

90277R01 ①

TECHNICAL SUPPORT FOR
ROCKY MOUNTAIN ARSENAL

AD-A279 054



FINAL
HUMAN HEALTH EXPOSURE ASSESSMENT
FOR ROCKY MOUNTAIN ARSENAL
VOLUME VII
SUMMARY EXPOSURE ASSESSMENT
VERSION 4.1
SEPTEMBER 1990
CONTRACT NO. DAAA15-88-D-0024
RIFS2

Prepared by:

EBASCO SERVICES INCORPORATED
Applied Environmental, Inc.
CH2M HILL
DataChem, Inc.
R.L. Stollar and Associates

DTIC
ELECTE
MAY 09 1994
S G D

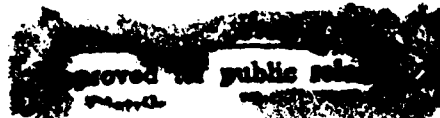
Prepared for:

U.S. ARMY PROGRAM MANAGER'S OFFICE
FOR THE ROCKY MOUNTAIN ARSENAL CONTAMINATION CLEANUP

THE VIEWS, OPINIONS, AND/OR FINDINGS CONTAINED IN THIS REPORT ARE
THOSE OF THE AUTHOR(S) AND SHOULD NOT BE CONSTRUED AS AN
OFFICIAL DEPARTMENT OF THE ARMY POSITION, POLICY, OR DECISION
UNLESS SO DESIGNATED BY OTHER DOCUMENTATION.

THE USE OF TRADE NAMES IN THIS REPORT DOES NOT CONSTITUTE AN
OFFICIAL ENDORSEMENT OR APPROVAL OF THE USE OF SUCH COMMERCIAL
PRODUCTS. THIS REPORT MAY NOT BE CITED FOR PURPOSES OF
ADVERTISEMENT.

94-13818



5 06

REPORT DOCUMENTATION PAGE			Form Approved OMB No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.				
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE 09/00/90	3. REPORT TYPE AND DATES COVERED		
4. TITLE AND SUBTITLE HUMAN HEALTH EXPOSURE ASSESSMENT FOR ROCKY MOUNTAIN ARSENAL, FINAL, VERSION 4.1		5. FUNDING NUMBERS DAAA15 88 D 0024		
6. AUTHOR(S)		8. PERFORMING ORGANIZATION REPORT NUMBER 90277R01		
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) EBASCO SERVICES, INC.		9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES) ROCKY MOUNTAIN ARSENAL (CO.). PMMA		
9. SPONSORING / MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSORING / MONITORING AGENCY REPORT NUMBER		
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION / AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED		12b. DISTRIBUTION CODE		
13. ABSTRACT (Maximum 200 words) THE OBJECTIVES OF THE HUMAN HEALTH EXPOSURE ASSESSMENT INCLUDE: 1. ESTIMATE THE TYPE AND MAGNITUDE OF EXPOSURES TO CONTAMINANTS 2. IDENTIFY CONTAMINANTS OF CONCERN 3. IDENTIFY SITES FOR REMEDIAL ACTION 4. RECOMMEND SITES FOR THE NO ACTION REMEDIAL ALTERNATIVE 5. PROVIDE A BASIS FOR DETAILED CHARACTERIZATION OF THE RISK ASSOCIATED WITH ALL SITES. THIS DOCUMENT CONSISTS OF THE FOLLOWING: AN EXECUTIVE SUMMARY. VOL. I - LAND USE AND EXPOSED POPULATION EVALUATIONS. VOL. II & III - TOXICITY ASSESSMENT (INCLUDES ARMY AND SHELL TOXICITY PROFILES). VOL. IV - PPLV METHODOLOGY. VOL. V - PPLV CALCULATIONS. VOL. VI - STUDY AREA EXPOSURE ANALYSIS (A INTRODUCTION, B WESTERN STUDY AREA, C SOUTHERN STUDY AREA, D NORTHERN CENTRAL STUDY AREA, E CENTRAL STUDY AREA, F EASTERN STUDY AREA, G SOUTH PLANTS STUDY AREA, AND H NORTH PLANTS STUDY AREA. VOL. VII - SUMMARY EXPOSURE ASSESSMENT. VOL. VIII -				
14. SUBJECT TERMS PPLV, LAND USE, SOIL, WATER, BIOTA		15. NUMBER OF PAGES		
		16. PRICE CODE		
17. SECURITY CLASSIFICATION UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE	19. SECURITY CLASSIFICATION OF ABSTRACT	20. LIMITATION OF ABSTRACT	

TABLE OF CONTENTS

	<u>Page</u>
<u>EXECUTIVE SUMMARY</u>	viii
<u>1.0 INTRODUCTION</u>	1-1
1.1 OBJECTIVES	1-1
1.2 ORGANIZATION OF EXPOSURE ASSESSMENT	1-1
1.3 REPORT FORMAT	1-3
<u>2.0 APPROACH</u>	2-1
2.1 CONCEPTUAL FRAMEWORK	2-1
2.1.1 <u>Study Area Exposure Assessments</u>	2-1
2.1.1.1 Soils	2-1
2.1.1.2 Groundwater	2-3
2.1.2 <u>Integration of Exposure Assessments</u>	2-3
2.2 SPECIAL CONSIDERATIONS IN CHARACTERIZING EXPOSURE . .	2-4
2.3 DECISIONS FOR INCORPORATING NONTARGETS IN THE EXPOSURE ASSESSMENT	2-4
<u>3.0 SUMMARY OF STUDY AREA EXPOSURE ASSESSMENT</u>	3-1
3.1 WESTERN STUDY AREA	3-1
3.2 SOUTHERN STUDY AREA	3-6
3.3 NORTH CENTRAL STUDY AREA	3-10
3.4 CENTRAL STUDY AREA	3-21
3.5 EASTERN STUDY AREA	3-26
3.6 SOUTH PLANTS STUDY AREA	3-26
3.7 NORTH PLANTS STUDY AREA	3-40
<u>4.0 ARSENAL-WIDE PERSPECTIVE OF THE EXPOSURE ASSESSMENT</u>	4-1
4.1 ADDITIONAL SCREENING EVALUATIONS	4-1
4.1.1 <u>Underestimation of Exposure</u>	4-1
4.1.2 <u>Additivity</u>	4-1
4.1.2.1 Carcinogens	4-2
4.1.2.2 Noncarcinogens	4-2
4.1.3 <u>Reasonable Maximum Exposure (RME) Parameter</u> <u>Estimates</u>	4-3
4.1.4 <u>Conclusion</u>	4-16
4.2 CONTAMINANTS OF CONCERN	4-16

TABLE OF CONTENTS (Continued)

	<u>Page</u>
4.3 FIRST SCREEN REMEDIAL BOUNDARY DETERMINATION FOR RMA STUDY AREAS	4-16
4.3.1 <u>Methodology and Assumptions</u>	4-23
4.3.2 <u>Areal Extent of Exceedances</u>	4-24
5.0 <u>HISTORICAL PERSPECTIVE</u>	5-1
5.1 COMPARISON WITH HISTORICAL PRIORITY 1/PRIORITY 2 SITES	5-1
5.2 COMPARISON WITH HISTORICAL AREAS OF CONTAMINATION .	5-1
6.0 <u>REFERENCES</u>	6-1
APPENDIX A: ADDITIVITY SCREEN	A-1
APPENDIX B: CERTIFIED REPORTING LIMITS FOR SOIL	B-1

Accession For	
NTIS CRA&I	☒
DTIC TAB	☐
Unannounced	☐
Justification	
By	
Distribution /	
Availability Codes	
Dist	Avail and/or Special
A-1	

LIST OF TABLES

<u>Table</u>	<u>Page</u>
3-1 WESTERN STUDY AREA COC EXPOSURE SUMMARY	3-2
3-2 WESTERN STUDY AREA COS EXPOSURE SUMMARY	3-5
3-3 SOUTHERN STUDY AREA COC EXPOSURE SUMMARY	3-7
3-4 SOUTHERN STUDY AREA COS EXPOSURE SUMMARY	3-9
3-5 NORTH CENTRAL STUDY AREA COC EXPOSURE SUMMARY . .	3-11
3-6 NORTH CENTRAL STUDY AREA COS EXPOSURE SUMMARY . .	3-17
3-7 CENTRAL STUDY AREA COC EXPOSURE SUMMARY	3-22
3-8 CENTRAL STUDY AREA COS EXPOSURE SUMMARY	3-25
3-9 EASTERN STUDY AREA COC EXPOSURE SUMMARY	3-27
3-10 SOUTH PLANTS STUDY AREA COC EXPOSURE SUMMARY . . .	3-29
3-11 SOUTH PLANTS STUDY AREA COS EXPOSURE SUMMARY . . .	3-36
3-12 NORTH PLANTS STUDY AREA COC EXPOSURE SUMMARY . . .	3-41
3-13 NORTH PLANTS STUDY AREA COS EXPOSURE SUMMARY . . .	3-43
4-1 REASONABLE MAXIMUM EXPOSURE (RME) ESTIMATES FOR THE EXPOSURE ASSESSMENT SCREENING EVALUATION	4-4
4-2 RME DIRECT SOIL EXPOSURE PATHWAY PPLVs	4-7
4-3 RME EXPOSURE EVALUATIONS FOR REGULATED VISITORS . .	4-10
4-4 RME EXPOSURE EVALUATIONS FOR CASUAL VISITORS	4-11
4-5 RME EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS	4-12
4-6 RME EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS	4-13
4-7 RME EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS .	4-14

LIST OF TABLES (Continued)

<u>Table</u>		<u>Page</u>
4-8	SUMMARY OF CONTAMINANT OF CONCERN, CRITICAL PATHWAY, AND AFFECTED POPULATION	4-15
4-9	STUDY AREA CONTAMINANTS OF CONCERN	4-17
4-10	CATEGORY RANKING OF ARSENAL-WIDE CONTAMINANTS OF CONCERN	4-21
4-11	PRIORITY 1/PRIORITY 2 SITES AT RMA STUDY AREAS	4-22
4-12	EXCEEDANCE AREAS FOR RMA STUDY AREAS	4-25

LIST OF FIGURES

<u>Figure</u>		<u>Page</u>
2-1	EXPOSURE ASSESSMENT APPROACH	2-2

LIST OF PLATES

<u>Plate</u>	<u>Page</u>
E-1 ESTIMATED AREAS OF EXCEEDANCE FOR ROCKY MOUNTAIN ARSENAL	Pocket

LIST OF ACRONYMS

CAR	Contamination Assessment Report
COC	contaminant of concern
COS	contaminants of significance
CSA	Central Study Area
EA	Endangerment Assessment
EI	exposure index
EPA	U.S. Environmental Protection Agency
ESA	Eastern Study Area
FAVN	actual time-average vapor flux
F _{CRIT}	critical vapor flux
FFA	Federal Facility Agreement
FS	feasibility study
ft	foot/feet
NCSA	North Central Study Area
NPSA	North Plants Study Area
OAS	Organizations and the State
PPLV	preliminary pollutant limit value
RfD	reference dose
RI	Remedial Investigation
RMA	Rocky Mountain Arsenal
RME	Reasonable Maximum Exposure
RSD	risk-specific dose
SAR	Study Area Report
SPSA	South Plants Study Area
SPPPLV	single pathway preliminary pollutant limit value
SSA	Southern Study Area
VEI	vapor exposure index
WSA	Western Study Area

EXECUTIVE SUMMARY

Volume VII of the Exposure Assessment for Rocky Mountain Arsenal (RMA) contains the summary of the study area exposure assessments presented in Volume VI-B through VI-H for each of the seven RMA study areas: Western, Southern, North Central, Central, Eastern, South Plants, and North Plants. This report also discusses the conceptual framework for performing the study area exposure assessments and the integration of each to: (1) identify Arsenal-wide contaminants of concern (COCs) (i.e., contaminants for which risk characterization will be performed); (2) screen sites, Arsenal-wide, as Priority 1 or Priority 2 sites; and (3) prepare a study area perspective of unacceptable exposure to be used as a first screen in defining remedial boundaries, along with a comparison to the historical recommendations presented in the 1984 Decontamination Assessment for Land and Facilities at RMA.

The assessments in Volume VI were based on the maximum soil contaminant concentrations reported in the site-specific Contamination Assessment Reports (CARs) and Study Area Reports (SARs). Draft Preliminary Pollutant Limit Values (PPLVs) were computed for each of these site-specific contaminants as described in Volume IV for the five exposure pathways (soil ingestion, suspended particulate inhalation, dermal contact, open space vapor inhalation and enclosed space vapor inhalation). Draft PPLVs were computed for five exposed populations (regulated visitors, casual visitors, recreational visitors, commercial workers, and industrial workers).

The site-by-site assessments consisted of comparisons of the maximum site contaminant concentrations to their corresponding cumulative Draft PPLVs in order to determine exceedances and, hence, establish a first screen for determining sites which may be considered as candidates for remedial action during the feasibility study. These are ranked into two categories: Priority 1 which consists of sites where available soil contaminant concentration data indicate that the maximum detected concentrations exceed the draft human health based criteria; and Priority 2 which consists of sites where available soil contaminant concentration data indicate that the maximum detected concentrations do not exceed the draft human health based criteria.

As was discussed in Volume VI-A, unacceptable exposure is normally considered in cases where the exposure index (EI) is greater than unity ($EI > 1$). To account for the potential of underestimating exposure attributed to an uncertainty in the Draft PPLV values, a value of 0.1 and above for the exposure index was considered as an indication of unacceptable exposure. COCs were, therefore, identified as those chemicals with an EI greater than 0.1. Furthermore, the effect of additivity and Reasonable Maximum Exposure (RME) parameter estimates on the EI were also evaluated to determine if any additional contaminants should be added to the COC list.

Based on the most sensitive exposed population PPLV (i.e., the industrial worker), each study area results were as follows: Of the 31 sites evaluated in the Western Study Area, 14 were designated as Priority 1 sites. The remaining 17 sites were designated as Priority 2 sites. Seventeen chemicals were selected as COCs on these sites.

For the Southern Study Area, 17 sites were evaluated; 13 were designated as Priority 1 sites. The remaining four sites were designated as Priority 2 sites. Fourteen chemicals were selected as COCs for the Southern Study Area.

Of the 43 sites evaluated in the North Central Study Area, 30 were designated as Priority 1 sites. The remaining 13 sites were designated as Priority 2 sites. Thirty-one chemicals were selected as COCs for the North Central Study Area.

For the Central Study Area, 10 sites were evaluated; seven were designated as Priority 1 sites. The remaining three sites were designated as Priority 2 sites. Thirty-seven chemicals were selected as COCs for the Central Study Area.

Of the 26 sites evaluated in the Eastern Study Area, 14 were designated as Priority 1 sites. The remaining 12 sites were designated as Priority 2 sites. Ten chemicals were selected as COCs for the Eastern Study Area.

For the South Plants Study Area, 35 sites were evaluated; 33 were designated as Priority 1 sites. Two sites were designated as Priority 2 sites. Twenty-seven chemicals were selected as COCs for the South Plants Study Area.

Of the 16 sites evaluated in the North Plants Study Area, ten were designated as Priority 1 sites. The remaining six sites were designated as Priority 2 sites. Nine chemicals were selected as COCs for the North Plants Study Area.

Arsenal-wide contaminants of concern and the recommended Priority 1/Priority 2 sites were identified through integration of the study area exposure summaries. Of the 178 sites evaluated, 121 were designated as Priority 1 and 57 for Priority 2.

A total of 38 chemicals were designated as Arsenal-wide COCs, based on the most sensitive exposed population PPLV (i.e., the industrial worker). These chemicals were separated into four categories as follows. Category A consists of the 20 COCs whose maximum concentration resulted in a value of $EI > 10$. Category B consists of the nine COCs whose maximum concentration resulted in $10 > EI > 1.0$. Category C consists of the nine COCs whose maximum concentration resulted in $1.0 > EI > 0.1$. The RME and additivity screen did not identify any additional COCs.

The areas of unacceptable exposure for the Arsenal were estimated by plotting the locations of the borings in which contaminant concentrations resulted in an EI value greater than 0.1 for an industrial worker. First screen remedial boundaries were determined by plotting and calculating the areas of Priority 1 sites. The significance of contamination at RMA was estimated by comparing the Priority 1 site areas to the areas of known (i.e., actual) contaminants. From this analysis, approximately 41 percent of the areas of known contaminants defined in the RI are considered significant based on draft human health criteria. A comparison was also made from a historical perspective between the significant areas recommended in this investigation and the suggested contaminated areas made in the 1984 Decontamination Assessment for Land and Facilities at RMA report. Approximately 59 percent of these areas (which were based strictly on historical information) were

considered to be significant. Although the Human Health Exposure Assessment considers all pathways related to soils which are not expressly precluded by the terms of the Federal Facility Agreement (FFA), it must be recognized that the conclusions of the land use analysis contained in Volume I reiterate the goal of the Organizations as stated in the FFA, that "...significant portions of the Arsenal will be made available for open space for public benefit (including, but not limited to, wildlife habitat(s) and parks(s)) consistent with the terms of this Agreement." This conclusion must be kept clearly in mind and given the appropriate significance in all subsequent use of the Human Health Exposure Assessment as well as other Endangerment Assessment and Feasibility Study products.

1.0 INTRODUCTION

One of the components of the Endangerment Assessment (EA) performed for Rocky Mountain Arsenal (RMA) is the Human Health Exposure Assessment. This report is the EA product described by paragraph 24.30 (viii) of the Federal Facility Agreement (FFA). The Human Health Exposure Assessment presents an analysis of the estimated magnitude, frequency, duration, and routes of exposure for predicted future human populations and their associated activities at the Arsenal. The Human Health Exposure Assessment also presents a quantitative framework for establishing risk-based criteria for the protection of human health.

1.1 OBJECTIVES OF THE EXPOSURE ASSESSMENT

The objectives of the Human Health Exposure Assessment are to: (1) estimate the type and magnitude of exposures to the contaminants that are present at specific sites on RMA; (2) identify the contaminants of concern that will be critical to the remediation of specific sites; (3) identify sites within RMA where current contaminant levels may pose an unacceptable exposure to future target populations; (4) provide a first screen of all sites based on preliminary human health risk-based soil criteria to identify which sites are designated as Priority 1 (sites where available soil contaminant concentration data indicate that the maximum detected concentrations exceed the draft human health based criteria), and Priority 2 (sites where available soil contaminant concentration data indicate that the maximum detected concentrations do not exceed the draft human health based criteria); (5) provide a basis for future detailed characterization of risk associated with all sites; and (6) provide the database for establishing a study area-wide and Arsenal-wide perspective of the spatial extent of remediation which may be required at RMA.

1.2 ORGANIZATION OF THE EXPOSURE ASSESSMENT

The above objectives were met by performing a sequence of analyses and evaluations which are documented in eight individual report volumes. The content of these documents is summarized below.

Volume I is an evaluation of land use and exposed populations at RMA which includes: (1) projections of potential land use alternatives and associated human activities for the Arsenal following cleanup; and (2) projections of human populations that may be potentially exposed to residual contamination, following remediation.

Volumes II and III consist of the Toxicity Assessment of the RMA target contaminants and include: (1) summary toxicity profiles developed by both the Army (Volumes II and III) and Shell (Volumes II-A and III-A) for each target chemical; and (2) a listing of reference doses (RfDs) for noncarcinogens and risk-specific doses (RSDs) for carcinogens, together with a description of the basis for their computation.

Volume IV consists of a detailed presentation of the preliminary pollutant limit value (PPLV) methodology as applied to RMA including a description of the exposure pathway equations together with general parameters appropriate to the projected exposed populations and land uses.

Volume V consists of the second part to the PPLV methodology. It contains: (1) the computed Draft PPLVs for each applicable direct exposure pathway and projected exposed population; (2) supporting chemical-specific parameter data; and (3) a computer user's manual and diskette for computing the Draft PPLVs.

Volume VI (A-H) is a detailed presentation of the study area exposure assessments consisting of comparisons of the site contaminant concentrations measured during the Remedial Investigation (RI) with their corresponding Draft PPLVs, calculated and presented for the range of projected exposed populations and their associated activities.

Volume VII (this report) is an integrated presentation of the study area exposure assessments (Volume VI) consisting of: (1) the identification of Arsenal-wide contaminants of concern (i.e., contaminants for which risk characterization will be performed); (2) an Arsenal-wide initial screening to designate sites as Priority 1 and Priority 2; (3) a study area perspective of unacceptable exposure to be used as a first screen in defining remedial

boundaries, along with a comparison to the historical recommendations presented in the 1984 Decontamination Assessment for Land and Facilities at RMA; and (4) the results of an analysis of additivity and consideration of reasonable maximum exposure parameters in the PPLV equations.

Volume VIII is a compilation of the Army's responses to the Organizations and the State (OAS) comments on the Draft Exposure Assessment Report submitted to the parties in July 1989.

1.3 REPORT FORMAT

The conceptual framework for the study area exposure assessments is presented in Section 2.0. The summary of the study area exposure assessments are discussed in Section 3.0. Section 4.0 presents the Arsenal-wide perspective of the exposure assessment, and Section 5.0 provides a historical perspective of contamination. Section 6.0 includes the cited references.

2.0 APPROACH

2.1 CONCEPTUAL FRAMEWORK

2.1.1 Study Area Exposure Assessments

The study area exposure assessments were performed on a site-by-site basis for each of the seven RMA study areas. The approach used in these assessments is depicted in Figure 2-1. A summary follows.

The evaluations in the study area exposure assessments were based on the soil contaminant concentrations presented in the site-specific RI Contamination Assessment Reports (CARs) and the groundwater data presented in the DP Associates Groundwater Base. The site designations are consistent with those used in the RI Study Area Report (ARs). Maximum contaminant concentrations for soil and groundwater were reported at each site.

2.1.1.1 Soils

For soil, Draft PPLVs were computed for each of the site-specific contaminants as described in Volume IV for the direct exposure pathways (soil ingestion, suspended particulate inhalation, and dermal contact) and the indirect pathways (open space and enclosed space vapor inhalation). Cumulative pathway quantities were computed for five exposed populations (regulated visitors, casual visitors, recreational visitors, commercial workers, and industrial workers).

The site-by-site evaluations consisted of comparisons of the maximum soil contaminant concentrations to their corresponding cumulative Draft PPLVs, and the corresponding exposure index (EI) was computed. The EI is defined as the ratio of the maximum contaminant concentration to the cumulative Draft PPLV. For those sites where the EI is less than 0.1, a recommendation was made to designate them as Priority 2 sites. Sites displaying an EI greater than 0.1 were designated as Priority 1 sites, and the contaminants of concern (COCs) determined. Based on the COCs identified for the most sensitive exposed population identified in Volume I, the industrial worker, the areas and boundaries of exceedance were determined and are presented in this volume.

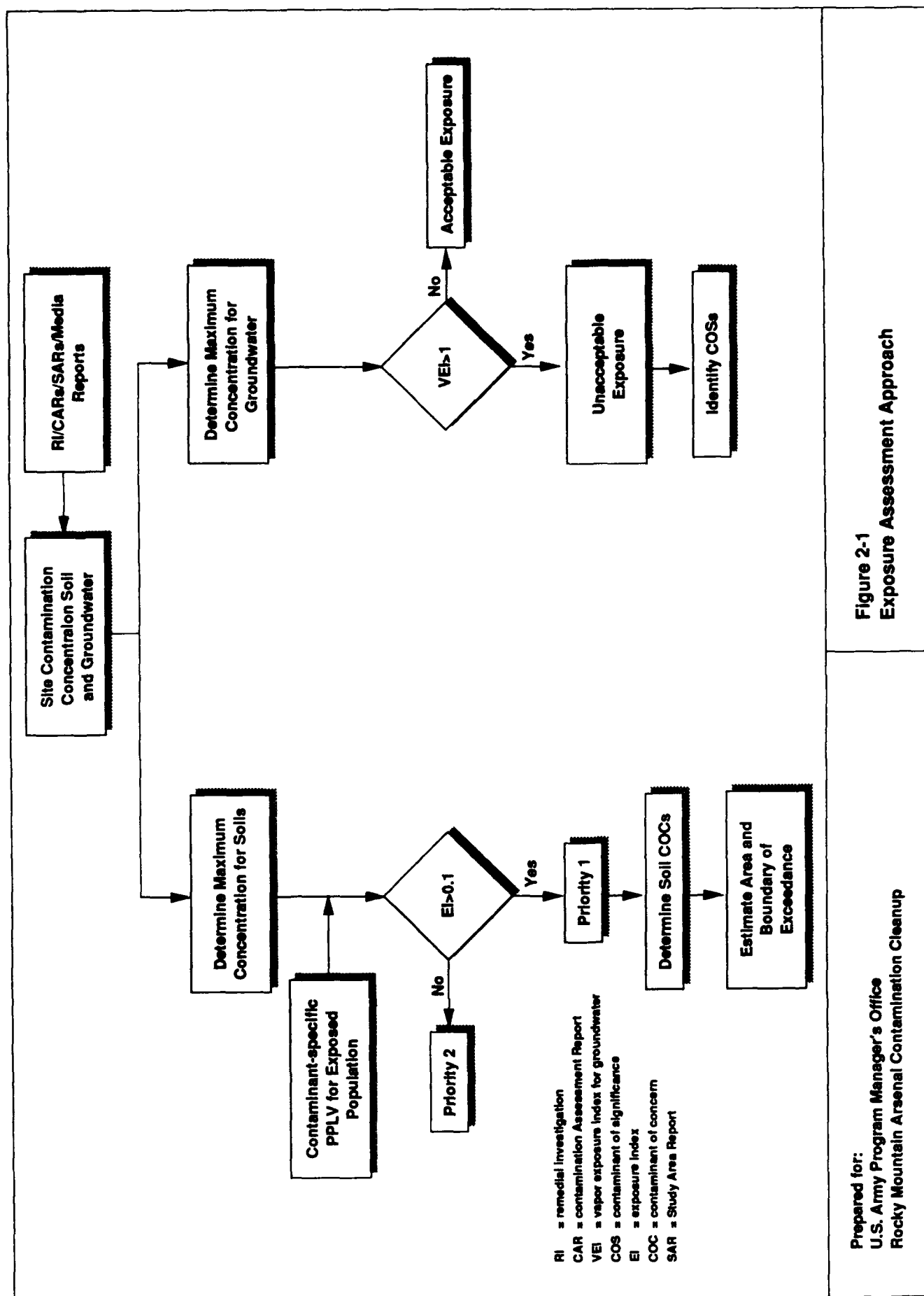


Figure 2-1
Exposure Assessment Approach

Prepared for:
U.S. Army Program Manager's Office
Rocky Mountain Arsenal Contamination Cleanup

Although the Human Health Exposure Assessment considers all pathways related to soils which are not expressly precluded by the terms of the FFA, it must be recognized that the conclusions of the land use analysis contained in Volume I reiterate the goal of the Organizations as stated in the FFA, that "... significant portions of the Arsenal will be made available for open space for public benefit (including, but not limited to, wildlife habitat(s) and park(s)) consistent with the terms of this Agreement." This conclusion must be kept clearly in mind and given the appropriate significance in all subsequent use of the Human Health Exposure Assessment as well as other EA and Feasibility Study (FS) products.

2.1.1.2 Groundwater

For groundwater, the vapor exposure index (VEI) was computed for each contaminant measured. The VEI is defined as the ratio of the actual time-average vapor flux (FAVN) to the critical vapor flux (F_{CRT}) as defined in Volume VI-A (Section 2.5.4) of the Exposure Assessment Report. The value of VEI was then examined. If a VEI was less than 1, then the exposure to contaminant vapors contributed by groundwater at the site was considered acceptable. If a VEI was greater than 1, then the exposure was deemed unacceptable and the contaminants contributing to this exposure were identified as contaminants of significance (COSs) for groundwater only. These compounds are presented here as additional information for consideration of the practicality in constructing structures containing basements at the site.

2.1.2 Integration of Exposure Assessments

The exposure evaluations for the industrial worker, presented in Volumes VI-B through VI-H, were integrated to estimate "first cut" or preliminary remedial boundaries. The areas within these boundaries will be considered as first priority in the FS. The boundaries will be redefined following the detailed Uncertainty Analysis performed during the Risk Characterization. The procedure used is discussed in detail in Section 4.3 of this report.

2.2 SPECIAL CONSIDERATIONS IN CHARACTERIZING EXPOSURE

The site-by-site exposure assessments presented in Volumes VI-B through VI-H were performed as described in Section 2.1.1. The assessments were modified for a few special cases. These included lake and pond sites, sewer lines and the buried lake sludge in Southern Study Area (SSA) Sites SSA-3a and SSA-3b. The manner in which these sites were treated was discussed in Volume VI-A, Section 2.5.2. The implications on characterizing exposure for these sites is discussed below.

Concentrations of contaminants measured in lake and pond sediments were conservatively evaluated for the direct exposure pathways for all lake sites because: (1) certain lakes are completely or partially dry at various times of the year, and (2) certain lakes have been drained in the past exposing bottom sediments. Inhalation of vaporized sediment contaminants was assessed; however, no significant exposure was predicted. One overall evaluation was made for each unique sewer line using maximum contaminant concentrations only, as discussed in Volume VI-A, Section 2.5.2.2. The maximum concentrations were assumed to represent the contamination along the entire sewer line as a worst-case estimate. Boring-by-boring exceedances were not computed for sewer lines because these sites are already being considered for remedial action under the ongoing FS.

The buried lake sludge at Site SSA-3a was evaluated as discussed in Volume VI-A, Section 2.5.3. Concentrations of contaminants that were not measured in the Phase I investigation and not analyzed in Phase II were assumed to occur at the Phase I detection limit as a worst-case analysis. The exposure evaluation performed with these values resulted in no exceedances and, therefore, did not affect the site designation for Priority 2.

2.3 DECISIONS FOR INCORPORATING NONTARGETS IN THE EXPOSURE ASSESSMENT

As discussed in Volume VI-A, Section 2.2.3.1, the contaminants included in the nontarget list presented in the RMA Chemical Index (EBASCO, 1988/RIC 88357R01) were screened in order to determine if PPLVs were to be computed. This analysis was performed on a site-by-site basis and used four screening criteria: frequency of occurrence, similarity of

nontarget concentration to that of target contaminants, suspicion that the detection was a laboratory contaminant, and co-occurrence of nontargets with targets in Arsenal soil. Based on these screening evaluations, only one nontarget chemical, 1,1,2,2-tetrachloroethane, met the above screening criteria. This chemical was also found to be a COC Arsenal-wide for both direct and indirect exposure pathways.

For cases in which the nontarget decision was to "defer," the chemical was reevaluated on an Arsenal-wide basis. Trichloropropene was the only contaminant that met these criteria in the South Plants Study Area (SPSA) Site SPSA-12a. This contaminant was detected in eight sites. The above screen was applied on an Arsenal-wide basis and the need to compute a PPLV for trichloropropene was rejected, since both the frequency of occurrence and concentration were considered to be low.

3.0 SUMMARY OF STUDY AREA EXPOSURE ASSESSMENT

Each of the seven Study Area Exposure Assessments presented in Volumes VI-B through VI-H were integrated as discussed in Section 2.1.2 and the results are detailed below. It should be emphasized here that these results represent the exposure assessments for the industrial worker (i.e., the most sensitive exposed population PPLV). The results of the exposure assessments for the other identified exposed populations may result in fewer COCs as well as Priority 1 sites.

3.1 WESTERN STUDY AREA

The Western Study Area Exposure Assessment is summarized in Tables 3-1 and 3-2. Of the 31 sites evaluated in the Western Study Area (WSA), 14 sites were designated as Priority 1 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Section 3 - Isolated Spill Area (WSA-1b), Railyard - Zinc Detection Area (WSA-1d), Railyard-Nemagon Spill Area (WSA-1e), Railyard - Aldrin and Dieldrin Detection (WSA-1f), Railyard - Mercury Detection (WSA-1g), West Landfill - Burning Pit (WSA-2), East Landfill - Toluene, Trichloropropene, and Cadmium Detection (WSA-3a), East Landfill - Main Surface Disposal Area (WSA-3c), Open Storage and Salvage Yard Support Areas (WSA-4b), North Landfill - Trench (WSA-5a), North Landfill - Trenches (WSA-5d), Motor Pool Area - Main Ditch (WSA-6a), Motor Pool - Drainage Ditch (WSA-6d), and Sanitary Sewers - Internal Sediment (WSA-7a). WSA-1b, WSA-1d, WSA-1e, WSA-1f, WSA-1g, WSA-6a, WSA-6d, and WSA-7a are Priority 1 sites based on RI data in this Exposure Assessment, and identified in the FFA as sites for Interim Response Action (IRA).

The remaining 17 sites were designated as Priority 2 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Section 3 - Pyrene/Fluoranthene Detection Area (WSA-1a), Section 3 - Wood Preservation Derivative Area (WSA-1c), East Landfill - Disposal Pit (WSA-3b), East Landfill - Methylisobutyl Ketone Detection (WSA-3d), Open Storage Yard - Methyl Cyclohexane Detection (WSA-4a), North Landfill - Burn Pit (WSA-5b), North Landfill-Trench (WSA-5c), Motor Pool - Fuel Tank Storage Area (WSA-6b), Motor Pool Area - Roundhouse and Old Septic

TABLE 3-1
WESTERN STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
WSA-1a	None	None	Priority 2
WSA-1b	Benzene Carbon tetrachloride Tetrachloroethylene	Indirect Indirect Indirect	Priority 1
WSA-1c	None	None	Priority 2
WSA-1d	Methylene chloride	Indirect	Priority 1
WSA-1e	Dibromochloropropane	Direct, Indirect	Priority 1
WSA-1f	Aldrin Dieldrin Methylene chloride	Direct, Indirect Direct, Indirect Indirect	Priority 1
WSA-1g	Methylene chloride	Indirect	Priority 1
WSA-2	Aldrin Dieldrin Hexachlorocyclopentadiene 1,1,2,2-Tetrachloroethane Tetrachloroethylene Trichloroethylene Arsenic Cadmium Chromium Lead	Direct Direct, Indirect Indirect Direct, Indirect Indirect Direct, Indirect Direct Direct Direct Direct	Priority 1
WSA-3a	Cadmium	Direct	Priority 1
WSA-3b	None	None	Priority 2
WSA-3c	Methylene chloride Tetrachloroethylene Trichloroethylene Cadmium	Indirect Indirect Indirect Direct	Priority 1

TABLE 3-1 (Continued)
WESTERN STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
WSA-3d	None	None	Priority 2
WSA-4a	None	None	Priority 2
WSA-4b	Methylene chloride Tetrachloroethylene Trichloroethylene Chromium	Indirect Indirect Indirect Direct	Priority 1
WSA-5a	Tetrachloroethylene	Indirect	Priority 1
WSA-5b	None	None	Priority 2
WSA-5c	None	None	Priority 2
WSA-5d	Aldrin Dicyclopentadiene Dieldrin Isodrin Arsenic Cadmium Chromium Copper Lead	Direct Indirect Direct, Indirect Direct Direct Direct Direct Direct Direct	Priority 1
WSA-6a	Tetrachloroethylene Trichloroethylene Arsenic Cadmium Chromium Lead	Indirect Indirect Direct Direct Direct Direct	Priority 1
WSA-6b	None	None	Priority 2
WSA-6c	None	None	Priority 2

TABLE 3-1 (Continued)
WESTERN STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
WSA-6d	Arsenic Cadmium	Direct Direct	Priority 1
WSA-6e	None	None	Priority 2
WSA-7a	Chromium Methylene chloride	Direct Indirect	Priority 1
WSA-7b	None	None	Priority 2
WSA-8a	None	None	Priority 2
WSA-8b	None	None	Priority 2
WSA-8c	None	None	Priority 2
WSA-8d	None	None	Priority 2
WSA-8e	None	None	Priority 2
WSA-8f	None	None	Priority 2

TABLE 3-2
WESTERN STUDY AREA COS EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Significance	Critical Exposure Pathway
WSA-2	1,1-Dichloroethylene	Enclosed

Tank System (WSA-6c), Motor Pool Area - Culvert Outfall (WSA-6e), Sanitary Sewers - Overflow Area (WSA-7b), Section 33 - Copper Detection (WSA-8a), Section 33 - Zinc Detection (WSA-8b), Section 4 - 1,1,2,2-Tetrachloroethane Detection (WSA-8c), Section 3 - Phosphoric Acid, Tributyl Ester Detection (WSA-8d), Section 3 - Phosphoric Acid, Tributyl Ester Detection (WSA-8e), and Section 9 - Methyl Naphthalene Detection (WSA-8f). WSA-1a, WSA-1c, WSA-6b, WSA-6c, and WSA-6e are Priority 2 sites based on RI data in this Exposure Assessment, but are identified in the FFA as sites for IRA.

The COCs in soil and sediment (i.e., those displaying an EI greater than 0.1) for the WSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are: Aldrin, benzene, carbon tetrachloride, dibromochloropropane, dicyclopentadiene, Dieldrin, hexachlorocyclopentadiene, Isodrin, methylene chloride, 1,1,2,2-tetrachloroethane, tetrachloroethylene, trichloroethylene, arsenic, cadmium, chromium, copper, and lead.

The COS in groundwater (i.e., those displaying a VEI greater than 1) for the WSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), is 1,1-dichloroethylene.

3.2 SOUTHERN STUDY AREA

The Southern Study Area Exposure Assessment is summarized in Tables 3-3 and 3-4. Of the 17 sites evaluated in the SSA, 13 were designated as Priority 1 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Eastern Upper Derby Lake (SSA-1a), Upper Derby Lake (SSA-1b), Lower Derby Lake (SSA-1c), Rod and Gun Club Pond (SSA-1d), Lake Ladora (SSA-1e), Drainage Ditches (SSA-2a), Sand Creek Lateral (SSA-2b), Drainage Ditch and Overflow Basin (SSA-2c), Buried Lake Sludge (SSA-3a), Buried Lake Sludge (SSA-3b), Trash Dump (SSA-4), Havana/Peoria Streets - Ponds and Ditches (SSA-5b), and Section 11 - Ulvalda Ditch (SSA-5e).

TABLE 3-3
SOUTHERN STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
SSA-1a	1,1,2,2-Tetrachloroethane	Cumulative	Priority 1
SSA-1b	Aldrin Dieldrin Arsenic PPDDE PPDDT Chlordane 1,1,2,2-Tetrachloroethane	Direct, Indirect Direct, Indirect Direct Direct Direct, Indirect Direct, Indirect Direct	Priority 1
SSA-1c	Aldrin Dibromochloropropane Dieldrin Chlordane Chromium	Direct, Indirect Direct Direct Direct Direct	Priority 1
SSA-1d	1,1,2,2-Tetrachloroethane	Cumulative	Priority 1
SSA-1e	Aldrin Dieldrin Arsenic Chromium	Direct Direct Direct Direct	Priority 1
SSA-1f	None	None	Priority 2
SSA-2a	Aldrin Dieldrin Methylene chloride	Direct, Indirect Direct, Indirect Indirect	Priority 1
SSA-2b	Aldrin Chlordane PPDDE PPDDT Dieldrin Isodrin Lead	Direct, Indirect Direct Direct Direct, Indirect Direct, Indirect Indirect Direct	Priority 1

TABLE 3-3 (Continued)
SOUTHERN STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
SSA-2c	PPDDE Dieldrin Methylene chloride 1,1,2,2-Tetrachloroethane Arsenic	Direct Direct Indirect Direct, Indirect Direct	Priority 1
SSA-3a	Aldrin Dieldrin	Direct Direct	Priority 1
SSA-3b	Aldrin Chlordane PPDDT Dieldrin Hexachlorocyclopentadiene	Direct, Indirect Direct Direct Direct, Indirect Indirect	Priority 1
SSA-4	Aldrin Dieldrin Chlordane	Direct Direct Direct	Priority 1
SSA-5a	None	None	Priority 2
SSA-5b	Carbon tetrachloride Chlordane	Indirect Direct, Indirect	Priority 1
SSA-5c	None	None	Priority 2
SSA-5d	None	None	Priority 2
SSA-5e	Dibromochloropropane	Direct, Indirect	Priority 1

TABLE 3-4
SOUTHERN STUDY AREA COS EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Significance	Critical Exposure Pathway
	None	

The remaining four sites were designated as Priority 2 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Lake Mary (SSA-1f), Section 1 - Dibromochloropropane Detection (SSA-5a), Section 12 - Lead Detection (SSA-5c), and Section 12 - Lead Detection (SSA-5d).

The COCs in soil and sediment (i.e., those displaying an EI greater than 0.1) for the SSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are: Aldrin, carbon tetrachloride, Chlordane, dibromochloropropane, Dieldrin, PPDDE, PPDDT, hexachlorocyclopentadiene, Isodrin, methylene chloride, 1,1,2,2-tetrachloroethane, arsenic, chromium, and lead.

No COSs in groundwater (i.e., those displaying a VEI greater than 1) were identified for the SSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker).

3.3 NORTH CENTRAL STUDY AREA

The North Central Study Area Exposure Assessment is summarized in Tables 3-5 and 3-6. Of the 43 sites evaluated in the North Central Study Area (NCSA), 30 were designated as Priority 1 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Basin A (NCSA-1a), Lime Settling Basins (NCSA-1b), Drainage Ditch (NCSA-1c), Liquid Storage Pool (NCSA-1d), Burn Site (NCSA-1e), South Plants Drainage Ditches (NCSA-1f), Basin C (NCSA-2a), Basin D (NCSA-2b), Basin E (NCSA-2c), Drainage Ditches (NCSA-2d), Basin F (NCSA-3), Deep Disposal Well (NCSA-4a), Basin F Exterior (NCSA-4b), Basin B (NCSA-5a), Drainage Ditches (NCSA-5b), Sand Creek Lateral (NCSA-5c), Surface Drainage Canal (NCSA-5d), Chemical Sewers from South Plants (NCSA-6a), Chemical Sewers from North Plants (NCSA-6b), North Bog (NCSA-7), Sanitary Sewer Lines (NCSA-8a), Domestic Sewer Treatment Plant (NCSA-8b), Section 34 - Mercury Detection (NCSA-8c), Section 23 - Cadmium Detection (NCSA-9b), Section 23 - Cadmium Detection (NCSA-9c), Section 23 - Cadmium Detection (NCSA-9d), Section 26 - Cadmium Detection (NCSA-9h), Section 27 - Arsenic Detection (NCSA-9i), and Section 35 - Arsenic Detection (NCSA-9o), Cadmium Detection (NCSA-9r). NCSA-1a, NCSA-1b, NCSA-2a, NCSA-2b, NCSA-2c, NCSA-3, and NCSA-8a

TABLE 3-5
NORTH CENTRAL STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Critical Exposure Contaminant of Concern	Priority Pathway	Recommendation
NCSA-1a	Aldrin	Direct, Indirect	Priority 1
	Benzene	Indirect	
	Chlordane	Direct	
	Chlorobenzene	Indirect	
	PPDDE	Direct	
	PPDDT	Direct	
	Dicyclopentadiene	Indirect	
	Dieldrin	Direct, Indirect	
	Endrin	Direct	
	Fluoroacetic acid	Direct	
	Hexachlorocyclopentadiene	Direct, Indirect	
	Isodrin	Direct	
	Methylene chloride	Indirect	
	Tetrachloroethylene	Indirect	
	Trichloroethylene	Indirect	
	Arsenic	Direct	
	Cadmium	Direct	
	Chromium	Direct	
	Mercury	Direct	
NCSA-1b	Aldrin	Direct, Indirect	Priority 1
	Benzene	Indirect	
	Chlordane	Direct, Indirect	
	Chloroform	Cumulative	
	PPDDE	Direct, Indirect	
	PPDDT	Direct, Indirect	
	Dibromochloropropane	Indirect	
	Dieldrin	Direct, Indirect	
	Endrin	Direct	
	Fluoroacetic acid	Direct	
	Isodrin	Direct	
	Methylene chloride	Indirect	
	Arsenic	Direct	
	Cadmium	Direct	
	Lead	Direct	
	Mercury	Direct	

TABLE 3-5 (Continued)
NORTH CENTRAL STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
NCSA-1c	Aldrin Dieldrin Fluoroacetic acid Arsenic	Direct Direct, Indirect Direct Direct	Priority 1
NCSA-1d	Aldrin Dieldrin Arsenic	Direct, Indirect Direct, Indirect Direct	Priority 1
NCSA-1e	Aldrin Chlordane Dieldrin Arsenic Cadmium Chromium Lead Mercury	Direct, Indirect Direct, Indirect Direct, Indirect Direct Direct Direct Direct Direct	Priority 1
NCSA-1f	Aldrin Dieldrin Fluoroacetic acid Arsenic Cadmium	Direct Direct, Indirect Direct Direct Direct	Priority 1
NCSA-1g	None	None	Priority 2
NCSA-2a	Aldrin PPDDE Dieldrin Arsenic	Direct, Indirect Direct Direct, Indirect Direct	Priority 1
NCSA-2b	Aldrin Dieldrin Fluoroacetic acid Arsenic Lead Cadmium	Direct, Indirect Direct, Indirect Direct Direct Direct Direct	Priority 1

TABLE 3-5 (Continued)
NORTH CENTRAL STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
NCSA-2c	Dieldrin	Direct	Priority 1
	Fluoroacetic acid	Direct	
	Arsenic	Direct	
	Chromium	Direct	
NCSA-2d	Aldrin	Direct, Indirect	Priority 1
	Dieldrin	Direct, Indirect	
	Arsenic	Direct	
NCSA-3	Aldrin	Direct, Indirect	Priority 1
	Benzene	Indirect	
	Bicycloheptadiene	Indirect	
	Chloroacetic acid	Direct	
	Chloroform	Direct, Indirect	
	Chlorophenylmethyl sulfide	Indirect	
	Chlorophenylmethyl sulfone	Indirect	
	Chlorophenylmethyl sulfoxide	Indirect	
	Dibromochloropropane	Direct, Indirect	
	1,2-Dichloroethane	Indirect	
	Dicyclopentadiene	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Endrin	Direct	
	Isodrin	Direct, Indirect	
	Methylene chloride	Indirect	
	Tetrachloroethylene	Direct, Indirect	
	1,1,2,2-Tetrachloroethane	Direct, Indirect	
	Toluene	Indirect	
	Arsenic	Direct	
	Cadmium	Direct	
NCSA-4a	Aldrin	Direct, Indirect	Priority 1
	Dibromochloropropane	Indirect	
	Dieldrin	Direct, Indirect	
	Isodrin	Direct	

TABLE 3-5 (Continued)
NORTH CENTRAL STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
NCSA-4a (cont.)	Methylene chloride Tetrachloroethylene	Indirect Indirect	
NCSA-4b	Aldrin Chlordane PPDDT Dieldrin Endrin Fluoroacetic acid Isodrin Methylene chloride	Direct, Indirect Direct Direct, Indirect Direct, Indirect Direct Direct Direct Indirect	Priority 1
NCSA-5a	Aldrin Chlordane Dieldrin Arsenic Cadmium	Direct Direct, Indirect Direct, Indirect Direct Direct	Priority 1
NCSA-5b	Aldrin Chlordane Dieldrin Fluoroacetic acid Methylene chloride 1,1,2,2-Tetrachloroethane Arsenic Cadmium	Direct, Indirect Direct, Indirect Direct, Indirect Direct Indirect Indirect Direct Direct	Priority 1
NCSA-5c	Aldrin Dieldrin Cadmium Lead	Direct, Indirect Direct, Indirect Direct Direct	Priority 1
NCSA-5d	Aldrin Dieldrin Cadmium	Direct, Indirect Direct, Indirect Direct	Priority 1

TABLE 3-5 (Continued)
NORTH CENTRAL STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
NCSA-6a	Aldrin Chloroform Dieldrin Dimethyldisulfide	Indirect Indirect Indirect Indirect	Priority 1
NCSA-6b	Aldrin PPDDE PPDDT Dibromochloropropane Dieldrin Isodrin Arsenic	Direct, Indirect Direct Direct Indirect Direct, Indirect Direct Direct	Priority 1
NCSA-7	Dieldrin	Direct	Priority 1
NCSA-8a	Chloroform Dieldrin Chromium	Indirect Direct, Indirect Direct	Priority 1
NCSA-8b	Aldrin Dieldrin Arsenic	Direct Direct, Indirect Direct	Priority 1
NCSA-8c	Chromium Lead	Direct Direct	Priority 1
NCSA-9a	None	None	Priority 2
NCSA-9b	Cadmium	Direct	Priority 1
NCSA-9c	Cadmium	Direct	Priority 1
NCSA-9d	Cadmium	Direct	Priority 1
NCSA-9e	None	None	Priority 2
NCSA-9f	None	None	Priority 2

TABLE 3-5 (Continued)
NORTH CENTRAL STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
NCSA-9g	None	None	Priority 2
NCSA-9h	Cadmium	Direct	Priority 1
NCSA-9i	None	None	Priority 2
NCSA-9j	None	None	Priority 2
NCSA-9k	None	None	Priority 2
NCSA-9l	Arsenic	Direct	Priority 1
NCSA-9m	None	None	Priority 2
NCSA-9n	None	None	Priority 2
NCSA-9o	Arsenic	Direct	Priority 1
NCSA-9p	None	None	Priority 2
NCSA-9q	None	None	Priority 2
NCSA-9r	Cadmium	Direct	Priority 1
NCSA-9s	None	None	Priority 2

TABLE 3-6
NORTH CENTRAL STUDY AREA COS EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Significance	Critical Exposure Pathway
NCSA-1a	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
	Chlorobenzene	Enclosed
	Chloroform	Enclosed
	1,1-Dichloroethylene	Enclosed
	Dicyclopentadiene	Enclosed
	Methylene chloride	Enclosed
	Trichloroethylene	Enclosed
NCSA-1b	Carbon tetrachloride	Enclosed
	Chloroform	Open, Enclosed
	Methylene chloride	Enclosed
	Trichloroethylene	Enclosed
NCSA-1d	Benzene	Enclosed
	Chlorobenzene	Enclosed
	Chloroform	Enclosed
	1,1-Dichloroethylene	Enclosed
	Methylene chloride	Enclosed
NCSA-1f	Benzene	Open, Enclosed
	Chlorobenzene	Enclosed
	Chloroform	Enclosed
	1,1-Dichloroethylene	Enclosed
	Methylene chloride	Enclosed
NCSA-1g	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
	Chlorobenzene	Enclosed
	Chloroform	Enclosed
	Dibromochloropropane	Enclosed
	1,1-Dichloroethylene	Enclosed
	Dicyclopentadiene	Enclosed
	Tetrachloroethylene	Enclosed
	Trichloroethylene	Enclosed
NCSA-4a	Benzene	Enclosed

TABLE 3-6 (Continued)
NORTH CENTRAL STUDY AREA COS EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Significance	Critical Exposure Pathway
NCSA-4a (cont.)	Chloroform 1,2-Dichloroethane Dicyclopentadiene Tetrachloroethylene	Enclosed Enclosed Enclosed Enclosed
NCSA-4b	Chloroform 1,2-Dichloroethane 1,1-Dichloroethylene Dicyclopentadiene	Enclosed Enclosed Enclosed Enclosed
NCSA-5d	Chloroform	Enclosed
NCSA-8b	Carbon tetrachloride	Enclosed
NCSA-9a	Chloroform Dicyclopentadiene	Enclosed Enclosed
NCSA-9g	Benzene 1,2-Dichloroethane Chloroform 1,1-Dichloroethylene Dicyclopentadiene Tetrachloroethylene	Enclosed Enclosed Enclosed Enclosed Enclosed Enclosed
NCSA-9o	Chloroform	Enclosed
NCSA-9q	Benzene Carbon tetrachloride Chlorobenzene Chloroform Dibromochloropropane 1,1-Dichloroethylene Dicyclopentadiene Methylene chloride Tetrachloroethylene Trichloroethylene	Enclosed Enclosed Enclosed Enclosed Enclosed Enclosed Enclosed Enclosed Enclosed Enclosed

TABLE 3-6 (Continued)
NORTH CENTRAL STUDY AREA COS EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Significance	Critical Exposure Pathway
NCSA-9r	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
	Chlorobenzene	Enclosed
	Chloroform	Enclosed
	Dibromochloropropane	Enclosed
	1,1-Dichloroethylene	Enclosed
	Dicyclopentadiene	Enclosed
	Methylene chloride	Enclosed
	Trichloroethylene	Enclosed
NCSA-9s	Chloroform	Enclosed

are Priority 1 sites based on RI data in this Exposure Assessment, and identified in the FFA as sites for IRA.

The remaining 13 sites evaluated were designated as Priority 2 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Inferred Surficial Contamination (NCSA-1g), Section 23 - Diisopropylmethyl Phosphonate Detection (NCSA-9a), Section 24 - Zinc Detection (NCSA-9e), Section 25 - Zinc and Copper Detections (NCSA-9f), Section 26 - Suspected Methylene Chloride Detection (NCSA-9g), Section 26 - Butoxyethanol Detection (NCSA-9i), Section 26 - Mercury Detection (NCSA-9j), Section 26 - Trichloropropene Detection (NCSA-9k), Zinc Detection in Bedrock (NCSA-9m), Section 35 - Trichloropropene Detection (NCSA-9n), and Section 36 - Arsenic and Mercury Detections (NCSA-9p), Mercury Detection (NCSA-9q), and Section 36 - Mercury Detection (NCSA-9s).

The COCs in soil and sediment (i.e., those displaying an EI greater than 0.1) for the NCSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are: Aldrin, benzene, bicycloheptadiene, Chlordane, chloroacetic acid, chlorobenzene, chloroform, chlorophenylmethyl sulfide, chlorophenylmethyl sulfone, chlorophenylmethyl sulfoxide, dibromochloropropane, 1,2-dichloroethane, dicyclopentadiene, PPDDE, PPDDT, Dieldrin, dimethyldisulfide, Endrin, fluoroacetic acid, hexachlorocyclopentadiene, Isodrin, methylene chloride, 1,1,2,2-tetrachloroethane, tetrachloroethylene, trichloroethylene, toluene, arsenic, cadmium, chromium, lead, and mercury.

The COSs in groundwater (i.e., those displaying a VEI greater than 1), based on the most sensitive exposed population PPLV (i.e., the industrial worker) are: benzene, carbon tetrachloride, chlorobenzene, chloroform, dibromochloropropane, 1,2-dichloroethane, 1,1-dichloroethylene, dicyclopentadiene, methylene chloride, tetrachloroethylene, and trichloroethylene.

3.4 CENTRAL STUDY AREA

The Central Study Area Exposure Assessment is summarized in Tables 3-7 and 3-8. Of the 10 sites evaluated in the Central Study Area (CSA), seven were designated as Priority 1 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Pesticide Pit (CSA-1a), Complex Disposal Area South (CSA-1b), Complex Disposal Area North (CSA-1c), Sanitary Landfill and Incinerator 834 (CSA-1d), Munitions Test Buildings (CSA-2a), Parking Lot/Scrap Storage (CSA-2b), and Section 36 - Low-Level OCP Detection (CSA-4). CSA-1a and CSA-1c are Priority 1 sites based on RI data in this Exposure Assessment, and identified in the FFA as sites for IRA.

The remaining three sites were designated as Priority 2 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Munitions Test Site (CSA-2c), Chemical Sewers - North Plants (CSA-3), and Incinerator NN3601 (CSA-2d).

The COCs (i.e., those displaying an EI less than 0.1) for the CSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are: Aldrin, benzene, benzothiazole, bicycloheptadiene, carbon tetrachloride, Chlordane, chloroacetic acid, chloroform, chlorophenylmethyl sulfide, 1,2-dichloroethane, 1,1-dichloroethylene, dicyclopentadiene, dimethyldisulfide, 2,2-bis(Para-chlorophenyl)-1,1-dichloroethene (PPDDE), Dieldrin, Endrin, fluoroacetic acid, hexachlorocyclopentadiene, Isodrin, chloroacetic acid, dibromochloropropane, 2,2-bis(Para-chlorophenyl)-1,1-trichloroethane (PPDDT), methylene chloride, methylisobutyl ketone^{1/}, 1,1,2,2-tetrachloroethane, tetrachloroethylene, arsenic, cadmium, chromium, copper, and lead.

The COSs in groundwater (i.e., those displaying a VEI greater than 1) for the CSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are: benzene, carbon tetrachloride, chloroform, dibromochloropropane, 1,2-dichloroethane, 1,1-dichloroethylene, and trichloroethylene.

1/ Identified as a COC for the commercial worker only (see Section 4.2).

TABLE 3-7
CENTRAL STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
CSA-1a	Aldrin	Direct, Indirect	Priority 1
	Benzene	Direct, Indirect	
	Benzothiazole	Indirect	
	Carbon tetrachloride	Direct, Indirect	
	Chlordane	Direct	
	Chloroform	Indirect	
	PPDDE	Direct	
	Dibromochloropropane	Direct, Indirect	
	1,2-Dichloroethane	Indirect	
	1,1-Dichloroethylene	Indirect	
	Dicyclopentadiene	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Dimethyldisulfide	Indirect	
	Endrin	Direct	
	Fluoroacetic acid	Direct	
	Hexachlorocyclopentadiene	Direct, Indirect	
	Isodrin	Direct, Indirect	
	Methylene chloride	Indirect	
	Methylisobutyl ketone ^{1/}	Indirect	
	Tetrachloroethylene	Direct, Indirect	
	Cadmium	Direct	
CSA-1b	Aldrin	Direct, Indirect	Priority 1
	Benzene	Indirect	
	Chlordane	Direct	
	Chloroacetic acid	Direct	
	Dibromochloropropane	Direct, Indirect	
	PPDDE	Direct	
	PPDDT	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Fluoroacetic acid	Direct	
	Methylene chloride	Indirect	
	Arsenic	Direct	

^{1/} Identified as a COC for the commercial worker only (see Section 4.2).

TABLE 3-7 (Continued)
CENTRAL STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
CSA-1c	Aldrin	Direct, Indirect	Priority 1
	Chlordane	Direct	
	Dibromochloropropane	Cumulative	
	PPDDE	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Fluoroacetic acid	Direct	
	Hexachlorocyclopentadiene	Indirect	
	1,1,2,2-Tetrachloroethane	Direct, Indirect	
	Tetrachloroethylene	Direct, Indirect	
	Arsenic	Direct	
	Cadmium	Direct	
	Chromium	Direct	
	Copper	Direct	
	Lead	Direct	
CSA-1d	Aldrin	Direct, Indirect	Priority 1
	Dieldrin	Direct, Indirect	
	Fluoroacetic acid	Direct	
	Methylene chloride	Indirect	
	Arsenic	Direct	
	Cadmium	Direct	
CSA-2a	Dieldrin	Direct, Indirect	Priority 1
	Fluoroacetic acid	Direct	
	Cadmium	Direct	
CSA-2b	Aldrin	Direct, Indirect	Priority 1
	Dieldrin	Direct, Indirect	
CSA-2c	None	None	Priority 2
CSA-2d	None	None	Priority 2
CSA-3	None	None	Priority 2

TABLE 3-7 (Continued)
CENTRAL STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
CSA-4	Aldrin	Direct	Priority 1
	Chlordane	Direct	
	Dieldrin	Direct	
	Cadmium	Direct	

TABLE 3-8
CENTRAL STUDY AREA COS EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Significance	Critical Exposure Pathway
CSA-1a	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
	Chloroform	Enclosed
	Dibromochloropropane	Enclosed
	Trichloroethylene	Enclosed
CSA-1b	Benzene	Enclosed
	Carbon tetrachloride	Open, Enclosed
	Chloroform	Enclosed
	Dibromochloropropane	Enclosed
	Trichloroethylene	Enclosed
CSA-1c	Benzene	Enclosed
	Dibromochloropropane	Enclosed
	1,2-Dichloroethane	Enclosed
	1,1-Dichloroethylene	Enclosed
	Trichloroethylene	Enclosed
CSA-2d	1,2-Dichloroethane	Enclosed
	Trichloroethylene	Enclosed

3.5 EASTERN STUDY AREA

The Eastern Study Area Exposure Assessment is summarized in Table 3-9. Of the 26 sites evaluated in the Eastern Study Area (ESA), 14 were designated as Priority 1 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Section 19 - Surface Burn (ESA-1a), Section 20 - Surface Burn (ESA-1b), Section 29 - Surface Burn (ESA-1c), Section 30 - Surface Burn (ESA-1d), Burn Pits (ESA-2a), Sanitary Landfill (ESA-2b), Open Trenches (ESA-2c), Old Toxic Storage Yard (ESA-3b), New Toxic Storage Yard (ESA-3c), Toxic Yard Plots (ESA-3d), Demilitarization Area (ESA-5), Section 6 - Chromium, Copper, Lead, and Zinc Detections (ESA-6a), Section 30 - Fluoroacetic Acid Detection (ESA-6b), and Section 30 - Arsenic Detection (ESA-6c).

The remaining 12 sites were designated as Priority 2 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Storage Yard (ESA-3a), Concrete VX Demilitarization Pad (ESA-3e), Rail Spur and Loading Dock (ESA-3f), Open Drum Storage Area (ESA-3g), Open Storage Area Ditch (ESA-3h), Toxic Storage Plots Ditch (ESA-3i), Toxic Storage Yard Fence (ESA-3j), Trash Pit (ESA-3k), Impact Area (ESA-4a), Demolition Area (ESA-4b), Trench and Mound (ESA-4c), and Section 20 - Hexachlorobenzene Detection (ESA-6d).

The COCs in soil and sediment (i.e., those displaying an EI greater than 0.1) for the ESA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are: benzene, Dieldrin, fluoroacetic acid, methylene chloride, trichloroethylene, arsenic, cadmium, chromium, lead, and zinc.

3.6 SOUTH PLANTS STUDY AREA

The South Plants Study Area Exposure Summary is summarized in Tables 3-10 and 3-11. Of the 35 sites evaluated in the SPSA, 33 were designated as Priority 1 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Army Agents and Shell Pesticides Processing Area (SPSA-1a), Mounded Material (SPSA-1b), Lime Pits (SPSA-1c), Drainage Ditches (SPSA-1d), Buried M-1 Pits (SPSA-1e), Buried Barrels Containing Hexachlorocyclopentadiene (SPSA-1f), Balance of SPSA-1

TABLE 3-9
EASTERN STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
ESA-1a	Cadmium	Direct	Priority 1
ESA-1b	Cadmium Chromium	Direct Direct	Priority 1
ESA-1c	Cadmium Chromium	Direct Direct	Priority 1
ESA-1d	Arsenic Cadmium Chromium	Direct Direct Direct	Priority 1
ESA-2a	Benzene Arsenic Cadmium Lead Zinc	Indirect Direct Direct Direct Direct	Priority 1
ESA-2b	Benzene Dieldrin Methylene chloride Trichloroethylene	Indirect Indirect Indirect Indirect	Priority 1
ESA-2c	Arsenic Fluoroacetic acid	Direct Direct	Priority 1
ESA-3a	None	None	Priority 2
ESA-3b	Arsenic Cadmium	Direct Direct	Priority 1
ESA-3c	Trichloroethylene	Indirect	Priority 1
ESA-3d	Chromium	Direct	Priority 1
ESA-3e	None	None	Priority 2

TABLE 3-9 (Continued)
EASTERN STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
ESA-3f	None	None	Priority 2
ESA-3g	None	None	Priority 2
ESA-3h	None	None	Priority 2
ESA-3i	None	None	Priority 2
ESA-3j	None	None	Priority 2
ESA-3k	None	None	Priority 2
ESA-4a	None	None	Priority 2
ESA-4b	None	None	Priority 2
ESA-4c	None	None	Priority 2
ESA-5	Fluoroacetic acid	Direct	Priority 1
ESA-6a	Chromium	Direct	Priority 1
ESA-6b	Fluoroacetic acid	Direct	Priority 1
ESA-6c	Arsenic Fluoroacetic acid	Direct Direct	Priority 1
ESA-6d	None	None	Priority 2

TABLE 3-10
SOUTH PLANTS STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
SPSA-1a	Aldrin	Direct, Indirect	Priority 1
	Benzene	Direct, Indirect	
	Carbon tetrachloride	Direct, Indirect	
	Chlordane	Direct	
	Chloroacetic acid	Direct	
	Chloroform	Direct, Indirect	
	Dibromochloropropane	Direct, Indirect	
	PPDDE	Direct	
	PPDDT	Direct	
	Dicyclopentadiene	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Endrin	Direct	
	Hexachlorocyclopentadiene	Direct, Indirect	
	Isodrin	Direct	
	Methylene chloride	Indirect	
	1,1,2,2-Tetrachloroethane	Direct, Indirect	
	Tetrachloroethylene	Direct, Indirect	
	Arsenic	Direct	
	Cadmium	Direct	
	Chromium	Direct	
	Lead	Direct	
	Mercury	Direct	
SPSA-1b	Aldrin	Direct, Indirect	Priority 1
	PPDDE	Cumulative	
	PPDDT	Direct	
	Dieldrin	Direct, Indirect	
	Methylene chloride	Indirect	
	Arsenic	Direct	
	Cadmium	Direct	
	Lead	Direct	

TABLE 3-10 (Continued)
SOUTH PLANTS STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
SPSA-1c	Aldrin	Direct	Priority 1
	Chlordane	Direct	
	PPDDE	Direct	
	PPDDT	Direct	
	Dieldrin	Direct	
	Arsenic	Direct	
SPSA-1d	Aldrin	Direct	Priority 1
	Dieldrin	Direct	
SPSA-1e	Aldrin	Direct, Indirect	Priority 1
	Bicycloheptadiene	Direct, Indirect	
	Chlordane	Direct, Indirect	
	Dicyclopentadiene	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Hexachloropentadiene	Direct, Indirect	
	Isodrin	Direct	
	Arsenic	Direct	
	Cadmium	Direct	
	Mercury	Direct	
SPSA-1f	Aldrin	Direct	Priority 1
	Dieldrin	Direct, Indirect	
	Hexachlorocyclopentadiene	Indirect	
SPSA-1g	Aldrin	Direct	Priority 1
	Benzene	Direct, Indirect	
	Chloroform	Indirect	
	Dieldrin	Direct, Indirect	
	Methylene chloride	Indirect	
	Methylisobutyl ketone ^{1/}	Indirect	
	1,1,2,2-Tetrachloroethane	Indirect	
	Arsenic	Direct	
	Cadmium	Direct	
	Chromium	Direct	
	Lead	Direct	

1/ Identified as a COC for the commercial worker only (see Section 4.2).

TABLE 3-10 (Continued)
SOUTH PLANTS STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
SPSA-2a	Aldrin	Direct	Priority 1
	Benzene	Direct	
	Chlordane	Direct	
	Dicyclopentadiene	Direct, Indirect	
	Dieldrin	Direct	
	Methylene chloride	Direct, Indirect	
	1,1,2,2-Tetrachloroethane	Direct	
SPSA-2b	Aldrin	Direct, Indirect	Priority 1
	Benzene	Indirect	
	Dicyclopentadiene	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Methylene chloride	Indirect	
	1,1,2,2-Tetrachloroethane	Direct, Indirect	
SPSA-2c	Aldrin	Direct, Indirect	Priority 1
	Chlordane	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Methylene chloride	Indirect	
SPSA-2d	Aldrin	Direct, Indirect	Priority 1
	Chlordane	Cumulative	
	Dieldrin	Direct	
SPSA-2e	Benzene	Direct, Indirect	Priority 1
	Dibromochloropropane	Direct, Indirect	
	Dicyclopentadiene	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Chromium	Direct	
SPSA-3a	Aldrin	Direct, Indirect	Priority 1
	Chlordane	Direct, Indirect	
	PPDDT	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Isodrin	Direct, Indirect	

TABLE 3-10 (Continued)
SOUTH PLANTS STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
SPSA-3b	Aldrin	Direct, Indirect	Priority 1
	Chlordane	Direct, Indirect	
	Chloroform	Indirect	
	Chlorophenylmethyl sulfide	Direct, Indirect	
	PPDDE	Direct, Indirect	
	PPDDT	Direct, Indirect	
	1,2-Dichloroethane	Indirect	
	Dicyclopentadiene	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Hexachlorocyclopentadiene	Direct, Indirect	
	Isodrin	Direct, Indirect	
	1,1,2,2-Tetrachloroethane	Indirect	
	Arsenic	Direct	
SPSA-3c	Aldrin	Direct, Indirect	Priority 1
	Dieldrin	Direct, Indirect	
	Methylene chloride	Indirect	
	Cadmium	Direct	
	Chromium	Direct	
	Lead	Direct	
SPSA-3d	Aldrin	Direct, Indirect	Priority 1
	Chlordane	Direct, Indirect	
	PPDDT	Direct, Indirect	
	Dieldrin	Direct, Indirect	
SPSA-3e	Dicyclopentadiene	Indirect	Priority 1
	Dieldrin	Direct, Indirect	
SPSA-4a	Aldrin	Direct, Indirect	Priority 1
	Chlordane	Direct	
	PPDDT	Direct	
	PPDDE	Direct, Indirect	
	Dieldrin	Direct, Indirect	
	Isodrin	Direct, Indirect	

TABLE 3-10 (Continued)
SOUTH PLANTS STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
SPSA-4a (cont.)	Methylene chloride Chromium Lead	Direct, Indirect Direct Direct	
SPSA-4b	Aldrin Dieldrin Methylene chloride	Direct, Indirect Direct, Indirect Indirect	Priority 1
SPSA-5a	Dieldrin Cadmium	Direct, Indirect Direct	Priority 1
SPSA-5b	Aldrin Chlordane Dicyclopentadiene Dieldrin Methylene chloride Trichloroethylene Chromium	Direct, Indirect Direct Indirect Direct, Indirect Indirect Indirect Direct	Priority 1
SPSA-6	Dieldrin Arsenic	Direct Direct	Priority 1
SPSA-7a	Dieldrin	Direct	Priority 1
SPSA-7b	Aldrin PPDDT Dieldrin Arsenic	Direct, Indirect Direct, Indirect Direct Direct	Priority 1
SPSA-7c	Benzene Dieldrin	Direct, Indirect Direct	Priority 1
SPSA-8a	Aldrin Chlordane PPDDT Dieldrin Hexachlorocyclopentadiene	Direct, Indirect Direct, Indirect Direct, Indirect Direct, Indirect Direct, Indirect	Priority 1

TABLE 3-10 (Continued)
SOUTH PLANTS STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
SPSA-8a (cont.)	Isodrin Arsenic	Direct, Indirect Direct	
SPSA-8b	Aldrin Dieldrin	Direct, Indirect Direct, Indirect	Priority 1
SPSA-8c	None	None	Priority 2
SPSA-9a	Aldrin Chlordane PPDDE PPDDT Dieldrin	Direct, Indirect Direct, Indirect Direct, Indirect Direct Direct, Indirect	Priority 1
SPSA-9b	None	None	Priority 2
SPSA-10	Aldrin Benzene Carbon tetrachloride Chloroacetic acid Chloroform Dibromochloropropane PPDDE PPDDT 1,2-Dichloroethane Dieldrin Hexachlorocyclopentadiene Isodrin Tetrachloroethylene Supona Arsenic Cadmium Chromium	Direct, Indirect Direct Direct, Indirect Direct Direct, Indirect Direct, Indirect Direct Direct Direct Direct Direct Direct Direct Direct Direct Direct Direct	Priority 1
SPSA-11	Aldrin Dieldrin	Direct Direct	Priority 1

TABLE 3-10 (Continued)
SOUTH PLANTS STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
SPSA-12	Aldrin Dieldrin	Direct Direct	Priority 1
SPSA-12a	Aldrin Dieldrin 1,1,2,2-Tetrachloroethane	Direct, Indirect Direct Direct	Priority 1
SPSA-12b	Aldrin Dieldrin	Direct, Indirect Direct, Indirect	Priority 1

TABLE 3-11
SOUTH PLANTS STUDY AREA COS EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Significance	Critical Exposure Pathway
SPSA-1a	Benzene	Open
	Carbon tetrachloride	Open
	1,1-Dichloroethylene	Open
SPSA-1b	Aldrin	Enclosed
	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
	Chloroform	Enclosed
	Dibromochloropropane	Enclosed
	Tetrachloroethylene	Enclosed
	Trichloroethylene	Enclosed
SPSA-1e	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
	Chlorobenzene	Enclosed
	Chloroform	Enclosed
	Dibromochloropropane	Enclosed
	1,1-Dichloroethylene	Enclosed
	Methylene chloride	Enclosed
	Tetrachloroethylene	Enclosed
	1,1,2-Trichloroethylene	Enclosed
	Trichloroethylene	Enclosed
SPSA-1f	Aldrin	Enclosed
	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
	Chloroform	Enclosed
	Dibromochloropropane	Enclosed
	1,1-Dichloroethylene	Enclosed
	Dicyclopentadiene	Enclosed
	Dimethyldisulfide	Enclosed
	Hexachlorocyclopentadiene	Enclosed
	Methylisobutyl ketone	Enclosed
	Methylene chloride	Enclosed
	Tetrachloroethylene	Enclosed
	Trichloroethylene	Enclosed

TABLE 3-11 (Continued)
SOUTH PLANTS STUDY AREA COS EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Significance	Critical Exposure Pathway
SPSA-1g	Benzene	Enclosed
	Carbon tetrachloride	Open, Enclosed
	Chloroform	Enclosed
	Dibromochloropropane	Enclosed
	1,1-Dichloroethylene	Enclosed
	Hexachlorocyclopentadiene	Enclosed
	Methylene chloride	Enclosed
	Tetrachloroethylene	Enclosed
	1,1,2-Trichloroethane	Enclosed
	Trichloroethylene	Enclosed
SPSA-2a	Benzene	Open
SPSA-2b	Benzene	Open, Enclosed
SPSA-2c	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
SPSA-2d	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
SPSA-2e	Benzene	Open, Enclosed
	Bicycloheptadiene	Enclosed
	Chloroform	Enclosed
SPSA-3c	Carbon tetrachloride	Enclosed
	Dicyclopentadiene	Enclosed
SPSA-3d	Chloroform	Enclosed
	Dicyclopentadiene	Enclosed
SPSA-3e	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
	Dicyclopentadiene	Enclosed
SPSA-4b	Dicyclopentadiene	Enclosed

TABLE 3-11 (Continued)
SOUTH PLANTS STUDY AREA COS EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Significance	Critical Exposure Pathway
SPSA-5a	Carbon tetrachloride	Enclosed
	Chloroform	Enclosed
	Trichloroethylene	Enclosed
SPSA-6	Carbon tetrachloride	Enclosed
	Trichloroethylene	Enclosed
SPSA-7c	Dicyclopentadiene	Enclosed
SPSA-9a	Carbon tetrachloride	Enclosed
	Trichloroethylene	Enclosed
SPSA-9b	Carbon tetrachloride	Enclosed
	Trichloroethylene	Enclosed
SPSA-12a	Benzene	Enclosed
	Carbon tetrachloride	Enclosed
SPSA-12b	Benzene	Enclosed
	Bicycloheptadiene	Enclosed
	Chloroform	Enclosed
	Dibromochloropropane	Enclosed

(SPSA-1g), South Tank Farm Area (SPSA-2a), Open Storage Area (SPSA-2b), Salvage Yard (SPSA-2c), Drainage Ditches (SPSA-2d), Balance of SPSA-2 (SPSA-2e), Drainage Ditches (SPSA-3a), Salt Storage Pad (SPSA-3b), Former Tank Storage Area (SPSA-3c), Revetted Tank Storage Area (SPSA-3d), Balance of SPSA-3 (SPSA-3e), Drainage Ditches (SPSA-4a), Balance of SPSA-4 (SPSA-4b), Drainage Ditch (SPSA-5a), Balance of SPSA-5 (SPSA-5b), Hydrazine Facility (SPSA-6), Drainage Ditches (SPSA-7a), Lagoon (SPSA-7b), Balance of SPSA-7 (SPSA-7c), Sanitary Landfill (SPSA-8a), Drainage Ditches (SPSA-8b), Drainage Ditch (SPSA-9a), Chemical Sewer System (SPSA-10), Sanitary Sewer System (SPSA-11), Processs Water System (SPSA-12), Aeration Basin (SPSA-12a), and Sedimentation Pond (SPSA-12b). SPSA-1e, SPSA-2a, SPSA-2b, SPSA-2c, SPSA-2d, SPSA-2e, SPSA-6, and SPSA-11 are Priority 1 sites based on RI data in this Exposure Assessment, and identified in the FFA as sites for IRA.

The remaining two sites were designated as Priority 2 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Balance of SPSA-8 (SPSA-8c) and Balance of SPSA-9 (SPSA-9b).

The COCs (i.e., those displaying an EI greater than 0.1) for the SPSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are: Aldrin, benzene, bicycloheptadiene, carbon tetrachloride, Chlordane, chloroacetic acid, chloroform, chlorophenylmethyl sulfide, dibromochloropropane, 1,2-dichloroethane, PPDDE, PPDDT, dicyclopentadiene, Dieldrin, Endrin, hexachlorocyclopentadiene, Isodrin, methylene chloride, methylisobutyl ketone^{1/}, Supona, 1,1,2,2-tetrachloroethane, tetrachloroethylene, trichloroethylene, arsenic, cadmium, chromium, lead, and mercury.

The COSs in groundwater (i.e., those displaying a VEI greater than 1) for the SPSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are: Aldrin, benzene, bicycloheptadiene, carbon tetrachloride, chlorobenzene, chloroform, dibromochloropropane, 1,1-dichloroethylene, dicyclopentadiene, dimethyldisulfide,

^{1/} Identified as a COC for the commercial worker only (see Section 4.2).

hexachlorocyclopentadiene, methylene chloride, methylisobutyl ketone, tetrachloroethylene, 1,1,2-trichloroethane, and trichloroethylene.

3.7 NORTH PLANTS STUDY AREA

The North Plants Study Area Exposure Summary is summarized in Tables 3-12 and 3-13. Of the 16 sites that were evaluated in the North Plants Study Area (NPSA), ten sites were designated as Priority 1 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Chemical Sewer System (NPSA-1), Tank Farm (NPSA-2), GB Manufacturing Area (NPSA-3), Fuze and Detonator Magazine (NPSA-4), Special Weapons Plant (NPSA-5), Underground Spill Area (NPSA-6), Drainage Ditch (NPSA-8c), Chromium Detection (NPSA-9b), Benzene and Zinc Detections (NPSA-9d), and Arsenic Detection (NPSA-9f).

The remaining six sites were designated as Priority 2 sites based on the most sensitive exposed population PPLV (i.e., the industrial worker). These include: Surface Spill Area (NPSA-7), Drainage Ditch (NPSA-8a), Drainage Ditch (NPSA-8b), Railroad Tracks (NPSA-9a), Zinc Detection (NPSA-9c), and Railroad Tracks (NPSA-9e).

The COCs in soil and sediment (i.e., those displaying a cumulative EI less than 0.1) for the NPSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are: Aldrin, benzene, chloroacetic acid, chloroform, Dieldrin, tetrachloroethylene, arsenic, cadmium, and chromium.

The COSs in groundwater (i.e., those with a VEI greater than 1) for the NPSA, based on the most sensitive exposed population PPLV (i.e., the industrial worker), are: carbon tetrachloride and 1,1-dichloroethylene.

TABLE 3-12
NORTH PLANTS STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
NPSA-1	Cadmium	Direct	Priority 1
NPSA-2	Benzene Chloroform Tetrachloroethylene	Indirect Indirect Indirect	Priority 1
NPSA-3	Dieldrin Cadmium	Direct Direct	Priority 1
NPSA-4	Chloroacetic acid	Direct	Priority 1
NPSA-5	Benzene Arsenic Cadmium	Indirect Direct Direct	Priority 1
NPSA-6	Aldrin Benzene Dieldrin Arsenic Cadmium	Direct Indirect Direct, Indirect Direct Direct	Priority 1
NPSA-7	None	None	Priority 2
NPSA-8a	None	None	Priority 2
NPSA-8b	None	None	Priority 2
NPSA-8c	Arsenic	Direct	Priority 1
NPSA-9a	None	None	Priority 2
NPSA-9b	Chromium	Direct	Priority 1
NPSA-9c	None	None	Priority 2
NPSA-9d	Benzene	Indirect	Priority 1

TABLE 3-12 (Continued)
NORTH PLANTS STUDY AREA COC EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Concern	Critical Exposure Pathway	Priority Recommendation
NPSA-9e	None	None	Priority 2
NPSA-9f	Arsenic	Direct	Priority 1

TABLE 3-13
NORTH PLANTS STUDY AREA COS EXPOSURE SUMMARY
EXPOSED POPULATION: INDUSTRIAL WORKER

Site Name	Contaminant of Significance	Critical Exposure Pathway
NPSA-2	Carbon tetrachloride 1,1-Dichloroethylene	Enclosed Enclosed
NPSA-4	1,1-Dichloroethylene	Enclosed
NPSA-6	1,1-Dichloroethylene	Enclosed
NPSA-7	Carbon tetrachloride 1,1-Dichloroethylene	Enclosed Enclosed
NPSA-8b	1,1-Dichloroethylene	Enclosed
NPSA-9d	Carbon tetrachloride 1,1-Dichloroethylene	Enclosed Enclosed

4.0 ARSENAL-WIDE PERSPECTIVE OF THE EXPOSURE ASSESSMENT

To ensure that the objectives of the Human Health Exposure Assessment were met consistent with current U.S. Environmental Protection Agency (EPA) guidance, supplemental screening analyses were made to account for underestimation of exposure, additivity, and Reasonable Maximum Exposure (RME) parameter estimates in deriving the Draft PPLVs. Each of these screens is discussed below.

4.1 ADDITIONAL SCREENING EVALUATIONS

4.1.1 Underestimation of Exposure

As was discussed in Volume VI-A, Section 2.1.2.3 of the Exposure Assessment Report, unacceptable exposure is normally considered in cases where the EI is greater than unity ($EI > 1$). To account for the potential of underestimating exposure attributed to an uncertainty in the Draft PPLV values, an EI of 0.1 was considered as an indication of unacceptable exposure. Therefore, for all pathways and exposed populations, a chemical measured at a site for which its maximum concentration was one-tenth of its cumulative Draft PPLV value was considered as a COC. This condition was set as a requirement in the site-by-site assessments (see Volumes VI-B through VI-H). Any site for which an EI value of at least 0.1 was computed for any of the contaminants measured was recommended as a Priority 1 site. In this manner, contaminants which could potentially contribute to the contamination being significant at a site were not prematurely rejected from consideration as potential COCs prior to the risk characterization.

4.1.2 Additivity

To determine whether additional chemicals should be considered as COCs for each site examined, additive effects were computed for carcinogens and noncarcinogens using the appropriate exposure pathways for industrial workers based on the following approach.

4.1.2.1 Carcinogens

For carcinogens, the risk for each contaminant measured was estimated by multiplying the computed EI_{max} by an acceptable risk level of 1×10^{-6} consistent with EPA guidance (EPA, 1990). Mathematically, the individual risk from chemical i can be expressed as:

$$Risk_i = EI_{i, max} * 10^{-6}$$

The individual chemical risk values were then summed to obtain the total site risk expressed as:

$$Risk_{TOTAL} = \sum_i Risk_i$$

If the total risk for this site was greater than 10^{-6} , then the chemicals contributing to that excess risk were identified and deleted and the total residual risk computed. The carcinogens contributing to the excess risk were then included in the COC list.

4.1.2.2 Noncarcinogens

A similar procedure was used for noncarcinogens. The hazard index ($HI_{i, max}$) for each noncarcinogen at a site was computed as:

$$HI_{i, max} = \frac{C_{i, max}}{PPLV_i}$$

where $C_{i, max}$ is the maximum soil concentration of i measured at the site and $PPLV_i$ is its Draft PPLV for an industrial worker. The Total Hazard Index (HI_{TOTAL}) for the site was then computed as:

$$HI_{TOTAL} = \sum_i HI_{i, max}$$

If HI_{TOTAL} was greater than unity, then the chemicals contributing to that excess HI were identified and deleted and the total residual HI computed. The chemicals contributing to the excess HI were then included in the COC list. It should be noted here that this screen was actually performed for all chemicals at a site (i.e., both carcinogens and noncarcinogens) since carcinogens can contribute to adverse noncarcinogenic health effects as well. The results of the additivity screening process are presented in Appendix A.

4.1.3 Reasonable Maximum Exposure (RME) Parameter Estimates

The effect of assigning RME values to the parameters of the Draft PPLV equations for the exposed populations considered resulted in a reduction of the PPLV values as follows. For the direct pathways the PPLVs were reduced by an average factor of 20 for regulated and casual visitors, 7 for recreational visitors, 19 for commercial workers, and 6 for industrial workers. The RME input parameters are summarized in Table 4-1. RME direct soil exposure PPLVs are presented in Table 4-2.

For the indirect pathways the PPLV changes were estimated for an exemplary site North Central Study Area (NCSA-3/Basin F), one of the most contaminated areas on RMA. Tables 4-3 through 4-7 present Draft PPLVs, EIs, and VEIs for each site contaminant. The depth to groundwater below Site NCSA-3 is greater than 10 ft; therefore, the enclosed space vapor inhalation exposure pathway is included in the calculation of the cumulative Draft PPLVs. The COCs (i.e., those contaminants whose maximum detected concentrations result in an EI greater than 1.0), are summarized below together with the associated critical exposure pathways and the affected population (Table 4-8).

The results of the RME screen indicate that there are no additional COCs from the MLE site evaluation for NCSA-3.

4.1.4 Conclusion

The results of the three screening evaluation described above provide greater certainty that all contaminants which could potentially contribute to unacceptable human health risk have been identified and will be considered further in the risk characterization process.

TABLE 4-1
REASONABLE MAXIMUM EXPOSURE (RME) ESTIMATES
FOR THE EXPOSURE ASSESSMENT SCREENING EVALUATION

Parameter Name	Recreational Visitors			Regulated/Casual Visitors			Commercial Workers	Industrial Workers
Soil Ingestion	2 1/2 6 Adult	250 mg/day 250 mg/day 100 mg/day	2 1/2 6 Adult	250 mg/day 250 mg/day 100 mg/day	100 mg/day	100 mg/day	100 mg/day	100 mg/day
Breathing Rate	2 1/2 6 Adult	8.3 l/min 20.3 l/min 24 l/min	2 1/2 6 Adult	4.2 l/min 13.3 l/min 10 l/min	4.8 m ³ /day	20 m ³ /day		
Dust Load Factor		0.042 mg/m ³		0.042 mg/m ³	0.021 mg/m ³	0.042 mg/m ³		
Pulmonary Retention		0.75		0.75	0.75	0.75		
Pulmonary Absorption (All compounds)		1 (100 percent)		1 (100 percent)	1 (100 percent)	1 (100 percent)		
Daily Exposure Period		6 hours		6 hours	8 hours	8 hours		
Annual Exposure Frequency		108 days/year		108 days/year	253 days/year	253 days/year		
Lifetime Exposure Duration		70 years		30 years	30 years	30 years		
Skin Surface Area	2 1/2 6 Adult	2,100 cm ² 2,500 cm ² 4,500 cm ²	2 1/2 6 Adult	2,100 cm ² 2,500 cm ² 4,500 cm ²	1,120 cm ²	3200 cm ²		

TABLE 4-1 (Continued)
 REASONABLE MAXIMUM EXPOSURE (RME) ESTIMATES
 FOR THE EXPOSURE ASSESSMENT SCREENING EVALUATION

Parameter Name	Recreational Visitors	Regulated/Casual Visitors	Commercial Workers	Industrial Workers
Soil Covering	0.51 mg/cm ²	0.51 mg/cm ²	0.11 mg/cm ²	1.5 mg/cm ²
Soil Matrix Factor	1.0	1.0	1.0	1.0
Dermal Absorption (All compounds)	0.01 (metals) 0.10 (organics)	0.01 (metals) 0.10 (organics)	0.01 (metals) 0.10 (organics)	0.01 (metals) 0.10 (organics)
Body Weight	Adult: 70 kg Child: 10th percentile(M&F)	Adult: 70 kg Child: 10th percentile(M&F)	70 kg	70 kg
Area of Basement	NA ^v	NA	138 m ²	138 m ²
Basement Volume	NA	NA	210 m ³	210 m ³
Basement Volume/ Surface Area Ratio	NA	NA	1.52 m	1.52 m
Depth of Basement Below Soil	NA	NA	2 m	2 m
Volume of Basement Air Inhaled	NA	NA	0.75 m ³ /day	0.75 m ³ /day
Time Per Basement Air Change	NA	NA	0.069 days/ exchange	0.069 days/ exchange
Soil Temperature	NA	NA	13°C	13°C

REA3/TBL0036.REA VII 9/16/90 10:30 am sma 2

TABLE 4-1 (Continued)
 REASONABLE MAXIMUM EXPOSURE (RME) ESTIMATES
 FOR THE EXPOSURE ASSESSMENT SCREENING EVALUATION

Parameter Name	Recreational Visitors	Regulated/Casual Visitors	Commercial Workers	Industrial Workers
Soil Density	NA	NA	1.7 g/cm ³	1.75 g/cm ³
Soil Porosity Air Space	NA	NA	0.45 cm ³ /cm ³	0.45 cm ³ /cm ³
Soil Organic Content	NA	NA	0.001 (fraction)	0.001 (fraction)

1/ Not Applicable

TABLE 4-2
RME DIRECT SOIL EXPOSURE PATHWAY PPLVs^{1/}

Chemical	Recreational Visitors (mg/kg)		Regulated/Casual Visitors (mg/kg)		Commercial Worker (mg/kg)		Industrial Worker (mg/kg)	
	MLE	RME	MLE	RME	MLE	RME	MLE	RME
Aldrin	0.21	0.030	1.50	0.07	1.9	0.098	0.12	0.019
Arsenic	3.4	0.84	19	2.0	17	1.2	1.5	0.81
Atrazine	18,000	2,500	41,000	2,100	23,000	3,500	4,200	690
Benzene	120	17	860	40	1,100	56	67	11
Benzothiazole	16,000	2,400	39,000	2,000	22,000	3,300	4,000	650
Bicycloheptadiene	140,000	20,000	320,000	16,000	180,000	27,000	33,000	5,300
Cadmium	58	87	450	400	360	280	7.6	44
Carbon tetrachloride	27	3.9	200	9.1	250	13	15	2.5
Chlordane	2.7	0.39	20	0.91	25	1.3	1.5	0.25
Chloroacetic acid	7,000	1,000	16,000	840	9,200	1,400	1,700	270
Chlorobenzene	68,000	10,000	160,000	8,400	88,000	14,000	15,000	2,700
Chloroform	560	81	4,000	190	5,100	260	310	51
Chlorophenylmethyl sulfide	70,000	10,000	160,000	8,300	91,000	14,000	17,000	2,700
Chlorophenylmethyl sulfone	70,000	10,000	160,000	8,300	91,000	14,000	17,000	2,700
Chlorophenylmethyl sulfoxide	70,000	10,000	160,000	8,300	91,000	14,000	17,000	2,700
Chromium	8.8	15	69	82	55	59	1.2	7.1
Copper	250,000	48,000	420,000	36,000	180,000	30,000	57,000	20,000
Dibromochloropropane	2.5	0.36	18.0	0.84	180,000	1.2	1.4	0.23
PPDDE (isomer)	10	1.5	74	3.4	93	4.8	5.7	0.93
PPDDT (isomer)	10	1.5	74	3.4	93	4.8	5.7	0.93
1,1-Dichloroethane	39	5.6	280	13	360	18	23	3.5
1,2-Dichloroethane	39	5.6	280	13	350	18	22	3.5
1,1-Dichloroethylene	5.9	0.86	43	2.0	54	2.8	3.2	0.54
1,2-Dichloroethylene	70,000	10,000	160,000	8,400	92,000	14,000	17,000	2,700

REA3/TBL0036.REA VII 9/24/90 5:12 pm sma 4

TABLE 4-2 (Continued)
RME DIRECT SOIL EXPOSURE PATHWAY PPLVs

Chemical	Recreational Visitors (mg/kg)		Regulated/Casual Visitors (mg/kg)		Commercial Worker (mg/kg)		Industrial Worker (mg/kg)	
	MLE	RME	MLE	RME	MLE	RME	MLE	RME
Dicyclopentadiene	18,000	11,000	54,000	11,000	17,000	16,000	1,200	2,700
Dieldrin	0.22	0.031	1.6	0.073	2.0	0.10	0.12	0.020
Diisopropylmethyl phosphonate	280,000	41,000	660,000	34,000	370,000	57,000	68,000	11,000
Dimethyldisulfide	29,000	4,100	67,000	3,400	37,000	5,700	6,900	1,100
Dimethylmethyl phosphonate	63,000	9,100	150,000	7,600	82,000	13,000	15,000	2,500
Dithiane	35,000	5,100	83,000	4,200	46,000	7,100	8,500	1,400
Endrin	1,000	150	2,500	130	1,400	210	250	41
Ethylbenzene	350,000	51,000	830,000	42,000	460,000	71,000	85,000	14,000
Fluoroacetic acid	16	2.4	39	2.0	22	3.3	4.0	0.65
Hexachlorocyclo- pentadiene	5,700	2,800	17,000	2,600	5,400	4,000	380	700
Isodrin	250	35	580	29	320	50	59	9.6
Isopropyl methyl- phosphonate	>1.0E+06	150,000	1.0E+06	130,000	>1.0E+06	210,000	250,000	41,000
Isopropylmethyl phosphonic acid	>1.0E+06	150,000	1.0E+06	130,000	>1.0E+06	210,000	250,000	41,000
Lead	9,200	1,800	16,000	1,300	6,500	1,100	2,200	740
Lewisite	70	10	160	8.4	92	14	17	2.7
Lewisite Oxide	70	10	160	8.4	92	14	17	2.7
Malathion	70,000	10,000	160,000	8,400	92,000	14,000	17,000	2,700
Mercury	1,900	380	3,300	290	1,400	240	460	160
Methylene chloride	450	66	3,300	150	4,100	220	250	42

TABLE 4-2 (Continued)
RME DIRECT SOIL EXPOSURE PATHWAY PPLVs

Chemical	Recreational Visitors (mg/kg)		Regulated/Casual Visitors (mg/kg)		Commercial Worker (mg/kg)		Industrial Worker (mg/kg)	
	MLE	RME	MLE	RME	MLE	RME	MLE	RME
Methylisobutyl ketone	170,000	25,000	410,000	21,000	220,000	35,700	40,000	6,900
N-Nitrosodimethylamine	0.07	0.01	0.51	0.024		0.033	0.039	0.0064
1,4-Oxathiane	100,000	15,000	250,000	13,000	140,000	21,000	25,000	4,100
Parathion	21,000	3,000	50,000	2,500	28,000	4,300	5,100	820
Sarin	3.0	0.44	7.1	0.36	3.9	0.61	0.73	0.12
Sulfur mustard	12	1.7	86	4.0	110	5.6	6.7	1.1
Supona	530	76	1,200	63	690	110	130	21
1,1,2,2-Tetrachloroethane	18	2.5	130	5.9	160	8.3	9.9	1.6
Tetrachloroethylene	70	10	500	24	650	33	41	6.4
Thiodiglycol	140,000	20,000	330,000	17,000	180,000	28,000	34,000	5,500
Toluene	>1.0E+06	150,000	>1.0E+06	130,000	>1.0E+06	210,000	260,000	41,000
1,1,1-Trichloroethane	320,000	46,000	750,000	38,000	420,000	64,000	78,000	12,000
1,1,2-Trichloroethane	60	8.6	430	20	540	28	34	5.5
Trichloroethylene	320	46	2,300	110	2,900	150	180	29
Vapona	12	1.7	86	4.0	110	5.6	6.7	1.1
Xylene	>1.0E+06	1.0E+06	>1.0E+06	830,000	>1.0E+06	>1.0E+06	880,000	270,000
Zinc	>1.0E+06	260,000	>1.0E+06	200,000	>1.0E+06	160,000	140,000	100,000

1/ MLE-RME/PPLVs were computed using Version 3.1.

TABLE 4-3
RME EXPOSURE EVALUATIONS FOR REGULATED VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPH
ALDRIN	7.0E-02	1.0E+06	7.0E-02	5.7E+04*	7.6E-03a	5.7E+04*	0.0E+00
ATRAZINE	2.1E+03	0.0E+00	2.1E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-14
BENZENE	4.0E+01	6.6E+04	4.0E+01	7.5E-02	4.6E-05	7.5E-02	9.4E-07
BENZOTHAZOLE	2.0E+03	0.0E+00	2.0E+03	0.0E+00	0.0E+00	0.0E+00	5.7E-09
BICYCLOHEPTADIENE	1.6E+04	1.8E+07	1.6E+04	1.9E-03	1.6E-06	1.9E-03	6.2E-09
CHLORDANE	9.1E-01	0.0E+00	9.1E-01	0.0E+00	0.0E+00	0.0E+00	1.2E-07
CHLOROACETIC ACID	8.4E+02	0.0E+00	8.4E+02	9.4E+00*	0.0E+00	9.4E+00*	0.0E+00
CHLOROBENZENE	8.4E+03	7.2E+06	8.4E+03	6.0E-04	6.9E-07	6.0E-04	2.7E-09
CHLOROFORM	1.9E+02	7.7E+04	1.9E+02	3.7E-01	9.1E-04	3.7E-01	7.1E-08
CHLOROPHENYLMETHYL SULFIDE	8.3E+03	1.0E+06	8.3E+03	8.4E-02	2.5E-05a	8.4E-02	0.0E+00
CHLOROPHENYLMETHYL SULFONE	8.3E+03	1.0E+06	8.3E+03	3.6E-02	1.3E-05a	3.6E-02	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	8.3E+03	1.5E+07	8.3E+03	8.4E-03	4.7E-06	8.4E-03	1.6E-10
PPDE	3.4E+00	0.0E+00	3.4E+00	0.0E+00	0.0E+00	0.0E+00	5.7E-09
PPDT	3.4E+00	0.0E+00	3.4E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-08
DIBROMOCHLOROPROPANE	8.4E-01	8.1E+02	8.4E-01	2.4E+01*	2.5E-02	2.4E+01*	2.5E-08
1,2-DICHLOROETHANE	1.3E+01	4.8E+04	1.3E+01	7.7E-02	2.1E-05	7.7E-02	2.6E-06
DICYCLOPENTADIENE	1.1E+04	1.6E+04	6.4E+03	3.7E-01	2.5E-01	6.2E-01	0.0E+00
DIELDRI	7.3E-02	1.0E+06	7.3E-02	2.7E+04*	9.3E-03a	2.7E+04*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.4E+04	4.6E+07	3.4E+04	8.9E-05	6.5E-08	8.9E-05	4.4E-09
DIMETHYLDISULFIDE	3.4E+03	1.2E+07	3.4E+03	2.1E-02	6.0E-06	2.1E-02	2.0E-09
DIMETHYLMETHYL PHOSPHONATE	7.6E+03	0.0E+00	7.6E+03	9.3E-03	0.0E+00	9.3E-03	0.0E+00
DITHIANE	4.2E+03	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.3E+02	1.0E+06	1.3E+02	7.1E+00*	4.6E-06a	7.1E+00*	0.0E+00
ETHYLBENZENE	4.2E+04	1.4E+08	4.2E+04	1.9E-04	5.6E-08	1.9E-04	1.8E-10
HEXACHLOROCYCLOPENTADIENE	2.6E+03	0.0E+00	2.6E+03	0.0E+00	0.0E+00	0.0E+00	1.0E-06
ISODRIN	2.9E+01	1.0E+06	2.9E+01	1.0E+02*	7.3E-05a	1.0E+02*	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	1.3E+05	0.0E+00	1.3E+05	3.6E-02	0.0E+00	3.6E-02	0.0E+00
MALATHION	8.4E+03	0.0E+00	8.4E+03	0.0E+00	0.0E+00	0.0E+00	1.7E-14
METHYLISSOBUTYL KETONE	2.1E+04	4.1E+06	2.1E+04	1.9E-05	2.4E-07	1.9E-05	5.2E-11
METHYLENE CHLORIDE	1.5E+02	8.3E+05	1.5E+02	0.0E+00	3.6E-06	3.6E-06	0.0E+00
1,4-OXATHIANE	1.3E+04	0.0E+00	1.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	6.3E+01	0.0E+00	6.3E+01	0.0E+00	0.0E+00	0.0E+00	3.6E-14
1,1,2,2-TETRACHLOROETHANE	5.9E+00	8.8E+04	5.9E+00	5.1E+00*	3.4E-04	5.1E+00*	0.0E+00
TETRACHLOROETHYLENE	2.4E+01	3.5E+05	2.4E+01	1.7E+00*	1.2E-04	1.7E+00*	2.9E-08
THIODIGLYCOL	1.7E+04	0.0E+00	1.7E+04	3.4E-02	0.0E+00	3.4E-02	0.0E+00
TOLUENE	1.3E+05	1.0E+06	1.3E+05	1.6E-02	1.4E-05a	1.6E-02	0.0E+00
1,1,1-TRICHLOROETHANE	3.8E+04	1.0E+08	3.8E+04	1.1E-05	5.9E-09	1.1E-05	1.1E-10
TRICHLOROETHYLENE	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-07
VAPONA	4.0E+00	0.0E+00	4.0E+00	0.0E+00	0.0E+00	0.0E+00	5.1E-11
M-XYLENE	8.3E+05	4.2E+07	8.2E+05	6.0E-06	1.2E-07	6.1E-06	1.0E-10
O,P-XYLENE	8.3E+05	4.3E+07	8.2E+05	1.2E-05	2.4E-07	1.2E-05	1.0E-09
ARSENIC	2.0E+00	0.0E+00	2.0E+00	2.4E+01*	0.0E+00	2.4E+01*	0.0E+00
COPPER	3.6E+04	0.0E+00	3.6E+04	6.4E-02	0.0E+00	6.4E-02	0.0E+00
MERCURY	2.9E+02	0.0E+00	2.9E+02	1.2E-03	0.0E+00	1.2E-03	0.0E+00
ZINC	2.0E+05	0.0E+00	2.0E+05	1.6E-03	0.0E+00	1.6E-03	0.0E+00

TABLE 4-4
RME EXPOSURE EVALUATIONS FOR CASUAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	7.0E-02	1.0E+06	7.0E-02	5.7E+04*	7.6E-03a	5.7E+04*	0.0E+00
ATRAZINE	2.1E+03	0.0E+00	2.1E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-14
BENZENE	4.0E+01	6.6E+04	4.0E+01	7.5E-02	4.6E-05	7.5E-02	9.4E-07
BENZOTHAZOLE	2.0E+03	0.0E+00	2.0E+03	0.0E+00	0.0E+00	0.0E+00	5.7E-09
BICYCLOHEPTADIENE	1.6E+04	1.8E+07	1.6E+04	1.9E-03	1.6E-06	1.9E-03	6.2E-09
CHLORDANE	9.1E-01	0.0E+00	9.1E-01	0.0E+00	0.0E+00	0.0E+00	1.2E-07
CHLOROACETIC ACID	8.4E+02	0.0E+00	8.4E+02	9.4E+00*	0.0E+00	9.4E+00*	0.0E+00
CHLOROBENZENE	8.4E+03	7.2E+06	8.4E+03	6.0E-04	6.9E-07	6.0E-04	2.7E-09
CHLOROFORM	1.9E+02	7.7E+04	1.9E+02	3.7E-01	9.1E-04	3.7E-01	7.1E-08
CHLOROPHENYLMETHYL SULFIDE	8.3E+03	1.0E+06	8.3E+03	8.4E-02	2.5E-05a	8.4E-02	0.0E+00
CHLOROPHENYLMETHYL SULFONE	8.3E+03	1.0E+06	8.3E+03	3.6E-02	1.3E-05a	3.6E-02	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	8.3E+03	1.5E+07	8.3E+03	8.4E-03	4.7E-06	8.4E-03	1.6E-10
PPDE	3.4E+00	0.0E+00	3.4E+00	0.0E+00	0.0E+00	0.0E+00	5.7E-09
PPDT	3.4E+00	0.0E+00	3.4E+00	0.0E+00	0.0E+00	0.0E+00	4.1E-08
DIBROMOCHLOROPROPANE	8.4E-01	8.1E+02	8.4E-01	2.4E+01*	2.5E-02	2.4E+01*	2.5E-08
1,2-DICHLOROETHANE	1.3E+01	4.8E+04	1.3E+01	7.7E-02	2.1E-05	7.7E-02	2.6E-06
DICYCLOPENTADIENE	1.1E+04	1.6E+04	6.4E+03	3.7E-01	2.5E-01	6.2E-01	0.0E+00
DIELDRIN	7.3E-02	1.0E+06	7.3E-02	2.7E+04*	9.3E-03a	2.7E+04*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	3.4E+04	4.6E+07	3.4E+04	8.9E-05	6.5E-08	8.9E-05	4.4E-09
DIMETHYLDISULFIDE	3.4E+03	1.2E+07	3.4E+03	2.1E-02	6.0E-06	2.1E-02	2.0E-09
DIMETHYLMETHYL PHOSPHONATE	7.6E+03	0.0E+00	7.6E+03	9.3E-03	0.0E+00	9.3E-03	0.0E+00
DITHIANE	4.2E+03	0.0E+00	4.2E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.3E+02	1.0E+06	1.3E+02	7.1E+00*	4.6E-06a	7.1E+00*	0.0E+00
ETHYLBENZENE	4.2E+04	1.4E+08	4.2E+04	1.9E-04	5.6E-08	1.9E-04	1.8E-10
HEXACHLOROCYCLOPENTADIENE	2.6E+03	0.0E+00	2.6E+03	0.0E+00	0.0E+00	0.0E+00	1.0E-06
ISODRIN	2.9E+01	1.0E+06	2.9E+01	1.0E+02*	7.3E-05a	1.0E+02*	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	1.3E+05	0.0E+00	1.3E+05	3.6E-02	0.0E+00	3.6E-02	0.0E+00
MALATHION	8.4E+03	0.0E+00	8.4E+03	0.0E+00	0.0E+00	0.0E+00	1.7E-14
METHYLISOBUTYL KETONE	2.1E+04	4.1E+06	2.1E+04	1.9E-05	2.4E-07	1.9E-05	5.2E-11
METHYLENE CHLORIDE	1.5E+02	8.3E+05	1.5E+02	0.0E+00	3.6E-06	3.6E-06	0.0E+00
1,4-OXATHIANE	1.3E+04	0.0E+00	1.3E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	6.3E+01	0.0E+00	6.3E+01	0.0E+00	0.0E+00	0.0E+00	3.6E-14
1,1,2,2-TETRACHL	5.9E+00	8.8E+04	5.9E+00	5.1E+00*	3.4E-04	5.1E+00*	0.0E+00
TETRACHLOROETHYLENE	2.4E+01	3.5E+05	2.4E+01	1.7E+00*	1.2E-04	1.7E+00*	2.9E-08
THIODIGLYCOL	1.7E+04	0.0E+00	1.7E+04	3.4E-02	0.0E+00	3.4E-02	0.0E+00
TOLUENE	1.3E+05	1.0E+06	1.3E+05	1.6E-02	1.4E-05a	1.6E-02	0.0E+00
1,1,1-TRICHLOROETHANE	3.8E+04	1.0E+08	3.8E+04	1.1E-05	5.9E-09	1.1E-05	1.1E-10
TRICHLOROETHYLENE	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	2.4E-07
VAPONA	4.0E+00	0.0E+00	4.0E+00	0.0E+00	0.0E+00	0.0E+00	5.1E-11
M-XYLENE	8.3E+05	4.2E+07	8.2E+05	6.0E-06	1.2E-07	6.1E-06	1.0E-10
O,P-XYLENE	8.3E+05	4.3E+07	8.2E+05	1.2E-05	2.4E-07	1.2E-05	1.0E-09
ARSENIC	2.0E+00	0.0E+00	2.0E+00	2.4E+01*	0.0E+00	2.4E+01*	0.0E+00
COPPER	3.6E+04	0.0E+00	3.6E+04	6.4E-02	0.0E+00	6.4E-02	0.0E+00
MERCURY	2.9E+02	0.0E+00	2.9E+02	1.2E-03	0.0E+00	1.2E-03	0.0E+00
ZINC	2.0E+05	0.0E+00	2.0E+05	1.6E-03	0.0E+00	1.6E-03	0.0E+00

TABLE 4-5
RME EXPOSURE EVALUATIONS FOR RECREATIONAL VISITORS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI OPN
ALDRIN	3.0E-02	1.0E+06	3.0E-02	1.3E+05*	1.8E-02a	1.3E+05*	0.0E+00
ATRAZINE	2.5E+03	0.0E+00	2.5E+03	0.0E+00	0.0E+00	0.0E+00	2.2E-14
BENZENE	1.7E+01	6.6E+04	1.7E+01	1.7E-01	4.6E-05	1.7E-01	2.2E-06
BENZOTHIADIAZOLE	2.4E+03	0.0E+00	2.4E+03	0.0E+00	0.0E+00	0.0E+00	5.7E-09
BICYCLOHEPTADIENE	2.0E+04	4.3E+07	1.9E+04	1.5E-03	7.0E-07	1.5E-03	6.2E-09
CHLORDANE	3.9E-01	0.0E+00	3.9E-01	0.0E+00	0.0E+00	0.0E+00	2.7E-07
CHLOROACETIC ACID	1.0E+03	0.0E+00	1.0E+03	7.8E+00*	0.0E+00	7.8E+00*	0.0E+00
CHLOROBENZENE	1.0E+04	1.7E+07	1.0E+04	4.9E-04	3.0E-07	4.9E-04	2.7E-09
CHLOROFORM	8.1E+01	7.7E+04	8.1E+01	8.6E-01	9.1E-04	8.6E-01	1.7E-07
CHLOROPHENYLMETHYL SULFIDE	1.0E+04	1.0E+06	1.0E+04	7.0E-02	1.1E-05a	7.0E-02	0.0E+00
CHLOROPHENYLMETHYL SULFONE	1.0E+04	1.0E+06	1.0E+04	3.0E-02	1.3E-05a	3.0E-02	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	1.0E+04	1.5E+07	1.0E+04	7.0E-03	4.7E-06	7.0E-03	1.6E-10
PPDE	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	1.3E-08
PPDT	1.5E+00	0.0E+00	1.5E+00	0.0E+00	0.0E+00	0.0E+00	9.6E-08
DIBROMOCHLOROPROPANE	3.6E-01	6.6E+02	3.6E-01	5.6E+01*	3.0E-02	5.6E+01*	5.8E-08
1,2-DICHLOROETHANE	5.6E+00	4.8E+04	5.6E+00	1.8E-01	2.1E-05	1.8E-01	6.1E-06
DICYCLOPENTADIENE	1.1E+04	3.7E+04	8.4E+03	3.7E-01	1.1E-01	4.8E-01	0.0E+00
DIELDRIN	3.1E-02	1.0E+06	3.1E-02	6.4E+04*	2.2E-02a	6.4E+04*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	4.1E+04	1.1E+08	4.1E+04	7.4E-05	2.8E-08	7.4E-05	4.4E-09
DIMETHYLDISULFIDE	4.1E+03	2.7E+07	4.1E+03	1.7E-02	2.6E-06	1.7E-02	2.0E-09
DIMETHYLMETHYL PHOSPHONATE	9.1E+03	0.0E+00	9.1E+03	7.7E-03	0.0E+00	7.7E-03	0.0E+00
DITHIANE	5.1E+03	0.0E+00	5.1E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	1.5E+02	1.0E+06	1.5E+02	5.9E+00*	4.6E-06a	5.9E+00*	0.0E+00
ETHYLBENZENE	5.1E+04	3.4E+08	5.1E+04	1.6E-04	2.4E-08	1.6E-04	1.8E-10
HEXACHLOROCYCLOPENTADIENE	2.8E+03	0.0E+00	2.8E+03	0.0E+00	0.0E+00	0.0E+00	1.0E-06
ISODRIN	3.5E+01	1.0E+06	3.5E+01	8.5E+01*	7.3E-05a	8.5E+01*	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	1.5E+05	0.0E+00	1.5E+05	3.0E-02	0.0E+00	3.0E-02	0.0E+00
MALATHION	1.0E+04	0.0E+00	1.0E+04	0.0E+00	0.0E+00	0.0E+00	1.7E-14
METHYLISOBUTYL KETONE	2.5E+04	4.1E+06	2.5E+04	1.6E-05	2.4E-07	1.6E-05	5.2E-11
METHYLENE CHLORIDE	6.6E+01	8.3E+05	6.6E+01	0.0E+00	3.6E-06	3.6E-06	0.0E+00
1,4-OXATHIANE	1.5E+04	0.0E+00	1.5E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	7.6E+01	0.0E+00	7.6E+01	0.0E+00	0.0E+00	0.0E+00	3.6E-14
1,1,2,2-TETRACHLOROETHANE	2.5E+00	8.8E+04	2.5E+00	1.2E+01*	3.4E-04	1.2E+01*	0.0E+00
TETRACHLOROETHYLENE	1.0E+01	3.5E+05	1.0E+01	3.9E+00*	1.2E-04	3.9E+00*	6.9E-08
THIODIGLYCOL	2.0E+04	0.0E+00	2.0E+04	2.8E-02	0.0E+00	2.8E-02	0.0E+00
TOLUENE	1.5E+05	1.0E+06	1.5E+05	1.3E-02	6.0E-06a	1.3E-02	0.0E+00
1,1,1-TRICHLOROETHANE	4.6E+04	2.4E+08	4.6E+04	8.8E-06	2.5E-09	8.8E-06	1.1E-10
TRICHLOROETHYLENE	4.6E+01	0.0E+00	4.6E+01	0.0E+00	0.0E+00	0.0E+00	5.5E-07
VAPONA	1.7E+00	0.0E+00	1.7E+00	0.0E+00	0.0E+00	0.0E+00	1.2E-10
M-XYLENE	1.0E+06	9.9E+07	9.9E+05	5.0E-06	5.1E-08	5.1E-06	1.0E-10
O,P-XYLENE	1.0E+06	9.9E+07	9.9E+05	1.0E-05	1.0E-07	1.0E-05	1.0E-09
ARSENIC	8.4E-01	0.0E+00	8.4E-01	5.7E+01*	0.0E+00	5.7E+01*	0.0E+00
COPPER	4.8E+04	0.0E+00	4.8E+04	4.8E-02	0.0E+00	4.8E-02	0.0E+00
MERCURY	3.8E+02	0.0E+00	3.8E+02	8.9E-04	0.0E+00	8.9E-04	0.0E+00
ZINC	2.6E+05	0.0E+00	2.6E+05	1.2E-03	0.0E+00	1.2E-03	0.0E+00

REA3/RPT0030.REA VII 9/18/90 3:48 pm sma

TABLE 4-6
RME EXPOSURE EVALUATIONS FOR COMMERCIAL WORKERS

CONTAMINANT	DIRECT PPLV (mg/kg)	INDIRECT PPLV (mg/kg)	CUMULATIVE PPLV (mg/kg)	DIRECT EI	INDIRECT EI	CUMULATIVE EI	VEI ENC
ALDRIN	9.8E-02	3.5E+00	9.5E-02	4.1E+04*	1.1E+03*	4.2E+04*	0.0E+00
ATRAZINE	3.5E+03	0.0E+00	3.5E+03	0.0E+00	0.0E+00	0.0E+00	4.1E-09
BENZENE	5.6E+01	9.4E-01	9.3E-01	5.3E-02	3.2E+00*	3.2E+00*	1.8E-01
BENZOTHAZOLE	3.3E+03	0.0E+00	3.3E+03	0.0E+00	0.0E+00	0.0E+00	1.1E-03
BICYCLOHEPTADIENE	2.7E+04	1.0E+02	1.8E+02	1.1E-03	1.7E-01	1.7E-01	1.2E-03
CHLORDANE	1.3E+00	0.0E+00	1.3E+00	0.0E+00	0.0E+00	0.0E+00	2.2E-02
CHLOROACETIC ACID	1.4E+03	0.0E+00	1.4E+03	5.6E+00*	0.0E+00	5.6E+00*	0.0E+00
CHLOROBENZENE	1.4E+04	1.1E+03	1.0E+03	3.5E-04	4.5E-03	4.8E-03	5.1E-04
CHLOROFORM	2.6E+02	6.2E-01	6.2E-01	2.6E-01	1.1E+02*	1.1E+02*	1.3E-02
CHLOROPHENYLMETHYL SULFIDE	1.4E+04	4.4E+03	3.4E+03	5.0E-02	1.6E-01	2.1E-01	0.0E+00
CHLOROPHENYLMETHYL SULFONE	1.4E+04	1.5E+02	1.5E+02	2.1E-02	2.0E+00*	2.0E+00*	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	1.4E+04	2.3E+02	2.3E+02	5.0E-03	3.0E-01	3.0E-01	3.0E-05
PPDE	4.8E+00	0.0E+00	4.8E+00	0.0E+00	0.0E+00	0.0E+00	1.1E-03
PPDT	4.8E+00	0.0E+00	4.8E+00	0.0E+00	0.0E+00	0.0E+00	7.7E-03
DIBROMOCHLOROPROPANE	1.2E+00	6.0E-03	6.0E-03	1.7E+01*	3.3E+03*	3.3E+03*	4.6E-03
1,2-DICHLOROETHANE	1.8E+01	3.2E-01	3.2E-01	5.5E-02	3.1E+00*	3.2E+00*	4.9E-01
DICYCLOPENTADIENE	1.6E+04	1.3E-01	1.3E-01	2.5E-01	3.1E+04*	3.1E+04*	0.0E+00
DIELDRIN	1.0E-01	1.4E+00	9.6E-02	1.9E+04*	1.4E+03*	2.1E+04*	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	5.7E+04	5.0E+02	5.0E+02	5.3E-05	6.0E-03	6.0E-03	8.3E-04
DIMETHYLDISULFIDE	5.7E+03	1.8E+03	1.4E+03	1.2E-02	3.9E-02	5.1E-02	3.7E-04
DIMETHYLMETHYL PHOSPHONATE	1.3E+04	0.0E+00	1.3E+04	5.5E-03	0.0E+00	5.5E-03	0.0E+00
DITHIANE	7.1E+03	0.0E+00	7.1E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	2.1E+02	1.3E+03	1.8E+02	4.2E+00*	6.9E-01	4.9E+00*	0.0E+00
ETHYLBENZENE	7.1E+04	2.2E+04	1.7E+04	1.1E-04	3.6E-04	4.7E-04	3.3E-05
HEXACHLOROCYCLOPENTADIENE	4.0E+03	0.0E+00	4.0E+03	0.0E+00	0.0E+00	0.0E+00	1.9E-01
ISODRIN	5.0E+01	2.8E+02	4.2E+01	6.0E+01*	1.1E+01*	7.1E+01*	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	2.1E+05	0.0E+00	2.1E+05	2.2E-02	0.0E+00	2.2E-02	0.0E+00
MALATHION	1.4E+04	0.0E+00	1.4E+04	0.0E+00	0.0E+00	0.0E+00	3.1E-09
METHYLISOBUTYL KETONE	3.5E+04	2.2E+01	2.2E+01	1.1E-05	4.5E-02	4.5E-02	9.8E-06
METHYLENE CHLORIDE	2.2E+02	5.5E+00	5.4E+00	0.0E+00	5.4E-01	5.4E-01	0.0E+00
1,4-OXATHIANE	2.1E+04	0.0E+00	2.1E+04	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	1.1E+02	0.0E+00	1.1E+02	0.0E+00	0.0E+00	0.0E+00	6.7E-09
1,1,2,2-TETRACHLOROETHANE	8.3E+00	2.3E+01	6.1E+00	3.6E+00*	1.3E+00*	4.9E+00*	0.0E+00
TETRACHLOROETHYLENE	3.3E+01	3.4E+00	3.1E+00	1.2E+00*	1.2E+01*	1.3E+01*	5.5E-03
THIODIGLYCOL	2.8E+04	0.0E+00	2.8E+04	2.0E-02	0.0E+00	2.0E-02	0.0E+00
TOLUENE	2.1E+05	1.1E+03	1.1E+03	9.4E-03	1.7E+00*	1.8E+00*	0.0E+00
1,1,1-TRICHLOROETHANE	6.4E+04	6.8E+02	6.7E+02	6.3E-06	8.9E-04	8.9E-04	2.1E-05
TRICHLOROETHYLENE	1.5E+02	0.0E+00	1.5E+02	0.0E+00	0.0E+00	0.0E+00	4.4E-02
VAPONA	5.6E+00	0.0E+00	5.6E+00	0.0E+00	0.0E+00	0.0E+00	9.5E-06
M-XYLENE	1.4E+06	4.2E+02	4.2E+02	3.6E-06	1.2E-02	1.2E-02	2.0E-05
O,P-XYLENE	1.4E+06	4.2E+02	4.2E+02	7.1E-06	2.4E-02	2.4E-02	1.9E-04
ARSENIC	1.2E+00	0.0E+00	1.2E+00	3.9E+01*	0.0E+00	3.9E+01*	0.0E+00
COPPER	3.0E+04	0.0E+00	3.0E+04	7.7E-02	0.0E+00	7.7E-02	0.0E+00
MERCURY	2.4E+02	0.0E+00	2.4E+02	1.4E-03	0.0E+00	1.4E-03	0.0E+00
ZINC	1.6E+05	0.0E+00	1.6E+05	2.0E-03	0.0E+00	2.0E-03	0.0E+00

TABLE 4-7
RME EXPOSURE EVALUATIONS FOR INDUSTRIAL WORKERS

CONTAMINANT	DIRECT	INDIRECT		CUMULATIVE	DIRECT	INDIRECT	CUMULATIVE	VEI	
	PPLV (mg/kg)	OSVI (mg/kg)	ESVI (mg/kg)	PPLV (mg/kg)	EI	EI	EI	OPN	ENC
ALDRIN	1.9E-02	1.3E+05	3.5E+00	1.9E-02	2.1E+05*	1.1E+03*	2.1E+05*	0.0E+00	0.0E+00
ATRAZINE	6.9E+02	0.0E+00	0.0E+00	6.9E+02	0.0E+00	0.0E+00	0.0E+00	8.6E-14	4.1E-09
BENZENE	1.1E+01	1.7E+04	9.4E-01	8.7E-01	2.8E-01	3.2E+00*	3.5E+00*	3.7E-06	1.8E-01
BENZOTHAZOLE	6.5E+02	0.0E+00	0.0E+00	6.5E+02	0.0E+00	0.0E+00	0.0E+00	2.2E-08	1.1E-03
BICYCLOHEPTADIENE	5.3E+03	4.7E+06	1.8E+02	1.7E+02	5.7E-03	1.7E-01	1.7E-01	2.5E-08	1.2E-03
CHLORDANE	2.5E-01	0.0E+00	0.0E+00	2.5E-01	0.0E+00	0.0E+00	0.0E+00	4.6E-07	2.2E-02
CHLOROACETIC ACID	2.7E+02	0.0E+00	0.0E+00	2.7E+02	2.9E+01*	0.0E+00	2.9E+01*	0.0E+00	0.0E+00
CHLOROBENZENE	2.7E+03	1.8E+06	1.1E+03	7.9E+02	1.8E-03	4.5E-03	6.3E-03	1.1E-08	5.1E-04
CHLOROFORM	5.1E+01	1.9E+04	6.2E-01	6.2E-01	1.4E+00*	1.1E+02*	1.1E+02*	2.8E-07	1.3E-02
CHLOROPHENYLMETHYL SULFIDE	2.7E+03	7.2E+06	4.4E+03	1.7E+03	2.6E-01	1.6E-01	4.2E-01	0.0E+00	0.0E+00
CHLOROPHENYLMETHYL SULFONE	2.7E+03	5.7E+06	1.5E+02	1.4E+02	1.1E-01	2.0E+00*	2.1E+00*	0.0E+00	0.0E+00
CHLOROPHENYLMETHYL SULFOXIDE	2.7E+03	3.8E+06	2.3E+02	2.2E+02	2.6E-02	3.0E-01	3.2E-01	6.2E-10	3.0E-05
PPDE	9.3E-01	0.0E+00	0.0E+00	9.3E-01	0.0E+00	0.0E+00	0.0E+00	2.3E-08	1.1E-03
PPDT	9.3E-01	0.0E+00	0.0E+00	9.3E-01	0.0E+00	0.0E+00	0.0E+00	1.6E-07	7.7E-03
DIBROMOCHLOROPROPANE	2.3E-01	2.1E+02	6.0E-03	5.9E-03	8.8E+01*	3.3E+03*	3.4E+03*	9.8E-08	4.6E-03
1,2-DICHLOROETHANE	3.5E+00	1.2E+04	3.2E-01	2.9E-01	2.8E-01	3.1E+00*	3.4E+00*	1.0E-05	4.9E-01
DICYCLOPENTADIENE	2.7E+03	4.0E+03	1.3E-01	1.3E-01	1.5E+00*	3.1E+04*	3.1E+04*	0.0E+00	0.0E+00
DIELDRIN	2.0E-02	5.5E+04	1.4E+00	2.0E-02	1.0E+05*	1.4E+03*	1.0E+05*	0.0E+00	0.0E+00
DIISOPROPYLMETHYL PHOSPHONATE	1.1E+04	1.2E+07	5.0E+02	4.8E+02	2.7E-04	6.0E-03	6.2E-03	1.8E-08	8.3E-04
DIMETHYLDISULFIDE	1.1E+03	3.0E+06	1.8E+03	6.9E+02	6.3E-02	3.9E-02	1.0E-01	7.9E-09	3.7E-04
DIMETHYLMETHYL PHOSPHONATE	2.5E+03	0.0E+00	0.0E+00	2.5E+03	2.8E-02	0.0E+00	2.8E-02	0.0E+00	0.0E+00
DITHIANE	1.4E+03	0.0E+00	0.0E+00	1.4E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
ENDRIN	4.1E+01	5.0E+07	1.3E+03	4.0E+01	2.2E+01*	6.9E-01	2.3E+01*	0.0E+00	0.0E+00
ETHYLBENZENE	1.4E+04	3.6E+07	2.2E+04	8.5E+03	5.8E-04	3.6E-04	9.4E-04	6.9E-10	3.3E-05
HEXACHLOROCYCLOPENTADIENE	7.0E+02	0.0E+00	0.0E+00	7.0E+02	0.0E+00	0.0E+00	0.0E+00	4.0E-06	1.9E-01
ISODRIN	9.6E+00	1.0E+07	2.8E+02	9.3E+00	3.1E+02*	1.1E+01*	3.2E+02*	0.0E+00	0.0E+00
ISOPROPYL METHYL PHOSPHONIC ACID	4.1E+04	0.0E+00	0.0E+00	4.1E+04	1.1E-01	0.0E+00	1.1E-01	0.0E+00	0.0E+00
MALATHION	2.7E+03	0.0E+00	0.0E+00	2.7E+03	0.0E+00	0.0E+00	0.0E+00	6.6E-14	3.1E-09
METHYL ISOBUTYL KETONE	6.9E+03	1.0E+06	2.2E+01	2.2E+01	5.8E-05	4.5E-02	4.5E-02	2.1E-10	9.8E-06
METHYLENE CHLORIDE	4.2E+01	2.1E+05	5.5E+00	4.9E+00	0.0E+00	5.4E-01	5.4E-01	0.0E+00	0.0E+00
1,4-OXATHIANE	4.1E+03	0.0E+00	0.0E+00	4.1E+03	0.0E+00	0.0E+00	0.0E+00	0.0E+00	0.0E+00
SUPONA	2.1E+01	0.0E+00	0.0E+00	2.1E+01	0.0E+00	0.0E+00	0.0E+00	1.4E-13	6.7E-09
1,1,2,2-TETRACHLOROETHANE	1.6E+00	2.2E+04	2.3E+01	1.5E+00	1.9E+01*	1.3E+00*	2.0E+01*	0.0E+00	0.0E+00
TETRACHLOROETHYLENE	6.4E+00	8.8E+04	3.4E+00	2.2E+00	6.2E+00*	1.2E+01*	1.8E+01*	1.2E-07	5.5E-03
THIODIGLYCOL	5.5E+03	0.0E+00	0.0E+00	5.5E+03	1.0E-01	0.0E+00	1.0E-01	0.0E+00	0.0E+00
TOLUENE	4.1E+04	3.6E+07	1.1E+03	1.1E+03	4.8E-02	1.7E+00*	1.8E+00*	0.0E+00	0.0E+00
1,1,1-TRICHLOROETHANE	1.2E+04	2.6E+07	6.8E+02	6.4E+02	3.2E-05	8.9E-04	9.2E-04	4.4E-10	2.1E-05
TRICHLOROETHYLENE	2.9E+01	0.0E+00	0.0E+00	2.9E+01	0.0E+00	0.0E+00	0.0E+00	9.3E-07	4.4E-02
VAPONA	1.1E+00	0.0E+00	0.0E+00	1.1E+00	0.0E+00	0.0E+00	0.0E+00	2.0E-10	9.5E-06
M-XYLENE	2.7E+05	1.1E+07	4.2E+02	4.2E+02	1.9E-05	1.2E-02	1.2E-02	4.2E-10	2.0E-05
O,P-XYLENE	2.7E+05	1.1E+07	4.2E+02	4.2E+02	3.7E-05	2.4E-02	2.4E-02	4.1E-09	1.9E-04
ARSENIC	8.1E-01	0.0E+00	0.0E+00	8.1E-01	5.9E+01*	0.0E+00	5.9E+01*	0.0E+00	0.0E+00
COPPER	2.0E+04	0.0E+00	0.0E+00	2.0E+04	1.1E-01	0.0E+00	1.1E-01	0.0E+00	0.0E+00
MERCURY	1.6E+02	0.0E+00	0.0E+00	1.6E+02	2.1E-03	0.0E+00	2.1E-03	0.0E+00	0.0E+00
ZINC	1.0E+05	0.0E+00	0.0E+00	1.0E+05	3.1E-03	0.0E+00	3.1E-03	0.0E+00	0.0E+00

TABLE 4-8
SUMMARY OF CONTAMINANTS OF CONCERN, CRITICAL PATHWAY,
AND AFFECTED POPULATION

Contaminant of Concern	Critical Pathway	Affected Population
1,1-Dichloroethylene	Indirect	COMW, INDW
1,1,2,2-Tetrachloroethane	Direct, Indirect, Cumulative	ALL
1,2-Dichloroethane	Direct, Indirect	ALL
Aldrin	Direct, Indirect	ALL
Benzene	Direct, Indirect	ALL
Benzothiazole	Direct	COMW, INDW
Bicycloheptadiene	Direct, Indirect	COMW, INDW
Carbon tetrachloride	Direct, Indirect	ALL
Chlordane	Direct, Indirect, Cumulative	ALL
Chloroacetic acid	Direct	ALL
Chlorobenzene	Indirect	INDW
Chloroform	Direct, Indirect, Cumulative	ALL
Chlorophenylmethyl sulfide	Direct, Indirect	INDW, COMW
Chlorophenylmethyl sulfone	Indirect	INDW, COMW
Chlorophenylmethyl sulfoxide	Indirect	INDW, COMW
Dibromochloropropane	Direct, Indirect, Cumulative	ALL
Dicyclopentadiene	Direct, Indirect, Cumulative	ALL
Dieldrin	Direct, Indirect	ALL
Dimethyldisulfide	Indirect	COMW, INDW
Endrin	Direct	ALL
Fluoroacetic acid	Direct	ALL
Hexachlorocyclopentadiene	Direct, Indirect	ALL
Isodrin	Direct, Indirect, Cumulative	ALL
Methylene chloride	Direct, Indirect	ALL
Methylisobutyl ketone	Indirect	COMW
PPDDE	Direct, Indirect, Cumulative	ALL
PPDDT	Direct, Indirect, Cumulative	ALL
Supona	Direct	INDW
Tetrachloroethylene	Direct, Indirect	ALL
Toluene	Indirect	INDW, COMW
Trichloroethylene	Direct, Indirect	RECV, COMW, INDW
Arsenic	Direct	ALL
Cadmium	Direct	ALL
Chromium	Direct	ALL
Copper	Direct	INDW
Lead	Direct	ALL
Mercury	Direct	ALL
Zinc	Direct	INDW

4.2 CONTAMINANTS OF CONCERN

Of the 60 target RMA contaminants for which PPLVs were computed (see Volume V), only 8 were not detected in the RI Phase I and II sampling program. Of the 52 remaining contaminants, 38 were identified as contaminants of concern. Thirty-seven of the 38 chemicals were identified as COCs from the site-by-site exposure assessments for the industrial worker and one chemical, methylisobutyl ketone (MIBK) was identified as a COC for the commercial worker only. MIBK is a COC for the commercial worker, but not the industrial worker only for Sites CSA-1a and SPSA-1g. At these sites, MIBK has a dryout time that is shorter than the exposure period for a commercial worker (10 years). The average vapor flux (FAVN) and subsequent single pathway PPLV (SPPPLV) were, therefore, calculated using the $FAVN_{Mass\ Balance}$ equation. This process indicates a lower SPPPLV for a commercial worker than for an industrial worker and results in an indirect EI exceedance at Sites CSA-1a and SPSA-1g.

These chemicals are summarized in Table 4-9 together with the study areas on which they exceeded and the total number of exceedances. No additional COCs were identified in the additivity or RME screen.

The COCs were assigned a category as follows:

- Category A consists of 20 contaminants of concern which exceed their respective PPLVs by a significant margin (i.e., $EI > 10$).
- Category B contains the nine contaminants with $10 > EI > 1.0$.
- Category C consists of nine contaminants with $1.0 > EI > 0.1$.

The COCs are summarized by priority ranking in Table 4-10.

4.3 FIRST SCREEN REMEDIAL BOUNDARY DETERMINATION FOR RMA STUDY AREAS

Of the 178 sites evaluated in the Study Area Exposure Assessments, 121 are designated as Priority 1 sites, based on the most sensitive exposed population PPLV (i.e., the industrial worker). The remaining 57 sites are designated as Priority 2 sites. Table 4-11 summarizes the Priority 1/Priority 2 site designations for each study area.

TABLE 4-9
STUDY AREA CONTAMINANTS OF CONCERN
EXPOSED POPULATION: INDUSTRIAL WORKER

Contaminant of Concern	Study Area	Total Number of Exceedances	Number of Exceedances Based on Vapor Inhalation
Aldrin	NPSA, CSA, SSA, SPSA, WSA, NCSA	64	2
Benzene	NPSA, CSA, ESA, SPSA, WSA, NCSA	19	24
Benzothiazole	CSA	1	0
Bicycloheptadiene	SPSA, NCSA	2	2
Carbon tetrachloride	CSA, SSA, SPSA, WSA	5	25
Chloroacetic acid	NPSA, NCSA, CSA SPSA	5	0
Chlordane	CSA, SSA, SPSA, NCSA	29	3
Chlorobenzene	NCSA	1	7
Chloroform	NPSA, SPSA, CSA NCSA	10	24
Chlorophenylmethyl sulfide	SPSA, NCSA	2	0
Chlorophenylmethyl sulfone	NCSA	1	0
Chlorophenylmethyl sulfoxide	NCSA	1	0
Dibromochloropropane	CSA, SSA, SPSA, WSA, NCSA	13	11

TABLE 4-9 (Continued)
STUDY AREA CONTAMINANTS OF CONCERN
EXPOSED POPULATION: INDUSTRIAL WORKER

Contaminant of Concern	Study Area	Total Number of Exceedances	Number of Exceedances Based on Vapor Inhalation
PPDDE	CSA, SSA, SPSA, NCSA	17	3
PPDDT	CSA, SSA, SPSA, NCSA	19	6
1,1-Dichloroethylene	CSA	1	20
1,2-Dichloroethane	SPSA, NCSA, CSA	4	5
Dicyclopentadiene	SPSA, WSA, NCSA CSA	12	14
Dieldrin	NPSA, CSA, SSA, ESA, WSA, NCSA, SPSA	77	0
Dimethyldisulfide	NCSA, CSA	2	1
Endrin	CSA, SPSA, NCSA	6	0
Fluoroacetic acid	CSA, ESA, NCSA	17	0
Hexachlorocyclo- pentadiene	CSA, SPSA, SSA NCSA, WSA	11	2
Isodrin	CSA, SSA, SPSA, NCSA, WSA	16	10
Methylene chloride	CSA, SSA, ESA, SPSA, WSA, NCSA	28	9

TABLE 4-9 (Continued)
STUDY AREA CONTAMINANTS OF CONCERN
EXPOSED POPULATION: INDUSTRIAL WORKER

Contaminant of Concern	Study Area	Total Number of Exceedances	Number of Exceedances Based on Vapor Inhalation
Methylisobutyl ketone ¹¹	SPSA, CSA	2	1
1,1,2,2-Tetrachloro- ethane	CSA, SSA, SPSA, WSA, NCSA	14	2
Tetrachloroethylene	NPSA, CSA, NCSA, SPSA, WSA	14	8
1,1,2-Tetrachloro- ethylene	SPSA	0	2
Toluene	NCSA	1	1
Trichloroethylene	ESA, WSA, NCSA, SPSA	8	17
Supona	SPSA	1	0
Arsenic	NPSA, SSA, CSA, ESA, SPSA, WSA, NCSA	46	-
Chromium	CSA, SPSA, WSA, SSA, NCSA, NPSA, ESA	26	-
Copper	CSA, WSA	2	-
Cadmium	SPSA, WSA, NCSA, CSA, ESA, NPSA	43	-
Lead	CSA, SSA, ESA, SPSA, WSA, NCSA	16	-

TABLE 4-9 (Continued)
STUDY AREA CONTAMINANTS OF CONCERN
EXPOSED POPULATION: INDUSTRIAL WORKER

Contaminant of Concern	Study Area	Total Number of Exceedances	Number of Exceedances Based on Vapor Inhalation
Mercury	SPSA, NCSA	5	-
Zinc	ESA	1	-

38 COCs

1/ Identified as a COC for the commercial worker only.

TABLE 4-10
CATEGORY RANKING OF ARSENAL-WIDE CONTAMINANTS OF CONCERN

Category	Weight of Evidence Classification ^{1/}
<u>Category A (EI > 10)</u>	
Aldrin	B2
Benzene	A
Carbon tetrachloride	B2
Chlordane	B2
Chloroform	B2
Dibromochloropropane	B2
Dieldrin	B2
PPDDT	B2
Dicyclopentadiene	NC
Endrin	D
Fluoroacetic acid ^{2/3/}	NC
Hexachlorocyclopentadiene	D
Isodrin	NC
Methylene chloride	B2
1,1,2,2-Tetrachloroethane	C
Tetrachloroethylene	NC
Arsenic	A
Cadmium	B1
Chromium	A
Mercury	D
<u>Category B (10 > EI > 1)</u>	
Benzothiazole	NC
Bicycloheptadiene	NC
Chloroacetic acid ^{3/4/}	NC
1,2-Dichloroethane	B2
1,1-Dichloroethylene	C
PPDDE	B2
Toluene	D
Trichloroethylene	B2
Lead	B2
<u>Category C (1 > EI > 0.1)</u>	
Chlorobenzene	C
Chlorophenylmethyl sulfide	NC
Chlorophenylmethyl sulfone	NC
Chlorophenylmethyl sulfoxide	NC
Copper	D
Dimethyldisulfide	NC
Supona	NC
Zinc	D
Methylisobutyl ketone ^{5/}	NC

1/ Weight of evidence classifications are defined in Table 3-1, Section 3.2.1, Volume II Toxicity Assessment; NC denotes no classification available.

2/ Degradation product of Sarin

3/ Surety agent degradation products certified as of November 1986

4/ Degradation product of mustard

5/ Identified as a COC for the commercial worker only (see Section 4.2).

TABLE 4-11
PRIORITY 1/PRIORITY 2 SITES AT RMA STUDY AREAS
EXPOSED POPULATION: INDUSTRIAL WORKER

Study Area	Prioirty 2 Candidate	Priority 1 Candidate	Total
Western	17	14	31
Southern	4	13	17
North Central	13	20	43
Central	3	7	10
Eastern	12	14	26
South Plants	2	33	35
North Plants	<u>6</u>	<u>10</u>	<u>16</u>
TOTAL	57	121	178

The significance of the areal extent of contamination in each study area was determined by plotting the areas where the detected contaminant concentrations exceeded their applicable cumulative direct and indirect PPLVs for the industrial worker (i.e., areas of exceedance) and comparing these to the areas of known or inferred contaminants determined by the RI. These exceedance plots generated through the exposure assessment can be considered as first screen boundaries within which remedial action would most likely be investigated under the FS. The ensuing sections discuss the methodology by which the remedial boundaries were determined and the results follow.

4.3.1 Methodology and Assumptions

Borings in which an EI was computed to be greater than 0.1, based on industrial PPLVs, were plotted on an Arsenal-wide map. Areas in which concentrations exceeded direct PPLVs are designated differently than areas in which concentrations exceeded indirect PPLVs. The exceedance areas were generated consistent with the methods used in the SARs to determine the contaminated volumes. Simple geometric shapes were used to delineate areas of exceedance. Where necessary, larger scale maps from the Phase I and II RI reports were examined to better define areas and site characteristics. A set of assumptions for each type of feature was consistently applied to each study area as follows.

- Isolated exceedances located within a site boundary were assumed to extend to the nearest sample that showed no exceedance. Multiple adjacent exceedances were assumed to extend one half the distance to adjacent samples with no exceedance or to the site or study area boundary.
- The area of potential contamination corresponding to exceedances within ditch and railroad track samples was assumed to have a width equal to that of the ditch or track plus 5 ft on each side. The length of the exceeding area was assumed to extend one-half the distance to the adjacent samples with no exceedance or to the site or study area boundary.
- Isolated detections were assigned an area equal to that of a circle with a diameter of 20 ft consistent with the SAR methodology.
- Isolated or multiple exceedances occurring within a trench or pit in a site were assigned an area equal to the length and width of the trench or pit. If no documented size was available (e.g., some of the trenches in the Central Study Area (CSA) anomalies), an estimate was made from Phase I and II RI figures depicting the trench locations.
- Single nonexceeding borings surrounded by exceedances were included in the area of exceedance.

- Sewer lines were evaluated using maximum contaminant concentrations. Boring-by-boring analyses were therefore not performed, and an exceedance of the maximum was assumed to extend the entire length of the sewer line.

Consistent with the individual SARs, the exceptions to the above assumptions include:

- All exceedances in the Complex Disposal Area south of CSA-1b in the CSA were assumed to extend to adjacent samples with no exceedance or to the site boundaries, whichever was closest.
- Isolated detections in the South Plants Study Area (SPSA) were assigned an area to be equal to a circle with a 50-ft diameter consistent with the SAR methodology. In some cases, these areas were modified to account for barriers such as buildings, ditches, or roads.

Areas of exceedance were computed for each study area by calculating the areas for the individual geometric shapes depicted on the Arsenal-wide map. A total area of exceedance was computed for the Arsenal by summing the values for each study area.

4.3.2 Areal Extent of Exceedances

Areas of exceedance were plotted for each study area as discussed above and are depicted in Plate E-1, along with the areas of known or inferred contaminants determined in the RI. It can be determined through visual inspection of this map that only a portion of the areas of known contaminants may be considered significant. It should be noted, however, that these areas are only a first screen. In a few cases, the areas of exceedance can be misleading due to the methodology used and since exceedances cannot be inferred. These situations are listed below and will be considered in the FS.

- In the Central Study Area, exceedances occurring in the adjacent North Central Study Area were not accounted for, since the methodology limits exceedance areas to the study area boundary. For example, if it were not for the study area boundary between Basin A and the Complex Disposal Area North, a larger area of exceedance would be shown in Anomaly H.

Exceedance areas were compared to the estimated area of known contaminants to approximate the significance of contamination. Table 4-12 lists the areas of known contaminants, the exceedance areas, and the percent of contaminant areas which the areas of exceedance occupy for each study area. It can be seen that the area of contamination

TABLE 4-12
EXCEEDANCE AREAS FOR RMA STUDY AREAS

Study Area	Area of Known Contaminants (ft ²)	Area of Exceedance (ft ²)	Percent of Area of Known Contaminants
Western	1,800,000	1,600,000	67
Southern	5,400,000	2,900,000	54
North Central	29,000,000	11,000,000	38
Central	7,500,000	4,100,000	55
Eastern	3,600,000	1,000,000	28
South Plants	4,000,000	2,900,000	73
North Plants	<u>420,000</u>	<u>96,000</u>	<u>23</u>
TOTAL ARSENAL	52,000,000	23,000,000	44

of possible significance to human health is approximately 2.3×10^7 ft² (0.82 mile²). This area occupies about 44 percent of the area of known contaminants or 3 percent of the total area of RMA. Of the 2.3×10^7 ft², 1.5×10^6 ft², or 7.1 percent, accounts for areas in which contaminant concentrations exceeded the enclosed space vapor inhalation pathway only.

5.0 HISTORICAL PERSPECTIVE

5.1 COMPARISON WITH HISTORICAL PRIORITY 1/PRIORITY 2 SITES

The Priority 1/Priority 2 designations from the Exposure Assessment were compared with the historical recommendations presented in the Decontamination Assessment for Land and Facilities at RMA of 1984 (D'Appolonia, 1984/RIC 84034R01). This comparison was made to allow a "first cut" contrast between the "suggested" areas of proposed remediation in the earlier, less exhaustive DALF to the determinations in the current Exposure Assessment evaluations based on open space with supporting commercial/industrial use development of the Arsenal. The comparisons are presented below.

Recommendation	Decontamination Assessment for Land and Facilities (1984)	<u>Exposure Assessment (1990)</u> Industrial Worker
Priority 1	96	122
Priority 2	<u>69</u>	<u>56</u>
TOTAL	165	178

It should be noted that direct comparison of the total number of sites cannot be made since many of the site boundaries and designations have changed in the comprehensive RI. Additionally, the Decontamination Assessment for Land and Facilities report did not rely on actual sampling and analysis, but on historical information only (e.g., storage, spills, etc.) to recommend sites for Priority 1/Priority 2. Extensive field sampling and analysis programs have been provided in the RI. Based on these data, the current evaluations require the consideration of somewhat fewer sites during the course of the FS than had been previously estimated.

5.2 COMPARISON WITH HISTORICAL AREAS OF CONTAMINATION

The areas of exceedance from the Exposure Assessment were compared with the historical suggested area of contamination in the Decontamination Assessment for Land and Facilities. The total area of exceedance as discussed in Section 3.3 was calculated to be

$2.3 \times 10^7 \text{ ft}^2$. Comparing this value to the contaminated area in the Decontamination Assessment for Land and Facilities, which was estimated as $5.6 \times 10^7 \text{ ft}^2$, reveals that approximately 41 percent of this area is considered to be significant. It should be noted that this value is based on historical information only, and that the value based on analytical data from the RI was calculated in Section 4.3 to be slightly higher at 44 percent.

6.0 REFERENCES

RIC 84034R01

D'Appolonia Consulting Engineering, Inc. 1984. Decontamination Assessment for Land and Facilities at RMA. Draft Final Report prepared for U.S. Army Toxic and Hazardous Materials Agency. Aberdeen Proving Ground, MD. Battelle Delivery Order No. 0537.

RIC 88357R01

EBASCO (Ebasco Services Incorporated). 1988. Rocky Mountain Arsenal Chemical Index. Volumes I-II. May 1988. Prepared for U.S. Army Program Manager's Office for RMA Contamination Cleanup.

EPA (U.S. Environmental Protection Agency). 1990. 55 Federal Register 8666, March 8, 1990, 40CFR Part 300. National Oil and Hazardous Substances Pollution Contingency Plan.

APPENDIX A
CHEMICAL-SPECIFIC CONCENTRATION AND EXCEEDANCE DATA

WESTERN STUDY AREA

Site W-5A-1b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
BENZENE	1.1E-02	1.1E-08		
CARBON TETRACHLORIDE	2.5E-02	2.5E-08		
TETRACHLOROETHYLENE	9.9E-03	9.9E-09		
TOTALS	4.7E-02	4.7E-08	0.0E+00	.00%

RESIDUAL RISK = 4.7E-08

Site W SA-1b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CARBON TETRACHLORIDE	6.5E-04		
TETRACHLOROETHYLENE	6.1E-05		
TOTALS	7.1E-04	0.0E+00	.00%

RESIDUAL HI = 7.1E-04

Site W-SA-1d
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	7.4E-03	7.4E-09		
TOTALS	7.4E-03	7.4E-09	0.0E+00	.00%
RESIDUAL RISK - 7.4E-09				

Site W-SA 1d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	1.4E-06		
TOTALS	1.4E-06	0.0E+00	.00%

RESIDUAL HI = 1.4E-06

Site W-Sale
CARCINOGEN

CHEMICAL	DI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIBROMOCHLOROPROPANE	9.8E-01	9.8E-07		
TOTALS	9.8E-01	9.8E-07	0.0E+00	.00%

RESIDUAL RISK = 9.8E-07

Site W-SA-1e
NON-ARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
----------	----	------------------------------------	--

TOTALS	0.0E+00	0.0E+00	.00%
--------	---------	---------	------

RESIDUAL HI - 0.0E+00

Site W-SA 1f
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.7E+01	1.7E-05	1.7E-05	23.09%
DIELDRIN	5.7E+01	5.7E-05	5.7E-05	76.91%
METHYLENE CHLORIDE	1.3E-04	1.3E-10		
TOTALS	7.4E+01	7.4E-05	7.4E-05	100.00%

RESIDUAL RISK = 1.2E-10

Site W-5A-1f
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALIRIN	7.9E-02		
DIELIRIN	1.7E-01		
METHYLENE CHLORIDE	2.5E-08		
TOTALS	2.4E-01	0.0E+00	.00%

RESIDUAL HI = 2.4E-01

Site W-SA 19
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	2.4E-02	2.4E-08		
TOTALS	2.4E-02	2.4E-08	0.0E+00	.00%
RESIDUAL RISK = 2.4E-08				

Site W-SA-1g
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	9.4E-03		
MERCURY	4.3E-04		
TOTALS	9.9E-03	0.0E+00	.00%
RESIDUAL HI = 9.9E-03			

Site W-SA-2
CARCINOMAS

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.6E+01	2.6E-05	2.6E-05	10.53%
DIELDRIN	8.2E+01	8.2E-05	8.2E-05	33.41%
1,1,2,2-TETRACHLOROETHANE	2.3E-01	2.3E-07		
TETRACHLOROETHYLENE	2.9E-02	2.9E-08		
1,1,2 TRICHLOROETHANE	1.7E-02	1.7E-08		
TRICHLOROETHYLENE	2.9E-01	2.9E-07		
ARSENIC	1.4E+01	1.4E-05	1.4E-05	5.82%
CADMIUM	7.9E-01	7.9E-07	7.9E-07	.32%
CHROMIUM	1.2E+02	1.2E-04	1.2E-04	49.91%
TOTALS	2.5E+02	2.5E-04	2.4E-04	100.00%
RESIDUAL RISK				5.7E-07

Site W-SA-2
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.2E-01		
1,2-DICHLOROETHYLENE	3.5E-04		
DIELDRIN	2.4E-01		
ENDRIN	2.8E-02		
HEXACHLOROCYCLOPENTADIENE	1.5E-02		
TETRACHLOROETHYLENE	4.2E-04		
1,1,1-TRICHLOROETHANE	1.1E-05		
1,1,2-TRICHLOROETHANE	1.7E-04		
ARSENIC	1.2E-02		
CADMIUM	6.3E-03		
CHROMIUM	1.5E-02		
COPPER	3.3E-02		
LEAD	3.2E-01		
MERCURY	8.7E-03		
ZINC	9.3E-03		
TOTALS	8.0E-01	0.0E+00	.00%

RESIDUAL HI = 8.0E-01

Site W-SA-1a
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CADMIUM	4.2E-01	4.2E-07		
TOTALS	4.2E-01	4.2E-07	0.0E+00	.00%

RESIDUAL RISK = 4.2E-07

Site W-SA-1a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
TOLUENE	1.2E-06		
CADMIUM	3.4E-03		
TOTALS	3.4E-03	0.0E+00	.00%

RESIDUAL HI = 3.4E-03

Site W-SA-1b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	3.2E-02	3.2E-08		
TOTALS	3.2E-02	3.2E-08	0.0E+00	.000

RESIDUAL RISK = 3.2E-08

Site W-SA-1b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	1.5E-02		
TOTALS	1.5E-02	0.0E+00	.00%

RESIDUAL HI = 1.5E-02

Site W-SA-1C
CARCINOGEN

CHEMICAL	DI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	2.5E-02	2.5E-08		
TETRACHLOROETHYLENE	2.7E-02	2.7E-08		
TRICHLOROETHYLENE	8.8E-04	8.8E-10		
CADMIUM	1.4E+02	1.4E-04	1.4E-04	100.00%
TOTALS	1.4E+02	1.4E-04	1.4E-04	100.00%

RESIDUAL RISK = 5.3E-08

Site W-SA-1c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	1.5E-03		
TETRACHLOROETHYLENE	3.0E-04		
1,1,1-TRICHLOROETHANE	8.5E-06		
CADMIUM	1.2E+00	1.2E+00	100.00%
COPPER	3.0E-03		
LEAD	6.4E-02		
ZINC	2.2E-03		
TOTALS	1.2E+00	1.2E+00	100.00%

RESIDUAL HI = 7.1E-02

Site W SA-3d
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00E

RESIDUAL RISK = 0.0E+00

Site W-SA-3d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
METHYL ISOBUTYL KETONE	4.0E-07		
TOTALS	4.0E-07	0.0E+00	.00%
RESIDUAL HI - 4.0E 07			

Site W-SA-4a
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site W-SA-4a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
----------	----	------------------------------------	--

TOTALS	0.0E+00	0.0E+00	.00%
--------	---------	---------	------

RESIDUAL HI = 0.0E+00

Site W-SA-4b
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	3.7E-02	3.7E-08		
TETRACHLOROETHYLENE	9.9E-03	9.9E-09		
TRICHLOROETHYLENE	9.8E-05	9.8E-11		
CHROMIUM	3.8E+01	3.8E-05	3.8E-05	100.00%
TOTALS	3.8E+01	3.8E-05	3.8E-05	100.00%

RESIDUAL RISK = 4.7E-08

Site W-SA-4b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	1.7E-02		
TETRACHLOROETHYLENE	5.6E-05		
TOLUENE	3.1E-06		
CHROMIUM	4.5E-03		
COPPER	1.1E-03		
MERCURY	9.7E-04		
ZINC	1.3E-03		
TOTALS	2.5E-02	0.0E+00	.00%

RESIDUAL HI = 2.5E-02

Site W-5A-5a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TETRACHLOROETHYLENE	1.1E-03	1.1E-09		
TOTALS	1.1E-03	1.1E-09	0.0E+00	.00%

RESIDUAL RISK = 1.1E-09

Site W-SA-5a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
TETRACHLOROETHYLENE	7.9E-05		
TOTALS	7.9E-05	0.0E+00	.00%

RESIDUAL HI = 7.9E-05

Site W-SA-5b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%
--------	---------	---------	---------	------

RESIDUAL RISK - 0.0E+00

Site W-SA-5b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
1,1,1-TRICHLOROETHANE	1.9E-07		
COPPER	8.2E-04		
LEAD	2.4E-02		
MERCURY	3.0E-04		
ZINC	1.0E-03		
TOTALS	2.6E-02	0.0E+00	.00%

RESIDUAL HI = 2.6E-02

Site W-SA-5c
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%
--------	---------	---------	---------	------

RESIDUAL RISK = 0.0E+00

Site W-SA-5c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
----------	----	------------------------------------	--

TOTALS	0.0E+00	0.0E+00	.00%
--------	---------	---------	------

RESIDUAL HI = 0.0E+00

Site W-SA-5d
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.7E+01	1.7E-05	1.7E-05	1.05%
DIELDRIN	3.3E+01	3.3E-05	3.3E-05	2.00%
TETRACHLOROETHYLENE	7.4E-03	7.4E-09		
ARSENIC	1.1E+01	1.1E-05	1.1E-05	.68%
CADMIUM	6.7E-01	6.7E-07		
CHROMIUM	1.6E+03	1.6E-03	1.6E-03	96.26%
TOTALS	1.6E+03	1.6E-03	1.6E-03	100.00%

RESIDUAL RISK = 6.7E-07

Site W-SA-5d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	7.9E-02		
BICYCLOHEPTADIENE	7.3E-05		
DICYCLOPENTADIENE	2.3E-03		
DIELDRIN	9.5E-02		
ISODRIN	5.1E-01	5.1E-01	35.71%
TETRACHLOROETHYLENE	3.9E-05		
ARSENIC	9.5E-03		
CADMIUM	5.4E-03		
CHROMIUM	1.9E-01		
COPPER	1.7E-01		
LEAD	9.1E-01	9.1E-01	64.29%
MERCURY	5.6E-03		
ZINC	9.3E-03		
TOTALS	2.0E+00	1.4E+00	100.00%

RESIDUAL HI = 5.7E-01

Site W-SA-6a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	9.6E-08	9.6E-14		
DIBROMOCHLOROPROPANE	7.2E-03	7.2E-09		
TETRACHLOROETHYLENE	3.6E-04	3.6E-10		
TRICHLOROETHYLENE	1.2E-02	1.2E-08		
ARSENIC	1.7E+01	1.7E-05	1.7E-05	3.73%
CADMIUM	3.9E+00	3.9E-06	3.9E-06	.88%
CHROMIUM	4.3E+02	4.3E-04	4.3E-04	95.39%
TOTALS	4.5E+02	4.5E-04	4.5E-04	100.00%

RESIDUAL RISK = 2.0E 08

Site W-SA-6a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.4E-10		
TETRACHLOROETHYLENE	2.6E-05		
TOLUENE	1.6E-05		
ARSENIC	1.4E-02		
CADMIUM	3.2E-02		
CHROMIUM	5.2E-02		
COPPER	3.9E-03		
LEAD	9.1E-01	9.1E-01	100.00%
MERCURY	8.2E-04		
ZINC	1.6E-02		
TOTALS	1.0E+00	9.1E-01	100.00%

RESIDUAL HI = 1.2E-01

Site W-SA 6b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK - 0.0E+00

Site W-SA-6b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ETHYLBENZENE	5.5E-05		
TOLUENE	8.4E-06		
M-XYLENE	6.9E-06		
LEAD	3.6E-02		
ZINC	7.9E-04		
TOTALS	3.7E-02	0.0E+00	.00%

RESIDUAL HI ~ 3.7E-02

Site W-SA-6c
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site W-SA-6c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
LEAD	2.0E-02		
TOTALS	2.0E-02	0.0E+00	.00%
RESIDUAL HI = 2.0E-02			

Site W-SA 6d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ARSENIC	7.4E+00	7.4E-06	7.4E-06	100.00%
CADMIUM	5.9E-01	5.9E-07		
TOTALS	8.0E+00	8.0E-06	7.4E-06	100.00%

RESIDUAL RISK = 5.9E-07

Site W-SA-6d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ARSENIC	6.3E-03		
CADMIUM	4.8E-03		
ZINC	8.6E-03		
TOTALS	2.0E-02	0.0E+00	.00%
RESIDUAL HI = 2.0E-02			

Site W-SA-6e
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (S)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00E
--------	---------	---------	---------	------

RESIDUAL RISK = 0.0E+00

Site W-SA 6e
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
LEAD	4.5E-02		
MERCURY	5.0E-04		
TOTALS	4.5E-02	0.0E+00	.00%

RESIDUAL HI = 4.5E-02

Site W-SA-7a
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
METHYLENE CHLORIDE	4.4E-03	4.4E-09		
CHROMIUM	7.1E+01	7.1E-05	7.1E-05	100.00%
TOTALS	7.1E+01	7.1E-05	7.1E-05	100.00%

RESIDUAL RISK = 4.4E-09

Site W-SA-7a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHLOROACETIC ACID	3.8E-02		
METHYLENE CHLORIDE	1.9E-03		
CHROMIUM	8.5E-03		
COPPER	8.8E-03		
LEAD	7.8E-02		
MERCURY	2.1E-03		
ZINC	1.2E-03		
TOTALS	1.4E-01	0.0E+00	.00%

RESIDUAL HI = 1.4E-01

Site W-SA-7b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site W-SA-7b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
MERCURY	9.1E-04		
TOTALS	9.1E-04	0.0E+00	.00%
RESIDUAL HI -	9.1E-04		

Site W-SA-Ra
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.000

RESIDUAL RISK = 0.0E+00

Site W-SA-8a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
COPPER	1.2E-03		
TOTALS	1.2E-03	0.0E+00	.00%
RESIDUAL HI = 1.2E-03			

Site W-SA-8b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
LEAD	1.9E-02		
ZINC	2.5E-03		
TOTALS	2.1E-02	0.0E+00	.00%
RESIDUAL HI = 2.1E-02			

Site W-SA-8b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK - 0.0E+00

Site W-SA-8c
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
1,1,2,2-TETRACHLOROETHANE	5.1E-02	5.1E-08		
TOTALS	5.1E-02	5.1E-08	0.0E+00	.00%

RESIDUAL RISK = 5.1E-08

Site W-SA-8c
NONCARCINOGEN

FRACTIONAL
HI OF
CONTRIBUTING
CHEMICALS (%)

HI OF
CONTRIBUTING
CHEMICALS

CHEMICAL

.00%

0.0E+00 0.0E+00

TOTALS

RESIDUAL HI = 0.0E+00

EASTERN STUDY AREA

Site E-SA-1a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CADMIUM	3.7E-01	3.7E-07		
TOTALS	3.7E-01	3.7E-07	0.0E+00	.00%

RESIDUAL RISK = 3.7E-07

Site E-SA-1a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
O,P-XYLENE	2.0E-06		
CADMIUM	3.0E-03		
LEAD	2.1E-02		
TOTALS	2.4E-02	0.0E+00	.00%

RESIDUAL HI = 2.4E-02

Site E-SA-1b
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CADMIUM	5.2E-01	5.2E-07		
CHROMIUM	4.3E+01	4.3E-05	4.3E-05	100.00%
TOTALS	4.3E+01	4.3E-05	4.3E-05	100.00%

RESIDUAL RISK = 5.2E-07

Site E-SA-1b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CADMIUM	4.2E-03		
CHROMIUM	5.2E-03		
COPPER	2.3E-03		
LEAD	3.8E-02		
TOTALS	5.0E-02	0.0E+00	.00%

RESIDUAL HI = 5.0E-02

Site B-SA-1c
CARCINOGEN

CHEMICAL	RI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CADMIUM	6.7E-01	6.7E-07		
CHROMIUM	4.9E+01	4.9E-05	4.9E-05	100.00%
TOTALS	5.0E+01	5.0E-05	4.9E-05	100.00%

RESIDUAL RISK = 6.7E-07

Site E-SA-1c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CADMIUM	5.4E-03		
CHROMIUM	5.9E-03		
LEAD	5.0E-02		
ZINC	5.8E-04		
TOTALS	6.2E-02	0.0E+00	.00%

RESIDUAL HI = 6.2E-02

Site E-SA-1d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ARSENIC	1.2E+01	1.2E-05	1.2E-05	22.47%
CADMIUM	6.3E-01	6.3E-07		
CHROMIUM	4.3E+01	4.3E-05	4.3E-05	77.53%
TOTALS	5.6E+01	5.6E-05	5.6E-05	100.00%

RESIDUAL RISK - 6.3E-07

Site 8-SA-1d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ARSENIC	1.1E-02		
CALCIUM	5.1E-03		
CHROMIUM	5.2E-03		
COPPER	1.9E-03		
LEAD	2.7E-02		
ZINC	7.9E-04		
TOTALS	5.0E-02	0.0E+00	.001

RESIDUAL HI = 5.0E-02

Site E-SA-2a
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
BENZENE	2.2E-02	2.2E-08		
CHLOROPH	1.8E-03	1.8E-09		
TETRACHLOROETHYLENE	9.9E-03	9.9E-09		
ARSENIC	8.7E+00	8.7E-06	8.7E-06	52.90%
CADMIUM	7.7E+00	7.7E-06	7.7E-06	47.10%
TOTALS	1.6E+01	1.6E-05	1.6E-05	100.00%

RESIDUAL RISK = 3.4E-08

Site E-SA-2a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHLOROFORM	6.1E-05		
TETRACHLOROETHYLENE	6.0E-05		
ARSENIC	7.4E-03		
CADMIUM	6.2E-02		
COPPER	6.0E-03		
LEAD	1.6E+00	1.6E+00	100.00%
ZINC	4.1E-01		
TOTALS	2.0E+00	1.6E+00	100.00%

RESIDUAL HI = 4.8E-01

Site E-SA-2b
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.9E-06	3.9E-12		
BENZENE	1.4E-02	1.4E-08		
DIELDRIN	4.5E-04	4.5E-10		
METHYLENE CHLORIDE	1.8E-02	1.8E-08		
TRICHLOROETHYLENE	6.9E-03	6.9E-09		
TOTALS	3.9E-02	3.9E-08	0.0E+00	.00%

RESIDUAL RISK = 3.9E-08

Site 8-SA-2b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.8E-08		
P-CHLOROPHENYLMETHYL SULFONE	2.9E-06		
DIELDRIN	1.3E-06		
METHYLENE CHLORIDE	1.9E-03		
1,1,1-TRICHLOROETHANE	5.8E-05		
M-XYLENE	2.8E-06		
O,P-XYLENE	2.6E-05		
TOTALS	2.0E-03	0.0E+00	.00%
RESIDUAL HI - 2.0E-03			

Site E-SA-2c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	2.5E-02	2.5E-08		
ARSENIC	2.0E+01	2.0E-05	2.0E-05	100.00%
TOTALS	2.0E+01	2.0E-05	2.0E-05	100.00%

RESIDUAL RISK = 2.5E-08

Site E-SA-2c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	7.1E-05		
FLUOROACETIC ACID	4.8E+00	4.8E+00	100.00%
ARSENIC	1.7E-02		
COPPER	1.5E-03		
LEAD	2.0E-02		
ZINC	8.6E-04		
TOTALS	4.8E+00	4.8E+00	100.00%
RESIDUAL HI = 3.9E-02			

Slt. F. SA- 2a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.000

RESIDUAL RISK - 0.0E+00

Site E-SA-1a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHLOROACETIC ACID	7.1E-02		
TOTALS	7.1E-02	0.0E+00	.00%

RESIDUAL HI = 7.1E-02

Site E-SA-1b
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ARSENIC	1.7E+02	1.7E-04	1.7E-04	100.00%
CADMIUM	5.6E-01	5.6E-07		
TOTALS	1.7E+02	1.7E-04	1.7E-04	100.00%

RESIDUAL RISK = 5.6E-07

Site E-SA-7b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DITHANE	3.9E-02		
1,4-OXATHIANE	3.9E-04		
THIODIGLYCOL	6.8E-04		
ARSENIC	1.4E-01		
CADMIUM	4.5E-03		
TOTALS	1.9E-01	0.0E+00	.00%

RESIDUAL HI = 1.9E-01

Site E SA 3c
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TRICHLOROETHYLENE	5.6E-03	5.6E-09		
TOTALS	5.6E-03	5.6E-09	0.0E+00	.00%

RESIDUAL RISK = 5.6E-09

Site E-SA-3c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
LEAD	2.5E-02		
ZINC	1.3E-03		
TOTALS	2.6E-02	0.0E+00	.00%

RESIDUAL HI = 2.6E-02

Site E-SA-3d
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TETRACHLOROETHYLENE	7.4E-03	7.4E-09		
CHROMIUM	3.6E+01	3.6E-05	3.6E-05	100.00%
TOTALS	3.6E+01	3.6E-05	3.6E-05	100.00%

RESIDUAL RISK = 7.4E-09

Site E-SA-3d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
P-CHLOROPHENYLMETHYL SULFOXIDE	6.1E-04		
DITHIANE	1.1E-02		
TETRACHLOROETHYLENE	4.5E-05		
THIODIGLYCOL	1.9E-03		
TOLUENE	6.0E-06		
1,1,1-TRICHLOROETHANE	3.4E-05		
CHROMIUM	4.3E-03		
LEAD	6.4E-02		
ZINC	3.9E-03		
TOTALS	8.6E-02	0.0E+00	.00%
RESIDUAL HI = 8.6E-02			

Site B-SA-3e
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
1,1,2,2-TETRACHLOROETHANE	6.5E-02	6.5E-08		
TOTALS	6.5E-02	6.5E-08	0.0E+00	.00%
RESIDUAL RISK = 6.5E-08				

Site E-SA-3e
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ISOPROPYL METHYL PHOSPHONIC ACID	3.9E-04		
ZINC	5.9E-04		
TOTALS	9.8E-04	0.0E+00	.00%
RESIDUAL HI = 9.8E-04			

Site E-SA If
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00E
--------	---------	---------	---------	------

RESIDUAL RISK = 0.0E+00

Site B-SA-3f
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ZINC	6.4E-04		
TOTALS	6.4E-04	0.0E+00	.00%

RESIDUAL HI = 6.4E-04

Site E SA-1q
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%
--------	---------	---------	---------	------

RESIDUAL RISK = 0.0E+00

Site E-SA 1g
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHLORACETIC ACID	7.7E-02		
TOTALS	7.7E-02	0.0E+00	.008

RESIDUAL HI = 7.7E 02

Site E-SA-31
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site E-SA 31
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (8)
MERCURY	3.5E-04		
TOTALS	3.5E-04	0.0E+00	.008
RESIDUAL HI ~	3.5E-04		

Site E SA 4a
CARCINXEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.001

RESIDUAL RISK - 0.0E+00

Site E-SA-4a
NONARCINGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
COPPER	6.8E-04		
ZINC	6.6E-04		
TOTALS	1.3E-03	0.0E+00	.00%

RESIDUAL HI = 1.3E-03

Site E SA 4b
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (b)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.008

RESIDUAL RISK = 0.0E+00

Site E-SA-4b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
LEAD	2.1E-02		
MERCURY	3.0E-04		
ZINC	5.9E-04		
TOTALS	2.2E-02	0.0E+00	.008

RESIDUAL HI = 2.2E 02

Site R-SA-4c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site 8-SA-4c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
COPPER	8.8E-03		
LEAD	9.6E-02		
ZINC	1.1E-03		
TOTALS	1.1E-01	0.0E+00	.00%

RESIDUAL HI = 1.1E-01

Site E-SA-5
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%
--------	---------	---------	---------	------

RESIDUAL RISK - 0.0E+00

Site E-SA-5
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
FLUOROACETIC ACID	1.8E+00	1.8E+00	100.00%
COPPER	9.5E-04		
ZINC	7.9E-04		
TOTALS	1.8E+00	1.8E+00	100.00%

RESIDUAL HI = 1.7E-03

Site E-SA 6a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CHROMIUM	4.0E+01	4.0E-05	4.0E-05	100.00%
TOTALS	4.0E+01	4.0E-05	4.0E-05	100.00%
RESIDUAL RISK = 0.0E+00				

Site E-SA-6a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHROMIUM	4.9E-03		
COPPER	2.1E-03		
LEAD	8.2E-02		
ZINC	8.6E-04		
TOTALS	9.0E-02	0.0E+00	.00%

RESIDUAL HI = 9.0E-02

Site E SA-6b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%
--------	---------	---------	---------	------

RESIDUAL RISK = 0.0E+00

Site E-SA-6b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
FLUOROACETIC ACID	2.2E+00	2.2E+00	100.00%
COPPER	8.1E-04		
ZINC	7.9E-04		
TOTALS	2.2E+00	2.2E+00	100.00%

RESIDUAL HI = 1.6E-03

Site B-SA 6c
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ARSENIC	1.3E+01	1.3E-05	1.3E-05	100.00%
TOTALS	1.3E+01	1.3E-05	1.3E-05	100.00%

RESIDUAL RISK = 0.0E+00

Site E-SA 6C
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
FLUOROACETIC ACID	6.8E-01		
ARSENIC	1.1E-02		
ZINC	5.8E-04		
TOTALS	6.9E-01	0.0E+00	.00%

RESIDUAL HI = 6.9E-01

SOUTH PLANTS STUDY AREA

CHEMICAL	FI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	6.9E+04	6.9E-02	6.9E-02	26.36%
BENZENE	6.3E-01	6.3E-07		
CARBON TETRACHLORIDE	3.6E+00	3.6E-06	3.6E-06	.00%
CHLORFANE	6.6E+02	6.6E-04	6.6E-04	.25%
CHLOROPOM	1.4E+03	1.4E-03	1.4E-03	.52%
DDE	5.2E+00	5.2E-06	5.2E-06	.00%
DDT	1.0E+01	1.0E-05	1.0E-05	.00%
DIBROMOCHLOROPROPANE	1.2E+05	1.2E-01	1.2E-01	45.77%
DIELDRIN	5.7E+04	5.7E-02	5.7E-02	21.95%
METHYLENE CHLORIDE	1.2E+00	1.2E-06	1.2E-06	.00%
1,1,2,2-TETRACHLOROETHANE	3.1E+00	3.1E-06	3.1E-06	.00%
TETRACHLOROETHYLENE	8.7E-01	8.7E-07	8.7E-07	.00%
ARSENIC	1.3E+04	1.3E-02	1.3E-02	4.99%
CADMIUM	9.9E+01	9.9E-05	9.9E-05	.04%
CHROMIUM	2.4E+02	2.4E-04	2.4E-04	.09%
TOTALS	2.6E+05	2.6E-01	2.6E-01	100.00%

RESIDUAL RISK = 6.9E 07

Site SP-5A 1b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.6E+01	3.6E-05	3.6E-05	11.9%
DDE	9.1E-02	9.1E-08		
DVT	3.3E-01	3.3E-07		
DIELDRIN	2.5E+02	2.5E-04	2.5E-04	81.10%
METHYLENE CHLORIDE	1.2E-02	1.2E-08		
TETRACHLOROETHYLENE	2.4E-02	2.4E-08		
ARSENIC	2.1E+01	2.1E-05	2.1E-05	6.96%
CALCIUM	5.1E-01	5.1E-07		
TOTALS	3.0E+02	3.0E-04	3.0E-04	100.00%

RESIDUAL RISK = 9.7E-07

Site SP-SA-1b
NON-CARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.7E-01		
P-CHLOROPHENYLMETHYL SULFONE	6.0E-04		
P-CHLOROPHENYLMETHYL SULFOXIDE	3.6E-04		
DDT	4.5E-03		
DIELDRIN	7.1E-01	7.1E-01	100.00%
ENDRIN	1.4E-03		
ISODRIN	6.4E-04		
METHYLENE CHLORIDE	5.7E-03		
TETRACHLOROETHYLENE	1.2E-04		
THIODIGLYCOL	1.8E-04		
1,1,1-TRICHLOROETHANE	5.1E-05		
ARSENIC	1.8E-02		
CADMIUM	4.1E-03		
COPPER	9.6E-04		
LEAD	2.0E-01		
MERCURY	4.1E-03		
ZINC	8.6E-04		
TOTALS	1.1E+00	7.1E-01	100.00%
RESIDUAL HI	4.1E-01		

Site SP-SA 1c
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.9E+01	5.9E-05	5.9E-05	17.96%
CHLORDANE	1.3E+00	1.3E-06	1.3E-06	.40%
DDE	7.5E-01	7.5E-07		
DOT	3.0E+00	3.0E-06	3.0E-06	.90%
DIELDRIN	2.5E+02	2.5E-04	2.5E-04	76.80%
ARSENIC	1.3E+01	1.3E-05	1.3E-05	3.94%
TOTALS	3.3E+02	3.3E-04	3.3E-04	100.00%

RESIDUAL RISK = 7.5E-07

Site SP-SA-1c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.7E-01		
CHLORDANE	3.9E-02		
DDT	4.0E-02		
DIELDRIN	7.3E-01	7.3E-01	100.00%
ENDRIN	1.3E-03		
HEXACHLOROCYCLOPENTADIENE	2.4E-05		
ISODRIN	5.1E-02		
ARSENIC	1.1E-02		
MERCURY	3.0E-04		
TOTALS	1.1E+00	7.3E-01	100.00%
RESIDUAL HI = 4.1E-01			

Site SP-SA-1d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	8.6E+02	8.6E-04	8.6E-04	91.31%
DDE	1.0E-02	1.0E-08		
DDT	5.4E-03	5.4E-09		
DIELDRIN	8.2E+01	8.2E-05	8.2E-05	8.69%
TOTALS	9.4E+02	9.4E-04	9.4E-04	100.00%

RESIDUAL RISK = 1.6E-08

Site SP-SA-1d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.9E+00	3.9E+00	100.00%
DDT	7.3E-05		
DIELDRIN	2.4E-01		
ENDRIN	1.8E-04		
ISODRIN	1.7E-02		
TOLUENE	7.7E-06		
COPPER	1.5E-03		
MERCURY	5.4E-04		
ZINC	7.9E-04		
TOTALS	4.2E+00	3.9E+00	100.00%

RESIDUAL HI = 2.6E-01

Site SP-SA-le
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	6.9E+02	6.9E-04	6.9E-04	.98%
CHLORDANE	1.3E+00	1.3E-06	1.3E-06	.00%
DIELDRIN	8.2E+02	8.2E-04	8.2E-04	1.17%
ARSENIC	6.8E+04	6.8E-02	6.8E-02	97.11%
CADMIUM	5.1E+02	5.1E-04	5.1E-04	.73%
TOTALS	7.0E+04	7.0E-02	7.0E-02	100.00%

RESIDUAL RISK = 0.0E+00

Site SP-SA-le
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.2E+00	3.2E+00	3.15%
BICYCLOHEPTADIENE	1.5E-01		
CHLORDANE	3.9E-02		
DICYCLOPENTADIENE	3.9E+00	3.9E+00	3.91%
DIELDRIN	2.4E+00	2.4E+00	2.36%
HEXACHLOROCYCLOPENTADIENE	8.2E+00	8.2E+00	8.16%
ISODRIN	1.7E-01		
ARSENIC	5.8E+01	5.8E+01	58.00%
CADMIUM	4.1E+00	4.1E+00	4.11%
LEAD	2.9E-02		
MERCURY	2.0E+01	2.0E+01	20.32%
TOTALS	1.0E+02	1.0E+02	100.00%

RESIDUAL HI = 3.9E-01

Site SP-SA 1f
CARCINOGEN

CHEMICAL	P1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.2E+00	5.2E-06	5.2E-06	3.06%
DIELDRIN	1.6E+02	1.6E-04	1.6E-04	96.94%
TOTALS	1.7E+02	1.7E-04	1.7E-04	100.00%

RESIDUAL RISK = 0.0E+00

Site SP-SA 1f
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.4E-02		
DIELDRIN	4.7E-01		
ENDRIN	3.5E-02		
HEXACHLOROCYCLOPENTADIENE	2.6E-02		
ISODRIN	3.4E-02		
MERCURY	3.9E-04		
TOTALS	5.9E-01	0.0E+00	.00%
RESIDUAL HI = 5.9E-01			

Site SP-SA-1g
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.6E+00	2.6E-06	2.6E-06	.08%
BENZENE	1.4E-01	1.4E-07		
CHLOROPHORM	9.6E-03	9.6E-09		
DIELDRIN	1.6E+02	1.6E-04	1.6E-04	5.0%
METHYLENE CHLORIDE	6.1E-03	6.1E-09		
1,1,2,2-TETRACHLOROETHANE	6.2E-02	6.2E-08		
TETRACHLOROETHYLENE	1.2E-04	1.2E-10		
ARSENIC	3.1E+01	3.1E-05	3.1E-05	.95%
CADMIUM	1.7E+00	1.7E-06	1.7E-06	.05%
CHROMIUM	3.1E+03	3.1E-03	3.1E-03	91.89%
TOTALS	3.3E+03	1.7E-03	3.3E-03	100.00%

RESIDUAL RISK = 2.2E-07

Site SP-SA-19
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.2E-02		
BICYCLOHEPTADIENE	1.9E-05		
CHLOROFORM	3.0E-04		
DIELDRIN	4.7E-01		
ENDRIN	7.9E-03		
ISODRIN	6.8E-02		
METHYL ISOBUTYL KETONE	1.6E-03		
METHYLENE CHLORIDE	1.9E-03		
TETRACHLOROETHYLENE	8.1E-06		
ARSENIC	2.6E-02		
CADMIUM	1.4E-02		
CHROMIUM	3.7E-01		
COPPER	8.1E-03		
LEAD	5.0E-01	5.0E-01	100.00%
MERCURY	5.0E-01		
ZINC	1.3E-02		
	1.5E-03		
TOTALS	1.5E+00	5.0E-01	100.00%

RESIDUAL HI = 1.0E+00

Site SP SA-2a
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.4E+00	1.4E-06	1.4E-06	.81%
BENZENE	1.1E-01	1.1E-07		
CHLORDANE	1.5E-01	1.5E-07		
DDE	8.4E-03	8.4E-09		
DVT	4.9E-02	4.9E-08		
DIELDRIN	1.6E+02	1.6E-04	1.6E-04	99.17%
METHYLENE CHLORIDE	5.1E-01	5.1E-07		
1,1,2,2-TETRACHLOROETHANE	1.5E-01	1.5E-07		
TOTALS	1.7E+02	1.7E-04	1.6E-04	100.00%

RESIDUAL RISK = 9.8E-07

Site SP-SA-2a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	6.3E-03		
CHLORDANE	4.5E-03		
DDT	6.6E-04		
DICYCLOPENTADIENE	7.9E-01	7.9E-01	100.00%
DIELDRIN	4.7E-01		
ENDRIN	1.1E-03		
HEXACHLOROCYCLOPENTADIENE	1.8E-05		
ISODRIN	3.4E-04		
METHYLENE CHLORIDE	1.7E-01		
1,1,1-TRICHLOROETHANE	8.9E-05		
COPPER	8.8E-04		
MERCURY	4.3E-04		
ZINC	7.9E-04		
TOTALS	1.5E+00	7.9E-01	100.00%

RESIDUAL HI = 6.6E 01

Site SP-SA-2b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.5E+00	4.5E-06	4.5E-06	20.19%
BENZENE	1.3E+00	1.3E-06	1.3E-06	5.92%
CHLORFANE	6.2E-02	6.2E-08		
DOS	1.5E-02	1.5E-08		
DOT	1.4E-02	1.4E-08		
DIELDRIN	1.6E+01	1.6E-05	1.6E-05	73.89%
METHYLENE CHLORIDE	2.0E-01	2.0E-07		
1,1,2,2-TETRACHLOROETHANE	3.4E-01	3.4E-07		
TETRACHLOROETHYLENE	1.0E-02	1.0E-08		
TOTALS	2.3E+01	2.3E-05	2.2E-05	100.00%

RESIDUAL RISK = 6.4E-07

Site SP-SA-2b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.0E-02		
CHLORDANE	1.9E-03		
DDT	1.9E-04		
DICYCLOPENTADIENE	1.6E+01	1.6E+01	100.00%
DIELDRIN	4.7E-02		
ENDRIN	1.9E-03		
HEXACHLOROCYCLOPENTADIENE	1.2E-02		
ISODRIN	6.1E-05		
METHYL ISOBUTYL KETONE	6.7E-05		
METHYLENE CHLORIDE	3.8E-02		
TETRACHLOROETHYLENE	6.2E-05		
TOLUENE	2.1E-06		
O, P-XYLENE	2.2E-06		
COPPER	7.2E-04		
LEAD	2.2E-02		
ZINC	1.0E-03		
TOTALS	1.6E+01	1.6E+01	100.00%

RESIDUAL HI = 1.5E-01

Site SP-SA-2c
CARCINOGEN

CHEMICAL	DI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.7E+01	1.7E-05	1.7E-05	34.44%
CHLORDANE	5.9E-01	5.9E-07		
DDE	3.3E-02	3.3E-08		
DOT	8.7E-02	8.7E-08		
DIELDRIN	3.3E+01	3.3E-05	3.3E-05	65.56%
METHYLENE CHLORIDE	5.6E-02	5.6E-08		
TOTALS	5.1E+01	5.1E-05	5.0E-05	100.00%

RESIDUAL RISK = 7.7E-07

Site SP-SA-2c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	7.9E-02		
CHLORDANE	1.8E-02		
DDT	1.2E-03		
DIELDRIN	9.5E-02		
ENDRIN	6.7E-03		
ISODRIN	3.7E-02		
METHYL ISOBUTYL KETONE	3.6E-05		
METHYLENE CHLORIDE	2.1E-02		
1,1,1-TRICHLOROETHANE	2.5E-05		
COPPER	6.5E-04		
MERCURY	2.4E-04		
ZINC	2.1E-03		
TOTALS	2.6E-01	0.0E+00	.00%

RESIDUAL HI = 2.6E-01

Site SP-SA-2d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.8E+02	5.8E-04	5.8E-04	97.81%
BENZENE	9.1E-03	9.1E-09		
CHLORIDANE	9.2E-02	9.2E-08		
DDG	1.4E-02	1.4E-08		
DYT	1.6E-02	1.6E-08		
DIELDRIN	1.3E+01	1.3E-05	1.3E-05	2.19%
TOTALS	6.0E+02	6.0E-04	6.0E-04	100.00%

RESIDUAL RISK = 1.3E-07

Site SP-SA-2d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.7E+00	2.7E+00	100.00%
CHLORDANE	2.8E-03		
DDT	2.1E-04		
DIELDRIN	3.8E-02		
ENDRIN	1.4E-03		
ISODRIN	2.2E-02		
COPPER	1.3E-03		
MERCURY	7.8E-04		
ZINC	9.3E-04		
TOTALS	2.7E+00	2.7E+00	100.00%

RESIDUAL HI = 6.7E 02

Site SP-SA-2e
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
BENZENE	2.9E-01	2.9E-07		
DIBROMOCHLOROPROPANE	1.8E+00	1.8E-06	1.8E-06	2.21%
DIELDRIN	4.1E+01	4.1E-05	4.1E-05	48.82%
CHROMIUM	4.1E+01	4.1E-05	4.1E-05	48.97%
TOTALS	8.4E+01	8.4E-05	8.4E-05	100.00%

RESIDUAL RISK = 2.9E-07

Site SP-SA-2e
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DICYCLOPENTADIENE	1.9E+01	1.9E+01	100.00%
DIELDRIN	1.2E-01		
ETHYLENBENZENE	6.3E-06		
M-XYLENE	1.1E-05		
O,P-XYLENE	6.8E-05		
CHROMIUM	5.0E-03		
COPPER	7.2E-04		
ZINC	6.3E-04		
TOTALS	1.9E+01	1.9E+01	100.00%

RESIDUAL HI ~ 1.2E-01

Site SP-SA-3a
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.3E+03	5.3E-03	5.3E-03	91.06%
CHLORDANE	3.7E-01	3.7E-07		
DDE	1.3E-02	1.3E-08		
DDT	3.5E-01	3.5E-07		
DIELDRIN	5.2E+02	5.2E-04	5.2E-04	8.94%
TOTALS	5.8E+03	5.8E-03	5.8E-03	100.00%

RESIDUAL RISK ~ 7.3E-07

Site SP-5A-1a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.4E+01	2.4E+01	94.17%
CHLORDANE	1.1E-02		
DDT	4.7E-03		
DIELDRIN	1.5E+00	1.5E+00	5.83%
ENDRIN	4.7E-03		
HEXACHLOROCYCLOPENTADIENE	6.3E-05		
ISODRIN	4.4E-01		
TOTALS	2.6E+01	2.6E+01	100.00%

RESIDUAL HI = 4.6E-01

Site SP-SA-3b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.5E+05	1.5E-01	1.5E-01	97.67%
CHLORDANE	2.0E+02	2.0E-04	2.0E-04	.13%
CHLOROFORM	1.8E-03	1.8E-09		
DDE	3.5E-01	3.5E-07		
DDT	1.2E+00	1.2E-06	1.2E-06	.00%
DIBROMOCHLOROPROPANE	8.1E-03	8.1E-09		
1,2-DICHLOROETHANE	1.1E-01	1.1E-07		
DIELDRIN	3.3E+03	3.3E-03	3.3E-03	2.19%
1,1,2,2-TETRACHLOROETHANE	2.1E-02	2.1E-08		
ARSENIC	1.9E+01	1.9E-05	1.9E-05	.01%
TOTALS	1.5E+05	1.5E-01	1.5E-01	100.00%

RESIDUAL RISK - 4.8E-07

Site SP-SA-1b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	6.7E+02	6.7E+02	95.55%
ATRAZINE	1.4E-04		
CHLORDANE	5.9E+00	5.9E+00	.84%
CHLOROPH	5.2E-05		
P-CHLOROPHENYLMETHYL SULFIDE	1.2E-01		
P-CHLOROPHENYLMETHYL SULFONE	5.2E-03		
P-CHLOROPHENYLMETHYL SULFOXIDE	1.4E-03		
DDE	1.7E-02		
DICYCLOPENTADIENE	3.6E-01		
DIELDRIN	9.5E+00	9.5E+00	1.35%
DITROPYLMETHYL PHOSPHONATE	1.2E-06		
ENDRIN	5.1E-02		
HEXACHLOROCYCLOPENTADIENE	6.5E-01	6.5E-01	.09%
ISODRIN	1.5E+01	1.5E+01	2.17%
ARSENIC	1.6E-02		
COPPER	4.2E-03		
LEAD	3.5E-02		
MERCURY	4.8E-03		
ZINC	1.2E-03		
TOTALS	7.0E+02	7.0E+02	100.00%

RESIDUAL HI = 6.2E-01

Site SP-SA-3c
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	7.7E+03	7.7E-03	7.7E-03	80.08%
DDT	2.4E-03	2.4E-09		
DIELDRIN	7.7E-03	7.7E-09		
METHYLENE CHLORIDE	1.6E+03	1.6E-03	1.6E-03	16.94%
	1.1E-03	1.1E-09		
CADMIUM	2.9E-01	2.9E-07		
CHROMIUM	2.9E+02	2.9E-04	2.9E-04	2.98%
TOTALS	9.7E+03	9.7E-03	9.7E-03	100.00%

RESIDUAL RISK = 3.0E-07

Site SP-SA-3c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.5E+01	3.5E+01	83.14%
P-CHLOROPHENYLMETHYL SULFONE	3.6E-05		
DVT	1.0E-04		
DIELDRIN	4.7E+00	4.7E+00	11.09%
ENDRIN	1.5E-04		
ISODRIN	6.8E-03		
METHYLENE CHLORIDE	2.1E-07		
CADMIUM	2.3E-03		
CHROMIUM	3.5E-02		
COPPER	9.6E-04		
LEAD	2.5E+00	2.5E+00	5.77%
MERCURY	3.7E-03		
ZINC	1.1E-02		
TOTALS	4.3E+01	4.3E+01	100.00%

RESIDUAL HI = 6.0E-02

Site SP-SA 3d
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.7E+01	1.7E-05	1.7E-05	23.26%
CHLORDANE	1.9E+00	1.9E-06	1.9E-06	2.58%
DDC	1.3E-02	1.3E-08		
DDT	7.0E-01	7.0E-07		
DIELDRIN	5.5E+01	5.5E-05	5.5E-05	74.15%
TOTALS	7.5E+01	7.5E-05	7.4E-05	100.00%

RESIDUAL RISK = 7.1E-07

Site SP-SA-3d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	7.9E-02		
CHLORDANE	5.7E-02		
DDT	9.5E-03		
DIELDRIN	1.6E-01		
ENDRIN	4.7E-04		
HEXACHLOROCYCLOPENTADIENE	9.5E-04		
ISODRIN	1.3E-03		
LEAD	3.1E-02		
ZINC	6.9E-04		
TOTALS	3.4E-01	0.0E+00	.00%
RESIDUAL HI = 3.4E-01			

Site SP-SA-3e
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	2.5E+01	2.5E-05	2.5E-05	100.00%
TOTALS	2.5E+01	2.5E-05	2.5E-05	100.00%

RESIDUAL RISK = 0.0E+00

Site SP-SA-3e
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
O,P-XYLENE	1.6E-06		
DICYCLOPENTADIENE	8.7E-01		
DIELDRIN	7.1E-02		
M-XYLENE	2.7E-05		
COPPER	7.2E-04		
LEAD	4.3E-02		
ZINC	7.9E-04		
TOTALS	9.9E-01	0.0E+00	.00%

RESIDUAL HI = 9.9E-01

Site SP-SA-4a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	9.4E+03	9.4E-03	9.4E-03	92.07%
CHLORDANE	6.1E+00	6.1E-06	6.1E-06	.06%
DDE	3.8E-01	3.8E-07		
DDT	4.2E-01	4.2E-07		
DIELDRIN	7.2E+02	7.2E-04	7.2E-04	7.01%
METHYLENE CHLORIDE	8.4E-01	8.4E-07	8.4E-07	.01%
CHROMIUM	8.7E+01	8.7E-05	8.7E-05	.85%
TOTALS	1.0E+04	1.0E-02	1.0E-02	100.00%

RESIDUAL RISK = 8.0E-07

Site SP-SA-4a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.3E+01	4.3E+01	93.68%
CHLORDANE	1.8E-01		
DDT	5.7E-03		
DIELDRIN	2.1E+00	2.1E+00	4.50%
ENDRIN	1.3E-02		
HEXACHLOROCYCLOPENTADIENE	4.9E-04		
ISODRIN	8.4E-01	8.4E-01	1.82%
METHYLENE CHLORIDE	3.8E-01		
CHROMIUM	1.1E-02		
COPPER	1.9E-03		
LEAD	3.1E-01		
MERCURY	1.8E-03		
ZINC	1.9E-03		
TOTALS	4.7E+01	4.6E+01	100.00%

RESIDUAL HI = 9.0E-01

Site SP-SA-4b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.3E+01	4.3E-05	4.3E-05	34.44%
DIELDRIN	8.2E+01	8.2E-05	8.2E-05	65.56%
METHYLENE CHLORIDE	2.0E-02	2.0E-08		
TETRACHLOROETHYLENE	7.7E-03	7.7E-09		
TOTALS	1.2E+02	1.2E-04	1.2E-04	100.00%

RESIDUAL RISK = 2.8E-08

Site SP-SA-4b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.0E-01		
P-CHLOROPHENYLMETHYL SULFONE	2.6E-05		
DIELDRIN	2.4E-01		
METHYL ISOBUTYL KETONE	6.0E-05		
METHYLENE CHLORIDE	3.8E-03		
TETRACHLOROETHYLENE	6.5E-05		
COPPER	1.3E-03		
LEAD	7.8E-02		
MERCURY	1.8E-03		
ZINC	2.0E-03		
TOTALS	5.2E-01	0.0E+00	.00%
RESIDUAL HI = 5.2E-01			

Site SP-SA-5a
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	4.1E+01	4.1E-05	4.1E-05	100.000
CADMIUM	3.3E-01	3.3E-07		
TOTALS	4.1E+01	4.1E-05	4.1E-05	100.000

RESIDUAL RISK = 3.3E-07

Site SP-SA-5a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	1.2E-01		
METHYL ISOBUTYL KETONE	2.9E-05		
CADMIUM	2.6E-03		
COPPER	1.8E-03		
LEAD	5.5E-02		
MERCURY	6.9E-03		
ZINC	1.9E-03		
TOTALS	1.9E-01	0.0E+00	.00%
RESIDUAL HI -	1.9E-01		

Site SP-SA-5b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.3E-01	5.3E-07		
CHLORDANE	2.3E-01	2.3E-07		
DDE	1.9E-03	1.9E-09		
DOT	3.1E-02	3.1E-08		
DIELDRIN	5.7E+01	5.7E-05	5.7E-05	35.35%
METHYLENE CHLORIDE	3.5E-02	3.5E-08		
TRICHLOROETHYLENE	4.3E-03	4.3E-09		
CHROMIUM	1.0E+02	1.0E-04	1.0E-04	64.65%
TOTALS	1.6E+02	1.6E-04	1.6E-04	100.00%

RESIDUAL RISK = 8.4E-07

Site SP-SA-5b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.4E-03		
CHLORDANE	6.9E-03		
DDT	4.3E-04		
DICYCLOPENTADIENE	2.2E-01		
DIELDRIN	1.7E-01		
ENDRIN	6.7E-04		
ETHYLBENZENE	1.8E-05		
HEXACHLOROCYCLOPENTADIENE	1.4E-03		
ISODRIN	2.0E-04		
METHYLENE CHLORIDE	5.7E-03		
TOLUENE	4.5E-07		
CHROMIUM	1.3E-02		
COPPER	7.2E-04		
LEAD	9.1E-02		
MERCURY	1.1E-03		
ZINC	1.1E-03		
TOTALS	5.1E-01	0.0E+00	.00%
RESIDUAL HI = 5.1E-01			

Site SP-SA-6
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	3.3E+00	3.3E-06	3.3E-06	30.55%
ARSENIC	7.4E+00	7.4E-06	7.4E-06	69.45%
TOTALS	1.1E+01	1.1E-05	1.1E-05	100.00%

RESIDUAL RISK -- 9.1E-13

Site SP-SA-6
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	9.5E-03		
METHYL ISOBUTYL KETONE	3.5E-05		
ARSENIC	6.3E-03		
COPPER	1.4E-03		
LEAD	5.9E-02		
ZINC	1.1E-03		
TOTALS	7.8E-02	0.0E+00	.00%

RESIDUAL HI = 7.8E-02

Site SP-SA-7a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	4.1E+00	4.1E-06	4.1E-06	100.00%
TETRACHLOROETHYLENE	7.3E-03	7.3E-09		
TOTALS	4.1E+00	4.1E-06	4.1E-06	100.00%

RESIDUAL RISK = 7.3E-09

Site SP-SA-7a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	1.2E-02		
TETRACHLOROETHYLENE	3.6E-05		
TOTALS	1.2E-02	0.0E+00	.00%
RESIDUAL HI = 1.2E-02			

Site SP-SA-7b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.2E-01	4.2E-07		
DDT	7.5E-04	7.5E-10		
DDT	3.5E-01	3.5E-07		
DIELDRIN	2.0E+00	2.0E-06	2.0E-06	8.30%
ARSENIC	2.2E+01	2.2E-05	2.2E-05	91.70%
TOTALS	2.4E+01	2.4E-05	2.4E-05	100.00%

RESIDUAL RISK = 7.7E-07

Site SP-SA-7b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.9E-03		
DDT	4.7E-03		
DIELDRIN	5.7E-03		
ARSENIC	1.8E-02		
TOTALS	3.1E-02	0.0E+00	.00%

RESIDUAL HI = 3.1E-02

Site SP-SA-7c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
BENZENE	7.7E-01	7.7E-07		
DIELDRIN	3.3E+00	3.3E-06	3.3E-06	100.00%
TOTALS	4.0E+00	4.0E-06	3.3E-06	100.00%

RESIDUAL RISK = 7.7E-07

Site SP-SA-7c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	9.5E-03		
COPPER	9.5E-04		
ZINC	2.2E-03		
TOTALS	1.3E-02	0.0E+00	.00%

RESIDUAL HI = 1.3E-02

Site SP-SA-8a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	6.9E+02	6.9E-04	6.9E-04	2.67%
CHLORDANE	5.3E+02	5.3E-04	5.3E-04	2.04%
DDT	1.4E-02	1.4E-08		
DIELDRIN	1.7E+00	1.7E-06	1.7E-06	.01%
ARSENIC	2.5E+04	2.5E-02	2.5E-02	95.23%
	1.3E+01	1.3E-05	1.3E-05	.05%
TOTALS	2.6E+04	2.6E-02	2.6E-02	100.00%

RESIDUAL RISK = 1.5E-08

Site SP-SA-8a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.2E+00	3.2E+00	2.02%
CHLORDANE	1.6E+01	1.6E+01	10.08%
DDT	2.4E-02		
DIELDRIN	7.1E+01	7.1E+01	45.35%
ENDRIN	7.9E-02		
HEXACHLOROCYCLOPENTADIENE	5.8E+01	5.8E+01	37.16%
ISODRIN	8.4E+00	8.4E+00	5.40%
ARSENIC	1.1E-02		
COPPER	6.8E-04		
MERCURY	2.4E-03		
ZINC	7.2E-04		
TOTALS	1.6E+02	1.6E+02	100.00%

RESIDUAL HI = 1.2E-01

Site SP-SA-8b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	8.6E+02	8.6E-04	8.6E-04	51.24%
DDE	1.2E-03	1.2E-09		
DDT	4.0E-02	4.0E-08		
DIELDRIN	8.2E+02	8.2E-04	8.2E-04	48.76%
TOTALS	1.7E+03	1.7E-03	1.7E-03	100.00%

RESIDUAL RISK = 4.1E-08

Site SP-SA-8b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.9E+00	3.9E+00	62.50%
P-CHLOROPHENYLMETHYL SULFONE	2.5E-05		
DDT	5.4E-04		
DIELDRIN	2.4E+00	2.4E+00	37.50%
ENDRIN	1.3E-04		
ISODRIN	3.7E-03		
COPPER	7.5E-04		
LEAD	6.4E-02		
MERCURY	1.3E-03		
ZINC	7.2E-04		
TOTALS	6.4E+00	6.3E+00	100.00%

RESIDUAL HI = 7.1E-02

Site SP-SA-8c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site SP-SA-8c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
----------	----	------------------------------------	--

TOTALS	0.0E+00	0.0E+00	.00%
--------	---------	---------	------

RESIDUAL HI - 0.0E+00

Site SP-SA-9a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.6E-01	5.6E-07	5.6E-07	1.31%
BENZENE	2.3E-03	2.3E-09		
CHLORDANE	4.8E-01	4.8E-07		
DDE	1.2E+00	1.2E-06	1.2E-06	2.71%
DOT	1.9E-01	1.9E-07		
DIELDRIN	4.1E+01	4.1E-05	4.1E-05	95.98%
TOTALS	4.3E+01	4.3E-05	4.3E-05	100.00%

RESIDUAL RISK = 6.7E-07

Site SP-SA-9a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.6E-03		
CHLORDANE	1.4E-02		
DDT	2.6E-03		
DIELDRIN	1.2E-01		
ENDRIN	1.3E-03		
ISODRIN	3.2E-04		
MERCURY	5.0E-04		
TOTALS	1.4E-01	0.0E+00	.00%
RESIDUAL HI = 1.4E-01			

Site SP-SA-9b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site SP-SA-9b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
LEAD	3.4E-02		
ZINC	6.7E-04		
TOTALS	3.5E-02	0.0E+00	.00%
RESIDUAL HI = 3.5E-02			

Site SP-SA-10
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.4E+05	3.4E-01	3.4E-01	93.15%
BENZENE	3.2E-01	3.2E-07		
CARBON TETRACHLORIDE	1.4E+01	1.4E-05	1.4E-05	.00%
CHLOROFORM	1.4E+00	1.4E-06	1.4E-06	.00%
DDE	1.2E+00	1.2E-06	1.2E-06	.00%
DDT	8.7E+01	8.7E-05	8.7E-05	.02%
DIBROMOCHLOROPROPANE	2.3E+04	2.3E-02	2.3E-02	6.24%
1,2-DICHLOROETHANE	1.8E+00	1.8E-06	1.8E-06	.00%
DIELDRIN	1.6E+03	1.6E-03	1.6E-03	.44%
METHYLENE CHLORIDE	4.1E-02	4.1E-08		
TETRACHLOROETHYLENE	2.2E+00	2.2E-06	2.2E-06	.00%
1,1,2-TRICHLOROETHANE	2.4E-02	2.4E-08		
TRICHLOROETHYLENE	3.4E-03	3.4E-09		
ARSENIC	4.6E+02	4.6E-04	4.6E-04	.12%
CADMIUM	4.4E+00	4.4E-06	4.4E-06	.00%
CHROMIUM	5.6E+01	5.6E-05	5.6E-05	.02%
TOTALS	3.7E+05	3.7E-01	3.7E-01	100.00%

RESIDUAL RISK = 3.3E-07

Site SP-SA-10
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.6E+03	1.6E+03	97.91%
ATRAZINE	2.4E-03		
BICYCLOHEPTADIENE	3.3E-03		
CARBON TETRACHLORIDE	1.6E-01		
CHLOROACETIC ACID	1.5E-03		
CHLOROBENZENE	5.0E-02		
CHLOROFORM	1.8E-05		
P-CHLOROPHENYLMETHYL SULFONE	1.2E+00	1.2E+00	.07%
DDT	1.2E+00		
DICYCLOPENTADIENE	7.7E-03		
DIELDRIN	4.7E+00	4.7E+00	.29%
ETHYLENE	2.4E-04		
HEXACHLOROCYCLOPENTADIENE	1.0E+01	1.0E+01	.65%
ISODRIN	1.7E+01	1.7E+01	1.05%
METHYL ISOBUTYL KETONE	1.3E-04		
METHYLENE CHLORIDE	1.7E-02		
PARATHION	5.9E-03		
SUPONA	2.4E-01		
TETRACHLOROETHYLENE	1.1E-02		
THIODIGLYCOL	5.3E-04		
TOLUENE	1.2E-03		
1,1,1-TRICHLOROETHANE	6.4E-06		
1,1,2-TRICHLOROETHANE	2.4E-04		
M-XYLENE	1.4E-04		
O,P-XYLENE	5.6E-05		
ARSENIC	3.9E-01	3.9E-01	.02%
CADMIUM	3.6E-02		
CHROMIUM	6.8E-03		
COPPER	2.6E-02		
LEAD	4.4E-02		
MERCURY	1.9E-02		
ZINC	5.9E-03		
TOTALS	1.6E+03	1.6E+03	100.00%
RESIDUAL HI = 9.9E-01			

Site SP-SA-11
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	6.0E+01	6.0E-05	6.0E-05	96.08%
CHLORFORM	9.3E-02	9.3E-08		
DIELDRIN	2.5E+00	2.5E-06	2.5E-06	3.92%
TOTALS	6.3E+01	6.3E-05	6.3E-05	100.00%

RESIDUAL RISK = 9.3E-08

Site SP-SA-11
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.8E-01		
CHLOROFORM	3.2E-03		
DIELDRIN	7.1E-03		
COPPER	9.1E-04		
ZINC	7.9E-04		
TOTALS	2.9E-01	0.0E+00	.00%

RESIDUAL HI = 2.9E-01

Site SP-SA-12
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.3E+00	4.3E-06	4.3E-06	4.99%
DIELDRIN	8.2E+01	8.2E-05	8.2E-05	95.01%
TETRACHLOROETHYLENE	3.9E-05	3.9E-11		
TOTALS	8.6E+01	8.6E-05	8.6E-05	100.00%

RESIDUAL RISK = 3.6E-11

Site SP-SA-12
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.0E-02		
DICYCLOPENTADIENE	5.9E-03		
DIELDRIN	2.4E-01		
TETRACHLOROETHYLENE	2.7E-06		
COPPER	6.1E-04		
LEAD	1.8E-02		
MERCURY	1.6E-03		
ZINC	7.9E-04		
TOTALS	2.8E-01	0.0E+00	.00%
RESIDUAL HI = 2.8E-01			

Site SP-SAL2a
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	8.6E-01	8.6E-07		
DDE	2.4E-03	2.4E-09		
DDT	4.0E-03	4.0E-09		
DIELDRIN	9.8E+00	9.8E-06	9.8E-06	100.00%
1,1,2,2-TETRACHLOROETHANE	1.0E-01	1.0E-07		
TETRACHLOROETHYLENE	7.3E-03	7.3E-09		
TOTALS	1.1E+01	1.1E-05	9.8E-06	100.00%

RESIDUAL RISK = 9.8E-07

Site SP-SAL2b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	8.6E+02	8.6E-04	8.6E-04	96.33%
DIELDRIN	3.3E+01	3.3E-05	3.3E-05	3.67%
TOTALS	8.9E+02	8.9E-04	8.9E-04	100.00%

RESIDUAL RISK = 5.8E-11

Site SP-SAI2a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.9E-03		
DDT	5.4E-05		
DIELDRIN	2.8E-02		
ENDRIN	5.5E-04		
HEXACHLOROCYCLOPENTADIENE	2.1E-04		
ISODRIN	4.6E-05		
TETRACHLOROETHYLENE	3.7E-05		
COPPER	6.5E-03		
MERCURY	5.4E-04		
ZINC	1.2E-03		
TOTALS	4.1E-02	0.0E+00	.00%

RESIDUAL HI = 4.1E-02

Site SP-SAI2b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.9E+00	3.9E+00	100.00%
DIELDRIN	9.5E-02		
ISODRIN	6.8E-02		
COPPER	5.6E-03		
LEAD	3.5E-02		
MERCURY	6.9E-03		
ZINC	1.1E-03		
TOTALS	4.2E+00	3.9E+00	100.00%
RESIDUAL HI - 2.1E-01			

NORTH PLANTS STUDY AREA

Site NP-SA-1
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	5.7E-08	5.7E-14		
CADMIUM	4.4E-01	4.4E-07		
TOTALS	4.4E-01	4.4E-07	0.0E+00	.00%
RESIDUAL RISK = 4.4E-07				

Site NP-SR-1
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	1.7E-10		
CADMIUM	3.6E-03		
TOTALS	3.6E-03	0.0E+00	.00%

RESIDUAL HI = 3.6E-03

Site NP-SA-2
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
BENZENE	1.5E-02	1.5E-08		
CHLOROFORM	2.0E-03	2.0E-09		
TETRACHLOROETHYLENE	1.5E-02	1.5E-08		
TOTALS	3.2E-02	3.2E-08	0.0E+00	.00%

RESIDUAL RISK = 3.2E-08

Site NP-SA-2
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHLOROFORM	7.2E-05		
TETRACHLOROETHYLENE	7.2E-05		
ZINC	5.8E-04		
TOTALS	7.2E-04	0.0E+00	.00%
RESIDUAL HI = 7.2E-04			

Site NP-SA-3
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	2.5E+00	2.5E-06	2.5E-06	65.90%
TETRACHLOROETHYLENE	7.5E-03	7.5E-09		
CADMIUM	1.3E+00	1.3E-06	1.3E-06	34.10%
TOTALS	3.7E+00	3.7E-06	3.7E-06	100.00%

RESIDUAL RISK = 7.5E-09

Site NP-SA-3
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	7.1E-03		
DIISOPROPYLMETHYL PHOSPHONATE	7.2E-07		
TETRACHLOROETHYLENE	4.9E-05		
CADMIUM	1.0E-02		
LEAD	5.0E-02		
ZINC	8.6E-04		
TOTALS	6.8E-02	0.0E+00	.00%

RESIDUAL HI = 6.8E-02

Site NP-SA-4
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK - 0.0E+00

Site NP-SA-4
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHLOROACETIC ACID	1.4E-01		
ZINC	6.7E-04		
TOTALS	1.4E-01	0.0E+00	.00%
RESIDUAL HI = 1.4E-01			

Site NP-SA-5
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
BENZENE	2.2E-02	2.2E-08		
ARSENIC	1.5E+02	1.5E-04	1.5E-04	98.87%
CADMIUM	1.7E+00	1.7E-06	1.7E-06	1.13%
TOTALS	1.5E+02	1.5E-04	1.5E-04	100.00%

RESIDUAL RISK = 2.2E-08

Site NP-SA-5
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIISOPROPYLMETHYL PHOSPHONATE	2.4E-05		
1,1,1-TRICHLOROETHANE	1.0E-05		
ARSENIC	1.3E-01		
CADMIUM	1.4E-02		
COPPER	1.2E-03		
LEAD	8.7E-02		
MERCURY	6.3E-04		
ZINC	1.9E-03		
TOTALS	2.3E-01	0.0E+00	.00%

RESIDUAL HI = 2.3E-01

Site NP-SA-6
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.8E-01	2.8E-07		
BENZENE	1.3E-02	1.3E-08		
DIELDRIN	2.5E+01	2.5E-05	2.5E-05	.82%
ARSENIC	3.0E+03	3.0E-03	3.0E-03	99.18%
CADMIUM	5.9E-01	5.9E-07		
TOTALS	3.0E+03	3.0E-03	3.0E-03	100.00%

RESIDUAL RISK = 8.9E-07

SITE NP SA 6
NON-AROMATIC

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALUMINUM	1.3E-03		
DIELDRIN	7.1E-02		
DIISOPROPYL METHYL PHOSPHONATE	3.1E-05		
ARSENIC	2.5E+00	2.5E+00	100.00%
CALCIUM	4.8E-03		
COPPER	7.0E-04		
LEAD	5.0E-02		
MERCURY	6.3E-03		
ZINC	1.2E-03		
TOTALS	2.7E+00	2.5E+00	100.00%

RESIDUAL HI - 1.4E-01

Site NP SA 7
CARCINXEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%
--------	---------	---------	---------	------

RESIDUAL RISK = 0.0E+00

Site NP-SA-7
NONCARCINOGEN

FRACTIONAL
HI OF
CONTRIBUTING
CHEMICALS (%)

HI OF
CONTRIBUTING
CHEMICALS

HI

CHEMICAL

.00%

0.0E+00 0.0E+00

0.0E+00

TOTALS

RESIDUAL HI = 0.0E+00

Site NP-SA-8a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site NP-SN-8a
 NTNCARCINOGEN

CHEMICAL	FRACTIONAL	
	HI OF	CONTRIBUTING
	HI	CHEMICALS (%)
LEAD	2.1E-02	
MERCURY	2.8E-04	
ZINC	8.6E-04	
TOTALS	2.2E-02	0.0E+00

RESIDUAL HI = 2.2E-02

Site NP-SA-8b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TETRACHLOROETHYLENE	7.3E-03	7.3E-09		
TOTALS	7.3E-03	7.3E-09	0.0E+00	.004
RESIDUAL RISK = 7.3E-09				

Site NP-SA-8b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
TETRACHLOROETHYLENE	3.5E-05		
MERCURY	4.3E-04		
ZINC	1.5E-03		
TOTALS	2.0E-03	0.0E+00	.00%

RESIDUAL HI = 2.0E-03

Site NP-SA-8c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ARSENIC	3.1E+01	3.1E-05	3.1E-05	100.00%
TOTALS	3.1E+01	3.1E-05	3.1E-05	100.00%

RESIDUAL RISK = 0.0E+00

Site NP-SA-8c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ARSENIC	2.6E-02		
MERCURY	9.8E-04		
TOTALS	2.7E-02	0.0E+00	.00%

RESIDUAL HI = 2.7E-02

Site NP-SA-9a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
BENZENE	6.0E-03	6.0E-09		
TOTALS	6.0E-03	6.0E-09	0.0E+00	.00%

RESIDUAL RISK = 6.0E-09

Site NP-SA-9a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
----------	----	------------------------------------	--

TOTALS	0.0E+00	0.0E+00	.00%
--------	---------	---------	------

RESIDUAL HI = 0.0E+00

Site NP-SA-9b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CHROMIUM	5.0E+01	5.0E-05	5.0E-05	100.00%
TOTALS	5.0E+01	5.0E-05	5.0E-05	100.00%

RESIDUAL RISK = 0.0E+00

Site NP-SA-9b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHROMIUM	6.0E-03		
TOTALS	6.0E-03	0.0E+00	.00%

RESIDUAL HI = 6.0E-03

Site NP-SA 9c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site NP-SA-9c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ZINC	6.1E-04		
TOTALS	6.1E-04	0.0E+00	.00%

RESIDUAL HI = 6.1E-04

Site NP-SA-9d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
BENZENE	1.5E-02	1.5E-08		
TOTALS	1.5E-02	1.5E-08	0.0E+00	.00%

RESIDUAL RISK = 1.5E-08

Site NP-SA-9d
NONCARCINOGEN

CHEMICAL	FRACTIONAL		
	HI	HI OF CONTRIBUTING CHEMICALS	HI OF CONTRIBUTING CHEMICALS (%)
ZINC	6.5E-04		
TOTALS	6.5E-04	0.0E+00	.00%

RESIDUAL HI = 6.5E-04

Site NP-SA-9f
CARCINOGEN

Chemical	EI	Risk	Risk of Contributing Chemicals	Fractional Risk of Contributing Chemicals (%)
ARSENIC	2.7E+01	2.7E-05	2.7E-05	100.00%
TOTALS	2.7E+01	2.7E-05	2.7E-05	100.00%

RESIDUAL RISK = 0.0E+00

Site NP-SA-9f
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ARSENIC	2.3E-02		
TOTALS	2.3E-02	0.0E+00	.00%
RESIDUAL HI = 2.3E-02			

CENTRAL STUDY AREA

Site C-SA-1a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.8E+03	5.8E-03	5.8E-03	62.34%
BENZENE	3.9E-01	3.9E-07	3.9E-07	.00%
CARBON TETRACHLORIDE	5.9E-01	5.9E-07	5.9E-07	.01%
CHLORDANE	2.9E-01	2.9E-07		
CHLOROFORM	3.2E-02	3.2E-08		
DDE	3.3E-01	3.3E-07		
DDT	4.7E-02	4.7E-08		
DIBROMOCHLOROPROPANE	5.0E+02	5.0E-04	5.0E-04	5.34%
1,2-DICHLOROETHANE	2.1E-02	2.1E-08		
1,1-DICHLOROETHYLENE	6.5E-02	6.5E-08		
DIELDRIN	3.0E+03	3.0E-03	3.0E-03	32.28%
METHYLENE CHLORIDE	4.0E-03	4.0E-09		
TETRACHLOROETHYLENE	2.4E+00	2.4E-06	2.4E-06	.03%
1,1,2-TRICHLOROETHANE	6.0E-03	6.0E-09		
TRICHLOROETHYLENE	1.7E-02	1.7E-08		
CADMIUM	4.6E-01	4.6E-07	4.6E-07	.00%
TOTALS	9.4E+03	9.4E-03	9.4E-03	100.00%

RESIDUAL RISK = 8.1E-07

Site C-SA-la
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.7E+01	2.7E+01	16.44%
BENZOTHIADIAZOLE	6.5E-02		
BICYCLOHEPTADIENE	1.8E-03		
CARBON TETRACHLORIDE	1.5E-02		
CHLORDANE	8.7E-03		
CHLOROBENZENE	6.7E-05		
CHLOROPHORM	1.2E-03		
P-CHLOROPHENYLMETHYL SULFIDE	6.6E-03		
P-CHLOROPHENYLMETHYL SULFONE	1.2E-03		
P-CHLOROPHENYLMETHYL SULFOXIDE	2.6E-04		
DDT	6.4E-04		
1,1-DICHLOROETHYLENE	2.8E-05		
DICYCLOPENTADIENE	1.2E-01		
DIELDRIN	8.8E+00	8.8E+00	5.37%
DIISOPROPYLMETHYL PHOSPHONATE	5.5E-04		
DIMETHYL DISULFIDE	1.6E-02		
DIMETHYL METHYL PHOSPHONATE	4.4E-05		
DITHIANE	1.4E-03		
ENDRIN	1.6E+00	1.6E+00	.97%
ETHYLBENZENE	1.2E-04		
FLUOROACETIC ACID	4.8E+00	4.8E+00	2.93%
HEXACHLOROCYCLOPENTADIENE	1.0E+02	1.0E+02	63.93%
ISODRIN	1.7E+01	1.7E+01	10.36%
METHYL ISOBUTYL KETONE	5.3E-04		
METHYLENE CHLORIDE	1.9E-03		
TETRACHLOROETHYLENE	1.2E-02		
TOLUENE	1.5E-03		
1,1,2-TRICHLOROETHANE	5.9E-05		
M-XYLENE	1.4E-05		
O,P-XYLENE	1.7E-05		
CADMIUM	3.7E-03		
LEAD	3.1E-02		
MERCURY	9.8E-04		
TOTALS	1.6E+02	1.6E+02	100.00%
RESIDUAL HI - 2.9E-01			

Site C-SA-1b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.2E+01	5.2E-05	5.2E-05	19.61%
BENZENE	4.4E-02	4.4E-08		
CHLORDANE	6.6E+01	6.6E-05	6.6E-05	25.04%
DDE	1.7E-01	1.7E-07		
DDT	4.7E+00	4.7E-06	4.7E-06	1.79%
DIBROMOCHLOROPROPANE	9.3E-01	9.3E-07	9.3E-07	.35%
DIELDRIN	1.1E+02	1.1E-04	1.1E-04	43.55%
METHYLENE CHLORIDE	9.5E-02	9.5E-08		
ARSENIC	2.5E+01	2.5E-05	2.5E-05	9.66%
TOTALS	2.6E+02	2.6E-04	2.6E-04	100.00%

RESIDUAL RISK = 3.1E-07

Site C-SA-1b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.4E-01		
CHLORDANE	2.0E+00	2.0E+00	21.86%
CHLOROACETIC ACID	1.9E-01		
P-CHLOROPHENYLMETHYL SULFIDE	5.7E-05		
DDT	6.4E-02		
DIELDRIN	3.3E-01		
DIISOPROPYLMETHYL PHOSPHONATE	7.1E-04		
DIMETHYL DISULFIDE	8.6E-04		
ENDRIN	5.5E-02		
FLUOROACETIC ACID	7.0E+00	7.0E+00	78.14%
HEXACHLOROCYCLOPENTADIENE	9.0E-04		
ISODRIN	1.5E-02		
ISOPROPYL METHYL PHOSPHONIC ACID	2.2E-04		
METHYLENE CHLORIDE	3.8E-03		
TOLUENE	1.4E-05		
ARSENIC	2.2E-02		
LEAD	2.5E-02		
MERCURY	5.2E-02		
TOTALS	1.0E+01	9.0E+00	100.00%

RESIDUAL HI = 1.0E+00

Site C-SA-1c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	8.6E+03	8.6E-03	8.6E-03	49.26%
CHLORDANE	4.8E+01	4.8E-05	4.8E-05	.26%
DDE	5.2E-01	5.2E-07		
DDT	4.0E-03	4.0E-09		
DIBROMOCHLOROPROPANE	1.5E-01	1.5E-07		
DIELDRIN	4.1E+03	4.1E-03	4.1E-03	23.44%
1,1,2,2-TETRACHLOROETHANE	8.3E+01	8.3E-05	8.3E-05	.47%
TETRACHLOROETHYLENE	2.5E+01	2.5E-05	2.5E-05	.14%
ARSENIC	6.8E+01	6.8E-05	6.8E-05	.39%
CADMIUM	4.3E+00	4.3E-06	4.3E-06	.02%
CHROMIUM	4.5E+03	4.5E-03	4.5E-03	26.01%
TOTALS	1.7E+04	1.7E-02	1.7E-02	100.00%

RESIDUAL RISK = 6.8E-07

Site C-SA-1c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.9E+01	3.9E+01	66.33%
CHLORDANE	1.4E+00	1.4E+00	2.32%
DDT	5.4E-05		
DIELDRIN	1.2E+01	1.2E+01	19.90%
DIISOPROPYLMETHYL PHOSPHONATE	3.4E-04		
DITHIANE	4.1E-02		
ENDRIN	6.3E-03		
FLUOROACETIC ACID	3.0E+00	3.0E+00	5.08%
HEXACHLOROCYCLOPENTADIENE	2.9E-03		
ISODRIN	8.5E-03		
ISOPROPYL METHYL PHOSPHONIC ACID	1.3E-04		
1,4-OXATHIANE	2.0E-05		
TETRACHLOROETHYLENE	1.5E-01		
TOLUENE	1.3E-05		
O,P-XYLENE	9.1E-06		
ARSENIC	5.8E-02		
CADMIUM	3.5E-02		
CHROMIUM	5.5E-01	5.5E-01	.92%
COPPER	4.9E-01		
LEAD	3.2E+00	3.2E+00	5.45%
MERCURY	8.7E-03		
ZINC	8.6E-02		
TOTALS	6.0E+01	5.9E+01	100.00%

RESIDUAL HI = 8.9E-01

Site C-SA-1d
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	6.0E+01	6.0E-05	6.0E-05	39.78%
DIELDRIN	8.2E+01	8.2E-05	8.2E-05	54.08%
METHYLENE CHLORIDE	1.3E-03	1.3E-09		
ARSENIC	9.3E+00	9.3E-06	9.3E-06	6.15%
CADMIUM	6.7E-01	6.7E-07		
TOTALS	1.5E+02	1.5E-04	1.5E-04	100.00%

RESIDUAL RISK 6/1/07

Site C-SA-1d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.8E-01		
P-CHLOROPHENYLMETHYL SULFIDE	5.0E-04		
P-CHLOROPHENYLMETHYL SULFONE	6.5E-05		
P-CHLOROPHENYLMETHYL SULFOXIDE	2.9E-04		
DIELDRIN	2.4E-01		
ENDRIN	3.9E-03		
FLUOROACETIC ACID	3.8E+00	3.8E+00	100.00%
ISODRIN	8.4E-03		
METHYLENE CHLORIDE	2.6E-07		
TOLUENE	1.7E-06		
ARSENIC	7.9E-03		
CADMIUM	5.4E-03		
COPPER	1.3E-03		
LEAD	3.7E-02		
MERCURY	4.6E-03		
ZINC	1.8E-03		
TOTALS	4.4E+00	3.8E+00	100.00%

RESIDUAL HI = 5.8E-01

Site C-SA-2a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	2.5E+01	2.5E-05	2.5E-05	100.00%
CADMIUM	3.8E-01	3.8E-07		
TOTALS	2.5E+01	2.5E-05	2.5E-05	100.00%
RESIDUAL RISK = 3.8E-07				

Site C-SA-2a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	7.1E-02		
FLUORACETIC ACID	6.8E-01		
CADMIUM	3.1E-03		
COPPER	1.6E-03		
LEAD	7.3E-02		
MERCURY	2.8E-04		
ZINC	1.9E-03		
TOTALS	8.3E-01	0.0E+00	.00%
RESIDUAL HI = 8.3E-01			

Site C-SA-2b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	8.1E-01	8.1E-07		
DDE	3.5E-04	3.5E-10		
DDT	5.2E-04	5.2E-10		
DIELDRIN	1.6E+01	1.6E-05	1.6E-05	100.00%
TOTALS	1.7E+01	1.7E-05	1.6E-05	100.00%

RESIDUAL RISK = 8.1E-07

Site C-SA-2b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.7E-03		
DDT	7.1E-06		
DIELDRIN	4.7E-02		
ENDRIN	3.9E-05		
ISODRIN	5.1E-05		
TOLUENE	4.0E-06		
COPPER	4.2E-03		
LEAD	3.8E-02		
MERCURY	2.4E-03		
ZINC	1.4E-03		
TOTALS	9.7E-02	0.0E+00	.00%

RESIDUAL HI = 9.7E-02

Site C-SA-2c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site C-SA-2c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
BENZOTHIAZOLE	1.1E-04		
TOLUENE	3.2E-05		
MERCURY	3.7E-04		
TOTALS	5.1E-04	0.0E+00	.00%

RESIDUAL HI = 5.1E-04

Site C-SA-2d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK - 0.0E+00

Site C-SA-2d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
TOLUENE	2.3E-06		
TOTALS	2.3E-06	0.0E+00	.00%
RESIDUAL HI = 2.3E-06			

Site C-SA-3
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site C-SA-3
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIISOPROPYLMETHYL PHOSPHONATE	1.5E-05		
MERCURY	1.4E-03		
TOTALS	1.4E-03	0.0E+00	.00%
RESIDUAL HI = 1.4E-03			

Site C-SA-4
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.6E-01	1.6E-07		
CHLORDANE	1.8E-01	1.8E-07		
DDP	2.1E-03	2.1E-09		
DDT	2.4E-03	2.4E-09		
DIELDRIN	4.8E+00	4.8E-06	4.8E-06	100.00%
CADMIUM	4.3E-01	4.3E-07		
TOTALS	5.6E+00	5.6E-06	4.8E-06	100.00%

RESIDUAL RISK = 7.8E-07

Site C-SA-4
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	7.5E-04		
CHLORDANE	5.3E-03		
DDT	3.3E-05		
DIELDRIN	1.4E-02		
ENDRIN	3.5E-04		
ISODRIN	1.0E-04		
CADMIUM	3.5E-03		
COPPER	1.2E-03		
LEAD	2.7E-02		
MERCURY	2.6E-03		
ZINC	7.9E-04		
TOTALS	5.6E-02	0.0E+00	.00%
RESIDUAL HI = 5.6E-02			

NORTH CENTRAL STUDY AREA

Site NC-SA-1a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.4E+03	3.4E-03	3.4E-03	33.68%
BENZENE	2.4E-02	2.4E-08		
CHLORDANE	2.6E+02	2.6E-04	2.6E-04	2.58%
CHLOROFORM	8.7E-04	8.7E-10		
DDE	1.7E+00	1.7E-06	1.7E-06	.02%
DDT	1.0E+01	1.0E-05	1.0E-05	.10%
DIBROMOCHLOROPROPANE	5.0E-03	5.0E-09		
DIELDRIN	5.7E+03	5.7E-03	5.7E-03	56.08%
METHYLENE CHLORIDE	8.1E-03	8.1E-09		
TETRACHLOROETHYLENE	8.0E-02	8.0E-08		
TRICHLOROETHYLENE	6.3E-03	6.3E-09		
ARSENIC	6.8E+02	6.8E-04	6.8E-04	6.68%
CADMIUM	1.1E+00	1.1E-06	1.1E-06	.01%
CHROMIUM	8.7E+01	8.7E-05	8.7E-05	.85%
TOTALS	1.0E+04	1.0E-02	1.0E-02	100.00%

RESIDUAL RISK = 1.2E-07

Site NC-SA-1a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.6E+01	1.6E+01	33.24%
CHLORDANE	7.9E+00	7.9E+00	16.62%
CHLOROBENZENE	3.0E-04		
CHLOROPH	3.2E-05		
P-CHLOROPHENYLMETHYL SULFIDE	3.2E-04		
P-CHLOROPHENYLMETHYL SULFONE	1.2E-04		
P-CHLOROPHENYLMETHYL SULFOXIDE	3.6E-04		
DDT	1.4E-01		
DICYCLOPENTADIENE	2.6E-03		
DIELDRIN	1.7E+01	1.7E+01	34.90%
DIISOPROPYLMETHYL PHOSPHONATE	1.5E-04		
DITHIANE	9.5E-05		
ENDRIN	3.5E-01		
ETHYLBENZENE	8.5E-05		
FLUOROACETIC ACID	5.3E+00	5.3E+00	11.14%
HEXACHLOROCYCLOPENTADIENE	2.6E-01		
ISODRIN	8.3E-01	8.3E-01	1.74%
ISOPROPYL METHYL PHOSPHONIC ACID	1.9E-05		
METHYLENE CHLORIDE	3.8E-03		
TETRACHLOROETHYLENE	3.9E-04		
TOLUENE	3.4E-06		
M-XYLENE	1.5E-05		
O, P-XYLENE	1.5E-05		
ARSENIC	5.8E-01	5.8E-01	1.23%
CADMIUM	8.7E-03		
CHROMIUM	1.1E-02		
COPPER	3.7E-03		
LEAD	5.5E-02		
MERCURY	5.4E-01	5.4E-01	1.14%
ZINC	1.4E-03		
TOTALS	4.8E+01	4.7E+01	100.00%

RESIDUAL HI = 8.4E-01

Site NC-SA-1b
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.2E+03	5.2E-03	5.2E-03	80.66%
BENZENE	1.2E-01	1.2E-07		
CHLORDANE	2.0E+01	2.0E-05	2.0E-05	.31%
CHLOROFORM	3.1E-02	3.1E-08		
DDE	4.4E+00	4.4E-06	4.4E-06	.07%
DDT	1.2E+00	1.2E-06	1.2E-06	.02%
DIBROMOCHLOROPROPANE	1.9E-02	1.9E-08		
DIELDRIN	9.8E+02	9.8E-04	9.8E-04	15.35%
METHYLENE CHLORIDE	1.4E-02	1.4E-08		
TETRACHLOROETHYLENE	6.1E-03	6.1E-09		
ARSENIC	2.3E+02	2.3E-04	2.3E-04	3.59%
CADMIUM	4.8E-01	4.8E-07		
TOTALS	6.4E+03	6.4E-03	6.4E-03	100.00%

RESIDUAL RISK = 6.7E-07

Site NC-SA-1b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.4E+01	2.4E+01	24.24%
CHLORDANE	5.9E-01	5.9E-01	.61%
CHLOROBENZENE	1.9E-04		
CHLOROFORM	1.1E-03		
P-CHLOROPHENYLMETHYL SULFIDE	1.2E-03		
P-CHLOROPHENYLMETHYL SULFONE	3.3E-03		
P-CHLOROPHENYLMETHYL SULFOXIDE	7.1E-04		
DDT	1.7E-02		
DICYCLOPENTADIENE	2.4E-02		
DIELDRIN	2.8E+00	2.8E+00	2.91%
ENDRIN	1.6E-01		
FLUOROACETIC ACID	6.5E+01	6.5E+01	67.05%
HEXACHLOROCYCLOPENTADIENE	5.8E-03		
ISODRIN	5.1E+00		
METHYLENE CHLORIDE	3.8E-03	5.1E+00	5.19%
TETRACHLOROETHYLENE	3.2E-05		
TOLUENE	1.6E-05		
ARSENIC	2.0E-01		
CADMIUM	3.9E-03		
COPPER	4.7E-03		
LEAD	1.0E-01		
MERCURY	2.4E-01		
ZINC	3.6E-03		
TOTALS	9.8E+01	9.8E+01	100.00%

RESIDUAL HI = 7.7E-01

Site NC-SA-1c
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.0E-01	4.0E-07		
CHLORDANE	7.2E-02	7.2E-08		
DDE	5.1E-02	5.1E-08		
DDT	1.7E-03	1.7E-09		
DIELDRIN	1.6E+01	1.6E-05	1.6E-05	31.65%
TETRACHLOROETHYLENE	4.9E-03	4.9E-09		
ARSENIC	3.5E+01	3.5E-05	3.5E-05	68.35%
TOTALS	5.2E+01	5.2E-05	5.2E-05	100.00%

RESIDUAL RISK = 5.3E-07

Site NC-SA-1c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.9E-03		
CHLORDANE	2.2E-03		
DDT	2.4E-05		
DIELDRIN	4.7E-02		
DIISOPROPYLMETHYL PHOSPHONATE	8.1E-05		
ENDRIN	7.9E-03		
FLUOROACETIC ACID	2.3E+00	2.3E+00	100.00%
ISODRIN	3.9E-04		
TETRACHLOROETHYLENE	2.4E-05		
ARSENIC	3.0E-02		
MERCURY	4.1E-03		
TOTALS	2.4E+00	2.3E+00	100.00%

RESIDUAL HI = 9.4E-02

Site NC-SA-1d
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.0E-01	4.0E-07		
CHLORDANE	7.2E-02	7.2E-08		
DDE	4.2E-03	4.2E-09		
DDT	7.2E-03	7.2E-09		
DIBROMOCHLOROPROPANE	9.5E-03	9.5E-09		
DIELDRIN	1.6E+01	1.6E-05	1.6E-05	67.00%
ARSENIC	8.1E+00	8.1E-06	8.1E-06	33.00%
TOTALS	2.5E+01	2.5E-05	2.4E-05	100.00%

RESIDUAL RISK = 4.9E-07

Site NC-SA-1d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.0E-03		
CHLORDANE	2.2E-03		
DDT	9.7E-05		
DIELDRIN	4.7E-02		
ENDRIN	7.1E-04		
HEXACHLOROCYCLOPENTADIENE	2.0E-05		
ISODRIN	5.1E-05		
ARSENIC	6.9E-03		
COPPER	7.7E-04		
MERCURY	1.5E-03		
TOTALS	6.1E-02	0.0E+00	.00%
RESIDUAL HI = 6.1E-02			

Site NC-SA-le
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	8.6E+01	8.6E-05	8.6E-05	7.23%
CHLORDANE	6.6E+00	6.6E-06	6.6E-06	.55%
DIELDRIN	2.5E+02	2.5E-04	2.5E-04	20.65%
ARSENIC	7.4E+02	7.4E-04	7.4E-04	62.57%
CADMIUM	2.2E+00	2.2E-06	2.2E-06	.19%
CHROMIUM	1.0E+02	1.0E-04	1.0E-04	8.81%
TOTALS	1.2E+03	1.2E-03	1.2E-03	100.00%

RESIDUAL RISK = 1.2E-10

Site NC-SA-le
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.9E-01	3.9E-01	22.68%
CHLORDANE	2.0E-01		
DIELDRIN	7.1E-01	7.1E-01	40.82%
DIISOPROPYLMETHYL PHOSPHONATE	1.6E-05		
DITHIANE	1.2E-04		
ENDRIN	3.9E-03		
HEXACHLOROCYCLOPENTADIENE	1.9E-04		
ISODRIN	6.9E-02		
ARSENIC	6.3E-01	6.3E-01	36.50%
CADMIUM	1.8E-02		
CHROMIUM	1.3E-02		
COPPER	3.3E-03		
LEAD	2.1E-01		
MERCURY	1.4E-01		
ZINC	5.7E-03		
TOTALS	2.4E+00	1.7E+00	100.00%

RESIDUAL HI = 6.6E-01

Site NC-SA-1f
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.7E-01	3.7E-07		
CHLORDANE	7.2E-02	7.2E-08		
DDE	7.0E-03	7.0E-09		
DDT	7.2E-03	7.2E-09		
DIELDRIN	1.6E+01	1.6E-05	1.6E-05	9.50%
ARSENIC	1.5E+02	1.5E-04	1.5E-04	89.95%
CADMIUM	9.6E-01	9.6E-07	9.6E-07	.55%
TOTALS	1.7E+02	1.7E-04	1.7E-04	100.00%

RESIDUAL RISK = 4.6E-07

Site NC-SA-1f
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.7E-03		
CHLORDANE	2.2E-03		
DDT	9.7E-05		
DIELDRIN	4.7E-02		
ENDRIN	7.5E-04		
FLUORACETIC ACID	1.0E+00	1.0E+00	100.00%
HEXACHLOROCYCLOPENTADIENE	1.8E-03		
ISODRIN	7.6E-04		
ARSENIC	1.3E-01		
CADMIUM	7.7E-03		
MERCURY	1.7E-03		
TOTALS	1.2E+00	1.0E+00	100.00%

RESIDUAL HI = 2.0E-01

Site NC-SA-1g
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-1g
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	.00%

RESIDUAL HI = 0.0E+00

Site NC-SA-2a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.4E+02	3.4E-04	3.4E-04	63.42%
DDP	1.7E-01	1.7E-07		
DDT	3.3E-02	3.3E-08		
DIELDRIN	1.6E+02	1.6E-04	1.6E-04	30.18%
ARSENIC	3.5E+01	3.5E-05	3.5E-05	6.40%
TOTALS	5.4E+02	5.4E-04	5.4E-04	100.00%

RESIDUAL RISK = 2.1E-07

Site NC SA-2a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.6E+00	1.6E+00	100.00%
DDT	4.5E-04		
DIELDRIN	4.7E-01		
DIISOPROPYLMETHYL PHOSPHONATE	9.0E-05		
ENDRIN	1.7E-03		
ETHYLBENZENE	6.7E-06		
FLUOROACETIC ACID	2.1E-05		
ISOBORN	3.2E-03		
M-XYLENE	1.4E-05		
O,P-XYLENE	5.8E-06		
ARSENIC	3.0E-02		
COPPER	2.8E-03		
LEAD	4.5E-02		
MERCURY	2.8E-03		
ZINC	8.6E-04		
TOTALS	2.1E+00	1.6E+00	100.00%

RESIDUAL HI = 5.6E-01

Site NC-SA-2b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.3E+01	4.3E-05	4.3E-05	35.57%
DDE	9.1E-03	9.1E-09		
DDT	5.2E-03	5.2E-09		
DIELDRIN	2.5E+01	2.5E-05	2.5E-05	20.31%
ARSENIC	5.3E+01	5.3E-05	5.3E-05	44.12%
CALCIUM	5.1E-01	5.1E-07		
TOTALS	1.2E+02	1.2E-04	1.2E-04	100.00%

RESIDUAL RISK = 5.2E-07

Site NC-SA-2b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.0E-01		
P-CHLOROPHENYLMETHYL SULFONE	4.2E-05		
DDT	7.1E-05		
DIELDRIN	7.1E-02		
ENDRIN	1.1E-04		
FLUOROACETIC ACID	4.0E+00	4.0E+00	100.00%
ISODRIN	1.5E-04		
ARSENIC	4.5E-02		
CADMIUM	4.1E-03		
COPPER	7.9E-04		
LEAD	4.2E-01		
MERCURY	2.8E-03		
ZINC	1.4E-03		
TOTALS	4.8E+00	4.0E+00	100.00%

RESIDUAL HI = 7.4E-01

Site NC-SA-2c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	8.2E+00	8.2E-06	8.2E-06	13.47%
METHYLENE CHLORIDE	3.1E-03	3.1E-09		
ARSENIC	1.2E+01	1.2E-05	1.2E-05	20.41%
CHROMIUM	4.0E+01	4.0E-05	4.0E-05	66.12%
TOTALS	6.1E+01	6.1E-05	6.1E-05	100.00%

RESIDUAL RISK = 3.1E-09

Site NC-SA-2c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
P-CHLOROPHENYLMETHYL SULFONE	2.4E-05		
DIELDRIN	2.4E-02		
DIISOPROPYLMETHYL PHOSPHONATE	1.4E-05		
ENDRIN	2.4E-05		
FLUOROACETIC ACID	1.5E+00	1.5E+00	100.00%
METHYLENE CHLORIDE	7.6E-04		
ARSENIC	1.1E-02		
CHROMIUM	4.9E-03		
LEAD	3.7E-02		
ZINC	6.2E-04		
TOTALS	1.5E+00	1.5E+00	100.00%

RESIDUAL HI = 7.8E-02

Site NC-SA-2d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL	
				CON CHEM	% (%)
ALDRIN	3.4E+01	3.4E-05	3.4E-05	40.12%	
DOE	2.8E-03	2.8E-09			
DIELDRIN	3.3E+01	3.3E-05	3.3E-05	38.18%	
ARSENIC	1.9E+01	1.9E-05	1.9E-05	21.70%	
TOTALS	8.6E+01	8.6E-05	8.6E-05	100.00%	

RESIDUAL RISK = 2.8E-09

Site NC-SA-2d
NONCARCINOGEN

CHEMICAL	HI OF CONTRIBUTING CHEMICALS		FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
	HI	HI OF CONTRIBUTING CHEMICALS	
ALDRIN	1.6E-01		
DIELDRIN	9.5E-02		
ENDRIN	1.6E-04		
ARSENIC	1.6E-02		
LEAD	5.9E-02		
MERCURY	3.7E-03		
ZINC	5.9E-04		
TOTALS	3.3E-01	0.0E+00	.00%
RESIDUAL HI = 3.3E-01			

Site NC-SA-3
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.4E+04	3.4E-02	3.4E-02	67.70%
BENZENE	4.5E-02	4.5E-08		
CHLOROFORM	2.3E-01	2.3E-07		
DIBROMOCHLOROPROPANE	1.4E+01	1.4E-05	1.4E-05	.03%
1,2-DICHLOROETHANE	4.6E-02	4.6E-08		
DIELDRIN	1.6E+04	1.6E-02	1.6E-02	32.21%
METHYLENE CHLORIDE	4.1E-06	4.1E-12		
1,1,2,2-TETRACHLOROETHANE	3.0E+00	3.0E-06	3.0E-06	.01%
TETRACHLOROETHYLENE	9.7E-01	9.7E-07	9.7E-07	.00%
ARSENIC	3.0E+01	3.0E-05	3.0E-05	.06%
TOTALS	5.1E+04	5.1E-02	5.1E-02	100.00%

RESIDUAL RISK = 3.2E-07

Site NC-SA-3
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.6E+02	1.6E+02	58.98%
BICYCLOHEPTADIENE	9.2E-04		
CHLOROACETIC ACID	4.7E+00	4.7E+00	1.75%
CHLOROBENZENE	3.3E-04		
CHLOROFORM	8.3E-03		
P-CHLOROPHENYLMETHYL SULFIDE	4.2E-02		
P-CHLOROPHENYLMETHYL SULFONE	1.8E-02		
P-CHLOROPHENYLMETHYL SULFOXIDE	4.2E-03		
DICYCLOPENTADIENE	3.4E+00	3.4E+00	1.29%
DIELDRIN	4.7E+01	4.7E+01	17.70%
DIISOPROPYLMETHYL PHOSPHONATE	4.5E-05		
DIMETHYL DISULFIDE	1.0E-02		
DIMETHYL METHYL PHOSPHONATE	4.6E-03		
ENDRIN	3.5E+00	3.5E+00	1.33%
ETHYLENEDIAMINE	9.5E-05		
ISODRIN	5.1E+01	5.1E+01	18.96%
ISOPROPYL METHYL PHOSPHONIC ACID	1.8E-02		
METHYL ISOBUTYL KETONE	1.0E-05		
METHYLENE CHLORIDE	7.9E-10		
TETRACHLOROETHYLENE	4.7E-03		
THIODIGLYCOL	1.7E-02		
TOLUENE	7.7E-03		
1,1,1-TRICHLOROETHANE	5.1E-06		
M-XYLENE	5.8E-06		
O,P-XYLENE	1.2E-05		
ARSENIC	2.5E-02		
COPPER	4.0E-02		
MERCURY	7.4E-04		
ZINC	2.3E-03		
TOTALS	2.7E+02	2.7E+02	100.00%

RESIDUAL HI = 2.0E-01

Site NC-SA-4a
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.6E+02	2.6E-04	2.6E-04	80.78%
DDT	3.7E-03	3.7E-09		
DIBROMOCHLOROPROPANE	1.0E-03	1.0E-09		
DIELDRIN	1.4E-04	1.4E-10		
METHYLENE CHLORIDE	6.1E+01	6.1E-05	6.1E-05	19.22%
TETRACHLOROETHYLENE	1.1E-01	1.1E-07		
TOTALS	3.2E+02	3.2E-04	3.2E-04	100.00%

RESIDUAL RISK = 1.2E-07

Site NC-SA-4a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.2E+00	1.2E+00	100.00%
DDT	1.4E-05		
DIELDRIN	1.8E-01		
ENDRIN	3.5E-02		
ISODRIN	1.7E-01		
METHYLENE CHLORIDE	3.8E-02		
TETRACHLOROETHYLENE	7.7E-06		
MERCURY	4.1E-04		
ZINC	7.2E-04		
TOTALS	1.6E+00	1.2E+00	100.00%
RESIDUAL HI = 4.2E-01			

Site NC-SA-4b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.0E+03	4.0E-03	4.0E-03	45.52%
CHLORDANE	2.9E-01	2.9E-07		
DDE	3.5E-02	3.5E-08		
DOT	9.8E+00	9.8E-06	9.8E-06	1.1%
DIBROMOCHLOROPROPANE	3.1E-02	3.1E-08		
DIELDRIN	4.8E+03	4.8E-03	4.8E-03	54.37%
METHYLENE CHLORIDE	2.8E-03	2.8E-09		
TOTALS	8.9E+03	8.9E-03	8.9E-03	100.00%

RESIDUAL RISK = 3.6E-07

Site NC-SA-4b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.9E+01	1.9E+01	55.66%
CHLORDANE	8.7E-03		
P-CHLOROPHENYLMETHYL SULFONE	4.8E-04		
DDT	1.3E-01		
DIELDRIN	1.4E+01	1.4E+01	41.92%
DIISOPROPYLMETHYL PHOSPHONATE	2.1E-06		
ENDRIN	3.2E-01		
FLUOROACETIC ACID	8.1E-01	8.1E-01	2.42%
HEXACHLOROCYCLOPENTADIENE	1.6E-05		
ISODRIN	2.5E-01		
METHYLENE CHLORIDE	1.3E-03		
COPPER	3.7E-02		
LEAD	8.2E-02		
MERCURY	1.4E-03		
ZINC	1.0E-02		
TOTALS	3.4E+01	3.3E+01	100.00%
RESIDUAL HI = 8.5E-01			

Site NC-SA-5a
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.6E+00	2.6E-06	2.6E-06	1.53%
CHLORDANE	3.6E+00	3.6E-06	3.6E-06	2.11%
DDE	1.0E-02	1.0E-08		
DDT	7.0E-04	7.0E-10		
DIELDRIN	5.7E+01	5.7E-05	5.7E-05	33.93%
ARSENIC	1.1E+02	1.1E-04	1.1E-04	62.43%
CADMIUM	3.8E-01	3.8E-07		
TOTALS	1.7E+02	1.7E-04	1.7E-04	100.00%

RESIDUAL RISK = 3.9E-07

Site NC-SA-5a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.2E-02		
CHLORDANE	1.1E-01		
DDT	9.5E-06		
DIELDRIN	1.7E-01		
DITHIANE	7.1E-04		
ENDRIN	2.8E-03		
FLUOROACETIC ACID	1.1E-06		
ARSENIC	9.0E-02		
CADMIUM	3.1E-03		
COPPER	7.0E-04		
LEAD	3.7E-02		
MERCURY	4.8E-03		
ZINC	1.0E-03		
TOTALS	4.2E-01	0.0E+00	.00%

RESIDUAL HI = 4.2E-01

Site NC-SA-5b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.6E+01	5.6E-05	5.6E-05	20.07%
CHLORDANE	6.6E+00	6.6E-06	6.6E-06	2.37%
DDE	2.8E-03	2.8E-09		
DIELDRIN	9.8E+01	9.8E-05	9.8E-05	35.26%
METHYLENE CHLORIDE	4.0E-03	4.0E-09		
1,1,2,2-TETRACHLOROETHANE	1.9E-06	1.9E-12		
ARSENIC	1.2E+02	1.2E-04	1.2E-04	42.30%
CADMIUM	4.3E-01	4.3E-07		
TOTALS	2.8E+02	2.8E-04	2.8E-04	100.00%

RESIDUAL RISK = 4.4E-07

Site NC-SA-5b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.6E-01		
CHLORDANE	2.0E-01		
DIELDRIN	2.8E-01		
DIISOPROPYLMETHYL PHOSPHONATE	7.4E-05		
DITHIANE	3.5E-03		
ENDRIN	1.4E-02		
FLUOROACETIC ACID	7.8E-01	7.8E-01	100.00%
ISODRIN	2.0E-04		
ISOPROPYL METHYL PHOSPHONIC ACID	2.2E-05		
METHYLENE CHLORIDE	1.9E-03		
ARSENIC	1.0E-01		
CADMIUM	3.5E-03		
COPPER	9.8E-04		
LEAD	5.9E-02		
MERCURY	5.0E-03		
ZINC	1.1E-03		
TOTALS	1.7E+00	7.8E-01	100.00%

RESIDUAL HI = 9.3E-01

Site NC-SA-5c
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.4E+02	3.4E-04	3.4E-04	45.67%
DDE	9.4E-03	9.4E-09		
DDT	7.2E-03	7.2E-09		
DIELDRIN	4.1E+02	4.1E-04	4.1E-04	54.33%
CADMIUM	3.0E-01	3.0E-07		
TOTALS	7.5E+02	7.5E-04	7.5E-04	100.00%

RESIDUAL RISK = 3.2E-07

Site NC-SA-5c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.6E+00	1.6E+00	57.14%
DDT	9.7E-05		
DIELDRIN	1.2E+00	1.2E+00	42.86%
ENDRIN	1.3E-04		
HEXACHLOROCYCLOPENTADIENE	1.1E-04		
ISODRIN	6.9E-04		
CADMIUM	2.4E-03		
LEAD	6.4E-01		
ZINC	2.3E-03		
TOTALS	3.4E+00	2.8E+00	100.00%

RESIDUAL HI = 6.4E-01

Site NC-SA-5d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	8.6E+00	8.6E-06	8.6E-06	25.17%
DIELDRIN	2.5E+01	2.5E-05	2.5E-05	71.84%
CADMIUM	1.0E+00	1.0E-06	1.0E-06	2.99%
TOTALS	3.4E+01	3.4E-05	3.4E-05	100.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-5d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.9E-02		
DIELDRIN	7.1E-02		
ENDRIN	3.2E-05		
CADMIUM	8.2E-03		
TOTALS	1.2E-01	0.0E+00	.00%
RESIDUAL HI = 1.2E-01			

Site NC-SA-6a
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.9E-05	5.9E-11		
CHLOROFORM	6.6E-04	6.6E-10		
DIELDRIN	1.8E-04	1.8E-10		
TOTALS	9.0E-04	9.0E-10	0.0E+00	.00%

RESIDUAL RISK = 9.0E-10

Site NC-SA-6a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.7E-07		
CHLOROFORM	1.8E-05		
P-CHLOROPHENYLMETHYL SULFONE	4.7E-07		
DIELDRIN	5.3E-07		
DIMETHYL DISULFIDE	6.7E-05		
ENDRIN	2.1E-07		
ISODRIN	7.0E-07		
METHYL ISOBUTYL KETONE	2.3E-05		
COPPER	1.1E-03		
ZINC	8.6E-04		
TOTALS	2.1E-03	0.0E+00	.00%
RESIDUAL HI = 2.1E-03			

Site NC-SA-6b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	7.7E+01	7.7E-05	7.7E-05	51.79%
CHLORDANE	7.2E-02	7.2E-08		
DDE	1.7E-01	1.7E-07		
DDT	3.5E-01	3.5E-07		
DIBROMOCHLOROPROPANE	2.3E-02	2.3E-08		
DIELDRIN	4.9E+01	4.9E-05	4.9E-05	32.86%
TETRACHLOROETHYLENE	1.5E-02	1.5E-08		
ARSENIC	2.3E+01	2.3E-05	2.3E-05	15.35%
TOTALS	1.5E+02	1.5E-04	1.5E-04	100.00%

RESIDUAL RISK = 6.3E-07

Site NC-SA-6b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.5E-01		
CHLORDANE	2.2E-03		
DDT	4.7E-03		
DIELDRIN	1.4E-01		
ENDRIN	2.4E-02		
ISODRIN	1.2E-01		
TETRACHLOROETHYLENE	7.2E-05		
ARSENIC	2.0E-02		
COPPER	7.7E-04		
LEAD	4.1E-02		
MERCURY	2.1E-03		
ZINC	9.3E-04		
TOTALS	7.1E-01	0.0E+00	.00%

RESIDUAL HI = 7.1E-01

Site NC-SA-7
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DOE	1.3E-03	1.3E-09		
DIELDRIN	1.1E+00	1.1E-06	1.1E-06	100.00%
TOTALS	1.1E+00	1.1E-06	1.1E-06	100.00%

RESIDUAL RISK = 1.3E-09

Site NC SA-7
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIELDRIN	3.3E-03		
DIMETHYL METHYL PHOSPHONATE	1.3E-05		
ENDRIN	8.3E-05		
LEAD	2.0E-02		
ZINC	7.2E-04		
TOTALS	2.4E-02	0.0E+00	.00%

RESIDUAL HI = 2.4E-02

Site NC-SA-8a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CHLOROFORM	4.8E-05	4.8E-11		
DIBROMOCHLOROPROPANE	1.0E-02	1.0E-08		
DIELDRIN	1.6E+01	1.6E-05	1.6E-05	27.67%
CHROMIUM	4.3E+01	4.3E-05	4.3E-05	72.33%
TOTALS	5.9E+01	5.9E-05	5.9E-05	100.00%

RESIDUAL RISK = 1.0E-08

Site NC-SA-8a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHLOROACETIC ACID	3.7E-02		
CHLOROPHORM	1.3E-06		
DIELDRIN	4.7E-02		
DIISOPROPYLMETHYL PHOSPHONATE	1.2E-07		
CHROMIUM	5.2E-03		
COPPER	3.2E-03		
LEAD	4.0E-02		
MERCURY	2.8E-03		
ZINC	1.3E-03		
TOTALS	1.4E-01	0.0E+00	.00%
RESIDUAL HI = 1.4E-01			

Site NC-SA-8b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.6E+01	2.6E-05	2.6E-05	31.14%
DDE	3.7E-03	3.7E-09		
DDT	9.1E-02	9.1E-08		
DIELDRIN	4.1E+01	4.1E-05	4.1E-05	49.40%
METHYLENE CHLORIDE	1.8E-02	1.8E-08		
ARSENIC	1.6E+01	1.6E-05	1.6E-05	19.46%
TOTALS	8.3E+01	8.3E-05	8.3E-05	100.00%

RESIDUAL RISK = 1.1E-07

Site NC-SA-8b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.2E-01		
DDT	1.2E-03		
DIELDRIN	1.2E-01		
ENDRIN	7.5E-04		
ISODRIN	1.7E-02		
METHYLENE CHLORIDE	5.7E-03		
1,1,1-TRICHLOROETHANE	2.8E-05		
ARSENIC	1.4E-02		
COPPER	9.1E-04		
MERCURY	1.1E-03		
ZINC	7.2E-03		
TOTALS	2.8E-01	0.0E+00	.00%

RESIDUAL HI ~ 2.8E-01

Site NC-SA-8c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CHROMIUM	4.4E+01	4.4E-05	4.4E-05	100.00%
TOTALS	4.4E+01	4.4E-05	4.4E-05	100.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-8c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHLOROACETIC ACID	3.7E-02		
CHROMIUM	5.3E-03		
COPPER	1.0E-03		
LEAD	3.2E-01		
MERCURY	2.4E-03		
ZINC	8.6E-04		
TOTALS	3.7E-01	0.0E+00	.00%

RESIDUAL HI = 3.7E-01

Site NC-SA-9a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-9a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
DIISOPROPYLMETHYL PHOSPHONATE	1.7E-05		
TOTALS	1.7E-05	0.0E+00	.00%
RESIDUAL HI = 1.7E-05			

Site NC-SA-9b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (3)
CADMIUM	5.9E-01	5.9E-07		
TOTALS	5.9E-01	5.9E-07	0.0E+00	.008

RESIDUAL RISK = 5.9E-07

Site NC-SA-9b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CADMIUM	4.8E-03		
TOTALS	4.8E-03	0.0E+00	.00%

RESIDUAL HI = 4.8E-03

Site NC-SA-9c
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CADMIUM	3.7E-01	3.7E-07		
TOTALS	3.7E-01	3.7E-07	0.0E+00	.00%

RESIDUAL RISK = 3.7E-07

Site NC-SA-9c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CADMIUM	3.0E-03		
TOTALS	3.0E-03	0.0E+00	.00%
RESIDUAL HI = 3.0E-03			

Site NC 5A 9d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CADMIUM	4.8E-01	4.8E-07		
TOTALS	4.8E-01	4.8E-07	0.0E+00	.00%

RESIDUAL RISK = 4.8E-07

Site M SA 9d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CADMIUM	3.9E-03		
TOTALS	3.9E-03	0.0E+00	.00%

RESIDUAL HI = 3.9E-03

Site NC-SA-9c
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-9e
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ZINC	6.6E-04		
TOTALS	6.6E-04	0.0E+00	.00%

RESIDUAL HI - 6.6E-04

Site NC SA-9f
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK - 0.0E+00

Site NC-SA-9f
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
COPPER	9.3E-04		
ZINC	7.2E-04		
TOTALS	1.6E-03	0.0E+00	.00%

RESIDUAL HI = 1.6E-03

Site NC-SA-9g
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-9g
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
----------	----	------------------------------------	--

TOTALS	0.0E+00	0.0E+00	.00%
--------	---------	---------	------

RESIDUAL HI = 0.0E+00

Site NC-SA-9h
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-9h
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	.00%
RESIDUAL HI = 0.0E+00			

Site NC-SA-9}
CARCINOGEN

FRACTIONAL
RISK OF
CONTRIBUTING
CHEMICALS (%)

RISK OF
CONTRIBUTING
CHEMICALS

RISK

EI

CHEMICAL

.00%

0.0E+00

0.0E+00

0.0E+00

TOTALS

RESIDUAL RISK = 0.0E+00

Site NC-SA-9j
NONCARCINOGEN

CHEMICAL	FRACTIONAL		FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
	HI	HI OF CONTRIBUTING CHEMICALS	
MERCURY	2.4E-04		
TOTALS	2.4E-04	0.0E+00	.00%

RESIDUAL HI = 2.4E-04

Site NC-SA-9K
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL R1/A OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-9k
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
----------	----	------------------------------------	--

TOTALS	0.0E+00	0.0E+00	.008
--------	---------	---------	------

RESIDUAL HI = 0.0E+00

Site NC-SA-91
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ARSENIC	7.4E+00	7.4E-06	7.4E-06	100.00%
TOTALS	7.4E+00	7.4E-06	7.4E-06	100.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-91
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ARSENIC	6.3E-03		
TOTALS	6.3E-03	0.0E+00	.00%

RESIDUAL HI = 6.3E-03

Site NC-SA-9m
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-9m
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
----------	----	------------------------------------	--

TOTALS	0.0E+00	0.0E+00	.00%
--------	---------	---------	------

RESIDUAL HI = 0.0E+00

Site NC-SA-9n
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%
--------	---------	---------	---------	------

RESIDUAL RISK = 0.0E+00

Site NC-SA-9n
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
TOLUENE	1.2E-06		
TOTALS	1.2E-06	0.0E+00	.00%

RESIDUAL HI = 1.2E-06

Site NC-SA-90
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ARSENIC	7.4E+00	7.4E-06	7.4E-06	100.00%
TOTALS	7.4E+00	7.4E-06	7.4E-06	100.00%

RESIDUAL RISK = 0.0E+00

Site NC-SA-90
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ARSENIC	6.3E-03		
TOTALS	6.3E-03	0.0E+00	.00%

RESIDUAL HI = 6.3E-03

Site NC-SA-9p
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%
--------	---------	---------	---------	------

RESIDUAL RISK = 0.0E+00

Site NC-SA-9p
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	.00%

RESIDUAL HI - 0.0E+00

Site NC-SA-9q
CARCINOGEN

FRACTIONAL
RISK OF
CONTRIBUTING
CHEMICALS (%)

RISK OF
CONTRIBUTING
CHEMICALS

RISK

EI

CHEMICAL

.00%

0.0E+00

0.0E+00

0.0E+00

TOTALS

RESIDUAL RISK = 0.0E+00

Site NC-SA-9q
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
LEAD	1.9E-02		
MERCURY	3.7E-04		
TOTALS	1.9E-02	0.0E+00	.00%

RESIDUAL HI = 1.9E-02

Site NC-SA 9f
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CADMIUM	3.7E-01	3.7E-07		
TOTALS	3.7E 01	3.7E-07	0.0E+00	.00%

RESIDUAL RISK = 3.7E-07

Site NC-SA-9r
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CADMIUM	3.0E-03		
TOTALS	3.0E-03	0.0E+00	.00%

RESIDUAL HI = 3.0E-03

Site NC-SA-9s
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%
--------	---------	---------	---------	------

RESIDUAL RISK = 0.0E+00

Site NC-SA-9s
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
MERCURY	3.3E-04		
TOTALS	3.3E-04	0.0E+00	.00%
RESIDUAL HI = 3.3E-04			

SOUTHERN STUDY AREA

Site S-SA-1a
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (3)
ALDRIN	3.5E-02	3.5E-08		
DIELDRIN	8.2E-02	8.2E-08		
1,1,2,2-TETRACHLOROETHANE	1.1E-01	1.1E-07		
TOTALS	2.2E-01	2.2E-07	0.0E+00	.003
RESIDUAL RISK = 2.2E-07				

Site S-SA la
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.6E-04		
DIELDRIN	2.4E-04		
TOTALS	4.0E-04	0.0E+00	.00%

RESIDUAL HI = 4.0E-04

Site S-SA-lb
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.3E+02	2.3E-04	2.3E-04	72.96%
CHLORDANE	3.6E+01	3.6E-05	3.6E-05	11.39%
DIELDRIN	4.2E+01	4.2E-05	4.2E-05	13.12%
DDE	2.3E-01	2.3E-07		
DDT	3.8E-01	3.8E-07		
1,1,2,2-TETRACHLOROETHANE	1.0E-01	1.0E-07		
ARSENIC	8.1E+00	8.1E-06	8.1E-06	2.53%
TOTALS	3.2E+02	3.2E-04	3.2E-04	100.00%

RESIDUAL RISK = 7.1E-07

Site S-SA-1b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.1E+00	1.1E+00	49.54%
CHLORDANE	1.1E+00	1.1E+00	50.46%
DIELDRIN	1.2E-01		
DDT	5.2E-03		
ENDRIN	9.1E-04		
HEXACHLOROCYCLOPENTADIENE	1.1E-03		
ISODRIN	6.1E-03		
ARSENIC	6.9E-03		
COPPER	6.5E-04		
LEAD	3.1E-02		
MERCURY	3.9E-02		
ZINC	1.2E-03		
TOTALS	2.4E+00	2.1E+00	100.00%

RESIDUAL HI = 2.1E-01

Site S-SA-1c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.1E+02	1.1E-04	1.1E-04	45.74%
CHLORDANE	2.0E-01	2.0E-07		
DIBROMOCHLOROPROPANE	2.1E-01	2.1E-07		
DDE	1.0E-02	1.0E-08		
DDT	7.9E-03	7.9E-09		
DIELDRIN	1.6E+00	1.6E-06	1.6E-06	.67%
CHROMIUM	1.3E+02	1.3E-04	1.3E-04	53.59%
TOTALS	2.4E+02	2.4E-04	2.4E-04	100.00%

RESIDUAL RISK = 4.3E-07

Site S-SA-1c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	5.1E-01		
CHLORDANE	5.9E-03		
DDT	1.1E-04		
DIELDRIN	4.7E-03		
ENDRIN	4.3E-04		
ISODRIN	2.5E-03		
CHROMIUM	1.6E-02		
COPPER	1.3E-03		
LEAD	4.0E-02		
MERCURY	8.9E-03		
ZINC	7.9E-04		
TOTALS	5.9E-01	0.0E+00	.00%

RESIDUAL HI = 5.9E-01

Site S-SA-1d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CHLORDANE	9.2E-02	9.2E-08		
DIELDRIN	4.4E-02	4.4E-08		
1,1,2,2-TETRACHLOROETHANE	1.0E-01	1.0E-07		
TOTALS	2.4E-01	2.4E-07	0.0E+00	.00%

RESIDUAL RISK = 2.4E-07

Site S-SA-ld
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CHLORDANE	2.8E-03		
DIELDRIN	1.3E-04		
1,1,1-TRICHLOROETHANE	6.5E-06		
TOTALS	2.9E-03	0.0E+00	.00%
RESIDUAL HI = 2.9E-03			

Site S-SA-le
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.5E+01	1.5E-05	1.5E-05	23.55%
DDE	4.2E-03	4.2E-09		
DOT	2.6E-02	2.6E-08		
DIBROMOCHLOROPROPANE	7.5E-02	7.5E-08		
DIELDRIN	4.3E-01	4.3E-07		
METHYLENE CHLORIDE	9.7E-03	9.7E-09		
TETRACHLOROETHYLENE	2.4E-02	2.4E-08		
ARSENIC	9.9E+00	9.9E-06	9.9E-06	15.98%
CHROMIUM	3.8E+01	3.8E-05	3.8E-05	60.48%
TOTALS	6.3E+01	6.3E-05	6.2E-05	100.00%

RESIDUAL RISK = 5.7E-07

Site S-SA-le
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	6.7E-02		
DDT	3.5E-04		
DELDRIN	1.3E-03		
ENDRIN	3.5E-05		
ISODRIN	7.1E-04		
METHYLENE CHLORIDE	3.8E-03		
METHYL ISOBUTYL KETONE	3.0E-05		
TETRACHLOROETHYLENE	1.2E-04		
1,1,1-TRICHLOROETHANE	7.9E-06		
ARSENIC	8.5E-03		
CHROMIUM	4.5E-03		
COPPER	1.7E-03		
LEAD	2.9E-02		
MERCURY	4.3E-03		
ZINC	1.2E-03		
TOTALS	1.2E-01	6.0E+00	.00%

RESIDUAL HI = 1.2E-01

Site S-SA-1f
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.2E-03	4.2E-08		
DDP	1.4E-03	1.4E-09		
DDT	2.6E-03	2.6E-09		
TOTALS	4.6E-02	4.6E-08	0.0E+00	.00%

RESIDUAL RISK = 4.6E-08

Site S-SA-1f
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.9E-04		
DDT	3.5E-05		
TOTALS	2.3E-04	0.0E+00	.00%
RESIDUAL HI = 2.3E-04			

Site S-SA-2a
CARCINOGEN

CHEMICAL	BI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.6E+02	2.6E-04	2.6E-04	86.31%
DDE	4.4E-03	4.4E-09		
DOT	3.1E-02	3.1E-08		
DIELDRIN	4.1E+01	4.1E-05	4.1E-05	13.69%
METHYLENE CHLORIDE	9.5E-02	9.5E-08		
TOTALS	3.0E+02	3.0E-04	3.0E-04	100.00%

RESIDUAL RISK = 1.3E-07

Site S-SA-2a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.2E+00	1.2E+00	100.00%
DDT	4.3E-04		
DIELDRIN	1.2E-01		
ENDRIN	1.1E-03		
ISODRIN	3.4E-02		
METHYLENE CHLORIDE	1.9E-02		
TOLUENE	2.4E-06		
MERCURY	4.1E-04		
TOTALS	1.4E+00	1.2E+00	100.00%

RESIDUAL HI = 1.7E-01

Site S-SA-2b
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.4E+03	3.4E-03	3.4E-03	76.34%
CHLORDANE	1.1E+00	1.1E-06	1.1E-06	.02%
DDX	8.0E-01	8.0E-07		
DDT	1.0E+00	1.0E-06	1.0E-06	.02%
DIELDRIN	1.1E+03	1.1E-03	1.1E-03	23.61%
TOTALS	4.5E+03	4.5E-03	4.5E-03	100.00%

RESIDUAL RISK = 8.0E-07

Site S-SA-2b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.6E+01	1.6E+01	83.68%
CHLORDANE	3.4E-02		
DDT	1.4E-02		
DIELDRIN	3.1E+00	3.1E+00	16.32%
ENDRIN	1.5E-03		
HEXACHLOROCYCLOPENTADIENE	5.2E-03		
ISODRIN	6.8E-02		
COPPER	1.3E-03		
LEAD	5.5E-01		
MERCURY	1.9E-03		
ZINC	1.3E-03		
TOTALS	2.0E+01	1.9E+01	100.00%

RESIDUAL HI = 6.7E-01

Site S-SA-2c
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	3.8E-02	3.8E-08		
DDE	1.3E-01	1.3E-07		
DDT	5.6E-02	5.6E-08		
DIELDRIN	4.8E-01	4.8E-07		
METHYLENE CHLORIDE	1.8E-02	1.8E-08		
1,1,2,2-TETRACHLOROETHANE	2.4E-01	2.4E-07		
ARSENIC	8.7E+00	8.7E-06	8.7E-06	100.00%
TOTALS	9.6E+00	9.6E-06	8.7E-06	100.00%

RESIDUAL RISK = 9.6E-07

Site S-SA-2c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.7E-04		
DDT	7.6E-04		
DIELDRIN	1.4E-03		
ENDRIN	5.1E-05		
METHYLENE CHLORIDE	3.8E-03		
ARSENIC	7.4E-03		
MERCURY	2.8E-04		
TOTALS	1.4E-02	0.0E+00	.00%
RESIDUAL HI = 1.4E-02			

Site S-SA-3a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.6E+00	2.6E-06	2.6E-06	51.248
DIELDRIN	2.5E+00	2.5E-06	2.5E-06	48.761
TOTALS	5.0E+00	5.0E-06	5.0E-06	100.008

RESIDUAL RISK = 0.0E+00

Site S-SA-3a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.2E-02		
DIELDRIN	7.1E-03		
ENDRIN	2.0E-03		
MERCURY	1.5E-03		
TOTALS	2.2E-02	0.0E+00	.00%
RESIDUAL HI = 2.2E-02			

Site S-SA-3b
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	4.6E+02	4.6E-04	4.6E-04	51.44%
CHLORDANE	4.6E+00	4.6E-06	4.6E-06	.51%
DDE	9.1E-03	9.1E-09		
DDT	1.3E-01	1.3E-07		
DIBROMOCHLOROPROPANE	1.4E-02	1.4E-08		
DIELDRIN	4.3E+02	4.3E-04	4.3E-04	48.05%
TOTALS	9.0E+02	9.0E-04	9.0E-04	100.00%

RESIDUAL RISK = 1.5E-07

Site S-SA-3b
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	2.1E+00	2.1E+00	62.94%
CHLORDANE	1.4E-01		
DDT	1.7E-03		
DIELDRIN	1.3E+00	1.3E+00	37.06%
ENDRIN	1.2E-02		
HEXACHLOROCYCLOPENTADIENE	1.4E-02		
ISODRIN	3.9E-03		
MERCURY	5.0E-03		
TOTALS	3.6E+00	3.4E+00	100.00%
RESIDUAL HI = 1.7E-01			

Site S-SA-4
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
ALDRIN	1.5E+01	1.5E-05	1.5E-05	10.04%
CHLORDANE	4.1E-01	4.1E-07		
CHLOROFORM	3.1E-03	3.1E-09		
DDE	8.6E-02	8.6E-08		
DOT	1.5E-02	1.5E-08		
DIELDRIN	1.3E+02	1.3E-04	1.3E-04	89.96%
TOTALS	1.5E+02	1.5E-04	1.5E-04	100.00%

RESIDUAL RISK = 5.2E-07

Site S-SA-4
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
ALDRIN	6.7E-02		
CHLORDANE	1.2E-02		
CHLOROFORM	1.1E-04		
DDT	2.0E-04		
DICYCLOPENTADIENE	3.3E-03		
DIELDRIN	3.8E-01		
ENDRIN	2.4E-03		
HEXACHLOROCYCLOPENTADIENE	1.7E-04		
ISODRIN	8.3E-04		
TOTALS	4.6E-01	0.0E+00	.00%

RESIDUAL HI = 4.6E-01

Site S-SA-5a
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIBROMOCHLOROPROPANE	3.6E-02	3.6E-08		
TOTALS	3.6E-02	3.6E-08	0.0E+00	.00%

RESIDUAL RISK = 3.6E-08

Site S-SA-5a
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	.001

RESIDUAL HI - 0.0E+00

Site S-SA-5b
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
CARBON TETRACHLORIDE	4.8E-02	4.8E-08		
CHLORDANE	2.6E+00	2.6E-06	2.6E-06	100.00%
TOTALS	2.7E+00	2.7E-06	2.6E-06	100.00%
RESIDUAL RISK = 4.8E-08				

Site S-SA-Sb
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
CARBON TETRACHLORIDE	1.2E-03		
CHLORDANE	7.9E-02		
LEAD	2.4E-02		
TOTALS	1.0E-01	0.0E+00	.00%

RESIDUAL HI = 1.0E-01

Site S-SA-5c
CARCINOGEN

CHEMICAL	E1	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
----------	----	------	--------------------------------------	--

TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%
--------	---------	---------	---------	------

RESIDUAL RISK = 0.0E+00

Site S-SA-5c
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
LEAD	2.8E-02		
TOTALS	2.8E-02	0.0E+00	.00%
RESIDUAL HI = 2.8E-02			

Site S-5A-5d
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
TOTALS	0.0E+00	0.0E+00	0.0E+00	.00%

RESIDUAL RISK = 0.0E+00

Site S-SA-5d
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
LEAD	5.5E-02		
TOTALS	5.5E-02	0.0E+00	.00%
RESIDUAL HI = 5.5E-02			

Site S-SA-5e
CARCINOGEN

CHEMICAL	EI	RISK	RISK OF CONTRIBUTING CHEMICALS	FRACTIONAL RISK OF CONTRIBUTING CHEMICALS (%)
DIBROMOCHLOROPROPANE	4.6E-01	4.6E-07		
TOTALS	4.6E-01	4.6E-07	0.0E+00	.00%
RESIDUAL RISK = 4.6E-07				

Site S SA-5e
NONCARCINOGEN

CHEMICAL	HI	HI OF CONTRIBUTING CHEMICALS	FRACTIONAL HI OF CONTRIBUTING CHEMICALS (%)
LEAD	2.3E-02		
TOTALS	2.3E-02	0.0E+00	.00%

RESIDUAL HI = 2.3E-02

APPENDIX B
CERTIFIED REPORTING LIMITS
FOR DETECTED CHEMICALS AT RMA

B-1

TABLE B-1
CERTIFIED REPORTING LIMITS
FOR DETECTED CHEMICALS AT RMA

Chemical	<u>Certified Reporting Limit Range (ug/g)</u>	
	Phase I	Phase II
Aldrin	0.3	0.0019
Arsenic	2.5-5.0	2.5-5.0
Atrazine	0.3	0.25
Benzene	0.3	0.085
Benzothiazole	0.5	1.1-110
Bicycloheptadiene	0.3-0.4	1.1
Cadmium	0.66-0.74	0.66-0.74
Carbon tetrachloride	0.3	0.12
Chlordane	0.6-2.0	0.023
Chloroacetic acid	36	36
Chlorobenzene	0.3-2.0	0.20
Chloroform	0.3	0.068
Chlorophenylmethyl sulfide	0.9-4.0	4.0
Chlorophenylmethyl sulfone	0.3-0.6	9.0
Chlorophenylmethyl sulfoxide	0.9-7.0	4.8
Chromium	5.2-6.5	5.2-6.5
Copper	4.7-4.9	4.7-4.9
Dibromochloropropane	0.005-0.3	0.005-0.014
PPDDE (isomer)	0.3-0.6	0.0024
PPDDT (isomer)	0.5-0.6	0.002
1,2-Dichloroethane	0.3-0.6	0.085
1,1-Dichloroethylene	--	0.12
1,2-Dichloroethylene	0.3-0.8	0.15-0.30
Dicyclopentadiene	0.3-1.0	0.45
Dieldrin	0.3	0.0033
Diisopropylmethyl phosphonate	0.3-1.0	0.05
Dimethyldisulfide	0.5-0.7	0.69
Dimethylmethyl phosphonate	0.1-300	0.59-300
Dithiane	0.4-7.0	0.30
Endrin	0.3-0.5	0.0058
Ethylbenzene	0.3-0.4	0.16
Hexachlorocyclopentadiene	0.3-0.6	0.0018
Isodrin	0.3	0.0011
Isopropylmethyl phosphonic acid	--	2.1
Lead	8.4-13	8.4-13
Malathion	0.3-0.7	0.25

TABLE B-1 (Continued)
 CERTIFIED REPORTING LIMITS
 FOR DETECTED CHEMICALS AT RMA

Chemical	<u>Certified Reporting Limit Range (ug/g)</u>	
	Phase I	Phase II
Mercury	0.05-0.06	0.05-0.06
Methylene chloride	0.7-2.0	3.7
Methylisobutyl ketone	0.3-0.7	0.64
1,4-Oxathiane	0.3-0.5	0.3-2.0
Parathion	0.4-0.9	0.25
Supona	0.3-0.6	0.25
1,1,2,2-Tetrachloroethane	0.3	0.3
Tetrachloroethylene	0.3	0.27
Thiodiglycol	4.2	4.2
Toluene	0.3	0.19
1,1,1-Trichloroethane	0.3-0.4	0.088
1,1,2-Trichloroethane	0.3-0.4	0.26
Trichloroethylene	0.3-0.5	0.14
Xylene	0.3-5.0	0.26-0.39
Zinc	8.7-9.5	8.7-9.5

2170000

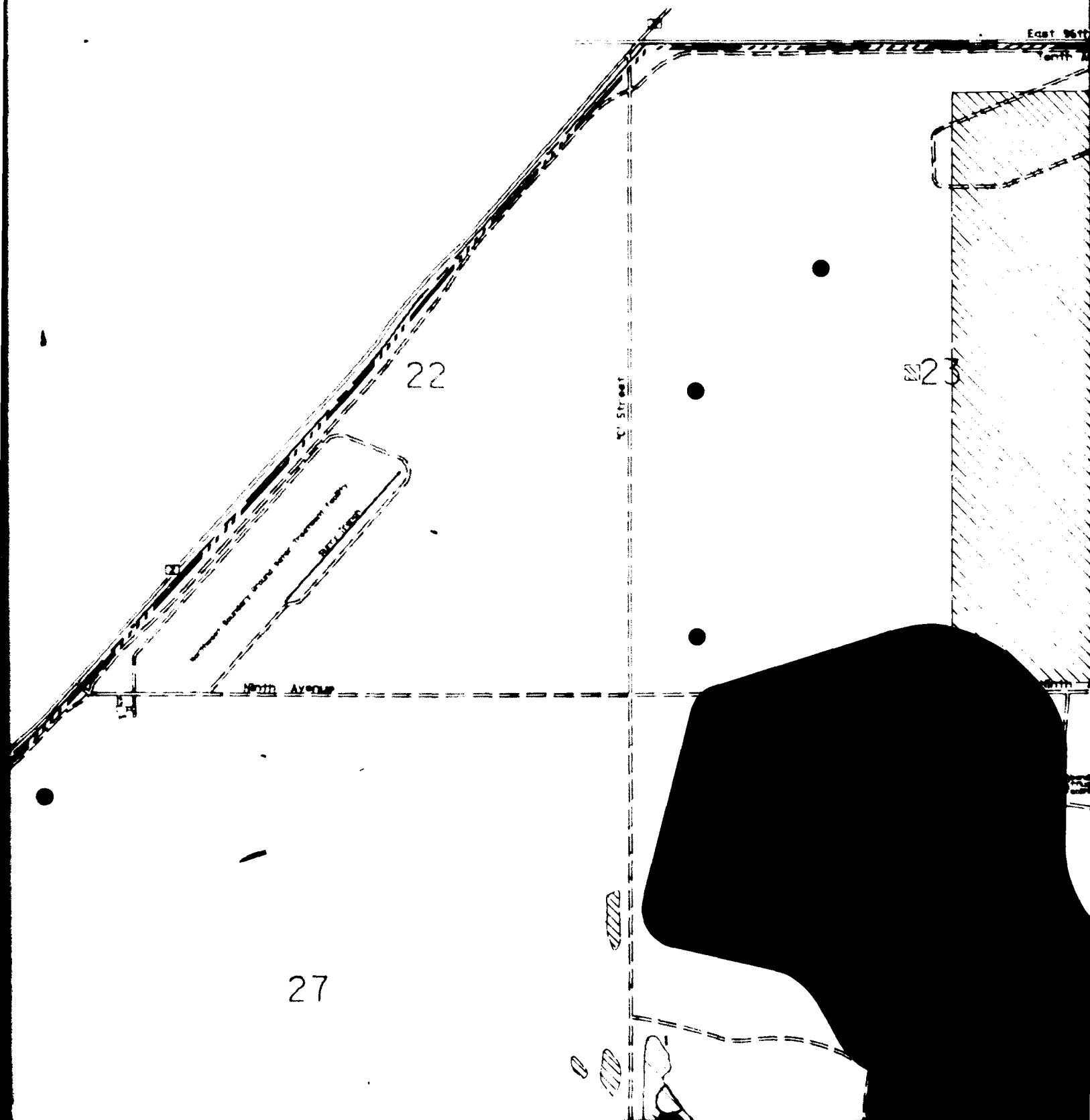
1950000

1900000

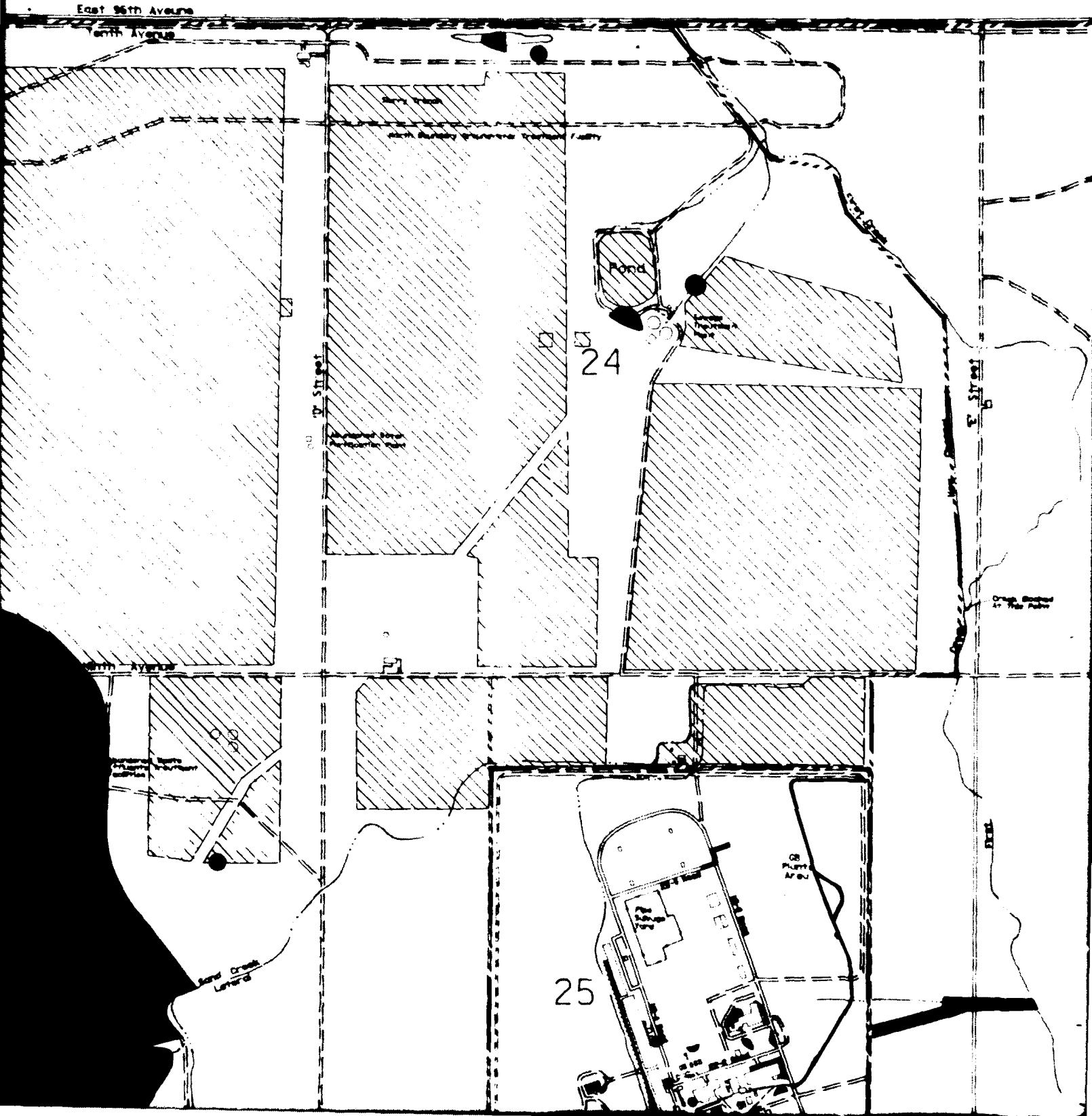
28

Street

2180000



2185000
1



2190000

2195000

East 25th Avenue
Yerth Avenue

20

19

E 31st St

North Avenue

Drainage
to the North

Antenna Foundation

North Avenue

U

East

30

29

2200000

195000

190000

20

29

10 Street
Buckley Road

BOULDER CO.
JEFFERSON CO.

25

270

STAPLETON AIRPORT

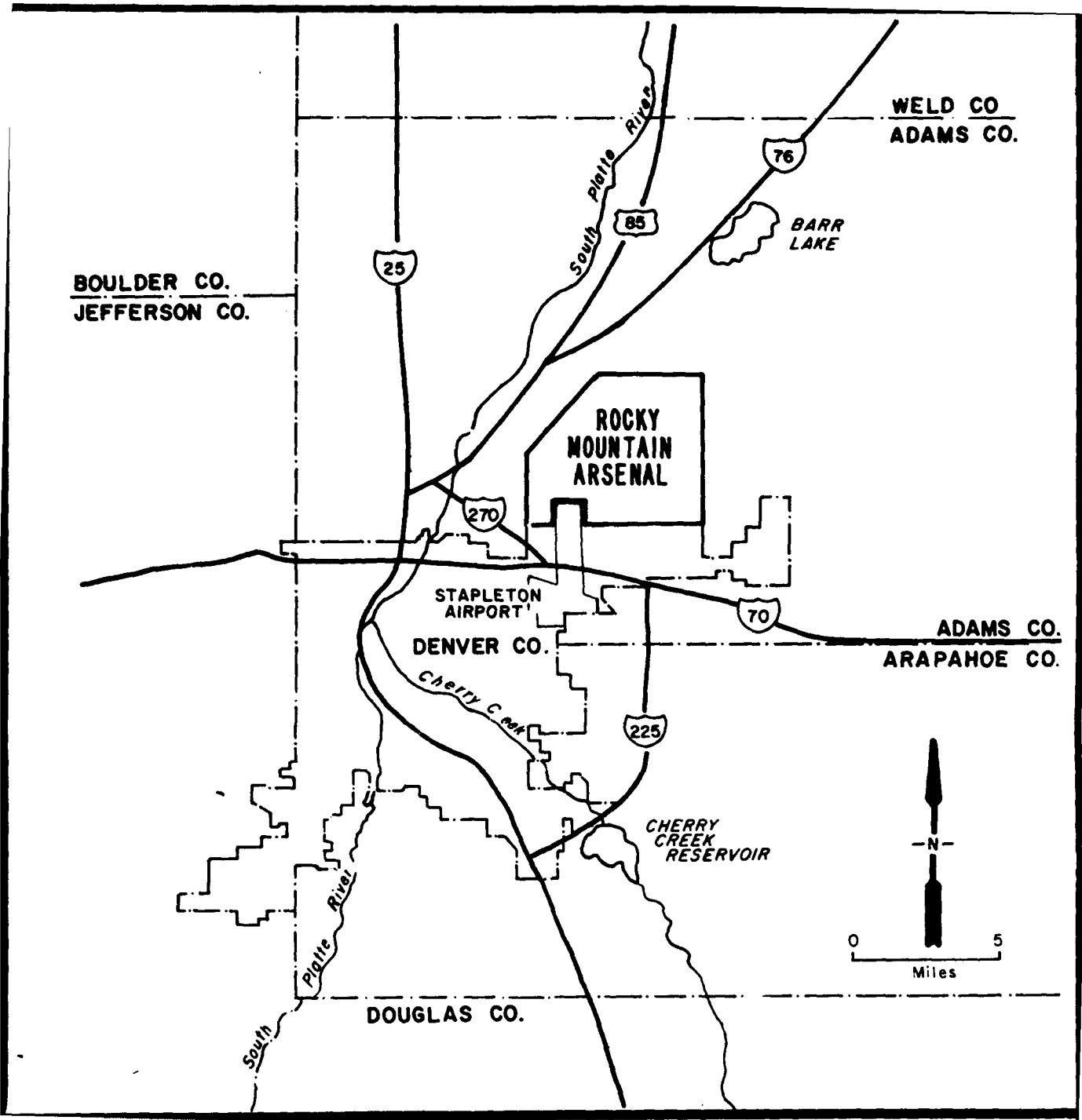
DENVER

Cherry Creek

Platte River

South

DOUGLAS CO.



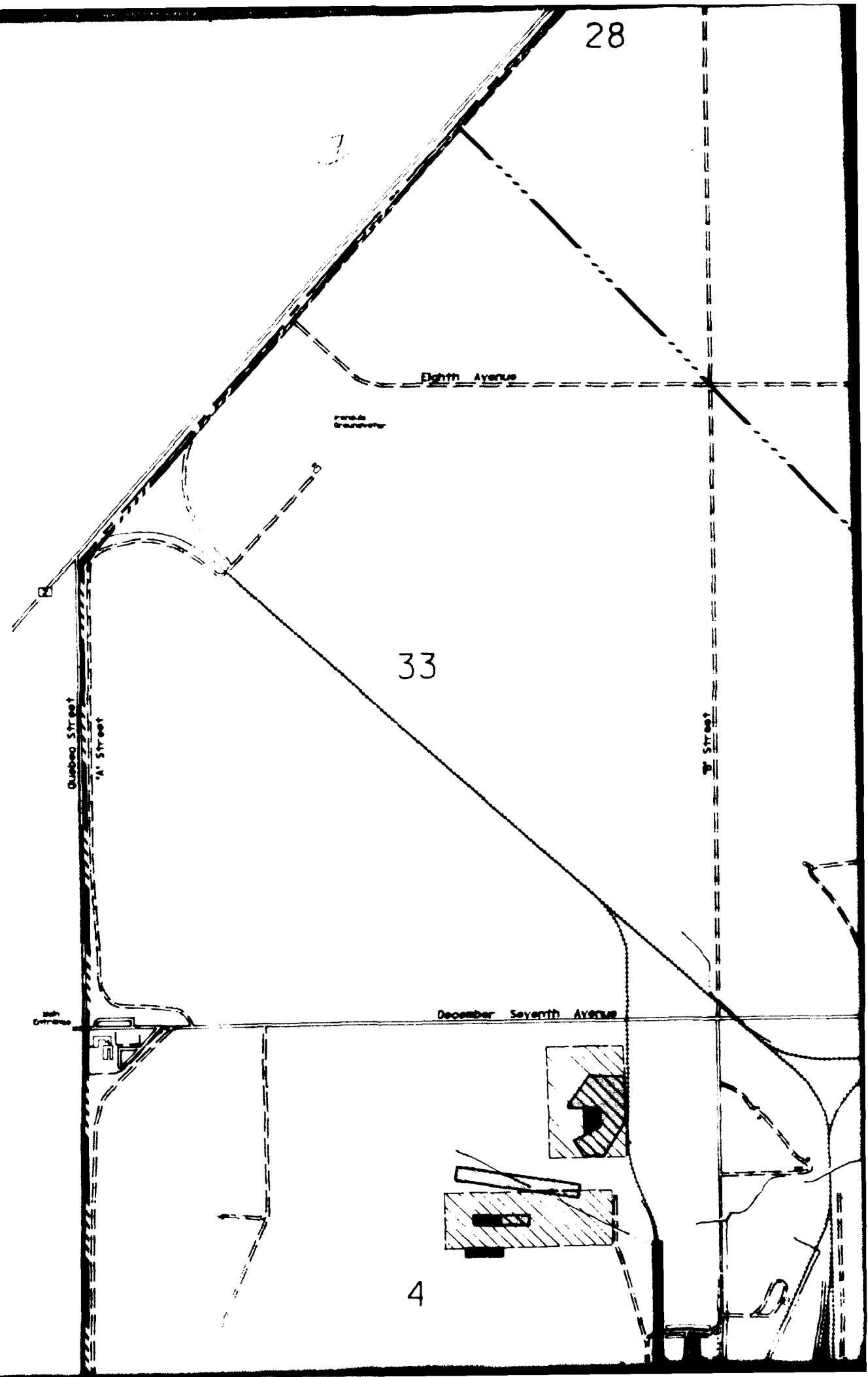
185000

180000

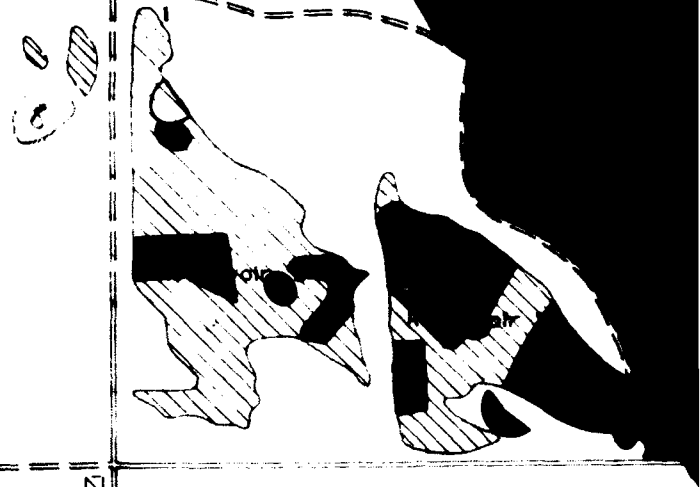
28

33

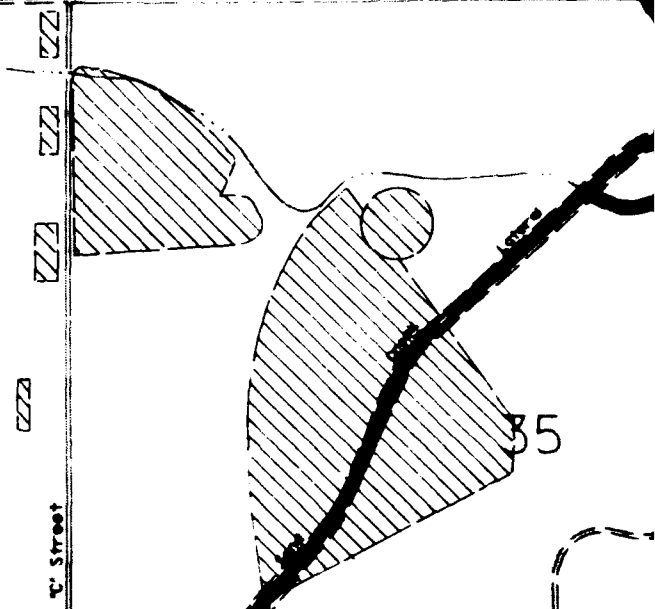
4



27



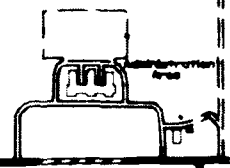
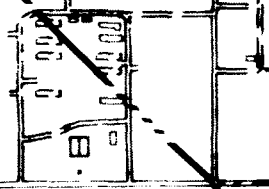
34



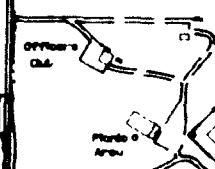
35

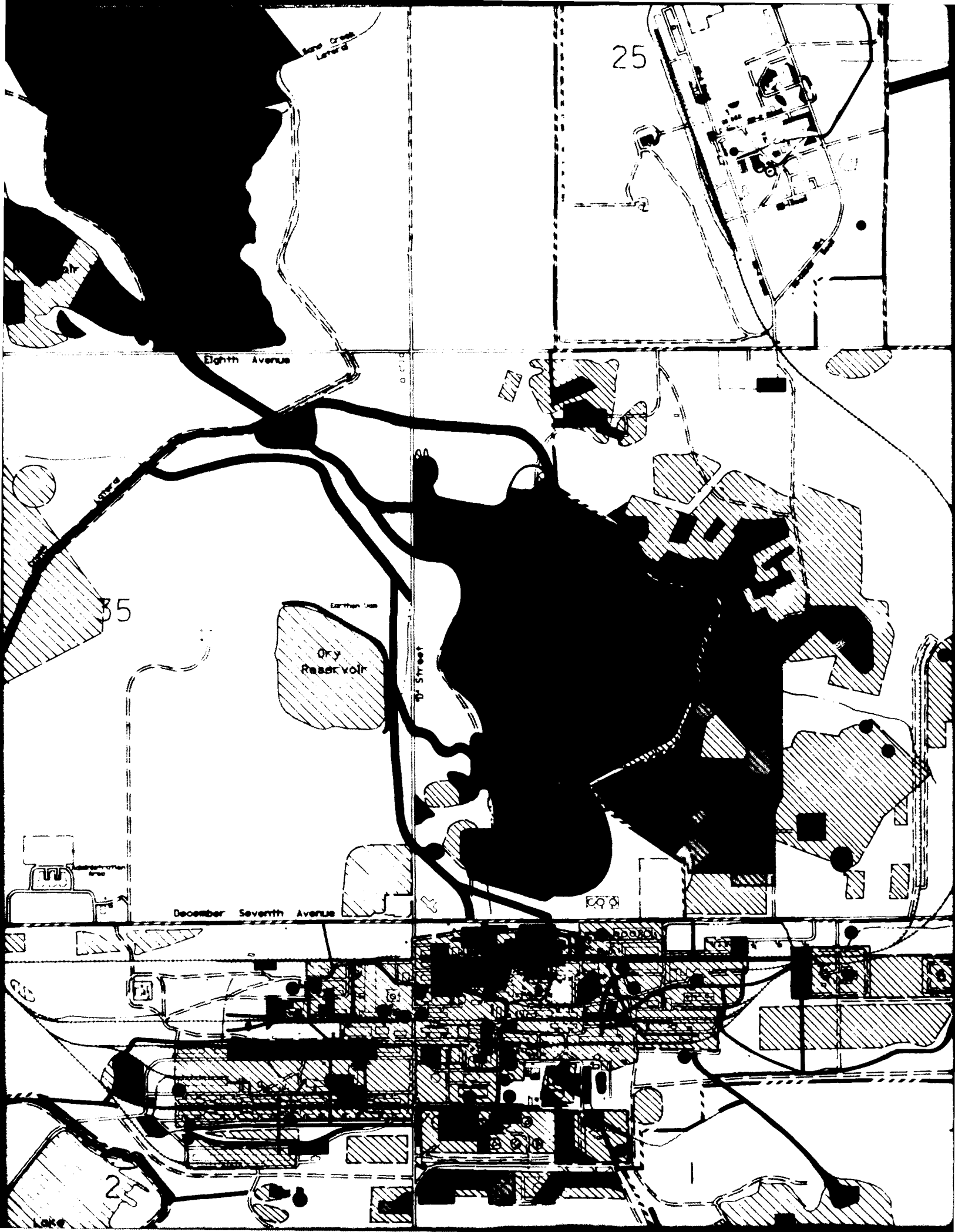
W Street

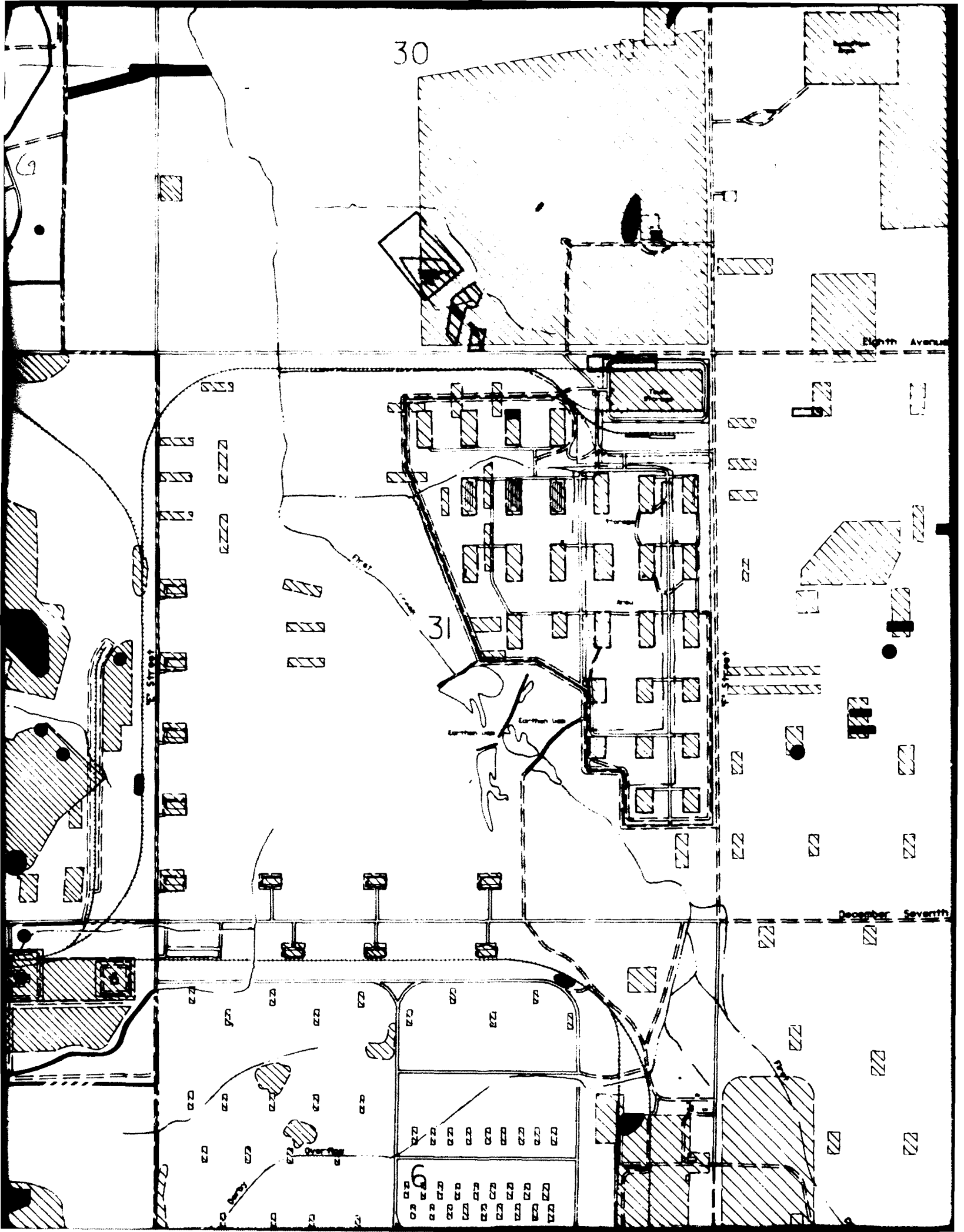
W Street



3





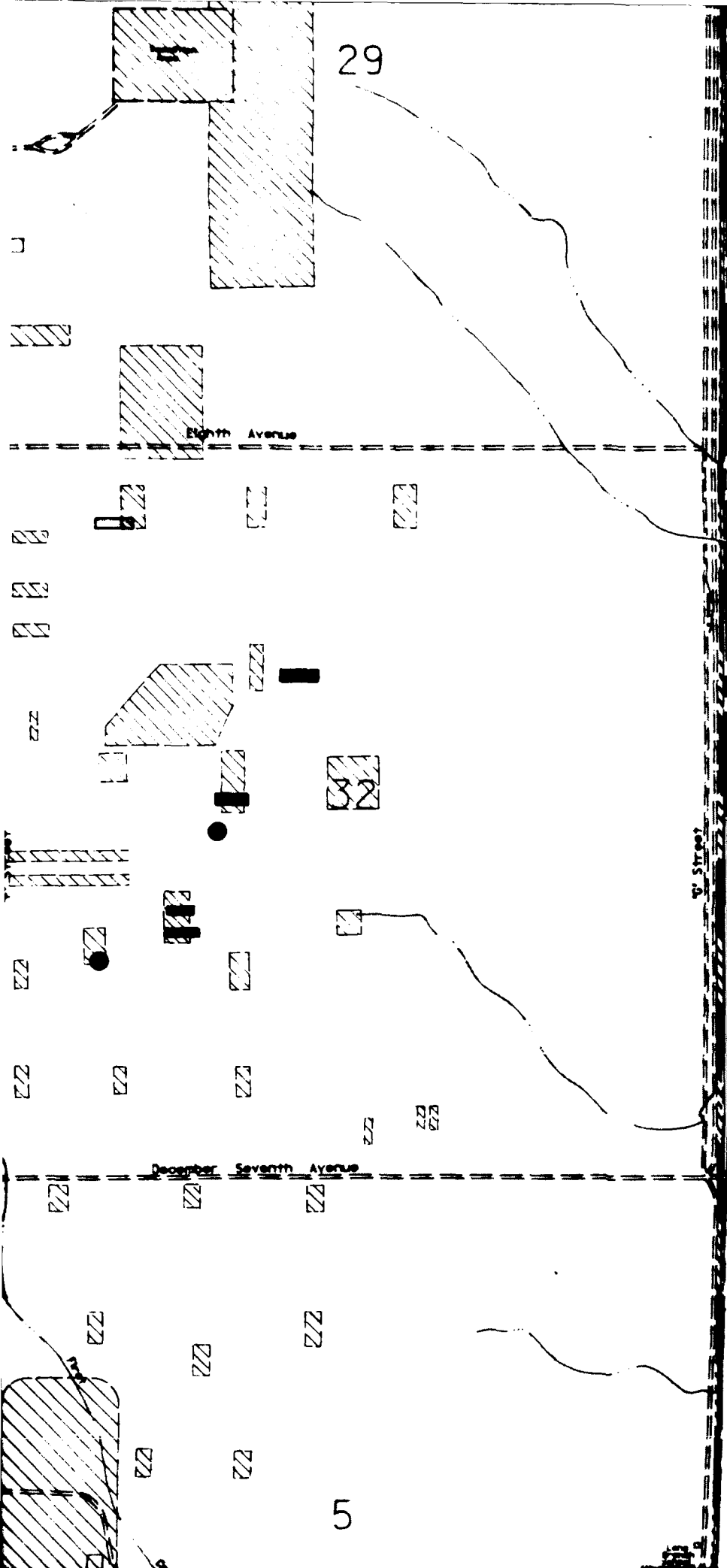


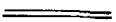
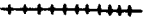
30

Eighth Avenue

31

Seventh Avenue



-  RMAC
-  Contar
-  Contar inhalat
-  Study
-  Paved
-  Struct
-  Section
-  Shore
-  Railroa

185000

180000

12

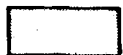
Legend



RMACCPMT Sites



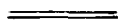
Contaminant concentrations exceed direct and indirect PPLVs



**Contaminant concentrations exceed enclosed space vapor
inhalation PPLVs only**



Study Area Boundaries



Paved Road



Unpaved Trail or Road



Structure



Foundation

7

Section Number



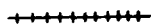
**Drainage Ditch or
Stream**



Shore Line



Arsenal Boundary



Railroad Tracks



Fence

175000

170000

Quebec Street

1st Street

4

Sixth Avenue

9

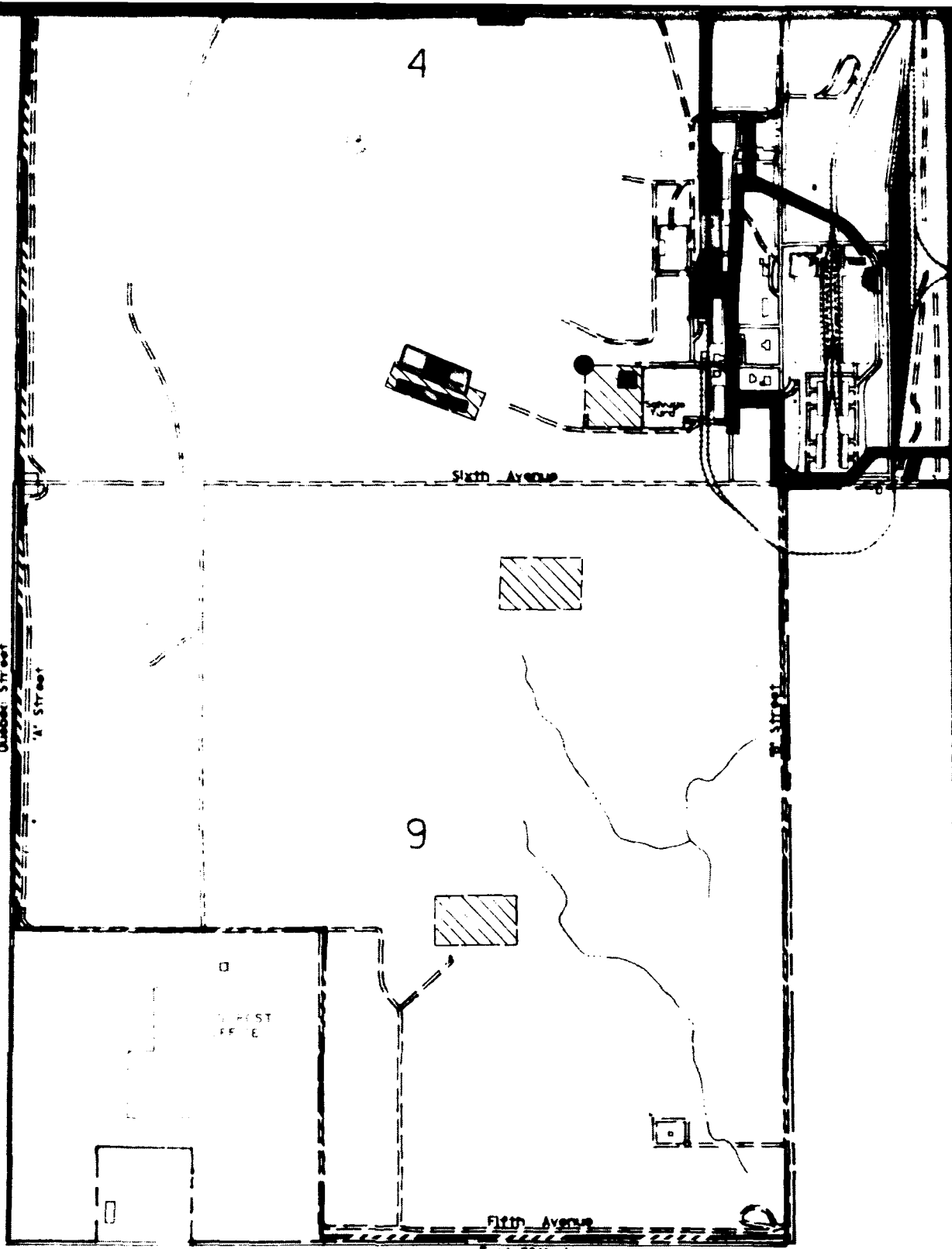
2nd Street

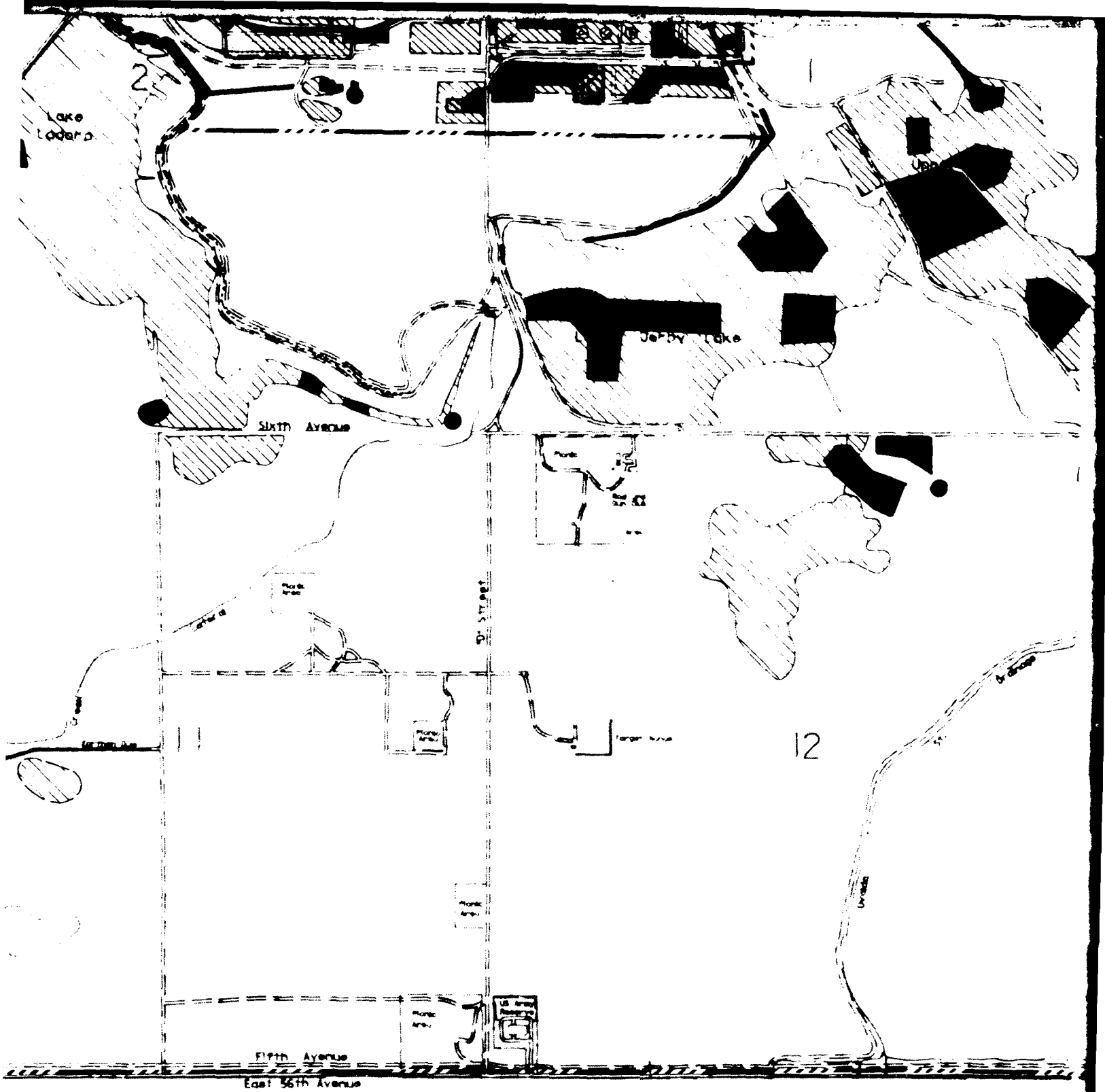
WEST
FENCE

Fifth Avenue

East 56th Avenue

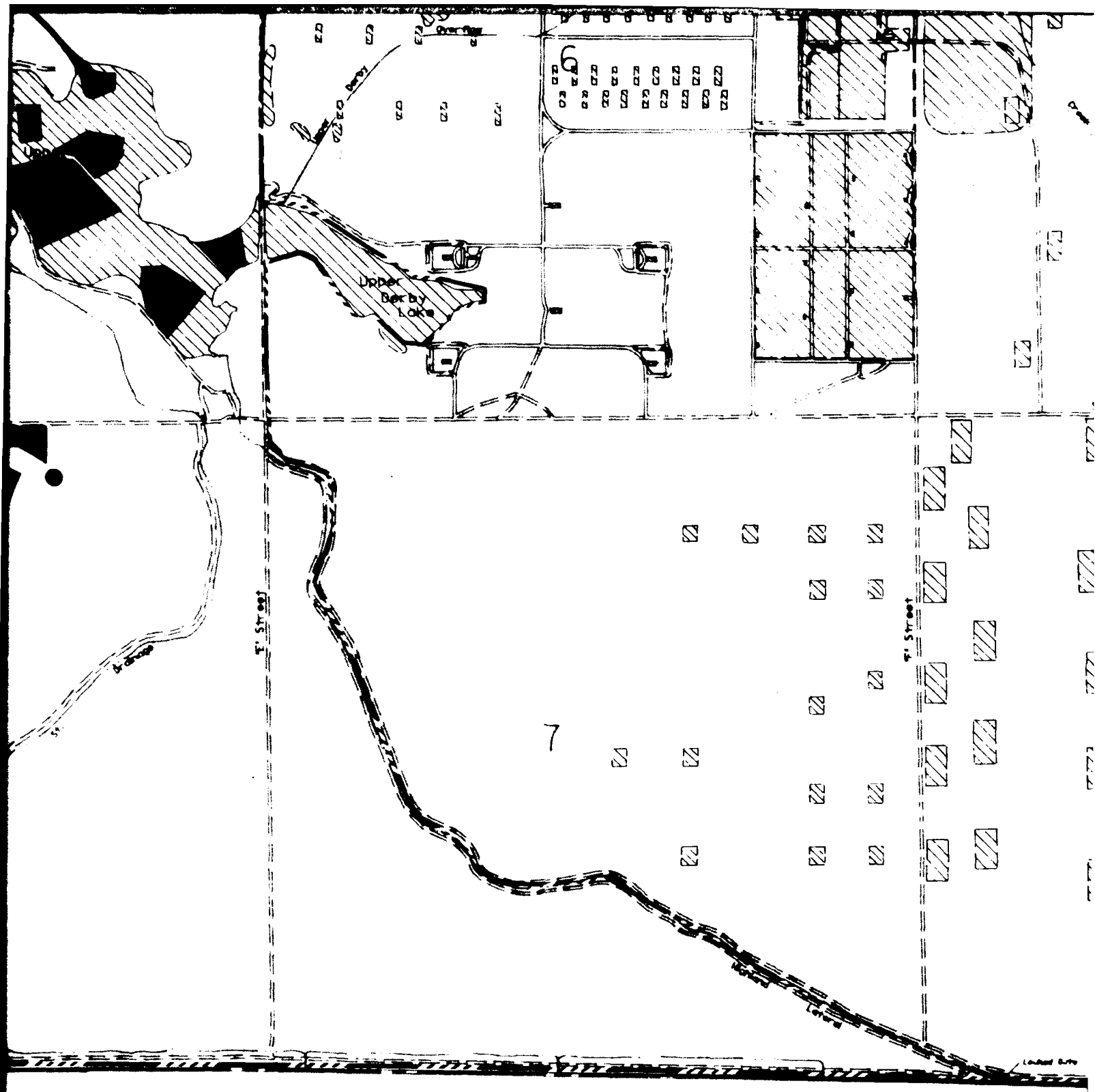
2170000





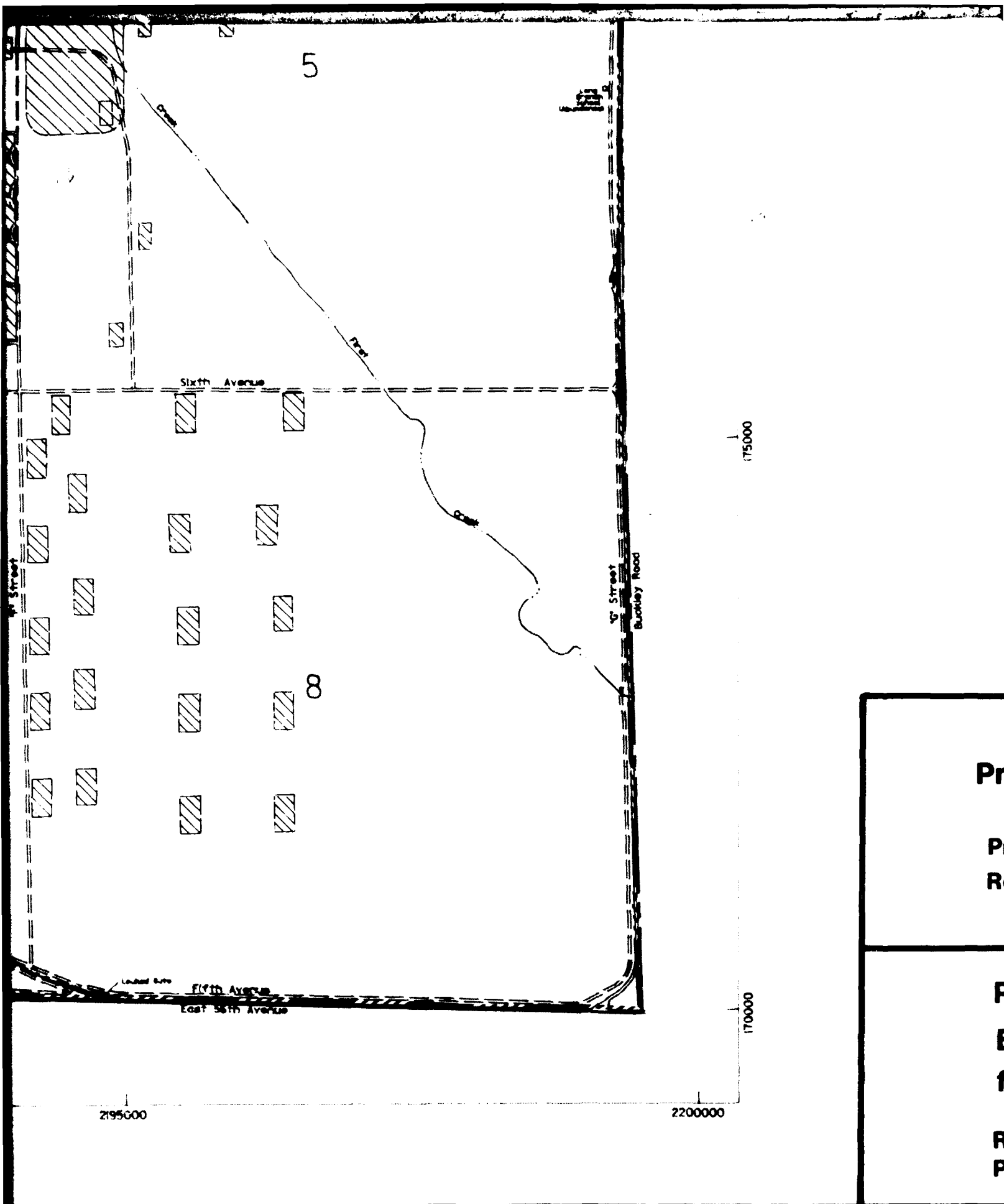
180000

2185000



2190000

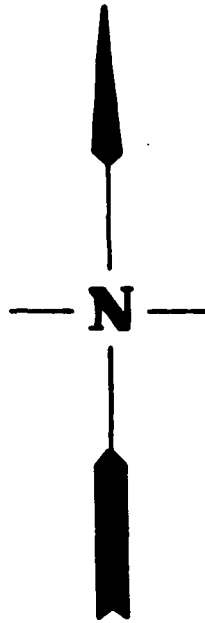
2195000



Pr

P
R

F
E
1
R
P



Prepared for :

**Program Manager's Office for
Rocky Mountain Arsenal Cleanup**

PLATE E-1

**Estimated Areas of Exceedance
for Rocky Mountain Arsenal**

**Rocky Mountain Arsenal
Prepared by : Ebasco Services Incorporated**

9/19/90