.40E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trichloroethylene | NA | 3.00E-04 | 4.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 5.01E+01 | 6.00E-04 | NA | 3.66E-05 | 6.10E-02 | NA | NA | 1.168E-05 | 1.95E-02 | NA | NA | 3.92E-06 | 6.54E-03 | NA | NA | 7.84E-06 | 1.31E-02 | NA | NA | 9.66E-06 | 1.61E-02 | NA | NA |
| Vanadium | NA | 7.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes | NA | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Zinc | NA | 3.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | | | | | | | | | | | | | | | | | | | | total = | 4.25E-02 | total = | 5.01E-06 |

**Undeveloped Park User - Dermal Contact with Surface Water**
**Risk calculation for A6W-CU5**

| | | | UNITS | Assigned Values child | youth | adult | senior |
|---|---|---|---|---|---|---|---|
| Intake Equation: | CDI = | (DA*EF*ED*SA)/(BW*AT) | | | | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below | | | |
| | DA = | Dermal absorption dose | mg/cm²day | see COC list below | | | |
| | EF = | Exposure frequency | days/yr | 12 | 12 | 12 | 12 |
| | ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| | SA = | Surface area of skin | cm² | 2180 | 4470 | 6070 | 6070 |
| | BW = | Body weight | kg | 15 | 47 | 70 | 70 |
| | ATc = | Average time for carcinogens | days | 25550 | 25550 | 25550 | 25550 |
| | ATn = | Average time for non-carcinogens | days | 1095 | 2190 | 5110 | 2555 |
| where: | DA = $C_v$*$K_p$*CF*ET | | | | | | |
| | $C_v$ = | concentation of ith contaminant in surface water | mg/L | see COC list below | | | |
| | $K_p$ = | permeability constant for ith contaminant | cm/hr | see COC list below | | | |
| | CF = | conversion factor | L/cm³ | 0.001 | 0.001 | 0.001 | 0.001 |
| | ET = | exposure time | hr/d | 1 | 1 | 1 | 1 |

| COC | $C_v$ | $K_p$ | DA | RfDd | CSFd | CHILD CDI | CHILD HQ | CHILD CDI | CHILD ILCR | YOUTH CDI | YOUTH HQ | YOUTH CDI | YOUTH ILCR | ADULT CDI | ADULT HQ | ADULT CDI | ADULT ILCR | SENIOR CDI | SENIOR HQ | SENIOR CDI | SENIOR ILCR | SUM CDI | SUM HQ | SUM CDI | SUM ILCR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg/L | cm/hr | mg/cm²day | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| 1,1,2-Trichloroethane | NA | 6.43E-03 | NA | 3.24E-03 | 7.04E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 1.59E-02 | NA | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 5.34E-03 | NA | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Butanone | NA | 1.11E-03 | NA | 4.80E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | 1.69E-02 | NA | NA | 9.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methylphenol | NA | 9.95E-03 | NA | 3.25E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 2.66E-03 | NA | 2.40E-03 | 2.63E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acetone | NA | 5.69E-04 | NA | 7.47E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Antimony | 2.50E-04 | 1.00E-03 | 2.50E-10 | 8.00E-06 | NA | 1.19E-09 | 1.49E-04 | NA | NA | 7.82E-10 | 9.77E-05 | NA | NA | 7.13E-10 | 8.91E-05 | NA | NA | 7.13E-10 | 8.91E-05 | NA | NA | 7.75E-10 | 9.68E-05 | NA | NA |
| Aroclor-1254 | NA | 1.29E+00 | NA | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Aroclor-1260 | NA | 5.48E+00 | NA | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Arsenic | 1.50E-03 | 1.00E-03 | 1.50E-09 | 1.23E-04 | 3.66E+00 | 7.17E-09 | 5.83E-05 | 3.07E-10 | 1.12E-09 | 4.69E-09 | 3.81E-05 | 4.02E-10 | 1.47E-09 | 4.28E-09 | 3.48E-05 | 8.55E-10 | 3.13E-09 | 4.28E-09 | 3.48E-05 | 4.28E-10 | 1.57E-09 | 4.65E-09 | 3.78E-05 | 1.99E-09 | 7.29E-09 |
| Barium | NA | 1.00E-03 | NA | 1.40E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzene | NA | 2.07E-02 | NA | 3.88E-03 | 5.67E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | 9.48E-01 | NA | NA | 2.35E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | 1.24E+00 | NA | NA | 2.35E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | 6.99E-01 | NA | NA | 2.35E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | 1.20E+00 | NA | NA | 2.35E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beryllium | NA | 1.00E-03 | NA | 2.00E-05 | 4.30E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 7.63E-02 | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 1.97E+00 | NA | 3.80E-03 | 7.37E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Boron | NA | 1.00E-03 | NA | 1.80E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 5.02E-03 | NA | 1.96E-02 | 6.33E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromoform | NA | 2.77E-03 | NA | 1.20E-02 | 1.32E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromomethane | NA | 3.51E-03 | NA | 1.12E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cadmium | 5.00E-05 | 1.00E-03 | 5.00E-11 | 1.00E-05 | NA | 2.39E-10 | 2.39E-05 | NA | NA | 1.56E-10 | 1.56E-05 | NA | NA | 1.43E-10 | 1.43E-05 | NA | NA | 1.43E-10 | 1.43E-05 | NA | NA | 1.55E-10 | 1.55E-05 | NA | NA |
| Carbazole | NA | 7.97E-02 | NA | NA | 2.86E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon disulfide | NA | 1.56E-02 | NA | 6.30E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 2.24E-02 | NA | 4.55E-04 | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlordane | NA | 1.57E-01 | NA | 2.50E-04 | 7.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorobenzene | NA | 4.07E-02 | NA | 6.20E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroform | NA | 8.92E-03 | NA | 2.00E-03 | 3.05E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium (VI) | NA | 2.00E-03 | NA | 6.00E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | NA | 1.03E+00 | NA | NA | 2.35E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cobalt | NA | 4.00E-04 | NA | 1.60E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Copper | NA | 1.00E-03 | NA | 1.20E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | NA | 1.00E-03 | NA | 3.40E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 1.80E-03 | NA | 4.00E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | 1.68E+00 | NA | NA | 2.35E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dieldrin | NA | 4.45E-02 | NA | 2.50E-05 | 3.20E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 4.45E+00 | NA | 3.60E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethyl ether | NA | 2.88E-03 | NA | 1.60E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

TABLE E-2 - DermalSWchem

**Undeveloped Park User - Dermal Contact with Surface Water**
**Risk calculation for A6W-CU5**

| | | | UNITS | Assigned Values child | youth | adult | senior |
|---|---|---|---|---|---|---|---|
| Intake Equation: | CDI = | (DA*EF*ED*SA)/(BW*AT) | | | | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below | | | |
| | DA = | Dermal absorption dose | mg/cm²day | see COC list below | | | |
| | EF = | Exposure frequency | days/yr | 12 | 12 | 12 | 12 |
| | ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| | SA = | Surface area of skin | cm² | 2180 | 4470 | 6070 | 6070 |
| | BW = | Body weight | kg | 15 | 47 | 70 | 70 |
| | ATc = | Average time for carcinogens | days | 25550 | 25550 | 25550 | 25550 |
| | ATn = | Average time for non-carcinogens | days | 1095 | 2190 | 5110 | 2555 |
| where: | DA = $C_v$*$K_p$*CF*ET | | | | | | |
| | $C_v$ = | concentation of ith contaminant in surface water | mg/L | see COC list below | | | |
| | $K_p$ = | permeability constant for ith contaminant | cm/hr | see COC list below | | | |
| | CF = | conversion factor | L/cm³ | 0.001 | 0.001 | 0.001 | 0.001 |
| | ET = | exposure time | hr/d | 1 | 1 | 1 | 1 |

| COC | $C_v$ mg/L | $K_p$ cm/hr | DA mg/cm²day | RfDd mg/kgday | CSFd kgday/mg | CHILD CDI mg/kgday | CHILD HQ CDI/RfD | CHILD CDI mg/kgday | CHILD ILCR CDI*CSF | YOUTH CDI mg/kgday | YOUTH HQ CDI/RfD | YOUTH CDI mg/kgday | YOUTH ILCR CDI*CSF | ADULT CDI mg/kgday | ADULT HQ CDI/RfD | ADULT CDI mg/kgday | ADULT ILCR CDI*CSF | SENIOR CDI mg/kgday | SENIOR HQ CDI/RfD | SENIOR CDI mg/kgday | SENIOR ILCR CDI*CSF | SUM CDI mg/kgday | SUM HQ CDI/RfD | SUM CDI mg/kgday | SUM ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ethylbenzene | NA | 7.39E-02 | NA | 9.70E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoride | NA | 1.00E-03 | NA | 5.82E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | 2.55E+00 | NA | NA | 3.00E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | 3.22E+00 | NA | NA | 3.00E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | 2.38E+00 | NA | NA | 3.00E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | 5.29E+00 | NA | NA | 3.00E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | 2.23E+00 | NA | NA | 2.35E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead | NA | 1.00E-04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.00E-03 | NA | 1.84E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mercury | NA | 1.00E-03 | NA | 2.10E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methanol | NA | 3.45E-04 | NA | 4.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methyl-2-pentanone | NA | 3.97E-03 | NA | 6.40E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 4.46E-03 | NA | 5.70E-02 | 7.89E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Molybdenum | NA | 1.00E-03 | NA | 1.90E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nickel | NA | 2.00E-04 | NA | 5.40E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 1.96E-02 | NA | 5.00E-03 | 1.96E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | 2.83E-03 | NA | NA | 2.80E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | 4.78E+00 | NA | NA | 3.00E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | 1.65E+01 | NA | NA | 3.00E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | 1.06E+00 | NA | NA | 1.50E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | 3.79E-01 | NA | NA | 1.50E+05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorophenol | NA | 1.95E-01 | NA | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NA | 2.29E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 1.00E-03 | NA | 2.20E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Silver | 1.00E-04 | 6.00E-04 | 6.00E-11 | 9.00E-04 | NA | 2.87E-10 | 3.19E-07 | NA | NA | 1.88E-10 | 2.08E-07 | NA | NA | 1.71E-10 | 1.90E-07 | NA | NA | 1.71E-10 | 1.90E-07 | NA | NA | 1.86E-10 | 2.07E-07 | NA | NA |
| Tetrachlorodibenzofuran | NA | 1.12E+00 | NA | NA | 3.00E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | 1.39E+00 | NA | NA | 3.00E+05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 4.81E-02 | NA | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Thallium | NA | 1.00E-03 | NA | 1.80E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | NA | 4.53E-02 | NA | 6.40E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 3.13E-02 | NA | 1.00E-01 | 1.08E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trichloroethylene | NA | 1.57E-02 | NA | 4.50E-05 | 2.67E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 8.05E-03 | 1.00E-03 | 8.05E-09 | 5.10E-04 | NA | 3.85E-08 | 7.54E-05 | NA | NA | 2.52E-08 | 4.94E-05 | NA | NA | 2.29E-08 | 4.50E-05 | NA | NA | 2.29E-08 | 4.50E-05 | NA | NA | 2.49E-08 | 4.89E-05 | NA | NA |
| Vanadium | NA | 1.00E-03 | NA | 7.00E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 1.13E-02 | NA | 3.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes | NA | 7.04E-02 | NA | 1.84E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Zinc | NA | 6.00E-04 | NA | 6.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | | | | | | | | | | | | | | | | | | | | | | total = | 1.99E-04 | total = | 7.29E-09 |

TABLE E-2 - IngestSWchem

**Undeveloped Park User - Ingestion of Surface Water**
**Risk calculation for A6W-CU5**

Intake Equation:

| | | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|---|
| | | | | child | youth | adult | senior |
| CDI = | (CW*EF*ED*IR)/(BW*AT) | | | | | | |
| CDI = | Chronic Daily Intake | | mg/kgday | | | | |
| CW = | Concentration of chemical in water | | mg/L | see COC table below | | | |
| EF = | Exposure frequency | | days/yr | 12 | 12 | 12 | 12 |
| ED = | Exposure duration | | yrs | 3 | 6 | 14 | 7 |
| IR = | Ingestion rate | | L/day | 0.035 | 0.035 | 0.015 | 0.015 |
| BW = | Body weight | | kg | 15 | 47 | 70 | 70 |
| ATc = | Average time for carcinogens | | days | 25550 | 25550 | 25550 | 25550 |
| ATn = | Average time for non-carcinogens | | days | 1095 | 2190 | 5110 | 2555 |

| COC | CW | RfDo | CSFo | CHILD | | | | YOUTH | | | | ADULT | | | | SENIOR | | | | SUM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR |
| | mg/L | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| 1,1,2-Trichloroethane | NA | 4.00E-03 | 5.70E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 2-Butanone | NA | 6.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | NA | 4.50E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methylphenol | NA | 5.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 3.00E-03 | 2.10E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Acetone | NA | 9.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Antimony | 2.50E-04 | 4.00E-04 | NA | 1.92E-08 | 4.79E-05 | NA | NA | 6.12E-09 | 1.53E-05 | NA | NA | 1.76E-09 | 4.40E-06 | NA | NA | 1.76E-09 | 4.40E-06 | NA | NA | 4.37E-09 | 1.09E-05 | NA | NA |
| Aroclor-1254 | NA | 2.00E-05 | 4.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Aroclor-1260 | NA | 2.00E-05 | 4.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Arsenic | 1.50E-03 | 3.00E-04 | 1.50E+00 | 1.15E-07 | 3.84E-04 | 4.93E-09 | 7.40E-09 | 3.67E-08 | 1.22E-04 | 3.15E-09 | 4.72E-09 | 1.06E-08 | 3.52E-05 | 2.11E-09 | 3.17E-09 | 1.06E-08 | 3.52E-05 | 1.06E-09 | 1.59E-09 | 2.62E-08 | 8.75E-05 | 1.12E-08 | 1.69E-08 |
| Barium | NA | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzene | NA | 4.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Beryllium | NA | 2.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 4.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Boron | NA | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromoform | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Bromomethane | NA | 1.40E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cadmium | 5.00E-05 | 1.00E-03 | NA | 3.84E-09 | 3.84E-06 | NA | NA | 1.22E-09 | 1.22E-06 | NA | NA | 3.52E-10 | 3.52E-07 | NA | NA | 3.52E-10 | 3.52E-07 | NA | NA | 8.75E-10 | 8.75E-07 | NA | NA |
| Carbazole | NA | NA | 2.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon disulfide | NA | 1.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 7.00E-04 | 1.30E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlordane | NA | 5.00E-04 | 3.50E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chlorobenzene | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chloroform | NA | 1.00E-02 | 6.10E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chromium (VI) | NA | 3.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Chrysene | NA | NA | 7.30E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cobalt | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Copper | NA | 4.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 5.00E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | NA | 7.30E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Dieldrin | NA | 5.00E-05 | 1.60E+01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 4.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |

TABLE E-2 - IngestSWchem

**Risk calculation for A6W-CU5**

Intake Equation:

| | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|
| | | | child | youth | adult | senior |
| CDI = | (CW*EF*ED*IR)/(BW*AT) | | | | | |
| CDI = | Chronic Daily Intake | mg/kgday | | | | |
| CW = | Concentration of chemical in water | mg/L | see COC table below | | | |
| EF = | Exposure frequency | days/yr | 12 | 12 | 12 | 12 |
| ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| IR = | Ingestion rate | L/day | 0.035 | 0.035 | 0.015 | 0.015 |
| BW = | Body weight | kg | 15 | 47 | 70 | 70 |
| ATc = | Average time for carcinogens | days | 25550 | 25550 | 25550 | 25550 |
| ATn = | Average time for non-carcinogens | days | 1095 | 2190 | 5110 | 2555 |

| COC | CW | RfDo | CSFo | CHILD | | | | YOUTH | | | | ADULT | | | | SENIOR | | | | SUM | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR | CDI | HQ | CDI | ILCR |
| | mg/L | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| Ethyl ether | NA | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 1.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Fluoride | NA | 6.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | NA | 1.50E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | NA | 1.50E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | NA | 7.30E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 4.60E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Mercury | NA | 3.00E-04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methanol | NA | 5.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| 4-Methyl-2-pentanone | NA | 8.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 6.00E-02 | 7.50E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Molybdenum | NA | 5.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Nickel | NA | 2.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 2.00E-02 | 4.90E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | NA | 7.00E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | NA | 1.50E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | NA | 1.50E+02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | NA | 7.50E+03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | NA | 7.50E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Pentachlorophenol | NA | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 5.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Silver | 1.00E-04 | 5.00E-03 | NA | 7.67E-09 | 1.53E-06 | NA | NA | 2.45E-09 | 4.90E-07 | NA | NA | 7.05E-10 | 1.41E-07 | NA | NA | 7.05E-10 | 1.41E-07 | NA | NA | 1.75E-09 | 3.50E-07 | NA | NA |
| Tetrachlorodibenzofuran | NA | NA | 1.50E+04 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | NA | 1.50E+05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Thallium | NA | 9.00E-05 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Toluene | NA | 8.00E-02 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 2.00E-01 | 5.40E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trichloroethylene | NA | 3.00E-04 | 4.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 8.05E-03 | 6.00E-04 | NA | 6.18E-07 | 1.03E-03 | NA | NA | 1.97E-07 | 3.28E-04 | NA | NA | 5.67E-08 | 9.45E-05 | NA | NA | 5.67E-08 | 9.45E-05 | NA | NA | 1.41E-07 | 2.35E-04 | NA | NA |
| Vanadium | NA | 7.00E-03 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Xylenes | NA | 2.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Zinc | NA | 3.00E-01 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| | | | | | | | | | | | | | | | | | | | | total = | 3.34E-04 | total = | 1.69E-08 |

TABLE E-2 - InhaleRad

**Undeveloped Park User - Inhalation of Gases & Particulates**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|---|
| | | | | child | youth | adult | senior |
| | CDI = | (CA*EF*ED*IR*ET) | | | | | |
| | CDI = | Chronic Daily Intake | pCi | | | | |
| | CA = | Concentration of radionuclide in air | pCi/m³ | see table of COCs below | | | |
| | EF = | Exposure frequency | days/yr | 20 | 40 | 20 | 40 |
| | ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| | IR = | Inhalation rate | m³/hr | 1.0 | 1.0 | 1.0 | 1.0 |
| | ET = | Exposure time | hrs/day | 2 | 2 | 2 | 2 |

| COC | conc | CSFi | CHILD | | YOUTH | | ADULT | | SENIOR | | SUM | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CDI | ILCR | CDI | ILCR | CDI | ILCR | CDI | ILCR | CDI | ILCR |
| | pCi/m³ | 1/pCi | pCi | CDI*CSF | pCi | CDI*CSF | pCi | CDI*CSF | pCi | CDI*CSF | pCi | CDI*CSF |
| Cesium-137 + D | NA | 1.19E-11 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead-210 + D | NA | 1.39E-08 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Neptunium-237 + D | NA | 1.77E-08 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Plutonium-238 | NA | 3.36E-08 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Plutonium-239/240 | NA | 3.33E-08 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Radium-226 + D | 3.09E-05 | 1.16E-08 | 3.71E-03 | 4.31E-11 | 1.49E-02 | 1.72E-10 | 1.73E-02 | 2.01E-10 | 1.73E-02 | 2.01E-10 | 5.32E-02 | 6.17E-10 |
| Radium-228 + D | 3.04E-05 | 5.23E-09 | 3.65E-03 | 1.91E-11 | 1.46E-02 | 7.64E-11 | 1.70E-02 | 8.91E-11 | 1.70E-02 | 8.91E-11 | 5.23E-02 | 2.74E-10 |
| Radon-222+ D | 3.18E+02 | 1.80E-11 | 3.81E+04 | 6.86E-07 | 1.53E+05 | 2.75E-06 | 1.78E+05 | 3.20E-06 | 1.78E+05 | 3.20E-06 | 5.46E+05 | 9.84E-06 |
| Strontium-90 + D | NA | 1.13E-10 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Technetium-99 | 1.48E-04 | 1.41E-11 | 1.78E-02 | 2.51E-13 | 7.13E-02 | 1.00E-12 | 8.31E-02 | 1.17E-12 | 8.31E-02 | 1.17E-12 | 2.55E-01 | 3.60E-12 |
| Thorium-228 + D | 3.33E-05 | 1.43E-07 | 3.99E-03 | 5.71E-10 | 1.60E-02 | 2.28E-09 | 1.86E-02 | 2.67E-09 | 1.86E-02 | 2.67E-09 | 5.72E-02 | 8.19E-09 |
| Thorium-230 | 1.15E-04 | 2.85E-08 | 1.38E-02 | 3.92E-10 | 5.50E-02 | 1.57E-09 | 6.42E-02 | 1.83E-09 | 6.42E-02 | 1.83E-09 | 1.97E-01 | 5.62E-09 |
| Thorium-232 | 3.04E-05 | 4.33E-08 | 3.65E-03 | 1.58E-10 | 1.46E-02 | 6.32E-10 | 1.70E-02 | 7.38E-10 | 1.70E-02 | 7.38E-10 | 5.23E-02 | 2.27E-09 |
| Uranium-234 | 4.45E-04 | 1.14E-08 | 5.33E-02 | 6.08E-10 | 2.13E-01 | 2.43E-09 | 2.49E-01 | 2.84E-09 | 2.49E-01 | 2.84E-09 | 7.65E-01 | 8.72E-09 |
| Uranium-235 + D | 2.03E-05 | 1.01E-08 | 2.43E-03 | 2.46E-11 | 9.72E-03 | 9.82E-11 | 1.13E-02 | 1.15E-10 | 1.13E-02 | 1.15E-10 | 3.48E-02 | 3.52E-10 |
| Uranium-238 + D | 4.34E-04 | 9.35E-09 | 5.21E-02 | 4.87E-10 | 2.08E-01 | 1.95E-09 | 2.43E-01 | 2.27E-09 | 2.43E-01 | 2.27E-09 | 7.47E-01 | 6.98E-09 |
| | | | | | | | | | | | **total =** | **9.87E-06** |

Air particulate is 26 ug/m3, the 2005 SER background average from monitor AMS-12.
Rn-222 is derived by multiplying the soil Ra-226 value by 267 g/m3. This conversion factor is based on Rn-222 air background and Ra-226 soil background (i.e., 400 pCi/m3 divided by 1.5 pCi/g)

TABLE E-2 - IngestSoilRad

**Undeveloped Park User - Ingestion of Soil**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|---|
| | | | | child | youth | adult | senior |
| | CDI = | (CS*EF*ED*IR*FI) | | | | | |
| | CDI = | Chronic Daily Intake | pCi | | | | |
| | CS = | Concentration of radionuclide in soil | pCi/g | see table of COCs below | | | |
| | EF = | Exposure frequency | days/yr | 20 | 40 | 20 | 40 |
| | ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| | IR = | Ingestion rate | g/day | 0.2 | 0.1 | 0.1 | 0.1 |
| | FI = | Fraction of contaminated soil | unitless | 1 | 1 | 1 | 1 |

| COC | conc | CSFos | CHILD | | YOUTH | | ADULT | | SENIOR | | SUM | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CDI | ILCR | CDI | ILCR | CDI | ILCR | CDI | ILCR | CDI | ILCR |
| | pCi/g | 1/pCi | pCi | CDI*CSF | pCi | CDI*CSF | pCi | CDI*CSF | pCi | CDI*CSF | pCi | CDI*CSF |
| Cesium-137 + D | NA | 4.33E-11 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead-210 + D | NA | 2.66E-09 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Neptunium-237 + D | NA | 1.62E-10 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Plutonium-238 | NA | 2.72E-10 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Plutonium-239/240 | NA | 2.76E-10 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Radium-226 + D | 1.19E+00 | 7.30E-10 | 1.43E+01 | 1.04E-08 | 2.86E+01 | 2.08E-08 | 3.33E+01 | 2.43E-08 | 3.33E+01 | 2.43E-08 | 1.09E+02 | 7.99E-08 |
| Radium-228 + D | 1.17E+00 | 2.29E-09 | 1.40E+01 | 3.22E-08 | 2.81E+01 | 6.43E-08 | 3.28E+01 | 7.50E-08 | 3.28E+01 | 7.50E-08 | 1.08E+02 | 2.46E-07 |
| Radon-222+ D | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Strontium-90 + D | NA | 1.44E-10 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Technetium-99 | 5.71E+00 | 7.66E-12 | 6.85E+01 | 5.25E-10 | 1.37E+02 | 1.05E-09 | 1.60E+02 | 1.22E-09 | 1.60E+02 | 1.22E-09 | 5.25E+02 | 4.02E-09 |
| Thorium-228 + D | 1.28E+00 | 8.09E-10 | 1.54E+01 | 1.24E-08 | 3.07E+01 | 2.49E-08 | 3.58E+01 | 2.90E-08 | 3.58E+01 | 2.90E-08 | 1.18E+02 | 9.53E-08 |
| Thorium-230 | 4.41E+00 | 2.02E-10 | 5.29E+01 | 1.07E-08 | 1.06E+02 | 2.14E-08 | 1.23E+02 | 2.49E-08 | 1.23E+02 | 2.49E-08 | 4.06E+02 | 8.20E-08 |
| Thorium-232 | 1.17E+00 | 2.31E-10 | 1.40E+01 | 3.24E-09 | 2.81E+01 | 6.49E-09 | 3.28E+01 | 7.57E-09 | 3.28E+01 | 7.57E-09 | 1.08E+02 | 2.49E-08 |
| Uranium-234 | 1.71E+01 | 1.58E-10 | 2.05E+02 | 3.24E-08 | 4.10E+02 | 6.48E-08 | 4.79E+02 | 7.56E-08 | 4.79E+02 | 7.56E-08 | 1.57E+03 | 2.49E-07 |
| Uranium-235 + D | 7.79E-01 | 1.63E-10 | 9.35E+00 | 1.52E-09 | 1.87E+01 | 3.05E-09 | 2.18E+01 | 3.56E-09 | 2.18E+01 | 3.56E-09 | 7.17E+01 | 1.17E-08 |
| Uranium-238 + D | 1.67E+01 | 2.10E-10 | 2.00E+02 | 4.21E-08 | 4.01E+02 | 8.42E-08 | 4.68E+02 | 9.82E-08 | 4.68E+02 | 9.82E-08 | 1.54E+03 | 3.23E-07 |
| | | | | | | | | | | | **total =** | **1.12E-06** |

TABLE E-2 - IngestSWrad

**Undeveloped Park User - Ingestion of Surface Water**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|---|
| | | | | child | youth | adult | senior |
| | CDI = | (CW*EF*ED*IR)/(BW*AT) | | | | | |
| | CDI = | Chronic Daily Intake | pCi | | | | |
| | CW = | Concentration of radionuclide in water | pCi/L | see COC table below | | | |
| | EF = | Exposure frequency | days/yr | 12 | 12 | 12 | 12 |
| | ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| | IR = | Ingestion rate | L/day | 0.035 | 0.035 | 0.015 | 0.015 |

| COC | conc | CSF | CHILD | | YOUTH | | ADULT | | SENIOR | | SUM | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CDI | ILCR | CDI | ILCR | CDI | ILCR | CDI | ILCR | CDI | ILCR |
| | pCi/L | 1/pCi | pCi | CDI*CSF | pCi | CDI*CSF | pCi | CDI*CSF | pCi | CDI*CSF | pCi | CDI*CSF |
| Cesium-137 + D | NA | 3.04E-11 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead-210 + D | NA | 1.27E-09 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Neptunium-237 + D | NA | 6.74E-11 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Plutonium-238 | NA | 1.31E-10 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Plutonium-239/240 | NA | 1.35E-10 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Radium-226 + D | 1.96E-01 | 3.86E-10 | 2.47E-01 | 9.53E-11 | 4.94E-01 | 1.91E-10 | 4.94E-01 | 1.91E-10 | 2.47E-01 | 9.53E-11 | 1.48E+00 | 5.72E-10 |
| Radium-228 + D | 3.65E+00 | 1.04E-09 | 4.60E+00 | 4.78E-09 | 9.20E+00 | 9.57E-09 | 9.20E+00 | 9.57E-09 | 4.60E+00 | 4.78E-09 | 2.76E+01 | 2.87E-08 |
| Radon-222+ D | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Strontium-90 + D | NA | 7.40E-11 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Technetium-99 | 6.20E+00 | 2.75E-12 | 7.81E+00 | 2.15E-11 | 1.56E+01 | 4.30E-11 | 1.56E+01 | 4.30E-11 | 7.81E+00 | 2.15E-11 | 4.69E+01 | 1.29E-10 |
| Thorium-228 + D | 3.65E+00 | 3.00E-10 | 4.60E+00 | 1.38E-09 | 9.20E+00 | 2.76E-09 | 9.20E+00 | 2.76E-09 | 4.60E+00 | 1.38E-09 | 2.76E+01 | 8.28E-09 |
| Thorium-230 | 6.30E-02 | 9.10E-11 | 7.94E-02 | 7.22E-12 | 1.59E-01 | 1.44E-11 | 1.59E-01 | 1.44E-11 | 7.94E-02 | 7.22E-12 | 4.76E-01 | 4.33E-11 |
| Thorium-232 | 3.65E+00 | 1.01E-10 | 4.60E+00 | 4.64E-10 | 9.20E+00 | 9.29E-10 | 9.20E+00 | 9.29E-10 | 4.60E+00 | 4.64E-10 | 2.76E+01 | 2.79E-09 |
| Uranium-234 | 2.75E+00 | 7.07E-11 | 3.46E+00 | 2.45E-10 | 6.93E+00 | 4.90E-10 | 6.93E+00 | 4.90E-10 | 3.46E+00 | 2.45E-10 | 2.08E+01 | 1.47E-09 |
| Uranium-235 + D | 1.25E-01 | 7.18E-11 | 1.58E-01 | 1.13E-11 | 3.16E-01 | 2.27E-11 | 3.16E-01 | 2.27E-11 | 1.58E-01 | 1.13E-11 | 9.47E-01 | 6.80E-11 |
| Uranium-238 + D | 2.68E+00 | 8.71E-11 | 3.38E+00 | 2.95E-10 | 6.77E+00 | 5.89E-10 | 6.77E+00 | 5.89E-10 | 3.38E+00 | 2.95E-10 | 2.03E+01 | 1.77E-09 |
| | | | | | | | | | | | **total =** | **4.38E-08** |

TABLE E-2 - ExternalRad

**Undeveloped Park User - External Radiation**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Values | | | |
|---|---|---|---|---|---|---|---|
| | | | | child | youth | adult | senior |
| | CDI = | (CS*EF*ED*$ET_o$*(1-$SH_o$)) | | | | | |
| | CDI = | Chronic Daily Intake | yr pCi/g | | | | |
| | CS = | Concentration of radionuclide in soil | pCi/g | see table of COCs below | | | |
| | EF = | Fraction of year exposed to radiation | -- | 0.055 | 0.11 | 0.055 | 0.11 |
| | ED = | Exposure duration | yrs | 3 | 6 | 14 | 7 |
| | $ET_o$ = | Fraction of day spent outdoors | -- | 0.083 | 0.083 | 0.083 | 0.083 |
| | $ET_i$ = | Fraction of day spent indoors | -- | NA | NA | NA | NA |
| | $SH_o$ = | Shield factor outdoors | -- | 0.25 | 0.25 | 0.25 | 0.25 |
| | $SH_i$ = | Shield factor indoors | -- | NA | NA | NA | NA |

| COC | conc | CSFx | CHILD | | YOUTH | | ADULT | | SENIOR | | SUM | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | CDI | ILCR | CDI | ILCR | CDI | ILCR | CDI | ILCR | CDI | ILCR |
| | pCi/g | g/pCi yr | yr pCi/g | CDI*CSF | yr pCi/g | CDI*CSF | yr pCi/g | CDI*CSF | yr pCi/g | CDI*CSF | yr pCi/g | CDI*CSF |
| Cesium-137 + D | NA | 2.55E-06 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Lead-210 + D | NA | 4.21E-09 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Neptunium-237 + D | NA | 7.97E-07 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Plutonium-238 | NA | 7.22E-11 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Plutonium-239/240 | NA | 2.00E-10 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Radium-226 + D | 1.19E+00 | 8.49E-06 | 1.22E-02 | 1.04E-07 | 4.89E-02 | 4.15E-07 | 5.71E-02 | 4.84E-07 | 5.71E-02 | 4.84E-07 | 1.75E-01 | 1.49E-06 |
| Radium-228 + D | 1.17E+00 | 4.53E-06 | 1.20E-02 | 5.45E-08 | 4.81E-02 | 2.18E-07 | 5.61E-02 | 2.54E-07 | 5.61E-02 | 2.54E-07 | 1.72E-01 | 7.80E-07 |
| Radon-222+ D | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Strontium-90 + D | NA | 1.96E-08 | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Technetium-99 | 5.71E+00 | 8.14E-11 | 5.87E-02 | 4.78E-12 | 2.35E-01 | 1.91E-11 | 2.74E-01 | 2.23E-11 | 2.74E-01 | 2.23E-11 | 8.41E-01 | 6.84E-11 |
| Thorium-228 + D | 1.28E+00 | 7.76E-06 | 1.32E-02 | 1.02E-07 | 5.26E-02 | 4.08E-07 | 6.14E-02 | 4.76E-07 | 6.14E-02 | 4.76E-07 | 1.88E-01 | 1.46E-06 |
| Thorium-230 | 4.41E+00 | 8.19E-10 | 4.53E-02 | 3.71E-11 | 1.81E-01 | 1.48E-10 | 2.11E-01 | 1.73E-10 | 2.11E-01 | 1.73E-10 | 6.49E-01 | 5.32E-10 |
| Thorium-232 | 1.17E+00 | 3.42E-10 | 1.20E-02 | 4.11E-12 | 4.81E-02 | 1.64E-11 | 5.61E-02 | 1.92E-11 | 5.61E-02 | 1.92E-11 | 1.72E-01 | 5.89E-11 |
| Uranium-234 | 1.71E+01 | 2.52E-10 | 1.76E-01 | 4.43E-11 | 7.03E-01 | 1.77E-10 | 8.20E-01 | 2.07E-10 | 8.20E-01 | 2.07E-10 | 2.52E+00 | 6.35E-10 |
| Uranium-235 + D | 7.79E-01 | 5.43E-07 | 8.01E-03 | 4.35E-09 | 3.20E-02 | 1.74E-08 | 3.74E-02 | 2.03E-08 | 3.74E-02 | 2.03E-08 | 1.15E-01 | 6.23E-08 |
| Uranium-238 + D | 1.67E+01 | 1.14E-07 | 1.72E-01 | 1.96E-08 | 6.86E-01 | 7.82E-08 | 8.01E-01 | 9.13E-08 | 8.01E-01 | 9.13E-08 | 2.46E+00 | 2.80E-07 |
| | | | | | | | | | | | **total =** | **4.07E-06** |

TABLE E-2 - SumPaths

**Undeveloped Park User - Summation of all Pathways**
**Risk calculation for A6W-CU5**

| | | HQ | ILCR | rad only ILCR |
|---|---|---|---|---|
| **Inhale** | | 0.00E+00 | 9.89E-06 | 9.87E-06 |
| **Dermal Soil** | | 9.10E-03 | 1.72E-06 | NA |
| **Ingest Soil** | | 4.25E-02 | 6.12E-06 | 1.12E-06 |
| **Dermal Surface Water** | | 1.99E-04 | 7.29E-09 | NA |
| **Ingest Surface Water** | | 3.34E-04 | 1.69E-08 | 4.38E-08 |
| **External Radiation** | | NA | 4.12E-06 | 4.07E-06 |
| | **SUM** | **5.21E-02** | **2.19E-05** | **1.51E-05** |

Summation of all paths for individual nuclides

| | ILCR |
|---|---|
| Cesium-137 + D | NA |
| Lead-210 + D | NA |
| Neptunium-237 + D | NA |
| Plutonium-238 | NA |
| Plutonium-239/240 | NA |
| Radium-226 + D | 1.57E-06 |
| Radium-228 + D | 1.06E-06 |
| Radon-222+ D | 9.84E-06 |
| Strontium-90 + D | NA |
| Technetium-99 | 4.22E-09 |
| Thorium-228 + D | 1.57E-06 |
| Thorium-230 | 8.82E-08 |
| Thorium-232 | 3.00E-08 |
| Uranium-234 | 2.59E-07 |
| Uranium-235 + D | 7.44E-08 |
| Uranium-238 + D | 6.12E-07 |
| | **1.51E-05** |

TABLE E-2 - SumPaths

Summation of all paths for individual chemicals

| | ILCR | HQ |
|---|---|---|
| 1,1,2-Trichloroethane | NA | NA |
| 1,1-Dichloroethylene | NA | NA |
| 1,2-dichloroethane | NA | NA |
| 2-Butanone | no CSFs | NA |
| 3,3-Dichlorobenzidine | NA | no RfDs |
| 4-Methylphenol | no CSFs | NA |
| 4-Nitroanaline | NA | NA |
| Acetone | no CSFs | NA |
| Antimony | no CSFs | 5.56E-04 |
| Aroclor-1254 | NA | NA |
| Aroclor-1260 | NA | NA |
| Arsenic | 6.77E-06 | 3.50E-02 |
| Barium | no CSFs | NA |
| Benzene | NA | NA |
| Benzo(a)anthracene | NA | no RfDs |
| Benzo(a)pyrene | NA | no RfDs |
| Benzo(b)fluoranthene | NA | no RfDs |
| Benzo(k)fluoranthene | NA | no RfDs |
| Beryllium | NA | NA |
| Bis(2-chloroisopropyl)ether | no CSFs | NA |
| Bis(2-ethylhexyl)phthalate | NA | NA |
| Boron | no CSFs | NA |
| Bromodichloromethane | NA | NA |
| Bromoform | NA | NA |
| Bromomethane | no CSFs | NA |
| Cadmium | 5.42E-11 | 8.63E-05 |
| Carbazole | NA | no RfDs |
| Carbon disulfide | no CSFs | NA |
| Carbon tetrachloride | NA | NA |
| Chlordane | NA | NA |
| Chlorobenzene | no CSFs | NA |
| Chloroform | NA | NA |
| Chromium (VI) | NA | NA |
| Chrysene | NA | no RfDs |
| Cobalt | NA | NA |
| Copper | no CSFs | NA |
| Cyanide | no CSFs | NA |
| Cyclohexanone | no CSFs | NA |

TABLE E-2 - SumPaths

| | | |
|---|---|---|
| Dibenzo(a,h)anthracene | NA | no RfDs |
| Dieldrin | NA | NA |
| Di-n-octylphthalate | no CSFs | NA |
| Ethyl ether | no CSFs | NA |
| Ethylbenzene | NA | NA |
| Fluoride | no CSFs | NA |
| Heptachlorodibenzofuran | NA | no RfDs |
| Heptachlorodibenzo-p-dioxin | NA | no RfDs |
| Hexachlorodibenzofuran | NA | no RfDs |
| Hexachlorodibenzo-p-dioxin | NA | no RfDs |
| Indeno(1,2,3-cd)pyrene | NA | no RfDs |
| Lead | no CSFs | no RfDs |
| Manganese | no CSFs | NA |
| Mercury | no CSFs | NA |
| Methanol | no CSFs | NA |
| Methyl-2-pentanone | no CSFs | NA |
| Methylene chloride | NA | NA |
| Molybdenum | no CSFs | NA |
| Nickel | no CSFs | NA |
| N-nitrosodiphenylamine | NA | NA |
| N-nitrosodipropylamine | NA | no RfDs |
| Octachlorodibenzofuran | NA | no RfDs |
| Octochlorodibenzo-p-dioxin | NA | no RfDs |
| Pentachlorodibenzofuran | no CSFs | no RfDs |
| Pentachlorodibenzo-p-dioxin | NA | no RfDs |
| Pentachlorophenol | NA | NA |
| Phenanthrene | no CSFs | no RfDs |
| Selenium | no CSFs | NA |
| Silver | no CSFs | 1.08E-05 |
| Tetrachlorodibenzofuran | no CSFs | no RfDs |
| Tetrachlorodibenzo-p-dioxin | no CSFs | no RfDs |
| Tetrachloroethylene | NA | NA |
| Thallium | no CSFs | no RfDs |
| Toluene | no CSFs | NA |
| Tributyl phosphate | NA | NA |
| Trichloroethylene | NA | NA |
| Trifluorochloromethane | no CSFs | no RfDs |
| Uranium | no CSFs | 1.65E-02 |
| Vanadium | no CSFs | NA |
| Vinyl chloride | NA | NA |
| Xylenes | no CSFs | NA |
| Zinc | no CSFs | NA |
| | **6.77E-06** | **5.21E-02** |

TABLE E-3 - InhaleChem

**Groundskeeper/Sampler - Inhalation of Gases & Particulates**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*ET)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | CA = | Concentration of chemical in air | $mg/m^3$ | see COC list below |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Inhalation rate | $m^3/hr$ | 2.5 |
| | ET = | Exposure time | hrs/day | 8 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc mg/m³ | RfDi mg/kgday | CSFi kgday/mg | ADULT CDI mg/kgday | HQ CDI/RfD | CDI mg/kgday | ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | NA | NA | 5.60E-02 | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 5.71E-02 | 1.75E-01 | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | NA | 9.10E-02 | NA | NA | NA | NA |
| 2-Butanone | NA | 1.43E+00 | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | NA | NA | NA | NA | NA | NA |
| 4-Methylphenol | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 1.14E-03 | NA | NA | NA | NA | NA |
| Acetone | NA | NA | NA | NA | NA | NA | NA |
| Antimony | 1.96E-08 | NA | NA | NA | NA | NA | NA |
| Aroclor-1254 | NA | NA | 2.00E+00 | NA | NA | NA | NA |
| Aroclor-1260 | NA | NA | 2.00E+00 | NA | NA | NA | NA |
| Arsenic | 1.05E-06 | NA | 1.51E+01 | NA | NA | 2.937E-08 | 4.43E-07 |
| Barium | NA | 1.43E-04 | NA | NA | NA | NA | NA |
| Benzene | NA | 8.57E-03 | 2.73E-02 | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | NA | 3.08E-01 | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | NA | 3.08E-01 | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | NA | 3.08E+00 | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | NA | 3.08E-02 | NA | NA | NA | NA |
| Beryllium | NA | 5.71E-06 | 8.40E+00 | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | NA | NA | NA | NA | NA | NA |
| Boron | NA | 5.71E-03 | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | NA | NA | NA | NA | NA | NA |
| Bromoform | NA | NA | 3.85E-03 | NA | NA | NA | NA |
| Bromomethane | NA | 1.43E-03 | NA | NA | NA | NA | NA |
| Cadmium | 6.42E-09 | NA | 6.30E+00 | NA | NA | 1.795E-10 | 1.13E-09 |
| Carbazole | NA | NA | NA | NA | NA | NA | NA |
| Carbon disulfide | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | NA | 5.25E-02 | NA | NA | NA | NA |
| Chlordane | NA | 2.00E-04 | 3.50E-01 | NA | NA | NA | NA |
| Chlorobenzene | NA | 1.43E-02 | NA | NA | NA | NA | NA |
| Chloroform | NA | NA | 8.05E-02 | NA | NA | NA | NA |
| Chromium (VI) | NA | 2.86E-05 | 4.20E+01 | NA | NA | NA | NA |
| Chrysene | NA | NA | 3.08E-03 | NA | NA | NA | NA |
| Cobalt | NA | 5.71E-06 | 9.80E+00 | NA | NA | NA | NA |
| Copper | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | NA | NA | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | NA | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | NA | 3.08E+00 | NA | NA | NA | NA |
| Dieldrin | NA | NA | 1.61E+01 | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | NA | NA | NA | NA | NA | NA |

TABLE E-3 - InhaleChem

**Groundskeeper/Sampler - Inhalation of Gases & Particulates**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*ET)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | CA = | Concentration of chemical in air | $mg/m^3$ | see COC list below |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Inhalation rate | $m^3/hr$ | 2.5 |
| | ET = | Exposure time | hrs/day | 8 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc $mg/m^3$ | RfDi mg/kgday | CSFi kgday/mg | ADULT CDI mg/kgday | ADULT HQ CDI/RfD | ADULT CDI mg/kgday | ADULT ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|
| Ethyl ether | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 2.86E-01 | 3.85E-03 | NA | NA | NA | NA |
| Fluoride | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | NA | 1.16E+03 | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | NA | 1.16E+03 | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | NA | 1.16E+04 | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | NA | 1.16E+04 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | NA | 3.08E-01 | NA | NA | NA | NA |
| Lead | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.43E-05 | NA | NA | NA | NA | NA |
| Mercury | NA | NA | NA | NA | NA | NA | NA |
| Methanol | NA | NA | NA | NA | NA | NA | NA |
| Methyl-2-pentanone | NA | 8.57E-01 | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 8.57E-01 | 1.65E-03 | NA | NA | NA | NA |
| Molybdenum | NA | NA | NA | NA | NA | NA | NA |
| Nickel | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | NA | NA | NA | NA | NA | NA |
| Octochlorodibenzofuran | NA | NA | 1.16E+02 | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | NA | 1.16E+02 | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | NA | 5.78E+03 | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | NA | 5.78E+04 | NA | NA | NA | NA |
| Pentachlorophenol | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | NA | NA | NA | NA | NA | NA |
| Silver | 6.76E-09 | NA | NA | NA | NA | NA | NA |
| Tetrachlorodibenzofuran | NA | NA | 1.16E+04 | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | NA | 1.16E+05 | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.71E-01 | 2.07E-02 | NA | NA | NA | NA |
| Thallium | NA | NA | NA | NA | NA | NA | NA |
| Toluene | NA | 1.43E+00 | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | NA | NA | NA | NA | NA | NA |
| Trichloroethylene | NA | 1.14E-02 | 4.00E-01 | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 1.30E-06 | NA | NA | NA | NA | NA | NA |
| Vanadium | NA | NA | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 2.86E-02 | 3.08E-02 | NA | NA | NA | NA |
| Xylenes | NA | 2.86E-02 | NA | NA | NA | NA | NA |
| Zinc | NA | NA | NA | NA | NA | NA | NA |
| | | | | **total =** | **0.00E+00** | **total =** | **4.45E-07** |

Air particulate is 26 ug/m3, the 2005 SER background average from monitor AMS-12.

TABLE E-3 - DermalSoilChem

**Groundskeeper/Sampler - Dermal Contact with Soil/Sediment**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*AB*SA*EF*ED*AF*CF)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | CS = | Concentration of chemical in soil | mg/kg | see COC list below |
| | AB | Absorption factor | -- | see COC list below |
| | SA | Surface area of exposed skin | $cm^2$/day | 3300 |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | AF = | Adherence factor | mg/$cm^2$ | 0.3 |
| | CF = | Conversion factor | kg/mg | 1.00E-06 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc mg/kg | AB unitless | RfDd mg/kgday | CSFd kgday/mg | ADULT CDI mg/kgday | HQ CDI/RfD | CDI mg/kgday | ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | NA | 1.00E-02 | 3.24E-03 | 7.04E-02 | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 1.00E-02 | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 1.00E-02 | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA |
| 2-Butanone | NA | 1.00E-02 | 4.80E-01 | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | 1.00E-02 | NA | 9.00E-01 | NA | NA | NA | NA |
| 4-Methylphenol | NA | 1.00E-02 | 3.25E-03 | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 1.00E-02 | 2.40E-03 | 2.63E-02 | NA | NA | NA | NA |
| Acetone | NA | 1.00E-02 | 7.47E-01 | NA | NA | NA | NA | NA |
| Antimony | 7.53E-01 | 1.00E-03 | 8.00E-06 | NA | 2.918E-09 | 3.65E-04 | NA | NA |
| Aroclor-1254 | NA | 1.40E-01 | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA |
| Aroclor-1260 | NA | 1.40E-01 | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA |
| Arsenic | 4.04E+01 | 3.00E-02 | 1.23E-04 | 3.66E+00 | 4.696E-06 | 3.82E-02 | 1.677E-06 | 6.14E-06 |
| Barium | NA | 1.00E-03 | 1.40E-02 | NA | NA | NA | NA | NA |
| Benzene | NA | 1.00E-02 | 3.88E-03 | 5.67E-02 | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | 1.30E-01 | NA | 2.35E+00 | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | 1.30E-01 | NA | 2.35E+01 | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | 1.30E-01 | NA | 2.35E+00 | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | 1.30E-01 | NA | 2.35E-01 | NA | NA | NA | NA |
| Beryllium | NA | 1.00E-03 | 2.00E-05 | 4.30E+02 | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 1.00E-02 | 2.00E-02 | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 1.00E-02 | 3.80E-03 | 7.37E-02 | NA | NA | NA | NA |
| Boron | NA | 1.00E-03 | 1.80E-01 | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 1.00E-02 | 1.96E-02 | 6.33E-02 | NA | NA | NA | NA |
| Bromoform | NA | 1.00E-02 | 1.20E-02 | 1.32E-02 | NA | NA | NA | NA |
| Bromomethane | NA | 1.00E-02 | 1.12E-03 | NA | NA | NA | NA | NA |
| Cadmium | 2.47E-01 | 1.00E-03 | 1.00E-05 | NA | 9.571E-10 | 9.57E-05 | NA | NA |
| Carbazole | NA | 1.00E-02 | NA | 2.86E-02 | NA | NA | NA | NA |
| Carbon disulfide | NA | 2.50E-01 | 6.30E-02 | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 1.00E-02 | 4.55E-04 | 2.00E-01 | NA | NA | NA | NA |
| Chlordane | NA | 4.00E-02 | 2.50E-04 | 7.00E-01 | NA | NA | NA | NA |
| Chlorobenzene | NA | 1.00E-02 | 6.20E-03 | NA | NA | NA | NA | NA |
| Chloroform | NA | 1.00E-02 | 2.00E-03 | 3.05E-02 | NA | NA | NA | NA |
| Chromium (VI) | NA | 1.00E-03 | 6.00E-05 | NA | NA | NA | NA | NA |
| Chrysene | NA | 1.30E-01 | NA | 2.35E-02 | NA | NA | NA | NA |
| Cobalt | NA | 1.00E-03 | 1.60E-02 | NA | NA | NA | NA | NA |
| Copper | NA | 1.00E-03 | 1.20E-02 | NA | NA | NA | NA | NA |
| Cyanide | NA | 1.00E-02 | 3.40E-03 | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 1.00E-02 | 4.00E+00 | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | 1.30E-01 | NA | 2.35E+01 | NA | NA | NA | NA |
| Dieldrin | NA | 1.00E-02 | 2.50E-05 | 3.20E+01 | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 1.00E-02 | 3.60E-02 | NA | NA | NA | NA | NA |

TABLE E-3 - DermalSoilChem

**Groundskeeper/Sampler - Dermal Contact with Soil/Sediment**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*AB*SA*EF*ED*AF*CF)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | CS = | Concentration of chemical in soil | mg/kg | see COC list below |
| | AB | Absorption factor | -- | see COC list below |
| | SA | Surface area of exposed skin | $cm^2$/day | 3300 |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | AF = | Adherence factor | $mg/cm^2$ | 0.3 |
| | CF = | Conversion factor | kg/mg | 1.00E-06 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc mg/kg | AB unitless | RfDd mg/kgday | CSFd kgday/mg | ADULT CDI mg/kgday | ADULT HQ CDI/RfD | ADULT CDI mg/kgday | ADULT ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|---|
| Ethyl ether | NA | 1.00E-02 | 1.60E-01 | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 1.00E-02 | 9.70E-02 | NA | NA | NA | NA | NA |
| Fluoride | NA | 1.00E-03 | 5.82E-02 | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+03 | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+03 | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+04 | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+04 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | 1.30E-01 | NA | 2.35E+00 | NA | NA | NA | NA |
| Lead | NA | 1.00E-03 | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.00E-03 | 5.60E-03 | NA | NA | NA | NA | NA |
| Mercury | NA | 1.00E-03 | 2.10E-05 | NA | NA | NA | NA | NA |
| Methanol | NA | 1.00E-02 | 4.00E-01 | NA | NA | NA | NA | NA |
| Methyl-2-pentanone | NA | 1.00E-02 | 6.40E-02 | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 1.00E-02 | 5.70E-02 | 7.89E-03 | NA | NA | NA | NA |
| Molybdenum | NA | 1.00E-03 | 1.90E-03 | NA | NA | NA | NA | NA |
| Nickel | NA | 1.00E-03 | 5.40E-03 | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 1.00E-02 | 5.00E-03 | 1.96E-02 | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | 1.00E-02 | NA | 2.80E+01 | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+02 | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+02 | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | 1.00E-02 | NA | 1.50E+04 | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 1.50E+05 | NA | NA | NA | NA |
| Pentachlorophenol | NA | 2.50E-01 | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA |
| Phenanthrene | NA | 1.00E-02 | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 1.00E-03 | 2.20E-03 | NA | NA | NA | NA | NA |
| Silver | 2.60E-01 | 1.00E-03 | 9.00E-04 | NA | 1.007E-09 | 1.12E-06 | NA | NA |
| Tetrachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+04 | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+05 | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.00E-02 | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA |
| Thallium | NA | 1.00E-03 | 1.80E-05 | NA | NA | NA | NA | NA |
| Toluene | NA | 1.00E-02 | 6.40E-02 | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 1.00E-02 | 1.00E-01 | 1.08E-02 | NA | NA | NA | NA |
| Trichloroethylene | NA | 1.00E-02 | 4.50E-05 | 2.67E+00 | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 5.01E+01 | 1.00E-03 | 5.10E-04 | NA | 1.941E-07 | 3.81E-04 | 6.933E-08 | NA |
| Vanadium | NA | 1.00E-03 | 7.00E-05 | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 1.00E-02 | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA |
| Xylenes | NA | 1.00E-02 | 1.84E-01 | NA | NA | NA | NA | NA |
| Zinc | NA | 1.00E-03 | 6.00E-02 | NA | NA | NA | NA | NA |
| | | | | | **total =** | **3.90E-02** | **total =** | **6.14E-06** |

TABLE E-3 - IngestSoilChem

**Groundskeeper/Sampler - Ingestion of Soil**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*FI*CF)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated b |
| | CS = | Concentration of chemical in soil | mg/kg | see COC lis |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | mg/day | 100 |
| | FI = | Fraction of contaminated soil | unitless | 1 |
| | CF = | Conversion factor | kg/mg | 1.00E-06 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| | | | | ADULT | | | |
|---|---|---|---|---|---|---|---|
| COC | conc | RfDo | CSFo | CDI | HQ | CDI | ILCR |
| | mg/kg | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| 1,1,2-Trichloroethane | NA | 4.00E-03 | 5.70E-02 | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA |
| 2-Butanone | NA | 6.00E-01 | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | NA | 4.50E-01 | NA | NA | NA | NA |
| 4-Methylphenol | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 3.00E-03 | 2.10E-02 | NA | NA | NA | NA |
| Acetone | NA | 9.00E-01 | NA | NA | NA | NA | NA |
| Antimony | 7.53E-01 | 4.00E-04 | NA | 2.95E-07 | 7.37E-04 | NA | NA |
| Aroclor-1254 | NA | 2.00E-05 | 2.00E+00 | NA | NA | NA | NA |
| Aroclor-1260 | NA | 2.00E-05 | 2.00E+00 | NA | NA | NA | NA |
| Arsenic | 4.04E+01 | 3.00E-04 | 1.50E+00 | 1.58E-05 | 5.27E-02 | 5.65E-06 | 8.47E-06 |
| Barium | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Benzene | NA | 4.00E-03 | 5.50E-02 | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | NA | 7.30E+00 | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | NA | 7.30E-02 | NA | NA | NA | NA |
| Beryllium | NA | 2.00E-03 | 4.30E+00 | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 4.00E-02 | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 2.00E-02 | 1.40E-02 | NA | NA | NA | NA |
| Boron | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 2.00E-02 | 6.20E-02 | NA | NA | NA | NA |
| Bromoform | NA | 2.00E-02 | 7.90E-03 | NA | NA | NA | NA |
| Bromomethane | NA | 1.40E-03 | NA | NA | NA | NA | NA |
| Cadmium | 2.47E-01 | 1.00E-03 | NA | 9.67E-08 | 9.67E-05 | NA | NA |
| Carbazole | NA | NA | 2.00E-03 | NA | NA | NA | NA |
| Carbon disulfide | NA | 1.00E-01 | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 7.00E-04 | 1.30E-01 | NA | NA | NA | NA |
| Chlordane | NA | 5.00E-04 | 3.50E-01 | NA | NA | NA | NA |
| Chlorobenzene | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Chloroform | NA | 1.00E-02 | 6.10E-03 | NA | NA | NA | NA |
| Chromium (VI) | NA | 3.00E-03 | NA | NA | NA | NA | NA |
| Chrysene | NA | NA | 7.30E-03 | NA | NA | NA | NA |
| Cobalt | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Copper | NA | 4.00E-02 | NA | NA | NA | NA | NA |
| Cyanide | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 5.00E+00 | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | NA | 7.30E+00 | NA | NA | NA | NA |
| Dieldrin | NA | 5.00E-05 | 1.60E+01 | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 4.00E-02 | NA | NA | NA | NA | NA |

TABLE E-3 - IngestSoilChem

**Groundskeeper/Sampler - Ingestion of Soil**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*FI*CF)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated b |
| | CS = | Concentration of chemical in soil | mg/kg | see COC lis |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | mg/day | 100 |
| | FI = | Fraction of contaminated soil | unitless | 1 |
| | CF = | Conversion factor | kg/mg | 1.00E-06 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc mg/kg | RfDo mg/kgday | CSFo kgday/mg | ADULT CDI mg/kgday | HQ CDI/RfD | CDI mg/kgday | ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|
| Ethyl ether | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 1.00E-01 | NA | NA | NA | NA | NA |
| Fluoride | NA | 6.00E-02 | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | NA | 1.50E+04 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Lead | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.40E-01 | NA | NA | NA | NA | NA |
| Mercury | NA | 3.00E-04 | NA | NA | NA | NA | NA |
| Methanol | NA | 5.00E-01 | NA | NA | NA | NA | NA |
| Methyl-2-pentanone | NA | 8.00E-02 | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 6.00E-02 | 7.50E-03 | NA | NA | NA | NA |
| Molybdenum | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| Nickel | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 2.00E-02 | 4.90E-03 | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | NA | 7.00E+00 | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | NA | 1.50E+02 | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | NA | 1.50E+02 | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | NA | 7.50E+03 | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | NA | 7.50E+04 | NA | NA | NA | NA |
| Pentachlorophenol | NA | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA |
| Phenanthrene | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| Silver | 2.60E-01 | 5.00E-03 | NA | 1.02E-07 | 2.04E-05 | NA | NA |
| Tetrachlorodibenzofuran | NA | NA | 1.50E+04 | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | NA | 1.50E+05 | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA |
| Thallium | NA | 9.00E-05 | NA | NA | NA | NA | NA |
| Toluene | NA | 8.00E-02 | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 2.00E-01 | 5.40E-03 | NA | NA | NA | NA |
| Trichloroethylene | NA | 3.00E-04 | 4.00E-01 | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 5.01E+01 | 6.00E-04 | NA | 1.96E-05 | 3.27E-02 | NA | NA |
| Vanadium | NA | 7.00E-03 | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA |
| Xylenes | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Zinc | NA | 3.00E-01 | NA | NA | NA | NA | NA |
| | | | | **total =** | **8.62E-02** | **total =** | **8.47E-06** |

TABLE E-3 - DermalSWchem

**Groundskeeper/Sampler - Dermal Contact with Surface Water**
**Risk calculation for A6W-CU5**

| | | | UNITS | adult |
|---|---|---|---|---|
| Intake Equation: | CDI = | (DA*EF*ED*SA)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | DA = | Dermal absorption dose | $mg/cm^2day$ | see COC list below |
| | EF = | Exposure frequency | days/yr | 12 |
| | ED = | Exposure duration | yrs | 25 |
| | SA = | Surface area of skin | $cm^2$ | 5670 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |
| where: | DA = $C_v$*$K_p$*CF*ET | | | |
| | $C_v$ = | concentation of ith contaminant in surface water | mg/L | see COC list below |
| | $K_p$ = | permeability constant for ith contaminant | cm/hr | see COC list below |
| | CF = | conversion factor | $L/cm^3$ | 0.001 |
| | ET = | exposure time | hr/d | 1 |

| COC | $C_v$ mg/L | $K_p$ cm/hr | DA $mg/cm^2day$ | RfDd mg/kgday | CSFd kgday/mg | ADULT CDI mg/kgday | ADULT HQ CDI/RfD | ADULT CDI mg/kgday | ADULT ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | NA | 6.43E-03 | NA | 3.24E-03 | 7.04E-02 | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 1.59E-02 | NA | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 5.34E-03 | NA | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA |
| 2-Butanone | NA | 1.11E-03 | NA | 4.80E-01 | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | 1.69E-02 | NA | NA | 9.00E-01 | NA | NA | NA | NA |
| 4-Methylphenol | NA | 9.95E-03 | NA | 3.25E-03 | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 2.66E-03 | NA | 2.40E-03 | 2.63E-02 | NA | NA | NA | NA |
| Acetone | NA | 5.69E-04 | NA | 7.47E-01 | NA | NA | NA | NA | NA |
| Antimony | 2.50E-04 | 1.00E-03 | 2.50E-10 | 8.00E-06 | NA | 6.66E-10 | 8.32E-05 | NA | NA |
| Aroclor-1254 | NA | 1.29E+00 | NA | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA |
| Aroclor-1260 | NA | 5.48E+00 | NA | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA |
| Arsenic | 1.50E-03 | 1.00E-03 | 1.50E-09 | 1.23E-04 | 3.66E+00 | 3.99E-09 | 3.25E-05 | 1.43E-09 | 5.22E-09 |
| Barium | NA | 1.00E-03 | NA | 1.40E-02 | NA | NA | NA | NA | NA |
| Benzene | NA | 2.07E-02 | NA | 3.88E-03 | 5.67E-02 | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | 9.48E-01 | NA | NA | 2.35E+00 | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | 1.24E+00 | NA | NA | 2.35E+01 | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | 6.99E-01 | NA | NA | 2.35E+00 | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | 1.20E+00 | NA | NA | 2.35E-01 | NA | NA | NA | NA |
| Beryllium | NA | 1.00E-03 | NA | 2.00E-05 | 4.30E+02 | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 7.63E-02 | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 1.97E+00 | NA | 3.80E-03 | 7.37E-02 | NA | NA | NA | NA |
| Boron | NA | 1.00E-03 | NA | 1.80E-01 | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 5.02E-03 | NA | 1.96E-02 | 6.33E-02 | NA | NA | NA | NA |
| Bromoform | NA | 2.77E-03 | NA | 1.20E-02 | 1.32E-02 | NA | NA | NA | NA |
| Bromomethane | NA | 3.51E-03 | NA | 1.12E-03 | NA | NA | NA | NA | NA |
| Cadmium | 5.00E-05 | 1.00E-03 | 5.00E-11 | 1.00E-05 | NA | 1.33E-10 | 1.33E-05 | NA | NA |
| Carbazole | NA | 7.97E-02 | NA | NA | 2.86E-02 | NA | NA | NA | NA |
| Carbon disulfide | NA | 1.56E-02 | NA | 6.30E-02 | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 2.24E-02 | NA | 4.55E-04 | 2.00E-01 | NA | NA | NA | NA |
| Chlordane | NA | 1.57E-01 | NA | 2.50E-04 | 7.00E-01 | NA | NA | NA | NA |
| Chlorobenzene | NA | 4.07E-02 | NA | 6.20E-03 | NA | NA | NA | NA | NA |
| Chloroform | NA | 8.92E-03 | NA | 2.00E-03 | 3.05E-02 | NA | NA | NA | NA |
| Chromium (VI) | NA | 2.00E-03 | NA | 6.00E-05 | NA | NA | NA | NA | NA |
| Chrysene | NA | 1.03E+00 | NA | NA | 2.35E-02 | NA | NA | NA | NA |
| Cobalt | NA | 4.00E-04 | NA | 1.60E-02 | NA | NA | NA | NA | NA |
| Copper | NA | 1.00E-03 | NA | 1.20E-02 | NA | NA | NA | NA | NA |
| Cyanide | NA | 1.00E-03 | NA | 3.40E-03 | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 1.80E-03 | NA | 4.00E+00 | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | 1.68E+00 | NA | NA | 2.35E+01 | NA | NA | NA | NA |
| Dieldrin | NA | 4.45E-02 | NA | 2.50E-05 | 3.20E+01 | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 4.45E+00 | NA | 3.60E-02 | NA | NA | NA | NA | NA |

TABLE E-3 - DermalSWchem

**Groundskeeper/Sampler - Dermal Contact with Surface Water**
**Risk calculation for A6W-CU5**

| | | | UNITS | adult |
|---|---|---|---|---|
| Intake Equation: | CDI = | (DA*EF*ED*SA)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | DA = | Dermal absorption dose | mg/cm²day | see COC list below |
| | EF = | Exposure frequency | days/yr | 12 |
| | ED = | Exposure duration | yrs | 25 |
| | SA = | Surface area of skin | cm² | 5670 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |
| where: | DA = $C_v$*$K_p$*CF*ET | | | |
| | $C_v$ = | concentation of ith contaminant in surface water | mg/L | see COC list below |
| | $K_p$ = | permeability constant for ith contaminant | cm/hr | see COC list below |
| | CF = | conversion factor | L/cm³ | 0.001 |
| | ET = | exposure time | hr/d | 1 |

| COC | $C_v$ mg/L | $K_p$ cm/hr | DA mg/cm²day | RfDd mg/kgday | CSFd kgday/mg | ADULT CDI mg/kgday | ADULT HQ CDI/RfD | ADULT CDI mg/kgday | ADULT ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|---|---|
| Ethyl ether | NA | 2.88E-03 | NA | 1.60E-01 | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 7.39E-02 | NA | 9.70E-02 | NA | NA | NA | NA | NA |
| Fluoride | NA | 1.00E-03 | NA | 5.82E-02 | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | 2.55E+00 | NA | NA | 3.00E+03 | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | 3.22E+00 | NA | NA | 3.00E+03 | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | 2.38E+00 | NA | NA | 3.00E+04 | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | 5.29E+00 | NA | NA | 3.00E+04 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | 2.23E+00 | NA | NA | 2.35E+00 | NA | NA | NA | NA |
| Lead | NA | 1.00E-04 | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.00E-03 | NA | 1.84E-03 | NA | NA | NA | NA | NA |
| Mercury | NA | 1.00E-03 | NA | 2.10E-05 | NA | NA | NA | NA | NA |
| Methanol | NA | 3.45E-04 | NA | 4.00E-01 | NA | NA | NA | NA | NA |
| 4-Methyl-2-pentanone | NA | 3.97E-03 | NA | 6.40E-02 | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 4.46E-03 | NA | 5.70E-02 | 7.89E-03 | NA | NA | NA | NA |
| Molybdenum | NA | 1.00E-03 | NA | 1.90E-03 | NA | NA | NA | NA | NA |
| Nickel | NA | 2.00E-04 | NA | 5.40E-03 | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 1.96E-02 | NA | 5.00E-03 | 1.96E-02 | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | 2.83E-03 | NA | NA | 2.80E+01 | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | 4.78E+00 | NA | NA | 3.00E+02 | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | 1.65E+01 | NA | NA | 3.00E+02 | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | 1.06E+00 | NA | NA | 1.50E+04 | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | 3.79E-01 | NA | NA | 1.50E+05 | NA | NA | NA | NA |
| Pentachlorophenol | NA | 1.95E-01 | NA | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA |
| Phenanthrene | NA | 2.29E-01 | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 1.00E-03 | NA | 2.20E-03 | NA | NA | NA | NA | NA |
| Silver | 1.00E-04 | 6.00E-04 | 6.00E-11 | 9.00E-04 | NA | 1.60E-10 | 1.78E-07 | NA | NA |
| Tetrachlorodibenzofuran | NA | 1.12E+00 | NA | NA | 3.00E+04 | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | 1.39E+00 | NA | NA | 3.00E+05 | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 4.81E-02 | NA | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA |
| Thallium | NA | 1.00E-03 | NA | 1.80E-05 | NA | NA | NA | NA | NA |
| Toluene | NA | 4.53E-02 | NA | 6.40E-02 | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 3.13E-02 | NA | 1.00E-01 | 1.08E-02 | NA | NA | NA | NA |
| Trichloroethylene | NA | 1.57E-02 | NA | 4.50E-05 | 2.67E+00 | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 8.05E-03 | 1.00E-03 | 8.05E-09 | 5.10E-04 | NA | 2.14E-08 | 4.20E-05 | NA | NA |
| Vanadium | NA | 1.00E-03 | NA | 7.00E-05 | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 1.13E-02 | NA | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA |
| Xylenes | NA | 7.04E-02 | NA | 1.84E-01 | NA | NA | NA | NA | NA |
| Zinc | NA | 6.00E-04 | NA | 6.00E-02 | NA | NA | NA | NA | NA |
| | | | | | | **total =** | **1.71E-04** | **total =** | **5.22E-09** |

TABLE E-3 - IngestSWchem

**Groundskeeper/Sampler - Ingestion of Surface Water**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Va |
|---|---|---|---|---|
| | CDI = | (CW*EF*ED*IR)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | adult |
| | CW = | Concentration of chemical in water | mg/L | see COC tat |
| | EF = | Exposure frequency | days/yr | 12 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | L/day | 0.01 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | CW | RfDo | CSFo | ADULT | | | |
|---|---|---|---|---|---|---|---|
| | | | | CDI | HQ | CDI | ILCR |
| | mg/L | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| 1,1,2-Trichloroethane | NA | 4.00E-03 | 5.70E-02 | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA |
| 2-Butanone | NA | 6.00E-01 | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | NA | 4.50E-01 | NA | NA | NA | NA |
| 4-Methylphenol | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 3.00E-03 | 2.10E-02 | NA | NA | NA | NA |
| Acetone | NA | 9.00E-01 | NA | NA | NA | NA | NA |
| Antimony | 2.50E-04 | 4.00E-04 | NA | 1.17E-09 | 2.94E-06 | 4.19E-10 | NA |
| Aroclor-1254 | NA | 2.00E-05 | 4.00E-01 | NA | NA | NA | NA |
| Aroclor-1260 | NA | 2.00E-05 | 4.00E-01 | NA | NA | NA | NA |
| Arsenic | 1.50E-03 | 3.00E-04 | 1.50E+00 | 7.05E-09 | 2.35E-05 | 2.52E-09 | 3.77E-09 |
| Barium | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Benzene | NA | 4.00E-03 | 5.50E-02 | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | NA | 7.30E+00 | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | NA | 7.30E-02 | NA | NA | NA | NA |
| Beryllium | NA | 2.00E-03 | 4.30E+00 | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 4.00E-02 | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 2.00E-02 | 1.40E-02 | NA | NA | NA | NA |
| Boron | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 2.00E-02 | 6.20E-02 | NA | NA | NA | NA |
| Bromoform | NA | 2.00E-02 | 7.90E-03 | NA | NA | NA | NA |
| Bromomethane | NA | 1.40E-03 | NA | NA | NA | NA | NA |
| Cadmium | 5.00E-05 | 1.00E-03 | NA | 2.35E-10 | 2.35E-07 | 8.39E-11 | NA |
| Carbazole | NA | NA | 2.00E-03 | NA | NA | NA | NA |
| Carbon disulfide | NA | 1.00E-01 | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 7.00E-04 | 1.30E-01 | NA | NA | NA | NA |
| Chlordane | NA | 5.00E-04 | 3.50E-01 | NA | NA | NA | NA |
| Chlorobenzene | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Chloroform | NA | 1.00E-02 | 6.10E-03 | NA | NA | NA | NA |
| Chromium (VI) | NA | 3.00E-03 | NA | NA | NA | NA | NA |
| Chrysene | NA | NA | 7.30E-03 | NA | NA | NA | NA |
| Cobalt | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Copper | NA | 4.00E-02 | NA | NA | NA | NA | NA |
| Cyanide | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 5.00E+00 | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | NA | 7.30E+00 | NA | NA | NA | NA |
| Dieldrin | NA | 5.00E-05 | 1.60E+01 | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 4.00E-02 | NA | NA | NA | NA | NA |

TABLE E-3 - IngestSWchem

**Groundskeeper/Sampler - Ingestion of Surface Water**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Va |
|---|---|---|---|---|
| | CDI = | (CW*EF*ED*IR)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | adult |
| | CW = | Concentration of chemical in water | mg/L | see COC tat |
| | EF = | Exposure frequency | days/yr | 12 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | L/day | 0.01 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | CW | RfDo | CSFo | ADULT | | | |
|---|---|---|---|---|---|---|---|
| | | | | CDI | HQ | CDI | ILCR |
| | mg/L | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| Ethyl ether | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 1.00E-01 | NA | NA | NA | NA | NA |
| Fluoride | NA | 6.00E-02 | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | NA | 1.50E+04 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Lead | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 4.60E-02 | NA | NA | NA | NA | NA |
| Mercury | NA | 3.00E-04 | NA | NA | NA | NA | NA |
| Methanol | NA | 5.00E-01 | NA | NA | NA | NA | NA |
| 4-Methyl-2-pentanone | NA | 8.00E-02 | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 6.00E-02 | 7.50E-03 | NA | NA | NA | NA |
| Molybdenum | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| Nickel | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 2.00E-02 | 4.90E-03 | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | NA | 7.00E+00 | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | NA | 1.50E+02 | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | NA | 1.50E+02 | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | NA | 7.50E+03 | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | NA | 7.50E+04 | NA | NA | NA | NA |
| Pentachlorophenol | NA | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA |
| Phenanthrene | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| Silver | 1.00E-04 | 5.00E-03 | NA | 4.70E-10 | 9.39E-08 | 1.68E-10 | NA |
| Tetrachlorodibenzofuran | NA | NA | 1.50E+04 | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | NA | 1.50E+05 | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA |
| Thallium | NA | 9.00E-05 | NA | NA | NA | NA | NA |
| Toluene | NA | 8.00E-02 | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 2.00E-01 | 5.40E-03 | NA | NA | NA | NA |
| Trichloroethylene | NA | 3.00E-04 | 4.00E-01 | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 8.05E-03 | 6.00E-04 | NA | 3.78E-08 | 6.30E-05 | 1.35E-08 | NA |
| Vanadium | NA | 7.00E-03 | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA |
| Xylenes | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Zinc | NA | 3.00E-01 | NA | NA | NA | NA | NA |
| | | | | **total =** | **8.98E-05** | **total =** | **3.77E-09** |

TABLE E-3 - InhaleRad

**Groundskeeper/Sampler - Inhalation of Gases & Particulates**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CA*EF*ED*IR*ET) | | |
| | CDI = | Chronic Daily Intake | pCi | calculated below |
| | CA = | Concentration of radionuclide in air | pCi/m$^3$ | see COC list below |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Inhalation rate | m$^3$/hr | 2.5 |
| | ET = | Exposure time | hrs/day | 8 |

| COC | conc pCi/m$^3$ | CSFi 1/pCi | ADULT CDI pCi | ADULT ILCR CDI*CSF |
|---|---|---|---|---|
| Cesium-137 + D | NA | 1.19E-11 | NA | NA |
| Lead-210 + D | NA | 1.39E-08 | NA | NA |
| Neptunium-237 + D | NA | 1.77E-08 | NA | NA |
| Plutonium-238 | NA | 3.36E-08 | NA | NA |
| Plutonium-239/240 | NA | 3.33E-08 | NA | NA |
| Radium-226 + D | 3.09E-05 | 1.16E-08 | 1.55E+00 | 1.79E-08 |
| Radium-228 + D | 3.04E-05 | 5.23E-09 | 1.52E+00 | 7.95E-09 |
| Radon-222+ D | 3.18E+02 | 1.80E-11 | 1.59E+07 | 2.86E-04 |
| Strontium-90 + D | NA | 1.13E-10 | NA | NA |
| Technetium-99 | 1.48E-04 | 1.41E-11 | 7.42E+00 | 1.05E-10 |
| Thorium-228 + D | 3.33E-05 | 1.43E-07 | 1.66E+00 | 2.38E-07 |
| Thorium-230 | 1.15E-04 | 2.85E-08 | 5.73E+00 | 1.63E-07 |
| Thorium-232 | 3.04E-05 | 4.33E-08 | 1.52E+00 | 6.59E-08 |
| Uranium-234 | 4.45E-04 | 1.14E-08 | 2.22E+01 | 2.53E-07 |
| Uranium-235 + D | 2.03E-05 | 1.01E-08 | 1.01E+00 | 1.02E-08 |
| Uranium-238 + D | 4.34E-04 | 9.35E-09 | 2.17E+01 | 2.03E-07 |
| | | | **total =** | **2.87E-04** |

Air particulate is 26 ug/m3, the 2005 SER background average from monitor AMS-12.
Rn-222 is derived by multiplying the soil Ra-226 value by 267 g/m3. This conversion factor is based on Rn-222 air background and Ra-226 soil background (i.e., 400 pCi/m3 divided by 1.5 pCi/g)

TABLE E-3 - IngestSoilRad

**Groundskeep/Sampler - Ingestion of Soil**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*FI) | | |
| | CDI = | Chronic Daily Intake | pCi | calculated below |
| | CS = | Concentration of radionuclide in soil | pCi/g | see COC list below |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | g/day | 0.1 |
| | FI = | Fraction of contaminated soil | unitless | 1 |

| COC | conc pCi/g | CSFos 1/pCi | ADULT CDI pCi | ADULT ILCR CDI*CSF |
|---|---|---|---|---|
| Cesium-137 + D | NA | 4.33E-11 | NA | NA |
| Lead-210 + D | NA | 2.66E-09 | NA | NA |
| Neptunium-237 + D | NA | 1.62E-10 | NA | NA |
| Plutonium-238 | NA | 2.72E-10 | NA | NA |
| Plutonium-239/240 | NA | 2.76E-10 | NA | NA |
| Radium-226 + D | 1.19E+00 | 7.30E-10 | 2.98E+02 | 2.17E-07 |
| Radium-228 + D | 1.17E+00 | 2.29E-09 | 2.93E+02 | 6.70E-07 |
| Radon-222+ D | NA | NA | NA | NA |
| Strontium-90 + D | NA | 1.44E-10 | NA | NA |
| Technetium-99 | 5.71E+00 | 7.66E-12 | 1.43E+03 | 1.09E-08 |
| Thorium-228 + D | 1.28E+00 | 8.09E-10 | 3.20E+02 | 2.59E-07 |
| Thorium-230 | 4.41E+00 | 2.02E-10 | 1.10E+03 | 2.23E-07 |
| Thorium-232 | 1.17E+00 | 2.31E-10 | 2.93E+02 | 6.76E-08 |
| Uranium-234 | 1.71E+01 | 1.58E-10 | 4.27E+03 | 6.75E-07 |
| Uranium-235 + D | 7.79E-01 | 1.63E-10 | 1.95E+02 | 3.18E-08 |
| Uranium-238 + D | 1.67E+01 | 2.10E-10 | 4.18E+03 | 8.77E-07 |
| | | | **total =** | **3.03E-06** |

TABLE E-3 - IngestSWrad

**Groundskeeper/Sampler - Ingestion of Surface Water**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Values |
|---|---|---|---|---|
| | CDI = | (CW*EF*ED*IR) | | |
| | CDI = | Chronic Daily Intake | pCi | adult |
| | CW = | Concentration of radionuclide in water | pCi/L | see COC table below |
| | EF = | Exposure frequency | days/yr | 12 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | L/day | 0.01 |

| COC | conc | CSFow | ADULT | |
|---|---|---|---|---|
| | | | CDI | ILCR |
| | pCi/L | 1/pCi | pCi | CDI*CSF |
| Cesium-137 + D | NA | 3.04E-11 | NA | NA |
| Lead-210 + D | NA | 1.27E-09 | NA | NA |
| Neptunium-237 + D | NA | 6.74E-11 | NA | NA |
| Plutonium-238 | NA | 1.31E-10 | NA | NA |
| Plutonium-239/240 | NA | 1.35E-10 | NA | NA |
| Radium-226 + D | 1.96E-01 | 3.86E-10 | 5.88E-01 | 2.27E-10 |
| Radium-228 + D | 3.65E+00 | 1.04E-09 | 1.10E+01 | 1.14E-08 |
| Radon-222+ D | NA | NA | NA | NA |
| Strontium-90 + D | NA | 7.40E-11 | NA | NA |
| Technetium-99 | 6.20E+00 | 2.75E-12 | 1.86E+01 | 5.12E-11 |
| Thorium-228 + D | 3.65E+00 | 3.00E-10 | 1.10E+01 | 3.29E-09 |
| Thorium-230 | 6.30E-02 | 9.10E-11 | 1.89E-01 | 1.72E-11 |
| Thorium-232 | 3.65E+00 | 1.01E-10 | 1.10E+01 | 1.11E-09 |
| Uranium-234 | 2.75E+00 | 7.07E-11 | 8.25E+00 | 5.83E-10 |
| Uranium-235 + D | 1.25E-01 | 7.18E-11 | 3.76E-01 | 2.70E-11 |
| Uranium-238 + D | 2.68E+00 | 8.71E-11 | 8.05E+00 | 7.02E-10 |
| | | | **total =** | **1.74E-08** |

**Groundskeeper/Sampler - External Radiation**
**Risk calculation for A6W-CU5**

| | | | UNITS | adult |
|---|---|---|---|---|
| Intake Equation: | CDI = | $(CS*EF*ED*ET_o*(1-SH_o))+(CS*EF*ED*ET_i*(1-SH_i))$ | | |
| | CDI = | Chronic Daily Intake | yr pCi/g | calculated below |
| | CS = | Concentration of radionuclide in soil | pCi/g | see COC list below |
| | EF = | Fraction of year exposed to radiation | -- | 0.27 |
| | ED = | Exposure duration | yrs | 25 |
| | $ET_o$ = | Fraction of day spent outdoors | -- | 0.33 |
| | $ET_i$ = | Fraction of day spent indoors | -- | 0.00 |
| | $SH_o$ = | Shield factor outdoors | -- | 0.25 |
| | $SH_i$ = | Shield factor indoors | -- | 0.5 |

| COC | conc pCi/g | CSFx g/pCi yr | ADULT CDI yr pCi/g | ADULT ILCR CDI*CSF |
|---|---|---|---|---|
| Cesium-137 + D | NA | 2.55E-06 | NA | NA |
| Lead-210 + D | NA | 4.21E-09 | NA | NA |
| Neptunium-237 + D | NA | 7.97E-07 | NA | NA |
| Plutonium-238 | NA | 7.22E-11 | NA | NA |
| Plutonium-239/240 | NA | 2.00E-10 | NA | NA |
| Radium-226 + D | 1.19E+00 | 8.49E-06 | 2.04E+00 | 1.73E-05 |
| Radium-228 + D | 1.17E+00 | 4.53E-06 | 2.00E+00 | 9.07E-06 |
| Radon-222+ D | NA | NA | NA | NA |
| Strontium-90 + D | NA | 1.96E-08 | NA | NA |
| Technetium-99 | 5.71E+00 | 8.14E-11 | 9.77E+00 | 7.95E-10 |
| Thorium-228 + D | 1.28E+00 | 7.76E-06 | 2.19E+00 | 1.70E-05 |
| Thorium-230 | 4.41E+00 | 8.19E-10 | 7.55E+00 | 6.18E-09 |
| Thorium-232 | 1.17E+00 | 3.42E-10 | 2.00E+00 | 6.85E-10 |
| Uranium-234 | 1.71E+01 | 2.52E-10 | 2.93E+01 | 7.37E-09 |
| Uranium-235 + D | 7.79E-01 | 5.43E-07 | 1.33E+00 | 7.24E-07 |
| Uranium-238 + D | 1.67E+01 | 1.14E-07 | 2.86E+01 | 3.26E-06 |
| | | | **total =** | **4.74E-05** |

TABLE E-3 - SumPaths

**Groundskeeper/Sampler - Summation of all Pathways**
**Risk calculation for A6W-CU5**

| | | HQ | ILCR | rad only ILCR |
|---|---|---|---|---|
| **Inhale** | | 0.00E+00 | 2.87E-04 | 2.87E-04 |
| **Dermal Soil** | | 3.90E-02 | 6.14E-06 | NA |
| **Ingest Soil** | | 8.62E-02 | 1.15E-05 | 3.03E-06 |
| **Dermal Surface Water** | | 1.71E-04 | 5.22E-09 | NA |
| **Ingest Surface Water** | | 8.98E-05 | 2.12E-08 | 1.74E-08 |
| **External Radiation** | | NA | 4.74E-05 | 4.74E-05 |
| | **SUM** | **1.26E-01** | **3.52E-04** | **3.37E-04** |

Summation of all paths for individual nuclides

| | ILCR |
|---|---|
| Cesium-137 + D | NA |
| Lead-210 + D | NA |
| Neptunium-237 + D | NA |
| Plutonium-238 | NA |
| Plutonium-239/240 | NA |
| Radium-226 + D | 1.75E-05 |
| Radium-228 + D | 9.76E-06 |
| Radon-222+ D | 2.86E-04 |
| Strontium-90 + D | NA |
| Technetium-99 | 1.19E-08 |
| Thorium-228 + D | 1.75E-05 |
| Thorium-230 | 3.92E-07 |
| Thorium-232 | 1.35E-07 |
| Uranium-234 | 9.37E-07 |
| Uranium-235 + D | 7.66E-07 |
| Uranium-238 + D | 4.34E-06 |
| | **3.37E-04** |

TABLE E-3 - SumPaths

Summation of all paths for individual chemicals

| | ILCR | HQ |
|---|---|---|
| 1,1,2-Trichloroethane | NA | NA |
| 1,1-Dichloroethylene | NA | NA |
| 1,2-dichloroethane | NA | NA |
| 2-Butanone | No CSFs | NA |
| 3,3-Dichlorobenzidine | NA | No RfDs |
| 4-Methylphenol | No CSFs | NA |
| 4-Nitroanaline | NA | NA |
| Acetone | No CSFs | NA |
| Antimony | No CSFs | 1.19E-03 |
| Aroclor-1254 | NA | NA |
| Aroclor-1260 | NA | No RfDs |
| Arsenic | 1.51E-05 | 9.09E-02 |
| Barium | No CSFs | NA |
| Benzene | NA | NA |
| Benzo(a)anthracene | NA | No RfDs |
| Benzo(a)pyrene | NA | No RfDs |
| Benzo(b)fluoranthene | NA | No RfDs |
| Benzo(k)fluoranthene | NA | No RfDs |
| Beryllium | NA | NA |
| Bis(2-chloroisopropyl)ether | No CSFs | NA |
| Bis(2-ethylhexyl)phthalate | NA | NA |
| Boron | No CSFs | NA |
| Bromodichloromethane | NA | NA |
| Bromoform | NA | NA |
| Bromomethane | No CSFs | NA |
| Cadmium | 1.13E-09 | 2.06E-04 |
| Carbazole | NA | No RfDs |
| Carbon disulfide | No CSFs | NA |
| Carbon tetrachloride | NA | NA |
| Chlordane | NA | NA |
| Chlorobenzene | No CSFs | NA |
| Chloroform | NA | NA |
| Chromium (VI) | NA | NA |
| Chrysene | NA | No RfDs |
| Cobalt | NA | NA |
| Copper | No CSFs | NA |
| Cyanide | No CSFs | NA |
| Cyclohexanone | No CSFs | NA |
| Dibenzo(a,h)anthracene | NA | No RfDs |
| Dieldrin | NA | NA |
| Di-n-octylphthalate | No CSFs | NA |
| Ethyl ether | No CSFs | NA |
| Ethylbenzene | NA | NA |
| Fluoride | No CSFs | NA |
| Heptachlorodibenzofuran | NA | No RfDs |
| Heptachlorodibenzo-p-dioxin | NA | No RfDs |
| Hexachlorodibenzofuran | NA | No RfDs |
| Hexachlorodibenzo-p-dioxin | NA | No RfDs |
| Indeno(1,2,3-cd)pyrene | NA | No RfDs |

TABLE E-3 - SumPaths

| | | |
|---|---|---|
| Lead | No CSFs | No RfDs |
| Manganese | No CSFs | NA |
| Mercury | No CSFs | NA |
| Methanol | No CSFs | NA |
| 4-Methyl-2-pentanone | No CSFs | NA |
| Methylene chloride | NA | NA |
| Molybdenum | No CSFs | NA |
| Nickel | No CSFs | NA |
| N-nitrosodiphenylamine | NA | NA |
| N-nitrosodipropylamine | NA | No RfDs |
| Octachlorodibenzofuran | NA | No RfDs |
| Octochlorodibenzo-p-dioxin | NA | No RfDs |
| Pentachlorodibenzofuran | No CSFs | No RfDs |
| Pentachlorodibenzo-p-dioxin | NA | No RfDs |
| Pentachlorophenol | NA | NA |
| Phenanthrene | No CSFs | No RfDs |
| Selenium | No CSFs | NA |
| Silver | No CSFs | 2.17E-05 |
| Tetrachlorodibenzofuran | No CSFs | No RfDs |
| Tetrachlorodibenzo-p-dioxin | No CSFs | No RfDs |
| Tetrachloroethylene | NA | NA |
| Thallium | No CSFs | No RfDs |
| Toluene | No CSFs | NA |
| Tributyl phosphate | NA | NA |
| Trichloroethylene | NA | NA |
| Trifluorochloromethane | No CSFs | No RfDs |
| Uranium | No CSFs | 3.32E-02 |
| Vanadium | No CSFs | NA |
| Vinyl chloride | NA | NA |
| Xylenes | No CSFs | NA |
| Zinc | No CSFs | NA |
| | **1.51E-05** | **1.26E-01** |

# TABLE E-4 - InhaleChem

**Groundskeeper/Sampler - Inhalation of Gases & Particulates**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*ET)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | CA = | Concentration of chemical in air | $mg/m^3$ | see COC list below |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Inhalation rate | $m^3/hr$ | 2.5 |
| | ET = | Exposure time | hrs/day | 8 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc $mg/m^3$ | RfDi mg/kgday | CSFi kgday/mg | ADULT CDI mg/kgday | ADULT HQ CDI/RfD | ADULT CDI mg/kgday | ADULT ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | NA | NA | 5.60E-02 | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 5.71E-02 | 1.75E-01 | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | NA | 9.10E-02 | NA | NA | NA | NA |
| 2-Butanone | NA | 1.43E+00 | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | NA | NA | NA | NA | NA | NA |
| 4-Methylphenol | NA | NA | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 1.14E-03 | NA | NA | NA | NA | NA |
| Acetone | NA | NA | NA | NA | NA | NA | NA |
| Antimony | 1.96E-08 | NA | NA | NA | NA | NA | NA |
| Aroclor-1254 | NA | NA | 2.00E+00 | NA | NA | NA | NA |
| Aroclor-1260 | NA | NA | 2.00E+00 | NA | NA | NA | NA |
| Arsenic | 1.05E-06 | NA | 1.51E+01 | NA | NA | 2.937E-08 | 4.43E-07 |
| Barium | NA | 1.43E-04 | NA | NA | NA | NA | NA |
| Benzene | NA | 8.57E-03 | 2.73E-02 | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | NA | 3.08E-01 | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | NA | 3.08E-01 | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | NA | 3.08E+00 | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | NA | 3.08E-02 | NA | NA | NA | NA |
| Beryllium | NA | 5.71E-06 | 8.40E+00 | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | NA | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | NA | NA | NA | NA | NA | NA |
| Boron | NA | 5.71E-03 | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | NA | NA | NA | NA | NA | NA |
| Bromoform | NA | NA | 3.85E-03 | NA | NA | NA | NA |
| Bromomethane | NA | 1.43E-03 | NA | NA | NA | NA | NA |
| Cadmium | 6.42E-09 | NA | 6.30E+00 | NA | NA | 1.795E-10 | 1.13E-09 |
| Carbazole | NA | NA | NA | NA | NA | NA | NA |
| Carbon disulfide | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | NA | 5.25E-02 | NA | NA | NA | NA |
| Chlordane | NA | 2.00E-04 | 3.50E-01 | NA | NA | NA | NA |
| Chlorobenzene | NA | 1.43E-02 | NA | NA | NA | NA | NA |
| Chloroform | NA | NA | 8.05E-02 | NA | NA | NA | NA |
| Chromium (VI) | NA | 2.86E-05 | 4.20E+01 | NA | NA | NA | NA |
| Chrysene | NA | NA | 3.08E-03 | NA | NA | NA | NA |
| Cobalt | NA | 5.71E-06 | 9.80E+00 | NA | NA | NA | NA |
| Copper | NA | NA | NA | NA | NA | NA | NA |
| Cyanide | NA | NA | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | NA | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | NA | 3.08E+00 | NA | NA | NA | NA |
| Dieldrin | NA | NA | 1.61E+01 | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | NA | NA | NA | NA | NA | NA |

# TABLE E-4 - InhaleChem

**Groundskeeper/Sampler - Inhalation of Gases & Particulates**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*ET)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | CA = | Concentration of chemical in air | $mg/m^3$ | see COC list below |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Inhalation rate | $m^3/hr$ | 2.5 |
| | ET = | Exposure time | hrs/day | 8 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc $mg/m^3$ | RfDi mg/kgday | CSFi kgday/mg | ADULT CDI mg/kgday | HQ CDI/RfD | CDI mg/kgday | ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|
| Ethyl ether | NA | NA | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 2.86E-01 | 3.85E-03 | NA | NA | NA | NA |
| Fluoride | NA | NA | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | NA | 1.16E+03 | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | NA | 1.16E+03 | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | NA | 1.16E+04 | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | NA | 1.16E+04 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | NA | 3.08E-01 | NA | NA | NA | NA |
| Lead | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.43E-05 | NA | NA | NA | NA | NA |
| Mercury | NA | NA | NA | NA | NA | NA | NA |
| Methanol | NA | NA | NA | NA | NA | NA | NA |
| Methyl-2-pentanone | NA | 8.57E-01 | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 8.57E-01 | 1.65E-03 | NA | NA | NA | NA |
| Molybdenum | NA | NA | NA | NA | NA | NA | NA |
| Nickel | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | NA | NA | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | NA | NA | NA | NA | NA | NA |
| Octochlorodibenzofuran | NA | NA | 1.16E+02 | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | NA | 1.16E+02 | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | NA | 5.78E+03 | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | NA | 5.78E+04 | NA | NA | NA | NA |
| Pentachlorophenol | NA | NA | NA | NA | NA | NA | NA |
| Phenanthrene | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | NA | NA | NA | NA | NA | NA |
| Silver | 6.76E-09 | NA | NA | NA | NA | NA | NA |
| Tetrachlorodibenzofuran | NA | NA | 1.16E+04 | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | NA | 1.16E+05 | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.71E-01 | 2.07E-02 | NA | NA | NA | NA |
| Thallium | NA | NA | NA | NA | NA | NA | NA |
| Toluene | NA | 1.43E+00 | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | NA | NA | NA | NA | NA | NA |
| Trichloroethylene | NA | 1.14E-02 | 4.00E-01 | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 1.30E-06 | NA | NA | NA | NA | NA | NA |
| Vanadium | NA | NA | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 2.86E-02 | 3.08E-02 | NA | NA | NA | NA |
| Xylenes | NA | 2.86E-02 | NA | NA | NA | NA | NA |
| Zinc | NA | NA | NA | NA | NA | NA | NA |
| | | | | **total =** | **0.00E+00** | **total =** | **4.45E-07** |

Air particulate is 26 ug/m3, the 2005 SER background average from monitor AMS-12.

# TABLE E-4 - DermalSoilChem

**Groundskeeper/Sampler - Dermal Contact with Soil/Sediment**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*AB*SA*EF*ED*AF*CF)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | CS = | Concentration of chemical in soil | mg/kg | see COC list below |
| | AB | Absorption factor | -- | see COC list below |
| | SA | Surface area of exposed skin | $cm^2$/day | 3300 |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | AF = | Adherence factor | mg/$cm^2$ | 0.3 |
| | CF = | Conversion factor | kg/mg | 1.00E-06 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc mg/kg | AB unitless | RfDd mg/kgday | CSFd kgday/mg | ADULT CDI mg/kgday | HQ CDI/RfD | CDI mg/kgday | ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | NA | 1.00E-02 | 3.24E-03 | 7.04E-02 | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 1.00E-02 | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 1.00E-02 | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA |
| 2-Butanone | NA | 1.00E-02 | 4.80E-01 | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | 1.00E-02 | NA | 9.00E-01 | NA | NA | NA | NA |
| 4-Methylphenol | NA | 1.00E-02 | 3.25E-03 | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 1.00E-02 | 2.40E-03 | 2.63E-02 | NA | NA | NA | NA |
| Acetone | NA | 1.00E-02 | 7.47E-01 | NA | NA | NA | NA | NA |
| Antimony | 7.53E-01 | 1.00E-03 | 8.00E-06 | NA | 2.918E-09 | 3.65E-04 | NA | NA |
| Aroclor-1254 | NA | 1.40E-01 | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA |
| Aroclor-1260 | NA | 1.40E-01 | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA |
| Arsenic | 4.04E+01 | 3.00E-02 | 1.23E-04 | 3.66E+00 | 4.696E-06 | 3.82E-02 | 1.677E-06 | 6.14E-06 |
| Barium | NA | 1.00E-03 | 1.40E-02 | NA | NA | NA | NA | NA |
| Benzene | NA | 1.00E-02 | 3.88E-03 | 5.67E-02 | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | 1.30E-01 | NA | 2.35E+00 | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | 1.30E-01 | NA | 2.35E+01 | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | 1.30E-01 | NA | 2.35E+00 | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | 1.30E-01 | NA | 2.35E-01 | NA | NA | NA | NA |
| Beryllium | NA | 1.00E-03 | 2.00E-05 | 4.30E+02 | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 1.00E-02 | 2.00E-02 | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 1.00E-02 | 3.80E-03 | 7.37E-02 | NA | NA | NA | NA |
| Boron | NA | 1.00E-03 | 1.80E-01 | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 1.00E-02 | 1.96E-02 | 6.33E-02 | NA | NA | NA | NA |
| Bromoform | NA | 1.00E-02 | 1.20E-02 | 1.32E-02 | NA | NA | NA | NA |
| Bromomethane | NA | 1.00E-02 | 1.12E-03 | NA | NA | NA | NA | NA |
| Cadmium | 2.47E-01 | 1.00E-03 | 1.00E-05 | NA | 9.571E-10 | 9.57E-05 | NA | NA |
| Carbazole | NA | 1.00E-02 | NA | 2.86E-02 | NA | NA | NA | NA |
| Carbon disulfide | NA | 2.50E-01 | 6.30E-02 | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 1.00E-02 | 4.55E-04 | 2.00E-01 | NA | NA | NA | NA |
| Chlordane | NA | 4.00E-02 | 2.50E-04 | 7.00E-01 | NA | NA | NA | NA |
| Chlorobenzene | NA | 1.00E-02 | 6.20E-03 | NA | NA | NA | NA | NA |
| Chloroform | NA | 1.00E-02 | 2.00E-03 | 3.05E-02 | NA | NA | NA | NA |
| Chromium (VI) | NA | 1.00E-03 | 6.00E-05 | NA | NA | NA | NA | NA |
| Chrysene | NA | 1.30E-01 | NA | 2.35E-02 | NA | NA | NA | NA |
| Cobalt | NA | 1.00E-03 | 1.60E-02 | NA | NA | NA | NA | NA |
| Copper | NA | 1.00E-03 | 1.20E-02 | NA | NA | NA | NA | NA |
| Cyanide | NA | 1.00E-02 | 3.40E-03 | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 1.00E-02 | 4.00E+00 | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | 1.30E-01 | NA | 2.35E+01 | NA | NA | NA | NA |
| Dieldrin | NA | 1.00E-02 | 2.50E-05 | 3.20E+01 | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 1.00E-02 | 3.60E-02 | NA | NA | NA | NA | NA |

# TABLE E-4 - DermalSoilChem

**Groundskeeper/Sampler - Dermal Contact with Soil/Sediment**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*AB*SA*EF*ED*AF*CF)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | CS = | Concentration of chemical in soil | mg/kg | see COC list below |
| | AB | Absorption factor | -- | see COC list below |
| | SA | Surface area of exposed skin | $cm^2$/day | 3300 |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | AF = | Adherence factor | $mg/cm^2$ | 0.3 |
| | CF = | Conversion factor | kg/mg | 1.00E-06 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc mg/kg | AB unitless | RfDd mg/kgday | CSFd kgday/mg | ADULT CDI mg/kgday | ADULT HQ CDI/RfD | ADULT CDI mg/kgday | ADULT ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|---|
| Ethyl ether | NA | 1.00E-02 | 1.60E-01 | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 1.00E-02 | 9.70E-02 | NA | NA | NA | NA | NA |
| Fluoride | NA | 1.00E-03 | 5.82E-02 | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+03 | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+03 | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+04 | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+04 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | 1.30E-01 | NA | 2.35E+00 | NA | NA | NA | NA |
| Lead | NA | 1.00E-03 | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.00E-03 | 5.60E-03 | NA | NA | NA | NA | NA |
| Mercury | NA | 1.00E-03 | 2.10E-05 | NA | NA | NA | NA | NA |
| Methanol | NA | 1.00E-02 | 4.00E-01 | NA | NA | NA | NA | NA |
| Methyl-2-pentanone | NA | 1.00E-02 | 6.40E-02 | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 1.00E-02 | 5.70E-02 | 7.89E-03 | NA | NA | NA | NA |
| Molybdenum | NA | 1.00E-03 | 1.90E-03 | NA | NA | NA | NA | NA |
| Nickel | NA | 1.00E-03 | 5.40E-03 | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 1.00E-02 | 5.00E-03 | 1.96E-02 | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | 1.00E-02 | NA | 2.80E+01 | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+02 | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+02 | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | 1.00E-02 | NA | 1.50E+04 | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 1.50E+05 | NA | NA | NA | NA |
| Pentachlorophenol | NA | 2.50E-01 | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA |
| Phenanthrene | NA | 1.00E-02 | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 1.00E-03 | 2.20E-03 | NA | NA | NA | NA | NA |
| Silver | 2.60E-01 | 1.00E-03 | 9.00E-04 | NA | 1.007E-09 | 1.12E-06 | NA | NA |
| Tetrachlorodibenzofuran | NA | 1.00E-02 | NA | 3.00E+04 | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | 3.00E-02 | NA | 3.00E+05 | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.00E-02 | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA |
| Thallium | NA | 1.00E-03 | 1.80E-05 | NA | NA | NA | NA | NA |
| Toluene | NA | 1.00E-02 | 6.40E-02 | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 1.00E-02 | 1.00E-01 | 1.08E-02 | NA | NA | NA | NA |
| Trichloroethylene | NA | 1.00E-02 | 4.50E-05 | 2.67E+00 | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 5.01E+01 | 1.00E-03 | 5.10E-04 | NA | 1.941E-07 | 3.81E-04 | 6.933E-08 | NA |
| Vanadium | NA | 1.00E-03 | 7.00E-05 | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 1.00E-02 | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA |
| Xylenes | NA | 1.00E-02 | 1.84E-01 | NA | NA | NA | NA | NA |
| Zinc | NA | 1.00E-03 | 6.00E-02 | NA | NA | NA | NA | NA |
| | | | | | **total =** | **3.90E-02** | **total =** | **6.14E-06** |

# TABLE E-4 - IngestSoilChem

**Groundskeeper/Sampler - Ingestion of Soil**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*FI*CF)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | CS = | Concentration of chemical in soil | mg/kg | see COC list below |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | mg/day | 100 |
| | FI = | Fraction of contaminated soil | unitless | 1 |
| | CF = | Conversion factor | kg/mg | 1.00E-06 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc | RfDo | CSFo | ADULT | | | |
|---|---|---|---|---|---|---|---|
| | | | | CDI | HQ | CDI | ILCR |
| | mg/kg | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| 1,1,2-Trichloroethane | NA | 4.00E-03 | 5.70E-02 | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA |
| 2-Butanone | NA | 6.00E-01 | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | NA | 4.50E-01 | NA | NA | NA | NA |
| 4-Methylphenol | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 3.00E-03 | 2.10E-02 | NA | NA | NA | NA |
| Acetone | NA | 9.00E-01 | NA | NA | NA | NA | NA |
| Antimony | 7.53E-01 | 4.00E-04 | NA | 2.95E-07 | 7.37E-04 | NA | NA |
| Aroclor-1254 | NA | 2.00E-05 | 2.00E+00 | NA | NA | NA | NA |
| Aroclor-1260 | NA | 2.00E-05 | 2.00E+00 | NA | NA | NA | NA |
| Arsenic | 4.04E+01 | 3.00E-04 | 1.50E+00 | 1.58E-05 | 5.27E-02 | 5.65E-06 | 8.47E-06 |
| Barium | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Benzene | NA | 4.00E-03 | 5.50E-02 | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | NA | 7.30E+00 | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | NA | 7.30E-02 | NA | NA | NA | NA |
| Beryllium | NA | 2.00E-03 | 4.30E+00 | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 4.00E-02 | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 2.00E-02 | 1.40E-02 | NA | NA | NA | NA |
| Boron | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 2.00E-02 | 6.20E-02 | NA | NA | NA | NA |
| Bromoform | NA | 2.00E-02 | 7.90E-03 | NA | NA | NA | NA |
| Bromomethane | NA | 1.40E-03 | NA | NA | NA | NA | NA |
| Cadmium | 2.47E-01 | 1.00E-03 | NA | 9.67E-08 | 9.67E-05 | NA | NA |
| Carbazole | NA | NA | 2.00E-03 | NA | NA | NA | NA |
| Carbon disulfide | NA | 1.00E-01 | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 7.00E-04 | 1.30E-01 | NA | NA | NA | NA |
| Chlordane | NA | 5.00E-04 | 3.50E-01 | NA | NA | NA | NA |
| Chlorobenzene | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Chloroform | NA | 1.00E-02 | 6.10E-03 | NA | NA | NA | NA |
| Chromium (VI) | NA | 3.00E-03 | NA | NA | NA | NA | NA |
| Chrysene | NA | NA | 7.30E-03 | NA | NA | NA | NA |
| Cobalt | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Copper | NA | 4.00E-02 | NA | NA | NA | NA | NA |
| Cyanide | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 5.00E+00 | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | NA | 7.30E+00 | NA | NA | NA | NA |
| Dieldrin | NA | 5.00E-05 | 1.60E+01 | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 4.00E-02 | NA | NA | NA | NA | NA |

# TABLE E-4 - IngestSoilChem

**Groundskeeper/Sampler - Ingestion of Soil**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*FI*CF)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | CS = | Concentration of chemical in soil | mg/kg | see COC list below |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | mg/day | 100 |
| | FI = | Fraction of contaminated soil | unitless | 1 |
| | CF = | Conversion factor | kg/mg | 1.00E-06 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | conc | RfDo | CSFo | ADULT | | | |
|---|---|---|---|---|---|---|---|
| | | | | CDI | HQ | CDI | ILCR |
| | mg/kg | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| Ethyl ether | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 1.00E-01 | NA | NA | NA | NA | NA |
| Fluoride | NA | 6.00E-02 | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | NA | 1.50E+04 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Lead | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.40E-01 | NA | NA | NA | NA | NA |
| Mercury | NA | 3.00E-04 | NA | NA | NA | NA | NA |
| Methanol | NA | 5.00E-01 | NA | NA | NA | NA | NA |
| Methyl-2-pentanone | NA | 8.00E-02 | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 6.00E-02 | 7.50E-03 | NA | NA | NA | NA |
| Molybdenum | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| Nickel | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 2.00E-02 | 4.90E-03 | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | NA | 7.00E+00 | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | NA | 1.50E+02 | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | NA | 1.50E+02 | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | NA | 7.50E+03 | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | NA | 7.50E+04 | NA | NA | NA | NA |
| Pentachlorophenol | NA | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA |
| Phenanthrene | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| Silver | 2.60E-01 | 5.00E-03 | NA | 1.02E-07 | 2.04E-05 | NA | NA |
| Tetrachlorodibenzofuran | NA | NA | 1.50E+04 | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | NA | 1.50E+05 | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA |
| Thallium | NA | 9.00E-05 | NA | NA | NA | NA | NA |
| Toluene | NA | 8.00E-02 | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 2.00E-01 | 5.40E-03 | NA | NA | NA | NA |
| Trichloroethylene | NA | 3.00E-04 | 4.00E-01 | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 5.01E+01 | 6.00E-04 | NA | 1.96E-05 | 3.27E-02 | NA | NA |
| Vanadium | NA | 7.00E-03 | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA |
| Xylenes | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Zinc | NA | 3.00E-01 | NA | NA | NA | NA | NA |
| | | | | **total =** | **8.62E-02** | **total =** | **8.47E-06** |

# TABLE E-4 - DermalSWchem

**Groundskeeper/Sampler - Dermal Contact with Surface Water**
**Risk calculation for A6W-CU5**

| | | | UNITS | adult |
|---|---|---|---|---|
| Intake Equation: | CDI = | (DA*EF*ED*SA)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | DA = | Dermal absorption dose | mg/cm²day | see COC list below |
| | EF = | Exposure frequency | days/yr | 12 |
| | ED = | Exposure duration | yrs | 25 |
| | SA = | Surface area of skin | cm² | 5670 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |
| where: | DA = $C_v$*$K_p$*CF*ET | | | |
| | $C_v$ = | concentation of ith contaminant in surface water | mg/L | see COC list below |
| | $K_p$ = | permeability constant for ith contaminant | cm/hr | see COC list below |
| | CF = | conversion factor | L/cm³ | 0.001 |
| | ET = | exposure time | hr/d | 1 |

| COC | $C_v$ mg/L | $K_p$ cm/hr | DA mg/cm²day | RfDd mg/kgday | CSFd kgday/mg | ADULT CDI mg/kgday | ADULT HQ CDI/RfD | ADULT CDI mg/kgday | ADULT ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|---|---|
| 1,1,2-Trichloroethane | NA | 6.43E-03 | NA | 3.24E-03 | 7.04E-02 | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 1.59E-02 | NA | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 5.34E-03 | NA | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA |
| 2-Butanone | NA | 1.11E-03 | NA | 4.80E-01 | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | 1.69E-02 | NA | NA | 9.00E-01 | NA | NA | NA | NA |
| 4-Methylphenol | NA | 9.95E-03 | NA | 3.25E-03 | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 2.66E-03 | NA | 2.40E-03 | 2.63E-02 | NA | NA | NA | NA |
| Acetone | NA | 5.69E-04 | NA | 7.47E-01 | NA | NA | NA | NA | NA |
| Antimony | 2.50E-04 | 1.00E-03 | 2.50E-10 | 8.00E-06 | NA | 6.66E-10 | 8.32E-05 | NA | NA |
| Aroclor-1254 | NA | 1.29E+00 | NA | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA |
| Aroclor-1260 | NA | 5.48E+00 | NA | 1.80E-05 | 2.22E+00 | NA | NA | NA | NA |
| Arsenic | 1.50E-03 | 1.00E-03 | 1.50E-09 | 1.23E-04 | 3.66E+00 | 3.99E-09 | 3.25E-05 | 1.43E-09 | 5.22E-09 |
| Barium | NA | 1.00E-03 | NA | 1.40E-02 | NA | NA | NA | NA | NA |
| Benzene | NA | 2.07E-02 | NA | 3.88E-03 | 5.67E-02 | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | 9.48E-01 | NA | NA | 2.35E+00 | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | 1.24E+00 | NA | NA | 2.35E+01 | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | 6.99E-01 | NA | NA | 2.35E+00 | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | 1.20E+00 | NA | NA | 2.35E-01 | NA | NA | NA | NA |
| Beryllium | NA | 1.00E-03 | NA | 2.00E-05 | 4.30E+02 | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 7.63E-02 | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 1.97E+00 | NA | 3.80E-03 | 7.37E-02 | NA | NA | NA | NA |
| Boron | NA | 1.00E-03 | NA | 1.80E-01 | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 5.02E-03 | NA | 1.96E-02 | 6.33E-02 | NA | NA | NA | NA |
| Bromoform | NA | 2.77E-03 | NA | 1.20E-02 | 1.32E-02 | NA | NA | NA | NA |
| Bromomethane | NA | 3.51E-03 | NA | 1.12E-03 | NA | NA | NA | NA | NA |
| Cadmium | 5.00E-05 | 1.00E-03 | 5.00E-11 | 1.00E-05 | NA | 1.33E-10 | 1.33E-05 | NA | NA |
| Carbazole | NA | 7.97E-02 | NA | NA | 2.86E-02 | NA | NA | NA | NA |
| Carbon disulfide | NA | 1.56E-02 | NA | 6.30E-02 | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 2.24E-02 | NA | 4.55E-04 | 2.00E-01 | NA | NA | NA | NA |
| Chlordane | NA | 1.57E-01 | NA | 2.50E-04 | 7.00E-01 | NA | NA | NA | NA |
| Chlorobenzene | NA | 4.07E-02 | NA | 6.20E-03 | NA | NA | NA | NA | NA |
| Chloroform | NA | 8.92E-03 | NA | 2.00E-03 | 3.05E-02 | NA | NA | NA | NA |
| Chromium (VI) | NA | 2.00E-03 | NA | 6.00E-05 | NA | NA | NA | NA | NA |
| Chrysene | NA | 1.03E+00 | NA | NA | 2.35E-02 | NA | NA | NA | NA |
| Cobalt | NA | 4.00E-04 | NA | 1.60E-02 | NA | NA | NA | NA | NA |
| Copper | NA | 1.00E-03 | NA | 1.20E-02 | NA | NA | NA | NA | NA |
| Cyanide | NA | 1.00E-03 | NA | 3.40E-03 | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 1.80E-03 | NA | 4.00E+00 | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | 1.68E+00 | NA | NA | 2.35E+01 | NA | NA | NA | NA |
| Dieldrin | NA | 4.45E-02 | NA | 2.50E-05 | 3.20E+01 | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 4.45E+00 | NA | 3.60E-02 | NA | NA | NA | NA | NA |

# TABLE E-4 - DermalSWchem

**Groundskeeper/Sampler - Dermal Contact with Surface Water**
**Risk calculation for A6W-CU5**

| | | | UNITS | adult |
|---|---|---|---|---|
| Intake Equation: | CDI = | (DA*EF*ED*SA)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | calculated below |
| | DA = | Dermal absorption dose | $mg/cm^2day$ | see COC list below |
| | EF = | Exposure frequency | days/yr | 12 |
| | ED = | Exposure duration | yrs | 25 |
| | SA = | Surface area of skin | $cm^2$ | 5670 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |
| where: | $DA = C_v*K_p*CF*ET$ | | | |
| | $C_v$ = | concentation of ith contaminant in surface water | mg/L | see COC list below |
| | $K_p$ = | permeability constant for ith contaminant | cm/hr | see COC list below |
| | CF = | conversion factor | $L/cm^3$ | 0.001 |
| | ET = | exposure time | hr/d | 1 |

| COC | $C_v$ mg/L | $K_p$ cm/hr | DA $mg/cm^2day$ | RfDd mg/kgday | CSFd kgday/mg | ADULT CDI mg/kgday | ADULT HQ CDI/RfD | ADULT CDI mg/kgday | ADULT ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|---|---|
| Ethyl ether | NA | 2.88E-03 | NA | 1.60E-01 | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 7.39E-02 | NA | 9.70E-02 | NA | NA | NA | NA | NA |
| Fluoride | NA | 1.00E-03 | NA | 5.82E-02 | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | 2.55E+00 | NA | NA | 3.00E+03 | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | 3.22E+00 | NA | NA | 3.00E+03 | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | 2.38E+00 | NA | NA | 3.00E+04 | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | 5.29E+00 | NA | NA | 3.00E+04 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | 2.23E+00 | NA | NA | 2.35E+00 | NA | NA | NA | NA |
| Lead | NA | 1.00E-04 | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 1.00E-03 | NA | 1.84E-03 | NA | NA | NA | NA | NA |
| Mercury | NA | 1.00E-03 | NA | 2.10E-05 | NA | NA | NA | NA | NA |
| Methanol | NA | 3.45E-04 | NA | 4.00E-01 | NA | NA | NA | NA | NA |
| 4-Methyl-2-pentanone | NA | 3.97E-03 | NA | 6.40E-02 | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 4.46E-03 | NA | 5.70E-02 | 7.89E-03 | NA | NA | NA | NA |
| Molybdenum | NA | 1.00E-03 | NA | 1.90E-03 | NA | NA | NA | NA | NA |
| Nickel | NA | 2.00E-04 | NA | 5.40E-03 | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 1.96E-02 | NA | 5.00E-03 | 1.96E-02 | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | 2.83E-03 | NA | NA | 2.80E+01 | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | 4.78E+00 | NA | NA | 3.00E+02 | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | 1.65E+01 | NA | NA | 3.00E+02 | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | 1.06E+00 | NA | NA | 1.50E+04 | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | 3.79E-01 | NA | NA | 1.50E+05 | NA | NA | NA | NA |
| Pentachlorophenol | NA | 1.95E-01 | NA | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA |
| Phenanthrene | NA | 2.29E-01 | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 1.00E-03 | NA | 2.20E-03 | NA | NA | NA | NA | NA |
| Silver | 1.00E-04 | 6.00E-04 | 6.00E-11 | 9.00E-04 | NA | 1.60E-10 | 1.78E-07 | NA | NA |
| Tetrachlorodibenzofuran | NA | 1.12E+00 | NA | NA | 3.00E+04 | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | 1.39E+00 | NA | NA | 3.00E+05 | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 4.81E-02 | NA | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA |
| Thallium | NA | 1.00E-03 | NA | 1.80E-05 | NA | NA | NA | NA | NA |
| Toluene | NA | 4.53E-02 | NA | 6.40E-02 | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 3.13E-02 | NA | 1.00E-01 | 1.08E-02 | NA | NA | NA | NA |
| Trichloroethylene | NA | 1.57E-02 | NA | 4.50E-05 | 2.67E+00 | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 8.05E-03 | 1.00E-03 | 8.05E-09 | 5.10E-04 | NA | 2.14E-08 | 4.20E-05 | NA | NA |
| Vanadium | NA | 1.00E-03 | NA | 7.00E-05 | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 1.13E-02 | NA | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA |
| Xylenes | NA | 7.04E-02 | NA | 1.84E-01 | NA | NA | NA | NA | NA |
| Zinc | NA | 6.00E-04 | NA | 6.00E-02 | NA | NA | NA | NA | NA |
| | | | | | | **total =** | **1.71E-04** | **total =** | **5.22E-09** |

# TABLE E-4 - IngestSWchem

**Groundskeeper/Sampler - Ingestion of Surface Water**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Values |
|---|---|---|---|---|
| | CDI = | (CW*EF*ED*IR)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | adult |
| | CW = | Concentration of chemical in water | mg/L | see COC table below |
| | EF = | Exposure frequency | days/yr | 12 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | L/day | 0.01 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | CW | RfDo | CSFo | ADULT | | | |
|---|---|---|---|---|---|---|---|
| | | | | CDI | HQ | CDI | ILCR |
| | mg/L | mg/kgday | kgday/mg | mg/kgday | CDI/RfD | mg/kgday | CDI*CSF |
| 1,1,2-Trichloroethane | NA | 4.00E-03 | 5.70E-02 | NA | NA | NA | NA |
| 1,1-Dichloroethylene | NA | 5.00E-02 | 6.00E-01 | NA | NA | NA | NA |
| 1,2-dichloroethane | NA | 2.00E-02 | 9.10E-02 | NA | NA | NA | NA |
| 2-Butanone | NA | 6.00E-01 | NA | NA | NA | NA | NA |
| 3,3-Dichlorobenzidine | NA | NA | 4.50E-01 | NA | NA | NA | NA |
| 4-Methylphenol | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| 4-Nitroanaline | NA | 3.00E-03 | 2.10E-02 | NA | NA | NA | NA |
| Acetone | NA | 9.00E-01 | NA | NA | NA | NA | NA |
| Antimony | 2.50E-04 | 4.00E-04 | NA | 1.17E-09 | 2.94E-06 | 4.19E-10 | NA |
| Aroclor-1254 | NA | 2.00E-05 | 4.00E-01 | NA | NA | NA | NA |
| Aroclor-1260 | NA | 2.00E-05 | 4.00E-01 | NA | NA | NA | NA |
| Arsenic | 1.50E-03 | 3.00E-04 | 1.50E+00 | 7.05E-09 | 2.35E-05 | 2.52E-09 | 3.77E-09 |
| Barium | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Benzene | NA | 4.00E-03 | 5.50E-02 | NA | NA | NA | NA |
| Benzo(a)anthracene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Benzo(a)pyrene | NA | NA | 7.30E+00 | NA | NA | NA | NA |
| Benzo(b)fluoranthene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Benzo(k)fluoranthene | NA | NA | 7.30E-02 | NA | NA | NA | NA |
| Beryllium | NA | 2.00E-03 | 4.30E+00 | NA | NA | NA | NA |
| Bis(2-chloroisopropyl)ether | NA | 4.00E-02 | NA | NA | NA | NA | NA |
| Bis(2-ethylhexyl)phthalate | NA | 2.00E-02 | 1.40E-02 | NA | NA | NA | NA |
| Boron | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Bromodichloromethane | NA | 2.00E-02 | 6.20E-02 | NA | NA | NA | NA |
| Bromoform | NA | 2.00E-02 | 7.90E-03 | NA | NA | NA | NA |
| Bromomethane | NA | 1.40E-03 | NA | NA | NA | NA | NA |
| Cadmium | 5.00E-05 | 1.00E-03 | NA | 2.35E-10 | 2.35E-07 | 8.39E-11 | NA |
| Carbazole | NA | NA | 2.00E-03 | NA | NA | NA | NA |
| Carbon disulfide | NA | 1.00E-01 | NA | NA | NA | NA | NA |
| Carbon tetrachloride | NA | 7.00E-04 | 1.30E-01 | NA | NA | NA | NA |
| Chlordane | NA | 5.00E-04 | 3.50E-01 | NA | NA | NA | NA |
| Chlorobenzene | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Chloroform | NA | 1.00E-02 | 6.10E-03 | NA | NA | NA | NA |
| Chromium (VI) | NA | 3.00E-03 | NA | NA | NA | NA | NA |
| Chrysene | NA | NA | 7.30E-03 | NA | NA | NA | NA |
| Cobalt | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Copper | NA | 4.00E-02 | NA | NA | NA | NA | NA |
| Cyanide | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| Cyclohexanone | NA | 5.00E+00 | NA | NA | NA | NA | NA |
| Dibenzo(a,h)anthracene | NA | NA | 7.30E+00 | NA | NA | NA | NA |
| Dieldrin | NA | 5.00E-05 | 1.60E+01 | NA | NA | NA | NA |
| Di-n-octylphthalate | NA | 4.00E-02 | NA | NA | NA | NA | NA |

# TABLE E-4 - IngestSWchem

**Groundskeeper/Sampler - Ingestion of Surface Water**
**Risk calculation for A6W-CU5**

| Intake Equation: | | | UNITS | Assigned Values |
|---|---|---|---|---|
| | CDI = | (CW*EF*ED*IR)/(BW*AT) | | |
| | CDI = | Chronic Daily Intake | mg/kgday | adult |
| | CW = | Concentration of chemical in water | mg/L | see COC table below |
| | EF = | Exposure frequency | days/yr | 12 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | L/day | 0.01 |
| | BW = | Body weight | kg | 70 |
| | ATc = | Average time for carcinogens | days | 25550 |
| | ATn = | Average time for non-carcinogens | days | 9125 |

| COC | CW mg/L | RfDo mg/kgday | CSFo kgday/mg | ADULT CDI mg/kgday | ADULT HQ CDI/RfD | ADULT CDI mg/kgday | ADULT ILCR CDI*CSF |
|---|---|---|---|---|---|---|---|
| Ethyl ether | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Ethylbenzene | NA | 1.00E-01 | NA | NA | NA | NA | NA |
| Fluoride | NA | 6.00E-02 | NA | NA | NA | NA | NA |
| Heptachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Heptachlorodibenzo-p-dioxin | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Hexachlorodibenzofuran | NA | NA | 1.50E+03 | NA | NA | NA | NA |
| Hexachlorodibenzo-p-dioxin | NA | NA | 1.50E+04 | NA | NA | NA | NA |
| Indeno(1,2,3-cd)pyrene | NA | NA | 7.30E-01 | NA | NA | NA | NA |
| Lead | NA | NA | NA | NA | NA | NA | NA |
| Manganese | NA | 4.60E-02 | NA | NA | NA | NA | NA |
| Mercury | NA | 3.00E-04 | NA | NA | NA | NA | NA |
| Methanol | NA | 5.00E-01 | NA | NA | NA | NA | NA |
| 4-Methyl-2-pentanone | NA | 8.00E-02 | NA | NA | NA | NA | NA |
| Methylene chloride | NA | 6.00E-02 | 7.50E-03 | NA | NA | NA | NA |
| Molybdenum | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| Nickel | NA | 2.00E-02 | NA | NA | NA | NA | NA |
| N-nitrosodiphenylamine | NA | 2.00E-02 | 4.90E-03 | NA | NA | NA | NA |
| N-nitrosodipropylamine | NA | NA | 7.00E+00 | NA | NA | NA | NA |
| Octachlorodibenzofuran | NA | NA | 1.50E+02 | NA | NA | NA | NA |
| Octochlorodibenzo-p-dioxin | NA | NA | 1.50E+02 | NA | NA | NA | NA |
| Pentachlorodibenzofuran | NA | NA | 7.50E+03 | NA | NA | NA | NA |
| Pentachlorodibenzo-p-dioxin | NA | NA | 7.50E+04 | NA | NA | NA | NA |
| Pentachlorophenol | NA | 3.00E-02 | 1.20E-01 | NA | NA | NA | NA |
| Phenanthrene | NA | NA | NA | NA | NA | NA | NA |
| Selenium | NA | 5.00E-03 | NA | NA | NA | NA | NA |
| Silver | 1.00E-04 | 5.00E-03 | NA | 4.70E-10 | 9.39E-08 | 1.68E-10 | NA |
| Tetrachlorodibenzofuran | NA | NA | 1.50E+04 | NA | NA | NA | NA |
| Tetrachlorodibenzo-p-dioxin | NA | NA | 1.50E+05 | NA | NA | NA | NA |
| Tetrachloroethylene | NA | 1.00E-02 | 5.40E-01 | NA | NA | NA | NA |
| Thallium | NA | 9.00E-05 | NA | NA | NA | NA | NA |
| Toluene | NA | 8.00E-02 | NA | NA | NA | NA | NA |
| Tributyl phosphate | NA | 2.00E-01 | 5.40E-03 | NA | NA | NA | NA |
| Trichloroethylene | NA | 3.00E-04 | 4.00E-01 | NA | NA | NA | NA |
| Trifluorochloromethane | NA | NA | NA | NA | NA | NA | NA |
| Uranium | 8.05E-03 | 6.00E-04 | NA | 3.78E-08 | 6.30E-05 | 1.35E-08 | NA |
| Vanadium | NA | 7.00E-03 | NA | NA | NA | NA | NA |
| Vinyl chloride | NA | 3.00E-03 | 1.50E+00 | NA | NA | NA | NA |
| Xylenes | NA | 2.00E-01 | NA | NA | NA | NA | NA |
| Zinc | NA | 3.00E-01 | NA | NA | NA | NA | NA |
| | | | | **total =** | **8.98E-05** | **total =** | **3.77E-09** |

# TABLE E-4 - InhaleRad

**Groundskeeper/Sampler - Inhalation of Gases & Particulates**
**Risk calculation for A6W-CU5 minus rad background**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CA*EF*ED*IR*ET) | | |
| | CDI = | Chronic Daily Intake | pCi | calculated below |
| | CA = | Concentration of radionuclide in air | pCi/m$^3$ | see COC list below |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Inhalation rate | m$^3$/hr | 2.5 |
| | ET = | Exposure time | hrs/day | 8 |

| COC | conc pCi/m$^3$ | CSFi 1/pCi | ADULT CDI pCi | ADULT ILCR CDI*CSF |
|---|---|---|---|---|
| Cesium-137 + D | NA | 1.19E-11 | NA | NA |
| Lead-210 + D | NA | 1.39E-08 | NA | NA |
| Neptunium-237 + D | NA | 1.77E-08 | NA | NA |
| Plutonium-238 | NA | 3.36E-08 | NA | NA |
| Plutonium-239/240 | NA | 3.33E-08 | NA | NA |
| Radium-226 + D | 0.00E+00 | 1.16E-08 | 0.00E+00 | 0.00E+00 |
| Radium-228 + D | 0.00E+00 | 5.23E-09 | 0.00E+00 | 0.00E+00 |
| Radon-222+ D | 0.00E+00 | 1.80E-11 | 0.00E+00 | 0.00E+00 |
| Strontium-90 + D | NA | 1.13E-10 | NA | NA |
| Technetium-99 | 1.48E-04 | 1.41E-11 | 7.42E+00 | 1.05E-10 |
| Thorium-228 + D | 7.80E-07 | 1.43E-07 | 3.90E-02 | 5.58E-09 |
| Thorium-230 | 7.41E-05 | 2.85E-08 | 3.71E+00 | 1.06E-07 |
| Thorium-232 | 0.00E+00 | 4.33E-08 | 0.00E+00 | 0.00E+00 |
| Uranium-234 | 4.04E-04 | 1.14E-08 | 2.02E+01 | 2.30E-07 |
| Uranium-235 + D | 1.84E-05 | 1.01E-08 | 9.21E-01 | 9.30E-09 |
| Uranium-238 + D | 3.95E-04 | 9.35E-09 | 1.97E+01 | 1.85E-07 |
| | | | **total =** | **5.35E-07** |

Air particulate is 26 ug/m3, the 2005 SER background average from monitor AMS-12.
Rn-222 is derived by multiplying the soil Ra-226 value by 267 g/m3. This conversion factor is based on Rn-222 air background and Ra-226 soil background (i.e., 400 pCi/m3 divided by 1.5 pCi/g)

# TABLE E-4 - IngestSoilRad

**Groundskeep/Sampler - Ingestion of Soil**
**Risk calculation for A6W-CU5 minus rad background**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | (CS*EF*ED*IR*FI) | | |
| | CDI = | Chronic Daily Intake | pCi | calculated below |
| | CS = | Concentration of radionuclide in soil | pCi/g | see COC list below |
| | EF = | Exposure frequency | days/yr | 100 |
| | ED = | Exposure duration | yrs | 25 |
| | IR = | Ingestion rate | g/day | 0.1 |
| | FI = | Fraction of contaminated soil | unitless | 1 |

| COC | conc pCi/g | CSFos 1/pCi | ADULT CDI pCi | ADULT ILCR CDI*CSF |
|---|---|---|---|---|
| Cesium-137 + D | NA | 4.33E-11 | NA | NA |
| Lead-210 + D | NA | 2.66E-09 | NA | NA |
| Neptunium-237 + D | NA | 1.62E-10 | NA | NA |
| Plutonium-238 | NA | 2.72E-10 | NA | NA |
| Plutonium-239/240 | NA | 2.76E-10 | NA | NA |
| Radium-226 + D | 0.00E+00 | 7.30E-10 | 0.00E+00 | 0.00E+00 |
| Radium-228 + D | 0.00E+00 | 2.29E-09 | 0.00E+00 | 0.00E+00 |
| Radon-222+ D | NA | NA | NA | NA |
| Strontium-90 + D | NA | 1.44E-10 | NA | NA |
| Technetium-99 | 5.71E+00 | 7.66E-12 | 1.43E+03 | 1.09E-08 |
| Thorium-228 + D | 3.00E-02 | 8.09E-10 | 7.50E+00 | 6.07E-09 |
| Thorium-230 | 2.85E+00 | 2.02E-10 | 7.13E+02 | 1.44E-07 |
| Thorium-232 | 0.00E+00 | 2.31E-10 | 0.00E+00 | 0.00E+00 |
| Uranium-234 | 1.55E+01 | 1.58E-10 | 3.88E+03 | 6.14E-07 |
| Uranium-235 + D | 7.08E-01 | 1.63E-10 | 1.77E+02 | 2.89E-08 |
| Uranium-238 + D | 1.52E+01 | 2.10E-10 | 3.80E+03 | 7.97E-07 |
| | | | **total =** | **1.60E-06** |

# TABLE E-4 - IngestSWrad

**Groundskeeper/Sampler - Ingestion of Surface Water**
**Risk calculation for A6W-CU5 minus rad background**

| Intake Equation: | | |
|---|---|---|
| | CDI = | (CW*EF*ED*IR) |
| | CDI = | Chronic Daily Intake |
| | CW = | Concentration of radionuclide in water |
| | EF = | Exposure frequency |
| | ED = | Exposure duration |
| | IR = | Ingestion rate |

| UNITS | Assigned Values |
|---|---|
| pCi | adult |
| pCi/L | see COC table below |
| days/yr | 12 |
| yrs | 25 |
| L/day | 0.01 |

| COC | conc pCi/L | CSFow 1/pCi | ADULT CDI pCi | ADULT ILCR CDI*CSF |
|---|---|---|---|---|
| Cesium-137 + D | NA | 3.04E-11 | NA | NA |
| Lead-210 + D | NA | 1.27E-09 | NA | NA |
| Neptunium-237 + D | NA | 6.74E-11 | NA | NA |
| Plutonium-238 | NA | 1.31E-10 | NA | NA |
| Plutonium-239/240 | NA | 1.35E-10 | NA | NA |
| Radium-226 + D | 5.10E-02 | 3.86E-10 | 1.53E-01 | 5.91E-11 |
| Radium-228 + D | 2.40E+00 | 1.04E-09 | 7.20E+00 | 7.49E-09 |
| Radon-222+ D | NA | NA | NA | NA |
| Strontium-90 + D | NA | 7.40E-11 | NA | NA |
| Technetium-99 | 2.78E+00 | 2.75E-12 | 8.34E+00 | 2.29E-11 |
| Thorium-228 + D | 2.40E+00 | 3.00E-10 | 7.20E+00 | 2.16E-09 |
| Thorium-230 | 1.90E-03 | 9.10E-11 | 5.70E-03 | 5.19E-13 |
| Thorium-232 | 2.40E+00 | 1.01E-10 | 7.20E+00 | 7.27E-10 |
| Uranium-234 | 2.37E+00 | 7.07E-11 | 7.12E+00 | 5.03E-10 |
| Uranium-235 + D | 1.08E-01 | 7.18E-11 | 3.24E-01 | 2.33E-11 |
| Uranium-238 + D | 2.32E+00 | 8.71E-11 | 6.95E+00 | 6.06E-10 |
| | | | **total =** | **1.16E-08** |

# TABLE E-4 - ExternalRad

**Groundskeeper/Sampler - External Radiation**
**Risk calculation for A6W-CU5 minus rad background**

| Intake Equation: | | | UNITS | adult |
|---|---|---|---|---|
| | CDI = | $(CS*EF*ED*ET_o*(1-SH_o))+(CS*EF*ED*ET_i*(1-SH_i))$ | | |
| | CDI = | Chronic Daily Intake | yr pCi/g | calculated below |
| | CS = | Concentration of radionuclide in soil | pCi/g | see COC list below |
| | EF = | Fraction of year exposed to radiation | -- | 0.27 |
| | ED = | Exposure duration | yrs | 25 |
| | $ET_o$ = | Fraction of day spent outdoors | -- | 0.33 |
| | $ET_i$ = | Fraction of day spent indoors | -- | 0.00 |
| | $SH_o$ = | Shield factor outdoors | -- | 0.25 |
| | $SH_i$ = | Shield factor indoors | -- | 0.5 |

| COC | conc pCi/g | CSFx g/pCi yr | ADULT CDI yr pCi/g | ADULT ILCR CDI*CSF |
|---|---|---|---|---|
| Cesium-137 + D | NA | 2.55E-06 | NA | NA |
| Lead-210 + D | NA | 4.21E-09 | NA | NA |
| Neptunium-237 + D | NA | 7.97E-07 | NA | NA |
| Plutonium-238 | NA | 7.22E-11 | NA | NA |
| Plutonium-239/240 | NA | 2.00E-10 | NA | NA |
| Radium-226 + D | 0.00E+00 | 8.49E-06 | 0.00E+00 | 0.00E+00 |
| Radium-228 + D | 0.00E+00 | 4.53E-06 | 0.00E+00 | 0.00E+00 |
| Radon-222+ D | NA | NA | NA | NA |
| Strontium-90 + D | NA | 1.96E-08 | NA | NA |
| Technetium-99 | 5.71E+00 | 8.14E-11 | 9.77E+00 | 7.95E-10 |
| Thorium-228 + D | 3.00E-02 | 7.76E-06 | 5.13E-02 | 3.98E-07 |
| Thorium-230 | 2.85E+00 | 8.19E-10 | 4.88E+00 | 3.99E-09 |
| Thorium-232 | 0.00E+00 | 3.42E-10 | 0.00E+00 | 0.00E+00 |
| Uranium-234 | 1.55E+01 | 2.52E-10 | 2.66E+01 | 6.70E-09 |
| Uranium-235 + D | 7.08E-01 | 5.43E-07 | 1.21E+00 | 6.58E-07 |
| Uranium-238 + D | 1.52E+01 | 1.14E-07 | 2.60E+01 | 2.96E-06 |
| | | | **total =** | **4.03E-06** |

# TABLE E-4 - SumPaths

**Groundskeeper/Sampler - Summation of all Pathways**
**Risk calculation for A6W-CU5 minus rad background**

| | | HQ | ILCR | rad only ILCR |
|---|---|---|---|---|
| **Inhale** | | 0.00E+00 | 9.80E-07 | 5.35E-07 |
| **Dermal Soil** | | 3.90E-02 | 6.14E-06 | NA |
| **Ingest Soil** | | 8.62E-02 | 1.01E-05 | 1.60E-06 |
| **Dermal Surface Water** | | 1.71E-04 | 5.22E-09 | NA |
| **Ingest Surface Water** | | 8.98E-05 | 1.54E-08 | 1.16E-08 |
| **External Radiation** | | NA | 4.03E-06 | 4.03E-06 |
| | **SUM** | **1.26E-01** | **2.12E-05** | **6.18E-06** |

Summation of all paths for individual nuclides

| | ILCR |
|---|---|
| Cesium-137 + D | NA |
| Lead-210 + D | NA |
| Neptunium-237 + D | NA |
| Plutonium-238 | NA |
| Plutonium-239/240 | NA |
| Radium-226 + D | 5.91E-11 |
| Radium-228 + D | 7.49E-09 |
| Radon-222+ D | 0.00E+00 |
| Strontium-90 + D | NA |
| Technetium-99 | 1.19E-08 |
| Thorium-228 + D | 4.12E-07 |
| Thorium-230 | 2.54E-07 |
| Thorium-232 | 7.27E-10 |
| Uranium-234 | 8.51E-07 |
| Uranium-235 + D | 6.96E-07 |
| Uranium-238 + D | 3.94E-06 |
| | **6.18E-06** |

# TABLE E-4 - SumPaths

Summation of all paths for individual chemicals

| | ILCR | HQ |
|---|---|---|
| 1,1,2-Trichloroethane | NA | NA |
| 1,1-Dichloroethylene | NA | NA |
| 1,2-dichloroethane | NA | NA |
| 2-Butanone | No CSFs | NA |
| 3,3-Dichlorobenzidine | NA | No RfDs |
| 4-Methylphenol | No CSFs | NA |
| 4-Nitroanaline | NA | NA |
| Acetone | No CSFs | NA |
| Antimony | No CSFs | 1.19E-03 |
| Aroclor-1254 | NA | NA |
| Aroclor-1260 | NA | No RfDs |
| Arsenic | 1.51E-05 | 9.09E-02 |
| Barium | No CSFs | NA |
| Benzene | NA | NA |
| Benzo(a)anthracene | NA | No RfDs |
| Benzo(a)pyrene | NA | No RfDs |
| Benzo(b)fluoranthene | NA | No RfDs |
| Benzo(k)fluoranthene | NA | No RfDs |
| Beryllium | NA | NA |
| Bis(2-chloroisopropyl)ether | No CSFs | NA |
| Bis(2-ethylhexyl)phthalate | NA | NA |
| Boron | No CSFs | NA |
| Bromodichloromethane | NA | NA |
| Bromoform | NA | NA |
| Bromomethane | No CSFs | NA |
| Cadmium | 1.13E-09 | 2.06E-04 |
| Carbazole | NA | No RfDs |
| Carbon disulfide | No CSFs | NA |
| Carbon tetrachloride | NA | NA |
| Chlordane | NA | NA |
| Chlorobenzene | No CSFs | NA |
| Chloroform | NA | NA |
| Chromium (VI) | NA | NA |
| Chrysene | NA | No RfDs |
| Cobalt | NA | NA |
| Copper | No CSFs | NA |
| Cyanide | No CSFs | NA |
| Cyclohexanone | No CSFs | NA |
| Dibenzo(a,h)anthracene | NA | No RfDs |
| Dieldrin | NA | NA |
| Di-n-octylphthalate | No CSFs | NA |

# TABLE E-4 - SumPaths

| | | |
|---|---|---|
| Ethyl ether | No CSFs | NA |
| Ethylbenzene | NA | NA |
| Fluoride | No CSFs | NA |
| Heptachlorodibenzofuran | NA | No RfDs |
| Heptachlorodibenzo-p-dioxin | NA | No RfDs |
| Hexachlorodibenzofuran | NA | No RfDs |
| Hexachlorodibenzo-p-dioxin | NA | No RfDs |
| Indeno(1,2,3-cd)pyrene | NA | No RfDs |
| Lead | No CSFs | No RfDs |
| Manganese | No CSFs | NA |
| Mercury | No CSFs | NA |
| Methanol | No CSFs | NA |
| 4-Methyl-2-pentanone | No CSFs | NA |
| Methylene chloride | NA | NA |
| Molybdenum | No CSFs | NA |
| Nickel | No CSFs | NA |
| N-nitrosodiphenylamine | NA | NA |
| N-nitrosodipropylamine | NA | No RfDs |
| Octachlorodibenzofuran | NA | No RfDs |
| Octochlorodibenzo-p-dioxin | NA | No RfDs |
| Pentachlorodibenzofuran | No CSFs | No RfDs |
| Pentachlorodibenzo-p-dioxin | NA | No RfDs |
| Pentachlorophenol | NA | NA |
| Phenanthrene | No CSFs | No RfDs |
| Selenium | No CSFs | NA |
| Silver | No CSFs | 2.17E-05 |
| Tetrachlorodibenzofuran | No CSFs | No RfDs |
| Tetrachlorodibenzo-p-dioxin | No CSFs | No RfDs |
| Tetrachloroethylene | NA | NA |
| Thallium | No CSFs | No RfDs |
| Toluene | No CSFs | NA |
| Tributyl phosphate | NA | NA |
| Trichloroethylene | NA | NA |
| Trifluorochloromethane | No CSFs | No RfDs |
| Uranium | No CSFs | 3.32E-02 |
| Vanadium | No CSFs | NA |
| Vinyl chloride | NA | NA |
| Xylenes | No CSFs | NA |
| Zinc | No CSFs | NA |
| | **1.51E-05** | **1.26E-01** |