3.0 SCOPE AND OBJECTIVES

3.1 PHASE I RI SCOPE AND OBJECTIVES

The scope of this investigation is to identify any affected media (soil, sediment, or surface water) at EBG and to characterize the potential types and sources of contamination. Groundwater will not be evaluated as part of the Phase I RI because no confirmed source of contamination has been identified at EBG to date. The primary objectives of the Phase I RI are as follows:

- determine the potential types and sources of contamination at EBG, using historical process information and previous sampling data to locate Phase I RI samples for soil, sediment, and surface water media within the EBG;

- identify whether releases of contamination beyond the AOC boundary are occurring, by collecting environmental samples (surface water and sediment) downstream of the AOC boundary within exit conveyances and using applicable historical information;

- perform a screening risk evaluation to determine if additional investigation is warranted; human health and ecological risk screening will be used to determine the potential magnitude of risk associated with any contamination detected; and

- provide preliminary recommendations for any additional investigations and/or actions.

Investigation-specific objectives have been developed using the DQO approach presented in the Facility-wide SAP. Project-specific sampling objectives are presented for each environmental medium in Chapter 4.0 of this SAP Addendum.

3.2 PHASE I RI DATA QUALITY OBJECTIVES

The project DQO is to provide sufficient high-quality data to address the primary project objectives identified in Section 3.1.

3.2.1 Conceptual Site Model

The conceptual site model presented in the Facility-wide SAP is applicable to EBG for this Phase I RI, based on current knowledge. Operational information and analytical data collected during historical environmental investigations at EBG have also been used to refine the conceptual model for EBG as follows:

- Soils: Five previous soil samples analyzed for TNT and RDX did not indicate soil contamination (see Section 1.2); however, locations of the samples are not known. Based on operational data, the suspected source area having the highest likelihood of soil contamination is the "T-Area," the vicinity of the terminus of Track 49, and the terminus of the access road leading to the northern end of the "T-area." Thus, these areas are specifically targeted for biased sampling.

- Sediment: Previous sampling of sediment (see Section 1.2) at two locations in the northeast and southwest portions of EBG near the site boundaries did not indicate contaminant levels above risk-based screening criteria. However, operational data suggest that the "T-Area" ditches

represent the most likely locations where contaminants may have accumulated through erosional transport and accumulation. Additional potential accumulation points include the surface water basins (in particular, the area north of Track 49) and the surface water exit pathway at the southeast corner of the site. Thus, these locations are specifically targeted for biased sampling. In addition, sediment may function as a transport mechanism as contaminants that are adsorbed to particulates can be mobilized by surface water flow.

- Surface water: Previous sampling of surface water within the boundary of EBG indicated lead values above risk-based screening criteria (see Section 1.2). Historical sampling at station PF 534 does not provide conclusive data as to whether EBG is a source of measurable contaminant flux to surface water. Site characteristics and field reconnaissance information show that the most likely current surface water exit pathway is to the southeast via the culvert beneath Track 10. Potential contaminants would be expected to leach or erode from source areas into surface water, particularly along the "T-Area" ditch lines and surface water basins north of Track 49, and migrate slowly toward the exit point under ambient gradients. The great amount of vegetation, beaver activity, and flat topography at the site greatly reduce surface water flow rates within EBG and maximize the potential for settling, sorption onto organic matter, and biological uptake. However, storm events may produce flushing of the surface water system and result in transport beyond the site boundary. Based on the site conceptual model, and lack of previous sampling at the exit pathway, both the surface water basins and the stream exiting the EBG are specifically targeted for biased sampling. The previous stream channel that bisected the site (Figure 1-3) may have been an accumulation point for site runoff during the operational period for the EBG. If this former channel is located during field investigations, a contingency sample may be collected from this former potential migration pathway.

- Groundwater: Analytical evidence for source contamination (i.e., soil) does not presently exist at EBG. Potential site-related contaminants (SRCs) based on operational history (metals, explosives, and semivolatiles) have low mobility in groundwater. Thus, contaminant migration from source areas to groundwater via leaching or surface water infiltration is an unknown element of the conceptual model at present. Potential groundwater impacts and the possibility that groundwater is a migration pathway will be evaluated based upon the results of the Phase I RI. If source contamination is identified, then groundwater will be investigated as an element of a subsequent phase of the RI. The scope of groundwater characterization will depend on the level of source contaminants. If source contaminants are less than Phase I RI screening criteria, then groundwater characterization activities are anticipated to be minimal, and AOC-specific hydrogeologic data would be collected only as necessary to eliminate the groundwater pathway. If source contaminants exceed screening criteria, then collection of AOC-specific hydrogeologic data will be defined as a DQO of the subsequent phase of the RI.

3.2.2 Problem Definition

Open burning of explosive wastes and munitions on the ground surface has potentially contaminated surface and subsurface soils. A potential exists for contamination of surface water and sediment as a result of leaching and storm runoff processes and accumulation of contaminants within low-lying areas, such as the "T-Area" ditches. The likelihood of contaminant migration to groundwater via leaching of soils or infiltration of surface water is presently unknown and will be evaluated based on the results of this Phase I RI. Surface water represents the most probable contaminant exit pathway beyond EBG; consequently this medium is a specific focus of the Phase I RI.

3.2.3 Remedial Action Objectives

See Section 3.2.3 of the Facility-wide SAP.

3.2.4 Identify Decisions

The key decisions for all investigations at RVAAP have been identified in Section 3.2.4 and in Table 3-1 of the Facility-wide SAP. Phase I data inclusive of the risk evaluation results are necessary to initiate the decision process and determine whether additional investigation or response actions are needed.

3.2.5 Define the Study Boundaries

The investigation area boundary for EBG is that presented in Figure 1-3. This boundary was established to encompass all known or reported historical burning operations, adjacent support areas, and potential surface water exit pathways.

3.2.6 Identify Decision Rules

Decision rules used to guide remediation decisions are provided in Section 3.2.6 of the Facility-wide SAP. As stated therein, the purpose of the Phase I data is to determine the presence and type of contamination, compare these data to risk-based or applicable or relevant and appropriate requirement (ARAR)-based criteria, and to determine if further investigation is needed at EBG.

3.2.7 Identify Inputs to the Decisions

Inputs to the decision process are the analytical results, risk-screening results, and refined site-specific conceptual model developed from field observations.

3.2.8 Specify Limits on Decision Error

Limits on decision errors are addressed in Section 3.2.8 of the Facility-wide SAP.

3.2.9 Sample Design

The sample design for the Phase I RI of EBG is described in detail in Chapter 4.0 of this SAP Addendum. Suspected source areas and contaminant accumulation points represent specific focus areas for sampling. The known surface water exit pathway is also specifically targeted. A minimal number of contingency samples are planned for suspected source areas or exit points identified during the Phase I RI field effort.

3.3 DATA EVALUATION METHODS

The methods for identifying AOC-related chemicals are described in the following sections. The data evaluation methods are consistent with those established for the Phase I RI for 11 High Priority AOCs at RVAAP (USACE 1998). The general process for identifying AOC-related chemicals involves: initial data reduction, defining data aggregates, data quality assessment, and screening of data against statistical, background, and weight-of-evidence criteria. Analytical results are reported by the laboratory in electronic form and loaded into a database. Site data are extracted from the database so that only one result is used for each station and depth sampled. Quality control data such as sample

splits and duplicates and laboratory re-analyses and dilutions will not be included in the determination of contaminant nature and extent or in the risk evaluation. Samples rejected in the validation process also will be excluded. If it is found that a significant number of samples is rejected, the entire data set will be evaluated to determine if a representative data set exists without the rejected data. The percentage of rejected data will be presented in the data quality assessment section of the Phase I RI report.

3.3.1 Determination of AOC Chemical Background

The Phase I RI will not require determination of separate AOC-specific chemical background. Analytical results from the Phase I RI will be screened against final facility-wide background values for RVAAP in the *Phase II RI Report for the Winklepeck Burning Grounds at the Ravenna Army Ammunition Plant, Ravenna, Ohio* (USACE 1999). These facility-wide background criteria and the processes used to generate them are currently under review by USACE and Ohio EPA. The final criteria as presented in the final Phase II RI report will be used in this study at EBG. This screening step will be used to determine if detected metals and other potential anthropogenic compounds [such as polyaromatic hydrocarbons (PAHs)] are site related or naturally occurring.

3.3.2 Definition of Aggregates

Data collected from the EBG will be aggregated by environmental media (surface water, soil, and sediment). Soil data will be aggregated by depth interval [surface soils from 0 to 1 foot below ground surface (bgs)] and subsurface soil from 1 to 3 feet bgs). Data will be evaluated on an AOC-wide scale. Summary statistics (i.e., minimum detect, maximum detect, frequency of detection, mean detect, and 95% upper confidence limit), will be developed for the entire EBG data set. Source areas ("hot spots") will be identified spatially from the soil and sediment data. Evaluation of the spatial distribution of surface water contaminants will remain on an AOC-wide scale and include factors such as proximity to sources and flow patterns within EBG. Focused discussions of any identified source areas and contamination at surface water exit points will be developed in the nature and extent assessment and the risk evaluation.

3.3.3 Data Screening

Data screening prior to the risk evaluation will consist of four steps: (1) a data quality assessment, (2) frequency of detection screen, (3) background screening, and (4) screening of essential human nutrients. These screens will be used to identify SRCs. Those constituents identified as SRCs will then be screened in the risk evaluation. The application of these screens to the Phase I RI risk evaluation is presented in Section 3.4.

- A detailed assessment of the quality of the Phase I RI analytical results will take place. Data that are rejected as a result of the data quality assessment will not be evaluated further in the screening process.

- Each chemical for each environmental medium (aggregate) will be evaluated to determine its frequency of detection. Chemicals that are never detected will be eliminated as SRCs. For sample aggregations with greater than 20 samples and a frequency of detection of less than 5%, a weight-of-evidence approach will be used to determine if the chemical is an SRC. The magnitudes and locations (clustering) of the detects will be evaluated. If the detected results show no clustering and concentrations are not substantially elevated relative to the detection limit, they will be considered spurious and the chemical eliminated as an SRC.

- For each inorganic constituent passing the frequency of detection screen, concentrations will be screened against available naturally occurring background levels. If the maximum concentration of a constituent exceeds the background value, the constituent will be considered as an SRC. These background levels are presented in Tables 3-1 through 3-4 for surface soils, subsurface soils, sediment, and surface water, respectively. Note that in the event a constituent was never detected in the background data set, its background level is assigned as zero. This process ensures that any detected concentrations at the EBG for particular constituent in a particular medium cannot be eliminated simply because the chemical was never detected in background. All detected organic compounds will be considered as SRCs, evaluated in nature and extent, and screened using the risk evaluation.

- Chemicals that are considered as essential nutrients (calcium, chloride, iodine, iron, magnesium, potassium, phosphorous, and sodium) will not be evaluated as SRCs, unless grossly elevated relative to background. These chemicals are an integral part of the country's food supply, and are often added to foods as supplements; thus, these constituents are not generally addressed as contaminants (EPA 1989 and 1995). Data on essential elements, however, will be used to evaluate the subsurface geochemistry.

3.4 RISK EVALUATION

Using the results of the Phase I RI data screening, a risk evaluation process will be applied to determine the potential magnitude of risk associated with contamination at the EBG. Only those chemicals identified as SRCs will be subject to the risk evaluation. This process will involve the following steps to determine contaminants of potential concern (COPCs) for each medium:

- Identify potential migration and exposure pathways associated with the site and identify potential exposure scenarios that should be used to select screening levels (see Section 3.4.1).

- Identify risk-based and ARAR-based screening criteria for each contaminant detected at least once above background levels for each medium at the EBG (see Section 3.4.2).

- Compare concentrations to risk-based and ARAR-based screening criteria to determine if AOC conditions warrant additional characterization or action (see Section 3.4.3).

Only those data passing the data quality assessment will be used for the purposes of the risk evaluation. This assessment is necessary to address the impact of any data quality issues on the use of the data for decision-making. Of particular importance are the detection limits used and how these detection limits relate to the risk-based screening values. Chemicals eliminated on the basis of frequency of detection, weight-of-evidence, background, or essential element screening steps will not be evaluated as potential COPCs.

3.4.1 Exposure Pathway Analysis

Phase I risk screening methods generally require the use of the most conservative potential land use assumption for a site (EPA 1991 and 1996; ASTM 1995). This will ensure that a site with a potential future hazard will not be identified as needing "no further action" too early in the CERCLA process. An analysis of the characteristics of the EBG will be performed in order to identify current and future land uses, as well as appropriate exposure pathways within each land use/medium combination.

Table 3-1. Ravenna Surface Soil (0 to 1 foot) Background (Metals Only)

Analyte (Units)	Results > Detection Limit	Minimum Detect	Maximum Detect	Average Result	STD	Dist.	95% Upper Tolerance Limit	Nonparametric 95% UTL	99th Percentile	Background Criteria
Aluminum (mg/kg)	11/11	4,920.00	17,700.00	10,700.00	4,045.85	N	22,100.00	17,700.00	17,700.00	17,700.00
Antimony (mg/kg)	0/11			0.32	0.03	O		0.78	0.78	0.96[a]
Arsenic (mg/kg)	11/11	7.00	15.40	10.50	2.59	L	20.20	15.40	15.40	15.40
Barium (mg/kg)	11/11	47.90	88.40	65.20	13.03	L	112.00	88.40	88.40	88.40
Beryllium (mg/kg)	0/11			0.25	0.06	O		0.82	0.82	0.88[a]
Cadmium (mg/kg)	0/11			0.32	0.03	O		0.78	0.78	0.00
Calcium (mg/kg)	11/11	238.00	15,800.00	4,300.00	4,583.63	L	97,300.00	15,800.00	15,800.00	15,800.00
Chromium (mg/kg)	11/11	6.30	17.40	12.10	4.30	N	24.20	17.40	17.40	17.40
Cobalt (mg/kg)	11/11	4.10	10.40	7.53	2.36	N	14.20	10.40	10.40	10.40
Copper (mg/kg)	11/11	9.10	17.70	11.50	2.22	X		17.70	17.70	17.70
Cyanide (mg/kg)	0/11			0.32	0.03	O		0.78	0.78	0.00
Iron (mg/kg)	11/11	10,000.00	23,100.00	17,200.00	3,697.96	N	27,600.00	23,100.00	23,100.00	23,100.00
Lead (mg/kg)	11/11	12.80	26.10	18.40	4.00	L	32.80	26.10	26.10	26.10
Magnesium (mg/kg)	11/11	1,140.00	3,030.00	1,970.00	604.42	L	4,410.00	3,030.00	3,030.00	3,030.00
Manganese (mg/kg)	11/11	147.00	1,450.00	638.00	349.99	L	3,050.00	1,450.00	1,450.00	1,450.00
Mercury (mg/kg)	7/11	0.03	0.04	0.04	0.02	X		0.16	0.08	0.04
Nickel (mg/kg)	10/11	9.00	21.10	13.60	4.41	L	29.40	21.10	21.10	21.10
Potassium (mg/kg)	11/11	303.00	927.00	621.00	176.64	N	1,120.00	927.00	927.00	927.00
Selenium (mg/kg)	2/11	0.69	1.40	0.45	0.33	D		1.40	1.40	1.40
Silver (mg/kg)	0/11			0.65	0.07	O		1.60	1.60	0.00
Sodium (mg/kg)	1/11	123.00	123.00	42.80	27.35	D		123.00	123.00	123.00
Thallium (mg/kg)	0/11			0.32	0.03	O		0.78	0.78	0.00
Vanadium (mg/kg)	11/11	9.10	31.10	19.00	7.74	N	40.80	31.10	31.10	31.10
Zinc (mg/kg)	11/11	38.40	61.80	51.20	8.38	N	74.80	61.80	61.80	61.80

[a]Subsurface antimony and beryllium background used.

Results less than the detection limit were set to 1/2 the reported detection limit.

Dist. Codes: L = Distribution most similar to lognormal.
N = Distribution most similar to normal.
X = Distribution significantly different from normal and lognormal.
D = Nonparametric distribution: frequency of detection <50%.
O = Zero detects: background criteria set to 0.00.

If background criteria > maximum detect, then background criteria = maximum detect.

If distribution determined normal or lognormal and fewer than 3 samples, then background criteria = maximum detect.

Table 3-2. Ravenna Subsurface Soil (>1 foot) Background (Metals Only)

Analyte (Units)	Results > Detection Limit	Minimum Detect	Maximum Detect	Average Result	STD	Dist.	95% Upper Tolerance Limit	Nonparametric 95% UTL	99th Percentile	Background Criteria
Aluminum (mg/kg)	27/27	1,380.00	19,500.00	11,600.00	4,917.52	N	22,900.00	19,500.00	19,500.00	19,500.00
Antimony (mg/kg)	8/27	0.27	0.96	0.34	0.14	D		0.96	0.96	0.96
Arsenic (mg/kg)	27/27	3.50	19.80	12.10	4.04	N	21.40	19.80	19.80	19.80
Barium (mg/kg)	27/27	10.70	134.00	58.60	28.68	N	124.00	134.00	134.00	124.00
Beryllium (mg/kg)	12/27	0.26	0.88	0.37	0.25	D		0.88	0.88	0.88
Cadmium (mg/kg)	0/27			0.29	0.01	O		0.62	0.62	0.00
Calcium (mg/kg)	22/27	416.00	35,500.00	4,880.00	9,339.26	L	44,800.00	35,500.00	35,500.00	35,500.00
Chromium (mg/kg)	27/27	4.10	27.20	16.90	6.24	N	31.30	27.20	27.20	27.20
Cobalt (mg/kg)	27/27	2.30	23.20	9.94	4.97	L	31.00	23.20	23.20	23.20
Copper (mg/kg)	27/27	2.90	32.30	19.50	6.34	N	34.10	32.30	32.30	32.30
Cyanide (mg/kg)	0/27			0.29	0.01	O		0.62	0.62	0.00
Iron (mg/kg)	27/27	3,690.00	35,200.00	23,200.00	7,299.72	N	39,900.00	35,200.00	35,200.00	35,200.00
Lead (mg/kg)	27/27	2.50	19.10	11.60	3.20	X		19.10	19.10	19.10
Magnesium (mg/kg)	27/27	216.00	8,790.00	3,350.00	2,054.14	X		8,790.00	8,790.00	8,790.00
Manganese (mg/kg)	27/27	107.00	3,030.00	400.00	551.13	X		3,030.00	3,030.00	3,030.00
Mercury (mg/kg)	4/27	0.03	0.04	0.04	0.02	D		0.12	0.12	0.04
Nickel (mg/kg)	27/27	3.80	60.70	23.60	12.01	L	76.10	60.70	60.70	60.70
Potassium (mg/kg)	27/27	333.00	3,560.00	1,520.00	798.94	N	3,350.00	3,560.00	3,560.00	3,350.00
Selenium (mg/kg)	8/27	0.61	1.50	0.49	0.34	D		1.50	1.50	1.50
Silver (mg/kg)	0/27			0.58	0.03	O		1.20	1.20	0.00
Sodium (mg/kg)	7/23	29.90	145.00	59.50	55.32	D		524.00	524.00	145.00
Thallium (mg/kg)	3/27	0.77	0.91	0.35	0.17	D		0.91	0.91	0.91
Vanadium (mg/kg)	27/27	5.20	37.60	19.70	7.90	N	37.80	37.60	37.60	37.60
Zinc (mg/kg)	27/27	7.60	93.30	60.50	17.18	N	99.90	93.30	93.30	93.30

Results less than the detection limit were set to 1/2 the reported detection limit.

Dist. Codes: L = Distribution most similar to lognormal.
N = Distribution most similar to normal.
X = Distribution significantly different from normal and lognormal.
D = Nonparametric distribution: frequency of detection <50%.
O = Zero detects: background criteria set to 0.00.

If background criteria > maximum detect then background criteria = maximum detect.

If distribution determined normal or lognormal and fewer than 3 samples, then background criteria = maximum detect.

Table 3-3. Ravenna Sediment Background (Metals Only

Analyte (Units)	Results > Detection Limit	Minimum Detect	Maximum Detect	Average Result	STD	Dist.	95% Upper Tolerance Limit	Nonparametric 95% UTL	99th Percentile	Background Criteria
Aluminum (mg/kg)	7/7	1,710.00	13,900.00	6,430.00	4,801.40	L	75,900.00	13,900.00	13,900.00	13,900.00
Antimony (mg/kg)	0/7			0.48	0.18	O		1.50	1.50	0.00
Arsenic (mg/kg)	7/7	3.70	19.50	9.34	5.32	L	54.40	19.50	19.50	19.50
Barium (mg/kg)	7/7	15.20	123.00	62.00	46.05	N	219.00	123.00	123.00	123.00
Beryllium (mg/kg)	2/7	0.15	0.38	0.24	0.12	D		0.64	0.64	0.38
Cadmium (mg/kg)	0/7			0.48	0.18	O		1.50	1.50	0.00
Calcium (mg/kg)	5/7	920.00	5,510.00	2,320.00	2,117.85	L	50,300.00	5,510.00	5,510.00	5,510.00
Chromium (mg/kg)	7/7	2.60	18.10	8.99	6.19	L	91.50	18.10	18.10	18.10
Cobalt (mg/kg)	7/7	2.10	9.10	5.61	2.84	L	34.20	9.10	9.10	9.10
Copper (mg/kg)	7/7	2.50	27.60	12.40	9.27	L	198.00	27.60	27.60	27.60
Cyanide (mg/kg)	0/7			0.48	0.18	O		1.50	1.50	0.00
Iron (mg/kg)	7/7	5,170.00	28,200.00	15,500.00	9,328.75	L	123,000.00	28,200.00	28,200.00	28,200.00
Lead (mg/kg)	7/7	3.40	27.40	13.00	9.13	N	44.00	27.40	27.40	27.40
Magnesium (mg/kg)	7/7	434.00	2,760.00	1,450.00	854.43	L	11,200.00	2,760.00	2,760.00	2,760.00
Manganese (mg/kg)	7/7	154.00	1,950.00	694.00	636.28	L	12,100.00	1,950.00	1,950.00	1,950.00
Mercury (mg/kg)	2/7	0.04	0.06	0.07	0.03	D		0.28	0.28	0.06
Nickel (mg/kg)	5/7	4.00	17.70	9.00	5.48	L	68.20	17.70	17.70	17.70
Potassium (mg/kg)	7/7	195.00	1950.00	745.00	607.23	L	8,070.00	1,950.00	1,950.00	1,950.00
Selenium (mg/kg)	1/7	1.70	1.70	0.62	0.50	D		1.70	1.70	1.70
Silver (mg/kg)	0/7			0.96	0.37	O		3.00	3.00	0.00
Sodium (mg/kg)	4/7	22.40	112.00	56.80	34.01	L	923.00	174.00	112.00	112.00
Thallium (mg/kg)	1/7	0.89	0.89	0.56	0.23	D		1.50	1.50	0.89
Vanadium (mg/kg)	7/7	3.30	26.10	12.50	8.85	L	139.00	26.10	26.10	26.10
Zinc (mg/kg)	7/7	16.20	532.00	123.00	183.06	L	3,090.00	532.00	532.00	532.00

Results less than the detection limit were set to 1/2 the reported detection limit.
Dist. Codes: L = Distribution most similar to lognormal.
N = Distribution most similar to Normal.
X = Distribution significantly different from normal and lognormal.
D = Nonparametric distribution: frequency of detection <50%.
O = Zero detects: background criteria set to 0.00.
If background criteria > maximum detect, then background criteria = maximum detect.
If distribution determined normal or lognormal and fewer than 3 samples, then background criteria = maximum detect.

Table 3-4. Ravenna Surface Water Background (Metals Only)

Analyte (Units)	Results > Detection Limit	Minimum Detect	Maximum Detect	Average Result	STD	Dist.	95% Upper Tolerance Limit	Nonparametric 95% UTL	99th Percentile	Background Criteria
Aluminum (mg/kg)	5/6	661.00	3,370.00	1,450.00	1,138.27	N	5,670.00	3,370.00	3,370.00	3,370.00
Antimony (mg/kg)	0/7			2.50	0.00	O		5.00	5.00	0.00
Arsenic (mg/kg)	1/7	3.20	3.20	2.70	0.42	D		6.80	6.80	3.20
Barium (mg/kg)	7/7	12.50	47.50	28.50	10.69	N	64.90	47.50	47.50	47.50
Beryllium (mg/kg)	0/7			2.00	0.00	O		4.00	4.00	0.00
Cadmium (mg/kg)	0/7			2.50	0.00	O		5.00	5.00	0.00
Calcium (mg/kg)	7/7	13,500.00	41,400.00	23,100.00	10,554.28	L	92,700.00	41,400.00	41,400.00	41,400.00
Chromium (mg/kg)	0/7			5.00	0.00	O		10.00	10.00	0.00
Cobalt (mg/kg)	0/7			25.00	0.00	O		50.00	50.00	0.00
Copper (mg/kg)	4/7	3.50	7.90	5.94	3.56	L	62.40	25.00	12.50	7.90
Cyanide (mg/kg)	0/7			0.01	0.00	O		0.01	0.01	0.00
Iron (mg/kg)	7/7	440.00	2,560.00	1,370.00	715.43	L	8,420.00	2,560.00	2,560.00	2,560.00
Lead (mg/kg)	0/7			1.50	0.00	O		3.00	3.00	0.00
Magnesium (mg/kg)	7/7	3,240.00	10,800.00	5,520.00	2,703.77	L	22,300.00	10,800.00	10,800.00	10,800.00
Manganese (mg/kg)	7/7	33.60	391.00	153.00	125.29	L	1,820.00	391.00	391.00	391.00
Mercury (mg/kg)	0/7			0.10	0.00	O		0.20	0.20	0.00
Nickel (mg/kg)	0/7			20.00	0.00	O		40.00	40.00	0.00
Potassium (mg/kg)	7/7	519.00	3,170.00	1670.00	797.67	N	4,390.00	3,170.00	3,170.00	3,170.00
Selenium (mg/kg)	0/7			2.50	0.00	O		5.00	5.00	0.00
Silver (mg/kg)	0/7			5.00	0.00	O		10.00	10.00	0.00
Sodium (mg/kg)	6/7	4,770.00	21,300.00	11500.00	8,285.01	N	39,600.00	21,300.00	21,300.00	21,300.00
Thallium (mg/kg)	0/7			0.93	0.19	O		2.00	2.00	0.00
Vanadium (mg/kg)	0/7			25.00	0.00	O		50.00	50.00	0.00
Zinc (mg/kg)	4/7	14.60	42.00	17.40	11.73	X		42.00	42.00	42.00

Results less than the detection limit were set to 1/2 the reported detection limit.

Dist. Codes: L = Distribution most similar to lognormal.
N = Distribution most similar to normal.
X = Distribution significantly different from normal and lognormal.
D = Nonparametric distribution: frequency of detection <50%.
O = Zero detects: background criteria set to 0.00.

If background criteria > maximum detect, then background criteria = maximum detect.

If distribution determined normal or lognormal and fewer than 3 samples, then background criteria = maximum detect.

3.4.2 Screening Levels

Tables 3-5 and 3-6 provide human health risk-based screening criteria for soils (i.e., surface and subsurface soil) and for water media (i.e., surface water), respectively. These levels reflect Tier 1-type screening values (ASTM 1995), e.g., values that are easily obtainable and, due to their conservative nature, can be used with a high degree of confidence to indicate sites for which no further action is required. The regulatory screening values as well as the calculated risk-based values reflect a residential land use and, thus, are appropriate for a Phase I evaluation. Screening levels based on industrial land use are also provided for reference as EBG will ultimately be transferred to the Ohio Army National Guard (OHARNG). Future land use will be addressed more thoroughly as part of future assessments, as deemed necessary. Ecological risk screening will be performed for surface water and sediment as discussed in Sections 3.4.2.2 and 3.4.2.3.

The exposure part of the screening level work will be the comparison of the maximum detected value for an SRC to its respective criterion. Comparisons will be done for each data aggregate (soil, surface water, sediment) separately. The following sections present the screening levels and the comparison methods used in the risk evaluation for each medium type.

3.4.2.1 Human Health Screening Levels for Soils

Soil screening levels listed in Table 3-5 represent preliminary remediation goals (PRGs) developed by EPA Region IX (EPA 1998). The EPA Region IX soil screening values reflect the following:

- residential and industrial land use;
- soil screening levels for the protection of groundwater, obtained directly from EPA's Soil Screening Guidance (EPA 1996); and
- risk target goals of 10^{-6} for carcinogens and a hazard quotient of 1 for noncarcinogens.

The residential and industrial Region IX PRGs have been adjusted to reflect the Ohio EPA target screening goals of 10^{-7} risk and a hazard quotient of 0.1, which is a factor of 10 less than the Region IX PRGs (PRG/10). The Region IX values reflect the following exposure pathways:

- ingestion,
- inhalation of particulates,
- inhalation of volatiles, and
- dermal absorption.

The industrial values are provided for information; these values should be carefully applied in a Phase I risk evaluation since use of these values implies that some action (i.e., land use restrictions) must be implemented.

The soil levels developed for protection of groundwater were obtained from the EPA Soil Screening Guidance (EPA 1996). These values back-calculate an acceptable concentration in soil based on acceptable groundwater concentrations. They incorporate several sensitive assumptions and, thus, should be used with caution. Some of the more important assumptions used in developing these values include:

- the site is a large volume source [12 hectares (30 acres)];

Table 3-5. Soil Screening Levels (at risk = 10^{-7} and HQ = 0.1)

Chemical	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
	Residential[a]	Industrial[a]	Leaching to Groundwater (DAF=1)[b]
Major Metals			
Aluminum	7.49E+03	1.00E+04	
Antimony and compounds	3.00E+00	7.49E+01	3.00E-02
Arsenic (cancer endpoint)	3.77E-02	2.99E-01	1.00E-01
Arsenic (noncancer endpoint)	2.08E+00	4.81E+01	
Barium and compounds	5.15E+02	1.00E+04	8.20E+00
Beryllium and compounds	1.50E+01	3.40E+02	3.00E-01
Boron	4.90E+02	9.60E+03	
Cadmium and compounds	3.75E+00	9.34E+01	4.00E-02
Chromium VI	3.01E+00	6.40E+00	2.00E-01
Total Chromium (1/6 ratio Cr VI/Cr III)	2.11E+01	4.48E+01	2.00E-01
Cobalt	3.25E+02	2.86E+03	
Copper and compounds	2.78E+02	6.96E+03	
Free cyanide	1.09E+02	2.14E+03	2.00E-01
Flouride (soluble)	3.27E+02	6.41E+03	
Iron	2.25E+03	1.00E+04	
Lead	4.00E+01	1.00E+02	
Manganese and compounds	3.12E+02	4.53E+03	
Mercury (elemental)			
Mercury (methyl)	5.45E-01	1.07E+01	
Mercury and compounds	2.25E+00	5.62E+01	
Molybdenum	3.75E+01	9.37E+02	
Nickel (soluble salts)	1.50E+02	3.75E+03	7.00E-01
Nitrate			
Nitrite			
Selenium	3.75E+01	9.37E+02	3.00E-02
Silver and compounds	3.75E+01	9.37E+02	2.00E-01
Strontium, stable	4.50E+03	1.00E+04	
Thallium acetate	6.75E-01	1.69E+01	4.00E-02
Thallium carbonate	6.00E-01	1.50E+01	4.00E-02
Thallium chloride	6.00E-01	1.50E+01	4.00E-02
Thallium nitrate	6.75E-01	1.69E+01	4.00E-02
Thallium selenite	6.75E-01	1.69E+01	4.00E-02
Thallium sulfate	6.00E-01	1.50E+01	4.00E-02
Tin (inorganic, see tributyltin oxide for organic tin)	4.50E+03	1.00E+04	
Vanadium	5.25E+01	1.31E+03	3.00E+01
Zinc	2.25E+03	1.00E+04	6.20E+01
Other Chemicals			
1,1,1,2-Tetrachloroethane	2.85E-01	6.84E-01	
1,1,1-Trichloroethane	6.85E+01	1.40E+02	1.00E-02
1,1,2,2-Tetrachloroethane	3.64E-02	8.73E-02	2.00E-05
1,1,2-Trichloro-1,2,2-trifluoroethane	5.60E+02	5.60E+02	
1,1,2-Trichloroethane	8.15E-02	1.87E-01	9.00E-05

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
1,1,2-Trichloropropane	1.48E+00	5.08E+00	
1,1-Biphenyl	2.26E+02	2.38E+03	
1,1-Dichloroethane	5.71E+01	2.04E+02	1.00E-01
1,1-Dichloroethylene	5.25E-03	1.17E-02	3.00E-04
1,1-Dimethylhydrazine	1.71E-02	1.15E-01	
1,2,3-Trichloropropane	1.42E-04	3.08E-04	
1,1,2-Trichloropropane	1.48E+00	5.08E+00	
1,1-Biphenyl	2.26E+02	2.38E+03	
1,1-Dichloroethane	5.71E+01	2.04E+02	1.00E-01
1,1-Dichloroethylene	5.25E-03	1.17E-02	3.00E-04
1,1-Dimethylhydrazine	1.71E-02	1.15E-01	
1,2,3-Trichloropropane	1.42E-04	3.08E-04	
1,2,3-Trichloropropene	1.14E+00	3.84E+00	
1,2,4,5-Tetrachlorobenzene	1.64E+00	3.21E+01	
1,2,4-Tribromobenzene	2.73E+01	5.34E+02	
1,2,4-Trichlorobenzene	4.75E+01	1.70E+02	3.00E-02
1,2,4-Trimethylbenzene	5.13E+00	1.70E+01	
1,2-Dibromo-3-chloropropane	3.17E-02	2.14E-01	
1,2-Dibromoethane	4.91E-04	2.92E-03	
1,2-Dichlorobenzene	3.70E+01	3.70E+01	9.00E-02
1,2-Dichloroethane (EDC)	3.39E-02	7.56E-02	1.00E-04
1,2-Dichloroethylene (cis)	4.19E+00	1.46E+01	2.00E-03
1,2-Dichloroethylene (trans)	6.21E+00	2.13E+01	3.00E-03
1,2-Dichloropropane	3.45E-02	7.61E-02	1.00E-04
1,2-Dimethylhydrazine	1.20E-03	8.09E-03	
1,2-Dinitrobenzene	2.18E+00	4.28E+01	
1,2-Diphenylhydrazine	5.55E-02	3.74E-01	
1,2-Epoxybutane	3.11E+01	6.09E+02	
1,3,5-Trimethylbenzene	2.12E+00	6.97E+00	
1,3,5-Trinitrobenzene	1.64E+02	3.21E+03	
1,3-Butadiene	6.49E-04	1.39E-03	
1,3-Dichlorobenzene	4.06E+00	1.36E+01	
1,3-Dichloropropene	8.13E-03	1.77E-02	2.00E-05
1,3-Dinitrobenzene	5.45E-01	1.07E+01	
1,4-Dibromobenzene	5.45E+01	1.07E+03	
1,4-Dichloro-2-butene	7.53E-04	1.79E-03	
1,4-Dichlorobenzene	3.03E-01	7.26E-01	1.00E-02
1,4-Dinitrobenzene	2.18E+00	4.28E+01	
1,4-Dioxane	4.04E+00	2.72E+01	
1,4-Dithiane	5.45E+01	1.07E+03	
1,6-Hexamethylene diisocyanate			
1-Butanol	5.45E+02	1.07E+04	9.00E-02
1-Chloro-1,1-difluoroethane (HCFC-142b)	3.40E+01	3.40E+01	
1-Chlorobutane	4.80E+01	4.80E+01	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
2-(2,4,5-Trichlorophenoxy) propionic acid	4.36E+01	8.55E+02	
2-(2-Methyl-1,4-chlorophenoxy) propionic acid	5.45E+00	1.07E+02	
2-(2-Methyl-4-chlorophenoxy) propionic acid	5.45E+00	1.07E+02	
2-(Thiocyanomethylthio)-benzothiazole (TCMTB)	1.64E+02	3.21E+03	
2,3,4,6-Tetrachlorophenol	1.64E+02	3.21E+03	
2,3,7,8-TCDD (dioxin)	3.77E-07	3.00E-06	
2,3-Dichloropropanol	1.64E+01	3.21E+02	
2,4,5-Trichlorophenol	5.45E+02	1.07E+04	1.40E+00
2,4,5-Trichlorophenoxyacetic acid	5.45E+01	1.07E+03	
2,4,6-Trichloroaniline	1.31E+00	8.80E+00	
2,4,6-Trichloroaniline hydrochloride	1.53E+00	1.03E+01	
2,4,6-Trichlorophenol	4.04E+00	2.72E+01	8.00E-04
2,4,6-Trinitrotoluene	1.48E+00	9.98E+00	
2,4-Dichlorophenol	1.64E+01	3.21E+02	5.00E-03
2,4-Dichlorophenoxyacetic acid (2,4-D)	6.42E+01	1.40E+03	
2,4-Dimethylaniline	5.92E-02	3.99E-01	
2,4-Dimethylaniline hydrochloride	7.66E-02	5.16E-01	
2,4-Dimethylphenol	1.09E+02	2.14E+03	4.00E-02
2,4-Dinitrophenol	1.09E+01	2.14E+02	1.00E-03
2,4-Dinitrotoluene (also see Dinitrotoluene mixture)	1.09E+01	2.14E+02	4.00E-06
2,6-Dimethylphenol	3.27E+00	6.41E+01	
2,6-Dinitrotoluene (also see Dinitrotoluene mixture)	5.45E+00	1.07E+02	3.00E-06
2-Chloro-1,3-butadiene	3.62E-01	1.19E+00	
2-Chloroacetophenone	3.19E-03	1.11E-02	
2-Chloroethyl vinyl ether			
2-Chlorophenol	5.92E+00	2.36E+01	2.00E-02
2-Chloropropane	1.65E+01	5.90E+01	
2-Ethoxyethanol	2.18E+03	1.00E+04	
2-Ethoxyethanol acetate	1.64E+03	1.00E+04	
2-Mercaptobenzothiazole	1.53E+00	1.03E+01	
2-Methoxy-5-nitroaniline	9.65E-01	6.51E+00	
2-Methoxyethanol	5.45E+00	1.07E+02	
2-Methoxyethanol acetate	1.09E+01	2.14E+02	
2-Methyl-4-chlorophenoxyacetic acid	2.73E+00	5.34E+01	
2-Methyl-5-nitroaniline	1.35E+00	9.07E+00	
2-Methylaniline (o-toluidine)	1.85E-01	1.25E+00	
2-Methylaniline hydrochloride	2.47E-01	1.66E+00	
2-Methylphenol	2.73E+02	5.34E+03	8.00E-02
2-Nitroaniline	3.27E-01	6.41E+00	
2-Nitropropane			
2-Phenylphenol	2.29E+01	1.54E+02	
3,3-Dichlorobenzidine	9.87E-02	6.65E-01	3.00E-05

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
3,3'-Dimethoxybenzidine	3.17E+00	2.14E+01	
3,3'-Dimethylbenzidine	4.83E-03	3.25E-02	
3,4-Dimethylphenol	5.45E+00	1.07E+02	
3-Methylphenol	2.73E+02	5.34E+03	
3-Nitroaniline			
4-(2,4-Dichlorophenoxy)butyric acid (2,4-DB)	4.36E+01	8.55E+02	
4-(2-Methyl-4-chlorophenoxy) butyric acid	5.45E+01	1.07E+03	
4,4'-Methylene bis(2-chloroaniline)	3.42E-01	2.30E+00	
4,4'-Methylene bis(N,N'-dimethyl)aniline	9.65E-01	6.51E+00	
4,4'-Methylene diphenyl diisocyanate	9.30E-01	1.80E+01	
4,4'-Methylenebisbenzeneamine	1.78E-01	1.20E+00	
4,6-Dinitro-o-cyclohexyl phenol	1.09E+01	2.14E+02	
4-Aminopyridine	1.09E-01	2.14E+00	
4-Bromophenyl phenyl ether			
4-Chloro-2-methylaniline	7.66E-02	5.16E-01	
4-Chloro-2-methylaniline hydrochloride	9.65E-02	6.51E-01	
4-Chloroaniline	2.18E+01	4.28E+02	3.00E-03
4-Chlorobenzotrifluoride	1.09E+02	2.14E+03	
4-Methylphenol	2.73E+01	5.34E+02	
4-Nitroaniline			
4-Nitrophenol	3.38E+02	6.63E+03	
Acenaphthene	2.55E+02	2.80E+03	2.90E+00
Acephate	5.10E+00	3.44E+01	6.00E+00
Acetaldehyde	9.18E-01	2.19E+00	
Acetochlor	1.09E+02	2.14E+03	
Acetone	1.44E+02	6.05E+02	8.00E-02
Acetone cyanohydrin	4.36E+00	8.55E+01	
Acetonitrile	2.01E+01	1.35E+02	
Acetophenone	4.94E-02	1.61E-01	
Acifluorfen	4.04E-01	2.72E+00	
Acrolein	1.03E-02	3.37E-02	
Acrylamide	9.76E-03	6.58E-02	
Acrylic acid	2.60E+03	4.18E+04	
Acrylonitrile	1.94E-02	4.93E-02	
Alachlor	5.52E-01	3.72E+00	
Alar	8.18E+02	1.60E+04	
Aldicarb	5.45E+00	1.07E+02	
Aldicarb sulfone	5.45E+00	1.07E+02	
Aldrin	2.61E-03	1.76E-02	5.90E+01
Ally	1.36E+03	1.00E+04	
Allyl alcohol	2.73E+01	5.34E+02	
Allyl chloride	2.71E+02	5.20E+03	
Aluminum phosphide	3.00E+00	7.49E+01	
Amdro	1.64E+00	3.21E+01	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
Ametryn	4.91E+01	9.62E+02	
Amitraz	1.36E+01	2.67E+02	
Ammonia			
Ammonium sulfamate	1.09E+03	1.00E+04	
Aniline	7.79E+00	5.25E+01	
Anthracene	1.43E+03	2.22E+04	5.90E+01
Antimony pentoxide	3.75E+00	9.37E+01	
Antimony potassium tartrate	6.75E+00	1.69E+02	
Antimony tetroxide	3.00E+00	7.49E+01	
Antimony trioxide	3.00E+00	7.49E+01	
Apollo	7.09E+01	1.39E+03	
Aramite	1.78E+00	1.20E+01	
Aroclor 1016 (see PCBs for cancer endpoint)	3.40E-01	6.28E+00	
Aroclor 1254 (see PCBs for cancer endpoint)	9.72E-02	1.80E+00	
Arsine (see arsenic for cancer endpoint)			
Assure	4.91E+01	9.62E+02	
Asulam	2.73E+02	5.34E+03	
Atrazine	2.00E-01	1.35E+00	
Avermectin B1	2.18E+00	4.28E+01	
Azobenzene	4.04E-01	2.72E+00	
Barium cyanide	5.45E+02	1.00E+04	
Baygon	2.18E+01	4.28E+02	
Bayleton	1.64E+02	3.21E+03	
Baythroid	1.36E+02	2.67E+03	
Benefin	1.64E+03	1.00E+04	
Benomyl	2.73E+02	5.34E+03	
Bentazon	1.64E+02	3.21E+03	
Benz[a]anthracene	5.57E-02	3.59E-01	8.00E-03
Benzaldehyde	5.45E+02	1.07E+04	
Benzene	6.19E-02	1.36E-01	2.00E-04
Benzidine	1.93E-04	1.30E-03	
Benzo[a]pyrene	5.57E-03	3.59E-02	4.00E-02
Benzo[b]fluoranthene	5.57E-02	3.59E-01	2.00E-02
Benzo[k]fluoranthene	5.57E-01	3.59E+00	2.00E-01
Benzoic acid	1.00E+04	1.00E+04	2.00E+00
Benzotrichloride	3.42E-03	2.30E-02	
Benzyl alcohol	1.64E+03	1.00E+04	
Benzyl chloride	8.06E-02	2.17E-01	
beta-Chloronaphthalene	3.68E+02	2.37E+03	
Bidrin	5.45E-01	1.00E-01	
Biphenthrin (Talstar)	8.18E+01	1.60E+03	
Bis(2-chloro-1-methylethyl)ether	6.34E-01	4.28E+00	
Bis(2-chloroethyl)ether	1.82E-02	5.59E-02	2.00E-06
Bis(2-chloroisopropyl)ether	2.53E-01	7.41E-01	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
Bis(2-ethylhexyl)phthalate (DEHP)	3.17E+00	2.14E+01	
Bis(chloromethyl)ether	1.89E-05	4.29E-05	
Bisphenol A	2.73E+02	5.34E+03	
Boron trifluoride			
Bromobenzene	2.81E+00	9.22E+00	
Bromodichloromethane	9.81E-02	2.30E-01	3.00E-03
Bromoform (tribromomethane)	5.62E+00	3.79E+01	4.00E-03
Bromomethane (Methyl bromide)	3.84E-01	1.31E+00	1.00E-03
Bromophos	2.73E+01	5.34E+02	
Bromoxynil	1.09E+02	2.14E+03	
Bromoxynil octanoate	1.09E+02	2.14E+03	
Butyl benzyl phthalate	9.30E+01	9.30E+01	8.10E+01
Butylate	2.73E+02	5.34E+03	
Butylphthalyl butylglycolate	5.45E+03	1.00E+04	
Cacodylic acid	1.64E+01	3.21E+02	
Calcium cyanide	2.18E+02	4.28E+03	
Caprolactam	2.73E+03	1.00E+04	
Captafol	5.16E+00	3.48E+01	
Captan	1.27E+01	8.55E+01	
Carbaryl	5.45E+02	1.07E+04	
Carbazole	2.22E+00	1.50E+01	3.00E-03
Carbofuran	2.73E+01	5.34E+02	
Carbon disulfide	3.48E+01	1.20E+02	2.00E-01
Carbon tetrachloride	2.34E-02	5.24E-02	3.00E-04
Carbosulfan	5.45E+01	1.07E+03	
Carboxin	5.45E+02	1.07E+04	
Chloral	1.09E+01	2.14E+02	
Chloramben	8.18E+01	1.60E+03	
Chloranil	1.10E-01	7.43E-01	
Chlordane	1.55E-01	1.20E+00	5.00E-02
Chlorimuron-ethyl	1.09E+02	2.14E+03	
Chlorine			
Chlorine dioxide			
Chloroacetaldehyde			
Chloroacetic acid	1.09E+01	2.14E+02	
Chlorobenzene	5.38E+00	1.83E+01	7.00E-03
Chlorobenzilate	1.64E-01	1.11E+00	
Chlorodifluoromethane	3.40E+01	3.40E+01	
Chloroform	2.44E-02	5.21E-02	3.00E-03
Chloromethane	1.21E-01	2.65E-01	
Chlorothalonil	4.04E+00	2.72E+01	
Chlorpropham	1.09E+03	1.00E+04	
Chlorpyrifos	1.64E+01	3.21E+02	
Chlorpyrifos-methyl	5.45E+01	1.07E+03	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
Chlorsulfuron	2.73E+02	5.34E+03	
Chlorthiophos	4.36E+00	8.55E+01	
Chrysene	5.57E+00	3.59E+01	8.00E-01
Coke oven emissions			
Copper cyanide	2.73E+01	5.35E+02	
Crotonaldehyde	5.27E-04	1.14E-03	
Cumene (isopropylbenzene)	1.56E+01	5.21E+01	
Cyanazine	5.29E-02	3.56E-01	
Cyanogen	2.18E+02	4.28E+03	
Cyanogen bromide	4.91E+02	1.00E+04	
Cyanogen chloride	2.73E+02	5.34E+03	
Cyclohexanone	1.00E+04	1.00E+04	
Cyclohexylamine	1.09E+03	1.00E+04	
Cyhalothrin/Karate	2.73E+01	5.34E+02	
Cypermethrin	5.45E+01	1.07E+03	
Cyromazine	4.09E+01	8.02E+02	
Dacthal	5.45E+01	1.07E+03	
Dalapon	1.64E+02	3.21E+03	
Danitol	1.36E+02	2.67E+03	
DDD	2.36E-01	1.87E+00	8.00E-02
DDE	1.66E-01	1.32E+00	3.00E-01
DDT	1.66E-01	1.32E+00	2.00E-01
Decabromodiphenyl ether	5.45E+01	1.07E+03	
Demeton	2.18E-01	4.28E+00	
Di(2-ethylhexyl)adipate	3.70E+01	2.49E+02	
Diallate	7.28E-01	4.91E+00	
Diazinon	4.91E+00	9.62E+01	
Dibenz[ah]anthracene	5.57E-03	3.59E-02	8.00E-03
Dibenzofuran	2.07E+01	3.24E+02	
Dibromochloromethane	5.29E-01	3.56E+00	2.00E-03
Dibutyl phthalate	5.45E+02	1.07E+04	2.70E+01
Dicamba	1.64E+02	3.21E+03	
Dichlorodifluoromethane	9.36E+00	3.08E+01	
Dichlorvos	1.53E-01	1.03E+00	
Dicofol	1.01E-01	6.80E-01	
Dicyclopentadiene	5.45E-02	1.78E-01	
Dieldrin	2.78E-03	1.87E-02	2.00E-05
Diethyl phthalate	4.36E+03	1.00E+04	
Diethylene glycol, monobutyl ether	3.11E+01	6.09E+02	
Diethylene glycol, monoethyl ether	1.00E+04	1.00E+04	
Diethylformamide	6.00E+01	1.18E+03	
Diethylstilbestrol	9.45E-06	6.37E-05	
Difenzoquat (Avenge)	4.36E+02	8.55E+03	
Diflubenzuron	1.09E+02	2.14E+03	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
Diisopropyl methylphosphonate	4.36E+02	8.55E+03	
Dimethipin	1.09E+02	2.14E+03	
Dimethoate	1.09E+00	2.14E+01	
Dimethyl phthalate	1.00E+04	1.00E+04	
Dimethyl terephthalate	5.45E+02	1.07E+04	
Dimethylamine	6.30E-03	2.47E-02	
Dimethylphenethylamine	5.45E+00	1.07E+02	
Dinitrotoluene mixture	6.53E-02	4.40E-01	4.00E-06
di-n-Octyl phthalate	1.09E+02	1.00E+03	1.00E+03
Dinoseb	5.45E+00	1.07E+02	
Dioxin (2,3,7,8-TCDD)	3.77E-07	3.00E-06	
Diphenamid	1.64E+02	3.21E+03	
Diphenyl sulfone	4.91E+01	9.62E+02	
Diphenylamine	1.36E+02	2.67E+03	
Diquat	1.20E+01	2.35E+02	
Direct black 38	5.16E-03	3.48E-02	
Direct blue 6	5.48E-03	3.69E-02	
Direct brown 95	4.77E-03	3.22E-02	
Disulfoton	2.18E-01	4.28E+00	
Diuron	1.09E+01	2.14E+02	
Dodine	2.18E+01	4.28E+02	
Endosulfan	3.27E+01	6.41E+02	9.00E-02
Endothall	1.09E+02	2.14E+03	
Endrin	1.64E+00	3.21E+01	5.00E-03
Epichlorohydrin	7.40E-01	2.56E+00	
EPTC (S-Ethyl dipropylthiocarbamate)	1.36E+02	2.67E+03	
Ethephon (2-chloroethyl phosphonic acid)	2.73E+01	5.34E+02	
Ethion	2.73E+00	5.34E+01	
Ethyl acetate	1.68E+03	7.66E+03	
Ethyl acrylate	2.09E-02	4.53E-02	
Ethyl chloride	1.60E+02	1.60E+02	
Ethyl ether	1.80E+02	1.80E+02	
Ethyl methacrylate	1.40E+01	1.40E+01	
Ethyl p-nitrophenyl phenylphosphorothioate	5.45E-02	1.07E+00	
Ethylbenzene	2.30E+01	2.30E+01	7.00E-02
Ethylene cyanohydrin	1.64E+03	1.00E+04	
Ethylene diamine	1.09E+02	2.14E+03	
Ethylene glycol	1.00E+04	1.00E+04	
Ethylene glycol, monobutyl ether	3.11E+01	6.09E+02	
Ethylene oxide	1.28E-02	3.40E-02	
Ethylene thiourea (ETU)	4.04E-01	2.72E+00	
Ethylphthalyl ethyl glycolate	1.00E+04	1.00E+04	
Express	4.36E+01	8.55E+02	
Fenamiphos	1.36E+00	2.67E+01	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
Fluometuron	7.09E+01	1.39E+03	
Fluoranthene	2.00E+02	3.74E+03	2.10E+01
Fluorene	1.79E+02	2.24E+03	2.80E+00
Fluoridone	4.36E+02	8.55E+03	
Flurprimidol	1.09E+02	2.14E+03	
Flutolanil	3.27E+02	6.41E+03	
Fluvalinate	5.45E+01	1.07E+03	
Folpet	1.27E+01	8.55E+01	
Fomesafen	2.34E-01	1.58E+00	
Fonofos	1.09E+01	2.14E+02	
Formaldehyde	8.18E+02	1.00E+04	
Formic acid	1.00E+04	1.00E+04	
Fosetyl-al	1.00E+04	1.00E+04	
Furan	2.51E-01	8.51E-01	
Furazolidone	1.17E-02	7.88E-02	
Furfural	1.64E+01	3.21E+02	
Furium	8.88E-04	5.99E-03	
Furmecyclox	1.48E+00	9.98E+00	
Glufosinate-ammonium	2.18E+00	4.28E+01	
Glycidaldehyde	2.18E+00	4.28E+01	
Glyphosate	5.45E+02	1.07E+04	
Haloxyfop-methyl	2.73E-01	5.34E+00	
Harmony	7.09E+01	1.39E+03	
HCH (alpha)	8.64E-03	6.65E-02	3.00E-06
HCH (beta)	3.02E-02	2.33E-01	1.00E-05
HCH (gamma) Lindane	4.19E-02	3.23E-01	5.00E-05
HCH-technical	3.02E-02	2.33E-01	1.00E-05
Heptachlor	9.87E-03	6.65E-02	1.00E-01
Heptachlor epoxide	4.88E-03	3.29E-02	3.00E-03
Hexabromobenzene	1.09E+01	2.14E+02	
Hexachlorobenzene	2.78E-02	1.87E-01	1.00E-02
Hexachlorobutadiene	5.69E-01	3.84E+00	1.00E-02
Hexachlorocyclopentadiene	3.78E+01	7.09E+02	2.00E+00
Hexachlorodibenzo-p-dioxin mixture (HxCDD)	7.16E-06	4.83E-05	
Hexachloroethane	3.17E+00	2.14E+01	2.00E-03
Hexachlorophene	1.64E+00	3.21E+01	
Hexahydro-1,3,5-trinitro-1,3,5-triazine	4.04E-01	2.72E+00	
Hexazinone	1.80E+02	3.53E+03	
Hydrazine, hydrazine sulfate	1.48E-02	9.97E-02	
Hydrogen chloride			
Hydrogen cyanide	1.07E+00	3.54E+00	
Hydrogen sulfide			
Imazalil	7.09E+01	1.39E+03	
Imazaquin	1.36E+03	1.00E+04	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
Indeno[1,2,3-cd]pyrene	5.57E-02	3.59E-01	7.00E-02
Iprodione	2.18E+02	4.28E+03	
Isobutanol	1.02E+03	4.00E+03	
Isophorone	4.67E+01	3.15E+02	3.00E-03
Isopropalin	8.18E+01	1.60E+03	
Isopropyl methyl phosphonic acid	5.45E+02	1.07E+04	
iso-Propylbenzene	1.22E+01	4.92E+01	
Isoxaben	2.73E+02	5.34E+03	
Kepone	2.47E-03	1.66E-02	
Lactofen	1.09E+01	2.14E+02	
Lead (tetraethyl)	5.45E-04	1.07E-02	
Linuron	1.09E+01	2.14E+02	
Lithium	1.50E+02	3.75E+03	
Londax	1.09E+03	1.00E+04	
Malathion	1.09E+02	2.14E+03	
Maleic anhydride	5.45E+02	1.07E+04	
Maleic hydrazide	1.64E+02	5.63E+02	
Malononitrile	1.09E-01	2.14E+00	
m-Aminophenol	3.82E+02	7.48E+03	
Mancozeb	1.64E+02	3.21E+03	
Maneb	7.40E-01	4.99E+00	
Mephosfolan	4.91E-01	9.62E+00	
Mepiquat	1.64E+02	3.21E+03	
Merphos	1.64E-01	3.21E+00	
Merphos oxide	1.64E-01	3.21E+00	
Metalaxyl	3.27E+02	6.41E+03	
Methacrylonitrile	1.85E-01	8.43E-01	
Methamidophos	2.73E-01	5.34E+00	
Methanol	2.73E+03	1.00E+04	
Methidathion	5.45E+00	1.07E+02	
Methomyl	4.38E+00	1.47E+01	
Methoxychlor	2.73E+01	5.34E+02	8.00E-01
Methyl acetate	1.97E+03	9.19E+03	
Methyl acrylate	6.88E+00	2.33E+01	
Methyl chlorocarbonate	5.45E+03	1.00E+04	
Methyl ethyl ketone	6.86E+02	2.72E+03	
Methyl hydrazine	4.04E-02	2.72E-01	
Methyl isobutyl ketone	7.46E+01	2.84E+02	
Methyl Mercaptan	3.11E+00	6.09E+01	
Methyl methacrylate	2.17E+02	7.26E+02	
Methyl parathion	1.36E+00	2.67E+01	
Methyl phosphonic acid	1.09E+02	2.14E+03	
Methyl styrene (alpha)	6.80E+01	6.80E+01	
Methyl styrene (mixture)	1.16E+01	5.41E+01	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
Methyl tertbutyl ether (MTBE)			
Methylcyclohexane	4.69E+03	1.00E+04	
Methylene bromide	5.45E+01	1.07E+03	
Methylene chloride	8.49E-01	2.00E+00	1.00E-04
Metolaclor (Dual)	8.18E+02	1.00E+04	
Metribuzin	1.36E+02	2.67E+03	
Mirex	2.47E-02	1.66E-01	
m-Nitrotoluene	5.45E+01	1.07E+03	
Molinate	1.09E+01	2.14E+02	
Monochloramine	5.45E+02	1.07E+04	
m-Phenylenediamine	3.27E+01	6.41E+02	
m-Xylene	2.10E+01	2.10E+01	1.00E+00
N,N-Dimethylformamide	5.45E+02	1.07E+04	
Naled	1.09E+01	2.14E+02	
Naphthalene	5.48E+00	1.88E+01	4.00E-01
Napropamide	5.45E+02	1.07E+04	
n-Butylbenzene	1.34E+01	5.50E+01	
n-Hexane	1.10E+01	1.10E+01	
Nickel refinery dust			
Nickel subsulfide		1.11E+03	
Nitrapyrin	8.18E+00	1.60E+02	
Nitric Oxide	5.45E+02	1.07E+04	
Nitrobenzene	1.61E+00	1.04E+01	7.00E-04
Nitrofurantoin	3.82E+02	7.48E+03	
Nitrofurazone	2.96E-02	1.99E-01	
Nitrogen dioxide			
Nitroguanidine	5.45E+02	1.07E+04	
N-N-Dimethylaniline	1.09E+01	2.14E+02	
N-Nitroso di-n-propylamine	6.34E-03	4.28E-02	2.00E-07
N-Nitrosodiethanolamine	1.59E-02	1.07E-01	
N-Nitrosodiethylamine	2.96E-04	2.00E-03	
N-Nitrosodimethylamine	8.71E-04	5.87E-03	
N-Nitrosodi-n-butylamine	2.23E-03	5.83E-03	
N-Nitrosodiphenylamine	9.06E+00	6.11E+01	6.00E-03
N-Nitroso-N-methylethylamine	2.02E-03	1.36E-02	
N-Nitrosopyrrolidine	2.11E-02	1.43E-01	
Norflurazon	2.18E+02	4.28E+03	
n-Propylbenzene	1.34E+01	5.50E+01	
NuStar	3.82E+00	7.48E+01	
o-Chloronitrobenzene	1.78E+00	1.20E+01	
o-Chlorotoluene	1.52E+01	5.61E+01	
Octabromodiphenyl ether	1.64E+01	3.21E+02	
Octahydro-1357-tetranitro-1357- tetrazocine (HMX)	2.73E+02	5.34E+03	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
Octamethylpyrophosphoramide	1.09E+01	2.14E+02	
o-Nitrotoluene	5.45E+01	1.07E+03	
Oryzalin	2.73E+02	5.34E+03	
Oxadiazon	2.73E+01	5.34E+02	
Oxamyl	1.36E+02	2.67E+03	
Oxyfluorfen	1.64E+01	3.21E+02	
o-Xylene	2.80E+01	2.80E+01	9.00E-01
p,a,a,a-Tetrachlorotoluene	2.22E-03	1.50E-02	
Paclobutrazol	7.09E+01	1.39E+03	
Paraquat	2.45E+01	4.81E+02	
Parathion	3.27E+01	6.41E+02	
p-Chlorobenzoic acid	1.09E+03	1.00E+04	
p-Chloronitrobenzene	2.47E+00	1.66E+01	
Pebulate	2.73E+02	5.34E+03	
Pendimethalin	2.18E+02	4.28E+03	
Pentabromo-6-chloro cyclohexane	1.93E+00	1.30E+01	
Pentabromodiphenyl ether	1.09E+01	2.14E+02	
Pentachlorobenzene	4.36E+00	8.55E+01	
Pentachloronitrobenzene	1.71E-01	1.15E+00	
Pentachlorophenol	2.53E-01	1.45E+00	1.00E-04
Perchlorate	3.75E+00	9.37E+01	
Permethrin	2.73E+02	5.34E+03	
Phenmedipham	1.36E+03	1.00E+04	
Phenol	3.27E+03	1.00E+04	5.00E-01
Phenothiazine	1.09E+01	2.14E+02	
Phenylmercuric acetate	4.36E-01	8.55E+00	
Phorate	1.09E+00	2.14E+01	
Phosmet	1.09E+02	2.14E+03	
Phosphine	1.63E+00	3.21E+01	
Phosphoric acid			
Phosphorus (white)	1.50E-01	3.75E+00	
Phthalic anhydride	1.00E+04	1.00E+04	
p-Hydroquinone	2.18E+02	4.28E+03	
Picloram	3.82E+02	7.48E+03	
Pirimiphos-methyl	5.45E+01	1.07E+03	
p-Nitrotoluene	5.45E+01	1.07E+03	
Polybrominated biphenyls	4.99E-03	3.36E-02	
Polychlorinated biphenyls (PCBs)	1.98E-02	1.26E-01	
Potassium cyanide	2.73E+02	5.34E+03	
Potassium silver cyanide	1.09E+03	1.00E+04	
p-Phenylenediamine	1.04E+03	1.00E+04	
p-Phthalic acid	5.45E+03	1.00E+04	
Prochloraz	2.96E-01	2.00E+00	
Profluralin	3.27E+01	6.41E+02	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
Prometon	8.18E+01	1.60E+03	
Prometryn	2.18E+01	4.28E+02	
Pronamide	4.09E+02	8.02E+03	
Propachlor	7.09E+01	1.39E+03	
Propanil	2.73E+01	5.34E+02	
Propargite	1.09E+02	2.14E+03	
Propargyl alcohol	1.09E+01	2.14E+02	
Propazine	1.09E+02	2.14E+03	
Propham	1.09E+02	2.14E+03	
Propiconazole	7.09E+01	1.39E+03	
Propylene glycol	1.00E+04	1.00E+04	
Propylene glycol, monoethyl ether	3.82E+03	1.00E+04	
Propylene glycol, monomethyl ether	3.82E+03	1.00E+04	
Propylene oxide	1.46E-01	6.77E-01	
p-Toluidine	2.34E-01	1.58E+00	
Pursuit	1.36E+03	1.00E+04	
p-Xylene	3.70E+01	3.70E+01	1.00E+00
Pydrin	1.36E+02	2.67E+03	
Pyrene	1.48E+02	2.65E+03	2.10E+01
Pyridine	5.45E+00	1.07E+02	
Quinalphos	2.73E+00	5.34E+01	
Quinoline	3.70E-03	2.49E-02	
RDX (Cyclonite)	4.04E-01	2.72E+00	
Resmethrin	1.64E+02	3.21E+03	
Ronnel	2.73E+02	5.34E+03	
Rotenone	2.18E+01	4.28E+02	
Savey	1.36E+02	2.67E+03	
sec-Butylbenzene	1.05E+01	4.08E+01	
Selenious acid	2.73E+01	5.35E+02	
Selenourea	2.73E+01	5.35E+02	
Sethoxydim	4.91E+02	9.62E+03	
Silver cyanide	5.45E+02	1.07E+04	
Simazine	3.70E-01	2.49E+00	
Sodium azide	2.18E+01	4.28E+02	
Sodium cyanide	2.18E+02	4.28E+03	
Sodium diethyldithiocarbamate	1.64E-01	1.11E+00	
Sodium fluoroacetate	1.09E-01	2.14E+00	
Sodium metavanadate	5.45E+00	1.07E+02	
Strychnine	1.64E+00	3.21E+01	
Styrene	1.70E+02	1.70E+02	2.00E-02
Systhane	1.36E+02	2.67E+03	
Tebuthiuron	3.82E+02	7.48E+03	
Temephos	1.09E+02	2.14E+03	
Terbacil	7.09E+01	1.39E+03	

Table 3-5 (continued)

	EPA Region IX PRGs/10 (mg/kg)		Soil Screening Guidance/10 (mg/kg)
Chemical	**Residential**	**Industrial**	**Leaching to Groundwater (DAF=1)[b]**
Terbufos	1.36E-01	2.67E+00	
Terbutryn	5.45E+00	1.07E+02	
tert-Butylbenzene	1.22E+01	4.92E+01	
Tetrachloroethylene (PCE)	4.72E-01	1.62E+00	3.00E-04
Tetrachlorovinphos	1.85E+00	1.25E+01	
Tetraethyldithiopyrophosphate	2.73E+00	5.34E+01	
Tetrahydrofuran	4.67E+02	9.16E+03	
Thallic oxide	5.25E-01	1.31E+01	
Thiobencarb	5.45E+01	1.07E+03	
Thiocyanate	5.45E+02	1.00E+04	
Thiofanox	1.64E+00	3.21E+01	
Thiophanate-methyl	4.36E+02	8.55E+03	
Thiram	2.73E+01	5.34E+02	
Toluene	5.20E+01	5.20E+01	6.00E-02
Toluene-2,4-diamine	1.39E-02	9.35E-02	
Toluene-2,5-diamine	3.27E+03	1.00E+04	
Toluene-2,6-diamine	1.09E+03	1.00E+04	
Toxaphene	4.04E-02	2.72E-01	2.00E-01
Tralomethrin	4.09E+01	8.02E+02	
Triallate	7.09E+01	1.39E+03	
Triasulfuron	5.45E+01	1.07E+03	
Tributyltin oxide (TBTO)	1.64E+00	3.21E+01	
Trichloroethylene (TCE)	2.71E-01	6.05E-01	3.00E-04
Trichlorofluoromethane	3.83E+01	1.28E+02	
Tridiphane	1.64E+01	3.21E+02	
Triethylamine	2.20E+00	8.63E+00	
Trifluralin	5.77E+00	3.89E+01	
Trimethyl phosphate	1.20E+00	8.09E+00	
Trinitrophenylmethylnitramine	5.45E+01	1.07E+03	
Vanadium pentoxide	6.75E+01	1.69E+03	3.00E+01
Vanadium sulfate	1.50E+02	3.75E+03	3.00E+01
Vernam	5.45E+00	1.07E+02	
Vinclozolin	1.36E+02	2.67E+03	
Vinyl acetate	4.25E+01	1.40E+02	8.00E-01
Vinyl bromide (bromoethene)	1.90E-02	4.18E-02	
Vinyl chloride	2.11E-03	4.80E-03	7.00E-05
Warfarin	1.64E+00	3.21E+01	
Zinc cyanide	2.73E+02	5.34E+03	
Zinc phosphide	2.25E+00	5.62E+01	
Zinc	2.73E+02	5.34E+03	

[a]Values are from EPA 1998.
[b]Values are from EPA 1996; values assume a dilution/attenuation factor (DAF) = 1.

Table 3-6. Region IX Tap Water Preliminary Remediation Goals

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
630-20-6	1,1,1,2-Tetrachloroethane	4.3E-02
71-55-6	1,1,1-Trichloroethane	7.9E+01
79-34-5	1,1,2,2-Tetrachloroethane	5.5E-03
76-13-1	1,1,2-Trichloro-1,2,2-trifluoroethane	5.9E+03
79-00-5	1,1,2-Trichloroethane	2.0E-02
598-77-6	1,1,2-Trichloropropane	3.0E+00
92-52-4	1,1-Biphenyl	3.0E+01
75-34-3	1,1-Dichloroethane	8.1E+01
75-35-4	1,1-Dichloroethylene	4.6E-03
75-37-6	1,1-Difluoroethane	6.9E+03
57-14-7	1,1-Dimethylhydrazine	2.6E-03
96-18-4	1,2,3-Trichloropropane	1.6E-04
96-19-5	1,2,3-Trichloropropene	3.0E+00
95-94-3	1,2,4,5-Tetrachlorobenzene	1.1E+00
615-54-3	1,2,4-Tribromobenzene	1.8E+01
120-82-1	1,2,4-Trichlorobenzene	1.9E+01
95-63-6	1,2,4-Trimethylbenzene	1.2E+00
96-12-8	1,2-Dibromo-3-chloropropane	4.8E-03
106-93-4	1,2-Dibromoethane	7.6E-05
95-50-1	1,2-Dichlorobenzene	3.7E+01
107-06-2	1,2-Dichloroethane (EDC)	1.2E-02
156-59-2	1,2-Dichloroethylene (cis)	6.1E+00
156-60-5	1,2-Dichloroethylene (trans)	1.2E+01
78-87-5	1,2-Dichloropropane	1.6E-02
540-73-8	1,2-Dimethylhydrazine	1.8E-04
528-29-0	1,2-Dinitrobenzene	1.5E+00
122-66-7	1,2-Diphenylhydrazine	8.4E-03
106-88-7	1,2-Epoxybutane	2.1E+01
108-67-8	1,3,5-Trimethylbenzene	1.2E+00
99-35-4	1,3,5-Trinitrobenzene	1.1E+02
106-99-0	1,3-Butadiene	1.1E-03
541-73-1	1,3-Dichlorobenzene	1.7E+00
542-75-6	1,3-Dichloropropene	8.1E-03
99-65-0	1,3-Dinitrobenzene	3.7E-01
106-37-6	1,4-Dibromobenzene	3.7E+01
764-41-0	1,4-Dichloro-2-butene	1.2E-04
106-46-7	1,4-Dichlorobenzene	4.7E-02
100-25-4	1,4-Dinitrobenzene	1.5E+00
123-91-1	1,4-Dioxane	6.1E-01
505-29-3	1,4-Dithiane	3.7E+01
822-06-0	1,6-Hexamethylene diisocyanate	1.0E-02
71-36-3	1-Butanol	3.7E+02
75-68-3	1-Chloro-1,1-difluoroethane (HCFC-142b)	8.7E+03
109-69-3	1-Chlorobutane	2.4E+02
93-72-1	2-(2,4,5-Trichlorophenoxy) propionic acid	2.9E+01
16484-77-8	2-(2-Methyl-1,4-chlorophenoxy) propionic acid	3.7E+00
1746-01-6	2,3,7,8-TCDD (dioxin)	4.5E-08

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
616-23-9	2,3-Dichloropropanol	1.1E+01
95-95-4	2,4,5-Trichlorophenol	3.7E+02
93-76-5	2,4,5-Trichlorophenoxyacetic Acid	3.7E+01
634-93-5	2,4,6-Trichloroaniline	2.0E-01
33663-50-2	2,4,6-Trichloroaniline hydrochloride	2.3E-01
88-06-2	2,4,6-Trichlorophenol	6.1E-01
118-96-7	2,4,6-Trinitrotoluene	2.2E-01
120-83-2	2,4-Dichlorophenol	1.1E+01
94-75-7	2,4-Dichlorophenoxyacetic Acid (2,4-D)	3.7E+01
95-68-1	2,4-Dimethylaniline	9.0E-03
21436-96-4	2,4-Dimethylaniline hydrochloride	1.2E-02
105-67-9	2,4-Dimethylphenol	7.3E+01
51-28-5	2,4-Dinitrophenol	7.3E+00
121-14-2	2,4-Dinitrotoluene (also see Dinitrotoluene mixture)	7.3E+00
576-26-1	2,6-Dimethylphenol	2.2E+00
606-20-2	2,6-Dinitrotoluene (also see Dinitrotoluene mixture)	3.7E+00
126-99-8	2-Chloro-1,3-butadiene	1.4E+00
532-27-4	2-Chloroacetophenone	5.2E-03
110-75-8	2-Chloroethyl vinyl ether	
95-57-8	2-Chlorophenol	3.8E+00
75-29-6	2-Chloropropane	1.7E+01
110-80-5	2-Ethoxyethanol	1.5E+03
111-15-9	2-Ethoxyethanol acetate	1.1E+03
149-30-4	2-Mercaptobenzothiazole	2.3E-01
99-59-2	2-Methoxy-5-nitroaniline	1.5E-01
109-86-4	2-Methoxyethanol	3.7E+00
110-49-6	2-Methoxyethanol acetate	7.3E+00
94-74-6	2-Methyl-4-chlorophenoxyacetic acid	1.8E+00
99-55-8	2-Methyl-5-nitroaniline	2.0E-01
95-53-4	2-Methylaniline (o-toluidine)	2.8E-02
636-21-5	2-Methylaniline hydrochloride	3.7E-02
95-48-7	2-Methylphenol	1.8E+02
88-74-4	2-Nitroaniline	2.2E-01
79-46-9	2-Nitropropane	3.5E+00
90-43-7	2-Phenylphenol	3.5E+00
91-94-1	3,3-Dichlorobenzidine	1.5E-02
119-90-4	3,3'-Dimethoxybenzidine	4.8E-01
119-93-7	3,3'-Dimethylbenzidine	7.3E-04
95-65-8	3,4-Dimethylphenol	3.7E+00
108-39-4	3-Methylphenol	1.8E+02
99-09-2	3-Nitroaniline	
94-82-6	4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)	2.9E+01
94-81-5	4-(2-Methyl-4-chlorophenoxy) butyric acid	3.7E+01
101-14-4	4,4'-Methylene bis(2-chloroaniline)	5.2E-02
101-61-1	4,4'-Methylene bis(N,N'-dimethyl)aniline	1.5E-01
101-68-8	4,4'-Methylene diphenyl diisocyanate	6.2E-01
101-77-9	4,4'-Methylenebisbenzeneamine	2.7E-02

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
131-89-5	4,6-Dinitro-o-cyclohexyl phenol	7.3E+00
504-24-5	4-Aminopyridine	7.3E-02
101-55-3	4-Bromophenyl phenyl ether	
95-69-2	4-Chloro-2-methylaniline	1.2E-02
3165-93-3	4-Chloro-2-methylaniline hydrochloride	1.5E-02
106-47-8	4-Chloroaniline	1.5E+01
98-56-6	4-Chlorobenzotrifluoride	7.3E+01
106-44-5	4-Methylphenol	1.8E+01
100-01-6	4-Nitroaniline	
100-02-7	4-Nitrophenol	2.3E+02
83-32-9	Acenaphthene	3.7E+01
30560-19-1	Acephate	7.7E-01
75-07-0	Acetaldehyde	1.5E-01
34256-82-1	Acetochlor	7.3E+01
67-64-1	Acetone	6.1E+01
75-86-5	Acetone cyanohydrin	2.9E+00
75-05-8	Acetonitrile	7.1E+00
98-86-2	Acetophenone	4.2E-03
50594-66-6	Acifluorfen	6.1E-02
107-02-8	Acrolein	4.2E-03
79-06-1	Acrylamide	1.5E-03
79-10-7	Acrylic acid	1.8E+03
107-13-1	Acrylonitrile	3.7E-01
15972-60-8	Alachlor	8.4E-02
1596-84-5	Alar	5.5E+02
116-06-3	Aldicarb	3.7E+00
1646-88-4	Aldicarb sulfone	3.7E+00
309-00-2	Aldrin	4.0E-04
5585-64-8	Ally	9.1E+02
107-18-6	Allyl alcohol	1.8E+01
107-05-1	Allyl chloride	1.8E+02
7429-90-5	Aluminum	3.7E+03
20859-73-8	Aluminum phosphide	1.5E+00
67485-29-4	Amdro	1.1E+00
834-12-8	Ametryn	3.3E+01
33089-61-1	Amitraz	9.1E+00
7664-41-7	Ammonia	
7773-06-0	Ammonium sulfamate	7.3E+02
62-53-3	Aniline	1.2E+00
120-12-7	Anthracene	1.8E+02
7440-36-0	Antimony and compounds	1.5E+00
1314-60-9	Antimony pentoxide	1.8E+00
28300-74-5	Antimony potassium tartrate	3.3E+00
1332-81-6	Antimony tetroxide	1.5E+00
1309-64-4	Antimony trioxide	1.5E+00
74115-24-5	Apollo	4.7E+01
140-57-8	Aramite	2.7E-01

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
12674-11-2	Aroclor 1016 (see PCBs for cancer endpoint)	2.6E-01
11097-69-1	Aroclor 1254 (see PCBs for cancer endpoint)	7.3E-02
7440-38-2	Arsenic (cancer endpoint)	4.5E-03
7440-38-2	Arsenic (noncancer endpoint)	
7784-42-1	Arsine (see arsenic for cancer endpoint)	
76578-12-6	Assure	3.3E+01
3337-71-1	Asulam	1.8E+02
1912-24-9	Atrazine	3.0E-02
71751-41-2	Avermectin B1	1.5E+00
103-33-3	Azobenzene	6.1E-02
7440-39-3	Barium and compounds	2.6E+02
542-62-1	Barium cyanide	3.7E+02
114-26-1	Baygon	1.5E+01
43121-43-3	Bayleton	1.1E+02
68359-37-5	Baythroid	9.1E+01
1861-40-1	Benefin	1.1E+03
17804-35-2	Benomyl	1.8E+02
25057-89-0	Bentazon	1.1E+02
56-55-3	Benz[a]anthracene	9.2E-03
100-52-7	Benzaldehyde	3.7E+02
71-43-2	Benzene	3.9E-02
92-87-5	Benzidine	2.9E-05
50-32-8	Benzo[a]pyrene	9.2E-04
205-99-2	Benzo[b]fluoranthene	9.2E-03
207-08-9	Benzo[k]fluoranthene	9.2E-02
65-85-0	Benzoic acid	1.5E+04
98-07-7	Benzotrichloride	5.2E-04
100-51-6	Benzyl alcohol	1.1E+03
100-44-7	Benzyl chloride	6.6E-03
7440-41-7	Beryllium and compounds	7.3E+00
91-58-7	beta-Chloronaphthalene	4.9E+01
141-66-2	Bidrin	3.7E-01
82657-04-3	Biphenthrin (Talstar)	5.5E+01
108-60-1	Bis(2-chloro-1-methylethyl)ether	9.6E-02
111-44-4	Bis(2-chloroethyl)ether	9.8E-04
39638-32-9	Bis(2-chloroisopropyl)ether	2.7E-02
117-81-7	Bis(2-ethylhexyl)phthalate (DEHP)	4.8E-01
542-88-1	Bis(chloromethyl)ether	5.2E-06
80-05-7	Bisphenol A	1.8E+02
7440-42-8	Boron	3.3E+02
7637-07-2	Boron trifluoride	
108-86-1	Bromobenzene	2.0E+00
75-27-4	Bromodichloromethane	1.8E-02
75-25-2	Bromoform (tribromomethane)	8.5E-01
74-83-9	Bromomethane (Methyl bromide)	8.7E-01
2104-96-3	Bromophos	1.8E+01
1689-84-5	Bromoxynil	1.8E+01

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
1689-99-2	Bromoxynil octanoate	7.3E+01
85-68-7	Butyl benzyl phthalate	7.3E+02
2008-41-5	Butylate	1.8E+02
85-70-1	Butylphthalyl butylglycolate	3.7E+03
75-60-5	Cacodylic acid	1.1E+01
7440-43-9	Cadmium and compounds	1.8E+00
592-01-8	Calcium cyanide	1.5E+02
105-60-2	Caprolactam	1.8E+03
2425-06-1	Captafol	7.8E-01
133-06-2	Captan	1.9E+00
63-25-2	Carbaryl	3.7E+02
86-74-8	Carbazole	3.4E-01
1563-66-2	Carbofuran	1.8E+01
75-15-0	Carbon disulfide	1.0E+02
56-23-5	Carbon tetrachloride	1.7E-02
55285-14-8	Carbosulfan	3.7E+01
5234-68-4	Carboxin	3.7E+02
302-17-0	Chloral	7.3E+00
133-90-4	Chloramben	5.5E+01
118-75-2	Chloranil	1.7E-02
57-74-9	Chlordane	1.9E-02
90982-32-4	Chlorimuron-ethyl	7.3E+01
7782-50-5	Chlorine	3.7E+02
10049-04-4	Chlorine dioxide	
107-20-0	Chloroacetaldehyde	
79-11-8	Chloroacetic acid	7.3E+00
108-90-7	Chlorobenzene	3.9E+00
510-15-6	Chlorobenzilate	2.5E-02
75-45-6	Chlorodifluoromethane	8.5E+03
67-66-3	Chloroform	1.6E-02
74-87-3	Chloromethane	1.5E-01
1897-45-6	Chlorothalonil	6.1E-01
101-21-3	Chlorpropham	7.3E+02
2921-88-2	Chlorpyrifos	1.1E+01
5598-13-0	Chlorpyrifos-methyl	3.7E+01
64902-72-3	Chlorsulfuron	1.8E+02
60238-56-4	Chlorthiophos	2.9E+00
7440-47-3	Chromium VI	1.8E+01
218-01-9	Chrysene	9.2E-01
7440-48-4	Cobalt	2.2E+02
8007-45-2	Coke Oven Emissions	
7440-50-8	Copper and compounds	1.4E+02
544-92-3	Copper cyanide	1.8E+01
123-73-9	Crotonaldehyde	5.9E-04
98-82-8	Cumene (isopropylbenzene)	6.6E+01
21725-46-2	Cyanazine	8.0E-03
n/a	Cyanides	

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
460-19-5	Cyanogen	1.5E+02
506-68-3	Cyanogen bromide	3.3E+02
506-77-4	Cyanogen chloride	1.8E+02
108-94-1	Cyclohexanone	1.8E+04
108-91-8	Cyclohexylamine	7.3E+02
68085-85-8	Cyhalothrin/Karate	1.8E+01
52315-07-8	Cypermethrin	3.7E+01
66215-27-8	Cyromazine	2.7E+01
1861-32-1	Dacthal	3.7E+01
75-99-0	Dalapon	1.1E+02
39515-41-8	Danitol	9.1E+01
72-54-8	DDD	2.8E-02
72-55-9	DDE	2.0E-02
50-29-3	DDT	2.0E-02
1163-19-5	Decabromodiphenyl ether	3.7E+01
8065-48-3	Demeton	1.5E-01
103-23-1	Di(2-ethylhexyl)adipate	5.6E+00
2303-16-4	Diallate	1.1E-01
333-41-5	Diazinon	3.3E+00
53-70-3	Dibenz[ah]anthracene	9.2E-04
132-64-9	Dibenzofuran	2.4E+00
124-48-1	Dibromochloromethane	1.0E-01
84-74-2	Dibutyl phthalate	3.7E+02
1918-00-9	Dicamba	1.1E+02
75-71-8	Dichlorodifluoromethane	3.9E+01
62-73-7	Dichlorvos	2.3E-02
115-32-2	Dicofol	1.5E-02
77-73-6	Dicyclopentadiene	4.2E-02
60-57-1	Dieldrin	4.2E-04
84-66-2	Diethyl phthalate	2.9E+03
112-34-5	Diethylene glycol, monobutyl ether	2.1E+01
111-90-0	Diethylene glycol, monoethyl ether	7.3E+03
617-84-5	Diethylformamide	4.0E+01
56-53-1	Diethylstilbestrol	1.4E-06
43222-48-6	Difenzoquat (Avenge)	2.9E+02
35367-38-5	Diflubenzuron	7.3E+01
1445-75-6	Diisopropyl methylphosphonate	2.9E+02
55290-64-7	Dimethipin	7.3E+01
60-51-5	Dimethoate	7.3E-01
131-11-3	Dimethyl phthalate	3.7E+04
120-61-6	Dimethyl terephthalate	3.7E+02
124-40-3	Dimethylamine	3.5E-03
122-09-8	Dimethylphenethylamine	3.7E+00
25321-14-6	Dinitrotoluene mixture	9.9E-03
117-84-0	di-n-Octyl phthalate	7.3E+01
88-85-7	Dinoseb	3.7E+00
1746-01-6	Dioxin (2,3,7,8-TCDD)	4.5E-08

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
957-51-7	Diphenamid	1.1E+02
127-63-9	Diphenyl sulfone	3.3E+01
122-39-4	Diphenylamine	9.1E+01
85-00-7	Diquat	8.0E+00
1937-37-7	Direct black 38	7.8E-04
2602-46-2	Direct blue 6	8.3E-04
16071-86-6	Direct brown 95	7.2E-04
298-04-4	Disulfoton	1.5E-01
330-54-1	Diuron	7.3E+00
2439-10-3	Dodine	1.5E+01
115-29-7	Endosulfan	2.2E+01
145-73-3	Endothall	7.3E+01
72-20-8	Endrin	1.1E+00
106-89-8	Epichlorohydrin	2.0E-01
759-94-4	EPTC (S-Ethyl dipropylthiocarbamate)	9.1E+01
16672-87-0	Ethephon (2-chloroethyl phosphonic acid)	1.8E+01
563-12-2	Ethion	1.8E+00
141-78-6	Ethyl acetate	5.5E+02
140-88-5	Ethyl acrylate	2.3E-02
75-00-3	Ethyl chloride	8.6E+02
60-29-7	Ethyl ether	1.2E+02
97-63-2	Ethyl methacrylate	5.5E+01
2104-64-5	Ethyl p-nitrophenyl phenylphosphorothioate	3.7E-02
100-41-4	Ethylbenzene	1.3E+02
109-78-4	Ethylene cyanohydrin	1.1E+03
107-15-3	Ethylene diamine	7.3E+01
107-21-1	Ethylene glycol	7.3E+03
111-76-2	Ethylene glycol, monobutyl ether	2.1E+01
75-21-8	Ethylene oxide	2.4E-03
96-45-7	Ethylene thiourea (ETU)	6.1E-02
84-72-0	Ethylphthalyl ethyl glycolate	1.1E+04
101200-48-0	Express	2.9E+01
22224-92-6	Fenamiphos	9.1E-01
16984-48-8	Flouride (soluble)	2.2E+02
2164-17-2	Fluometuron	4.7E+01
206-44-0	Fluoranthene	1.5E+02
86-73-7	Fluorene	2.4E+01
59756-60-4	Fluoridone	2.9E+02
56425-91-3	Flurprimidol	7.3E+01
66332-96-5	Flutolanil	2.2E+02
69409-94-5	Fluvalinate	3.7E+01
133-07-3	Folpet	1.9E+00
72178-02-0	Fomesafen	3.5E-02
944-22-9	Fonofos	7.3E+00
50-00-0	Formaldehyde	5.5E+02
64-18-6	Formic Acid	7.3E+03
39148-24-8	Fosetyl-al	1.1E+04

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
57-12-5	Free cyanide	7.3E+01
110-00-9	Furan	6.1E-01
67-45-8	Furazolidone	1.8E-03
98-01-1	Furfural	1.1E+01
531-82-8	Furium	1.3E-04
60568-05-0	Furmecyclox	2.2E-01
77182-82-2	Glufosinate-ammonium	1.5E+00
765-34-4	Glycidaldehyde	1.5E+00
1071-83-6	Glyphosate	3.7E+02
69806-40-2	Haloxyfop-methyl	1.8E-01
79277-27-3	Harmony	4.7E+01
319-84-6	HCH (alpha)	1.1E-03
319-85-7	HCH (beta)	3.7E-03
58-89-9	HCH (gamma) Lindane	5.2E-03
608-73-1	HCH-technical	3.7E-03
76-44-8	Heptachlor	1.5E-03
1024-57-3	Heptachlor epoxide	7.4E-04
87-82-1	Hexabromobenzene	7.3E+00
118-74-1	Hexachlorobenzene	4.2E-03
87-68-3	Hexachlorobutadiene	8.6E-02
77-47-4	Hexachlorocyclopentadiene	2.6E+01
19408-74-3	Hexachlorodibenzo-p-dioxin mixture (HxCDD)	1.1E-06
67-72-1	Hexachloroethane	4.8E-01
70-30-4	Hexachlorophene	1.1E+00
121-82-4	Hexahydro-1,3,5-trinitro-1,3,5-triazine	6.1E-02
51235-04-2	Hexazinone	1.2E+02
302-01-2	Hydrazine, hydrazine sulfate	2.2E-03
7647-01-0	Hydrogen chloride	
74-90-8	Hydrogen cyanide	6.2E-01
7783-06-4	Hydrogen sulfide	2.0E-01
35554-44-0	Imazalil	4.7E+01
81335-37-7	Imazaquin	9.1E+02
193-39-5	Indeno[1,2,3-cd]pyrene	9.2E-03
36734-19-7	Iprodione	1.5E+02
7439-89-6	Iron	1.1E+03
78-83-1	Isobutanol	1.8E+02
78-59-1	Isophorone	7.1E+00
33820-53-0	Isopropalin	5.5E+01
1832-54-8	Isopropyl methyl phosphonic acid	3.7E+02
104-5-18	iso-Propylbenzene	6.1E+00
82558-50-7	Isoxaben	1.8E+02
143-50-0	Kepone	3.7E-04
77501-63-4	Lactofen	7.3E+00
7439-92-1	Lead	4.0E-01
78-00-2	Lead (tetraethyl)	3.7E-04
330-55-2	Linuron	7.3E+00
7439-93-2	Lithium	7.3E+01

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
83055-99-6	Londax	7.3E+02
121-75-5	Malathion	7.3E+01
108-31-6	Maleic anhydride	3.7E+02
123-33-1	Maleic hydrazide	3.0E+02
109-77-3	Malononitrile	7.3E-02
591-27-5	m-Aminophenol	2.6E+02
8018-01-7	Mancozeb	1.1E+02
12427-38-2	Maneb	1.1E-01
7439-96-5	Manganese and compounds	1.7E+02
950-10-7	Mephosfolan	3.3E-01
24307-26-4	Mepiquat	1.1E+02
7439-97-6	Mercury (elemental)	
22967-92-6	Mercury (methyl)	3.7E-01
7487-94-7	Mercury and compounds	1.1E+00
150-50-5	Merphos	1.1E-01
78-48-8	Merphos oxide	1.1E-01
57837-19-1	Metalaxyl	2.2E+02
126-98-7	Methacrylonitrile	1.0E-01
10265-92-6	Methamidophos	1.8E-01
67-56-1	Methanol	1.8E+03
950-37-8	Methidathion	3.7E+00
16752-77-5	Methomyl	1.5E+01
72-43-5	Methoxychlor	1.8E+01
79-20-9	Methyl acetate	6.1E+02
96-33-3	Methyl acrylate	1.8E+01
79-22-1	Methyl chlorocarbonate	3.7E+03
78-93-3	Methyl ethyl ketone	1.9E+02
60-34-4	Methyl hydrazine	6.1E-03
108-10-1	Methyl isobutyl ketone	1.6E+01
74-93-1	Methyl Mercaptan	2.1E+00
80-62-6	Methyl methacrylate	1.4E+02
298-00-0	Methyl parathion	9.1E-01
993-13-5	Methyl phosphonic acid	7.3E+01
98-83-9	Methyl styrene (alpha)	4.3E+01
25013-15-4	Methyl styrene (mixture)	6.0E+00
1634-04-4	Methyl tertbutyl ether (MTBE)	2.0E+00
108-87-2	Methylcyclohexane	3.1E+03
74-95-3	Methylene bromide	3.7E+01
75-09-2	Methylene chloride	4.3E-01
51218-45-2	Metolaclor (Dual)	5.5E+02
21087-64-9	Metribuzin	9.1E+01
2385-85-5	Mirex	3.7E-03
99-08-1	m-Nitrotoluene	3.7E+01
2212-67-1	Molinate	7.3E+00
7439-98-7	Molybdenum	1.8E+01
10599-90-3	Monochloramine	3.7E+02
108-45-2	m-Phenylenediamine	2.2E+01

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
108-38-3	m-Xylene	1.4E+02
68-12-2	N,N-Dimethylformamide	3.7E+02
300-76-5	Naled	7.3E+00
91-20-3	Naphthalene	6.2E-01
15299-99-7	Napropamide	3.7E+02
104-51-8	n-Butylbenzene	6.1E+00
110-54-3	n-Hexane	3.5E+01
7440-02-0	Nickel (soluble salts)	7.3E+01
N/A	Nickel refinery dust	
12035-72-2	Nickel subsulfide	
1929-82-4	Nitrapyrin	5.5E+00
14797-55-8	Nitrate	1.0E+03
10102-43-9	Nitric Oxide	3.7E+02
14797-65-0	Nitrite	1.0E+02
98-95-3	Nitrobenzene	3.4E-01
67-20-9	Nitrofurantoin	2.6E+02
59-87-0	Nitrofurazone	4.5E-03
101102-44-0	Nitrogen dioxide	
556-88-7	Nitroguanidine	3.7E+02
121-69-7	N-N-Dimethylaniline	7.3E+00
621-64-7	N-Nitroso di-n-propylamine	9.6E-04
1116-54-7	N-Nitrosodiethanolamine	2.4E-03
55-18-5	N-Nitrosodiethylamine	4.5E-05
62-75-9	N-Nitrosodimethylamine	1.3E-04
924-16-3	N-Nitrosodi-n-butylamine	2.0E-04
86-30-6	N-Nitrosodiphenylamine	1.4E+00
10595-95-6	N-Nitroso-N-methylethylamine	3.1E-04
930-55-2	N-Nitrosopyrrolidine	3.2E-03
27314-13-2	Norflurazon	1.5E+02
104-51-8	n-Propylbenzene	6.1E+00
85509-19-9	NuStar	2.6E+00
88-73-3	o-Chloronitrobenzene	2.7E-01
95-49-8	o-Chlorotoluene	1.2E+01
32536-52-0	Octabromodiphenyl ether	1.1E+01
2691-41-0	Octahydro-1357-tetranitro-1357- tetrazocine (HMX)	1.8E+02
152-16-9	Octamethylpyrophosphoramide	7.3E+00
99-08-1	o-Nitrotoluene	3.7E+01
19044-88-3	Oryzalin	1.8E+02
19666-30-9	Oxadiazon	1.8E+01
23135-22-0	Oxamyl	9.1E+01
42874-03-3	Oxyfluorfen	1.1E+01
95-47-6	o-Xylene	1.4E+02
5216-25-1	p,a,a,a-Tetrachlorotoluene	3.4E-04
76738-62-0	Paclobutrazol	4.7E+01
4685-14-7	Paraquat	1.6E+01
56-38-2	Parathion	2.2E+01
74-11-3	p-Chlorobenzoic acid	7.3E+02

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
100-00-5	p-Chloronitrobenzene	3.7E-01
1114-71-2	Pebulate	1.8E+02
40487-42-1	Pendimethalin	1.5E+02
87-84-3	Pentabromo-6-chloro cyclohexane	2.9E-01
32534-81-9	Pentabromodiphenyl ether	7.3E+00
608-93-5	Pentachlorobenzene	2.9E+00
82-68-8	Pentachloronitrobenzene	2.6E-02
87-86-5	Pentachlorophenol	5.6E-02
7601-90-3	Perchlorate	1.8E+00
52645-53-1	Permethrin	1.8E+02
13684-63-4	Phenmedipham	9.1E+02
108-95-2	Phenol	2.2E+03
92-84-2	Phenothiazine	7.3E+00
62-38-4	Phenylmercuric acetate	2.9E-01
298-02-2	Phorate	7.3E-01
732-11-6	Phosmet	7.3E+01
7803-51-2	Phosphine	1.1E+00
7664-38-2	Phosphoric acid	
7723-14-0	Phosphorus (white)	7.3E-02
85-44-9	Phthalic anhydride	7.3E+03
123-31-9	p-Hydroquinone	1.5E+02
1918-02-1	Picloram	2.6E+02
23505-41-1	Pirimiphos-methyl	3.7E+01
99-99-0	p-Nitrotoluene	3.7E+01
	Polybrominated biphenyls	7.6E-04
1336-36-3	Polychlorinated biphenyls (PCBs)	3.4E-03
	Polynuclear aromatic hydrocarbons (PAHs)	
151-50-8	Potassium cyanide	1.8E+02
506-61-6	Potassium silver cyanide	7.3E+02
106-50-3	p-Phenylenediamine	6.9E+02
100-21-0	p-Phthalic acid	3.7E+03
67747-09-5	Prochloraz	3.3E+01
26399-36-0	Profluralin	2.2E+01
1610-18-0	Prometon	5.5E+01
7287-19-6	Prometryn	1.5E+01
23950-58-5	Pronamide	2.7E+02
1918-16-7	Propachlor	4.7E+01
709-98-8	Propanil	1.8E+01
2312-35-8	Propargite	7.3E+01
107-19-7	Propargyl alcohol	7.3E+00
139-40-2	Propazine	7.3E+01
122-42-9	Propham	7.3E+01
60207-90-1	Propiconazole	4.7E+01
57-55-6	Propylene glycol	7.3E+04
111-35-3	Propylene glycol, monoethyl ether	2.6E+03
107-98-2	Propylene glycol, monomethyl ether	2.6E+03
75-56-9	Propylene oxide	2.2E-02

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
106-49-0	p-Toluidine	3.5E-02
81335-77-5	Pursuit	9.1E+02
106-42-3	p-Xylene	
51630-58-1	Pydrin	9.1E+01
129-00-0	Pyrene	1.8E+01
110-86-1	Pyridine	3.7E+00
13593-03-8	Quinalphos	1.8E+00
91-22-5	Quinoline	5.6E-04
121-82-4	RDX (Cyclonite)	6.1E-02
10453-86-8	Resmethrin	1.1E+02
299-84-3	Ronnel	1.8E+02
83-79-4	Rotenone	1.5E+01
78587-05-0	Savey	9.1E+01
135-9-88	sec-Butylbenzene	6.1E+00
7783-00-8	Selenious Acid	1.8E+01
7782-49-2	Selenium	1.8E+01
630-10-4	Selenourea	1.8E+01
74051-80-2	Sethoxydim	3.3E+02
7440-22-4	Silver and compounds	1.8E+01
506-64-9	Silver cyanide	3.7E+02
122-34-9	Simazine	5.6E-02
26628-22-8	Sodium azide	1.5E+01
143-33-9	Sodium cyanide	1.5E+02
148-18-5	Sodium diethyldithiocarbamate	2.5E-02
62-74-8	Sodium fluoroacetate	7.3E-02
13718-26-8	Sodium metavanadate	3.7E+00
7440-24-6	Strontium, stable	2.2E+03
57-24-9	Strychnine	1.1E+00
100-42-5	Styrene	1.6E+02
88671-89-0	Systhane	9.1E+01
34014-18-1	Tebuthiuron	2.6E+02
3383-96-8	Temephos	7.3E+01
5902-51-2	Terbacil	4.7E+01
13071-79-9	Terbufos	9.1E-02
886-50-0	Terbutryn	3.7E+00
104-5-18	tert-Butylbenzene	6.1E+00
127-18-4	Tetrachloroethylene (PCE)	1.1E-01
961-11-5	Tetrachlorovinphos	2.8E-01
3689-24-5	Tetraethyldithiopyrophosphate	1.8E+00
109-99-9	Tetrahydrofuran	3.1E+02
1314-32-5	Thallic oxide	2.6E-01
563-68-8	Thallium acetate	3.3E-01
6533-73-9	Thallium carbonate	2.9E-01
7791-12-0	Thallium chloride	2.9E-01
10102-45-1	Thallium nitrate	3.3E-01
12039-52-0	Thallium selenite	3.3E-01
7446-18-6	Thallium sulfate	2.9E-01

Table 3-6 (continued)

CAS No.	Chemical	Tap Water PRG/10 (µg/L)
28249-77-6	Thiobencarb	3.7E+01
N/A	Thiocyanate	3.7E+02
39196-18-4	Thiofanox	1.1E+00
23564-05-8	Thiophanate-methyl	2.9E+02
137-26-8	Thiram	1.8E+01
N/A	Tin (inorganic, see tributyltin oxide for organic tin)	2.2E+03
108-88-3	Toluene	7.2E+01
95-80-7	Toluene-2,4-diamine	2.1E-03
95-70-5	Toluene-2,5-diamine	2.2E+03
823-40-5	Toluene-2,6-diamine	7.3E+02
N/A	Total Chromium (1/6 ratio Cr VI/Cr III)	
8001-35-2	Toxaphene	6.1E-03
66841-25-6	Tralomethrin	2.7E+01
2303-17-5	Triallate	4.7E+01
82097-50-5	Triasulfuron	3.7E+01
56-35-9	Tributyltin oxide (TBTO)	1.1E+00
79-01-6	Trichloroethylene (TCE)	1.6E-01
75-69-4	Trichlorofluoromethane	1.3E+02
58138-08-2	Tridiphane	1.1E+01
121-44-8	Triethylamine	1.2E+00
1582-09-8	Trifluralin	8.7E-01
512-56-1	Trimethyl phosphate	1.8E-01
479-45-8	Trinitrophenylmethylnitramine	3.7E+01
7440-62-2	Vanadium	2.6E+01
1314-62-1	Vanadium pentoxide	3.3E+01
13701-70-7	Vanadium sulfate	7.3E+01
1929-77-7	Vernam	3.7E+00
50471-44-8	Vinclozolin	9.1E+01
108-05-4	Vinyl acetate	4.1E+01
593-60-2	Vinyl bromide (bromoethene)	1.0E-02
75-01-4	Vinyl chloride	2.0E-03
81-81-2	Warfarin	1.1E+00
7440-66-6	Zinc	1.1E+03
557-21-1	Zinc cyanide	1.8E+02
1314-84-7	Zinc phosphide	1.1E+00
12122-67-7	Zinc	1.8E+02

[a]Values represent a cancer-based screening level of 10^{-7} and a hazard index of 0.1.
N/A = Not available.

- soil contamination extends to the top of the aquifer; thus, there is no accounting for dilution/attenuation in the unsaturated zone; and

- use of a default dilution/attenuation factor in the saturated zone of 10 suggests unconfined, unconsolidated conditions in the aquifer.

These assumptions could be extremely conservative for the EBG. As seen in Table 3-5, values based on leaching to groundwater are significantly lower than other values and, thus, should be applied with caution.

Soil screening levels for lead reflect current EPA guidance (EPA 1994a and 1994b). The values were developed by EPA using the Integrated Exposure Uptake Biokinetic (IEUBK) Model.

For ecological risk evaluation of soil, no reliable screening data sources exist as was discussed for the Winklepeck Burning Grounds Phase II RI on March 18, 1998 at RVAAP among the U.S. Army, Ohio EPA, and SAIC ecological risk assessors. Assuming an ecological risk assessment is required as part of a subsequent RI phase, soils will be evaluated using a hazard quotient and weight-of-evidence approach.

3.4.2.2 Human Health and Ecological Screening Levels for Surface Water

Surface water criteria to be used for human health screening are EPA Region IX PRGs for tap water. The calculated risk-based values presented in the table reflect the default exposure pathways and parameters identified by EPA (EPA 1998). For most chemicals, the risk-based screening value reflects the water ingestion scenario and is calculated for a carcinogenic risk level of 10^{-7} or for a noncarcinogenic hazard quotient of 0.1, which is a factor of 10 less than the PRGs (PRG/10).

For ecological screening of surface water, chronic ambient water quality criteria (AWQC) from Ohio EPA will be used first. In the absence of AWQC, Tier II chronic value from EPA will be used. If neither source provides a screening value, toxicity reference value for daphnids and fish from EPA will be used.

3.4.2.3 Ecological Screening Levels for Sediments

Sediment screening levels reflect levels protective of ecological receptors rather than human receptors. The sediment screening levels include (in order of preference) ecotox thresholds from the EPA (EPA 540-F-95-038), Ontario Ministry of Environmental Laws (Persaud et al. 1993), State of New York Technical Guidance for Screening Contaminated Sediments, and National Oceanic and Atmospheric Administration Values (Long and Morgan 1991).

3.4.3 Screening Level Comparisons

The screening level comparison will be a systematic screening of sample results against the screening levels. Chemicals that do not get screened out during this process will be considered as potential AOC-related COPCs. The following screens are applied to all media (prior to media-specific screens that are listed below, beginning with Section 3.4.3.1):

- Chemicals that are never detected will not be considered COPCs.
- Metals only detected within the range of background will not be considered COPCs.
- Essential human nutrients will not be considered as human health COPCs.

At this point of the process, the media-specific risk-based screen will be applied. That is, the site-related concentrations will be compared to action levels to determine if site conditions warrant additional characterization or action.

3.4.3.1 Human Health Soil Screening

The final step that will be used to finalize COPCs for soils is to compare maximum SRC concentrations against the soil screening levels presented in Section 3.4.2.1. If the maximum result exceeds any screening level, the chemical is retained as a COPC, with the exception of the soil-leaching screen. Chemicals exceeding the soil-leaching screen will be noted but not identified as definitive COPCs because of the high degree of uncertainty and conservatism inherent in this screen (see Section 3.4.2.1).

3.4.3.2 Human Health and Ecological Surface Water Screening

The final steps to determine COPCs in surface water are as follows.

- If an SRC maximum result is above the EPA Region IX tap water PRG/10, it will be considered a COPC.

- If an SRC maximum result exceeds its AWQC, a Tier II EPA chronic value, or toxicity reference value for daphnids and fish, it will be considered a COPC.

3.4.3.3 Ecological Sediment Screening

Any SRC maximum results detected above their respective sediment criteria will be identified as COPCs.

THIS PAGE INTENTIONALLY LEFT BLANK