CDM

Supplemental Phase II Investigation

FORMER WHIRLPOOL/MAYTAG FACILITY

1 Executive Way | Ranson, WV 25438

December 7, 2007

Prepared for:

WPM PROPERTIES, LLC

12214 Lakewood Boulevard

Downey, CA 90242

SUPPLEMENTAL PHASE II INVESTIGATION

FORMER WHIRLPOOL/MAYTAG FACILITY
RANSON, WEST VIRGINIA

Prepared for:

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Project No. 54578-59077

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1.0 INTRODUCTION

Camp Dresser & McKee, Inc (CDM) on behalf of WPM Properties, LLC (WPM) has conducted supplemental Phase II Environmental Site Assessment (Supplemental Phase II) activities at the former Whirlpool/Maytag Facility in Ranson, West Virginia (Site). IRG Assumptions, LLC provided guidance to CDM throughout the Supplemental Phase II activities. Site activities that were performed for the Supplemental Phase II include a preliminary Site visit and document review followed by subsurface investigations, which consisted of advancing soil borings as well as collecting soil samples for subsequent analysis.

The Supplemental Phase II Site activities and limits thereof were performed in conjunction with established Data Quality Objectives (DQOs) for the project. As such, the evaluation and focus provided in this report has been structured in accordance with DQOs (EPA, 1994), which are presented in Section 4.0. The goals of this investigation were limited to identify previously unknown Releases of chemicals to the environment. It is important to note that this investigation did not attempt to define or characterize the full nature and extent of the Releases found nor did it attempt to determine the need or costs associated with potential investigation and/or remediation of discovered Releases.

Additional project documents, including Applicable or Relevant and Appropriate Requirements (ARARs), a summary of field activities, a list of historical Site documents, and copies of available closure documents and No Further Action (NFA) letters are provided as attachments to this report.

1.1 Relevant Terms and Definitions

This report, along with supporting documents, uses specific terms, which are defined based on the usage and intent of the Supplemental Phase II activities. These specific terms are defined below:

- Release – Any release, spill, emission, leaking, pumping, migration, leaching, percolation, seeping, injection, deposit, disposal, discharge, or escape of any hazardous material into the environment.

- Environmental Condition – An area, incident, process, and/or observed condition which has caused, or may have caused, the Release of hazardous material into the environment.

- Known Release – The area, incident, process, and/or observed condition has been related to a Release. The Release may have been investigated; closed; received an No

Further Action (NFA) determination or similar regulatory determination; require additional investigation; or, may be subject to current ongoing remedial action.

- Previously Unknown Release – The area, incident, process, and/or observed condition was previously identified as an environmental condition in historical documentation, Phase I/II assessments, and/or Site reconnaissance. As part of the Supplemental Phase II activities, a Release has been associated with the environmental condition.

1.2 Limitations

This Supplemental Phase II Report has been prepared for the exclusive use of WPM and their agents and assigns, in accordance with the standards of the environmental consulting industry at the time the services were performed, and in general accordance with the agreement between WPM and CDM, dated April 6, 2007. This work has been performed for the sole purpose of assisting in the evaluation of environmental conditions associated with the Site. The findings presented herein are based upon observations of Site conditions as of the date the assessment was performed and a review of *reasonably ascertainable* standard records sources.

The findings of this Supplemental Phase II Report, as represented within this report, must be viewed in recognition of certain limiting conditions. The limitations include factors such as data collection impediments, inadequate data refinement, suspected laboratory contamination, limitations of previous investigative efforts, and inherent limitations of Phase II assessments. A short synopsis of these specific limitations is as follows:

1. In the course of this investigation, CDM reviewed information provided by third parties; however, has made no independent investigation as to the validity, completeness, or accuracy of such information provided by third-party sources. Preparation of the scope of work (SOW) and correspondingly, the extent and focus of Supplemental Phase II activities, were developed primarily based upon review of Earth Tech Phase I and Phase II (Earth Tech, 2006[a,b]) Environmental Site Assessments (ESAs) and historical Site documentation, as well as discussions with WPM's representative. In addition, a Site reconnaissance was conducted to limit further evaluation of environmental conditions which have been addressed and/or evaluated as known Releases. CDM was responsible to identify previously unknown Releases as they relate to Site ARARs and not with evaluation of the validity or factual basis of previous investigations or conclusions. As such, CDM makes no guarantee of the validity or applicability of the findings in previous investigations. For the purposes of this assessment, such third-party information is assumed to be accurate unless contradictory evidence is noted, and CDM does not

express or imply any warranty regarding information provided by third-party sources.

2. Delineation and quantification of environmental conditions was not the focus of the Supplemental Phase II activities. As such, data collection efforts were limited to the identification of chemicals of concern (COCs) at specific areas, incidents, processes, and/or observed conditions. As a result the refinement of analytical data does not always allow for identification of COC source or magnitude.

3. Acetone and methylene chloride (DCM) are considered to be common analytical laboratory contaminants due to their use in the extraction process in certain analytical methods. Detections of these chemicals are referenced where detected during Supplemental Phase II activities, although they are not typically considered to be indicative of environmental conditions.

Conclusions in this report represent professional judgments, based upon historical information and information generated during Supplemental Phase II activities, and are therefore inherently limited by variability and scientific uncertainty. The data and findings presented in this report are valid as of the dates when the investigation was performed. The passage of time, manifestation of latent conditions or occurrence of future events may require further exploration at the Site, analysis of data, and re-evaluation of findings, observations, and conclusions expressed in the report.

The data reported and the findings, observations and conclusions expressed in the report are limited by the SOW. The SOW was defined by the requests of WPM and their representative, the time and budgetary constraints imposed by WPM, and the availability of access to the Site.

This report presents professional opinions and findings of a scientific and technical nature. While attempts were made to relate the data and findings to applicable environmental laws and regulations, the report shall not be construed to offer legal opinion or representations as to the requirements of, nor compliance with, environmental laws, rules, regulations or policies of federal, state or local government agencies. Any use of this report constitutes acceptance of the limits of CDM's liability. CDM's liability extends only to WPM and not to any other parties who might obtain this report. Issues raised by the report should be reviewed with appropriate legal council.

2.0 SITE DESCRIPTION AND HISTORY

The property for this facility has been occupied by Dixie-Narco since 1957 and is currently leased to several different tenants. All manufacturing operations at the facility ceased in 1991. The Site, as shown on Figure 1, includes the following features:

- Former Warehouse and office building (approximately 97,000 square feet);
- Former Assembly building (approximately 56,700 square feet);
- Former Powder Finishing building (approximately 32,000 square feet);
- Former Tooling Area building (approximately 3,900 square feet);
- Foundation of former Paint Shop building; and
- Various asphalt and gravel parking areas, loading docks, and roadways.

During the time period of Supplemental Phase II activities, Site facility buildings were either vacant or partially occupied by tenants (A,B&C Group [warehouse and office building] and the City of Ranson [powder finishing building]). A former tenant, Kidde, had occupied the former assembly building; however this building was vacant during the site visit.

The topography at the facility is generally flat, sloping slightly to the west and south. In general, the facility is bound by residential properties to the north and west and by commercial properties to the east. B&O Railroad tracks bound the south portion of the property followed by a church and the Boys and Girls Club of Ranson and residential properties.

3.0 PREVIOUSLY IDENTIFIED ENVIRONMENTAL CONDITIONS

The following environmental conditions were identified based on review of previous environmental investigations, Site documents, and Site reconnaissance:[1]

- Former soil stockpile area
- Metals and polynuclear aromatic hydrocarbons (PAH) detections (Southwest Site)
- Retention Pond (North of former warehouse building)
- Metals detections (former powder finishing building)
- Former paint building
- Presses and cutting areas (former assembly building)
- Former tooling area
- Shallow soil impacts (old materials storage area)
- Former excavation areas (paint shop pre-treatment pit and tooling area)
- Surface metals detections (former deburr machine area)
- Resource conservation and recovery act (RCRA) violations (Kidde fire area)
- Former powder finishing building
- Trench/Sump system (former powder finishing building)
- Potential polychlorinated biphenyls (PCB)-containing pole-mounted transformers
- (2) 10,000-gallon underground storage tanks (USTs)
- Hazardous waste storage building
- Foaming department investigation
- Outdoor storage area for non-hazardous waste
- Potential asbestos containing material[2]

Notes:
[1]) The environmental conditions identified have been obtained from several sections within the Phase I ESA report, historical Site documents, Site reconnaissance, and/or Site personnel. The environmental conditions listed may not be a "REC" according to the American Society for Testing and Materials (ASTM) standard practice definition.

[2]) An asbestos containing material (ACM) and lead-based paint survey was performed at the Site. The survey results are presented under separate cover.

The items listed above were used as a baseline for further evaluation of environmental conditions as known Releases as well as for evaluating the need to further investigate environmental conditions where the actual existence of a Release was unknown. The areas identified for further investigation at the Site include the former soil stockpile area and each of the former manufacturing buildings (powder finishing building, paint building, assembly building, and tooling building).

4.0 DATA QUALITY OBJECTIVES (DQOs)

Prior to initiating Supplemental Phase II activities, DQOs were established for the project to ensure appropriate data were obtained as part of the field efforts. The DQOs are presented in the table below.

Supplemental Phase II Environmental Site Assessment DQOs

DQO	Description
State the Problem	To identify potential unidentified Releases associated with environmental conditions at this Site, which was conveyed along with five (5) additional subject properties conveyed to WPM Properties, LLC on December 22, 2006.
Identify the Decision	Ascertain if previously unidentified Releases exist at the Site. Decisions to be identified include: • What are the applicable or relevant and appropriate requirements (ARARs) for the Site? • Do any prior or current investigation activities indicate the existence of a release? • Are identified chemicals of concern (COCs) related to a known or previously unknown Release? • If COCs are related to a previously unknown Release, has the source been identified? • Is the Release reportable under applicable state or federal environmental statutes or regulations (e.g., does the chemical concentration measured exceed an ARAR criteria)?
Identify the Inputs to the Decision	Define the inputs to be utilized for the Decision including: • Historical soil and groundwater data from previous site investigations • Review of available facility documentation • Findings of previous Phase I and Phase II environmental assessments from December 2006 • New soil data • ARARs, which include Environmental Laws (Appendix A) • Historical documentation regarding previous or ongoing actions which address specific releases, sources, and/or processes • Site reconnaissance and observations • Newly collected chemical concentration data and field parameters for subsurface soils (Tables 2 to 5 and Figures 2 to 6)

Supplemental Phase II Environmental Site Assessment DQOs

DQO	Description
Define the Study Boundaries	The study area is restricted to soil collection points within the Site property boundary. However, potential impacts from or to adjacent sites are considered. The study timeframe extends from the Supplemental Phase II investigation to the earliest environmental conditions identified in historical Site documents.
Develop a Decision Rule	Based on the results of the above analyses, the following decision rules will apply: • COCs detected in soil will indicate a Release, which includes any release, spill, emission, leaking, pumping, migration, leaching, percolation, seeping, injection, deposit, disposal, discharge or escape of any hazardous material into the environment. • Analytical data will be evaluated with respect to ARARs. • Final evaluation of a Release and/or ARARs exceedence will account for the limitations presented in Section 1.2.
Specify Tolerable Limits on Decision Errors	• Certified laboratory error tolerances for each analytical method. • Sample locations and quantities are not focused on delineation and/or magnitude of Release(s).
Optimize the Design	Based on visual observations during investigation activities, the sampling protocols, chemical analyses, and other sampling requirements may be changed to obtain more useable data, as necessary.

5.0 INPUTS TO THE DECISION

The purpose of this step of the DQO process is to identify the information and measurements required to resolve the principle questions and decisions presented in Section 3.0. The individual inputs identified in the DQOs have been combined and are further discussed in the following subsections.

5.1 PREVIOUS PHASE I AND PHASE II ENVIRONMENTAL SITE ASSESSMENTS

The Earth Tech Phase I and II Environmental Site Assessments (ESAs) were performed to identify and investigate environmental conditions at the Site. These environmental conditions were the primary basis for conducting the Supplemental Phase II activities. The findings from the Phase I and II ESAs provided a baseline for the consideration of environmental conditions as known Releases well as for evaluating the need to further investigate environmental conditions where the actual existence of a Release as was unknown. The environmental conditions identified in the Earth Tech Phase I ESA are summarized below:[1]

5.2 SITE RECONNAISSANCE AND FIELD OBSERVATIONS

This section describes the Site reconnaissance activities and field observations performed as part of the Supplemental Phase II activities.

Site Reconnaissance:

Information obtained during Site reconnaissance was utilized to assess Site environmental conditions, identify potential unknown environmental conditions, and obtain information from individuals with institutional knowledge of the Site. In addition, the initial Site reconnaissance was instrumental in refining and developing the SOW for the Supplemental Phase II activities.

Based on Site reconnaissance and the review of previous Site assessments (Section 5.1), specific areas, incidents, processes, and/or observed conditions were identified as requiring investigation. This evaluation formed the basis for selecting the boring locations and analytical constituents and methods used during Supplemental Phase II activities. Table 1 provides a summary of the investigational boring and sampling locations (incorporated from the SOW) along with the relationship of those locations with respect to known or previously unknown Releases. CDM assessed the requirement for these borings as follows:

- Borings associated with known Releases were required to ascertain additional information regarding uncertainties expressed in historical documentation, potential

additional Releases in the vicinity, or in response to suggestions by previous Phase I/II ESAs. In general, known Releases were not investigated.

- Borings associated with previously unknown Releases were required based on assessment of environmental conditions identified by historical documentation, previous Phase I/II ESAs, and/or Site reconnaissance.

Table 1 provides a summary of the rationale for selecting boring and sampling locations as well as the proposed sample analytical suite.

Field Observations:

Site observations made by field personnel were utilized during the performance and evaluation stages of this project to assess Site environmental conditions, identify potential unknown environmental conditions, and make modifications to the SOW based on field conditions.

5.3 SOIL DATA FROM CURRENT SITE INVESTIGATION

Soil data collected during the Supplemental Phase II activities conducted by CDM are presented in various portions of this report for evaluation of Site areas, Releases, processes, and/or observations, as related to environmental conditions. Data are provided in the following locations:

- A summary of soil analytical data are presented in Tables 2 through 5. The tables summarize the analytical results and the analytes with chemical detections that exceed soil chemical-specific ARARs (as applicable for the state of West Virginia). The analytes which exceed an ARAR are highlighted in the tables.

- Analytical results are also presented on Figures 3 through 6, which illustrate the analytical data with respect to investigation locations at the Site. The figures also highlight the chemical detections which exceed ARARs.

- Table 6 presents a summary of the Supplemental Phase II data and observations as well as historical data and observations as they relate to Site environmental conditions. This table also identifies the specific environmental conditions according to known or previously unknown status (as appropriate) as well as ARARs that relate to each environmental condition.

- Appendix B includes the Field Activity Summary and SOW, which provide information on limitations, field modifications to the SOW, field data and screening, field protocols, and details regarding additional Site-specific observations.

- Appendix C provides the laboratory analytical data reports from Test America Laboratories. The analytical reports are provided on the attached CD-ROM disk.

5.4 SITE ARARS

ARARs have been compiled to provide a reference of threshold criteria for evaluation of Site-specific environmental conditions. The ARARs, which present various requirements with respect to chemical-specific, location-specific, action-specific Site conditions, are included in Appendix A.

5.5 HISTORICAL SITE DOCUMENTATION

Historical Site documentation was obtained during the Supplemental Phase II activities from several sources. The documentation was utilized to assess the previous records, actions, remedial activities, time frames, details, and/or closures of Site environmental conditions. The sources for this historical information are described below:

- The Earth Tech Phase I ESA identified historical reports which were provided by Whirlpool/Maytag or from Freedom of Information Act (FOIA) sources. These documents were utilized to further assess and confirm the environmental conditions identified in the Phase I ESA. In part, this information was also used to prepare the Supplemental Phase II SOW.

- A formal document request of Whirlpool/Maytag was made to obtain additional supporting historical information. Concurrent with review of the Earth Tech Phase I and II ESA data, additional documents were requested from the Whirlpool/Maytag archives. Appendix D provides a list of known site documentation; items which CDM was able to review are indicated.

- CDM has compiled select items from the information sources listed above and present these items in Appendix E. The documents include available closure reports, closure/remediation documentation, "No Further Action" letters (or similarly titled), and/or correspondence. These documents have been included, to the extent possible, to reference the manner and extent that specific environmental conditions have been previously addressed at the Site.

6.0 FINDINGS BASED ON DQO DECISION RULES

This section summarizes the findings of the Supplemental Phase II activities with respect to the decision rules presented in the DQOs. As such, environmental conditions or findings are presented which were evaluated as a previously unknown Release, exceed an ARARs chemical-specific criteria, or both. COCs detected above ARARs do not necessarily indicate a Release and conversely, existence of a Release does not necessarily suggest that COCs exceed ARARs. Further details regarding the items listed below are presented in Table 10. In addition, analytical data are presented in Tables 2 through 5 and illustrated on Figures 2 through 6.

- Metals and PAH Verification: A Release was indicated based on detection of multiple PAH constituents in soil samples. ARARs chemical-specific criteria were not exceeded for any of the detected COCs. This is considered a known Release based on the results of previous investigations in the area.

- Metals Detections (Former Powder Finishing Building): A Release was indicated based on detection of multiple PAH constituents in soil samples. ARARs chemical-specific criteria were not exceeded for any of the detected COCs. This is considered a known Release based on the results of previous investigations in the area.

- Former paint building: A Release was indicated based on detection of toluene, ethylbenzene, xylenes, isopropylbenzene, and PCE in RB-13 soils. ARARs chemical-specific criteria were not exceeded for any of the detected COCs. This is considered a know Release based on previous investigations and remedial activities performed in the area.

7.0 REFERENCES

United States Environmental Protection Agency (EPA, 1994) *Guidance for the Data Quality Objectives Process*, EPA/600/G-96/055, September 1994

Earth Tech Inc. (Earth Tech, 2006a) *Phase I Environmental Site Assessment Update*, December 22, 2006

Earth Tech Inc. (Earth Tech, 2006b) *Phase II Environmental Site Assessment - Whirlpool Corporation, Former Dixie-Narco Facility*, Ranson, West Virginia, December, 2006

Note:
Refer to Appendix D for additional historical Site documents that were reviewed during Supplemental Phase II activities.

TABLE 1
SOIL BORING AND GROUNDWATER SAMPLE SUMMARY AND RATIONALE
FORMER WHIRLPOOL/MAYTAG FACILITY
RANSON, WEST VIRGINIA

Boring ID[1]	Boring Qualifier	Rationale for Boring Location	Building/Area	Chemicals of Concern (COCs)	Is a Release known or Suspected?	Was a Release Identified/Confirmed	Soil and Groundwater COCs Above Standards	Soil COCs Sampled[4]	Groundwater COCs Sampled[4]
RB-1	●	Former Soil Stockpile	NW Powder Bldg	Metals	Suspected	No	NA	L4	NA
RB-2	●	Former Soil Stockpile	NW Powder Bldg	Metals	Suspected	No	NA	L4	NA
RB-3	▲	Metals and PAH Verification	SW Powder Bldg	Metals and PAH	Suspected	Yes	NA	S1,L1,L4	NA
RB-4	▲	Metals and PAH Verification	SW Powder Bldg	Metals and PAH	Suspected	Yes	NA	S1,L1,L4	NA
RB-5	▲	Metals and PAH Verification	S Powder Bldg	Metals and PAH	Suspected	Yes	NA	S1,L1,L4	NA
RB-6	▲	Metals and PAH Verification	S of Kidde Fire	Metals and PAH	Suspected	Yes[3]	NA	S1,L1,L4	NA
RB-7	●	Retention Pond	W of pond	Metals	Suspected	No	NA	S2,L4	NA
RB-8	▲	Former Powder Finishing – Floor Drains	Powder Bldg	Metals and PAH	Suspected	Yes	NA	S1,L1,L4	NA
RB-9	▲	Former Powder Finishing – Floor Drains	Powder Bldg	Metals and PAH	Suspected	Yes[3]	NA	S1,L1,L4	NA
RB-10	▲	Former Powder Finishing – Floor Drains	Powder Bldg	Metals and PAH	Suspected	Yes	NA	S1,L1,L4	NA
RB-11	▲	Former Paint Building	Paint Bldg	BTEX, VOC, and Metals	Suspected	Yes[3]	NA	S1,L2,L3, L4	NA
RB-12	▲	Former Paint Building	Paint Bldg	BTEX, VOC, and Metals	Suspected	Yes[3]	NA	S1,L2,L3, L4	NA
RB-13	▲	Former Paint Building	Paint Bldg	BTEX, VOC, and Metals	Suspected	Yes	NA	S1,L2,L3, L4	NA
RB-14	●	Former Assembly Building	Kidde Fire	DRO/MRO, VOC, and metals	Suspected	No	NA	S1,L2,L4,L10	NA
RB-15	●	(presses and cutting)	Kidde Fire	DRO/MRO, VOC, and metals	Suspected	No	NA	S1,L2,L4,L10	NA
RB-16	●	Former Assembly Building (presses and cutting)	Kidde Fire	DRO/MRO, VOC, and metals	Suspected	No	NA	S1,L2,L4,L10	NA
RB-17	●	Former Assembly Building (presses and cutting)	Kidde Fire	DRO/MRO, VOC, and metals	Suspected	No	NA	S1,L2,L4,L10	NA
RB-18	●	Former Assembly Building (presses and cutting)	Kidde Fire	DRO/MRO, VOC, and metals	Suspected	No	NA	S1,L2,L4,L10	NA
RB-19	●	Former Assembly Building (presses and cutting)	Kidde Fire	DRO/MRO, VOC, and metals	Suspected	No	NA	S1,L2,L4,L10	NA
RB-20	●	Former Assembly Building (presses and cutting)	Kidde Fire	DRO/MRO, VOC, and metals	Suspected	No	NA	S1,L2,L4,L10	NA
RB-21	●	Former Tooling Building	Tooling Bldg	BTEX, VOC, and Metals	Suspected	No	NA	S1,L2,L3, L4	NA
RB-22	●	Former Tooling Building	Tooling Bldg	BTEX, VOC, and Metals	Suspected	No	NA	S1,L2,L3, L4	NA
Existing Well									
PSB-23/TW-23	NA	Metals and PAH Verification	Not located	Metals and PAHs	NA	NA	NA	NA	NA

Notes:
[1]) The boring locations associated with the listed well IDs are illustrated on Figure 2. Chemical analytical results are also presented with respect to each boring location on Figures 3 through 6.

[2]) Symbol designations are defined as follows:
■ - Previously unknown Release - The area, incident, process, and/or observed condition has not been related to a known Release, but has been identified as an environmental condition in historical documentation,
▲ - Known Release - The area, incident, process, and/or observed condition has been related to a Release. The Release may have been investigated, closed, received an NFA, require additional investigation, or may
● - The associated environmental condition was not identified as a Release during supplemental Phase II investigation

[3]) Although analytical results do not indicate that COCs have affected this area, the associated Release has been confirmed by other borings.

[4]) Screening and analytical method key:
S1 - PID
L1 - PAH using USEPA 8270C
L2 - VOCs using USEPA 8260B
L3 - BTEX using USEPA 8260B
L4 - RCRA Metals (total) using USEPA 6010B
L10 - DRO/MRO using USEPA 8015B

Definitions:
Release - Any release, spill, emission, leaking, pumping, migration, leaching, percolation, seeping, injection, deposit, disposal, discharge, or escape of any Hazardous Material into the environment.
Environmental Condition - An area, incident, process, and/or observed condition which has caused, or may have caused, the Release of Hazardous Material into the environment
COCs - Chemicals of Concern
PAH - Polynuclear Aromatic Hydrocarbon
Metals - This term refers to arsenic, barium, cadmium, chromium (total), lead, nickel, selenium, and silver, which were analyzed using USEPA 6010B
VOC - Volatile Organic Compounds - analyzed using method 8260B
PID - Photo-ionization detector
DRO/MRO - Diesel Range Organics/Motor Oil Range Organics - These analyses were performed to address potential impacts of oils from hydraulic machines, machining, cutting, etc.
NA - Not Applicable

TABLE 2

Soil VOC Analytical Results Table
Ranson, West Virginia

Location	Sample Date	Sample ID	Depth (ft)	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	MEK	MIBK	Acetone	Brmfrm	Chlrethne	c-1,2-DCE	DBCM	DCDFM	IsPBnz	MCHxn	DCM	PCE	t-1,2-DCE	TCE	TCFM	VC
West Virginia VRRA Industrial Soil Std (ug/kg)				**7.2*10^7**	**2.0*10^8**	**95,000**	**630,000**	**1.0*10^9**	**1.6*10^8**	**2.0*10^8**	**7.2*10^6**	**8.2*10^8**	**2.0*10^7**	**NA**	**4.1*10^8**	**8.2*10^7**	**NA**	**7.6*10^6**	**1.1*10^6**	**4.1*10^6**	**5.2*10^6**	**6.1*10^8**	**30,000**
RB-11																							
	07/26/07	RAN-RB11-020-072607	2	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U	5.3 U
RB-12																							
	07/26/07	RAN-RB12-140-072607	14	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U	7.1 U
	07/26/07	RAN-RB12-140-072607A	14	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U
RB-13																							
	07/26/07	RAN-RB13-042-072607	4.2	3800 U	3800 U	3800 U	3800 U	3800 U	3800 U *	3800 U	3800 U	3800 U	3800 U	3800 U	3800 U	12000	3800 U	3800 U	2000 J	3800 U	3800 U	3800 U	3800 U
RB-14																							
	07/25/07	RAN-RB14-110-072507	11	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U	6.6 U
RB-15																							
	07/25/07	RAN-RB15-058-072507	5.5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
RB-16																							
	07/25/07	RAN-RB16-035-072507	3.5	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	9.9	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U	7.3 U
RB-17																							
	07/25/07	RAN-RB17-065-072507	6.5	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U	6.7 U
RB-18																							
	07/25/07	RAN-RB18-035-072507	3.5	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U	6.2 U
RB-19																							
	07/25/07	RAN-RB19-075-072507	7.5	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U
RB-20																							
	07/25/07	RAN-RB20-049-072507	4.9	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U	6.4 U
RB-21																							
	07/25/07	RAN-RB21-025-072507	2.5	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U	5.0 U
RB-22																							
	07/25/07	RAN-RB22-060-072507	6	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U	6.9 U

Location	Sample Date	Sample ID	Depth (ft)	1,1,1-TCA	1,1-DCA	1,1-DCE	1,2-DCA	MEK	MIBK	Acetone	Brmfrm	Chlrethne	c-1,2-DCE	DBCM	DCDFM	IsPBnz	MCHxn	DCM	PCE	t-1,2-DCE	TCE	TCFM	VC
West Virginia VRRA Industrial Soil Std (ug/kg)				7.2*10^7	2.0*10^8	95,000	630,000	1.0*10^9	1.6*10^8	2.0*10^8	7.2*10^6	8.2*10^8	2.0*10^7	NA	4.1*10^8	8.2*10^7	NA	7.6*10^6	1.1*10^6	4.1*10^6	5.2*10^6	6.1*10^8	30,000

Notes:

All units reported in micrograms per kilogram (ug/kg)

= Concentration Detected Above West Virginia VRRA Industrial Soil Standard (non-Laboratory Flagged Data)

= Constituent Not Analyzed

NA = No Applicable West Virginia Standard

1,1,1-TCA = 1,1,1-Trichloroethane

1,1-DCA = 1,1-Dichloroethane

1,1-DCE = 1,1-Dichloroethene

1,2-DCA = 1,2-Dichloroethane

MEK = Methyl Ethyl Ketone (2-Butanone)

MIBK = 4-Methyl-2-pentanone

Brmfrm = Bromoform

Chlrethne = Chloroethane

c-1,2-DCE = cis-1,2-Dichloroethene

DBCM = Dibromochloromethane

DCDFM = Dichlorodifluoromethane

IsPBnz = Isopropylbenzene

MCHxn = Methylcyclohexane

DCM = Methylene Chloride

PCE = Tetrachloroethene

t-1,2-DCE = trans-1,2-Dichloroethene

TCE = Trichloroethene

TCFM = Trichlorofluoromethane

VC = Vinyl Chloride

U = Constituent Analyzed But Not Detected

* = Laboratory Control Sample Exceeds Limits

J = Estimated Value; Result Between Detection Limit and Reporting Limit

H = Sample Prepped or Analzyed Beyond Holding Time

B = Constituent Detected in Laboratory Blank

TABLE 3

Soil SVOC Analytical Results Table
Ranson, West Virginia

Location	Sample Date	Sample ID	Depth (ft)	1,4-Diox	Acnpthn	Anthrcn	B(a)Anth	B(a)P	B(b)Fl	B(g,h,i)P	B(k)Fl	Chrysene	Db(a,h)A	Fluranth	Fluorene	I(1,2,3-cd)P	Naphth	Phnanth	Pyrene
West Virginia VRRA Industrial Soil Standard (ug/kg)				5.2*10^6	1.2*10^8	6.1*10^8	78,000	8,000	78,000	NA	7.8*10^5	7.8*10^6	8,000	8.2*10^7	8.2*10^7	78,000	8.2*10^7	NA	6.1*10^7
RB-03																			
	07/26/07	RAN-RB3-028-072607	2.8		37 U	20 J	20 J	61	68	84	40	29 J	22 J	29 J	37 U	51	37 U	16 J	39
RB-04																			
	07/26/07	RAN-RB4-032-072607	3.2		36 U	36 U	34 J	36 J	50	33 J	28 J	59	36 U	58	36 U	25 J	36 U	74	97
RB-05																			
	07/26/07	RAN-RB5-150-072607	15		44 U	44 U	29 J	33 J	49	28 J	24 J	38 J	44 U	40 J	44 U	24 J	44 U	25 J	40 J
RB-06																			
	07/25/07	RAN-RB6-015-072507	1.5		33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U	33 U
RB-08																			
	07/27/07	RAN-RB8-110-072707	11		38 U	38 U	14 J	11 J	21 J	8.3 J	38 U	30 J	38 U	21 J	38 U	38 U	38 U	46	21 J
RB-09																			
	07/27/07	RAN-RB9-170-072707	17		42 U	42 U	42 U	42 U	42 U	42 U	42 U	42 U	42 U	42 U	42 U	42 U	42 U	42 U	42 U
RB-10																			
	07/27/07	RAN-RB10-140-072707	14		46 U	46 U	37 J	29 J	54	25 J	21 J	60	46 U	41 J	46 U	46 U	11 J	41 J	47
	07/27/07	RAN-RB10-140-072707A	14		38 U	38 U	29 J	23 J	41	18 J	13 J	45	38 U	31 J	38 U	38 U	16 J	43	37 J

Notes:

All units reported in micrograms per kilogram (ug/kg)

= Concentration Detected Above West Virginia VRRA Industrial Soil Standard (non-Laboratory Flagged Data)

= Constituent Not Analyzed

NA = No Applicable West Virginia Standard

1,4-Diox = 1,4-Dioxane

Acnpthn = Acenaphthene

Anthrcn - Anthracene

B(a)Anth = Benzo(a)anthracene

B(a)P = Benzo(a)pyrene

B(b)Fl = Benzo(b)fluoranthene

B(g,h,i)P = Benzo(g,h,i)perylene

B(k)Fl = Benzo(k)fluoranthene

Db(a,h)A = Dibenz(a,h)anthracene

Fluranth = Fluoranthene

I(1,2,3-cd)P = Indeno(1,2,3-cd)pyrene

Naphth = Naphthalene

Phnanth = Phenanthrene

U = Constituent Analyzed But Not Detected

* = Laboratory Control Sample Exceeds Limits

J = Estimated Value; Result Between Detection Limit and Reporting Limit

H = Sample Prepped or Analzyed Beyond Holding Time

B = Constituent Detected in Laboratory Blank

TABLE 4

Soil Metals Analytical Results Table
Ranson, West Virginia

Location	Sample Date	Sample ID	Depth (ft)	Arsenic	Barium	Cadmium	Chrom (ttl)	Chrom VI	Lead	Nickel	Selenium	Silver
West Virginia VRRA Industrial Soil Standard (mg/kg)				**610**	**140,000**	**1,000**	**NA**	**10,000**	**1,000**	**41,000**	**10,000**	**10,000**
RB-01												
	07/26/07	RAN-RB1-040-072607	4	8.6	86	0.60	20		38	17	1.1 U	0.55 U
RB-02												
	07/26/07	RAN-RB2-040-072607	4	14	200	0.84	25		180	16	0.92 J	0.51 J
RB-03												
	07/26/07	RAN-RB3-028-072607	2.8	11	95	0.29	26		76	20	0.42 J	0.12 J
RB-04												
	07/26/07	RAN-RB4-032-072607	3.2	14	140	0.73	21		37	21	0.98 U	0.24 J
RB-05												
	07/26/07	RAN-RB5-150-072607	15	16	97	1.2 U	25		18	33	5.9 U	3.0 U
RB-06												
	07/25/07	RAN-RB6-015-072507	1.5	13	54	0.33	6.2		39	5.8	0.97 U	0.48 U
RB-07												
	07/26/07	RAN-RB7-148-072607	14.8	11	54	1.2 U	37		10	44	6.2 U	3.1 U
RB-08												
	07/27/07	RAN-RB8-110-072707	11	9.2	88	0.54	29		21	22	1.1 U	0.14 J
RB-09												
	07/27/07	RAN-RB9-170-072707	17	12	100	0.48 U	41		17	30	2.4 U	0.27 J
RB-10												
	07/27/07	RAN-RB10-140-072707	14	32	400	1.2 U	67		43	88	2.5 J	3.1 U
	07/27/07	RAN-RB10-140-072707A	14	7.9	100	0.26	25		74	24	0.46 J	0.14 J
RB-11												
	07/26/07	RAN-RB11-020-072607	2	45	190	2.5	23		210	19	0.90 U	0.30 J

Location	Sample Date	Sample ID	Depth (ft)	Arsenic	Barium	Cadmium	Chrom (ttl)	Chrom VI	Lead	Nickel	Selenium	Silver
West Virginia VRRA Industrial Soil Standard (mg/kg)				610	140,000	1,000	NA	10,000	1,000	41,000	10,000	10,000
RB-12												
	07/26/07	RAN-RB12-140-072607	14	2.5	37	0.16 J	26		3.8	23	1.2 U	0.62 U
	07/26/07	RAN-RB12-140-072607A	14	3.1	43	0.13 J	26		3.9	23	1.2 U	0.59 U
RB-13												
	07/26/07	RAN-RB13-042-072607	4.2	15	74	0.54 U	50		16	53	1.2 J	1.4 U
RB-14												
	07/25/07	RAN-RB14-110-072507	11	14	74	1.2 U	37		15	41	5.9 U	2.9 U
RB-15												
	07/25/07	RAN-RB15-058-072507	5.5	7.1	38	0.081 J	17		9.5	26	0.44 J	0.46 U
RB-16												
	07/25/07	RAN-RB16-035-072507	3.5	11	350	1.6	21		200	20	1.1 J	0.68 U
RB-17												
	07/25/07	RAN-RB17-065-072507	6.5	8.0 J	32	2.6 U	20		8.1	53	13 U	6.4 U
RB-18												
	07/25/07	RAN-RB18-035-072507	3.5	11	54	0.48 U	19		28	49	1.4 J	1.2 U
RB-19												
	07/25/07	RAN-RB19-075-072507	7.5	8.0	30	0.0040	27		9.6	25	0.77 J	0.61 U
RB-20												
	07/25/07	RAN-RB20-049-072507	4.9	14	43	0.47 U	26		23 ^	36	1.2 J	1.2 U
RB-21												
	07/25/07	RAN-RB21-025-072507	2.5	18	21	0.92 U	0.57 J		11 ^	4.6 U	4.6 U	2.3 U
RB-22												
	07/25/07	RAN-RB22-060-072507	6	13	85	1.3 U	49		20 ^	48	2.6 J	3.2 U

Location	Sample Date	Sample ID	Depth (ft)	Arsenic	Barium	Cadmium	Chrom (ttl)	Chrom VI	Lead	Nickel	Selenium	Silver
West Virginia VRRA Industrial Soil Standard (mg/kg)				610	140,000	1,000	NA	10,000	1,000	41,000	10,000	10,000

Notes:

All units reported in milligrams per kilogram (mg/kg)

= Concentration Detected Above West Virginia VRRA Industrial Soil Standard (non-Laboratory Flagged Data)

= Constituent Not Analyzed

Chrom (ttl) = Total Chromium

Chrom VI = Hexavalent Chromium

NA = No Applicable West Virginia Standard

U = Constituent Analyzed But Not Detected

* = Laboratory Control Sample Exceeds Limits

J = Estimated Value; Result Between Detection Limit and Reporting Limit

H = Sample Prepped or Analzyed Beyond Holding Time

B = Constituent Detected in Laboratory Blank

TABLE 5

Soil BTEX and TPH Analytical Results Table
Ranson, West Virginia

Location	Sample Date	Sample ID	Depth (ft)	Benzene	Toluene	Ethbenz	Xylenes	GRO:0A-1	DRO:0A-2	MRO: OA-2	DRO	MRO
West Virginia VRRA Industrial Soil Std: BTEX = ug/kg; TPH = mg/kg				2.0 *10^6	4.1*10^8	2.0*10^8	1.0*10^9	NA	NA	NA	NA	NA
RB-11												
	07/26/07	RAN-RB11-020-072607	2	5.3 U	5.3 U	5.3 U	5.3 U					
RB-12												
	07/26/07	RAN-RB12-140-072607	14	7.1 U	7.1 U	7.1 U	7.1 U					
	07/26/07	RAN-RB12-140-072607A	14	6.4 U	6.4 U	6.4 U	6.4 U					
RB-13												
	07/26/07	RAN-RB13-042-072607	4.2	3800 U	4500	230000	1400000					
RB-14												
	07/25/07	RAN-RB14-110-072507	11								5.4 U	16
	07/25/07	RAN-RB14-110-072507	11	6.6 U	6.6 U	6.6 U	6.6 U					
RB-15												
	07/25/07	RAN-RB15-058-072507	5.5								4.2 U	12
	07/25/07	RAN-RB15-058-072507	5.5	5.0 U	5.0 U	5.0 U	5.0 U					
RB-16												
	07/25/07	RAN-RB16-035-072507	3.5	7.3 U	7.3 U	7.3 U	7.3 U					
	07/25/07	RAN-RB16-035-072507	3.5								14	120
RB-17												
	07/25/07	RAN-RB17-065-072507	6.5	6.7 U	6.7 U	6.7 U	6.7 U					
	07/25/07	RAN-RB17-065-072507	6.5								5.5 U	15
RB-18												
	07/25/07	RAN-RB18-035-072507	3.5								5.0 U	12
	07/25/07	RAN-RB18-035-072507	3.5	6.2 U	6.2 U	6.2 U	6.2 U					
RB-19												
	07/25/07	RAN-RB19-075-072507	7.5								5.4 U	20
	07/25/07	RAN-RB19-075-072507	7.5	6.4 U	6.4 U	6.4 U	6.4 U					

Location	Sample Date	Sample ID	Depth (ft)	Benzene	Toluene	Ethbenz	Xylenes	GRO:0A-1	DRO:0A-2	MRO: OA-2	DRO	MRO
West Virginia VRRA Industrial Soil Std: BTEX = ug/kg; TPH = mg/kg				**2.0 *10^6**	**4.1*10^8**	**2.0*10^8**	**1.0*10^9**	**NA**	**NA**	**NA**	**NA**	**NA**
RB-20												
	07/25/07	RAN-RB20-049-072507	4.9								5.1 U	13
	07/25/07	RAN-RB20-049-072507	4.9	6.4 U	6.4 U	6.4 U	6.4 U					
RB-21												
	07/25/07	RAN-RB21-025-072507	2.5	5.0 U	5.0 U	5.0 U	5.0 U					
RB-22												
	07/25/07	RAN-RB22-060-072507	6	6.9 U	6.9 U	6.9 U	6.9 U					

Notes:

BTEX results reported in micrograms per kilogram (ug/kg); TPH results (GRO, DRO, MRO) reported in milligrams per kilogram (mg/kg)

= Concentration Detected Above West Virginia VRRA Industrial Soil Standard (non-Laboratory Flagged Data)

= Constituent Not Analyzed

= Iowa-Specific TPH Method

NA = No Applicable West Virginia Standard

Ethbenz = Ethylbenzene

Xylenes = Total Xylenes

GRO:OA-1 = Gasoline as OA-1 (C6 - C10)

DRO:OA-2 = Diesel Fuel as OA-2 (C6 - C10)

DRO = Diesel Range Organics (C10 - C20)

U = Constituent Analyzed But Not Detected

* = Laboratory Control Sample Exceeds Limits

J = Estimated Value; Result Between Detection Limit and Reporting Limit

H = Sample Prepped or Analzyed Beyond Holding Time

B = Constituent Detected in Laboratory Blank

TABLE 6
INVESTIGATION RESULTS SUMMARY
FORMER WHIRLPOOL/MAYTAG FACILITY
RANSON, WEST VIRGINIA

Boring ID	Site Location by AOC/Building Number	Summary of Previous Activities	Results of Supplemental Phase II Activities[2]	Boring or Area Classification[1]	Comment	Related ARARs
RB-1	Former Soil Stockpile	A soil stockpile was formerly located adjacent to the former Powder Finishing Building. Petroleum odors have been observed near a soil stockpile.	Borings RB-1 and RB-2 were advanced in the vicinity of the former stockpile. VOC screening was performed and soil samples were collected and submitted for metals analysis. Screening and analytical results did not indicate the presence of COCs.		Investigation did not identify an ongoing contaminant source or environmental condition	Soil and GW regulations (ARARs Tables 5-1, 5-2, 5-3, and 7)
RB-2						
RB-3	Metals and PAH Verification	Previous investigations performed by Earth Tech during Phase II activities indicated that metals and various PAHs exist in borings located at the southwest portion of the Site. Borings which exhibit detections include PSB-04, PSB-11, PSB-14, and PSB-19. The observed detections were below industrial standards. Minor detections were above residential standards, including arsenic in PSB-04 and PAHs in PSB-11, PSB-14, and PSB-19.	Borings RB-3, RB-4, RB-5, and RB-6 were advanced at exterior locations along the southwest and south portions of the property, as displayed on Figure 2. Soil samples were collected for supplemental evaluation of metals and PAHs at these locations. Analytical samples indicated several PAH constituents in RB-3, RB-4, and RB-5 at concentrations below soil standards (note: multiple PAH constituents included J-flags). The soil sample collected from RB-6 did not indicate detections of PAHs. Metals were not detected above soil standards in any of the soil samples collected.		Investigation confirmed the existence of environmental conditions indicative of a Release in this area.	Soil and GW regulations (ARARs Tables 5-1, 5-2, 5-3, and 7)
RB-4						
RB-5						
RB-6						
RB-7	Retention Pond (North of Former Warehouse Building)	Previous boring (PSB-10) advanced to the east of the retention pond.	Soil boring RB-7 was advanced to the east of the retention pond. A soil sample was collected and analyzed for metals. Results did not indicate the presence of COCs		Environmental conditions were not identified associated with this area.	Soil and GW regulations (ARARs Tables 5-1, 5-2, 5-3, and 7)
RB-8	Metals Detections (Former Powder Finishing Building)	Elevated levels of chromium, barium, lead, and petroleum hydrocarbons were detected near the west of the former Powder Finishing Building. Previous assessment by ERM did not identify a risk to occupants. Samples collected on April 27, 1992 and afterwards did not indicate exceedence of soil standards. No groundwater investigation has been performed.	Soil borings RB-8, RB-9, and RB-10 were advanced at the interior of the west portion of the powder finishing building. Analytical results from soils collected indicated slight detections of several SVOC constituents, although the detected levels are far below soil standards (note; multiple PAH COCs included J-flags).		Investigation confirmed the existence of environmental conditions indicative of a Release in this area.	Soil and GW regulations (ARARs Tables 5-1, 5-2, 5-3, and 7)
RB-9						
RB-10						
RB-11	Former Paint Building	Previous activities in this area include soil excavation in the paint shop pretreatment pit and shallow soil investigation performed beneath the old materials storage area.	Borings RB-11, RB-12, and RB-13 were advanced to the south, west, and north of the former paint building, respectively. Soil samples were collected and analyzed for metals and VOC. VOC, including toluene, ethylbenzene, xylenes, isopropylbenzene, and PCE were detected in RB-13. Although these detections do not exceed soil standards, the analyzed values caused higher reporting limits for the remaining VOC constituents. In particular, the PCE detection in RB-13 was not highlighted due to a J-flag, although the estimated value is well above soil standards. It is also possible that additional VOC in the sample were masked by the increased detection limits. A sample collected from RB-11 indicated an exceedence of arsenic.		Investigation confirmed the existence of environmental conditions indicative of a Release at the Former Paint Building.	Soil and GW regulations (ARARs Tables 5-1, 5-2, 5-3, and 7)
RB-12						
RB-13						
RB-14	Presses and Cutting Areas (Former Assembly Building)	No previous investigation focused on this production activity	Borings RB-14 through RB-20 were advanced in the vicinity of former stamp press and cutting areas. Analytical samples submitted for VOC, DRO/MRO, and metals did not indicate the presence of COCs. A slight detection of acetone was detected in RB-16		Environmental conditions were not identified associated with this area	Soil and GW regulations (ARARs Tables 5-1, 5-2, 5-3, and 7)
RB-15						
RB-16						
RB-17						
RB-18						
RB-19						
RB-20						
RB-21	Former Tooling Area	A soil gas survey performed January 21, 1992 indicated the presence of VOCs in the tooling area. In November and December 1995, excavation activities were performed in the area, as detailed in *Remediation Activities, Paint Shop Pretreatment Pit and Tooling Area*, March 1996.	Borings RB-21 and RB-22 were advanced to the southeast and southwest of the tooling building. Soil samples were collected and evaluated for metals and VOCs. Analytical results did not indicate the presence of COCs. No groundwater was encountered during the supplemental investigation.		Environmental conditions were not identified associated with this area	Soil and GW regulations (ARARs Tables 5-1, 5-2, 5-3, and 7)
RB-22						
	Shallow Soil Impacts (old materials storage area)	VOCs, PNAs, and Metals have historically been detected in the shallow sub-slab soils (approximately 1-6 feet bgs). Previous investigations indicated that impacts have not migrated to groundwater, although no groundwater investigation has been performed. Findings included in the March 12, 1996 report, *Risk Assessment of Old Materials Storage Area* concluded that the surface cap (concrete pad) remain in place to prevent human contact.	Supplemental Phase II investigation activities described under "Former Paint Building"		NA	NA
	Former Excavation Areas (paint shop pre-treatment pit and Tooling Area)	Previous excavations removed and disposed of 140-tons of soil from these areas. Confirmation samples indicated beryllium in exceedence of soil standards. No groundwater investigation has been performed. Excavation activities performed during November and December 1995. Activity details provided in *Remediation Activities, Paint Shop Pretreatment Pit and Tooling Area*, March 1996.	Supplemental Phase II investigation activities for the paint shop pretreatment pit are described under "Former Paint Building" and activities for the tooling area are included under "Former Tooling Area"		NA	NA
	Surface Metals Detections (Former Deburr Machine Area)	Near surface soils from the deburr machine area on April 27, 1992 have exhibited elevated levels of lead, cadmium, chromium, nickel, and zinc. Lead detections varied between 30 to 11,000 mg/Kg, which exceeds soil standards. Soil gas samples were also collected. No groundwater investigation has been performed.	No additional investigation performed in this area. Previous activities represent known environmental conditions and therefore are not within the scope of the supplemental Phase II activities.		NA	NA
	RCRA Violations (Kidde Fire Area)	Earth Tech Phase I investigation indicates RCRA violations concerning the "groundwater protection rule" and the "maintenance and operation rule." FOIA research indicated that the violations were recorded for training and container management. It was not noted if the violations were rectified.	No additional investigation performed in this area. Previous activities represent known environmental conditions and therefore are not within the scope of the supplemental Phase II activities.		NA	NA
	Former Powder Finishing Building	Area is listed as a US Brownfields site	No additional investigation performed in this area. Previous activities represent known environmental conditions and therefore are not within the scope of the supplemental Phase II activities.		NA	NA
	Trench/Sump System (Former Powder Finishing Building)		No additional investigation performed in this area. Previous activities represent known environmental conditions and therefore are not within the scope of the supplemental Phase II activities.		NA	NA
	Potential PCB-containing pole-mounted Transformers	Six pole-mounted transformers were located at the Site. The transformers were scheduled for removal in 1997.	The current condition/existence of the transformers is not known. No additional investigation performed in conjunction with these structures.		NA	NA
	(2) 10,000-gallon USTs	In 1988, one 10,000-gallon No. 2 heading oil UST and one 10,000-gallon gasoline UST were removed from the Site.	The current condition/existence of the transformers is not known. No additional investigation performed in conjunction with these structures.		NA	NA

TABLE 6
INVESTIGATION RESULTS SUMMARY
FORMER WHIRLPOOL/MAYTAG FACILITY
RANSON, WEST VIRGINIA

Boring ID	Site Location by AOC/Building Number	Summary of Previous Activities	Results of Supplemental Phase II Activities[2]	Boring or Area Classification[1]	Comment	Related ARARs
	Hazardous Waste Storage Building	A closure report was prepared for the Hazardous Waste Storage Building by ERM in February 1995. During the investigation, lead impacts were discovered beneath the concrete floor. In November 1996, remediation activities were performed and a NFA letter was subsequently received from the WVDEP on January 15, 1997.	No additional investigation performed in this area. Previous activities represent known environmental conditions and therefore are not within the scope of the supplemental Phase II activities.		NA	NA
	Foaming Department Investigation	Soil samples collected from the foaming department by ERM on April 20, 1992 indicated DCM and Formaldehyde in soils. Detections were low and determined to require no further action.	No additional investigation performed in this area. Previous activities represent known environmental conditions and therefore are not within the scope of the supplemental Phase II activities.		NA	NA
	Outdoor Storage Area for Non-Hazardous Waste	Investigation was performed by ERM in July 1995 to evaluate elevated lead impacts. Two soil samples indicated PNAs in addition to lead detections in shallow soils. No further action was recommended following the evaluation based on the low detected levels, decreases in lead levels with depth, absence of groundwater, and a surface asphalt cap.	No additional investigation performed in this area. Previous activities represent known environmental conditions and therefore are not within the scope of the supplemental Phase II activities.		NA	NA

Notes:
AOC - Area of concern
AST - Aboveground storage tank
BTEX - Benzene, Toluene, Ethylbenzene, and Xylene
bgs - below ground surface
COCs - Chemicals of concern
DRO - Diesel range organics
MRO - Motor oil range organics
ESA - Environmental site assessment
MEK - Methyl ethyl ketone
MIBK - 4-Methyl-2-Pentanone
NA - Not Applicable
J-flag - Result is less than the reporting limit but greater than or equal to the method
NFA - No further action
NFR - No further remediation
PAH - Polynuclear aromatic hydrocarbon
ppb - Part per billion (micrograms per liter or micrograms per kilogram
ppm - part per million (milligrams per liter of milligrams per kilogram)
RFI - RCRA Facility Investigation
TCE - Trichloroethene
THE - Total extractable hydrocarbons
TPH - Total petroleum hydrocarbons
UST - Underground storage tank
VOC - Volatile organic compound

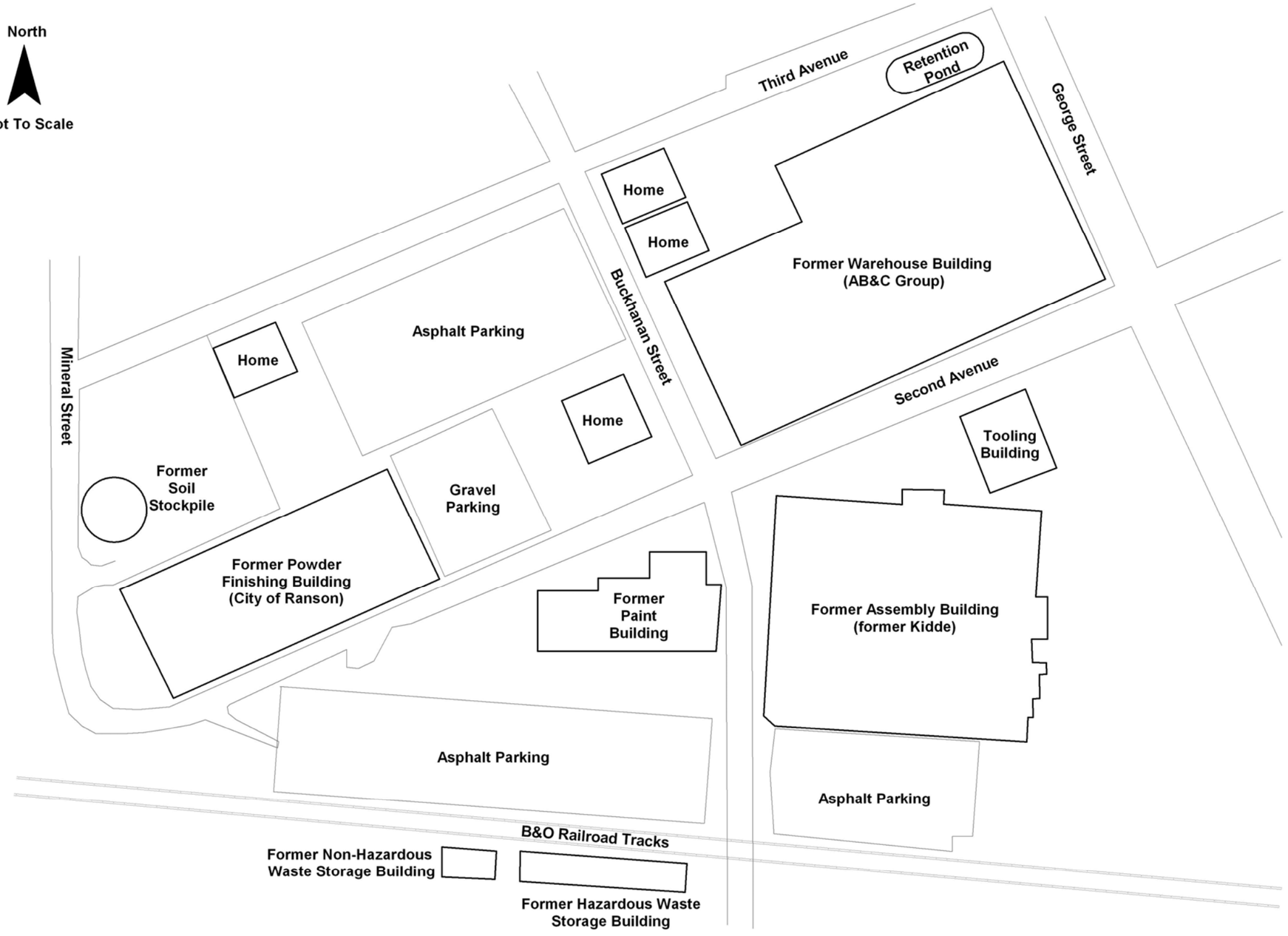
1) Color Designation of Boring or Area Classification:

Yellow	The COCs detected are in exceedence of ARARs chemical criteria
Blue	The COCs detected are not in exceedence of ARARs chemical criteria
Green	COCs were not detected
Brown	No additional investigation was performed. The environmental condition represents a known Release.
Gray	No additional investigation was performed. The environmental condition has been addressed in conjunction with previous assessments.

2) Acetone and/or Methylene Chloride (DCM) are considered to be common analytical laboratory contaminants due to their use in the extraction process in certain analytical methods. These chemicals are referenced where detected during

North

Not To Scale



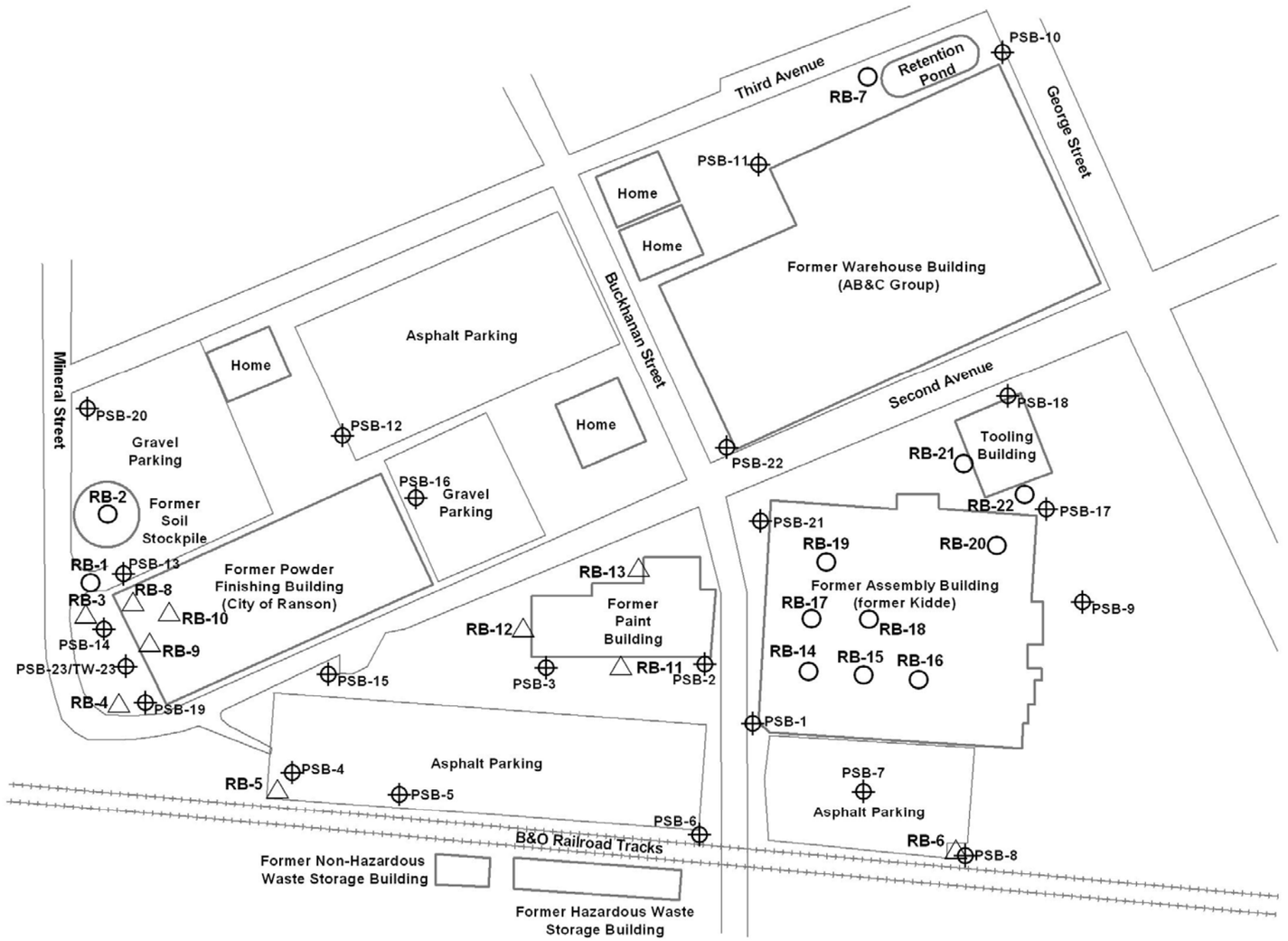
CDM

Figure 1
Site Map
Former Maytag Facility
Ranson, West Virginia

DRAWN: S. PHILLIPS	DATE: 10-2-07	PROJECT NUMBER: 54578-59077
APPV'D: C. MICKEL	REVISED: 10-30-07	

North

Not To Scale



Legend:

△ Known Release - The area, incident, process, and/or observed condition has been related to a Release. The Release may have been investigated, closed, received an NFA, require additional investigation, or may be subject to ongoing remedial action.

□ Previously unknown Release - The area, incident, process, and/or observed condition has not been related to a known Release, but has been identified as an environmental condition in historical documentation, previous Phase I/II reports, and/or during Site reconnaissance.

○ The associated environmental condition was not identified as a Release during supplemental Phase II investigation.

Notes:
- This table incorporates information and references from the following sources:
- Table 1 - Soil Boring and Groundwater Sample Summary and Rationale
- Table 10 - Investigation Results Summary

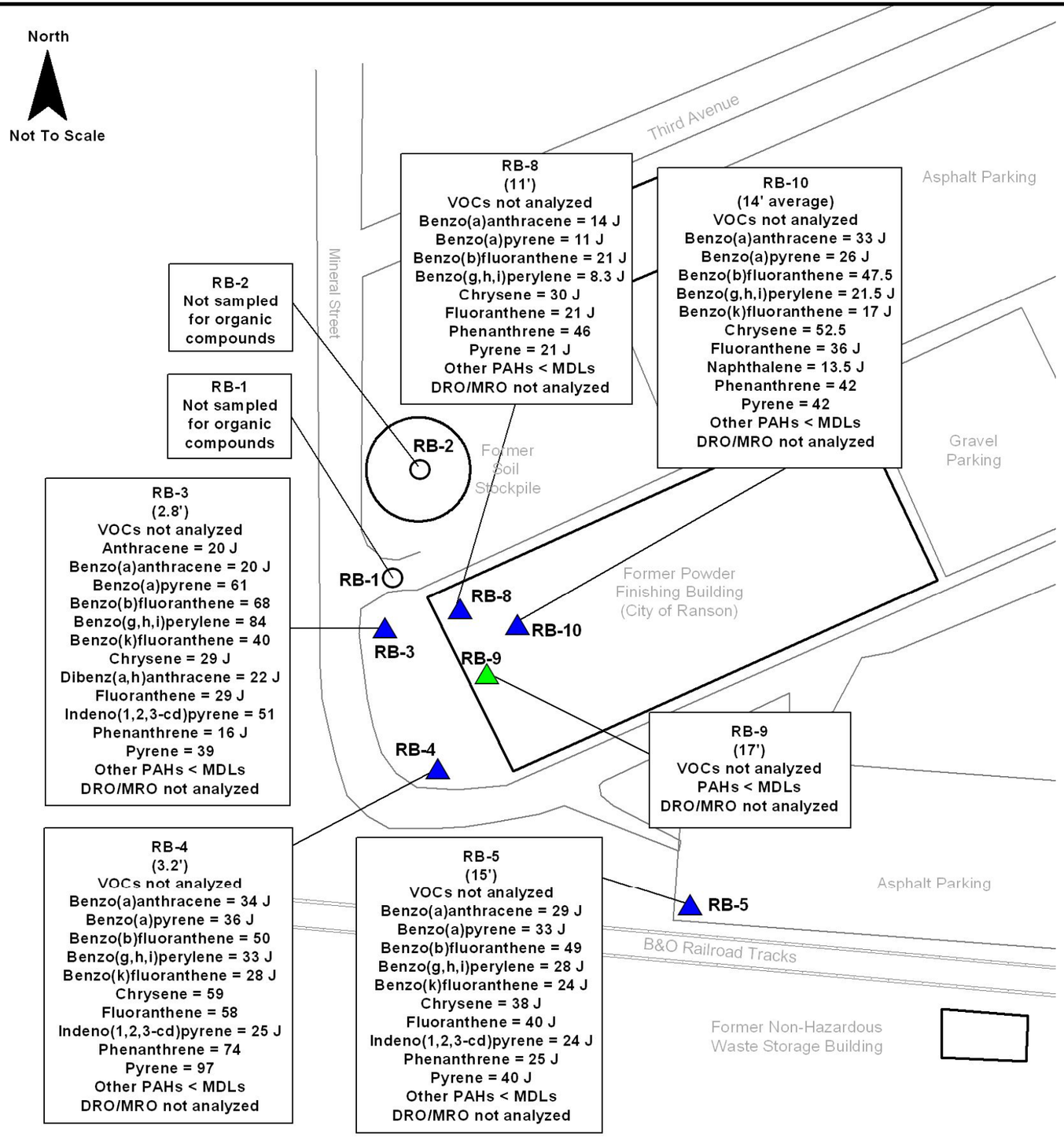
- Black and White copy or reproduction of this table will not display the intended color designations of boring icons.

CDM soil borings installed between July 25 to 27, 2007

CDM

Figure 2
Soil Boring Location Map
Former Maytag Facility
Ranson, West Virginia

DRAWN:	DATE:	PROJECT NUMBER:
S. PHILLIPS	10-2-07	54578-59077
APPV'D: C. MICKEL	REVISED: 11-27-07	



Legend:

Boring Icon Color and Shape Designations:

- The COC detected are in exceedence of ARARs chemical criteria
- The COC detected are not in exceedence of ARARs chemical criteria
- COC were not detected
- △ Known Release - The area, incident, process, and/or observed condition has been related to a Release. The Release may have been investigated, closed, received an NFA, require additional investigation, or may be subject to ongoing remedial action.
- □ Previously unknown Release - The area, incident, process, and/or observed condition has not been related to a known Release, but has been identified as an environmental condition in historical documentation, previous Phase I/II reports, and/or during Site reconnaissance.
- ○ The associated environmental condition was not identified as a Release during supplemental Phase II investigation.

Notes:
- This table incorporates information and references from the following sources:
- Table 1 - Soil Boring and Groundwater Sample Summary and Rationale
- Table 10 - Investigation Results Summary

- Black and White copy or reproduction of this table will not display the intended color designations of boring icons.

Notes:

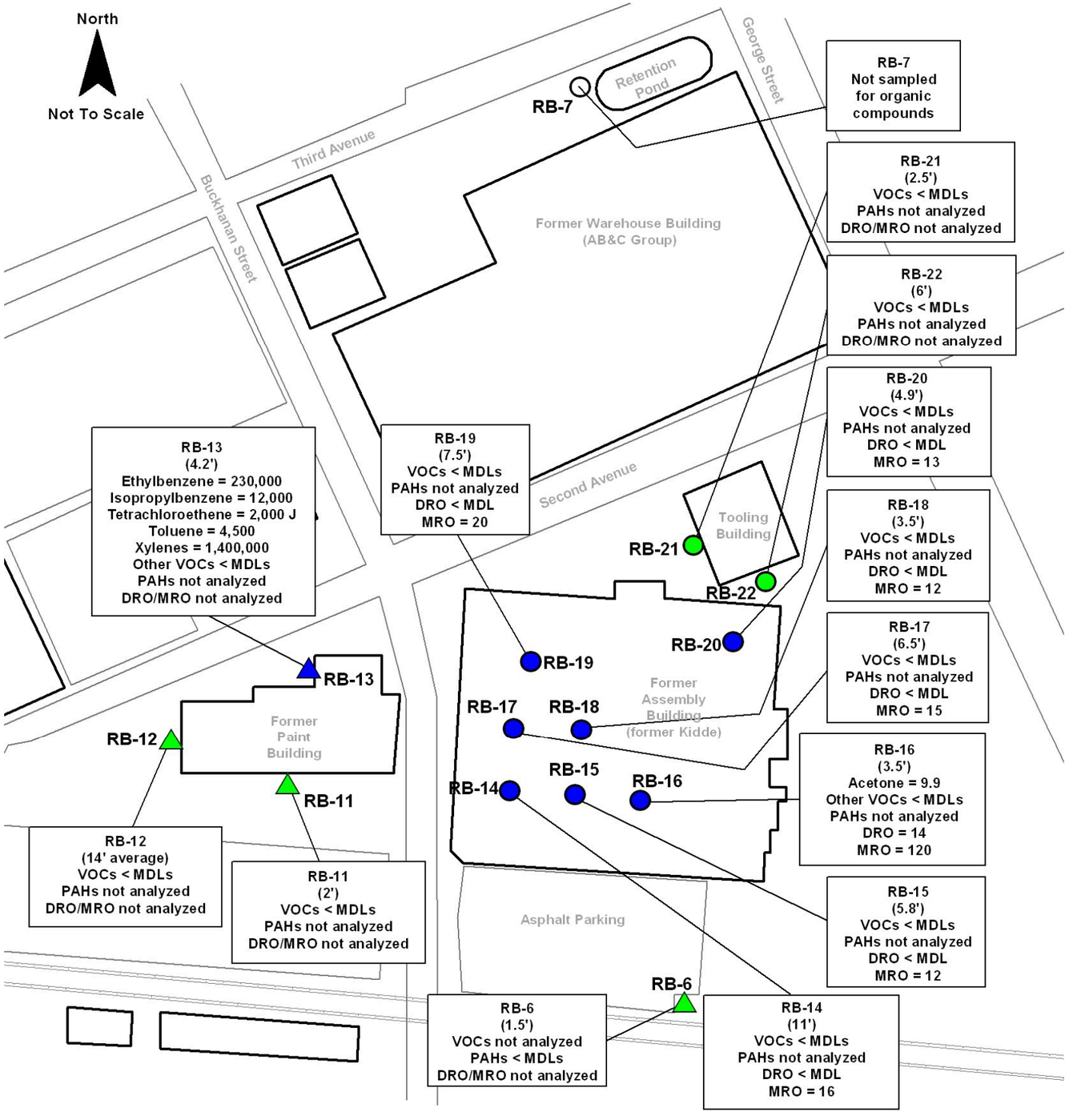
- VOC concentrations µg/kg
- DRO and MRO concentrations mg/kg
- Soil borings/temporary monitoring wells installed between Juiy 25 to 27, 2007
- VOCs – Volatile organic compounds analyzed by Method 8260B
- PAHs – Polynuclear aromatic hydrocarbon compounds analyzed by Method 8270C
- DRO – Diesel-range Organic compounds analyzed by Method 8015B
- MRO – Motor oil-range Organic compounds analyzed by Method 8015B
- MDLs – Laboratory method detection limits
- J – indicates estimated value; analytical result between laboratory detection limit and laboratory reporting limit

None of the analyzed organic compounds were detected at concentrations exceeding the respective West Virginia Department of Environmental Protection industrial land use target soil screening criteria provided in the West Virginia Voluntary Remediation and Redevelopment Act

CDM

Figure 3
Soil Organic Compounds Concentration Map
West Portion
Former Maytag Facility
Ranson, West Virginia

DRAWN: S. PHILLIPS	DATE: 10-2-07	PROJECT NUMBER: 54578-59077
APPV'D: C. MICKEL	REVISED: 11-19-07	



Legend:

Boring Icon Color and Shape Designations:

- The COC detected are in exceedence of ARARs chemical criteria
- The COC detected are not in exceedence of ARARs chemical criteria
- COC were not detected
- △ Known Release - The area, incident, process, and/or observed condition has been related to a Release. The Release may have been investigated, closed, received an NFA, require additional investigation, or may be subject to ongoing remedial action.
- □ Previously unknown Release - The area, incident, process, and/or observed condition has not been related to a known Release, but has been identified as an environmental condition in historical documentation, previous Phase I/II reports, and/or during Site reconnaissance.
- ○ The associated environmental condition was not identified as a Release during supplemental Phase II investigation.

Notes:
- This table incorporates information and references from the following sources:
- Table 1 - Soil Boring and Groundwater Sample Summary and Rationale
- Table 10 - Investigation Results Summary

- Black and White copy or reproduction of this table will not display the intended color designations of boring icons.

Notes:

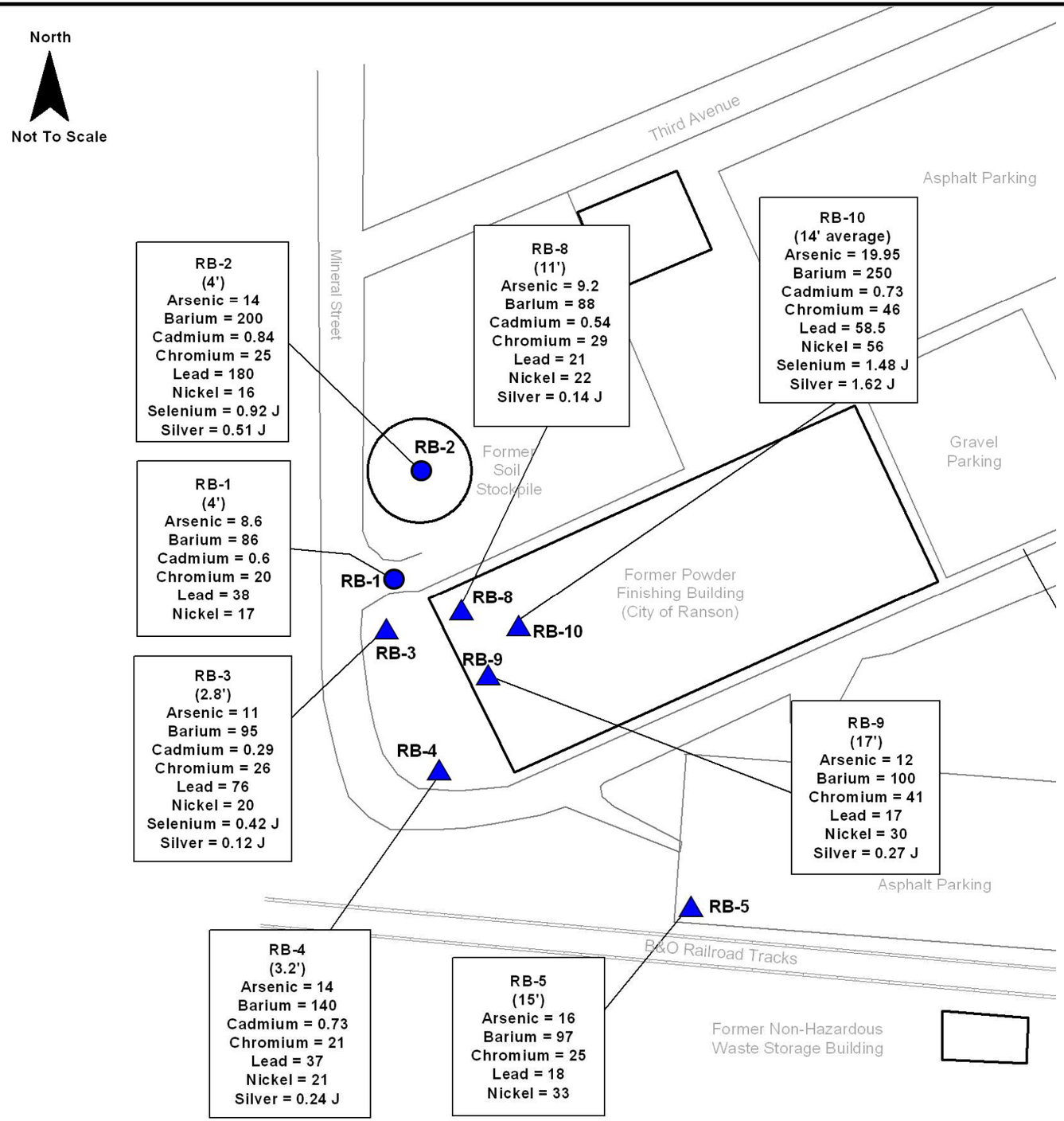
- VOC and PAH concentrations µg/kg
- DRO and MRO concentrations mg/kg
- Soil borings/temporary monitoring wells installed between July 25 to 27, 2007
- VOCs – Volatile organic compounds analyzed by Method 8260B
- PAHs – Polynuclear aromatic hydrocarbon compounds analyzed by Method 8270C
- DRO – Diesel-range Organic compounds analyzed by Method 8015B
- MRO – Motor oil-range Organic compounds analyzed by Method 8015B
- MDLs – Laboratory method detection limits
- J – indicates estimated value; analytical result between laboratory detection limit and laboratory reporting limit

None of the analyzed organic compounds were detected at concentrations exceeding the respective West Virginia Department of Environmental Protection industrial land use target soil screening criteria provided in the West Virginia Voluntary Remediation and Redevelopment Act

CDM

Figure 4
Soil Organic Compounds Concentration Map
East Portion
Former Maytag Facility
Ranson, West Virginia

DRAWN: S. PHILLIPS	DATE: 10-2-07	PROJECT NUMBER: 54578-59077
APPV'D: C. MICKEL	REVISED: 11-19-07	



Legend:

Boring Icon Color and Shape Designations:

- The COC detected are in exceedence of ARARs chemical criteria
- The COC detected are not in exceedence of ARARs chemical criteria
- COC were not detected
- △ Known Release - The area, incident, process, and/or observed condition has been related to a Release. The Release may have been investigated, closed, received an NFA, require additional investigation, or may be subject to ongoing remedial action.
- □ Previously unknown Release - The area, incident, process, and/or observed condition has not been related to a known Release, but has been identified as an environmental condition in historical documentation, previous Phase I/II reports, and/or during Site reconnaissance.
- ○ The associated environmental condition was not identified as a Release during supplemental Phase II investigation.

Notes:
- This table incorporates information and references from the following sources:
- Table 1 - Soil Boring and Groundwater Sample Summary and Rationale
- Table 10 - Investigation Results Summary

- Black and White copy or reproduction of this table will not display the intended color designations of boring icons.

Notes:

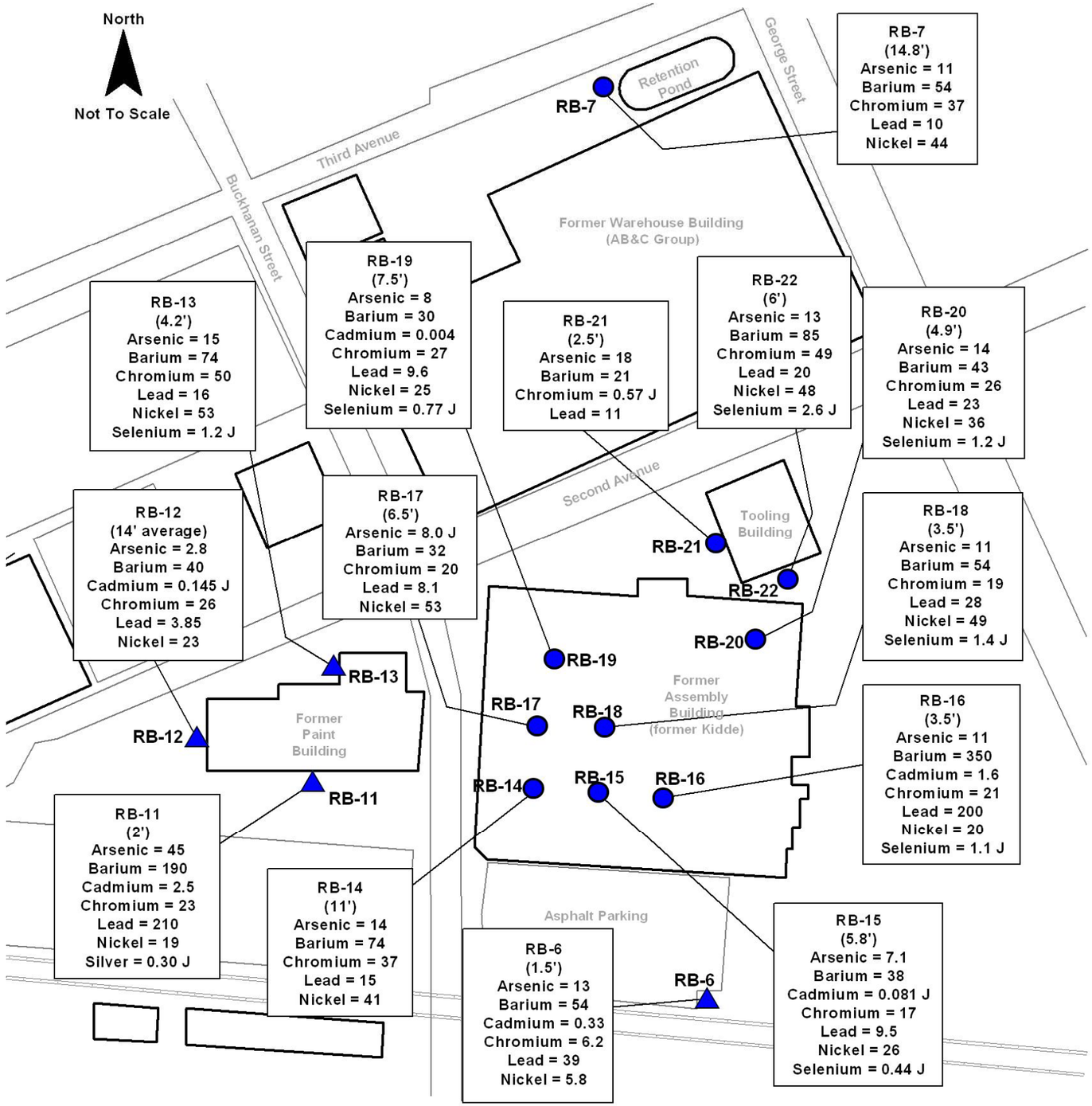
- Metals concentrations µg/kg
- Soil borings/temporary monitoring wells installed between July 25 to 27, 2007
- Metals analyzed by Method 6010B
- MDLs – Laboratory method detection limits
- J – indicates estimated value; analytical result between laboratory detection limit and laboratory reporting limit

None of the analyzed metals were detected at concentrations exceeding the respective West Virginia Department of Environmental Protection industrial land use target soil screening criteria provided in the West Virginia Voluntary Remediation and Redevelopment Act

CDM

Figure 5
Soil Metals Concentration Map
West Portion
Former Maytag Facility
Ranson, West Virginia

DRAWN: S. PHILLIPS	DATE: 10-2-07	PROJECT NUMBER: 54578-59077
APPV'D: C. MICKEL	REVISED: 11-19-07	



Legend:

Boring Icon Color and Shape Designations:

- The COC detected are in exceedence of ARARs chemical criteria
- The COC detected are not in exceedence of ARARs chemical criteria
- COC were not detected

△ Known Release - The area, incident, process, and/or observed condition has been related to a Release. The Release may have been investigated, closed, received an NFA, require additional investigation, or may be subject to ongoing remedial action.

□ Previously unknown Release - The area, incident, process, and/or observed condition has not been related to a known Release, but has been identified as an environmental condition in historical documentation, previous Phase I/II reports, and/or during Site reconnaissance.

○ The associated environmental condition was not identified as a Release during supplemental Phase II investigation.

Notes:
- This table incorporates information and references from the following sources:
- Table 1 - Soil Boring and Groundwater Sample Summary and Rationale
- Table 10 - Investigation Results Summary

- Black and White copy or reproduction of this table will not display the intended color designations of boring icons.

Notes:

- Metals concentrations µg/kg
- Soil borings/temporary monitoring wells installed between July 25 to 27, 2007
- Metals analyzed by Method 6010B
- MDLs – Laboratory method detection limits
- J – indicates estimated value; analytical result between laboratory detection limit and laboratory reporting limit

None of the analyzed metals were detected at concentrations exceeding the respective West Virginia Department of Environmental Protection industrial land use target soil screening criteria provided in the West Virginia Voluntary Remediation and Redevelopment Act

CDM

Figure 6
Soil Metals Concentration Map
East Portion
Former Maytag Facility
Ranson, West Virginia

DRAWN:	DATE:	PROJECT NUMBER:
S. PHILLIPS	10-2-07	54578-59077
APPV'D: C. MICKEL	REVISED: 11-19-07	

APPENDIX A

APPLICABLE AND RELEVANT AND APPROPRIATE REQUIREMENTS

17301 W Colfax Avenue
Golden, CO 80401
tel: (303) 566-5400
fax: (303) 216.2418

October 31, 2007

Mr. Ira Star
IRG Assumptions, LLC
7991 Shaffer Parkway
Suite 100
Littleton, CO 80127

Subject: Summary of Compiled ARARs and TBC Requirements
Former Whirlpool/Maytag Sites

Dear Mr. Star:

This letter presents a summary of the compiled Applicable or Relevant and Appropriate Requirements (ARARs) and To-Be-Considered (TBC) requirements for the six (6) former Maytag facilities including Galesburg, Illinois; Herrin, Illinois; Newton, Iowa Plant 2; Newton, Iowa Plant 8; Ranson, West Virginia; and Searcy, Arkansas. The ARARs and TBC requirements have been established specific to each site and based on known and/or anticipated conditions that may be present at the site. In addition, chemical-specific groundwater and soil action level and/or cleanup standards have been compiled for the States that the former Magtag facilities reside.

Site-specific ARARs may be either "applicable" or "relevant and appropriate" to the site, but not both. "Applicable" requirements are those cleanup standards, standards of control and other substantive environmental protection requirements, criteria, or limitations, promulgated under federal, state or local law. These requirements specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a site. "Relevant and appropriate" requirements are those clean-up standards, standards of control or other substantive environmental protection requirements, criteria, or limitations promulgated under federal, state or local law which are not applicable to circumstances at a site, but do address problems or situations sufficiently similar to those encountered at the site.

TBC requirements are other federal, state and local criteria, advisories, guidance's or proposed standards that are not legally binding, but may provide useful information or recommended procedures. For example, TBC requirements may be used to set clean-up

levels where no ARARs exist for a particular scenario, or existing ARARs do not ensure protectiveness.

Site-Specific ARARs and TBC Requirements

The site-specific ARARs and TBC requirements have been divided into three categories including chemical-specific requirements, location-specific requirements and action-specific requirements. These requirements are described below:

- Chemical-Specific Requirements: Chemical-specific ARARs and TBCs are usually health- or risk-based requirements often expressed as numerical values that when applied to site-specific conditions, establish the acceptable amount of a chemical that may be encountered in or discharge to the ambient environment;

- Location-Specific Requirements: Location-specific ARARs and TBCs are requirements which place restrictions either on the concentration of hazardous substances or the conduct of activities solely because they are in specific locations (i.e., wetlands, flood plains, historic places, etc.); and

- Action-Specific Requirements: Action-specific ARARs and TBCs are usually technology- or activity-based requirements which are triggered by the particular remedial activities that are selected to accomplish a remedy (i.e., capping, incineration, air stripping, etc.).

These site-specific ARARs and TBC requirements are presented by site in the three categories described above in tabular format. A master list of the site-specific ARARs and TBC requirements cross-referenced to each site is presented in the table below.

Site	Potential Location-Specific ARARs	Potential Chemical- Specific ARARs	Potential Action-Specific ARARs
Galesburg, IL	Table 1-1	Table 1-2	Table 1-3
Herrin, IL	Table 2-1	Table 2-2	Table 2-3
Newton, IA Plant 2	Table 3-1	Table 3-2	Table 3-3
Newton, IA Plant 8	Table 4-1	Table 4-2	Table 4-3
Ranson, WV	Table 5-1	Table 5-2	Table 5-3
Searcy, AR	Table 6-1	Table 6-2	Table 6-3

The cross-referenced tables for the site-specific ARARs and TBC requirements are provided in **Appendix A**. The results of the ARARs and TBC requirements evaluation can be used to assist in establishing potential clean-up thresholds for each site as well as guide future field investigations or remedial activities, if necessary.

Chemical-Specific Action Level and/or Cleanup Criteria

Chemical-specific groundwater and soil action level and/or cleanup criteria have been compiled for the States that the former Magtag facilities reside. A summary of the

groundwater and soil action level and/or cleanup criteria is provided in **Appendix B, Table 7**. The various State reference tables and/or guidance materials used to compile **Table 7** are provided in **Appendix C**.

Should you have questions or require additional information, please contact me at 303.566.5400.

Sincerely,

CDM

Charles (Chip) Mickel, P.E.
Principal

cc: Ann Wei – IRG Assumptions, LLC
Nicole Christ – IRG Assumptions, LLC

APPENDIX A
SITE-SPECIFIC ARARs AND TBC REQUIREMENT TABLES

Table 1-1
Potential Location-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Galesburg, Illinois

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Within migratory bird habitat	United States Migratory Bird Treaty Act (16 USC § 703-712)	This law implements the treaties that the US has signed with a number of countries protecting birds that migrate across our national boarders. It makes illegal the taking, possessing or selling of protected species.	Not Applicable nor Relevant and Appropriate	Facility is not known to be within a wetland
Within floodplain	Executive Order 11988 Floodplain Management	Action to avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values; applies to action that may occur in a floodplain.	Not Applicable nor Relevant and Appropriate	The facility is not within the floodplain.
Within 200 feet of a fault displaced in Holocene time	40 CFR 264.18(a)	New treatment, storage, or disposal of hazardous waste prohibited; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed
Within 100-year floodplain	40 CFR 264.18(b)	Facility must be designed, constructed, operated, and maintained to avoid washout; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed
Within area where action may cause irreparable harm, loss or destruction of significant scientific, prehistorical, historical, or archaeological data.	Archeological and Historic Preservation Act (16 USC Section 469)	Requires for the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of federally licensed activity. Requires that action be taken to recover and preserve artifacts when alteration of terrain threatens significant scientific, prehistorical, historical, or archaeological data.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of historical interest.
Historic project owned or controlled by a federal agency	National Historical Preservation Act (16 USC Section 106); 36 CFR Part 800.	Requires action to preserve historic properties and planning of action to minimize harm to National Historic Landmarks.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of historical interest.
Critical habitat upon which endangered species or threatened species depends	Endangered Species Act (16 USC § 1531 - 1534)	Conserve to the extent practicable the various species of fish or wildlife and plants facing extinction. Provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.	Not Applicable nor Relevant and Appropriate	The facility is not known to contain habitats that potentially could support endangered or threatened species.
Waters of United States	Discharges of Dredged or Fill Material into Waters of United States (33 CFR Part 323)	Regulate discharges of dredged or fill material into waters of the United States. Prohibits discharge of dredged or fill material into waters of the United States without permit.	Relevant and Appropriate	Facility located nearby Cedar Creek
Wetlands	Executive Order 11990 Protection of Wetlands	For all activities in wetlands, action must be taken to minimize the destruction, loss or degradation of wetlands, and preserve and enhance wetlands, to the extent possible.	Not Applicable nor Relevant and Appropriate	Facility is not known to be within a wetland
Wetlands, floodplains, important farmlands, coastal zones, wild and scenic rivers, fish and wildlife, and endangered species.	Fish and Wildlife Coordination Act (40 CFR Part 6.302)	Requires Federal agencies conducting certain activities to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and adverse effects associated with direct and indirect development of a floodplain. All Federal activities in coastal areas be consistent with approved State Coastal Zone Management Programs, to the maximum extent possible. Establishes requirements applicable to water resource projects affecting wild, scenic or recreational rivers within the National Wild and Scenic Rivers system as well as rivers designated on the National Rivers Inventory to be studied for inclusion in the national system. Protection of the Nation's significant/important agricultural lands from irreversible conversion to uses which result in its loss as an environmental or essential food production resource.	Not Applicable nor Relevant and Appropriate	The facility is not within a Federal Wilderness area.

Table 1-1
Potential Location-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Galesburg, Illinois

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Wilderness Area	Wilderness Act (16 USC 1131 et seq.); 50 CFR 35.1 et seq.	Only actions allowed under the previsions of 16 USC Section 668 dd(c) may be undertaken in areas that are part of the National Wildlife Refuge System	Not Applicable nor Relevant and Appropriate	The facility has not within a Federal Wilderness Area
Wildlife Refuge	16 USC 668 dd et seq.; 50 CFR 27.	For activities that affect or may affect any of the rivers specified in Section 1271(a); must avoid taking or assisting in action that will have direct adverse effect on scenic river.	Not Applicable nor Relevant and Appropriate	The facility has not been designated as a National Wildlife Refuge.
Within area affecting national wild, scenic, or recreational river	Wild and Scenic Rivers Act (16 USC 1271 et seq.); Section 7(a)); 40 CFR 6.302(e).	For activities that affect or may affect any of the rivers specified in Section 1271(a); must avoid taking or assisting in action that will have direct adverse effect on scenic river.	Not Applicable nor Relevant and Appropriate	The facility is not near a national wild, scenic, or recreational river.
Classification and potential use of an aquifer	Guidelines for Ground Water Classification, EPA Groundwater Protection Strategy (USEPA, 1984; USEPA, 1986).	Consider federal aquifer classifications in the assessment of remedial response objectives.	To Be Considered	Groundwater is encountered between 3.5 and 8.5 feet bgs on the property. Therefore, property overlies potential drinking water aquifer.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
State				
Illinois Permits and General Provisions	35 IAC Subchapter A	Designation of Air Quality Control Regions (AQCRs)	To Be Considered	Potential emissions from proposed investigation activities may trigger AQCR designation/jurisdiction
Illinois Water Quality Standards	35 IAC Part 302	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Illinois groundwater
Tiered Approach to Corrective Action Objectives (TACO) - State	35 IAC Part 742	Sets forth procedures for evaluating the risk to human health posed by environmental conditions and developing remediation objectives that achieve acceptable risk levels	Applicable	Initial efforts indicate the presence of contaminants at levels above the tiered approach to TACO. Applicable to proposed supplemental Phase II Investigations - advance investigative soil borings and drilling/ installation of monitoring wells.
Illinois Groundwater Quality Standards	35 IAC Part 620	Standards apply to groundwater quality. Sets standards for inorganic, organic/ complex organic chemical constituents, pH, Beta Particle and Photon Radioactivity. Protective of human health and the environment.	Applicable	Applicable to supplemental Phase II Investigations groundwater quality monitoring

Table 1-2
Potential Chemical-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Galesburg, Illinois

Health/Risk Criteria	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Air				
Release or discharge of emissions to the atmosphere	Clean Air Act (42 USC § 7401) - including National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) and National Emissions Standards for Hazardous Air Pollutants (NESHAPS) (40 CFR Part 61).	Regulates air emissions from area, stationary, and mobile sources.	Applicable	Potential VOC emissions from proposed investigation activities like advancing borings and drilling /installing groundwater monitoring wells
State of Illinois Air Pollution Control Board Air Quality standards and Episodes	Illinois Air Quality Standards (35 IAC Part 243)	Sets air pollution level standards and measurement methods for PM-10, Particulates (Repealed), Sulfur Oxides (Sulfur Dioxide), Carbon Monoxide, Nitrogen Dioxide, Ozone, and Lead.	Not Applicable nor Relevant and Appropriate	Such environmental concerns are not identified in as part of the initial efforts nor in the proposed supplemental Phase II investigations program
Toxic Substances Control Act (TSCA) Toxic Substances Control Act	15 USC § 2601-2692 Section 6	Control of toxic substances, asbestos hazard emergency response, Indoor radon abatement, Lead exposure reduction. Asbestos, CFCs, aerosol propellants, hexavalent chromium, PCBs.	Not applicable but relevant and appropriate	Not applicable but may be appropriate if toxic substances identified on-site
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
Surface Water				
Clean Water Act - including Water Quality Criteria and National Pollution Discharge Elimination System (NPDES)	33 USC § 1387 - including 40 CFR Part 13140 CFR Part122	Set water quality standards for all contaminants in surface waters	Relevant and Appropriate	Surface water (Cedar Creek) identified nearby facility
Safe Drinking Water Act - including National Primary Drinking Water Standards, National Secondary Drinking Water Standards, and Maximum Contaminant Level Goals	42 USC § 300 - including 40 CFR Part 141, 40 CFR Part 143, and 40 CFR Parts 141.50,141.51, and 141.52	Protect the quality of all waters in the U.S. that are actually or potentially designed for drinking use, whether from above ground or underground sources. Set MCLGs for organic, inorganic, and microbiological contaminants.	Relevant and Appropriate	Initial efforts indicate the existence of highly impacted soil at locations in the approximate groundwater flow direction which again is towards Cedar Creek . It is probable that surface and sub-surface soil contaminants reach the groundwater depth due to rainfall.
State of Illinois Water Pollution Control Board - Illinois Water Quality Standards	35 IAC Part 302	General Use standards to protect the State's water for aquatic life, wildlife, agricultural use, secondary contact use and most industrial uses and ensure the aesthetic quality of the State's aquatic environment	Relevant and Appropriate	Surface water (Cedar Creek) identified nearby facility
Illinois EPA requirements of contaminant discharges to waters of the State	Monitoring and Reporting Requirements 35 IAC Part 305	Protective of human health and the environment. Prescribes requirements for monitoring, reporting and measuring contaminant discharges.	Relevant and Appropriate	Surface water (Cedar Creek) identified nearby facility
Soil				
TCLP Maximum regulatory levels -State	Identification and Listing of Hazardous Waste (35 IAC Part 721)	Identifies and sets maximum regulatory levels of contaminants for toxicity characteristic - Solid waste	Applicable	Applicable to proposed supplemental Phase II Investigations - laboratory soil testing- TCLP
Tiered Approach to Corrective Action Objectives (TACO) - State	35 IAC Part 742	Sets forth procedures for evaluating the risk to human health posed by environmental conditions and developing remediation objectives that achieve acceptable risk levels	Applicable	Initial efforts indicate the presence of contaminants at levels above the tiered approach to TACO. Applicable to proposed supplemental Phase II Investigations - advance investigative soil borings and drilling/ installation of monitoring wells.
RCRA regulations: TCLP Maximum regulatory levels	Resource Conservation and Recovery Act (42 USC § 321) - including Identification and Listing of Hazardous Wastes (40 CFR Part 261)	Addresses the generation, transportation, treatment, storage, and disposal of hazardous waste including environmental problems that could result from USTs storing petroleum and other hazardous substances. Identification of solid wastes which are subject to regulation as hazardous wastes. Maximum Concentration of Contaminants for the Toxicity Characteristic.	Applicable	Applicable to proposed supplemental Phase II Investigations - advance investigative soil borings and drilling/ installation of monitoring wells.

Table 1-2
Potential Chemical-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Galesburg, Illinois

Health/Risk Criteria	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Groundwater				
Illinois Groundwater Quality Standards	35 IAC Part 620	Standards apply to groundwater quality. Sets standards for inorganic, organic/ complex organic chemical constituents, pH, Beta Particle and Photon Radioactivity. Protective of human health and the environment.	Applicable	Applicable to supplemental Phase II Investigations groundwater quality monitoring
Illinois Primary Drinking Water Standards	35 IAC Part 611	Maximum contaminant levels that satisfy the requirements of USEPA Safe Drinking Water Act. Also, included are additional, related State requirements that are consistent with and more stringent than USEPA regulations that apply to community water systems.	To Be Considered	No known drinking water sources on site
Safe Drinking Water Act including National Primary Drinking Water Standards,, National Secondary Drinking Water Standards, and Maximum Contaminant Level Goals	42 USC § 300 - including 40 CFR Part 141, 40 CFR Part 143, and 40 CFR Parts 141.50, 141.51, and 141.52	Protect the quality of all waters in the U.S. that are actually or potentially designed for drinking use, whether from above ground or underground sources. Set MCLGs for organic, inorganic, and microbiological contaminants.	To Be Considered	No known drinking water sources on site
Tiered Approach to Corrective Action Objectives (TACO): State	35 IAC Part 742	Sets forth procedures for evaluating the risk to human health posed by environmental conditions and developing remediation objectives that achieve acceptable risk levels	Applicable	Applicable to proposed Phase II Investigations - advance investigative soil borings collecting groundwater samples and drilling/ installation of monitoring wells.
Illinois Water Quality Standards	35 IAC Part 302	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Illinois groundwater
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
Other				
Residential lead-based paint (LBP) regulations	40 CFR 745	Federal approval of State residential lead-based paint management requirements	Relevant and Appropriate	Not applicable (residential) but may be appropriate if LBP identified on-site
Sewer Discharge Criteria	35 IAC Part 307	Standards for the discharge of contaminants to sewer systems - to publicly owned treatment works (POTWs) and to dischargers to other types of treatment works. Standards for the discharge of contaminants from certain industrial source categories into POTWs.	Not Applicable nor Relevant and Appropriate	No discharges to POTWs identified in initial efforts

Table 1-3
Potential Action-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Galesburg, Illinois

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Institutional Controls	EPA Memorandum entitled "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups," September 29, 2000.	Certain institutional controls may be required under a land use control (LUC) scenario.	To Be Considered	This is a guidance document.
Remediation Waste Management	EPA Memorandum entitled "Management of Remediation Waste Under RCRA," 14 October 1998	Provides a summary of guidance on RCRA regulations and policies regarding the management of remediation wastes	To Be Considered	This is a guidance document.
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 272.800 et. seq.	Approved State Hazardous Waste Management Programs	Not applicable or relevant and appropriate	Reserved CFR - No Approved Iowa State Hazardous Waste Management Program
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 282.65	Approved Underground Storage Tank Programs - State Programs	To Be Considered	Facility may have existing USTs
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 147.800 et. seq.	State Underground Injection Control Programs	To Be Considered	May be applicable as treatment alternative
Hazardous Materials Transportation Act	49 USC § 1801-1813	Regulates transportation of hazardous materials including mining wastes that are not exempt under the Bevill Amendment.	Applicable	Applies to removal of excavated materials from drilling investigative activities
Standards Applicable to Transport of Hazardous Materials	49 CFR Parts 10, 171 through 177	Regulates transportation of hazardous materials including mining wastes that are not exempt under the Bevill Amendment.	Applicable	Applies to removal of excavated materials from drilling investigative activities
Resource Conservation and Recovery Act Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR Part 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment and, thereby, constitute prohibited open dumps.	Not Applicable nor Relevant and Appropriate	Phase II investigation actions do not include storing solid waste
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Establishes standards which apply to persons transporting hazardous waste within the United States if the transportation requires a manifest under 40 CFR Part 262.	Applicable	Applies to transporters of excavated materials from drilling activities
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Establishes minimum national standards, which define the acceptable management of hazardous waste for owners and operators of facilities, which treat, store, or dispose of hazardous waste.	Not Applicable nor Relevant and Appropriate	Supplemental Phase II investigation actions do not include treatment and storage of hazardous waste.
Clean Water Act National Pollutant Discharge Elimination System	33 USC § 1342 40 CFR Part 122	Requires permits for the discharge of pollutants from any point source into waters of the United States (Big Creek).	To Be Considered	Surface water (Cedar Creek) identified nearby facility
Solid Waste Disposal Act	42 USC § 6941	Provides regulations of hazardous waste and authorizes environmental agencies to order the cleanup of contaminated sites. It also includes extensive regulation of underground storage tanks and the cleanup of contamination caused by leaking tanks. In addition, the Act addresses the environmental problems associated with nonhazardous solid waste and encourages states to develop solid waste management programs, regulate solid waste landfills and eliminate open dumps	Relevant and Appropriate	Relevant to removal of excavated materials from investigative activities
Surface Mining Control and Reclamation Act	30 USC § 1201 through 1326 30 CFR Part 816; 30 CFR Part 784	Protects the environment from effects of surface coal mining operations.	Not Applicable nor Relevant and Appropriate	Supplemental Phase II investigation does not anticipate to conduct coal mining operations.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document

Table 1-3
Potential Action-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Galesburg, Illinois

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
State				
Illinois Water Quality Standards	35 IAC Part 302	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Illinois groundwater
Tiered Approach to Corrective Action Objectives (TACO) - State	35 IAC Part 742	Sets forth procedures for evaluating the risk to human health posed by environmental conditions and developing remediation objectives that achieve acceptable risk levels	Applicable	Initial efforts indicate the presence of contaminants at levels above the tiered approach to TACO. Applicable to proposed supplemental Phase II Investigations - advance investigative soil borings and drilling/ installation of monitoring wells.
Illinois Groundwater Quality Standards	35 IAC Part 620	Standards apply to groundwater quality. Sets standards for inorganic, organic/ complex organic chemical constituents, pH, Beta Particle and Photon Radioactivity. Protective of human health and the environment.	Applicable	Applicable to supplemental Phase II Investigations groundwater quality monitoring

Table 2-1
Potential Location-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Herrin, Illinois

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Migratory bird habitat	United States Migratory Bird Treaty Act (16 USC § 703-712)	This law implements the treaties that the US has signed with a number of countries protecting birds that migrate across our national boarders. It makes illegal the taking, possessing or selling of protected species.	Not Applicable nor Relevant and Appropriate	Facility is not located in wetlands.
Within floodplain	Executive Order 11988 Floodplain Management	Action to avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values; applies to action that may occur in a floodplain.	Not Applicable nor Relevant and Appropriate	The facility is not within the floodplain.
Within 200 feet of a fault displaced in Holocene time	40 CFR 264.18(a)	New treatment, storage, or disposal of hazardous waste prohibited; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed
Within 100-year floodplain	40 CFR 264.18(b)	Facility must be designed, constructed, operated, and maintained to avoid washout; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	Facility is not known to be located in a 100-year floodplain. RCRA facility is not being constructed.
Within area where action may cause irreparable harm, loss or destruction of significant scientific, prehistorical, historical, or archaeological data.	Archeological and Historic Preservation Act (16 USC Section 469)	Requires for the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of federally licensed activity. Requires that action be taken to recover and preserve artifacts when alteration of terrain threatens significant scientific, prehistorical, historical, or archaeological data.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of scientific, archeological, prehistorical, and historical interest.
Historic project owned or controlled by a federal agency	National Historical Preservation Act (16 USC Section 106); 36 CFR Part 800.	Requires action to preserve historic properties and planning of action to minimize harm to National Historic Landmarks.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of scientific, archeological, prehistorical, and historical interest.
Critical habitat upon which endangered species or threatened species depends	Endangered Species Act (16 USC § 1531 - 1534)	Conserve to the extent practicable the various species of fish or wildlife and plants facing extinction. Provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.	Not Applicable nor Relevant and Appropriate	The facility is not known to include habitats that potentially could support endangered species.
Waters of United States	Discharges of Dredged or Fill Material into Waters of United States (33 CFR Part 323)	Regulate discharges of dredged or fill material into waters of the United States. Prohibits discharge of dredged or fill material into waters of the United States without permit.	Not Applicable nor Relevant and Appropriate	Facility is not known to include surface waters. However, fill materials were encountered at borehole locations and underneath building and parking areas.
Wetlands	Executive Order 11990 Protection of Wetlands	For all activities in wetlands, action must be taken to minimize the destruction, loss or degradation of wetlands, and preserve and enhance wetlands, to the extent possible.	Not Applicable nor Relevant and Appropriate	Facility is not known to include any wetland area.
Wetlands, floodplains, important farmlands, coastal zones, wild and scenic rivers, fish and wildlife, and endangered species.	Fish and Wildlife Coordination Act (40 CFR Part 6.302)	Requires Federal agencies conducting certain activities to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and adverse effects associated with direct and indirect development of a floodplain. All Federal activities in coastal areas be consistent with approved State Coastal Zone Management Programs, to the maximum extent possible. Establishes requirements applicable to water resource projects affecting wild, scenic or recreational rivers within the National Wild and Scenic Rivers system as well as rivers designated on the National Rivers Inventory to be studied for inclusion in the national system. Protection of the Nation's significant/important agricultural lands from irreversible conversion to uses which result in its loss as an environmental or essential food production resource.	Not Applicable nor Relevant and Appropriate	The facility is not within a Federal Wilderness area.

Table 2-1
Potential Location-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Herrin, Illinois

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Wilderness Area	Wilderness Act (16 USC 1131 et seq.); 50 CFR 35.1 et seq.	Only actions allowed under the previsions of 16 USC Section 668 dd(c) may be undertaken in areas that are part of the National Wildlife Refuge System	Not Applicable nor Relevant and Appropriate	The facility has not within a Federal Wilderness Area
Wildlife Refuge	16 USC 668 dd et seq.; 50 CFR 27.	For activities that affect or may affect any of the rivers specified in Section 1271(a); must avoid taking or assisting in action that will have direct adverse effect on scenic river.	Not Applicable nor Relevant and Appropriate	The facility has not been designated as a National Wildlife Refuge.
Within area affecting national wild, scenic, or recreational river	Wild and Scenic Rivers Act (16 USC 1271 et seq.); Section 7(a)); 40 CFR 6.302(e).	For activities that affect or may affect any of the rivers specified in Section 1271(a); must avoid taking or assisting in action that will have direct adverse effect on scenic river.	Not Applicable nor Relevant and Appropriate	The facility is not near a national wild, scenic, or recreational river.
Classification and potential use of an aquifer	Guidelines for Ground Water Classification, EPA Groundwater Protection Strategy (USEPA, 1984; USEPA, 1986).	Consider federal aquifer classifications in the assessment of remedial response objectives.	Relevant and Appropriate	Groundwater is encountered at numerous borings throughout the site (6 to 20 feet bgs). Property overlies potential drinking water aquifer.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
State				
Illinois Groundwater Quality Standards	35 IAC Part 620	Standards apply to groundwater quality. Sets standards for inorganic, organic/ complex organic chemical constituents, pH, Beta Particle and Photon Radioactivity. Protective of human health and the environment.	Applicable	Applicable to supplemental Phase II Investigations groundwater quality monitoring
Tiered Approach to Corrective Action Objectives (TACO): State	35 IAC Part 742	Sets forth procedures for evaluating the risk to human health posed by environmental conditions and developing remediation objectives that achieve acceptable risk levels	Applicable	Applicable to proposed Phase II Investigations - advance investigative soil borings collecting groundwater samples and drilling/ installation of monitoring wells.
Illinois Water Quality Standards	35 IAC Part 302	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Illinois groundwater
Illinois Permits and General Provisions	35 IAC Subchapter A	Designation of Air Quality Control Regions (AQCRs)	To Be Considered	Potential emissions from proposed investigation activities may trigger AQCR designation/jurisdiction

Table 2-2
Potential Chemical-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Herrin, Illinois

Health/Risk Criteria	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Air				
Release or discharge of emissions to the atmosphere	Clean Air Act (42 USC § 7401) - including National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) and National Emissions Standards for Hazardous Air Pollutants (NESHAPS) (40 CFR Part 61).	Regulates air emissions from area, stationary, and mobile sources.	Applicable	Potential methylene chloride and/or acetone emissions from proposed investigative activities.
State of Illinois Air Pollution Control Board Air Quality standards and Episodes	Illinois Air Quality Standards (35 IAC Part 243)	Sets air pollution level standards and measurement methods for PM-10, Particulates (Repealed), Sulfur Oxides (Sulfur Dioxide), Carbon Monoxide, Nitrogen Dioxide, Ozone, and Lead.	Not Applicable nor Relevant and Appropriate	Such environmental concerns are not identified in as part of the initial efforts nor in the proposed supplemental Phase II investigations program
Toxic Substances Control Act (TSCA) Toxic Substances Control Act	15 USC § 2601-2692 Section 6	Control of toxic substances, asbestos hazard emergency response, Indoor radon abatement, Lead exposure reduction. Asbestos, CFCs, aerosol propellants, hexavalent chromium, PCBs.	Not applicable but relevant and appropriate	Not applicable but may be appropriate if toxic substances identified on-site
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
Surface Water				
Clean Water Act - including Water Quality Criteria and National Pollution Discharge Elimination System (NPDES)	33 USC § 1387 - including 40 CFR Part 13140 CFR Part122	Set water quality standards for all contaminants in surface waters	To Be Considered	No surface waters identified on property or nearby facility
Safe Drinking Water Act - including National Primary Drinking Water Standards, National Secondary Drinking Water Standards, and Maximum Contaminant Level Goals	42 USC § 300 - including 40 CFR Part 141, 40 CFR Part 143, and 40 CFR Parts 141.50,141.51, and 141.52	Protect the quality of all waters in the U.S. that are actually or potentially designed for drinking use, whether from above ground or underground sources. Set MCLGs for organic, inorganic, and microbiological contaminants.	Relevant and Appropriate	Initial efforts indicate the existence of impacted soil on site. It is probable that surface and sub-surface soil contaminants reach the groundwater depth due to rainfall.
State of Illinois Water Pollution Control Board - Illinois Water Quality Standards	35 IAC Part 302	General Use standards to protect the State's water for aquatic life, wildlife, agricultural use, secondary contact use and most industrial uses and ensure the aesthetic quality of the State's aquatic environment	To Be Considered	No surface waters identified on property or nearby facility
Illinois EPA requirements of contaminant discharges to waters of the State	Monitoring and Reporting Requirements 35 IAC Part 305	Protective of human health and the environment. Prescribes requirements for monitoring, reporting and measuring contaminant discharges.	To Be Considered	No surface waters identified on property or nearby facility
Soil				
TCLP Maximum regulatory levels -State	Identification and Listing of Hazardous Waste (35 IAC Part 721)	Identifies and sets maximum regulatory levels of contaminants for toxicity characteristic - Solid waste	Applicable	Applicable to proposed supplemental Phase II Investigations - laboratory soil testing-TCLP
Tiered Approach to Corrective Action Objectives (TACO): State	35 IAC Part 742	Sets forth procedures for evaluating the risk to human health posed by environmental conditions and developing remediation objectives that achieve acceptable risk levels	Applicable	Initial efforts indicate the presence of contaminants at levels above the tiered approach to TACO. Applicable to proposed supplemental Phase II Investigative activities
RCRA regulations: TCLP Maximum regulatory levels	Resource Conservation and Recovery Act (42 USC § 321) - including Identification and Listing of Hazardous Wastes (40 CFR Part 261)	Addresses the generation, transportation, treatment, storage, and disposal of hazardous waste including environmental problems that could result from USTs storing petroleum and other hazardous substances. Identification of solid wastes which are subject to regulation as hazardous wastes. Maximum Concentration of Contaminants for the Toxicity Characteristic.	Applicable	Applicable to proposed supplemental Phase II Investigative activities

Table 2-2
Potential Chemical-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Herrin, Illinois

Health/Risk Criteria	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Groundwater				
Illinois Groundwater Quality Standards	35 IAC Part 620	Standards apply to groundwater quality. Sets standards for inorganic, organic/ complex organic chemical constituents, pH, Beta Particle and Photon Radioactivity. Protective of human health and the environment.	Applicable	Applicable to supplemental Phase II Investigations groundwater quality monitoring
Illinois Primary Drinking Water Standards	35 IAC Part 611	Maximum contaminant levels that satisfy the requirements of USEPA Safe Drinking Water Act. Also, included are additional, related State requirements that are consistent with and more stringent than USEPA regulations that apply to community water systems.	To Be Considered	No known drinking water sources on site
Safe Drinking Water Act including National Primary Drinking Water Standards,, National Secondary Drinking Water Standards, and Maximum Contaminant Level Goals	42 USC § 300 - including 40 CFR Part 141, 40 CFR Part 143, and 40 CFR Parts 141.50, 141.51, and 141.52	Protect the quality of all waters in the U.S. that are actually or potentially designed for drinking use, whether from above ground or underground sources. Set MCLGs for organic, inorganic, and microbiological contaminants.	To Be Considered	No known drinking water sources on site
Tiered Approach to Corrective Action Objectives (TACO): State	35 IAC Part 742	Sets forth procedures for evaluating the risk to human health posed by environmental conditions and developing remediation objectives that achieve acceptable risk levels	Applicable	Applicable to proposed Phase II Investigations - advance investigative soil borings collecting groundwater samples and drilling/ installation of monitoring wells.
Illinois Water Quality Standards	35 IAC Part 302	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Illinois groundwater
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
Other				
Residential lead-based paint (LBP) regulations	40 CFR 745	Federal approval of State residential lead-based paint management requirements	Relevant and Appropriate	Not applicable (residential) but may be appropriate if LBP identified on-site
Sewer Discharge Criteria	35 IAC Part 307	Standards for the discharge of contaminants to sewer systems - to publicly owned treatment works (POTWs) and to dischargers to other types of treatment works. Standards for the discharge of contaminants from certain industrial source categories into POTWs.	Not Applicable nor Relevant and Appropriate	No discharges to POTWs identified in initial efforts

Table 2-3

Potential Action-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Herrin, Illinois

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Institutional Controls	EPA Memorandum entitled "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups," September 29, 2000.	Certain institutional controls may be required under a land use control (LUC) scenario.	To Be Considered	This is a guidance document.
Remediation Waste Management	EPA Memorandum entitled "Management of Remediation Waste Under RCRA," 14 October 1998	Provides a summary of guidance on RCRA regulations and policies regarding the management of remediation wastes	To Be Considered	This is a guidance document.
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 282.65	Approved Underground Storage Tank Programs - State Programs	To Be Considered	Facility may have existing USTs
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 147.800 et. seq.	State Underground Injection Control Programs	To Be Considered	May be applicable as treatment alternative
Hazardous Materials Transportation Act	49 USC § 1801-1813	Regulates transportation of hazardous materials including mining wastes that are not exempt under the Bevill Amendment.	Applicable	Applies to removal of excavated materials from drilling activities i.e. advancing investigative borings and installation of monitoring wells
Standards Applicable to Transport of Hazardous Materials	49 CFR Parts 10, 171 through 177	Regulates transportation of hazardous materials including mining wastes that are not exempt under the Bevill Amendment.	Applicable	Applies to removal of excavated materials from drilling activities i.e. advancing investigative borings and installation of monitoring wells
Resource Conservation and Recovery Act Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR Part 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment and, thereby, constitute prohibited open dumps.	Not Applicable nor Relevant and Appropriate	Phase II investigation actions do not include storing solid waste
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Establishes standards which apply to persons transporting hazardous waste within the United States if the transportation requires a manifest under 40 CFR Part 262.	Applicable	Applies to transporters of excavated materials from drilling activities
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Establishes minimum national standards, which define the acceptable management of hazardous waste for owners and operators of facilities, which treat, store, or dispose of hazardous waste.	Not Applicable nor Relevant and Appropriate	Supplemental Phase II investigation actions do not include treatment and storage of hazardous waste.
Clean Water Act National Pollutant Discharge Elimination System	33 USC § 1342 40 CFR Part 122	Requires permits for the discharge of pollutants from any point source into waters of the United States (Big Creek).	Not Applicable nor Relevant and Appropriate	Surface water not identified nearby facility
Solid Waste Disposal Act	42 USC § 6941	Provides regulations of hazardous waste and authorizes environmental agencies to order the cleanup of contaminated sites. It also includes extensive regulation of underground storage tanks and the cleanup of contamination caused by leaking tanks. In addition, the Act addresses the environmental problems associated with nonhazardous solid waste and encourages states to develop solid waste management programs, regulate solid waste landfills and eliminate open dumps	Relevant and Appropriate	Relevant to removal of excavated materials from investigative activities
Surface Mining Control and Reclamation Act	30 USC § 1201 through 1326 30 CFR Part 816; 30 CFR Part 784	Protects the environment from effects of surface coal mining operations.	Not Applicable nor Relevant and Appropriate	Supplemental Phase II investigation does not anticipate to conduct coal mining operations.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document

Table 2-3

Potential Action-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Herrin, Illinois

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
State				
Illinois Groundwater Quality Standards	35 IAC Part 620	Standards apply to groundwater quality. Sets standards for inorganic, organic/ complex organic chemical constituents, pH, Beta Particle and Photon Radioactivity. Protective of human health and the environment.	Applicable	Applicable to supplemental Phase II Investigations groundwater quality monitoring
Tiered Approach to Corrective Action Objectives (TACO): State	35 IAC Part 742	Sets forth procedures for evaluating the risk to human health posed by environmental conditions and developing remediation objectives that achieve acceptable risk levels	Applicable	Applicable to proposed Phase II Investigations - advance investigative soil borings collecting groundwater samples and drilling/ installation of monitoring wells.
Illinois Water Quality Standards	35 IAC Part 302	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Illinois groundwater

Table 3-1
Potential Location-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant #2
Newton, Iowa

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Within 200 feet of a fault displaced in Holocene time	40 CFR 264.18(a).	New treatment, storage, or disposal of hazardous waste prohibited; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed.
Within 100-year floodplain	40 CFR 264.18(b).	Facility must be designed, constructed, operated, and maintained to avoid washout; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed.
Within floodplain	Protection of Floodplains (40 CFR 6, Appendix A); Fish and Wildlife Coordination Act (16 USC 661 et seq.); 40 CFR 6.302; Floodplains Executive Order (EO 11988).	Action to avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values; applies to action that will occur in a floodplain.	Not Applicable nor Relevant and Appropriate	The facility is not within the floodplain.
Within area where action may cause irreparable harm, loss or destruction of significant artifacts	National Historical Preservation Act (16 USC Section 469); 36 CFR Part 65.	Requires that action be taken to recover and preserve artifacts when alteration of terrain threatens significant scientific, prehistorical, historical, or archaeological data.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of historical interest.
Historic project owned or controlled by a federal agency	National Historical Preservation Act (16 USC Section 106); 36 CFR Part 800.	Requires action to preserve historic properties and planning of action to minimize harm to National Historic Landmarks.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of historical interest.
Critical habitat upon which endangered species or threatened species depends	Endangered Species Act of 1973 (16 USC 1531 et seq.); 50 CFR Part 200, 50 CFR Part 402; Fish and Wildlife Coordination Act (16 USC 661 et seq.); 33 CFR Parts 320-330.	If endangered or threatened species are present, action must be taken to conserve endangered or threatened species, including consultation with the Department of Interior.	Not Applicable nor Relevant and Appropriate	The facility is not known to contain habitats that potentially could support endangered or threatened species.
Wetlands	Clean Water Act Section 404; 40 CFR Part 230, 33 CFR Parts 320-330.	For wetlands as defined by U.S. Army Corps of Engineers regulations, must take action to prohibit discharge of dredged or fill material into wetlands without permit.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any wetland areas.
Wetlands	40 CFR Part 6, Appendix A.	For action involving construction of facilities or management of property in wetlands, action must be taken to avoid adverse effects, minimize potential harm, and preserve and enhance wetlands, to the extent possible.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any wetland areas.
Wilderness area	Wilderness Act (16 USC 1131 et seq.); 50 CFR 35.1 et seq.	For federally-owned area designated as wilderness area, the area must be administered in such manner as will leave it unimpaired as wilderness and to preserve the wilderness.	Not Applicable nor Relevant and Appropriate	The facility is not within a Federal Wilderness area.
Wildlife refuge	16 USC 668 dd et seq.; 50 CFR 27.	Only actions allowed under the previsions of 16 USC Section 668 dd(c) may be undertaken in areas that are part of the National Wildlife Refuge System	Not Applicable nor Relevant and Appropriate	The facility has not been designated as a National Wildlife Refuge.
Within area affecting national wild, scenic, or recreational river	Wild and Scenic Rivers Act (16 USC 1271 et seq.); Section 7(a)); 40 CFR 6.302(e).	For activities that affect or may affect any of the rivers specified in Section 1271(a); must avoid taking or assisting in action that will have direct adverse effect on scenic river.	Not Applicable nor Relevant and Appropriate	The facility is not near a national wild, scenic, or recreational river.
Classification and potential use of an aquifer	Guidelines for Ground Water Classification, EPA Groundwater Protection Strategy (USEPA, 1984; USEPA, 1986).	Consider federal aquifer classifications in the assessment of remedial response objectives.	Not Applicable nor Relevant and Appropriate	The facility is not known to overlie a drinking water aquifer.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document

Table 3-1
Potential Location-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant #2
Newton, Iowa

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
State				
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 133 - Rules for Determining Cleanup Actions and Responsible Parties	Determination of PRPs and Remedial Approaches	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 137 - Iowa Land Recycling Program (LRP)	Criteria for voluntary assessment and implementation of contaminated site remedial measures	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa
Iowa Department of Natural Resources - Surface and Groundwater Regulations	Iowa Administrative Code 567 - Chapter 61 - Water Quality Standards	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Iowa groundwater

Table 3-2

Potential Chemical-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant #2
Newton, Iowa

Health/Risk Criteria	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Air				
Release or discharge of emissions to the atmosphere	Clean Air Act (CAA) Amendments of 1990 (and other CAA regulations).	Regulation of uncontrolled emissions to the atmosphere from stationary sources.	To Be Considered	Potential emissions from proposed investigation activities may fall under CAA jurisdiction
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 81.260	Designation of Air Quality Control Regions (AQCRs)	To Be Considered	Potential emissions from proposed investigation activities may trigger AQCR designation/jurisdiction
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 81.316	Attainment status designations	To Be Considered	Potential emissions from proposed investigation activities may affect attainment status designation
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 52.820 et. seq.	Approval and Promulgation of CAA Implementation Plans	To Be Considered	Potential emissions from proposed investigation activities may fall under CAA jurisdiction
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 62.3840 et. seq.	Approval and Promulgation of State Plans for Designated Facilities and Pollutants	Not Applicable nor Relevant and Appropriate	Facility not a Designated Facility; No identified Designated Pollutants discharged from Site
Iowa Department of Natural Resources	Iowa Administrative Code 567 - Chapters 20-34 - Rules for Air Quality	Standards apply to air emissions in State of Iowa	To Be Considered	Potential emissions from proposed investigation activities may fall under IDNR
Toxic Substances Control Act (TSCA) Toxic Substances Control Act	15 USC § 2601-2692 Section 6	Control of toxic substances, asbestos hazard emergency response, Indoor radon abatement, Lead exposure reduction. Asbestos, CFCs, aerosol propellants, hexavalent chromium, PCBs.	Relevant and Appropriate	Initial investigations identified transformer on-site. Proposed investigations include evaluation for potential presence of PCB
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
Surface Water				
EPA Region 7 Ecological Screening Value, Freshwater	USEPA, Region 7 Ecological Screening Value, Freshwater Surface Water Screening Value	Risk-based screening concentrations for surface water.	Not Applicable nor Relevant and Appropriate	No identified surface water on or near vicinity of site.
National Recommended Water Quality Criteria	USEPA, National Recommended Water Quality Criteria -CCC, Freshwater 40 CFR 131, November 2002.	Standards apply to surface water bodies. Protective of human health and the environment.	Not Applicable nor Relevant and Appropriate	No identified surface water on or near vicinity of site.
Iowa Department of Natural Resources	Iowa Administrative Code 567 - Chapter 61 - Water Quality Standards	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Not Applicable nor Relevant and Appropriate	No identified surface water on or near vicinity of site.
Soil				
EPA Region 7 Preliminary Remediation Goals	EPA Region 7, Preliminary Remediation Goals, PRG Table and Background Information.	Risk-based screening concentrations for soils.	Applicable	May be applicable for use as preliminary site Soil Screening Level criteria
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 133 - Rules for Determining Cleanup Actions and Responsible Parties	Determination of PRPs and Remedial Approaches	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 137 - Iowa Land Recycling Program (LRP)	Criteria for voluntary assessment and implementation of contaminated site remedial measures	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa

Table 3-2

Potential Chemical-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant #2
Newton, Iowa

Health/Risk Criteria	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Groundwater				
Federal Primary and Secondary MCLs	USEPA, Drinking Water Section, National Primary Drinking Water Standards, July 2002.	Maximum contaminant levels apply to community water systems and non-transient non-community water systems for communities of 10,000 or greater.	To Be Considered	No known drinking water sources on site. Superseded by Chapter 62-520, FAC.
EPA Region 7 Preliminary Remediation Goals	USEPA, Region 7 Preliminary Remediation Goals, PRG Table and Background Information	Risk-based screening concentrations for groundwater.	Not Applicable nor Relevant and Appropriate	Not applicable because they are guidance values; Iowa has developed State standards
Iowa Department of Natural Resources - Surface and Groundwater Regulations	Iowa Administrative Code 567 - Chapter 61 - Water Quality Standards	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Iowa groundwater
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
Other				
Residential lead-based paint (LBP) regulations	40 CFR 745	Federal approval of State residential lead-based paint management requirements	Relevant and Appropriate	Not applicable (residential) but may be appropriate if LBP identified on-site

Table 3-3
Potential Action-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant #2
Newton, Iowa

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Institutional Controls	EPA Memorandum entitled "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups," September 29, 2000.	Certain institutional controls may be required under a land use control (LUC) scenario.	To Be Considered	This is a guidance document.
Remediation Waste Management	EPA Memorandum entitled "Management of Remediation Waste Under RCRA," 14 October 1998	Provides a summary of guidance on RCRA regulations and policies regarding the management of remediation wastes	To Be Considered	This is a guidance document.
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 272.800 et. seq.	Approved State Hazardous Waste Management Programs	Not applicable or relevant and appropriate	Reserved CFR - No Approved Iowa State Hazardous Waste Management Program
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 282.65	Approved Underground Storage Tank Programs - State Programs	Applicable	Facility has 8 known USTs that have been removed from the property
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 147.800 et. seq.	State Underground Injection Control Programs	To Be Considered	May be applicable as treatment alternative
Hazardous Materials Transportation Act	49 USC § 1801-1813	Regulates transportation of hazardous materials including mining wastes that are not exempt under the Bevill Amendment.	Applicable	Applies to removal of excavated materials from investigative activities
Standards Applicable to Transport of Hazardous Materials	49 CFR Parts 10, 171 through 177	Regulates transportation of hazardous materials including mining wastes that are not exempt under the Bevill Amendment.	Applicable	Applies to removal of excavated materials from investigative activities
Resource Conservation and Recovery Act Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR Part 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment and, thereby, constitute prohibited open dumps.	Not Applicable nor Relevant and Appropriate	Phase II investigation actions do not include storing solid waste
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Establishes standards which apply to persons transporting hazardous waste within the United States if the transportation requires a manifest under 40 CFR Part 262.	Applicable	Applies to transporters of excavated materials from drilling activities
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Establishes minimum national standards, which define the acceptable management of hazardous waste for owners and operators of facilities, which treat, store, or dispose of hazardous waste.	Not Applicable nor Relevant and Appropriate	Supplemental Phase II investigation actions do not include treatment and storage of hazardous waste.
Clean Water Act National Pollutant Discharge Elimination System	33 USC § 1342 40 CFR Part 122	Requires permits for the discharge of pollutants from any point source into waters of the United States (Big Creek).	Not Applicable nor Relevant and Appropriate	No known surface waters in the near vicinity of facility
Surface Mining Control and Reclamation Act	30 USC § 1201 through 1326 30 CFR Part 816; 30 CFR Part 784	Protects the environment from effects of surface coal mining operations.	Not Applicable nor Relevant and Appropriate	Supplemental Phase II investigation does not anticipate to conduct coal mining operations.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document

Table 3-3
Potential Action-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant #2
Newton, Iowa

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
State				
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 133 - Rules for Determining Cleanup Actions and Responsible Parties	Determination of PRPs and Remedial Approaches	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 137 - Iowa Land Recycling Program (LRP)	Criteria for voluntary assessment and implementation of contaminated site remedial measures	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa
Iowa Department of Natural Resources - Surface and Groundwater Regulations	Iowa Administrative Code 567 - Chapter 61 - Water Quality Standards	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Iowa groundwater
Iowa Department of Natural Resources - Waste Management	Iowa Administrative Code 567 - Chapter 100 - Waste Management	Standards apply to management of waste produced - includes waste from investigation/remediation sites. Protective of human health and the environment.	Applicable	Specific applicability to investigation and remediation sites within Iowa
Iowa Department of Natural Resources - Underground Storage Tank program	19 January 2007 Memorandum	Standards apply to design of UST containment	Not Applicable nor Relevant and Appropriate	No USTs to be installed during investigation/remediation activities; No existing USTs.
Iowa Department of Natural Resources - Underground Storage Tank program	"Uniform Environmental Covenants Act" (UECA), 2005 Iowa Acts, S.F. 375	Standards govern environmental covenants required for Iowa UST sites	Not Applicable nor Relevant and Appropriate	Facility has 8 known USTs that have been removed from the property
Iowa Department of Natural Resources - Underground Storage Tank program	Iowa Administrative Code 567 - Chapters 120, 133, 134, 135, 136 - UST Regulations	Iowa UST Regulations	Not Applicable nor Relevant and Appropriate	Facility has 8 known USTs that have been removed from the property

Table 4-1
Potential Location-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant #8
Newton, Iowa

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Within 200 feet of a fault displaced in Holocene time	40 CFR 264.18(a).	New treatment, storage, or disposal of hazardous waste prohibited; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed.
Within 100-year floodplain	40 CFR 264.18(b).	Facility must be designed, constructed, operated, and maintained to avoid washout; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed.
Within floodplain	Protection of Floodplains (40 CFR 6, Appendix A); Fish and Wildlife Coordination Act (16 USC 661 et seq.); 40 CFR 6.302; Floodplains Executive Order (EO 11988).	Action to avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values; applies to action that will occur in a floodplain.	Not Applicable nor Relevant and Appropriate	The facility is not within the floodplain.
Within area where action may cause irreparable harm, loss or destruction of significant artifacts	National Historical Preservation Act (16 USC Section 469); 36 CFR Part 65.	Requires that action be taken to recover and preserve artifacts when alteration of terrain threatens significant scientific, prehistorical, historical, or archaeological data.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of historical interest.
Historic project owned or controlled by a federal agency	National Historical Preservation Act (16 USC Section 106); 36 CFR Part 800.	Requires action to preserve historic properties and planning of action to minimize harm to National Historic Landmarks.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of historical interest.
Critical habitat upon which endangered species or threatened species depends	Endangered Species Act of 1973 (16 USC 1531 et seq.); 50 CFR Part 200, 50 CFR Part 402; Fish and Wildlife Coordination Act (16 USC 661 et seq.); 33 CFR Parts 320-330.	If endangered or threatened species are present, action must be taken to conserve endangered or threatened species, including consultation with the Department of Interior.	Not Applicable nor Relevant and Appropriate	The facility is not known to contain habitats that potentially could support endangered or threatened species.
Wetlands	Clean Water Act Section 404; 40 CFR Part 230, 33 CFR Parts 320-330.	For wetlands as defined by U.S. Army Corps of Engineers regulations, must take action to prohibit discharge of dredged or fill material into wetlands without permit.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any wetland areas.
Wetlands	40 CFR Part 6, Appendix A.	For action involving construction of facilities or management of property in wetlands, action must be taken to avoid adverse effects, minimize potential harm, and preserve and enhance wetlands, to the extent possible.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any wetland areas.
Wilderness area	Wilderness Act (16 USC 1131 et seq.); 50 CFR 35.1 et seq.	For federally-owned area designated as wilderness area, the area must be administered in such manner as will leave it unimpaired as wilderness and to preserve the wilderness.	Not Applicable nor Relevant and Appropriate	The facility is not within a Federal Wilderness area.
Wildlife refuge	16 USC 668 dd et seq.; 50 CFR 27.	Only actions allowed under the previsions of 16 USC Section 668 dd(c) may be undertaken in areas that are part of the National Wildlife Refuge System	Not Applicable nor Relevant and Appropriate	The facility has not been designated as a National Wildlife Refuge.
Within area affecting national wild, scenic, or recreational river	Wild and Scenic Rivers Act (16 USC 1271 et seq.); Section 7(a)); 40 CFR 6.302(e).	For activities that affect or may affect any of the rivers specified in Section 1271(a); must avoid taking or assisting in action that will have direct adverse effect on scenic river.	Not Applicable nor Relevant and Appropriate	The facility is not near a national wild, scenic, or recreational river.
Classification and potential use of an aquifer	Guidelines for Ground Water Classification, EPA Groundwater Protection Strategy (USEPA, 1984; USEPA, 1986).	Consider federal aquifer classifications in the assessment of remedial response objectives.	Not Applicable nor Relevant and Appropriate	The facility is not known to overlie a drinking water aquifer.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document

Table 4-1
Potential Location-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant #8
Newton, Iowa

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
State				
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 133 - Rules for Determining Cleanup Actions and Responsible Parties	Determination of PRPs and Remedial Approaches	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 137 - Iowa Land Recycling Program (LRP)	Criteria for voluntary assessment and implementation of contaminated site remedial measures	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa
Iowa Department of Natural Resources - Surface and Groundwater Regulations	Iowa Administrative Code 567 - Chapter 61 Water Quality Standards	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Iowa groundwater

Table 4-2
Potential Chemical-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant #8
Newton, Iowa

Health/Risk Criteria	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Air				
Release or discharge of emissions to the atmosphere	Clean Air Act (CAA) Amendments of 1990 (and other CAA regulations).	Regulation of uncontrolled emissions to the atmosphere from stationary sources.	To Be Considered	Potential emissions from proposed investigation activities may fall under CAA jurisdiction
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 81.260	Designation of Air Quality Control Regions (AQCRs)	To Be Considered	Potential emissions from proposed investigation activities may trigger AQCR designation/jurisdiction
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 81.316	Attainment status designations	To Be Considered	Potential emissions from proposed investigation activities may affect attainment status designation
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 52.820 et. seq.	Approval and Promulgation of CAA Implementation Plans	To Be Considered	Potential emissions from proposed investigation activities may fall under CAA jurisdiction
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 62.3840 et. seq.	Approval and Promulgation of State Plans for Designated Facilities and Pollutants	Not Applicable nor Relevant and Appropriate	Facility not a Designated Facility; No identified Designated Pollutants discharged from Site
Iowa Department of Natural Resources	Iowa Administrative Code 567 - Chapters 20-34 - Rules for Air Quality	Standards apply to air emissions in State of Iowa	To Be Considered	Potential emissions from proposed investigation activities may fall under IDNR
Toxic Substances Control Act (TSCA) Toxic Substances Control Act	15 USC § 2601-2692 Section 6	Control of toxic substances, asbestos hazard emergency response, Indoor radon abatement, Lead exposure reduction. Asbestos, CFCs, aerosol propellants, hexavalent chromium, PCBs.	Relevant and Appropriate	Initial investigations identified transformer on-site. Proposed investigations include evaluation for potential presence of PCB
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
Surface Water				
EPA Region 7 Ecological Screening Value, Freshwater	USEPA, Region 7 Ecological Screening Value, Freshwater Surface Water Screening Value	Risk-based screening concentrations for surface water.	Not Applicable nor Relevant and Appropriate	No identified surface water on or near vicinity of site.
National Recommended Water Quality Criteria	USEPA, National Recommended Water Quality Criteria -CCC, Freshwater 40 CFR 131, November 2002.	Standards apply to surface water bodies. Protective of human health and the environment.	Not Applicable nor Relevant and Appropriate	No identified surface water on or near vicinity of site.
Iowa Department of Natural Resources	Iowa Administrative Code 567 - Chapter 61 Water Quality Standards	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Not Applicable nor Relevant and Appropriate	No identified surface water on or near vicinity of site.
Soil				
EPA Region 7 Preliminary Remediation Goals	EPA Region 7, Preliminary Remediation Goals, PRG Table and Background Information.	Risk-based screening concentrations for soils.	Applicable	May be applicable for use as preliminary site Soil Screening Level criteria
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 133 - Rules for Determining Cleanup Actions and Responsible Parties	Determination of PRPs and Remedial Approaches	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 137 - Iowa Land Recycling Program (LRP)	Criteria for voluntary assessment and implementation of contaminated site remedial measures	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa

Table 4-2
Potential Chemical-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant #8
Newton, Iowa

Health/Risk Criteria	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Groundwater				
Federal Primary and Secondary MCLs	USEPA, Drinking Water Section, National Primary Drinking Water Standards, July 2002.	Maximum contaminant levels apply to community water systems and non-transient non-community water systems for communities of 10,000 or greater.	To Be Considered	No known drinking water sources on site. Superseded by Chapter 62-520, FAC.
EPA Region 7 Preliminary Remediation Goals	USEPA, Region 7 Preliminary Remediation Goals, PRG Table and Background Information	Risk-based screening concentrations for groundwater.	Not Applicable nor Relevant and Appropriate	Not applicable because they are guidance values; Iowa has developed State standards
Iowa Department of Natural Resources - Surface and Groundwater Regulations	Iowa Administrative Code 567 - Chapter 61 Water Quality Standards	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Iowa groundwater
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
Other				
Residential lead-based paint (LBP) regulations	40 CFR 745	Federal approval of State residential lead-based paint management requirements	Relevant and Appropriate	Not applicable (residential) but may be appropriate if LBP identified on-site

Table 4-3

Potential Action-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant # 8
Newton, Iowa

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Institutional Controls	EPA Memorandum entitled "Institutional Controls: A Site Manager's Guide to Identifying, Evaluating, and Selecting Institutional Controls at Superfund and RCRA Corrective Action Cleanups," September 29, 2000.	Certain institutional controls may be required under a land use control (LUC) scenario.	To Be Considered	This is a guidance document.
Remediation Waste Management	EPA Memorandum entitled "Management of Remediation Waste Under RCRA," 14 October 1998	Provides a summary of guidance on RCRA regulations and policies regarding the management of remediation wastes	To Be Considered	This is a guidance document.
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 272.800 et. seq.	Approved State Hazardous Waste Management Programs	Not applicable or relevant and appropriate	Reserved CFR - No Approved Iowa State Hazardous Waste Management Program
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 282.65	Approved Underground Storage Tank Programs - State Programs	To Be Considered	Facility has no known existing USTs at the property or removed from the property
EPA 40 CFR Codified Regulations - State Regulations	40 CFR 147.800 et. seq.	State Underground Injection Control Programs	To Be Considered	May be applicable as treatment alternative
Hazardous Materials Transportation Act	49 USC § 1801-1813	Regulates transportation of hazardous materials including mining wastes that are not exempt under the Bevill Amendment.	Applicable	Applies to removal of excavated materials from investigative activities
Standards Applicable to Transport of Hazardous Materials	49 CFR Parts 10, 171 through 177	Regulates transportation of hazardous materials including mining wastes that are not exempt under the Bevill Amendment.	Applicable	Applies to removal of excavated materials from investigative activities
Resource Conservation and Recovery Act Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR Part 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment and, thereby, constitute prohibited open dumps.	Not Applicable nor Relevant and Appropriate	Phase II investigation actions do not include storing solid waste
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Establishes standards which apply to persons transporting hazardous waste within the United States if the transportation requires a manifest under 40 CFR Part 262.	Applicable	Applies to transporters of excavated materials from drilling activities
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Establishes minimum national standards, which define the acceptable management of hazardous waste for owners and operators of facilities, which treat, store, or dispose of hazardous waste.	Not Applicable nor Relevant and Appropriate	Supplemental Phase II investigation actions do not include treatment and storage of hazardous waste.
Clean Water Act National Pollutant Discharge Elimination System	33 USC § 1342 40 CFR Part 122	Requires permits for the discharge of pollutants from any point source into waters of the United States (Big Creek).	Not Applicable nor Relevant and Appropriate	No known surface waters in the near vicinity of facility
Surface Mining Control and Reclamation Act	30 USC § 1201 through 1326 30 CFR Part 816; 30 CFR Part 784	Protects the environment from effects of surface coal mining operations.	Not Applicable nor Relevant and Appropriate	Supplemental Phase II investigation does not anticipate to conduct coal mining operations.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document

Table 4-3

Potential Action-Specific ARARs and TBCs
Former Maytag/Whirlpool Site - Plant # 8
Newton, Iowa

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
State				
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 133 - Rules for Determining Cleanup Actions and Responsible Parties	Determination of PRPs and Remedial Approaches	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa
Iowa Department of Natural Resources - Soil Regulations	Iowa Administrative Code 567 - Chapter 137 - Iowa Land Recycling Program (LRP)	Criteria for voluntary assessment and implementation of contaminated site remedial measures	Applicable	Specific applicability to assessment and remediation of contaminated sites within Iowa
Iowa Department of Natural Resources - Surface and Groundwater Regulations	Iowa Administrative Code 567 - Chapter 61 - Water Quality Standards	Standards apply to surface water and groundwater. Specific to designated use of water. Protective of human health and the environment.	Applicable	Specific applicability to Iowa groundwater
Iowa Department of Natural Resources - Waste Management	Iowa Administrative Code 567 - Chapter 100 - Waste Management	Standards apply to management of waste produced - includes waste from investigation/remediation sites. Protective of human health and the environment.	Applicable	Specific applicability to investigation and remediation sites within Iowa
Iowa Department of Natural Resources - Underground Storage Tank program	19 January 2007 Memorandum	Standards apply to design of UST containment	Not Applicable nor Relevant and Appropriate	No USTs to be installed during investigation/remediation activities; No existing USTs.
Iowa Department of Natural Resources - Underground Storage Tank program	"Uniform Environmental Covenants Act" (UECA), 2005 Iowa Acts, S.F. 375	Standards govern environmental covenants required for Iowa UST sites	Not Applicable nor Relevant and Appropriate	Facility has no known existing USTs at the property or removed from the property
Iowa Department of Natural Resources - Underground Storage Tank program	Iowa Administrative Code 567 - Chapters 120, 133, 134, 135, 136 - UST Regulations	Iowa UST Regulations	Not Applicable nor Relevant and Appropriate	Facility has no known existing USTs at the property or removed from the property

Table 5-1
Potential Location-Specific ARARs and TBCs
Former Dixie-Narco Property
Ranson, WV

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Wetland	United States Migratory Bird Treaty Act (16 USC § 703-712)	This law implements the treaties that the US has signed with a number of countries protecting birds that migrate across our national boarders. It makes illegal the taking, possessing or selling of protected species.	Not Applicable nor Relevant and Appropriate	Facility is not located in wetlands
Within floodplain	Executive Order 11988 Floodplain Management	Action to avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values; applies to action that may occur in a floodplain.	Not Applicable nor Relevant and Appropriate	The facility is not within the floodplain.
Within 200 feet of a fault displaced in Holocene time	40 CFR 264.18(a)	New treatment, storage, or disposal of hazardous waste prohibited; applies to RCRA hazardous waste treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed
Within 100-year floodplain	40 CFR 264.18(b)	Facility must be designed, constructed, operated, and maintained to avoid washout; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed
Within area where action may cause irreparable harm, loss or destruction of significant scientific, prehistorical, historical, or archaeological data.	Archeological and Historic Preservation Act (16 USC Section 469)	Requires for the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of federally licensed activity. Requires that action be taken to recover and preserve artifacts when alteration of terrain threatens significant scientific, prehistorical, historical, or archaeological data.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of historical interest.
Historic project owned or controlled by a federal agency	National Historical Preservation Act (16 USC Section 106); 36 CFR Part 800.	Requires action to preserve historic properties and planning of action to minimize harm to National Historic Landmarks.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of historical interest.
Critical habitat upon which endangered species or threatened species depends	Endangered Species Act (16 USC § 1531 - 1534)	Conserve to the extent practicable the various species of fish or wildlife and plants facing extinction. Provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.	Not Applicable nor Relevant and Appropriate	The facility is not known to contain habitats that potentially could support endangered o threatened species.
Waters of United States	Discharges of Dredged or Fill Material into Waters of United States (33 CFR Part 323)	Regulate discharges of dredged or fill material into waters of the United States. Prohibits discharge of dredged or fill material into waters of the United States without permit.	Not Applicable nor Relevant and Appropriate	Facility is not known to be located nearby surface water
Wetlands	Executive Order 11990 Protection of Wetlands	For all activities in wetlands, action must be taken to minimize the destruction, loss or degradation of wetlands, and preserve and enhance wetlands, to the extent possible.	Not Applicable nor Relevant and Appropriate	Facility is not known to be located nearby surface water
Wetlands, floodplains, important farmlands, coastal zones, wild and scenic rivers, fish and wildlife, and endangered species.	Fish and Wildlife Coordination Act (40 CFR Part 6.302)	Requires Federal agencies conducting certain activities to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and adverse effects associated with direct and indirect development of a floodplain. All Federal activities in coastal areas be consistent with approved State Coastal Zone Management Programs, to the maximum extent possible. Establishes requirements applicable to water resource projects affecting wild, scenic or recreational rivers within the National Wild and Scenic Rivers system as well as rivers designated on the National Rivers Inventory to be studied for inclusion in the national system. Protection of the Nation's significant/important agricultural lands from irreversible conversion to uses which result in its loss as an environmental or essential food production resource.	Not Applicable nor Relevant and Appropriate	The facility is not within a Federal Wilderness area.

Table 5-1
Potential Location-Specific ARARs and TBCs
Former Dixie-Narco Property
Ranson, WV

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Wilderness Area	Wilderness Act (16 USC 1131 et seq.); 50 CFR 35.1 et seq.	Only actions allowed under the previsions of 16 USC Section 668 dd(c) may be undertaken in areas that are part of the National Wildlife Refuge System	Not Applicable nor Relevant and Appropriate	The facility has not within a Federal Wilderness Area
Within area affecting national wild, scenic, or recreational river	Wild and Scenic Rivers Act (16 USC 1271 et seq.); Section 7(a)); 40 CFR 6.302(e).	For activities that affect or may affect any of the rivers specified in Section 1271(a); must avoid taking or assisting in action that will have direct adverse effect on scenic river.	Not Applicable nor Relevant and Appropriate	The facility is not near a national wild, scenic, or recreational river.
Classification and potential use of an aquifer	Guidelines for Ground Water Classification, EPA Groundwater Protection Strategy (USEPA, 1984; USEPA, 1986).	Consider federal aquifer classifications in the assessment of remedial response objectives.	To Be Considered	Groundwater is encountered 20 feet bgs on the property. Therefore, property overlies potential drinking water aquifer.
Wildlife Refuge	16 USC 668 dd et seq.; 50 CFR 27.	For activities that affect or may affect any of the rivers specified in Section 1271(a); must avoid taking or assisting in action that will have direct adverse effect on scenic river.	Not Applicable nor Relevant and Appropriate	The facility has not been designated as a National Wildlife Refuge.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
State				
Requirements Governing Groundwater Standards. West Virginia Environmental Quality Board	Title 46 Series 12 Requirements Governing Groundwater Standards. W. Va. Code "22-12-4 and 22B-3-4.	Establishes minimum standards of purity and quality for groundwater located within the State of West Virginia. Protective of human health and the environment.	Applicable	Specific applicability to West Virginia groundwater
West Virginia Voluntary Remediation and Redevelopment Act	W. Va. Code §22-22-1	Establishes risk-based remediation standards for voluntary remediation activities conducted in the state of West Virginia	Applicable	Specific applicability to sites located in West Virginia

Table 5-2
Potential Chemical-Specific ARARs and TBCs
Former Dixie-Narco Property
Ranson, WV

Health/Risk Criteria	Citation	Requirement description	Applicable or Relevant and Appropriate	Comment
Air				
Release or discharge of emissions to the atmosphere	Clean Air Act (42 USC § 7401) - including National Ambient Air Quality Standards (NAAQS) (40 CFR Part 50) and National Emissions Standards for Hazardous Air Pollutants (NESHAPS) (40 CFR Part 61).	Regulates air emissions from area, stationary, and mobile sources.	Applicable	Limited potential acetone emissions from proposed investigative activities.
STATE REGULATIONS: To Prevent & Control Particulate Matter Air Pollution	WVCSR 45-17(*)	To Prevent & Control Particulate Matter Air Pollution from Materials Handling, Preparation, Storage & Other Sources of Fugitive Particulate Matter	To Be Considered	Potential emissions from fugitive particulate matter re-entrainment into the air arising from unpaved streets, access roads, private parking lots and any other such sources of uncontrolled particulate matter.
National Emission Standard for Asbestos	40 CFR 61(*)	National Emission Standard for Asbestos	Not Applicable but Relevant and Appropriate	No known asbestos containing sources on site. Proposed investigation activities are not intended to discharge asbestos containing emissions to the atmosphere. Not applicable but may be appropriate if toxic substances identified on-site
Toxic Substances Control Act (TSCA) Toxic Substances Control Act	15 USC § 2601-2692 Section 6	Control of toxic substances, asbestos hazard emergency response, Indoor radon abatement, Lead exposure reduction. Asbestos, CFCs, aerosol propellants, hexavalent chromium, PCBs.	Not applicable but relevant and appropriate	Not applicable but may be appropriate if toxic substances identified on-site
West Virginia Ambient Air Quality Standards.	West Virginia Code of State Regulations; Title 45; Series 8, 9, and 12	Apply for remedial actions involving direct or indirect emissions to the atmosphere. Have been developed for sulfur dioxide, particulate matter, carbon monoxide, ozone, non-methane hydrocarbons.	To Be Considered	Potential emissions from proposed investigation activities; historic testing results indicate that overall type of COCs were not volatile (Except acetone)
Emission Standards for Hazardous Air Pollutant Pursuant 40 CFR Part 61 and 40 CFR Part 60	WVCSR 45-15 and 45-16	Apply for remedial actions involving emissions to the atmosphere. Include emission standards for hazardous air pollutants (same as 40 CFR, Part 61-NESHAPS) and standards for performance of new stationary sources (same as 40 CFR, Part 60.)	Applicable	Potential acetone emissions from proposed investigative activities.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document

Table 5-2
Potential Chemical-Specific ARARs and TBCs
Former Dixie-Narco Property
Ranson, WV

Health/Risk Criteria	Citation	Requirement description	Applicable or Relevant and Appropriate	Comment
Surface Water				
Clean Water Act - including Water Quality Criteria and National Pollution Discharge Elimination System (NPDES)	33 USC § 1387 - including 40 CFR Part 13140 CFR Part122	Set water quality standards for all contaminants in surface waters	Not Applicable nor Relevant and Appropriate	No surface waters identified on property or nearby facility
Safe Drinking Water Act - including National Primary Drinking Water Standards, National Secondary Drinking Water Standards, and Maximum Contaminant Level Goals	42 USC § 300 - including 40 CFR Part 141, 40 CFR Part 143, and 40 CFR Parts 141.50,141.51, and 141.52	Protect the quality of all waters in the U.S. that are actually or potentially designed for drinking use, whether from above ground or underground sources. Set MCLGs for organic, inorganic, and microbiological contaminants.	Not Applicable nor Relevant and Appropriate	No identified surface water on site.
Procedural Rules Governing Site-Specific revisions to Water Quality Standards. West Virginia Environmental Quality Board	Title 46 Series 6. W. Va. Code "22B-3-4 and 29A-3-3	Establishes procedures which govern the promulgation of legislative rules by the EQB and establishes procedures to be followed by the Board in reclassifying designated uses, granting variances from water quality standards, granting variances for re-mining activities and establishing site-specific numeric criteria	Not Applicable nor Relevant and Appropriate	No identified surface water on site.
The West Virginia Department of Natural Resources (WVDNR)	West Virginia Pollutant Discharge Elimination System Regulations. WVCSR 46-2(*)	Discharge limits are based on West Virginia Water Quality Standards (WVCSR 46-1). The discharge limits apply to remedial actions that involve treatment of wastes. Pollutant discharge eliminates system regulations for point source discharges of wastewater.	Not Applicable nor Relevant and Appropriate	Proposed investigative activities do not involve treatment of wastes.
Requirements Governing Water Quality Standards. West Virginia Environmental Quality Board	Title 46 Legislative Rules. W. Va. Code §22B-3-4	Requirements governing the discharge or deposit of sewage, industrial wastes and other wastes into the waters of the state and establish water quality standards for the waters of the State standing or flowing over the surface of the State.	Not Applicable nor Relevant and Appropriate	No identified surface water on site.
Soil				
RCRA regulations	Resource Conservation and Recovery Act (42 USC § 321) - including Identification and Listing of Hazardous Wastes (40 CFR Part 261)	Addresses the generation, transportation, treatment, storage, and disposal of hazardous waste including environmental problems that could result from USTs storing petroleum and other hazardous substances. Identification of solid wastes which are subject to regulation as hazardous wastes. Maximum Concentration of Contaminants for the Toxicity Characteristic.	Applicable	Applicable to proposed supplemental Phase II Investigative activities
West Virginia Voluntary Remediation and Redevelopment Act	W. Va. Code §22-22-1	Establishes risk-based remediation standards for voluntary remediation activities conducted in the state of West Virginia	Applicable	Specific applicability to sites located in West Virginia

Table 5-2
Potential Chemical-Specific ARARs and TBCs
Former Dixie-Narco Property
Ranson, WV

Health/Risk Criteria	Citation	Requirement description	Applicable or Relevant and Appropriate	Comment
Groundwater				
Federal Primary and Secondary MCLs	USEPA, Drinking Water Section, National Primary Drinking Water Standards, July 2002.	Maximum contaminant levels apply to community water systems and non-transient non-community water systems for communities of 10,000 or greater.	To Be Considered	No known drinking water sources on site. Potential future drinking water aquifer
Safe Drinking Water Act including National Primary Drinking Water Standards,, National Secondary Drinking Water Standards, and Maximum Contaminant Level Goals	42 USC § 300 - including 40 CFR Part 141, 40 CFR Part 143, and 40 CFR Parts 141.50, 141.51, and 141.52	Protect the quality of all waters in the U.S. that are actually or potentially designed for drinking use, whether from above ground or underground sources. Set MCLGs for organic, inorganic, and microbiological contaminants.	To Be Considered	No known drinking water sources on site. Potential drinking water aquifer
Requirements Governing Groundwater Standards. West Virginia Environmental Quality Board	Title 46 Series 12 Requirements Governing Groundwater Standards. W. Va. Code "22-12-4 and 22B-3-4.	Establishes minimum standards of purity and quality for groundwater located within the State of West Virginia. Protective of human health and the environment.	Applicable	Specific applicability to West Virginia groundwater
West Virginia Voluntary Remediation and Redevelopment Act	W. Va. Code §22-22-1	Establishes risk-based remediation standards for voluntary remediation activities conducted in the state of West Virginia	Applicable	Specific applicability to sites located in West Virginia
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
Other				
Residential lead-based paint (LBP) regulations	40 CFR 745	Federal approval of State residential lead-based paint management requirements	Not applicable but relevant and appropriate	Not applicable (residential) but may be appropriate if LBP identified on-site

Table 5-3
Potential Action-Specific ARARs and TBCs
Former Dixie-Narco Property
Ranson, WV

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Institutional Controls	EPA 540-F-00-005, OSWER 9355.0-74FS-P, September 2000	Certain institutional controls may be required under a land use control (LUC) scenario.	To Be Considered	This is a guidance document.
Hazardous Materials Transportation Act Standards Applicable to Transport of Hazardous Materials	49 USC § 1801-1813 49 CFR Parts 10, 171 through 177	Regulates transportation of hazardous materials including mining wastes that are not exempt under the Bevill Amendment.	Applicable	Applies to removal of excavated materials from drilling investigative activities. RCRA manifesting requirements are applicable to the off-Site shipment of RCRA hazardous waste-contaminated soil
Resource Conservation and Recovery Act Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR Part 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment and, thereby, constitute prohibited open dumps.	Not Applicable nor Relevant and Appropriate	Under the proposed investigative activities, no hazardous substances from soil will be stored, treated, or disposed of at the site. Therefore, RCRA hazardous waste treatment, storage, and disposal regulations are not ARARs to address soil.
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Establishes standards which apply to persons transporting hazardous waste within the United States if the transportation requires a manifest under 40 CFR Part 262.	Applicable	Applies to transporters of excavated materials from drilling activities. If soil excavated from drilling activities is identified as RCRA-hazardous-waste when subjected to the TCLP it will be shipped off-Site to a RCRA-compliant TSD. RCRA manifesting requirements are applicable to the off-Site shipment of RCRA hazardous waste-contaminated soil
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Establishes minimum national standards, which define the acceptable management of hazardous waste for owners and operators of facilities, which treat, store, or dispose of hazardous waste.	Not Applicable nor Relevant and Appropriate	Under the proposed investigative activities, no hazardous substances from soil will be stored, treated, or disposed of at the site.
Clean Water Act National Pollutant Discharge Elimination System	33 USC § 1342 40 CFR Part 122	Requires permits for the discharge of pollutants from any point source into waters of the United States (Big Creek).	Not Applicable nor Relevant and Appropriate	Proposed actions do not require discharge of pollutants into waters of the U.S.
Surface Mining Control and Reclamation Act	30 USC § 1201 through 1326 30 CFR Part 816; 30 CFR Part 784	Protects the environment from effects of surface coal mining operations.	Not Applicable nor Relevant and Appropriate	Supplemental Phase II investigation does not anticipate to conduct coal mining operations.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document

Table 5-3
Potential Action-Specific ARARs and TBCs
Former Dixie-Narco Property
Ranson, WV

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
State				
West Virginia Solid and Hazardous Waste Regulations. West Virginia Solid Waste Regulations	WVCSR 47-38	Apply for onsite disposal of solid wastes and contain requirements for solid waste facilities, permits and applications, and minimum performance standards.	Applicable	Proposed actions do not include onsite disposal but is applicable to transporters of hazardous waste
West Virginia Hazardous Waste Regulations	WVCSR 47-35	Contain standards for generators; transporters; and treatment, storage, and disposal facilities. These regulations apply for remedial actions that involve the handling of hazardous waste and may be appropriate and relevant for handling nonhazardous waste.	Applicable	Under the proposed investigative activities, no hazardous substances from soil will be stored, treated, or disposed of at the site. Is applicable to transporters of hazardous waste
The West Virginia Department of Natural Resources (WVDNR)	West Virginia Pollutant Discharge Elimination System Regulations. WVCSR 46-2(*)	Discharge limits are based on West Virginia Water Quality Standards (WVCSR 46-1). The discharge limits apply to remedial actions that involve treatment of wastes. Pollutant discharge eliminates system regulations for point source discharges of wastewater.	Not Applicable nor Relevant and Appropriate	Proposed investigative activities do not involve treatment of wastes.
Requirements Governing Groundwater Standards. West Virginia Environmental Quality Board	Title 46 Series 12 Requirements Governing Groundwater Standards. W. Va. Code "22-12-4 and 22B-3-4.	Establishes minimum standards of purity and quality for groundwater located within the State of West Virginia. Protective of human health and the environment.	Applicable	Specific applicability to West Virginia groundwater
West Virginia Voluntary Remediation and Redevelopment Act	W. Va. Code §22-22-1	Establishes risk-based remediation standards for voluntary remediation activities conducted in the state of West Virginia	Applicable	Specific applicability to sites located in West Virginia
West Virginia Air Pollution Control Regulations.	WVCSR Title 45	Contain rules pertaining to discharges of pollutants to the air	To Be Considered	Potential emissions from proposed investigation activities

Table 6-1
Potential Location-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Searcy, Arkansas

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Within migratory bird habitat	United States Migratory Bird Treaty Act (16 USC § 703-712)	This law implements the treaties that the US has signed with a number of countries protecting birds that migrate across our national boarders. It makes illegal the taking, possessing or selling of protected species.	Not Applicable nor Relevant and Appropriate	Facility is not known to be within wetlands.
Within floodplain	Executive Order 11988 Floodplain Management	Action to avoid adverse effects, minimize potential harm, restore and preserve natural and beneficial values; applies to action that may occur in a floodplain.	Not Applicable nor Relevant and Appropriate	The facility is not within the floodplain.
Within 200 feet of a fault displaced in Holocene time	40 CFR 264.18(a)	New treatment, storage, or disposal of hazardous waste prohibited; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed
Within 100-year floodplain	40 CFR 264.18(b)	Facility must be designed, constructed, operated, and maintained to avoid washout; applies to RCRA hazardous waste, treatment, storage, or disposal.	Not Applicable nor Relevant and Appropriate	RCRA facility is not being constructed
Within area where action may cause irreparable harm, loss or destruction of significant scientific, prehistorical, historical, or archaeological data.	Archeological and Historic Preservation Act (16 USC Section 469)	Requires for the preservation of historical and archeological data (including relics and specimens) which might otherwise be irreparably lost or destroyed as the result of federally licensed activity. Requires that action be taken to recover and preserve artifacts when alteration of terrain threatens significant scientific, prehistorical, historical, or archaeological data.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of historical interest.
Historic project owned or controlled by a federal agency	National Historical Preservation Act (16 USC Section 106); 36 CFR Part 800.	Requires action to preserve historic properties and planning of action to minimize harm to National Historic Landmarks.	Not Applicable nor Relevant and Appropriate	The facility is not known to include any items of historical interest.
Critical habitat upon which endangered species or threatened species depends	Endangered Species Act (16 USC § 1531 - 1534)	Conserve to the extent practicable the various species of fish or wildlife and plants facing extinction. Provide a means whereby the ecosystems upon which endangered species and threatened species depend may be conserved.	Not Applicable nor Relevant and Appropriate	The facility is not known to contain habitats that potentially could support endangered or threatened species.
Waters of United States	Discharges of Dredged or Fill Material into Waters of United States (33 CFR Part 323)	Regulate discharges of dredged or fill material into waters of the United States. Prohibits discharge of dredged or fill material into waters of the United States without permit.	Not Applicable nor Relevant and Appropriate	Facility is not known to be located nearby surface water
Wetlands	Executive Order 11990 Protection of Wetlands	For all activities in wetlands, action must be taken to minimize the destruction, loss or degradation of wetlands, and preserve and enhance wetlands, to the extent possible.	Not Applicable nor Relevant and Appropriate	Facility is not known to be located nearby surface water
Wetlands, floodplains, important farmlands, coastal zones, wild and scenic rivers, fish and wildlife, and endangered species.	Fish and Wildlife Coordination Act (40 CFR Part 6.302)	Requires Federal agencies conducting certain activities to avoid, to the extent possible, the adverse impacts associated with the destruction or loss of wetlands and adverse effects associated with direct and indirect development of a floodplain. All Federal activities in coastal areas be consistent with approved State Coastal Zone Management Programs, to the maximum extent possible. Establishes requirements applicable to water resource projects affecting wild, scenic or recreational rivers within the National Wild and Scenic Rivers system as well as rivers designated on the National Rivers Inventory to be studied for inclusion in the national system. Protection of the Nation's significant/important agricultural lands from irreversible conversion to uses which result in its loss as an environmental or essential food production resource.	Not Applicable nor Relevant and Appropriate	The facility is not within a Federal Wilderness area.

Table 6-1
Potential Location-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Searcy, Arkansas

Site Feature/Location	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Wilderness Area	Wilderness Act (16 USC 1131 et seq.); 50 CFR 35.1 et seq.	Only actions allowed under the previsions of 16 USC Section 668 dd(c) may be undertaken in areas that are part of the National Wildlife Refuge System	Not Applicable nor Relevant and Appropriate	The facility has not within a Federal Wilderness Area
Wildlife Refuge	16 USC 668 dd et seq.; 50 CFR 27.	For activities that affect or may affect any of the rivers specified in Section 1271(a); must avoid taking or assisting in action that will have direct adverse effect on scenic river.	Not Applicable nor Relevant and Appropriate	The facility has not been designated as a National Wildlife Refuge.
Within area affecting national wild, scenic, or recreational river	Wild and Scenic Rivers Act (16 USC 1271 et seq.); Section 7(a)); 40 CFR 6.302(e).	For activities that affect or may affect any of the rivers specified in Section 1271(a); must avoid taking or assisting in action that will have direct adverse effect on scenic river.	Not Applicable nor Relevant and Appropriate	The facility is not near a national wild, scenic, or recreational river.
Classification and potential use of an aquifer	Guidelines for Ground Water Classification, EPA Groundwater Protection Strategy (USEPA, 1984; USEPA, 1986).	Consider federal aquifer classifications in the assessment of remedial response objectives.	To Be Considered	Groundwater is encountered 10 feet bgs on the property. Therefore, property overlies potential drinking water aquifer.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
US EPA Region 6 Human Health Medium-Specific Screening levels 2007	US EPA Region 6 Human Health Medium-Specific Screening levels 2007	Establishes health-based screening levels for contaminants in residential and industrial soil, ambient air, and tap water. Screening values are used as a technical tool rather than action levels or cleanup levels	Applicable	Arkansas standards defer to the EPA Region 6 Screening Levels
No State- or local-specific regulations have been identified as preliminary ARARs				

Table 6-2
Potential Chemical-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Searcy, Arkansas

Standard or Criteria	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Air				
Clean Air Act	42 USC § 7409	Regulation of uncontrolled emissions to the atmosphere from stationary sources.	To Be Considered	Potential emissions from proposed investigation activities may fall under CAA jurisdiction
National Primary and Secondary Ambient Air Quality Standards	40 CFR Part 50	Air quality levels that protect public health.	To Be Considered	Potential emissions from proposed investigation activities may trigger AQCR designation/jurisdiction
Toxic Substances Control Act (TSCA) Toxic Substances Control Act	15 USC § 2601-2692 Section 6	Control of toxic substances, asbestos hazard emergency response, Indoor radon abatement, Lead exposure reduction. Asbestos, CFCs, aerosol propellants, hexavalent chromium, PCBs.	Not applicable but relevant and appropriate	Not applicable but may be appropriate if toxic substances identified on-site
Civil Penalties. Arkansas Pollution Control & Ecology Commission Regulation	Regulation 7	Provides guidance for the assessment of civil penalties for the violation of any air pollution regulation.	To Be Considered	Potential emissions from proposed investigation activities
Regulation for the Fee System for Environmental Permits	Regulation 9	Authorizes the collection and enforcement of permit fees and authorizes their use to defray the costs of operating the Department.	To Be Considered	Proposed investigative activities may require Air and /or Water, Solid Waste Permit
Arkansas Air Pollution Code	Regulation 18	Applicable to any source which emits or has the potential to emit any air contaminant as defined in the regulation. It is constructed in a manner that promotes a streamlined permitting process, alleviating regulatory costs, allowing flexibility in maintaining compliance with regulatory mandates and is not federally enforceable.	To Be Considered	Potential emissions from proposed investigation activities
Regulations of the Arkansas Plan of Implementation for Air Pollution Control	Regulation 19	Regulations applicable to any stationary source which has the potential to emit any federally regulated air pollutant.	To Be Considered	Potential emissions from proposed investigation activities
Regulations of the Arkansas Operating Air Permit Program	Regulation 26	Intended to meet the requirements of title V of the federal Clean Air Act and 40 CFR Part 70 by establishing a comprehensive state air quality permitting program for major sources of air contaminants emissions.	To Be Considered	Potential emissions from proposed investigation activities
Nonattainment New Source Review Requirements. Arkansas Pollution Control & Ecology Commission Regulation	Regulation 31	Applies to any new major stationary source or major modification that is major for the pollutant for which the area is designated nonattainment under for any national ambient air quality standard.	Not Applicable nor Relevant and Appropriate	Proposed investigative activities do not include contributing to a new major stationary source or major modification that is major for the pollutant for which the area is designated nonattainment under Section 107(d)(1)(A)(i) of the Act,
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document

Table 6-2
Potential Chemical-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Searcy, Arkansas

Standard or Criteria	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Surface Water				
Federal Clean Water Act	33 USC § 1251-1387; CWA 303 and 304; 40 CFR131	Chapter 26-Water Pollution Prevention and Control.	Not Applicable nor Relevant and Appropriate	No identified surface water on site.
Water Quality Standards	40 CFR Part 131	Sets criteria for water quality based on toxicity to aquatic organisms and human health.	Not Applicable nor Relevant and Appropriate	No identified surface water on site.
Safe Drinking Water Act	42 USC § 300	Set MCLGs for organic, inorganic, and microbiological contaminants.	Not Applicable nor Relevant and Appropriate	No identified surface water on site.
Regulation Establishing Water Quality Standards for Surface Waters of the State of Arkansas as revised, effective May 17, 2004. (Water Division, 501-682-0656)	ADEQ Water Quality Standards for Surface Waters. Regulation 2	Regulation Establishing Specific Water Quality Standards and MCLs for surface water.	Not Applicable nor Relevant and Appropriate	No identified surface water on site.
Soil				
RCRA regulations Solid Waste Disposal Act	Resource Conservation and Recovery Act (42 USC § 321) - including Identification and Listing of Hazardous Wastes (40 CFR Part 261). 42 USC § 6941	Addresses the generation, transportation, treatment, storage, and disposal of hazardous waste including environmental problems that could result from USTs storing petroleum and other hazardous substances. Identification of solid wastes which are subject to regulation as hazardous wastes. Maximum Concentration of Contaminants for the Toxicity Characteristic.	Applicable	Applicable to proposed investigative activities.
US EPA Region 6 Human Health Medium-Specific Screening levels 2007	US EPA Region 6 Human Health Medium-Specific Screening levels 2007	Establishes health-based screening levels for contaminants in residential and industrial soil, ambient air, and tap water. Screening values are used as a technical tool rather than action levels or cleanup levels	Applicable	Arkansas standards defer to the EPA Region 6 Screening Levels
Groundwater				
National Primary Drinking Water Standards	SDWA 42 U.S.C. §300f et seq.; 40 CFR141.11- 141.6	MCLs have been promulgated for several common organic and inorganic contaminants. These levels regulate the concentration of contaminants in public drinking water supplies	To Be Considered	No known drinking water sources on site. Groundwater encountered on site; it is a potential future drinking water source.
National Secondary Drinking Water Regulations	40 CFR Part 143	Establishes welfare-based standards for public water systems (secondary maximum contaminant levels).	To Be Considered	No known drinking water sources on site. Groundwater encountered on site; it is a potential future drinking water source.
Safe Drinking Water Act	42USC § 300	Protects the quality of drinking water in the U.S	To Be Considered	No known drinking water sources on site. Groundwater encountered on site is potentially designed for drinking use.
US EPA Region 6 Human Health Medium-Specific Screening levels 2007	US EPA Region 6 Human Health Medium-Specific Screening levels 2007	Establishes health-based screening levels for contaminants in residential and industrial soil, ambient air, and tap water. Screening values are used as a technical tool rather than action levels or cleanup levels	Applicable	Arkansas standards defer to the EPA Region 6 Screening Levels
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
Other				
Residential lead-based paint (LBP) regulations	40 CFR 745	Federal approval of State residential lead-based paint management requirements	Not Applicable but Relevant and Appropriate	Not applicable (residential) but may be appropriate if LBP identified on-site

Table 6-3

Potential Action-Specific ARARs and TBCs
Former Maytag/Whirlpool Site
Searcy, Arkansas

Potential Action	Citation	Requirement	Applicable or Relevant and Appropriate	Comment
Federal				
Institutional Controls	EPA 540-F-00-005, OSWER 9355.0-74FS-P, September 2000	Certain institutional controls may be required under a land use control (LUC) scenario.	To Be Considered	This is a guidance document.
Hazardous Materials Transportation Act Standards Applicable to Transport of Hazardous Materials	49 USC § 1801-1813 49 CFR Parts 10, 171 through 177	Regulates transportation of hazardous materials including mining wastes that are not exempt under the Bevill Amendment.	Applicable	Applies to removal of excavated materials from drilling investigative activities. RCRA manifesting requirements are applicable to the off-Site shipment of RCRA hazardous waste-contaminated soil
Resource Conservation and Recovery Act Criteria for Classification of Solid Waste Disposal Facilities and Practices	40 CFR Part 257	Establishes criteria for use in determining which solid waste disposal facilities and practices pose a reasonable probability of adverse effects on health or the environment and, thereby, constitute prohibited open dumps.	Not Applicable nor Relevant and Appropriate	Under the proposed investigative activities, no hazardous substances from soil will be stored, treated, or disposed of at the site. Therefore, RCRA hazardous waste treatment, storage, and disposal regulations are not ARARs to address soil.
Standards Applicable to Transporters of Hazardous Waste	40 CFR Part 263	Establishes standards which apply to persons transporting hazardous waste within the United States if the transportation requires a manifest under 40 CFR Part 262.	Applicable	Applies to transporters of excavated materials from drilling activities. If soil excavated from drilling activities is identified as RCRA-hazardous-waste when subjected to the TCLP it will be shipped off-Site to a RCRA-compliant TSD. RCRA manifesting requirements are applicable to the off-Site shipment of RCRA hazardous waste-contaminated soil
Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	40 CFR Part 264	Establishes minimum national standards, which define the acceptable management of hazardous waste for owners and operators of facilities, which treat, store, or dispose of hazardous waste.	Not Applicable nor Relevant and Appropriate	Under the proposed investigative activities, no hazardous substances from soil will be stored, treated, or disposed of at the site.
Clean Water Act National Pollutant Discharge Elimination System	33 USC § 1342 40 CFR Part 122	Requires permits for the discharge of pollutants from any point source into waters of the United States (Big Creek).	Not Applicable nor Relevant and Appropriate	Proposed actions do not require discharge of pollutants into waters of the U.S.
National Pollutant Discharge Elimination System	CWA; 40 CFR 125 (NPDES)	Regulations address criteria and standards for removal of pollutants prior to discharge.	Not Applicable nor Relevant and Appropriate	Proposed investigative activities do not require discharge
Surface Mining Control and Reclamation Act	30 USC § 1201 through 1326 30 CFR Part 816; 30 CFR Part 784	Protects the environment from effects of surface coal mining operations.	Not Applicable nor Relevant and Appropriate	Supplemental Phase II investigation does not anticipate to conduct coal mining operations.
Vapor intrusion to indoor air	Draft Guidance for Evaluating the Vapor Intrusion to Indoor Air Pathway from Groundwater and Soils (Subsurface Vapor Intrusion Guidance) (US EPA 2002)	Consider vapor intrusion exposure pathway to building occupants due to subsurface contamination	To Be Considered	This is a guidance document
US EPA Region 6 Human Health Medium-Specific Screening levels 2007	US EPA Region 6 Human Health Medium-Specific Screening levels 2007	Establishes health-based screening levels for contaminants in residential and industrial soil, ambient air, and tap water. Screening values are used as a technical tool rather than action levels or cleanup levels	Applicable	Arkansas standards defer to the EPA Region 6 Screening Levels
State				
Regulations For State Administration Of The National Pollutant Discharge Elimination System	ADEQ Pollutant Discharge Elimination System. Regulation 6	Specifies requirements of an NPDES permit for surface discharge, including removal of pollutants prior to discharge.	Not Applicable nor Relevant and Appropriate	Proposed investigative activities do not require construction and operation of wastewater facility
Liquid Animal Waste Management Systems	Regulation 5	Liquid Animal Waste Management Systems as revised, effective March 23, 2000.	Not Applicable nor Relevant and Appropriate	Facility is not known for confined animal operations using liquid animal waste management systems
Regulation to Require a Disposal Permit	Regulation 4	Regulation to Require a Disposal Permit for Real Estate Subdivisions in Proximity to Lakes and Streams, effective July 7, 1973.	Not Applicable nor Relevant and Appropriate	Facility is not known to be under a Real Estate Developer
Licensing of Wastewater Treatment Plant Operators	Regulation 3	Licensing of Wastewater Treatment Plant Operators as revised, effective January 20, 2003.	Not Applicable nor Relevant and Appropriate	No identified wastewater treatment site on site
Regulation for the Prevention of Pollution by Salt Water and Other Oil Field Wastes	Regulation 1	Regulation for the Prevention of Pollution by Salt Water and Other Oil Field Wastes Produced by Wells in All Fields or Pools, effective March, 16, 1993.	Not Applicable nor Relevant and Appropriate	Facility has no known oil and gas wells

APPENDIX B
SOIL AND GROUNDWATER CHEMICAL-SPECIFIC ACTION LEVEL AND/OR CLEANUP STANDARDS SUMMARY TABLE

Table 7
Soil and Groundwater Chemical-Specific Action Level and/or Clean-up Standards
Former Whirlpool/Maytag Sites

Analytical Method / Species Detected	Iowa DNR Soil/GW Standards (1)			Illinois EPA Soil/GW Standards (2)			West Virginia DEP Soil/GW Standards (3)			Arkansas/USEPA Region 6 Soil/GW Standards (4)	
	ug/L *		mg/kg *	ug/L *		mg/kg *	ug/L *	mg/kg *		ug/L *	mg/kg *
	Prot. GW	Non-Prot. GW	Soil	Class I - Drinking Water	Class II - Non-Potable Water	Soil - Industrial	Groundwater MCL	Soil -Indust	Soil - Resid.	GW Screening Level	Soil -Indust
Analytical Method 8260B (VOCs)											
Acetone	6,300	32,000	68,000	6,300	6,300	100,000 inh	3,700	200,000	7,800	5,500	56,000
Benzene	5	100	88	5	25	100	5	2,000	22	0.35	1.5
Bromoform	80	440	390	1	1	720	2.4	7,200	81	8.5	720
Bromodichloromethane	80	400	50	0.2	0.2	92	0.17	920	10	0.18	2.4
Bromomethane/Methyl Bromide	10	50	110	10	5	2900	8.7	2,900	110	9	13.0
Carbon Disulfide	700	3,500	7,600	700	3,500	200,000	1,000	200,000	7,800	1,000	720
Carbon Tetrachloride	5	27	24	5	25	44	5	440	4.9	0.17	0.53
Chlorobenzene	100	700	1,500	100	500	41,000	100	41,000	1,600	91	460
Chloroethane/Ethyl Chloride				2.8	14.0	820,000.0	8,600	820,000	31,000		
Chloroform	80	570	510	0.2	1	940	0.15	9,400	100	0.17	0.52
Chloromethane	30	270	240				1.4	4,400	49	2.1	3
Cyclohexane						280 inh				13,000	140
Dibromochloromethane	80	400	150	140.0	140.0	41,000				0.13	2.4
1,2-Dibromoethane	0.05	1.8	1.5	0.05	0.5	2.9	0.05	0.67	0.0075	0.006	0.0650
1,2-Dibromo-3-Chloropropane	0.2	2.5	2.2	0.2	2.0	4	0.2	41.0	0.46	0.0002	0.018
1,2-Dichlorobenzene	600	3,200	5,500	600	1,500	180,000	600	180000	7000	49	370
1,3-Dichlorobenzene	600	3,200	5,500				600	180000	7000	14	130
1,4-Dichlorobenzene	75	380	610	75	375	17,000 inh	75	2,400	27	0.47	7.5
Dichlorodifluoromethane	1,000	7,000	15,000	1,400	7,000	410,000	390	410,000	16,000	390	310
1,1-Dichloroethane	140	7,000	15,000	700	3,500	200,000	810	200,000	7,800	1,200	2,300
1,2-Dichloroethane	5	38	34	5	25	63	5	630	7	0.12	0.77
1,1 - Dichloroethene	7	180	380	7	35	100,000	7	95	1.1	340	430
cis-1,2-Dichloroethene	70	350	760	70	200	20,000	70	20,000	780	61	150
trans-1,2-Dichloroethene	100	700	1,500	100	500	41,000	100	41,000	1,600	110	180
1,2-Dichloropropane	5	51	46	5	25	84	5	840	9.4	0.16	0.77
cis-1,3-Dichloropropene	1.8	35	31	1	5	57	0.077	330	3.7	0.4	1.6
trans-1,3-Dichloropropene	1.8	35	31	1	5	57	0.077	330	3.7	0.4	1.6
Ethylbenzene	700	3,500	7,600	700	1,000	200,000	700	200,000	7,800	1,300	230
2-Hexanone (MBK)											
Isopropylbenzene (cumene)	700	3,500	7,600	0.7	3.5	200,000	1,500	82,000	3,100	660	520
Methyl Acetate				7,000	7,000	1,000,000	37,000	1,000,000	78,000	6,100	96,000
2-Butanone (MEK)	4,000	21,000	46,000	4,200	4,200	1,000,000	1,900	1,000,000	47,000	7,100	34,000
Methyl tert-butyl Ether	21	1,000	2,300	70	70	20,000	180	10,000	390	11	72
4-Methyl-2-Pentanone (MIBK)	560	2,800	6,100			3,100 inh	2,900	160,000	6,300	2,000	17,000
Methylcyclohexane						120 inh	31,000			5,200	140
Methylene Chloride	5	470	410	5	50	760	5	7,600	85	4	21
Styrene	100	7,000	15,000	100	500	410,000	100	410,000	16,000	1,600	1,700
1,1,2,2-Tetrachloroethane	0.3	18	15				0.052	290.0	3.2	0.055	0.9
Tetrachloroethene (PCE)	5	25	5.7	5	25	110	5	1,100	12	0.1	1.8
Toluene	1,000	5,000	6,100	1,000	2,500	410,000	1,000	410,000	16,000	2,300	520
1,1,2-Trichloro-1,2,2-trifluoroethane	2,100	10,000	23,000				59,000	1,000,000	1,000,000	59,000	5,600
1,2,4-Trichlorobenzene	70	350	760	70	700	20,000	70	20,000	780	8.2	240
1,1,1-Trichloroethane	200	1,200	2,700	200	1,000	1,200 inh	200	72,000	2,700	840	1,400
1,1,2-Trichloroethane	5	61	54	5	50	8,200	5	1,000	11	0.20	1.90
Trichloroethene (TCE)	5	25	7.7	5	25	520	5	5,200	58	0.028	0.092
Trichlorofluoromethane	2,000	10,000	23,000	2,100	10,500	610,000	1,300	610,000	23,000	1,300	1,300
Vinyl Chloride/Chloroethene	2	10	2.1	2	10	7.9	2	30	0.34	0.015	0.86
Xylenes, Total	10,000	50,000	15,000	10,000	10,000	410,000	10,000	1,000,000	160,000	200	210
Analytical Method 6010B (RCRA Metals)											
	mg/L	mg/L	mg/kg	ug/L	ug/L	mg/kg	ug/L	mg/kg	mg/kg	ug/L	mg/kg
Arsenic	0.010	0.050	19.0	50	200	1,200	11	610	23	0.045	3.8
Barium	2	10	15,000	2,000	2,000	140,000	2,000	140,000	5,500	7,300	100,000
Cadmium	0.005	0.025	70	5	50	2,000	5	1000	39	18	1,000
Chromium (total)(water)	0.1	0.5		100	1,000	6,100	100				450
Lead	0.015	0.075	400	7.5	100	800	15	1000	400	15	800
Selenium	0.050	0.25	390	50	50	10,000	50	10000	390	180	10,000
Silver	0.1	0.5	370	50	50	10,000	180	10000	390	180	10,000
Nickel	0.1	0.7	1,500	100	2,000	41,000	100	41000	1600	730	41,000
Analytical Method 7196A (Hexavalant Chromium)											
	mg/L	mg/L	mg/kg	mg/L		mg/kg	ug/L	mg/kg	mg/kg	ug/L	mg/kg
Chrome (VI)	0.021	0.100	210	0.100		6,100	180	10,000	390	110	64
Analytical Method 8270C (1,4-Dioxane)											
	ug/L	ug/L	mg/kg	ug/L	ug/L	mg/kg	ug/L	mg/kg	mg/kg	ug/L	mg/kg
1,4-Dioxane	16	320	280	1	1	520	6.1	5,200	58	6.1	520
Polynuclear aromatic hydrocarbons	mg/L	mg/L	mg/kg	mg/L	mg/L	mg/kg	ug/L	mg/kg	mg/kg	ug/L	mg/kg
Acenapthene	0.42000	2.10000	3,400	0.42000	2.10000	120,000	2,200.0	120,000	4,700	370.0	38,000
Anthracene	2.10000	10.00000	17,000	2.10000	10.50000	610,000	1,100.0	610,000	23,000	1,800.0	100,000
Benz(a)anthracene	0.00024	0.00480	3.100	0.00013	0.00065	8	0.1	78	1	0.029	7.8
Benzo(a)pyrene	0.00020	0.00100	0.310	0.00020	0.00200	0.8	0.2	8	0	0.0029	0.78
Benz(b)fluoranthene	0.00024	0.00480	3.100	0.00018	0.00090	8	0.1	78	1	0.029	7.8
Benzo(g,h,i)perylene				0.21000	1.05000	61,000					
Benzo(k)fluoranthene	0.00240	0.04800	31	0.00017	0.00085	78	0.9	780	9	0.290	78
Chrysene	0.02400	0.48000	310	0.00150	0.00750	780	9.2	7,800	88	2.900	780
Dibenz(ah)anthracene	0.00002	0.00048	0.310	0.00030	0.00150	0.8	0.0	8	0	0.003	0.780
Fluoranthene	0.28000	1.40000	2,300	0.28000	1.40000	82,000	1,500.0	82,000	3,100	1,500.0	82,000
Fluorene	0.28000	1.40000	2,300	0.28000	1.40000	82,000	1,500.0	82,000	3,100	240.0	33,000
Indeno(1,2,3-cd)pyrene	0.00024	0.00480	3.100	0.00043	0.00215	8	0.1	78	1	0.029	7.8
Napthalene	0.10000	0.70000	1,100	0.14000	0.22000	41,000	1,500.0	82,000	3,100	6.2	190
Phenanthrene				0.21000	0.15000	61,000					
Pyrene	0.21000	1.00000	1,700	0.21000	1.05000	61,000	1,100.0	61,000	2,300	180.0	54,000

Notes:

(1) Iowa soil and groundwater standards are referenced from the Iowa Department of Natural Resources (IDNR) Statewide Standards for Contaminants in Soil and Groundwater.
Iowa soil standards are exposure based and do not have separate residential/industrial standards.

(2) Illinois soil standards are referenced from the Illinois EPA TACO - 'Tier 1 Soil Remediation Objectives for Industrial/Commercial Properties' and the 'Soil Remediation Objectives for Industrial/Commercial Properties - Non-TACO Chemicals'.
Illinois groundwater standards are referenced from the Illinois EPA TACO 'Tier 1 Groundwater Remediation Objectives for the Groundwater Component of the Groundwater Ingestion Route' and the 'Groundwater Remediation Objectives for Chemicals Not Listed in TACO'.

(3) West Virginia soil standards collected from the Risk Based Concentrations (RBCs) presented in the WVDEP, West Virginia Voluntary Remediation and Redevelopment Act.
West Virginia groundwater standards are referenced from the USEPA MCL's for Public Water Supplies Under the Safe Drinking Water Act.

(4) Arkansas soil and groundwater standards defer to and are referenced from the USEPA Region 6 Human Health Medium Specific Screening Levels 2007.

* Concetrations for groundwater are ug/l and soils are mg/kg unless otherwise designated.
ug/l = micrograms per liter
mg/l = milligrams per liter
mg/kg = milligrams per kilograms

APPENDIX C
STATE REFERENCE TABLES AND/OR GUIDANCE MATERIALS

STATE OF IOWA

Iowa

Chemical[?]	CASRN[?]	Statewide Standards[?] for a Protected Groundwater Source[?](mg/l)[?]	Statewide Standards[?] for a Non-Protected Groundwater Source[?](mg/l)[?]	Statewide Standards for Soil(mg/kg)[?]
Acenaphthene	000083-32-9	0.42	2.1	3400
Acetochlor	034256-82-1	0.14	0.7	1200
Acetone	000067-64-1	6.3	32	68000
Acrylamide	000079-06-1	0.000039	0.00078	0.69
Acrylonitrile	000107-13-1	0.00032	0.0065	5.7
Alachlor	015972-60-8	0.002	0.044	30
Aldicarb	000116-06-3	0.007	0.035	61
Aldicarb Sulfone	001646-88-4	0.007	0.035	61
Aldicarb Sulfoxide	001646-87-3	0.007	0.035	61
Aldrin	000309-00-2	0.000010	0.00021	0.14
Ametryn	000834-12-8	0.06	0.32	550
Ammonia	007664-41-7	30	150	340000
Ammonium Sulfamate	007773-06-0	2	10	16000
Anthracene	000120-12-7	2.1	10	17000
Antimony	007440-36-0	0.006	0.03	31
Arsenic, Inorganic	007440-38-2	0.01	0.05	1.9(19 w/ background)
Atrazine	001912-24-9	0.003	1.2	2100
Barium	007440-39-3	2	10	15000
Baygon	000114-26-1	0.003	0.14	240
Bentazon	025057-89-0	0.2	1	1800
Benzene	000071-43-2	0.005	0.10	88
Benzo[a]anthracene	000056-55-3	0.00024	0.0048	3.1
Benzo[a]pyrene	000050-32-8	0.0002	0.001	0.31
Benzo[b]fluoranthene	000205-99-2	0.00024	0.0048	3.1
Benzo[k]fluoranthene	000207-08-9	0.0024	0.048	31
Beryllium	007440-41-7	0.004	0.02	0.51(3.1 w/background)
Bis(2-chloroethyl)ether	000111-44-4	0.00016	0.0032	2.2
Bis(2-chloroisopropyl)ether	000108-60-1	0.3	1.5	2400

Iowa

Bis(2-ethylhexyl)phthalate	000117-81-7	0.006	0.25	170
Boron And Borates Only	007440-42-8	1	7	16000
Bromacil	000314-40-9	0.07	3.5	6100
Bromate	015541-45-4	0.01	0.05	4.5
Bromochloromethane	000074-97-5	0.09	0.45	760
Bromodichloromethane	000075-27-4	0.08	0.4	50
Bromoform	000075-25-2	0.08	0.44	390
Bromomethane	000074-83-9	0.01	0.05	110
Bromoxynil	001689-84-5	0.14	0.7	1200
Butyl Benzyl Phthlate	000085-68-7	0.14	1.8	1300
Butylate	002008-41-5	0.4	2	3800
Butylbenzene, n-	000104-51-8	2.1	10	23000
Cadmium (air)	007440-43-9	N/A	N/A	N/A
Cadmium (soil)	007440-43-9	N/A	N/A	70
Cadmium (water)	007440-43-9	0.005	0.025	N/A
Carbaryl	000063-25-2	0.19	3.9	2700
Carbazole	000086-74-8	0.0088	0.18	120
Carbofuran	001563-66-2	0.04	0.2	310
Carbon Disulfide	000075-15-0	0.7	3.5	7600
Carbon Tetrachloride	000056-23-5	0.005	0.027	24
Carboxin	005234-68-4	0.7	3.5	6100
Chloral Hydrate	000302-17-0	0.07	3.5	6100
Chloramben	000133-90-4	0.1	0.52	920
Chlordane (also CASRN 57-74-9)	012789-03-6	0.002	0.01	8.1
Chlorimuron, Ethyl-	090982-32-4	0.14	0.7	1200
Chlorine	007782-50-5	4	20	7800
Chlorine Cyanide	000506-77-4	0.35	1.8	3800
Chlorine Dioxide	010049-04-4	0.8	4	2300
Chlorite	007758-19-2	1	5	2300
Chloroaniline, p-	000106-47-8	0.028	0.14	240
Chlorobenzene	000108-90-7	0.1	0.7	1500
Chlorodibromoethane	073506-94-2	0.06	0.3	N/A
Chloroform	000067-66-3	0.08	0.57	510
Chloromethane	000074-87-3	0.03	0.27	240
Chloronaphthalene, Beta-	000091-58-7	0.56	2.8	4900
Chlorophenol, 2-	000095-57-8	0.04	0.2	310
Chlorothalonil	001897-45-6	0.016	0.32	220

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Chlorotoluene, o-	000095-49-8	0.1	0.7	1500
Chlorotoluene, p-	000106-43-4	0.1	0.7	1500
Chlorpyrifos	002921-88-2	0.002	0.10	180
Chromium (total) (water)	007440-47-3	0.1	0.5	N/A
Chromium (VI) (air)	018540-29-9	N/A	N/A	N/A
Chromium III (soil)	016065-83-1	10	52	97000
Chromium VI (soil)	018540-29-9	0.021	0.10	210
Chrysene	000218-01-9	0.024	0.48	310
Copper	007440-50-8	1.3	6.5	N/A
Cumene (Isopropylbenzene)	000098-82-8	0.7	3.5	7600
Cyanazine	021725-46-2	0.001	0.007	12
Cyanide (CN-)	000057-12-5	0.2	1	1500
Dacthal	001861-32-1	0.07	0.35	610
Dalapon, sodium salt	000075-99-0	0.2	1	1800
Di(2-ethylhexyl)adipate	000103-23-1	0.4	2.9	3700
Diazinon	000333-41-5	0.001	0.007	12
Dibenz[a,h]anthracene	000053-70-3	0.000024	0.00048	0.31
Dibromo-3-chloropropane, 1,2- (DBCP)	000096-12-8	0.0002	0.0025	2.2
Dibromochloromethane	000124-48-1	0.08	0.4	150
Dibromoethane, 1,2-	000106-93-4	0.00005	0.0018	1.5
Dibromomethane (Methylene Bromide)	000074-95-3	0.07	0.35	760
Dibutyl Phthalate	000084-74-2	0.7	3.5	6100
Dicamba	001918-00-9	4	20	1800
Dichlorobenzene, 1,2-	000095-50-1	0.6	3.2	5500
Dichlorobenzene, 1,3-	000541-73-1	0.6	3.2	5500
Dichlorobenzene, 1,4-	000106-46-7	0.075	0.38	610
Dichlorobenzidine, 3,3-	000091-94-1	0.00039	0.0078	5.4
Dichlorodifluoromethane	000075-71-8	1	7	15000
Dichlorodiphenyldichloroethane, p,p- (DDD)	000072-54-8	0.00073	0.015	10
Dichlorodiphenyldichloroethylene, p,p- (DDE)	000072-55-9	0.00051	0.010	7.1
Dichlorodiphenyltrichloroethane, p,p- (DDT)	000050-29-3	0.00051	0.010	8.6
Dichloroethane, 1,1-	000075-34-3	0.14	7	15000
Dichloroethane, 1,2-	000107-06-2	0.005	0.038	34
Dichloroethylene, 1,1-	000075-35-4	0.007	0.18	380

Iowa

Dichloroethylene, 1,2-cis-	000156-59-2	0.07	0.35	760
Dichloroethylene, 1,2-trans-	000156-60-5	0.1	0.7	1500
Dichlorophenol, 2,4-	000120-83-2	0.02	0.10	180
Dichlorophenoxy Acetic Acid, 2,4-(2,4-D)	000094-75-7	0.07	0.35	690
Dichlorophenoxy)butyric Acid, 4-(2,4-DB)	000094-82-6	0.056	0.28	610
Dichloropropane, 1,2-	000078-87-5	0.005	0.051	46
Dichloropropene, 1,3-	000542-75-6	0.0018	0.035	31
Dieldrin	000060-57-1	0.000011	0.00022	0.15
Diethyl Phthalate	000084-66-2	5.6	28	49000
Diisopropyl Methylphosphonate	001445-75-6	0.6	3	4900
Dimethrin	000070-38-2	2	10	18000
Dimethyl methylphosphonate	000756-79-6	0.1	0.7	1200
Dimethylphenol, 2,4-	000105-67-9	0.14	0.7	1500
Dinitrobenzene, m-	000099-65-0	0.001	0.005	6.1
Dinitrophenol, 2,4-	000051-28-5	0.014	0.07	120
Dinitrotoluene, 2,4-	000121-14-2	0.00026	0.0051	3.6
Dinitrotoluene, 2,6	000606-20-2	0.00026	0.0051	3.6
Dinoseb	000088-85-7	0.007	0.035	61
Dioxane, 1,4-	000123-91-1	0.016	0.32	280
Diphenamid	000957-51-7	0.2	1	1800
Diphenylamine	000122-39-4	0.18	0.88	1500
Diquat	000085-00-7	0.02	0.1	130
Disulfoton	000298-04-4	0.0007	0.0035	2.4
Dithiane, 1,4-	000505-29-3	0.08	0.4	610
Diuron	000330-54-1	0.0088	0.18	120
Endosulfan	000115-29-7	0.042	0.21	370
Endothall	000145-73-3	0.1	0.7	1200
Endrin	000072-20-8	0.002	0.010	18
Epichlorohydrin	000106-89-8	0.018	0.35	310
Ethylbenzene	000100-41-4	0.7	3.5	7600
Ethylene Glycol	000107-21-1	14	70	120000
Ethylene Thiourea	000096-45-7	0.0016	0.032	22
Fenamiphos	022224-92-6	0.0007	0.0088	15
Fluometuron	002164-17-2	0.09	0.46	790
Fluoranthene	000206-44-0	0.28	1.4	2300
Fluorene	000086-73-7	0.28	1.4	2300

Iowa

Fluoride	007681-49-4	4	20	4700
Fonofos	000944-22-9	0.01	0.07	120
Formaldehyde (air)	000050-00-0	N/A	N/A	N/A
Formaldehyde (soil & water)	000050-00-0	1	7	15000
Glyphosate	001071-83-6	0.7	3.5	6100
Heptachlor	000076-44-8	0.0004	0.002	0.54
Heptachlor Epoxide	001024-57-3	0.0002	0.001	0.27
Hexachlorobenzene	000118-74-1	0.001	0.005	1.5
Hexachlorobutadiene	000087-68-3	0.001	0.045	31
Hexachlorocyclohexane, Alpha-	000319-84-6	0.000028	0.00056	0.39
Hexachlorocyclohexane, Gamma- (Lindane)	000058-89-9	0.0002	0.0027	2.2
Hexachlorocyclopentadiene	000077-47-4	0.05	0.25	370
Hexachloroethane	000067-72-1	0.001	0.25	170
Hexane, N-	000110-54-3	0.42	2.1	4600
Hexazinone	051235-04-2	0.4	2	2000
HMX	002691-41-0	0.4	2	3100
Imazaquin	081335-37-7	1.8	8.8	15000
Indeno[1,2,3-cd]pyrene	000193-39-5	0.00024	0.0048	3.1
Isophorone	000078-59-1	0.1	3.7	2600
Isopropyl methylphosphonate	001832-54-8	0.7	3.5	6100
Kerb (Pronamide)	023950-58-5	0.0088	0.18	120
Lactofen	077501-63-4	0.014	0.07	120
Lead and Compounds	007439-92-1	0.015	0.075	400
Malathion	000121-75-5	0.1	0.7	1200
Maleic Hydrazide	000123-33-1	4	20	31000
Manganese	007439-96-5	0.3	4.9	10000
Mercury	007439-97-6	0.002	0.010	23
Methomyl	016752-77-5	0.2	1	1500
Methoxychlor	000072-43-5	0.04	0.2	310
Methyl Ethyl Ketone	000078-93-3	4	21	46000
Methyl Isobutyl Ketone	000108-10-1	0.56	2.8	6100
Methyl Parathion	000298-00-0	0.001	0.0088	15
Methyl tert-Butyl Ether (MTBE)	001634-04-4	0.021	1	2300
Methyl-4-chlorophenoxy propianic acid,2-	000094-74-6	0.03	0.15	31
Methylene Chloride (Dichloromethane)	000075-09-2	0.005	0.47	410

Iowa

Methylnaphthalene, 2	000091-57-6	0.028	0.14	240
Methylphenol, 2	000095-48-7	0.035	1.8	3100
Methylphenol, 4	000106-44-5	0.0035	0.18	310
Metolachlor	051218-45-2	0.7	5.2	9200
Metribuzin	021087-64-9	0.07	0.88	1500
Molybdenum	007439-98-7	0.04	0.2	390
Monochloramine (measured as free chlorine)	010599-90-3	4	20	7600
Naphthalene	000091-20-3	0.1	0.7	1100
Nickel	007440-02-0	0.1	0.7	1500
Nitrate (measured as Nitrogen)	014797-55-8	10	56	120000
Nitrite (measured as Nitrogen)	014797-65-0	1	5	7800
Nitrobenzene	000098-95-3	0.0035	0.018	31
Nitroguanidine	000556-88-7	0.7	3.5	6100
Nitrophenol, p-	000100-02-7	0.06	0.3	490
Nitroso-di-N-butylamine, N-	000924-16-3	0.000032	0.00065	0.45
Nitrosodiphenylamine, N-	000086-30-6	0.036	0.71	500
Octyl Phthalate, di-N-	000117-84-0	0.14	0.7	1200
Oxamyl	023135-22-0	0.2	1	1500
Paraquat	001910-42-5	0.03	0.16	270
Pendimethalin	040487-42-1	0.28	1.4	2400
Pentachlorophenol	000087-86-5	0.001	0.029	15
Perchlorate	007790-98-9	0.0049	0.024	55
Permethrin	052645-53-1	0.35	1.8	3100
Phenmedipham	013684-63-4	1.8	8.8	15000
Phenol	000108-95-2	2	10	18000
Phorate	000298-02-2	0.0014	0.007	12
Picloram	001918-02-1	0.5	2.5	4300
Polychlorinated Biphenyls (PCBs)	001336-36-3	0.0005	0.0035	2.2
Prometon	001610-18-0	0.1	0.52	920
Propachlor	001918-16-7	0.091	0.46	790
Propazine	000139-40-2	0.01	0.7	1200
Propham	000122-42-9	0.1	0.7	1200
Pursuit	081335-77-5	1.8	8.8	15000
Pyrene	000129-00-0	0.21	1	1700
RDX (Cyclotrimethylenenitramine)	000121-82-4	0.002	0.032	22
Selenium	007782-49-2	0.05	0.25	390

Iowa

Sethoxydim	074051-80-2	0.63	3.2	5500
Silver	007440-22-4	0.1	0.5	370
Silver Cyanide	000506-64-9	0.7	3.5	7800
Simazine	000122-34-9	0.004	0.18	310
Strontium	007440-24-6	4	21	47000
Styrene	000100-42-5	0.1	7	15000
TCDD, 2,3,7,8- (Dioxin)	001746-01-6	0.00000003	0.00000015	0.000019
Tebuthiuron	034014-18-1	0.5	2.5	4300
Terbacil	005902-51-2	0.09	0.46	790
Terbufos	013071-79-9	0.0004	0.002	3.1
Tetrachlorobenzene, 1,2,4,5-	000095-94-3	0.0021	0.010	23
Tetrachloroethane, 1,1,1,2-	000630-20-6	0.07	0.35	230
Tetrachloroethane, 1,1,2,2-	000079-34-5	0.0003	0.018	15
Tetrachloroethylene	000127-18-4	0.005	0.025	5.7
Thallium	007440-28-0	0.002	0.01	5.5
Toluene	000108-88-3	1	5	6100
Toxaphene	008001-35-2	0.003	0.015	2.2
Trichloro-1,2,2-trifluoroethane, 1,1,2-	000076-13-1	2.1	10	23000
Trichlorobenzene, 1,2,4-	000120-82-1	0.07	0.35	760
Trichloroethane, 1,1,1-	000071-55-6	0.2	1.2	2700
Trichloroethane, 1,1,2-	000079-00-5	0.005	0.061	54
Trichloroethylene	000079-01-6	0.005	0.025	7.7
Trichlorofluoromethane	000075-69-4	2	10	23000
Trichlorophenol, 2,4,5-	000095-95-4	0.7	3.5	6100
Trichlorophenol, 2,4,6-	000088-06-2	0.016	0.32	220
Trichlorophenoxy) Propionic Acid, 2(2,4,5-	000093-72-1	0.05	0.28	490
Trichlorophenoxyacetic Acid, 2,4,5- (2,4,5-T)	000093-76-5	0.07	0.35	610
Trichloropropane, 1,2,3-	000096-18-4	0.04	0.2	0.44
Trifluralin	001582-09-8	0.01	0.45	320
Trimethylbenzene, 1,2,4-	000095-63-6	0.35	1.8	3800
Trimethylbenzene, 1,3,5-	000108-67-8	0.35	1.8	3800
Trinitroglycerol (Nitroglycerin)	000055-63-0	0.005	0.025	N/A
Trinitrotoluene, 2,4,6- (TNT)	000118-96-7	0.002	0.12	81
Vanadium	007440-62-2	0.049	0.24	490
Vinyl Chloride	000075-01-4	0.002	0.01	2.1

Iowa

White Phosphorus	007723-14-0	0.0001	0.0007	1.6
Xylene, Mixture	001330-20-7	10	50	15000
Zinc	007440-66-6	2	10	23000

STATE OF ILLINOIS

Illinois Pollution control Board

Section 302.504 Chemical Constituents

The following concentrations of chemical constituents must not be exceeded, except as provided in Sections 302.102 and 302.530:

a) The following standards must be met in all waters of the Lake Michigan Basin. Acute aquatic life standards (AS) must not be exceeded at any time except for those waters for which the Agency has approved a zone of initial dilution (ZID) pursuant to Sections 302.102 and 302.530. Chronic aquatic life standards (CS) and human health standards (HHS) must not be exceeded outside of waters in which mixing is allowed pursuant to Section 302.102 and 302.530 by the arithmetic average of at least four consecutive samples collected over a period of at least four days. The samples used to demonstrate compliance with the CS or HHS must be collected in a manner which assures an average representation of the sampling period.

Constituent	STORET Number	Unit	AS	CS	HHS
Arsenic (Trivalent, dissolved)	22680	µg/L	340 X 1.0*=340	148 X 1.0*=48	NA
Cadmium (dissolved)	01025	µg/L	exp[A +Bln(H)] X {1.138672-[(lnH)(0.041838)]}*, where A=-3.6867 and B=1.128	exp[A +Bln(H)] X {1.101672-[(lnH)(0.041838)]}*, where A=-2.715 and B=0.7852	NA
Chromium (Hexavalent, total)	01032	µg/L	16	11	NA
Chromium (Trivalent, dissolved)	80357	µg/L	exp[A +Bln(H)] X 0.316*, where A=3.7256 and B=0.819	exp[A +Bln(H)] X 0.860*, where A=0.6848 and B=0.819	NA
Copper (dissolved)	01040	µg/L	exp[A +Bln(H)] X 0.960*, where A=-1.700 and	exp[A +Bln(H)] X 0.960*, where A=-1.702 and	NA

Constituent	STORET Number	Unit	AS	CS	HHS
			B=0.9422	B=0.8545	
Cyanide (Weak acid dissociable)	00718	µg/L	22	5.2	NA
Lead (dissolved)	01049	µg/L	exp[A +Bln(H)] X {1.46203-[(lnH)(0.145712)]}*, where A=-1.055 and B=1.273	exp[A +Bln(H)] X {1.46203-[(lnH)(0.145712)]}*, where A=-4.003 and B=1.273	NA
Nickel (dissolved)	01065	µg/L	exp[A +Bln(H)] X 0.998*, where A=2.255 and B=0.846	exp[A +Bln(H)] X 0.997*, where A=0.0584 and B=0.846	NA
Selenium (dissolved)	01145	µg/L	NA	5.0	NA
TRC	50060	µg/L	19	11	NA
Zinc (dissolved)	01090	µg/L	exp[A +Bln(H)] X 0.978*, where A=0.884 and B=0.8473	exp[A +Bln(H)] X 0.986*, where A=0.884 and B=0.8473	NA
Benzene	78124	µg/L	3900	800	310
Chlorobenzene	34301	mg/L	NA	NA	3.2
2,4-Dimethylphenol	34606	mg/L	NA	NA	8.7
2,4-Dinitrophenol	03756	mg/L	NA	NA	2.8
Endrin	39390	µg/L	0.086	0.036	NA
Ethylbenzene	78113	µg/L	150	14	NA

Constituent	STORET Number	Unit	AS	CS	HHS
Hexachloroethane	34396	µg/L	NA	NA	6.7
Methylene chloride	34423	mg/L	NA	NA	2.6
Parathion	39540	µg/L	0.065	0.013	NA
Pentachlorophenol	03761	µg/L	exp B ([pH] +A), where A=-4.869 and B=1.005	exp B ([pH] +A), where A=-5.134 and B=1.005	NA
Toluene	78131	mg/L	2000	610	51.0
Tricholroethylene	39180	µg/L	NA	NA	370
Xylene(s)	81551	µg/L	1200	490	NA

Where:

NA = Not Applied

Exp[x] = base of natural logarithms raised to the x-power

ln(H) = natural logarithm of Hardness (STORET 00900)

* = conversion factor multiplier for dissolved metals

b) The following water quality standards must not be exceeded at any time in any waters of the Lake Michigan Basin, unless a different standard is specified under subsection (c) of this Section.

Constituent	STORET Number	Unit	Water Quality Standard
Barium (total)	01007	mg/L	5.0
Boron (total)	01022	mg/L	1.0
Chloride (total)	00940	mg/L	500
Fluoride	00951	mg/L	1.4

Constituent	STORET Number	Unit	Water Quality Standard
Iron (dissolved)	01046	mg/L	1.0
Manganese (total)	01055	mg/L	1.0
Phenols	32730	mg/L	0.1
Sulfate	00945	mg/L	500
Total Dissolved Solids	70300	mg/L	1000

c) In addition to the standards specified in subsections (a) and (b) of this Section, the following standards must not be exceeded at any time in the Open Waters of Lake Michigan as defined in Section 302.501.

Constituent	STORET Number	Unit	Water Quality Standard
Arsenic (total)	01002	µg/L	50.0
Barium (total)	01007	mg/L	1.0
Chloride	00940	mg/L	12.0
Iron (dissolved)	01046	mg/L	0.30
Lead (total)	01051	µg/L	50.0
Manganese (total)	01055	mg/L	0.15
Nitrate-Nitrogen	00620	mg/L	10.0
Phosphorus	00665	µg/L	7.0
Selenium (total)	01147	µg/L	10.0
Sulfate	00945	mg/L	24.0
Total Dissolved Solids	70300	mg/L	180.0
Oil (hexane solubles or equivalent)	00550, 00556 or	mg/L	0.10

Constituent	STORET Number	Unit	Water Quality Standard
	00560		
Phenols	32730	µg/L	1.0

d) In addition to the standards specified in subsections (a), (b) and (c) of this Section, the following human health standards (HHS) must not be exceeded in the Open Waters of Lake Michigan as defined in Section 302.501 by the arithmetic average of at least four consecutive samples collected over a period of at least four days. The samples used to demonstrate compliance with the HHS must be collected in a manner which assures an average representation of the sampling period.

Constituent	STORET Number	Unit	Water Quality Standard
Benzene	34030	µg/L	12.0
Chlorobenzene	34301	µg/L	470.0
2,4-Dimethylphenol	34606	µg/L	450.0
2,4-Dinitrophenol	03757	µg/L	55.0
Hexachloroethane (total)	34396	µg/L	5.30
Lindane	39782	µg/L	0.47
Methylene chloride	34423	µg/L	47.0
Toluene	78131	mg/L	5.60
Trichloroethylene	39180	µg/L	29.0

e) For the following bioaccumulative chemicals of concern (BCCs), acute aquatic life standards (AS) must not be exceeded at any time in any waters of the Lake Michigan Basin and chronic aquatic life standards (CS), human health standards (HHS), and wildlife standards (WS) must not be exceeded in any waters of the Lake Michigan Basin by the arithmetic average of at least four consecutive samples collected over a period of at least four days subject to the limitations of Sections 302.520 and 302.530. The samples used to demonstrate compliance with

the HHS and WS must be collected in a manner that assures an average representation of the sampling period.

Constituent	STORET Number	Unit	AS	CS	HHS	WS
Mercury (total)	71900	ng/L	1,700	910	3.1	1.3
Chlordane	39350	ng/L	NA	NA	0.25	NA
DDT and metabolites	39370	pg/L	NA	NA	150	11.0
Dieldrin	39380	ng/L	240	56	0.0065	NA
Hexachlorobenzene	39700	ng/L	NA	NA	0.45	NA
Lindane	39782	μg/L	0.95	NA	0.5	NA
PCBs (class)	79819	pg/L	NA	NA	26	120
2,3,7,8-TCDD	03556	fg/L	NA	NA	8.6	3.1
Toxaphene	39400	pg/L	NA	NA	68	NA

Where: mg/L = milligrams per liter (10^{-3} grams per liter)

μg/L = micrograms per liter (10^{-6} grams per liter)

ng/L = nanograms per liter (10^{-9} grams per liter)

pg/L = picograms per liter (10^{-12} grams per liter)

fg/L = femtograms per liter (10^{-15} grams per liter)

NA = Not Applied

Section 742.APPENDIX A: General

Section 742.TABLE A: Soil Saturation Limits (C_{sat})for Chemicals Whose Melting Point is Less than 30° C

CAS No.	Chemical Name	C_{sat} (mg/kg)
67-64-1	Acetone	100,000
71-43-2	Benzene	870
111-44-4	Bis(2-chloroethyl)ether	3,300
117-81-7	Bis(2-ethylhexyl)phthalate	31,000
75-27-4	Bromodichloromethane (Dichlorobromomethane)	3,000
75-25-2	Bromoform	1,900
71-36-3	Butanol	10,000
85-68-7	Butyl benzyl phthalate	930
75-15-0	Carbon disulfide	720
56-23-5	Carbon tetrachloride	1,100
108-90-7	Chlorobenzene (Monochlorobenzene)	680
124-48-1	Chlorodibromomethane (Dibromochloromethane)	1,300
67-66-3	Chloroform	2,900
96-12-8	1,2-Dibromo-3-chloropropane	1,400
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	2,800
84-74-2	Di-*n*-butyl phthalate	2,300
95-50-1	1,2-Dichlorobenzene (o-Dichlorobenzene)	560
75-34-3	1,1-Dichloroethane	1,700
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	1,800
75-35-4	1,1-Dichloroethylene	1,500
156-59-2	*cis*-1,2-Dichloroethylene	1,200
156-60-5	*trans*-1,2-Dichloroethylene	3,100
78-87-5	1,2-Dichloropropane	1,100
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	1,400
84-66-2	Diethyl phthalate	2,000
117-84-0	Di-*n*-octyl phthalate	10,000
100-41-4	Ethylbenzene	400
77-47-4	Hexachlorocyclopentadiene	2,200
78-59-1	Isophorone	4,600

74-83-9	Methyl bromide (Bromomethane)	3,200
1634-04-4	Methyl tertiary-butyl ether	8,800
75-09-2	Methylene chloride (Dichloromethane)	2,400
98-95-3	Nitrobenzene	1,000
100-42-5	Styrene	1,500
127-18-4	Tetrachloroethylene (Perchloroethylene)	240
108-88-3	Toluene	650
120-82-1	1,2,4-Trichlorobenzene	3,200
71-55-6	1,1,1-Trichloroethane	1,200
79-00-5	1,1,2-Trichloroethane	1,800
79-01-6	Trichloroethylene	1,300
108-05-4	Vinyl acetate	2,700
75-01-4	Vinyl chloride	1,200
108-38-3	m-Xylene	420
95-47-6	o-Xylene	410
106-42-3	p-Xylene	460
1330-20-7	Xylenes (total)	320
	Ionizable Organics	
95-57-8	2-Chlorophenol	53,000

(Source: Amended at 26 Ill. Reg. 2683, effective February 5, 2002)

Section 742.TABLE I Chemicals Whose Tier 1 Class I Groundwater Remediation Objective Exceeds the 1 in 1,000,000 Cancer Risk Concentration

Chemical	Class I Groundwater Remediation Objective (mg/L)	1 in 1,000,000 Cancer Risk Concentration (mg/L)	ADL (mg/L)
Aldrin	0.014	0.000005	0.014
Benzo(a)pyrene	0.0002	0.000012	0.00023
Bis(2-chloroethyl)ether	0.01	0.000077	0.01
Bis(2-ethylhexyl)phthalate (Di(2-ethylhexyl)phthalate)	0.006	0.0061	0.0027
Carbon Tetrachloride	0.005	0.00066	0.0001
Chlordane	0.002	0.000066	0.00014
DDD	0.014	0.00023	0.014
DDE	0.01	0.00023	0.01
DDT	0.006	0.00023	0.006
Dibenzo(a,h)anthracene	0.0003	0.000012	0.0003
1,2-Dibromo-3-chloropropane	0.0002	0.000061	0.001
1,2-Dibromoethane	0.00005	0.00002	0.001
3,3'-Dichlorobenzidine	0.02	0.00019	0.02
1,2-Dichloroethane	0.005	0.00094	0.0003
Dieldrin	0.009	0.0000053	0.009
2,6-Dinitrotoluene	0.00031	0.0001	0.00031
Heptachlor	0.0004	0.000019	0.013
Heptachlor epoxide	0.0002	0.0000094	0.015
Hexachlorobenzene	0.00006	0.000053	0.00006
Alpha-HCH	0.00011	0.000014	0.000111
Tetrachloroethylene	0.005	0.0016	0.0004
Toxaphene	0.003	0.000077	0.00086
Vinyl chloride	0.002	0.000045	0.0002
Ionizable Organics			
N-Nitrosodi-n-propylamine	0.0018	0.000012	0.0018
Pentachlorophenol	0.001	0.00071	0.000076
2,4,6-Trichlorophenol	0.01	0.007	0.01
Inorganics			
Arsenic	0.05	0.000057	0.001

(Source: Appendix A, Table I renumbered from Appendix A, Table H and amended at 31 Ill. Reg. 4063, effective February 23, 2007)

Section 742.APPENDIX B Tier 1 Illustrations and Tables

Section 742.Table B Tier 1 Soil Remediation Objectives[a] for Industrial/Commercial Properties

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
83-32-9	Acenaphthene	120,000[b]	-----[c]	120,000[b]	-----[c]	570[b]	2,900	*
67-64-1	Acetone	----[g]	100,000[d]	----[g]	100,000[d]	25[b]	25	*
15972-60-8	Alachlor[o]	72[e]	-----[c]	1,600[e]	-----[c]	0.04	0.2	NA
116-06-3	Aldicarb[o]	2,000[b]	-----[c]	200[b]	-----[c]	0.013	0.07	NA
309-00-2	Aldrin	0.3[e]	6.6[e]	6.1[b]	9.3[e]	0.5[e]	2.5	0.94
120-12-7	Anthracene	610,000[b]	-----[c]	610,000[b]	-----[c]	12,000[b]	59,000	*
1912-24-9	Atrazine[o]	72,000[b]	-----[c]	7,100[b]	-----[c]	0.066	0.33	NA
71-43-2	Benzene	100[e]	1.6[e]	2,300[e]	2.2[e]	0.03	0.17	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
56-55-3	Benzo(*a*)anthracene	8[e]	-----[c]	170[e]	-----[c]	2	8	*
205-99-2	Benzo(*b*)fluoranthene	8[e]	-----[c]	170[e]	-----[c]	5	25	*
207-08-9	Benzo(*k*)fluroanthene	78[e]	-----[c]	1,700[e]	-----[c]	49	250	*
50-32-8	Benzo(*a*)pyrene	0.8[e,x]	-----[c]	17[e]	-----[c]	8	82	*
111-44-4	Bis(2-chloroethyl)ether	5[e]	0.47[e]	75[e]	0.66[e]	0.0004[e,]	0.0004	0.66
117-81-7	Bis(2-ethylhexyl)phthalate	410[e]	31,000[d]	4,100[b]	31,000[d]	3,600	31,000[d]	*
75-27-4	Bromodichloromethane (Dichlorobromomethane)	92[e]	3,000[d]	2,000[e]	3,000[d]	0.6	0.6	*
75-25-2	Bromoform	720[e]	100[e]	16,000[e]	140[e]	0.8	0.8	*
71-36-3	Butanol	200,000[b]	10,000[d]	200,000[b]	10,000[d]	17[b]	17	NA
85-68-7	Butyl benzyl phthalate	410,000[b]	930[d]	410,000[b]	930[d]	930[d]	930[d]	*
86-74-8	Carbazole	290[e]	-----[c]	6,200[e]	-----[c]	0.6[e]	2.8	NA

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
1563-66-2	Carbofuran[o]	10,000[b]	-----[c]	1,000[b]	-----[c]	0.22	1.1	NA
75-15-0	Carbon disulfide	200,000[b]	720[d]	20,000[b]	9.0[b]	32[b]	160	*
56-23-5	Carbon tetrachloride	44[e]	0.64[e]	410[b]	0.90[e]	0.07	0.33	*
57-74-9	Chlordane	16[e]	140[e]	100[b]	22[b]	10	48	*
106-47-8	4 – Chloroaniline (*p*-Chloroaniline)	8,200[b]	-----[c]	820[b]	-----[c]	0.7[b]	0.7	*
108-90-7	Chlorobenzene (Monochlorobenzene)	41,000[b]	210[b]	4,100[b]	1.3[b]	1	6.5	*
124-48-1	Chlorodibromomethane (Dibromochloromethane)	41,000[b]	1,300[d]	41,000[b]	1,300[d]	0.4	0.4	*
67-66-3	Chloroform	940[e]	0.54[e]	2,000[b]	0.76[e]	0.6	2.9	*
218-01-9	Chrysene	780[e]	-----[c]	17,000[e]	-----[e]	160	800	*
94-75-7	2,4-D[o]	20,000[b]	-----[c]	2,000[b]	-----[c]	1.5	7.7	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
75-99-0	Dalapon[o]	61,000[b]	-----[c]	6,100[b]	-----[c]	0.85	8.5	*
72-54-8	DDD	24[e]	-----[c]	520[e]	-----[c]	16[e]	80	*
72-55-9	DDE	17[e]	-----[c]	370[e]	-----[c]	54[e]	270	*
50-29-3	DDT	17[e]	1,500[e]	100[b]	2,100[e]	32[e]	160	*
53-70-3	Dibenzo(*a*,*h*)anthracene	0.8[e]	-----[c]	17[e]	-----[c]	2	7.6	*
96-12-8	1,2-Dibromo-3-chloropropane	4[e]	17[b]	89[e]	0.11[b]	0.002	0.02	*
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	2.9[e]	0.12[e]	62[e]	0.16[e]	0.0004	0.004	0.005
84-74-2	Di-*n*-butyl phthalate	200,000[b]	2,300[d]	200,000[b]	2,300[d]	2,300[d]	2,300[d]	*
95-50-1	1,2-Dichlorobenzene (*o* – Dichlorobenzene)	180,000[b]	560[d]	18,000[b]	310[b]	17	43	*
106-46-7	1,4-Dichlorobenzene (*p* – Dichlorobenzene)	-----[c]	17,000[b]	-----[c]	340[b]	2	11	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
91-94-1	3,3'-Dichlorobenzidine	13[e]	-----[c]	280[e]	-----[c]	0.007[e,]	0.033	1.3
75-34-3	1,1-Dichloroethane	200,000[b]	1,700[d]	200,000[b]	130[b]	23[b]	110	*
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	63[e]	0.70[e]	1,400[e]	0.99[e]	0.02	0.1	*
75-35-4	1,1-Dichloroethylene	100,000[b]	470[b]	10,000[b]	3.0[b]	0.06	0.3	*
156-59-2	*cis*-1,2-Dichloroethylene	20,000[b]	1,200[d]	20,000[b]	1,200[d]	0.4	1.1	*
156-60-5	*Trans*-1,2-Dichloroethylene	41,000[b]	3,100[d]	41,000[b]	3,100[d]	0.7	3.4	*
78-87-5	1,2-Dichloropropane	84[e]	23[b]	1,800[e]	0.50[b]	0.03	0.15	*
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	57[e]	2.1[e]	1,200[e]	0.39[b]	0.004[e]	0.02	0.005
60-57-1	Dieldrin[n]	0.4[e]	2.2[e]	7.8[e]	3.1[e]	0.004[e]	0.02	0.603
84-66-2	Diethyl phthalate	1,000,000[b]	2,000[d]	1,000,000[b]	2,000[d]	470[b]	470	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
105-67-9	2,4-Dimethylphenol	41,000[b]	-----[c]	41,000[b]	-----[c]	9[b]	9	*
121-14-2	2,4-Dinitrotoluene	8.4[e]	-----[c]	180[e]	-----[c]	0.0008[e,]	0.0008	0.250
606-20-2	2,6-Dinitrotoluene	8.4[e]	-----[c]	180[e]	-----[c]	0.0007[e,]	0.0007	0.260
117-84-0	Di-*n*-octyl phthalate	41,000[e]	10,000[d]	4,100[b]	10,000[d]	10,000[d]	10,000[d]	*
115-29-7	Endosulfan[o]	12,000[b]	-----[c]	1,200[b]	-----[c]	18[b]	90	*
145-73-3	Endothall[o]	41,000[c]	-----[c]	4,100[b]	-----[c]	0.4	0.4	NA
72-20-8	Endrin	610[b]	-----[c]	61[b]	-----[c]	1	5	*
100-41-4	Ethylbenzene	200,000[b]	400[d]	20,000[b]	58[b]	13	19	*
206-44-0	Fluoranthene	82,000[b]	-----[c]	82,000[b]	-----[c]	4,300[b]	21,000	*
86-73-7	Fluorene	82,000[b]	-----[c]	82,000[b]	-----[c]	560[b]	2,800	*
76-44-8	Heptachlor	1[e]	11[e]	28[e]	16[e]	23	110	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
1024-57-3	Heptachlor epoxide	0.6[e]	9.2[e]	2.7[b]	13[e]	0.7	3.3	1.005
118-74-1	Hexachlorobenzene	4[e]	1.8[e]	78[e]	2.6[e]	2	11	*
319-84-6	*Alpha*-HCH (*alpha*-BHC)	0.9[e]	1.5[e]	20[e]	2.1[e]	0.0005[e,]	0.003	0.0074
58-89-9	*Gamma*-HCH (Lindane)[n]	4[e]	-----[c]	96[e]	-----[c]	0.009	0.047	*
77-47-4	Hexachlorocyclopentadiene	14,000[b]	16[b]	14,000[b]	1.1[b]	400	2,200[d]	*
67-72-1	Hexachloroethane	2,000[b]	-----[c]	2,000[b]	-----[c]	0.5[b]	2.6	*
193-39-5	Indeno(1,2,3-*c,d*)pyrene	8[e]	-----[c]	170[e]	-----[c]	14	69	*
78-59-1	Isophorone	410,000[b]	4,600[d]	410,000[b]	4,600[d]	8[b]	8	*
72-43-5	Methoxychlor[o]	10,000[b]	-----[c]	1,000[b]	-----[c]	160	780	*
74-83-9	Methyl bromide (Bromomethane)	2,900[b]	15[b]	1,000[b]	3.9[b]	0.2[b]	1.2	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
1634-04-4	Methyl tertiary-butyl ether	20,000[b]	8,800[d]	2,000[b]	140[b]	0.32	0.32	*
75-09-2	Methylene chloride (Dichloromethane)	760[e]	24[e]	12,000[b]	34[e]	0.02[e]	0.2	*
95-48-7	2-Methylphenol (*o* – Cresol)	100,000[b]	-----[c]	100,000[b]	-----[c]	15[b]	15	*
86-30-6	*N*-Nitrosodiphenylamine	1,200[e]	-----[c]	25,000[e]	-----[c]	1[e]	5.6	*
621-64-7	*N*-Nitrosodi-*n*-propylamine	0.8[e]	-----[c]	18[e]	-----[c]	0.00005[e]	0.00005	0.0018
91-20-3	Naphthalene	41,000[b]	270[b]	4,100[b]	1.8[b]	12[b]	18	*
98-95-3	Nitrobenzene	1,000[b]	140[b]	1,000[b]	9.4[b]	0.1[b]	0.1	0.26
108-95-2	Phenol	610,000[b]	-----[c]	61,000[b]	-----[c]	100[b]	100	*
1918-02-1	Picloram[o]	140,000[b]	-----[c]	14,000[b]	-----[c]	2	20	NA
1336-36-3	Polychlorinated biphenyls (PCBs)[n]	1[h]	-----[c,h]	1[h]	-----[c,h]	-----[h]	-----[h]	*
129-00-0	Pyrene	61,000[b]	-----[c]	61,000[b]	-----[c]	4,200[b]	21,000	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
122-34-9	Simazine[o]	10,000[b]	-----[c]	1,000[b]	-----[c]	0.04	0.37	NA
100-42-5	Styrene	410,000[b]	1,500[d]	41,000[b]	430[b]	4	18	*
127-18-4	Tetrachloroethylene (Perchloroethylene)	110[e]	20[e]	2,400[e]	28[e]	0.06	0.3	*
108-88-3	Toluene	410,000[b]	650[d]	410,000[b]	42[b]	12	29	*
8001-35-2	Toxaphene[n]	5.2[e]	170[e]	110[e]	240[e]	31	150	*
120-82-1	1,2,4-Trichlorobenzene	20,000[b]	3,200[d]	2,000[b]	920[b]	5	53	*
71-55-6	1,1,1-Trichloroethane	-----[c]	1,200[d]	-----[c]	1,200[d]	2	9.6	*
79-00-5	1,1,2-Trichloroethane	8,200[b]	1,800[d]	8,200[b]	1,800[d]	0.02	0.3	*
79-01-6	Trichloroethylene	520[e]	8.9[e]	1,200[b]	12[e]	0.06	0.3	*
108-05-4	Vinyl acetate	1,000,000[b]	1,600[b]	200,000[b]	10[b]	170[b]	170	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
75-01-4	Vinyl chloride	7.9[e]	1.1[e]	170[e]	1.1[b]	0.01	0.07	*
108-38-3	m-Xylene	410,000[b]	420[d]	41,000[b]	6.4[b]	210	210	*
95-47-6	o-Xylene	410,000[b]	410[d]	41,000[b]	6.5[b]	190	190	*
106-42-3	p-Xylene	410,000[b]	460[d]	41,000[b]	5.9[b]	200	200	*
1330-20-7	Xylenes (total)	410,000[b]	320[d]	41,000[b]	5.6[b]	150	150	*
	Ionizable Organics							
65-85-0	Benzoic Acid	1,000,000[b]	-----[c]	820,000[b]	-----[c]	400[b,i]	400[i]	*
95-57-8	2-Chlorophenol	10,000[b]	53,000[d]	10,000[b]	53,000[d]	4[b, i]	20[i]	*
120-83-2	2,4-Dichlorophenol	6,100[b]	-----[c]	610[b]	-----[c]	1[b, i]	1[i]	*
51-28-5	2,4-Dinitrophenol	4,100[b]	-----[c]	410[b]	-----[c]	0.2[b, i]	0.2[i]	3.3
88-85-7	Dinoseb[o]	2,000[b]	-----[c]	200[b]	-----[c]	0.34[b, i]	3.4[i]	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/kg)	ClassII (mg/kg)	ADL (mg/kg)
87-86-5	Pentachlorophenol	24[e,j]	-----[c]	520[e,j]	-----[c]	0.03 [i]	0.14[i]	*
93-72-1	2,4,5-TP (Silvex)	16,000[b]	-----[c]	1,600[b]	-----[c]	11[i]	55[i]	*
95-95-4	2,4,5-Trichlorophenol	200,000[b]	-----[c]	200,000[b]	-----[c]	270[b, i]	1,400[i]	*
88-06-2	2,4,6- Trichlorophenol	520[e]	390[e]	11,000[e]	540[e]	0.2[e, i]	0.77[i]	0.66

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	***ADL*** (mg/kg)
	Inorganics							
7440-36-0	Antimony	820[b]	-----[c]	82[b]	-----[c]	0.006[m]	0.024[m]	*
7440-38-2	Arsenic[l,n]	---[t]	1,200[e]	61[b]	25,000[e]	0.05[m]	0.2[m]	*
7440-39-3	Barium	140,000[b]	910,000[b]	14,000[b]	870,000[b]	2.0[m]	2.0[m]	*
7440-41-7	Beryllium	4,100[b]	2,100[e]	410[b]	44,000[e]	0.004[m]	0.5[m]	*
7440-42-8	Boron	410,000[b]	---[c]	41,000[b]	---[c]	2.0[m]	2.0[m]	*
7440-43-9	Cadmium[l,n]	2,000[b,r]	2,800[e]	200[b,r]	59,000[e]	0.005[m]	0.05[m]	*
7440-70-2	Calcium[n]	---[g]	---[c]	---[g]	---[c]	---[c]	---[c]	*
16887-00-6	Chloride	-------[c]	-----[c]	-----[c]	-----[c]	200[m]	200[m]	*
7440-47-3	Chromium, total	6,100 [b]	420[e]	4,100[b]	690[b]	0.1[m]	1.0[m]	*
16065-83-1	Chromium, ion, trivalent	1,000,000[b]	-----[c]	310,000[b]	-----[c]	-----[g]	-----[g]	*
18540-29-9	Chromium, ion, hexavalent	6,100[b]	420[e]	4,100[b]	690[b]	-----	-----	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	***ADL*** (mg/kg)
7440-48-4	Cobalt	120,000[b]	-----[c]	12,000[b]	-----[c]	1.0[m]	1.0[m]	*
7440-50-8	Copper[n]	82,000[b]	-----[c]	8,200[b]	-----[c]	0.65[m]	0.65[m]	*
57-12-5	Cyanide (amenable)	41,000[b]	-----[c]	4,100[b]	-----[c]	0.2[q,m]	0.6[q,m]	*
7782-41-4	Fluoride	120,000[b]	-----[c]	12,000[b]	-----[c]	4.0[m]	4.0[m]	*
15438-31-0	Iron	-----[c]	-----[c]	-----[c]	-----[c]	5.0[m]	5.0[m]	*
7439-92-1	Lead	800[y]	-----[c]	700[y]	-----[c]	0.0075[m]	0.1[m]	*
7439-95-4	Magnesium[n]	---[g]	---[c]	730,000	---[c]	---[c]	---[c]	*
7439-96-5	Manganese	41,000 [b,w]	91,000[b]	4,100 [b,w]	8,700[b]	0.15[m]	10.0[m]	*
7439-97-6	Mercury[l,n,s]	610[b]	16[b]	61[b]	0.1[b]	0.002[m]	0.01[m]	*
7440-02-0	Nickel[l]	41,000[b]	21,000[e]	4,100[b]	440,000[e]	0.1[m]	2.0[m]	*
14797-55-8	Nitrate as N[p]	1,000,000[b]	-----[c]	330,000[b]	-----[c]	10.0[q, m]	100[q]	*
7723-14-0	Phosphorus[n]	---[g]	---[c]	---[g]	---[c]	---[c]	---[c]	*

		Exposure Route-Specific Values for Soils				Soil Component of the Groundwater Ingestion Exposure Route Values		
		Industrial-Commercial		Construction Worker				
CAS No.	Chemical Name	Ingestion (mg/kg)	Inhalation (mg/kg)	Ingestion (mg/kg)	Inhalation (mg/kg)	Class I (mg/L)	Class II (mg/L)	***ADL*** (mg/kg)
7440-09-7	Potassium[n]	---[g]	---[c]	---[g]	---[c]	---[c]	---[c]	*
7782-49-2	Selenium[l,n]	10,000[b]	-----[c]	1,000[b]	-----[c]	0.05[m]	0.05[m]	*
7440-22-4	Silver	10,000[b]	-----[c]	1,000[b]	-----[c]	0.05[m]	-----	*
7440-23-5	Sodium[n]	---[g]	---[c]	---[g]	---[c]	---[c]	---[c]	*
14808-79-8	Sulfate	-----[c]	-----[c]	-----[c]	-----[c]	400[m]	400[m]	*
7440-28-0	Thallium	160[b,u]	-----[c]	160[b,u]	-----[c]	0.002[m]	0.02[m]	*
7440-62-2	Vanadium	14,000[b]	-----[c]	1,400[b]	-----[c]	0.049[m]	0.1[m]	*
7440-66-6	Zinc[l]	610,000[b]	-----[c]	61,000[b]	-----[c]	5.0[m]	10[m]	*

"*" indicates that the ADL is less than or equal to the specified remediation objective.

NA means Not Available; no PQL or EQL available in USEPA analytical methods.

Chemical Name and Soil Remediation Objective Notations (2nd, 5th thru 8th Columns)

[a] oil remediation objectives based on human health criteria only.
[b] Calculated values correspond to a target hazard quotient of 1.
[c] No toxicity criteria available for this route of exposure.
[d] Soil saturation concentration ($C_{[sat]}$) = the concentration at which the absorptive limits of the soil particles, the solubility limits of the available soil moisture, and saturation of soil pore air have been reached. Above the soil saturation concentration, the assumptions regarding vapor transport to air and/or dissolved phase transport to groundwater (for chemicals which are liquid at ambient soil temperatures) have been violated, and alternative modeling approaches are required.
[e] Calculated values correspond to a cancer risk level of 1 in 1,000,000.
[g] Chemical-specific properties are such that this route is not of concern at any soil contaminant concentration.
[h] 40 CFR 761 contains applicability requirements and methodologies for the development of PCB remediation objectives. Requests for approval of a Tier 3 evaluation must address the applicability of 40 CFR 761.

[i] Soil remediation objective for pH of 6.8. If soil pH is other than 6.8, refer to Appendix B, Tables C and D in this Part.
[j] Ingestion soil remediation objective adjusted by a factor of 0.5 to account for dermal route.
[l] Potential for soil-plant-human exposure.
[m] The person conducting the remediation has the option to use: (1) TCLP or SPLP test results to compare with the remediation objectives listed in this Table; (2) the total amount of contaminant in the soil sample results to compare with pH specific remediation objectives listed in Appendix B, Table C or D of this Part (see Section 742.510); or (3) the appropriate background value listed in Appendix A, Table G. If the person conducting the remediation wishes to calculate soil remediation objectives based on background concentrations, this should be done in accordance with Subpart D of this Part.
[n] The Agency reserves the right to evaluate the potential for remaining contaminant concentrations to pose significant threats to crops, livestock, or wildlife.
[o] For agrichemical facilities, remediation objectives for surficial soils which are based on field application rates may be more appropriate for currently registered pesticides. Consult the Agency for further information.
[p] For agrichemical facilities, soil remediation objectives based on site-specific background concentrations of Nitrate as N may be more appropriate. Such determinations shall be conducted in accordance with the procedures set forth in Subparts D and I of this Part.
[q] The TCLP extraction must be done using water at a pH of 7.0.
[r] Value based on dietary Reference Dose.
[s] Value for Ingestion based on Reference Dose for Mercuric chloride (CAS No. 7487-94-7); value for Inhalation based on Reference Concentration for elemental Mercury (CAS No. 7439-97-6). Inhalation remediation objective only applies at sites where elemental mercury is a contaminant of concern.
[t] For the ingestion route for arsenic for industrial/commercial, see 742.Appendix A, Table G.
[u] Value based on Reference Dose for Thallium sulfate (CAS No. 7446-18-6).
[w] Value based on Reference Dose adjusted for dietary intake.
[x] For any populated areas as defined in Section 742.200, Appendix A, Table H may be used.
[y] Value based on maintaining fetal blood lead below 10 ug/d1, using the USEPA adults Blood Lead Model.

(Source: Amended at 31 Ill. Reg. 4063, effective February 23, 2007)

Section 742.APPENDIX B Tier 1 Illustrations and Tables

Section 742.TABLE E Tier 1 Groundwater Remediation Objectives for the Groundwater Component of the Groundwater Ingestion Route

		Groundwater Remediation Objective	
CAS No.	Chemical Name Organics	Class I (mg/L)	Class II (mg/L)
83-32-9	Acenaphthene	0.42	2.1
67-64-1	Acetone	6.3	6.3
15972-60-8	Alachlor	0.002[c]	0.01[c]
116-06-3	Aldicarb	0.003[c]	0.015[c]
309-00-2	Aldrin	0.014[a]	0.07
120-12-7	Anthracene	2.1	10.5
1912-24-9	Atrazine	0.003[c]	0.015[c]
71-43-2	Benzene	0.005[c]	0.025[c]
56-55-3	Benzo(*a*)anthracene	0.00013[a]	0.00065
205-99-2	Benzo(*b*)fluoranthene	0.00018[a]	0.0009
207-08-9	Benzo(*k*)fluroanthene	0.00017[a]	0.00085
50-32-8	Benzo(*a*)pyrene	0.0002[a,c]	0.002[c]
65-85-0	Benzoic Acid	28	28
111-44-4	Bis(2-chloroethyl)ether	0.01[a]	0.01
117-81-7	Bis(2-ethylhexyl)phthalate (Di(2-ethylhexyl)phthalate)	0.006[c]	0.06[c]
75-27-4	Bromodichloromethane (Dichlorobromomethane)	0.0002[a]	0.0002
75-25-2	Bromoform	0.001[a]	0.001
71-36-3	Butanol	0.7	0.7
85-68-7	Butyl benzyl phthalate	1.4	7.0
86-74-8	Carbazole	---	---
1563-66-2	Carbofuran	0.04[c]	0.2[c]
75-15-0	Carbon disulfide	0.7	3.5
56-23-5	Carbon tetrachloride	0.005[c]	0.025[c]
57-74-9	Chlordane	0.002[c]	0.01[c]

		Groundwater Remediation Objective	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
106-47-8	4-Chloroaniline (ρ-Chloroaniline)	0.028	0.028
108-90-7	Chlorobenzene (Monochlorobenzene)	0.1[c]	0.5[c]
124-48-1	Chlorodibromomethane (Dibromochloromethane)	0.14	0.14
67-66-3	Chloroform	0.0002[a]	0.001
95-57-8	2-Chlorophenol (pH 4.9-7.3)	0.035	0.175
	2-Chlorophenol (pH 7.4-8.0)	0.035	0.035
218-01-9	Chrysene	0.0015[a]	0.0075
94-75-7	2,4-D	0.07[c]	0.35[c]
75-99-0	Dalapon	0.2[c]	2.0[c]
72-54-8	DDD	0.014[a]	0.07
72-55-9	DDE	0.01[a]	0.05
50-29-3	DDT	0.006[a]	0.03
53-70-3	Dibenzo(*a,h*)anthracene	0.0003[a]	0.0015
96-12-8	1,2-Dibromo-3-chloropropane	0.0002[c]	0.002 [c]
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.00005[c]	0.0005[c]
84-74-2	Di-*n*-butyl phthalate	0.7	3.5
95-50-1	1,2-Dichlorobenzene (*o* – Dichlorobenzene)	0.6[c]	1.5[c]
106-46-7	1,4-Dichlorobenzene (*p* – Dichlorobenzene)	0.075[c]	0.375[c]
91-94-1	3,3'-Dichlorobenzidine	0.02[a]	0.1
75-34-3	1,1-Dichloroethane	0.7	3.5
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	0.005[c]	0.025[c]
75-35-4	1,1-Dichloroethylene[b]	0.007[c]	0.035[c]
156-59-2	*cis*-1,2-Dichloroethylene	0.07[c]	0.2[c]
156-60-5	*trans*-1,2-Dichloroethylene	0.1[c]	0.5[c]
120-83-2	2,4-Dichlorophenol	0.021	0.021
78-87-5	1,2-Dichloropropane	0.005[c]	0.025[c]
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	0.001[a]	0.005

		Groundwater Remediation Objective	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
60-57-1	Dieldrin	0.009[a]	0.045
84-66-2	Diethyl phthalate	5.6	5.6
105-67-9	2,4-Dimethylphenol	0.14	0.14
51-28-5	2,4-Dinitrophenol	0.014	0.014
121-14-2	2,4-Dinitrotoluene	0.00002[a]	0.00002
606-20-2	2,6-Dinitrotoluene	0.00031[a]	0.00031
88-85-7	Dinoseb	0.007[c]	0.07[c]
117-84-0	Di-*n*-octyl phthalate	0.14	0.7
115-29-7	Endosulfan	0.042	0.21
145-73-3	Endothall	0.1[c]	0.1[c]
72-20-8	Endrin	0.002[c]	0.01[c]
100-41-4	Ethylbenzene	0.7[c]	1.0[c]
206-44-0	Fluoranthene	0.28	1.4
86-73-7	Fluorene	0.28	1.4
76-44-8	Heptachlor	0.0004[c]	0.002[c]
1024-57-3	Heptachlor epoxide	0.0002[c]	0.001[c]
118-74-1	Hexachlorobenzene	0.00006[a]	0.0003
319-84-6	*alpha*-HCH (*alpha*-BHC)	0.00011[a]	0.00055
58-89-9	*Gamma*-HCH (Lindane)	0.0002[c]	0.001[c]
77-47-4	Hexachlorocyclopentadiene	0.05[c]	0.5[c]
67-72-1	Hexachloroethane	0.007	0.035
193-39-5	Indeno(1,2,3-*c*,*d*)pyrene	0.00043[a]	0.00215
78-59-1	Isophorone	1.4	1.4
72-43-5	Methoxychlor	0.04[c]	0.2[c]
74-83-9	Methyl bromide (Bromomethane)	0.0098	0.049
1634-04-4	Methyl tertiary-butyl ether	0.07	0.07
75-09-2	Methylene chloride (Dichloromethane)	0.005[c]	0.05[c]
95-48-7	2-Methylphenol (*o*-Cresol)	0.35	0.35
91-20-3	Naphthalene	0.14	0.22
98-95-3	Nitrobenzene[b]	0.0035	0.0035

		Groundwater Remediation Objective	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
86-30-6	*N*-Nitrosodiphenylamine	0.0032 [a]	0.016
621-64-7	*N*-Nitrosodi-*n*-propylamine	0.0018 [a]	0.0018
87-86-5	Pentachlorophenol	0.001[c]	0.005[c]
108-95-2	Phenol	0.1[c]	0.1[c]
1918-02-1	Picloram	0.5[c]	5.0[c]
1336-36-3	Polychlorinated biphenyls (PCBs)	0.0005[c]	0.0025[c]
129-00-0	Pyrene	0.21	1.05
122-34-9	Simazine	0.004[c]	0.04[c]
100-42-5	Styrene	0.1[c]	0.5[c]
93-72-1	2,4,5-TP (Silvex)	0.05[c]	0.25[c]
127-18-4	Tetrachloroethylene (Perchloroethylene)	0.005[c]	0.025[c]
108-88-3	Toluene	1.0[c]	2.5[c]
8001-35-2	Toxaphene	0.003[c]	0.015[c]
120-82-1	1,2,4-Trichlorobenzene	0.07[c]	0.7[c]
71-55-6	1,1,1-Trichloroethane[b]	0.2[c]	1.0[c]
79-00-5	1,1,2-Trichloroethane	0.005[c]	0.05[c]
79-01-6	Trichloroethylene	0.005[c]	0.025[c]
95-95-4	2,4,5-Trichlorophenol (pH 4.9-7.8)	0.7	3.5
	2,4,5-Trichlorophenol (pH 7.9-8.0)	0.7	0.7
88-06-2	2,4,6-Trichlorophenol (pH 4.9-6.8)	0.01[a]	0.05
	2,4,6-Trichlorophenol (pH 6.9-8.0)	0.01	0.01
108-05-4	Vinyl acetate	7.0	7.0
75-01-4	Vinyl chloride	0.002[c]	0.01[c]
1330-20-7	Xylenes (total)	10.0[c]	10.0[c]

CAS No.	Chemical Name	Groundwater Remediation Objective	
		Class I (mg/L)	Class II (mg/L)
	Inorganics		
7440-36-0	Antimony	0.006[c]	0.024[c]
7440-38-2	Arsenic	0.05[c]	0.2[c]
7440-39-3	Barium	2.0[c]	2.0[c]
7440-41-7	Beryllium	0.004[c]	0.5[c]
7440-42-8	Boron	2.0[c]	2.0[c]
7440-43-9	Cadmium	0.005[c]	0.05[c]
7440-70-2	Calcium	---[d]	---[d]
16887-00-6	Chloride	200[c]	200[c]
7440-47-3	Chromium, total	0.1[c]	1.0[c]
18540-29-9	Chromium, ion, hexavalent	---	---
7440-48-4	Cobalt	1.0[c]	1.0[c]
7440-50-8	Copper	0.65[c]	0.65[c]
57-12-5	Cyanide	0.2[c]	0.6[c]
7782-41-4	Fluoride	4.0[c]	4.0[c]
15438-31-0	Iron	5.0[c]	5.0[c]
7439-92-1	Lead	0.0075[c]	0.1[c]
7439-95-4	Magnesium	---[d]	---[d]
7439-96-5	Manganese	0.15[c]	10.0[c]
7439-97-6	Mercury	0.002[c]	0.01[c]
7440-02-0	Nickel	0.1[c]	2.0[c]
14797-55-8	Nitrate as N	10.0[c]	100[c]
7723-14-0	Phosphorus	---[d]	---[d]
7440-09-7	Potassium	---[d]	---[d]
7782-49-2	Selenium	0.05[c]	0.05[c]

		Groundwater Remediation Objective	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
7440-22-4	Silver	0.05[c]	---
7440-23-5	Sodium	---[d]	---[d]
14808-79-8	Sulfate	400[c]	400[c]
7440-28-0	Thallium	0.002[c]	0.02[c]
7440-62-2	Vanadium[b]	0.049	0.1
7440-66-6	Zinc	5.0[c]	10[c]

Chemical Name and Groundwater Remediation Objective Notations

[a] The groundwater remediation objective is equal to the ADL for carcinogens according to the procedures specified in 35 Ill. Adm. Code 620.

[b] Oral Reference Dose and/or Reference Concentration under review by USEPA. Listed values subject to change.

[c] Value listed is also the Groundwater Quality Standard for this chemical pursuant to 35 Ill. Adm. Code 620.410 for Class I Groundwater or 35 Ill. Adm. Code 620.420 for Class II Groundwater.

[d] This chemical is included in the Total Dissolved Solids (TDS) Groundwater Quality Standard of 1,200 mg/l pursuant to 35 Ill. Adm. Code 620.410 for Class I Groundwater or 35 Ill. Adm. Code 620.420 for Class II Groundwater.

(Source: Amended at 31 Ill. Reg. 4063, effective February 23, 2007)

Section 742.APPENDIX B Tier 1 Illustrations and Tables

Section 742.TABLE F Values Used to Calculate the Tier 1 Soil Remediation Objectives for the Soil Component of the Groundwater Ingestion Route

		GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
CAS No.	Chemical Name Organics	Class I (mg/L)	Class II (mg/L)
83-32-9	Acenaphthene	2.0[b]	10
67-64-1	Acetone	6.3	6.3
15972-60-8	Alachlor	0.002[c]	0.01[c]
116-06-3	Aldicarb	0.003[c]	0.015[c]
309-00-2	Aldrin	5.0E-6[b]	2.5E-5
120-12-7	Anthracene	10[b]	50
1912-24-9	Atrazine	0.003[c]	0.015[c]
71-43-2	Benzene	0.005[c]	0.025[c]
56-55-3	Benzo(*a*)anthracene	0.0001[b]	0.0005
205-99-2	Benzo(*b*)fluoranthene	0.0001[b]	0.0005
207-08-9	Benzo(*k*)fluroanthene	0.001[b]	0.005
50-32-8	Benzo(*a*)pyrene	0.0002[a,c]	0.002[c]
65-85-0	Benzoic Acid	100[b]	100
111-44-4	Bis(2-chloroethyl)ether	8.0E-5[b]	8.0E-5
117-81-7	Bis(2-ethylhexyl)phthalate (Di(2-ethylhexyl)phthalate)	0.006[a,c]	0.06[c]
75-27-4	Bromodichloromethane (Dichlorobromomethane)	0.1[b]	0.1
75-25-2	Bromoform	0.1[b]	0.01
71-36-3	Butanol	4.0[b]	4.0
85-68-7	Butyl benzyl phthalate	7.0[b]	35
86-74-8	Carbazole	0.004[b]	0.02
1563-66-2	Carbofuran	0.04[c]	0.2[c]
75-15-0	Carbon disulfide	4.0[b]	20
56-23-5	Carbon tetrachloride	0.005[c]	0.025[c]
57-74-9	Chlordane	0.002[c]	0.01[c]

		GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
106-47-8	4-Chloroaniline (ρ-Chloroaniline)	0.1[b]	0.1
108-90-7	Chlorobenzene (Monochlorobenzene)	0.1[c]	0.5[c]
124-48-1	Chlorodibromomethane (Dibromochloromethane)	0.06[b]	0.06
67-66-3	Chloroform	0.1[b]	0.5
95-57-8	2-Chlorophenol (pH 4.9-7.3)	0.2[b]	1.0
	2-Chlorophenol (pH 7.4-8.0)	0.2	0.2
218-01-9	Chrysene	0.1[b]	0.05
94-75-7	2,4-D	0.07[c]	0.35[c]
75-99-0	Dalapon	0.2[c]	2.0[c]
72-54-8	DDD	0.0004[b]	0.002
72-55-9	DDE	0.0003[b]	0.0015
50-29-3	DDT	0.0003[b]	0.0015
53-70-3	Dibenzo(*a,h*)anthracene	1.0E-5[b]	5.0E-5
96-12-8	1,2-Dibromo-3-chloropropane	0.0002[c]	0.002 [c]
106-93-4	1,2-Dibromoethane (Ethylene dibromide)	0.00005[a,c]	0.0005[c]
84-74-2	Di-*n*-butyl phthalate	4.0[b]	20
95-50-1	1,2-Dichlorobenzene (*o* – Dichlorobenzene)	0.6[c]	1.5[c]
106-46-7	1,4-Dichlorobenzene (*p* – Dichlorobenzene)	0.075[c]	0.375[c]
91-94-1	3,3'-Dichlorobenzidine	0.0002[b]	0.001
75-34-3	1,1-Dichloroethane	4.0[b]	20
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	0.005[c]	0.025[c]
75-35-4	1,1-Dichloroethylene	0.007[c]	0.035[c]
156-59-2	*cis*-1,2-Dichloroethylene	0.07[c]	0.2[c]
156-60-5	*trans*-1,2-Dichloroethylene	0.1[c]	0.5[c]
120-83-2	2,4-Dichlorophenol	0.1[b]	0.1
78-97-5	1,2-Dichloropropane	0.005[c]	0.025[c]
542-75-6	1,3-Dichloropropene (1,3-Dichloropropylene, *cis* + *trans*)	0.0005[b]	0.0025

CAS No.	Chemical Name	GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
		Class I (mg/L)	Class II (mg/L)
60-57-1	Dieldrin	5.0E-6[b]	2.5E-5
84-66-2	Diethyl phthalate	30[b]	30
105-67-9	2,4-Dimethylphenol	0.7[b]	0.7
51-28-5	2,4-Dinitrophenol	0.04[b]	0.04
121-14-2	2,4-Dinitrotoluene	0.0001[b]	0.0001
606-20-2	2,6-Dinitrotoluene	0.0001	0.0001
88-85-7	Dinoseb	0.007[c]	0.07[c]
117-84-0	Di-*n*-octyl phthalate	0.7[b]	3.5
115-29-7	Endosulfan	0.2[b]	1.0
145-73-3	Endothall	0.1[c]	0.1[c]
72-20-8	Endrin	0.002[c]	0.01[c]
100-41-4	Ethylbenzene	0.7[c]	1.0[c]
206-44-0	Fluoranthene	1.0[b]	5.0
86-73-7	Fluorene	1.0[b]	5.0
76-44-8	Heptachlor	0.0004[c]	0.002[c]
1024-57-3	Heptachlor epoxide	0.0002[c]	0.001[c]
118-74-1	Hexachlorobenzene	0.001[b]	0.005
319-84-6	*alpha*-HCH (*alpha*-BHC)	1.0E-5[b]	5.0E-5
58-89-9	*Gamma*-HCH (Lindane)	0.0002[c]	0.001[c]
77-47-4	Hexachlorocyclopentadiene	0.05[c]	0.5[c]
67-72-1	Hexachloroethane	0.007	0.035
193-39-5	Indeno(1,2,3-*c*,*d*)pyrene	0.0001[b]	0.0005
78-59-1	Isophorone	1.4	1.4
72-43-5	Methoxychlor	0.04[c]	0.2[c]
74-83-9	Methyl bromide (Bromomethane)	0.05[b]	0.25
1634-04-4	Methyl tertiary-butyl ether	0.07	0.07
75-09-2	Methylene chloride (Dichloromethane)	0.005[c]	0.05[c]
95-48-7	2-Methylphenol (*o*-Cresol)	2.0[b]	2.0
91-20-3	Naphthalene	0.14	0.22
98-95-3	Nitrobenzene	0.02[b]	0.02

CAS No.	Chemical Name	GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
		Class I (mg/L)	Class II (mg/L)
86-30-6	*N*-Nitrosodiphenylamine	0.02[b]	0.1
621-64-7	*N*-Nitrosodi-*n*-propylamine	1.0E-5[b]	1.0E-5
87-86-5	Pentachlorophenol	0.001[a,c]	0.005[c]
108-95-2	Phenol	0.1[c]	0.1[c]
1918-02-1	Picloram	0.5[c]	5.0[c]
1336-36-3	Polychlorinated biphenyls (PCBs)	---	---
129-00-0	Pyrene	1.0[b]	5.0
122-34-9	Simazine	0.004[c]	0.04[c]
100-42-5	Styrene	0.1[c]	0.5[c]
93-72-1	2,4,5-TP (Silvex)	0.05[c]	0.25[c]
127-18-4	Tetrachloroethylene (Perchloroethylene)	0.005[c]	0.025[c]
108-88-3	Toluene	1.0[c]	2.5[c]
8001-35-2	Toxaphene	0.003[c]	0.015[c]
120-82-1	1,2,4-Trichlorobenzene	0.07[c]	0.7[c]
71-55-6	1,1,1-Trichloroethane	0.2[c]	1.0[c]
79-00-5	1,1,2-Trichloroethane	0.005[c]	0.05[c]
79-01-6	Trichloroethylene	0.005[c]	0.025[c]
95-95-4	2,4,5-Trichlorophenol (pH 4.9-7.8)	4.0[b]	20
	2,4,5-Trichlorophenol (pH 7.9-8.0)	4.0	4.0
88-06-2	2,4,6-Trichlorophenol (pH 4.9-6.8)	0.008[b]	0.04
	2.4.6-Trichlorophenol (pH 6.9-8.0)	0.008	0.008
108-05-4	Vinyl acetate	40[b]	40
75-01-4	Vinyl chloride	0.002[c]	0.01[c]
1330-20-7	Xylenes (total)	10.0[c]	10.0[c]

		GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
CAS No.	Chemical Name	Class I (mg/L)	Class II (mg/L)
	Inorganics		
7440-36-0	Antimony	0.006[c]	0.024[c]
7440-38-2	Arsenic	0.05[c]	0.2[c]
7440-39-3	Barium	2.0[c]	2.0[c]
7440-41-7	Beryllium	0.004[c]	0.5[c]
7440-42-8	Boron	2.0[c]	2.0[c]
7440-43-9	Cadmium	0.005[c]	0.05[c]
7440-70-2	Calcium	---	---
16887-00-6	Chloride	200[c]	200[c]
7440-47-3	Chromium, total	0.1[c]	1.0[c]
18540-29-9	Chromium, ion, hexavalent	---	---
7440-48-4	Cobalt	1.0[c]	1.0[c]
7440-50-8	Copper	0.65[c]	0.65[c]
57-12-5	Cyanide	0.2[c]	0.6[c]
7782-41-4	Fluoride	4.0[c]	4.0[c]
15438-31-0	Iron	5.0[c]	5.0[c]
7439-92-1	Lead	0.0075[c]	0.1[c]
7439-95-4	Magnesium	---	---
7439-96-5	Manganese	0.15[c]	10.0[c]
7439-97-6	Mercury	0.002[c]	0.01[c]
7440-02-0	Nickel	0.1[c]	2.0[c]
14797-55-8	Nitrate as N	10.0[c]	100[c]

CAS No.	Chemical Name	GW_{obj} Concentration used to Calculate Tier 1 Soil Remediation Objectives[a]	
		Class I (mg/L)	Class II (mg/L)
7723-14-0	Phosphorus	---	---
7440-09-7	Potassium	---	---
7782-49-2	Selenium	0.05[c]	0.05[c]
7440-22-4	Silver	0.05[c]	---
7440-23-5	Sodium	---	---
14808-79-8	Sulfate	400[c]	400[c]
7440-28-0	Thallium	0.002[c]	0.02[c]
7440-62-2	Vanadium	0.049	0.1
7440-66-6	Zinc	5.0[c]	10[c]

Chemical Name and Groundwater Remediation Objective Notations

[a] The Equation S17 is used to calculate the Soil Remediation Objective for the Soil Component of the Groundwater Ingestion Route; this equation requires calculation of the Target Soil Leachate Concentration (C_w) from Equation S18: $C_w = DF \times GW_{obj}$.

[b] Value listed is the Water Health Based Limit (HBL) for this chemical from Soil Screening Guidance: User's Guide, incorporated by reference at Section 742.210. The HBL is equal to the non-zero MCLG (if available); the MCL (if available); or, for carcinogens, a cancer risk of 1.0E-6, and for noncarcinogens is equal to a Hazard Quotient of 1.0. NOTE: These GW_{obj} concentrations are not equal to the Tier 1 Groundwater Remediation Objectives for the Direct Ingestion of Groundwater Component of the Groundwater Ingestion Route, listed in Section 742.Appendix B, Table E.

[c] Value listed is also the Groundwater Quality Standard for this chemical pursuant to 35 Ill. Adm. Code 620.410 for Class I Groundwater or 35 Ill. Adm. Code 620.420 for Class II Groundwater.

(Source: Amended at 31 Ill. Reg. 4063, effective February 23, 2007)

STATE OF WEST VIRGINIA

West Virginia

APPENDIX CA-1
WEST VIRGINIA GROUNDWATER STANDARDS
(EPA Maximum Contaminant Levels [MCL's] for Public Water Supplies Under the Safe Drinking Water Act)

Constituent	Not to Exceed (In mg/L, except where noted)
Alachlor	0.002
Antimony	0.006
Asbestos (fibers/1 less than 10 ug/1)	7 MFL*
Atrazine	0.003
Barium	2.0
Benzene	0.005
Benzo(a)pyrene (PAH)	0.0002
Beryllium	0.004
Cadmium	0.005
Carbofuran	0.04
Carbon tetrachloride	0.005
Chlordane	0.002
Chromium (total)	0.1
Cyanide	0.2
2,4-D	0.07
Dalapon	0.2
Di[2-ethylhexyl]adipate	0.4
Di[2-ethylhexy]phthlate	0.006
Dibromochloropropane	0.0002
Dichlorobenzene p-	0.075
Dichlorobenzene o-	0.6
Dichlorobenzene n-	0.6
Dichloroethane (1,2)	0.005
Dichloroethylene (1,1-)	0.007

Constituent	Not to Exceed (In mg/L, except where noted)
Dichloroethylene (cis-1,2-)	0.07
Dichloroethylene (trans-1,2-)	0.1
Dichloromethane	0.05
Dichloropropane (1,2-)	0.005
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylbenzene	0.7
Ethylene dibromide (EDB)	0.00005
Fluoride	4.0
Glyphosate	0.7
Heptachlor	0.0004
Heptachlor epoxide	0.0002
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lead	0.015
Lindane	0.0002
Mercury (inorganic)	0.002
Methoxychlor	0.04
Monochlorobenzene	0.1
Nickel	0.1
Nitrate (as N)	10.0
Nitrite (as N)	1.0
Total Nitrate and Nitrite (both as N)	10.0
Oxamyl (vydate)	0.2
Pentachlorophenol	0.001
Picloram	0.5

Constituent	Not to Exceed (In mg/L, except where noted)
Polychlorinated biphenyls	0.0005
Selenium	0.05
Simazine	0.004
Styrene	0.1
2,3,7,8-TCDD (Dioxin)	0.000000005
Tetrachloroethylene	0.005
Thallium	0.002
Toluene	1.0
Toxaphene	0.003
2,4,5-TP (silvex)	0.05
Trichlorobenzene (1,2,4-)	0.07
Trichloroethane (1,1,1-)	0.2
Trichloroethane (1,1,2-)	0.005
Trichloroethylene	0.005
Vinyl Chloride	0.002
Xylenes	10.0
Radionuclides	
Beta particle and photon activity	4 mrem **
Gross alpha particle activity	15 pCi/L***

* MFL = million fibers per liter
** mrem = millirem (rem=roentgen-equivalent-man)
*** pCi = picocurie

Sources: **I**=IRIS **H**=HEAST **A**=HEAST alternate **W**=Withdrawn from IRIS or HEAST **E**=EPA-NECA Regional Support provisional value **O**=Other EPA documents
Basis: **C**=Carcinogenic effects **N**=Noncarinogenic effects **S**=West Virginia Groundwater Quality Standards

Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		VOC	Risk-Based Concentrations: Ground Water µg/L		Soil Ingestion: Industrial2 mg/kg		Soil Ingestion: Residential mg/kg	
Acephate	30560191	4.00E-03	I			8.70E-03	I				7.7	C	6600	C	73	C
Acetaldehyde	75070			2.57E-03	I			7.70E-03	I		94	N				
Acetochlor	34256821	2.00E-02	I								730	N	41000	N	1600	N
Acetone	67641	1.00E-01	I								3700	N	200000	N	7800	N
Acetone cyanohydrin	75865	7.00E-02	H	4.00E-02	A						2600	N	140000	N	5500	N
Acetonitrile	75078	6.00E-03	I	1.43E-02	A						220	N	12000	N	470	N
Acetophenone	98862	1.00E-01	I	5.71E-06	W[1]					x	0.042	N	200000	N	7800	N
Acifluorfen	62476599	1.30E-02	I								470	N	27000	N	1000	N
Acrolein	107028	2.00E-02	H	5.71E-06	I						730	N	41000	N	1600	N
Acrylamide	79061	2.00E-04	I			4.50E+00	I	4.55E+00	I		0.015	C	13	C	0.14	C
Acrylic acid	79107	5.00E-01	I	2.86E-04	I						18000	N	1000000	N	39000	N
Acrylonitrile	107131	1.00E-03	H	5.71E-04	I	5.40E-01	I	2.38E-01	I		0.12	C	110	C	1.2	C
Alachlor	15972608	1.00E-02	I			8.00E-02	H				2	S	720	C	8	C
Alar	1596845	1.50E-01	I								5500	N	310000	N	12000	N
Aldicarb	116063	1.00E-03	I								37	N	2000	N	78	N
Aldicarb sulfone	1646884	1.00E-03	I								37	N	2000	N	78	N
Aldrin	309002	3.00E-05	I			1.70E+01	I	1.71E+01	I		0.004	C	3.4	C	0.038	C
Ally	74223646	2.50E-01	I								9100	N	510000	N	20000	N
Allyl alcohol	107186	5.00E-03	I								180	N	10000	N	390	N
Allyl chloride	107051	5.00E-02	W[1]	2.86E-04	I						1800	N	100000	N	3900	N
Aluminum	7429905	1.00E+00	E[1]								37000	N	1000000	N	78000	N
Aluminum phosphide	20859738	4.00E-04	I								15	N	820	N	31	N
Amdro	67485294	3.00E-04	I								11	N	610	N	23	N
Ametryn	834128	9.00E-03	I								330	N	18000	N	700	N
m-Aminophenol	591275	7.00E-02	H								2600	N	140000	N	5500	N
4-Aminopyridine	504245	2.00E-05	H								0.73	N	41	N	1.6	N
Amitraz	33089611	2.50E-03	I								91	N	5100	N	200	N
Ammonia	7664417			2.86E-02	I						1000	N				
Ammonium sulfamate	7773060	2.00E-01	I								7300	N	410000	N	16000	N
Aniline	62533			2.86E-04	I	5.70E-03	I				10	N	10000	C	110	C
Antimony and compounds	7440360	4.00E-04	I								6	S	820	N	31	N
Antimony pentoxide	1314609	5.00E-04	H								18	N	1000	N	39	N
Antimony potassium tartrate	304610	9.00E-04	H								33	N	1800	N	70	N
Antimony tetroxide	1332316	4.00E-04	H								15	N	820	N	31	N
Antimony trioxide	1309644	4.00E-04	H								15	N	820	N	31	N
Apollo	74115245	1.30E-02	I								470	N	27000	N	1000	N
Aramite	140578	5.00E-02	H			2.50E-02	I	2.49E-02	I		2.7	C	2300	C	26	C
Arsenic	7440382	3.00E-04	I								11	N	610	N	23	N
Arsenic (as carcinogen)	7440382					1.50E+00	I	1.51E+01	I		0.045	C	38	C	0.43	C
Arsine	7784421			1.43E-05	I						0.52	N				
Assure	76578148	9.00E-03	I								330	N	18000	N	700	N
Asulam	3337711	5.00E-02	I								1800	N	100000	N	3900	N

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											Risk-Based Concentrations					
													Soil Ingestion			
Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		VOC	Ground Water µg/L		Industrial2 mg/kg		Residential mg/kg	
Atrazine	1912249	3.50E-02	I			2.22E-01	H				3	S	260	C	2.9	C
Avermectin B1	65195553	4.00E-04	I								15	N	820	N	31	N
Azobenzene	103333					1.10E-01	I	1.08E-01	I		0.61	C	520	C	5.8	C
Barium and compounds	7440393	7.00E-02	I	1.43E-04	A						2000	S	140000	N	5500	N
Baygon	114261	4.00E-03	I								150	N	8200	N	310	N
Bayleton	43121433	3.00E-02	I								1100	N	61000	N	2300	N
Baythroid	68359375	2.50E-02	I								910	N	51000	N	2000	N
Benefin	1861401	3.00E-01	I								11000	N	610000	N	23000	N
Benomyl	17804352	5.00E-02	I								1800	N	100000	N	3900	N
Bentazon	25057890	2.50E-03	I								91	N	5100	N	200	N
Benzaldehyde	100527	1.00E-01	I							x	610	N	200000	N	7800	N
Benzene	71432			1.71E-03	E[1]	2.90E-02	I	2.90E-02	I	x	5	S	2000	C	22	C
Benzenethiol	108985	1.00E-05	H								0.37	N	20	N	0.78	N
Benzidine	92875	3.00E-03	I			2.30E+02	I	2.35E+02	I		0.00029	C	0.25	C	0.0028	C
Benzoic acid	65850	4.00E+00	I								150000	N	1000000	N	310000	N
Benzotrichloride	98077					1.30E+01	I				0.0052	C	4.4	C	0.049	C
Benzyl alcohol	100516	3.00E-01	H								11000	N	610000	N	23000	N
Benzyl chloride	100447					1.70E-01	I			x	0.062	C	340	C	3.8	C
Beryllium and compounds	7440417	5.00E-03	I			4.30E+00	I	8.40E+00	I		4	S	13	C	0.15	C
Bidrin	141662	1.00E-04	I								3.7	N	200	N	7.8	N
Biphenthrin (Talstar)	82657043	1.50E-02	I								550	N	31000	N	1200	N
1,1-Biphenyl	92524	5.00E-02	I								1800	N	100000	N	3900	N
Bis(2-chloroethyl)ether	111444					1.10E+00	I	1.16E+00	I	x	0.0092	C	52	C	0.58	C
Bis(2-chloroisopropyl)ether	39638329	4.00E-02	I			7.00E-02	H	3.50E-02	H	x	0.26	C	820	C	9.1	C
Bis(chloromethyl)ether	542881					2.20E+02	I	2.17E+02	I	x	0.000049	C	0.26	C	0.0029	C
Bis(2-chloro-1-methylethyl)ether	0					7.00E-02	W[1]	7.00E-02	W[1]		0.96	C	820	C	9.1	C
Bis(2-ethylhexyl)phthalate (DEHP)	117817	2.00E-02	I			1.40E-02	I				4.8	C	4100	C	46	C
Bisphenol A	80057	5.00E-02	I								1800	N	100000	N	3900	N
Boron (and borates)	7440428	9.00E-02	I	5.71E-03	H						3300	N	180000	N	7000	N
Boron trifluoride	7637072			2.00E-04	H						7.3	N				
Bromodichloromethane	75274	2.00E-02	I			6.20E-02	I			x	0.17	C	920	C	10	C
Bromoethene	593602							1.10E-01	H	x	0.096	C				
Bromoform (tribromomethane)	75252	2.00E-02	I			7.90E-03	I	3.85E-03	I	x	2.4	C	7200	C	81	C
Bromomethane	74839	1.40E-03	I	1.43E-03	I					x	8.7	N	2900	N	110	N
4-Bromophenyl phenyl ether	101553	5.80E-02	O[1]								2100	N	120000	N	4500	N
Bromophos	2104963	5.00E-03	H								180	N	10000	N	390	N
Bromoxynil	1689845	2.00E-02	I								730	N	41000	N	1600	N
Bromoxynil octanoate	1689992	2.00E-02	I								730	N	41000	N	1600	N
1,3-Butadiene	106990							9.80E-01	I	x	0.011	C				
1-Butanol	71363	1.00E-01	I								3700	N	200000	N	7800	N
Butyl benzyl phthalate	85687	2.00E-01	I								7300	N	410000	N	16000	N

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											Risk-Based Concentrations					
													Soil Ingestion			
Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		VOC	Ground Water µg/L		Industrial2 mg/kg		Residential mg/kg	
Butylate	2008415	5.00E-02	I								1800	N	100000	N	3900	N
sec-Butylbenzene	135988	1.00E-02	E[1]							x	61	N	20000	N	780	N
tert-Butylbenzene	104518	1.00E-02	E[1]							x	61	N	20000	N	780	N
Butylphthalyl butylglycolate	85701	1.00E+00	I								37000	N	1000000	N	78000	N
Cacodylic acid	75605	3.00E-03	H								110	N	6100	N	230	N
Cadmium and compounds	7440439	5.00E-04	I	5.71E-05	W[1]			6.30E+00	I		5	S	1000	N	39	N
Caprolactam	105602	5.00E-01	I								18000	N	1000000	N	39000	N
Captafol	2425061	2.00E-03	I			8.60E-03	H				7.8	C	6700	C	74	C
Captan	133062	1.30E-01	I			3.50E-03	H				19	C	16000	C	180	C
Carbaryl	63252	1.00E-01	I								3700	N	200000	N	7800	N
Carbofuran	1563662	5.00E-03	I								40	S	10000	N	390	N
Carbon disulfide	75150	1.00E-01	I	2.00E-01	I					x	1000	N	200000	N	7800	N
Carbon tetrachloride	56235	7.00E-04	I	5.71E-04	E[1]	1.30E-01	I	5.25E-02	I	x	5	S	440	C	4.9	C
Carbosulfan	55285148	1.00E-02	I								370	N	20000	N	780	N
Carboxin	5234684	1.00E-01	I								3700	N	200000	N	7800	N
Chloral	75876	2.00E-03	I								73	N	4100	N	160	N
Chloramben	133904	1.50E-02	I								550	N	31000	N	1200	N
Chloranil	118752					4.03E-01	H				0.17	C	140	C	1.6	C
Chlordane	57749	6.00E-05	I			1.30E+00	I	1.29E+00	I		2	S	44	C	0.49	C
Chlorimuron-ethyl	90982324	2.00E-02	I								730	N	41000	N	1600	N
Chlorine	7782505	1.00E-01	I								3700	N	200000	N	7800	N
Chlorine dioxide	10049044			5.71E-05	I						2.1	N				
Chloroacetaldehyde	107200	6.90E-03	O[1]								250	N	14000	N	540	N
Chloroacetic acid	79118	2.00E-03	H								73	N	4100	N	160	N
2-Chloroacetophenone	532274			8.57E-06	I						0.31	N				
4-Chloroaniline	106478	4.00E-03	I								150	N	8200	N	310	N
Chlorobenzene	108907	2.00E-02	I	5.71E-03	A					x	100	S	41000	N	1600	N
Chlorobenzilate	510156	2.00E-02	I			2.70E-01	H	2.70E-01	H		0.25	C	210	C	2.4	C
p-Chlorobenzoic acid	74113	2.00E-01	H								7300	N	410000	N	16000	N
4-Chlorobenzotrifluoride	98566	2.00E-02	H								730	N	41000	N	1600	N
2-Chloro-1,3-butadiene	126998	2.00E-02	A	2.00E-03	H					x	14	N	41000	N	1600	N
1-Chlorobutane	109693	4.00E-01	H							x	2400	N	820000	N	31000	N
Chlorodibromomethane	124481	2.00E-02	I			8.40E-02	I			x	0.13	C	680	C	7.6	C
1-Chloro-1,1-difluoroethane	75683			1.43E+01	I					x	87000	N				
Chlorodifluoromethane	75456			1.43e+01	I					x	87000	N				
Chloroethane	75003	4.00E-01	E[1]	2.86E+00	I					x	8600	N	820000	N	31000	N
2-Chloroethyl vinyl ether	110758	2.50E-02	O[1]							x	150	N	51000	N	2000	N
Chloroform	67663	1.00E-02	I			6.10E-03	I	8.05E-02	I	x	0.15	C	9400	C	100	C
Chloromethane	74873					1.30E-02	H	6.30E-03	H	x	1.40	C	4400	C	49	C

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Basis: **C**=Carcinogenic effects **N**=Noncarinogenic effects **S**=West Virginia Groundwater Quality Standards

Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		VOC	**Risk-Based Concentrations** Ground Water µg/L		Soil Ingestion Industrial2 mg/kg		Residential mg/kg	
4-Chloro-2,2-methylaniline hydrochloride	3165933					4.60E-01	H				0.15	C	120	C	1.4	C
4-Chloro-2-methylaniline	95692					5.80E-01	H				0.12	C	99	C	1.1	C
beta-Chloronaphthalene	91587	8.00E-02	I								2900	N	160000	N	6300	N
o-Chloronitrobenzene	88733					2.50E-02	H			x	0.42	C	2300	C	26	C
p-Chloronitrobenzene	100005					1.80E-02	H			x	0.59	C	3200	C	35	C
2-Chlorophenol	95578	5.00E-03	I								180	N	10000	N	390	N
2-Chloropropane	75296			2.86E-02	H					x	170	N				
Chlorothalonil	1897456	1.50E-02	I			1.10E-02	H				6.1	C	5200	C	58	C
o-Chlorotoluene	95498	2.00E-02	I							x	120	N	41000	N	1600	N
Chlorpropham	101213	2.00E-01	I								7300	N	410000	N	16000	N
Chlorpyrifos	2921882	3.00E-03	I								110	N	6100	N	230	N
Chlorpyrifos-methyl	5598130	1.00E-02	H								370	N	20000	N	780	N
Chlorsulfuron	64902723	5.00E-02	I								1800	N	100000	N	3900	N
Chlorthiophos	60238564	8.00E-04	H								29	N	1600	N	63	N
Chromium III and compounds	16065831	1.00E+00	I	5.71E-07	W[1]						37000	N	1000000	N	78000	N
Chromium VI and compounds	18540299	5.00E-03	I					4.20E+01	I		180	N	10000	N	390	N
Chromium (total)											100	S				
Cobalt	7440484	6.00E-02	E[1]								2200	N	120000	N	4700	N
Copper and compounds	7440508	4.00E-02	E[1]								1500	N	82000	N	3100	N
Crotonaldehyde	123739	1.00E-02	W[1]			1.90E+00	H	1.90E+00	W[1]		0.035	C	30	C	0.34	C
Cumene	98828	4.00E-02	I	2.57E-03	H						1500	N	82000	N	3100	N
Cyanides:	0															
Barium cyanide	542621	1.00E-01	W[1]								3700	N	200000	N	7800	N
Calcium cyanide	592018	4.00E-02	I								1500	N	82000	N	3100	N
**Chlorine cyanide	506774	5.00E-02	I								1800	N	100000	N	3900	N
Copper cyanide	544923	5.00E-03	I								180	N	10000	N	390	N
Cyanazine	21725462	2.00E-03	H			8.40E-01	H				0.08	C	68	C	0.76	C
Cyanogen	460195	4.00E-02	I								1500	N	82000	N	3100	N
Cyanogen bromide	506683	9.00E-02	I								3300	N	180000	N	7000	N
Cyanogen chloride	506774	5.00E-02	I								1800	N	100000	N	3900	N
Free cyanide	57125	2.00E-02	I								200	S	41000	N	1600	N
Hydrogen cyanide	74908	2.00E-02	I	8.57E-04	I						730	N	41000	N	1600	N
Potassium cyanide	151508	5.00E-02	I								1800	N	100000	N	3900	N
Potassium silver cyanide	506616	2.00E-01	I								7300	N	410000	N	16000	N
Silver cyanide	506649	1.00E-01	I								3700	N	200000	N	7800	N
Sodium cyanide	143339	4.00E-02	I								1500	N	82000	N	3100	N
Thiocyanate	0	2.00E-02	E[1]								730	N	41000	N	1600	N
Zinc cyanide	557211	5.00E-02	I								1800	N	100000	N	3900	N
Cyclohexanone	108941	5.00E+00	I							x	30000	N	1000000	N	390000	N
Cyclohexlamine	108918	2.00E-01	I								7300	N	410000	N	16000	N

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Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		VOC	**Risk-Based Concentrations** Ground Water µg/L		Soil Ingestion Industrial2 mg/kg		Residential mg/kg	
Cyhalothrin/Karate	68085858	5.00E-03	I								180	N	10000	N	390	N
Cypermethrin	52315078	1.00E-02	I								370	N	20000	N	780	N
Cyromazine	66215278	7.50E-03	I								270	N	15000	N	590	N
Dacthal	1861321	1.00E-02	I								370	N	20000	N	780	N
Dalapon	75990	3.00E-02	I								200	S	61000	N	2300	N
Danitol	39515418	2.50E-02	I								910	N	51000	N	2000	N
DDD	72548					2.40E-01	I				0.28	C	240	C	2.7	C
DDE	72559					3.40E-01	I				0.20	C	170	C	1.9	C
DDT	50293	5.00E-04	I			3.40E-01	I	3.40E-01	I		0.20	C	170	C	1.9	C
Decabromodiphenyl ether	1163195	1.00E-02	I							x	61	N	20000	N	780	N
Demeton	8065483	4.00E-05	I								1.5	N	82	N	3.1	N
Diallate	2303164					6.10E-02	H			x	0.17	C	940	C	10	C
Diazinon	333415	9.00E-04	H								33	N	1800	N	70	N
Dibenzofuran	132649	4.00E-03	E[1]								150	N	8200	N	310	N
1,4-Dibromobenzene	106376	1.00E-02	I							x	61	N	20000	N	780	N
1,2-Dibromo -3-chloropropane	96128			5.71E-05	I	1.40E+00	H	2.42E-03	H	x	0.2	S	41	C	0.46	C
1,2-Dibromoethane	106934			5.71E-05	H	8.50E+01	I	7.70E-01	I	x	0.05	S	0.67	C	0.0075	C
Dibutyl phthalate	84742	1.00E-01	I								3700	N	200000	N	7800	N
Dicamba	1918009	3.00E-02	I								1100	N	61000	N	2300	N
1,2-Dichlorobenzene	95501	9.00E-02	I	4.00E-02	A					x	600	S	180000	N	7000	N
1,3-Dichlorobenzene	541731	8.90E-02	O[1]							x	600	S	180000	N	7000	N
1,4-Dichlorobenzene	106467			2.29E-01	I	2.40E-02	H			x	75	S	2400	C	27	C
3,3'-Dichlorobenzidine	91941					4.50E-01	I				0.15	C	130	C	1.4	C
1,4-Dichloro-2-butene	764410							9.30E+00	H	x	0.0011	C				
Dichlorodifluoromethane	75718	2.00E-01	I	5.71E-02	A					x	390	N	410000	N	16000	N
1,1-Dichloroethane	75343	1.00E-01	H	1.43E-01	A					x	810	N	200000	N	7800	N
1,2-Dichloroethane (EDC)	107062			2.86E-03	E[1]	9.10E-02	I	9.10E-02	I	x	5	S	630	C	7	C
1,1-Dichloroethylene	75354	9.00E-03	I			6.00E-01	I	1.75E-01	I	x	7	S	95	C	1.1	C
1,2-Dichloroethylene (cis)	156592	1.00E-02	H							x	70	S	20000	N	780	N
1,2-Dichloroethylene (trans)	156605	2.00E-02	I							x	100	S	41000	N	1600	N
1,2-Dichloroethylene (mixture)	540590	9.00E-03	H							x	55	N	18000	N	700	N
2,4-Dichlorophenol	120832	3.00E-03	I								110	N	6100	N	230	N
2,4-Dichlorophenoxyacetic Acid (2,4-D)	94757	1.00E-02	I							x	70	S	20000	N	780	N
4-(2,4-Dichlorophenoxy)butyric Acid	94826	8.00E-03	I								290	N	16000	N	630	N
1,2-Dichloropropane	78875			1.14E-03	I	6.80E-02	H			x	5	S	840	C	9.4	C
2,3-Dichloropropanol	616239	3.00E-03	I								110	N	6100	N	230	N
1,3-Dichloropropene	542756	3.00E-04	I	5.71E-03	I	1.75E-01	H	1.30E-01	H	x	0.077	C	330	C	3.7	C
Dichlorvos	62737	5.00e-04	I	1.43E-04	I	2.90E-01	I				0.23	C	200	C	2.2	C
Dicofol	115322					4.40E-01	W[1]				0.15	C	130	C	1.5	C
Dicyclopentadiene	77736	3.00E-02	H	5.71E-05	A					x	0.42	N	61000	N	2300	N
Dieldrin	60571	5.00E-05	I			1.60E+01	I	1.61E+01	I		0.0042	C	3.6	C	0.04	C

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Diesel emissions	0			1.43E-03	I						52	N				
Diethyl phthalate	84662	8.00E-01	I								29000	N	1000000	N	63000	N
Diethylene glycol, monobutyl ether	112345			5.71E-03	H						210	N				
Diethylene glycol, monoethyl ether	111900	2.00E+00	H								73000	N	1000000	N	160000	N
Diethylforamide	617845	1.10E-02	H								400	N	22000	N	860	N
Di(2-ethylhexyl)adipate	103231	6.00E-01	I			1.20E-03	I				400	S	48000	C	530	C
Diethylstilbestrol	56531					4.70E+03	H				0.000014	C	0.012	C	0.00014	C
Difenzoquat (Avenge)	43222486	8.00E-02	I								2900	N	160000	N	6300	N
Diflubenzuron	35367385	2.00E-02	I								730	N	41000	N	1600	N
1,1-Difluoroethane	75376			1.14E+01	I					x	69000	N				
Diisopropyl methylphosphonate (DIMP)	1445756	8.00E-02	I								2900	N	160000	N	6300	N
Dimethipin	55290647	2.00E-02	I								730	N	41000	N	1600	N
Dimethoate	60515	2.00E-04	I								7.3	N	410	N	16	N
3,3'-Dimethoxybenzidine	119904					1.40E-02	H				4.8	C	4100	C	46	C
Dimethylamine	124403			5.71E-06	W[1]						0.21	N				
2,4-Dimethylaniline hydrochloride	21436964					5.80E-01	H				0.12	C	99	C	1.1	C
2,4-Dimethylaniline	95681					7.50E-01	H				0.09	C	76	C	0.85	C
N-N-Dimethylaniline	121697	2.00E-03	I								73	N	4100	N	160	N
3,3'-Dimethylbenzidine	119937					9.20E+00	H				0.0073	C	6.2	C	0.069	C
N,N-Dimethylformamide	68122	1.00E-01	H	8.57E-03	I						3700	N	200000	N	7800	N
1,1-Dimethylhydrazine	57147					2.60E+00	W[1]	3.50E+00	W[1]		0.026	C	22	C	0.25	C
1,2-Dimethylhydrazine	540738					3.70E+01	W[1]	3.70E+01	W[1]		0.0018	C	1.5	C	0.017	C
2,4-Dimethylphenol	105679	2.00E-02	I								730	N	41000	N	1600	N
2,6-Dimethylphenol	576261	6.00E-04	I								22	N	1200	N	47	N
3,4-Dimethylphenol	95658	1.00E-03	I								37	N	2000	N	78	N
Dimethyl phthalate	131113	1.00E+01	H								370000	N	1000000	N	780000	N
Dimethyl terephthalate	120616	1.00E-01	I								3700	N	200000	N	7800	N
1,2-Dinitrobenzene	528290	4.00E-04	H								15	N	820	N	31	N
1,3-Dinitrobenzene	99650	1.00E-04	I								3.7	N	200	N	7.8	N
1,4-Dinitrobenzene	100254	4.00E-04	H								15	N	820	N	31	N
4,6-Dinitro-o-cyclohexyl phenol	131895	2.00E-03	I								73	N	4100	N	160	N
2,4-Dinitrophenol	51285	2.00E-03	I								73	N	4100	N	160	N
Dinitrotoluene mixture	0					6.80E-01	I				0.099	C	84	C	0.94	C
2,4-Dinitrotoluene	121142	2.00E-03	I								73	N	4100	N	160	N
2,6-Dinitrotoluene	606202	1.00E-03	H								37	N	2000	N	78	N
Dinoseb	88857	1.00E-03	I								7	S	2000	N	78	N
di-n-Octyl phthalate	117840	2.00E-02	H								6	S	41000	N	1600	N
1,4-Dioxane	123911					1.10E-02	I				6.1	C	5200	C	58	C
Diphenamid	957517	3.00E-02	I								1100	N	61000	N	2300	N
Diphenylamine	122394	2.50E-02	I								910	N	51000	N	2000	N
1,2-Diphenylhydrazine	122667					8.00E-01	I	7.70E-01	I		0.084	C	72	C	0.8	C

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Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		VOC	**Risk-Based Concentrations** Ground Water µg/L		Soil Ingestion Industrial2 mg/kg		Residential mg/kg	
Diquat	85007	2.20E-03	I								20	S	4500	N	170	N
Direct black 38	1937377					8.60E+00	H				0.0078	C	6.7	C	0.074	C
Direct blue 6	2602462					8.10E+00	H				0.0083	C	7.1	C	0.079	C
Direct brown 95	16071866					9.30E+00	H				0.0072	C	6.2	C	0.069	C
Disulfoton	298044	4.00E-05	I								1.5	N	82	N	3.1	N
1,4-Dithiane	505293	1.00E-02	I								370	N	20000	N	780	N
Diuron	330541	2.00E-03	I								73	N	4100	N	160	N
Dodine	2439103	4.00E-03	I								150	N	8200	N	310	N
Endosulfan	115297	6.00E-03	I								220	N	12000	N	470	N
Endothall	145733	2.00E-02	I								100	S	41000	N	1600	N
Endrin	72208	3.00E-04	I								2	S	610	N	23	N
Epichlorohydrin	106898	2.00E-03	H	2.86E-04	I	9.90E-03	I	4.20E-03	I		6.8	C	5800	C	65	C
1,2-Epoxybutane	106887			5.71E-03	I						210	N				
Ethephon (2-chloroethyl phosphonic acid)	16672870	5.00E-03	I								180	N	10000	N	390	N
Ethion	563122	5.00E-04	I								18	N	1000	N	39	N
2-Ethoxyethanol acetate	111159	3.00E-01	A								11000	N	610000	N	23000	N
2-Ethoxyethanol	110805	4.00E-01	H	5.71E-02	I						15000	N	820000	N	31000	N
Ethyl acrylate	140885					4.80E-02	H				1.4	C	1200	C	13	C
EPTC (S-Ethyl dipropylthiocarbamate)	759944	2.50E-02	I								910	N	51000	N	2000	N
Ethyl acetate	141786	9.00E-01	I								33000	N	1000000	N	70000	N
Ethylbenzene	100414	1.00E-01	I	2.86E-01	I					x	700	S	200000	N	7800	N
Ethylene cyanohydrin	109784	3.00E-01	H								11000	N	610000	N	23000	N
Ethylene diamine	107153	2.00E-02	H								730	N	41000	N	1600	N
Ethylene glycol	107211	2.00E+00	I								73000	N	1000000	N	160000	N
Ethylene glycol, monobutyl ether	111762			5.71E-03	H						210	N				
Ethylene oxide	75218					1.02E+00	H	3.50E-01	H		0.066	C	56	C	0.63	C
Ethylene thiourea (ETU)	96457	8.00E-05	I			1.19E-01	H				0.57	C	480	C	5.4	C
Ethyl ether	60297	2.00E-01	I							x	1200	N	410000	N	16000	N
Ethyl methacrylate	97632	9.00E-02	H								3300	N	180000	N	7000	N
Ethyl p-nitrophenyl phenylphosphorothioate	2104645	1.00E-05	I								0.37	N	20	N	0.78	N
Ethylnitrosourea	759739					1.40E+02	W[1]				0.00048	C	0.41	C	0.0046	C
Ethylphthalyl ethyl glycolate	84720	3.00E+00	I								110000	N	1000000	N	230000	N
Express	10120	8.00E-03	I								290	N	16000	N	630	N
Fenamiphos	22224926	2.50E-04	I								9.1	N	510	N	20	N
Fluometuron	2164172	1.30E-02	I								470	N	27000	N	1000	N
Fluoride	7782414	6.00E-02	I								4000	S	120000	N	4700	N
Fluoridone	59756604	8.00E-02	I								2900	N	160000	N	6300	N
Flurprimidol	56425913	2.00E-02	I								730	N	41000	N	1600	N
Flutolanil	66332965	6.00E-02	I								2200	N	120000	N	4700	N
Fluvalinate	69409945	1.00E-02	I								370	N	20000	N	780	N
Folpet	133073	1.00E-01	I			3.50E-03	I				19	C	16000	C	180	C
Fomesafen	72178020					1.90E-01	I				0.35	C	300	C	3.4	C

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											Risk-Based Concentrations					
													Soil Ingestion			
Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		V O C	Ground Water µg/L		Industrial2 mg/kg		Residential mg/kg	
Fonofos	944229	2.00E-03	I								73	N	4100	N	160	N
Formaldehyde	50000	2.00E-01	I					4.55E-02	I		7300	N	410000	N	16000	N
Formic Acid	64186	2.00E+00	H								73000	N	1000000	N	160000	N
Fosetyl-al	39148248	3.00E+00	I								110000	N	1000000	N	230000	N
Furan	110009	1.00E-03	I								37	N	2000	N	78	N
Furazolidone	67458					3.80E+00	H				0.018	C	15	C	0.17	C
Furfural	98011	3.00E-03	I	1.43E-02	A						110	N	6100	N	230	N
Furium	531828					5.00E+01	H				0.0013	C	1.1	C	0.013	C
Furmecyclox	60568050					3.00E-02	I				2.2	C	1900	C	21	C
Glufosinate-ammonium	77182822	4.00E-04	I								15	N	820	N	31	N
Glycidaldehyde	765344	4.00E-04	I	2.86E-04	H						15	N	820	N	31	N
Glyphosate	1071836	1.00E-01	I								700	S	200000	N	7800	N
Haloxyfop-methyl	69806402	5.00E-05	I								1.8	N	100	N	3.9	N
Harmony	79277273	1.30E-02	I								470	N	27000	N	1000	N
HCH (alpha)	319846					6.30E+00	I	6.30E+00	I		0.011	C	9.1	C	0.1	C
HCH (beta)	319857					1.80E+00	I	1.80E+00	I		0.037	C	32	C	0.35	C
HCH (gamma) Lindane	58899	3.00E-04	I			1.30E+00	H				0.2	S	44	C	0.49	C
HCH-technical	608731					1.80E+00	I	1.79E+00	I		0.037	C	32	C	0.35	C
Heptachlor	76448	5.00E-04	I			4.50E+00	I	4.55E+00	I	x	0.4	S	13	C	0.14	C
Heptachlor epoxide	1024573	1.30E-05	I			9.10E+00	I	9.10E+00	I	x	0.2	S	6.3	C	0.07	C
Hexabromo benzene	87821	2.00E-03	I							x	12	N	4100	N	160	N
Hexachlorobenzene	118741	8.00E-04	I			1.60E+00	I	1.61E+00	I	x	1	S	36	C	0.4	C
Hexachlorobutadiene	87683	2.00E-04	H			7.80E-02	I	7.70E-02	I	x	0.14	C	730	C	8.2	C
Hexachlorocyclopentadiene	77474	7.00E-03	I	2.00E-05	H					x	50	S	14000	N	550	N
Hexachlorodibenzo-p-dioxin mixture	19408743					6.20E+03	I	4.55E+03	I		0.000011	C	0.0092	C	0.0001	C
Hexachloroethane	67721	1.00E-03	I			1.40E-02	I	1.40E-02	I	x	0.75	C	4100	C	46	C
Hexachlorophene	70304	3.00E-04	I								11	N	610	N	23	N
Hexahydro-1,3,5-trinitro-1,3,5-triazine	121824	3.00E-03	I			1.10E-01	I				0.61	C	520	C	5.8	C
1,6-Hexamethylene diisocyanate	822060			2.86E-06	I						0.10	N				
n-Hexane	110543	6.00E-02	H	5.71E-02	I					x	350	N	120000	N	4700	N
Hexazinone	51235042	3.30E-02	I								1200	N	67000	N	2600	N
Hydrazine, hydrazine sulfate	302012					3.00E+00	I	1.71E+01	I		0.022	C	19	C	0.21	C
Hydrogen chloride	7647010			5.71E-03	I						210	N				
Hydrogen sulfide	7783064	3.00E-03	I	2.85E-04	I						110	N	6100	N	230	N
Hydroquinone	123319	4.00E-02	H								1500	N	82000	N	3100	N
Imazalil	35554440	1.30E-02	I								470	N	27000	N	1000	N
Imazaquin	81335377	2.50E-01	I								9100	N	510000	N	20000	N
Iprodione	36734197	4.00E-02	I								1500	N	82000	N	3100	N
Iron	7439896	3.00E-01	E[1]								11000	N	610000	N	23000	N
Isobutanol	78831	3.00E-01	I							x	1800	N	610000	N	23000	N
Isophorone	78591	2.00E-01	I			9.50E-04	I				71	C	60000	C	670	C
Isopropalin	33820530	1.50E-02	I								550	N	31000	N	1200	N

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Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		VOC	Risk-Based Concentrations: Ground Water µg/L		Soil Ingestion: Industrial2 mg/kg		Soil Ingestion: Residential mg/kg	
Isopropyl methyl phosphonic acid	1832548	1.00E-01	I								3700	N	200000	N	7800	N
Isoxaben	82558507	5.00E-02	I								1800	N	100000	N	3900	N
Kepone	143500					1.80E+01	E[1]				0.0037	C	3.2	C	0.035	C
Lactofen	77501634	2.00E-03	I								73	N	4100	N	160	N
Lead	7439-92-1										15	S	1000	R1	400	R[2]
Linuron	330552	2.00E-03	I								73	N	4100	N	160	N
Lithium	7439932	2.00E-02	E[1]								730	N	41000	N	1600	N
Londax	83056996	2.00E-01	I								7300	N	410000	N	16000	N
Malathion	121755	2.00E-02	I								730	N	41000	N	1600	N
Maleic anhydride	108316	1.00E-01	I								3700	N	200000	N	7800	N
Maleic hydrazide	123331	5.00E-01	I								18000	N	1000000	N	39000	N
Malononitrile	109773	2.00E-05	H								0.73	N	41	N	1.6	N
Mancozeb	8018017	3.00E-02	H								1100	N	61000	N	2300	N
Maneb	12427382	5.00E-03	I								180	N	10000	N	390	N
**Manganese and compounds	7439965	2.30E-02	I	1.43e-05	I						840	N	47000	N	1800	N
Mephosfolan	950107	9.00E-05	H								3.3	N	180	N	7	N
Mepiquat chloride	24307264	3.00E-02	I								1100	N	61000	N	2300	N
Mercuric chloride	7487947	3.00E-04	I								11	N	610	N	23	N
Mercury (inorganic)	7439976	3.00E-04	H	8.57E-05	H						2	S	610	N	23	N
Mercury (methyl)	22967926	1.00E-04	I								3.7	N	200	N	7.8	N
Merphos	150505	3.00E-05	I								1.1	N	61	N	2.3	N
Merphos oxide	78488	3.00E-05	I								1.1	N	61	N	2.3	N
Metalaxyl	57837191	6.00E-02	I								2200	N	120000	N	4700	N
Methacrylonitrile	126987	1.00E-04	I	2.00E-04	A						3.7	N	200	N	7.8	N
Methamidophos	10265926	5.00E-05	I								1.8	N	100	N	3.9	N
Methanol	67561	5.00E-01	I								18000	N	1000000	N	39000	N
Methidathion	950378	1.00E-03	I								37	N	2000	N	78	N
Methomyl	16752775	2.50E-02	I								910	N	51000	N	2000	N
Methoxychlor	72435	5.00E-03	I								40	S	10000	N	390	N
2-Methoxyethanol acetate	110496	2.00E-03	A								73	N	4100	N	160	N
2-Methoxyethanol	109864	1.00E-03	H	5.71E-03	I						37	N	2000	N	78	N
2-Methoxy-5-nitroaniline	99592					4.60E-02	H				1.5	C	1200	C	14	C
Methyl acetate	79209	1.00E+00	H								37000	N	1000000	N	78000	N
Methyl acrylate	96333	3.00E-02	A								1100	N	61000	N	2300	N
2-Methylaniline hydrochloride	636215					1.80E-01	H				0.37	C	320	C	3.5	C
2-Methylaniline	95534					2.40E-01	H				0.28	C	240	C	2.7	C
Methyl chlorocarbonate	79221	1.00E+00	W[1]								37000	N	1000000	N	78000	N
4-(2-Methyl-4-chlorophenoxy) butyric acid	94815	1.00E-02	I								370	N	20000	N	780	N
2-Methyl-4-chlorophenoxyacetic acid	94746	5.00E-04	I								18	N	1000	N	39	N
2-(2-Methyl-14-chlorophenoxy)propionic acid	93652	1.00E-03	I								37	N	2000	N	78	N
Methylcyclohexane	108872			8.57E-01	H						31000	N				

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Methylene bromide	74953	1.00E-02	A							x	61	N	20000	N	780	N
Methylene chloride	75092	6.00E-02	I	8.57E-01	H	7.50E-03	I	1.64E-03	I	x	5	S	7600	C	85	C
4,4'-Methylene bis(2-chloroaniline)	101144	7.00E-04	H			1.30E-01	H	1.30E-01	H		0.52	C	440	C	4.9	C
4,4'-Methylenebisbenzeneamine	101779					2.50E-01	W1				0.27	C	230	C	2.6	C
4,4'-Methylene bis(N,N'-dimethyl)aniline	101611					4.60E-02	I				1.5	C	1200	C	14	C
4,4'-Methylenediphenyl isocyanate	101688			5.71E-06	I					x	0.035	N				
Methyl ethyl ketone	78933	6.00E-01	I	2.86E-01	I					x	1900	N	1000000	N	47000	N
Methyl hydrazine	60344					1.10E+00	W[1]				0.061	C	52	C	0.58	C
Methyl isobutyl ketone	108101	8.00E-02	H	2.29E-02	A						2900	N	160000	N	6300	N
Methyl methacrylate	80626	8.00E-02	H								2900	N	160000	N	6300	N
2-Methyl-5-nitroaniline	99558					3.30E-02	H				2	C	1700	C	19	C
Methyl parathion	298000	2.50E-04	I								9.1	N	510	N	20	N
2-Methylphenol (o-cresol)	95487	5.00E-02	I								1800	N	100000	N	3900	N
3-Methylphenol (m-cresol)	103394	5.00E-02	I								1800	N	100000	N	3900	N
4-Methylphenol (p-cresol)	106445	5.00E-03	H								180	N	10000	N	390	N
Methyl styrene (mixture)	25013154	6.00E-03	A	1.14E-02	A					x	60	N	12000	N	470	N
Methyl styrene (alpha)	98839	7.00E-02	A							x	430	N	140000	N	5500	N
Methyl tertbutyl ether (MTBE)	1634044	5.00E-03	E[1]	8.57E-01	I					x	180	N	10000	N	390	N
Metolaclor (Dual)	51218452	1.50E-01	H								5500	N	310000	N	12000	N
Metribuzin	21087649	2.50E-02	I								910	N	51000	N	2000	N
Mirex	2385855	2.00E-04	I			1.80E+00	W[1]				0.037	C	32	C	0.35	C
Molinate	2212671	2.00E-03	I								73	N	4100	N	160	N
Molybdenum	7439987	5.00E-03	I								180	N	10000	N	390	N
Monochloramine	10599903	1.00E-01	I								3700	N	200000	N	7800	N
Naled	300765	2.00E-03	I								73	N	4100	N	160	N
2-Naphthylamine	91598					1.30e+02	E[1]				0.00052	C	0.44	C	0.0049	C
Napropamide	15299997	1.00E-01	I								3700	N	200000	N	7800	N
Nickel and compounds	7440020	2.00E-02	I								100	S	41000	N	1600	N
Nitrapyrin	1929824	1.50E-03	W[1]								55	N	3100	N	120	N
Nitrate	14797558	1.60E+00	I								10000	S	1000000	N	130000	N
Nitric oxide	10102439	1.00E-01	W[1]								3700	N	200000	N	7800	N
Nitrite	14797650	1.00E-01	I								1000	S	200000	N	7800	N
2-Nitroaniline	88744	6.00E-05	W[1]	5.71E-05	H						2.2	N	120	N	4.7	N
3-Nitroaniline	99092	3.00E-03	O[1]								110	N	6100	N	230	N
4-Nitroaniline	100016	3.00E-03	O[1]								110	N	6100	N	230	N
Nitrobenzene	98953	5.00E-04	I	5.71E-04	A					x	3.4	N	1000	N	39	N
Nitrofurantoin	67209	7.00E-02	H								2600	N	140000	N	5500	N
Nitrofurazone	59870					1.50E+00	H	9.40E+00	H		0.045	C	38	C	0.43	C

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Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		VOC	Risk-Based Concentrations: Ground Water µg/L		Soil Ingestion: Industrial2 mg/kg		Soil Ingestion: Residential mg/kg	
Nitrogen dioxide	10102440	1.00E+00	W[1]								37000	N	1000000	N	78000	N
Nitroguanidine	556887	1.00E-01	I								3700	N	200000	N	7800	N
4-Nitrophenol	100027	6.20E-02	O[1]								2300	N	130000	N	4800	N
2-Nitropropane	79469			5.71E-03	I			9.40E+00	H		210	N				
N-Nitrosodi-n-butylamine	924163					5.40E+00	I	5.60E+00	I		0.012	C	11	C	0.12	C
N-Nitrosodiethanolamine	1116547					2.80E+00	I				0.024	C	20	C	0.23	C
N-Nitrosodiethylamine	55185					1.50E+02	I	1.51E+02	I		0.00045	C	0.38	C	0.0043	C
N-Nitrosodimethylamine	62759					5.10E+01	I	4.90E+01	I		0.0013	C	1.1	C	0.013	C
N-Nitrosodiphenylamine	86306					4.90E-03	I				14	C	12000	C	130	C
N-Nitroso di-n-propylamine	621647					7.00E+00	I				0.0096	C	8.2	C	0.091	C
N-Nitroso-N-methylethylamine	10595956					2.20E+01	I				0.0031	C	2.6	C	0.029	C
N-Nitrosopyrrolidine	930552					2.10E+00	I	2.13E+00	I		0.032	C	27	C	0.3	C
m-Nitrotoluene	99081	1.00E-02	H							x	61	N	20000	N	780	N
o-Nitrotoluene	88722	1.00E-02	H							x	61	N	20000	N	780	N
p-Nitrotoluene	99990	1.00E-02	H							x	61	N	20000	N	780	N
Norflurazon	27314132	4.00E-02	I								1500	N	82000	N	3100	N
NuStar	85509199	7.00E-04	I								26	N	1400	N	55	N
Octabromodiphenyl ether	32536520	3.00E-03	I								110	N	6100	N	230	N
Octahydro-1357-tetranitro-1357-tetrazocine	2691410	5.00E-02	I								1800	N	100000	N	3900	N
Octamethylpyrophosphoramide	152169	2.00E-03	H								73	N	4100	N	160	N
Oryzalin	19044883	5.00E-02	I								1800	N	100000	N	3900	N
Oxadiazon	19666309	5.00E-03	I								180	N	10000	N	390	N
Oxamyl	23135220	2.50E-02	I								200	S	51000	N	2000	N
Oxyfluorfen	42874033	3.00E-03	I								110	N	6100	N	230	N
Paclobutrazol	76738620	1.30E-02	I								470	N	27000	N	1000	N
Paraquat	1910425	4.50E-03	I								160	N	9200	N	350	N
Parathion	56382	6.00E-03	H								220	N	12000	N	470	N
Pebulate	1114712	5.00E-02	H								1800	N	100000	N	3900	N
Pendimethalin	40487421	4.00E-02	I								1500	N	82000	N	3100	N
Pentabromo-6-chloro cyclohexane	87843					2.30E-02	H				2.9	C	2500	C	28	C
Pentabromodiphenyl ether	32534819	2.00E-03	I								73	N	4100	N	160	N
Pentachlorobenzene	608935	8.00E-04	I							x	4.9	N	1600	N	63	N
Pentachloronitrobenzene	82688	3.00E-03	I			2.60E-01	H			x	0.041	C	220	C	2.5	C
Pentachlorophenol	87865	3.00E-02	I			1.20E-01	I				1	S	480	C	5.3	C
Permethrin	52645531	5.00E-02	I								1800	N	100000	N	3900	N
Phenmedipham	13684634	2.50E-01	I								9100	N	510000	N	20000	N
Phenol	108952	6.00E-01	I								22000	N	1000000	N	47000	N
m-Phenylenediamine	108452	6.00E-03	I								220	N	12000	N	470	N
p-Phenylenediamine	106503	1.90E-01	H								6900	N	390000	N	15000	N
Phenylmercuric acetate	62384	8.00E-05	I								2.9	N	160	N	6.3	N
2-Phenylphenol	90437					1.94E-03	H				35	C	30000	C	330	C
Phorate	298022	2.00E-04	H								7.3	N	410	N	16	N

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											Risk-Based Concentrations					
													Soil Ingestion			
Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		V O C	Ground Water µg/L		Industrial2 mg/kg		Residential mg/kg	
Phosmet	732116	2.00E-02	I								730	N	41000	N	1600	N
Phosphine	7803512	3.00E-04	I	8.57E-05	I						11	N	610	N	23	N
Phosphoric acid	7664382			2.86E-03	I						100	N				
Phosphorus (white)	7723140	2.00E-05	I								0.73	N	41	N	1.6	N
p-Phthalic acid	100210	1.00E+00	H								37000	N	1000000	N	78000	N
Phthalic anhydride	85449	2.00E+00	I	3.43E-02	H						73000	N	1000000	N	160000	N
Picloram	1918021	7.00E-02	I								500	S	140000	N	5500	N
Pirimiphos-methyl	29232937	1.00E-02	I								370	N	20000	N	780	N
Polybrominated biphenyls	0	7.00E-06	H			8.90E+00	H				0.0076	C	6.4	C	0.072	C
Polychlorinated biphenyls (PCBs)	1336363					7.70E+00	I				0.5	S	7.4	C	0.083	C
Aroclor 1016	12674112	7.00E-05	I								2.6	N	140	N	5.5	N
Aroclor 1254	11097691	2.00E-05	I								0.73	N	41	N	1.6	N
Polychlorinated terphenyls (PCTs)	0					4.50E+00	E[1]				0.015	C	13	C	0.14	C
Polynuclear aromatic hydrocarbons	0															
Acenaphthene	83329	6.00E-02	I								2200	N	120000	N	4700	N
Anthracene	120127	3.00E-01	I								11000	N	610000	N	23000	N
Benz[a]anthracene	56553					7.30E-01	E[1]	6.10E-01	E[1]		0.092	C	78	C	0.88	C
Benzo[b]fluoranthene	205992					7.30E-01	E[1]	6.10E-01	E[1]		0.092	C	78	C	0.88	C
Benzo[k]fluoranthene	207089					7.30E-02	E[1]	6.10E-02	E[1]		0.92	C	780	C	8.8	C
Benzo[a]pyrene	50328					7.30E+00	I	6.10E+00	W[1]		0.200	S	7.8	C	0.088	C
Carbazole	86748					2.00E-02	H				3.4	C	2900	C	32	C
Chrysene	218019					7.30E-03	E[1]	6.10E-03	E[1]		9.2	C	7800	C	88	C
Dibenz[ah]anthracene	53703					7.30E+00	E[1]	6.10E+00	E[1]		0.0092	C	7.8	C	0.088	C
Fluoranthene	206440	4.00E-02	I								1500	N	82000	N	3100	N
Fluorene	86737	4.00E-02	I								1500	N	82000	N	3100	N
Indeno[1,2,3-cd]pyrene	193395					7.30E-01	E[1]	6.10E-01	E[1]		0.092	C	78	C	0.88	C
Naphthalene	91203	4.00E-02	W[1]								1500	N	82000	N	3100	N
Pyrene	129000	3.00E-02	I								1100	N	61000	N	2300	N
Prochloraz	67747095	9.00E-03	I			1.50E-01	I				0.45	C	380	C	4.3	C
Profluralin	26399360	6.00E-03	H								220	N	12000	N	470	N
Prometon	1610180	1.50E-02	I								550	N	31000	N	1200	N
Prometryn	7287196	4.00E-03	I								150	N	8200	N	310	N
Pronamide	23950585	7.50E-02	I								2700	N	150000	N	5900	N
Propachlor	1918167	1.30E-02	I								470	N	27000	N	1000	N
Propanil	709988	5.00E-03	I								180	N	10000	N	390	N
Propargite	2312358	2.00E-02	I								730	N	41000	N	1600	N
Propargyl alcohol	107197	2.00E-03	I								73	N	4100	N	160	N
Propazine	139402	2.00E-02	I								730	N	41000	N	1600	N

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Contaminant	CAS	RfDo mg/kg/d		RfDi mg/kg/d		CPSo kg· d/mg		CPSi kg· d/mg		V O C	Ground Water µg/L		Industrial2 mg/kg		Residential mg/kg	
Propham	122429	2.00E-02	I								730	N	41000	N	1600	N
Propiconazole	60207901	1.30E-02	I								470	N	27000	N	1000	N
Propylene glycol	57556	2.00E+01	H								730000	N	1000000	N	1000000	N
Propylene glycol, monoethyl ether	52125538	7.00E-01	H								26000	N	1000000	N	55000	N
Propylene glycol, monomethyl ether	107982	7.00E-01	H	5.71E-01	I						26000	N	1000000	N	55000	N
Propylene oxide	75569			8.57E-03	I	2.40E-01	I	1.29E-02	I		0.28	C	240	C	2.7	C
Pursuit	81335775	2.50E-01	I								9100	N	510000	N	20000	N
Pydrin	51630581	2.50E-02	I								910	N	51000	N	2000	N
Pyridine	110861	1.00E-03	I								37	N	2000	N	78	N
Quinalphos	13593038	5.00E-04	I								18	N	1000	N	39	N
Quinoline	91225					1.20E+01	H				0.0056	C	5	C	0.053	C
Resmethrin	10463868	3.00E-02	I								1100	N	61000	N	2300	N
Ronnel	299843	5.00E-02	H								1800	N	100000	N	3900	N
Rotenone	83794	4.00E-03	I								150	N	8200	N	310	N
Savey	78587050	2.50E-02	I								910	N	51000	N	2000	N
Selenious Acid	7783008	5.00E-03	I								180	N	10000	N	390	N
Selenium	7782492	5.00E-03	I								50	S	10000	N	390	N
Selenourea	630104	5.00E-03	H								180	N	10000	N	390	N
Sethoxydim	74051802	9.00E-02	I								3300	N	180000	N	7000	N
Silver and compounds	7440224	5.00E-03	I								180	N	10000	N	390	N
Simazine	122349	5.00E-03	I			1.20E-01	H				4	S	480	C	5.3	C
Sodium azide	26628228	4.00E-03	I								150	N	8200	N	310	N
Sodium diethyldithiocarbamate	148185	3.00E-02	I			2.70E-01	H				0.25	C	210	C	2.4	C
Sodium fluoroacetate	62748	2.00E-05	I								0.73	N	41	N	1.6	N
Sodium metavanadate	13718268	1.00E-03	H								37	N	2000	N	78	N
Strontium, stable	7440246	6.00E-01	I								22000	N	1000000	N	47000	N
Strychnine	57249	3.00E-04	I								11	N	610	N	23	N
Styrene	100425	2.00E-01	I	2.86E-01	I					x	100	S	410000	N	16000	N
Systhane	88671890	2.50E-02	I								910	N	51000	N	2000	N
2,3,7,8-TCDD (dioxin)	1746016					1.56E+05	H	1.16E+05	H		0.000005	S	0.00037	C	0.0000041	C
Tebuthiuron	34014181	7.00E-02	I								2600	N	140000	N	5500	N
Temephos	3383968	2.00E-02	H								730	N	41000	N	1600	N
Terbacil	5902512	1.30E-02	I								470	N	27000	N	1000	N
Terbufos	13071799	2.50E-05	H								0.91	N	51	N	2	N
Terbutryn	886500	1.00E-03	I								37.00	N	2000	N	78	N
1,2,4,5-Tetrachlorobenzene	95943	3.00E-04	I							x	1.8	N	610	N	23	N
1,1,1,2-Tetrachloroethane	630206	3.00E-02	I			2.60E-02	I	2.59E-02	I	x	0.41	C	2200	C	25	C
1,1,2,2-Tetrachloroethane	79345					2.00E-01	I	2.03E-01	I	x	0.052	C	290	C	3.2	C
Tetrachloroethylene (PCE)	127184	1.00E-02	I			5.20E-02	E[1]	2.03E-03	E[1]	x	5	S	1100	C	12	C
2,3,4,6-Tetrachlorophenol	58902	3.00E-02	I								1100	N	61000	N	2300	N
p,a,a,a-Tetrachlorotoluene	5216251					2.00E+01	H			x	0.00053	C	2.9	C	0.032	C
Tetrachlorovinphos	961115	3.00E-02	I			2.40E-02	H				2.8	C	2400	C	27	C

STATE OF ARKANSAS

Key : i=IRIS p= PPRTV n=NCEA h=HEAST x=WITHDRAWN o=Other DOCUMENTS r=ROUTE EXTRAPOLATION Key : C=CANCER N=NONCANCER sat=SOIL SATURATION max=CEILING LIMIT

Region 6 Human Health Medium-Specific Screening Levels 2007

Contaminants	TOXICITY INFORMATION													SCREENING LEVELS										
	SFo 1/(mg/kg-d)	K E Y	Mutagen y for yes	CANCER CLASS	RfDo (mg/kg-d)	K E Y	SFi 1/(mg/kg-d)	K E Y	RfDi (mg/kg-d)	K E Y	RfC (mg/m3)	K E Y	MCL (ug/l)	CAS No.	Residential Soil (mg/kg)	K E Y	Industrial Indoor Worker w/o Dermal (mg/kg)	K E Y	Industrial-Outdoor Worker Soil (mg/kg)	K E Y	Ambient Air (ug/m^3)	K E Y	Tap Water (ug/l)	K E Y	DAF 1 (mg/kg)
Acetaldehyde							7.7E-03 i		2.6E-03 i					75-07-0	1.1E+01	C	2.3E+01	C	2.6E+01	C	8.7E-01	C	1.7E+00	C	
Acetochlor					2.0E-02 i				2.0E-02 r					34256-82-1	1.2E+03	N	4.1E+04	N	1.4E+04	N	7.3E+01	N	7.3E+02	N	
Acetone					9.0E-01 i				9.0E-01 r					67-64-1	1.4E+04	N	5.6E+04	N	6.0E+04	N	3.3E+03	N	5.5E+03	N	8.0E-01
Acetonitrile									1.7E-02 i					75-05-8	6.2E+02	N	2.0E+03	N	2.3E+03	N	6.2E+01	N	1.2E+02	N	
Acetophenone					1.0E-01 i				1.0E-01 r					98-86-2	1.7E+03	sat	1.7E+03	sat	1.7E+03	sat	3.7E+02	N	6.1E+02	N	
Acrolein					5.0E-04 i				5.7E-06 i					107-02-8	1.0E-01	N	3.4E-01	N	3.7E-01	N	2.1E-02	N	4.2E-02	N	
Acrylamide	4.6E+00 i			B2	2.0E-04 i		4.6E+00 i		2.0E-04 r					79-06-1	1.1E-01	C	1.3E+00	C	4.2E-01	C	1.5E-03	C	1.5E-02	C	
Acrylic acid					5.0E-01 i				2.9E-04 i					79-10-7	2.9E+04	N	1.0E+05	max	1.0E+05	max	1.0E+00	N	1.8E+04	N	
Acrylonitrile	5.4E-01 i			B1	1.0E-03 h		2.4E-01 i		5.7E-04 i					107-13-1	2.1E-01	C	5.2E-01	C	5.5E-01	C	2.8E-02	C	3.9E-02	C	
Alachlor	8.1E-02 h				1.0E-02 i		8.0E-02 r		1.0E-02 r				2.0E+00	15972-60-8	6.0E+00	C	7.1E+01	C	2.4E+01	C	8.4E-02	C	8.4E-01	C	
Alar					1.5E-01 i				1.5E-01 r					1596-84-5	9.2E+03	N	1.0E+05	max	1.0E+05	max	5.5E+02	N	5.5E+03	N	
Aldicarb					1.0E-03 i				1.0E-03 r				7.0E+00	116-06-3	6.1E+01	N	2.0E+03	N	6.8E+02	N	3.7E+00	N	3.7E+01	N	
Aldicarb sulfone					1.0E-03 i				1.0E-03 r				7.0E+00	1646-88-4	6.1E+01	N	2.0E+03	N	6.8E+02	N	3.7E+00	N	3.7E+01	N	
Aldrin	1.7E+01 i			B2	3.0E-05 i		1.7E+01 i		3.0E-05 r					309-00-2	2.9E-02	C	3.4E-01	C	1.1E-01	C	3.9E-04	C	4.0E-03	C	2.0E-02
Allyl chloride					5.0E-02 h				2.9E-04 i					107-05-1	3.0E+03	N	9.7E+04	N	3.4E+04	N	1.0E+00	N	1.8E+03	N	
Aluminum					1.0E+00 p				1.4E-03 p					7429-90-5	7.6E+04	N	1.0E+05	max	1.0E+05	max	5.2E+00	N	3.7E+04	N	
Amdro					3.0E-04 i				3.0E-04 r					67485-29-4	1.8E+01	N	6.1E+02	N	2.1E+02	N	1.1E+00	N	1.1E+01	N	
4-Aminopyridine					2.0E-05 h				2.0E-05 r					504-24-5	1.2E+00	N	4.1E+01	N	1.4E+01	N	7.3E-02	N	7.3E-01	N	
Ammonia									2.9E-02 i					7664-41-7							1.0E+02	N	2.1E+02	N	
Aniline	5.7E-03 i			B2	7.0E-03 p		5.7E-03 r		2.9E-04 i		1.0E-03 I			62-53-3	8.5E+01	C	1.0E+03	C	3.4E+02	C	1.0E+00	N	1.2E+01	C	
Antimony and compounds					4.0E-04 i								6.0E+00	7440-36-0	3.1E+01	N	8.2E+02	N	4.5E+02	N			1.5E+01	N	3.0E-01
Antimony pentoxide					5.0E-04 h									1314-60-9	3.9E+01	N	1.0E+03	N	5.7E+02	N			1.8E+01	N	
Antimony tetroxide					4.0E-04 h									1332-81-6	3.1E+01	N	8.2E+02	N	4.5E+02	N			1.5E+01	N	
Antimony trioxide					4.0E-04 h				5.7E-05 i					1309-64-4	3.1E+01	N	8.2E+02	N	4.5E+02	N	2.1E-01	N	1.5E+01	N	
Arsenic (noncancer endpoint)					3.0E-04 i								1.0E+01	7440-38-2	2.2E+01	N	6.1E+02	N	2.8E+02	N					
Arsenic (cancer endpoint)	1.5E+00 i			A	3.0E-04 i		1.5E+01 i						1.0E+01	7440-38-2	3.9E-01	C	3.8E+00	C	1.8E+00	C	4.5E-04	C	4.5E-02	C	1.0E+00
Arsine									1.4E-05 i		5.0E-05 i			7784-42-1							5.2E-02	N	1.0E-01	N	
Assure					9.0E-03 i				9.0E-03 r					76578-14-8	5.5E+02	N	1.8E+04	N	6.2E+03	N	3.3E+01	N	3.3E+02	N	
Atrazine	2.2E-01 h				3.5E-02 h		2.2E-01 r		3.5E-02 h				3.0E+00	1912-24-9	2.2E+00	C	2.6E+01	C	8.6E+00	C	3.1E-02	C	3.0E-01	C	
Azobenzene	1.1E-01 i			B2			1.1E-01 i							103-33-3	4.4E+00	C	5.2E+01	C	1.7E+01	C	6.2E-02	C	6.1E-01	C	
Barium and compounds					2.0E-01 i				2.0E-01 r				2.0E+03	7440-39-3	1.6E+04	N	1.0E+05	max	1.0E+05	max	7.3E+02	N	7.3E+03	N	8.2E+01
Baygon					4.0E-03 i				4.0E-03 r					114-26-1	2.4E+02	N	8.2E+03	N	2.7E+03	N	1.5E+01	N	1.5E+02	N	
Baythroid					2.5E-02 i				2.5E-02 r					68359-37-5	1.5E+03	N	5.1E+04	N	1.7E+04	N	9.1E+01	N	9.1E+02	N	
Bentazon					3.0E-02 i				3.0E-02 r					25057-89-0	1.8E+03	N	6.1E+04	N	2.1E+04	N	1.1E+02	N	1.1E+03	N	
Benzaldehyde					1.0E-01 i				1.0E-01 r					100-52-7	6.1E+03	N	1.0E+05	max	6.8E+04	N	3.7E+02	N	3.7E+03	N	
Benzene	5.5E-02 i			A	4.0E-03 i		2.7E-02 i		8.6E-03 i				5.0E+00	71-43-2	6.6E-01	C	1.5E+00	C	1.6E+00	C	2.5E-01	C	3.5E-01	C	2.0E-03
Benzidine	2.3E+02 i		y	A	3.0E-03 i		2.3E+02 i		3.0E-03 r					92-87-5	5.0E-04	C	2.5E-02	C	8.3E-03	C	9.4E-06	C	9.4E-05	C	
Benzoic acid					4.0E+00 i				4.0E+00 i					65-85-0	1.0E+05	max	1.0E+05	max	1.0E+05	max	1.5E+04	N	1.5E+05	N	2.0E+01
Benzyl alcohol					3.0E-01 h				3.0E-01 r					100-51-6	1.8E+04	N	1.0E+05	max	1.0E+05	max	1.1E+03	N	1.1E+04	N	
Benzyl chloride	1.7E-01 i			B2			1.7E-01 r							100-44-7	8.9E-01	C	2.3E+00	C	2.4E+00	C	4.0E-02	C	6.6E-02	C	
Beryllium and compounds				B1	2.0E-03 i		8.4E+00 i		5.7E-06 i				4.0E+00	7440-41-7	1.5E+02	N	2.2E+03	C	2.2E+03	N	8.0E-04	C	7.3E+01	N	3.0E+00
1,1-Biphenyl					5.0E-02 i				5.0E-02 r					92-52-4	3.0E+03	N	3.0E+04	N	2.6E+04	N	1.8E+02	N	3.0E+02	N	
Bis(2-chloroethyl)ether	1.1E+00 i			B2			1.2E+00 i							111-44-4	2.1E-01	C	6.2E-01	C	6.2E-01	C	5.8E-03	C	9.8E-03	C	2.0E-05
Bis(2-chloroisopropyl)ether	7.0E-02 h				4.0E-02 i		3.5E-02 h		4.0E-02 r					108-60-1	2.9E+00	C	8.1E+00	C	8.2E+00	C	1.9E-01	C	2.7E-01	C	
Bis(chloromethyl)ether	2.2E+02 i			A			2.2E+02 i							542-88-1	1.9E-04	C	4.4E-04	C	4.8E-04	C	3.1E-05	C	5.2E-05	C	
Bis(2-ethylhexyl)phthalate (DEHP)	1.4E-02 i			B2	2.0E-02 i		1.4E-02 r		2.0E-02 r				6.0E+00	117-81-7	3.5E+01	C	4.1E+02	C	1.4E+02	C	4.8E-01	C	4.8E+00	C	1.8E+02
Boron					2.0E-01 i				5.7E-03 h					7440-42-8	1.6E+04	N	1.0E+05	max	1.0E+05	max	2.1E+01	N	7.3E+03	N	
Boron trifluoride									2.0E-04 h					7637-07-2	1.0E+05	max	1.0E+05	max	1.0E+05	max	7.3E-01	N			
Bromobenzene					2.0E-02 p				3.3E-03 p		1.2E-02 p			108-86-1	7.3E+01	N	1.1E+02	N	1.2E+02	N	1.2E+01	N	2.3E+01	N	
Bromodichloromethane	6.2E-02 i			B2	2.0E-02 i		6.2E-02 r		2.0E-02 r					75-27-4	1.0E+00	C	2.4E+00	C	2.6E+00	C	1.1E-01	C	1.8E-01	C	3.0E-02
Bromoform (tribromomethane)	7.9E-03 i			B2	2.0E-02 i		3.9E-03 i		2.0E-02 r					75-25-2	6.2E+01	C	7.2E+02	C	2.4E+02	C	1.7E+00	C	8.5E+00	C	4.0E-02
Bromomethane					1.4E-03 i				1.4E-03 i					74-83-9	3.9E+00	N	1.3E+01	N	1.5E+01	N	5.2E+00	N	8.7E+00	N	1.0E-02
Bromophos					5.0E-03 h				5.0E-03 r					2104-96-3	3.1E+02	N	1.0E+04	N	3.4E+03	N	1.8E+01	N	1.8E+02	N	
Bromoxynil					2.0E-02 i				2.0E-02 r					1689-84-5	1.2E+03	N	4.1E+04	N	1.4E+04	N	7.3E+01	N	7.3E+02	N	
1,3-Butadiene				B2			1.1E-01 i		5.7E-04 i					106-99-0	6.2E-02	C	1.3E-01	C	1.5E-01	C	6.4E-02	C	1.3E-01	C	
1-Butanol					1.0E-01 i				1.0E-01 r					71-36-3	6.1E+03	N	1.0E+05	max	6.8E+04	N	3.7E+02	N	3.7E+03	N	9.0E-01
Butylate					5.0E-02 i				5.0E-02 r					2008-41-5	3.1E+03	N	1.0E+05	max	3.4E+04	N	1.8E+02	N	1.8E+03	N	
n-Butylbenzene					1.0E-02 n				1.0E-02 r					104-51-8	1.4E+02	N	2.4E+02	sat	2.4E+02	sat	3.7E+01	N	6.1E+01	N	
sec-Butylbenzene					1.0E-02 n				1.0E-02 r					135-98-8	1.1E+02	N	2.2E+02	sat	2.2E+02	sat	3.7E+01	N	6.1E+01	N	
tert-Butylbenzene					1.0E-02 n				1.0E-02 r					98-06-6	1.3E+02	N	3.9E+02	sat	3.7E+01	N	6.1E+01	N			
Butyl benzyl phthalate					2.0E-01 i				2.0E-01 r					85-68-7	2.4E+02	sat	2.4E+02	sat	2.4E+02	sat	7.3E+02	N	7.3E+03	N	8.1E+02
Cadmium and compounds					5.0E-04 i		6.3E+00 i		5.7E-05 x				5.0E+00	7440-43-9	3.9E+01	N	1.0E+03	N	5.6E+02	N	1.1E-03	C	1.8E+01	N	4.0E-01
Caprolactam					5.0E-01 i				5.0E-01 r					105-60-2	3.1E+04	N	1.0E+05	max	1.0E+05	max	1.8E+03	N	1.8E+04	N	
Captan	3.5E-03 h				1.3E-01 i		3.5E-03 r		1.3E-01 r					133-06-2	1.4E+02	C	1.6E+03	C	5.5E+02	C	1.9E+00	C	1.9E+01	C	
Carbaryl					1.0E-01 i				1.0E-01 r					63-25-2	6.1E+03	N	1.0E+05	max	6.8E+04	N	3.7E+02	N	3.7E+03	N	

Region 6 Human Health Medium-Specific Screening Levels 2007

Contaminants	TOXICITY INFORMATION													SCREENING LEVELS										
	SFo 1/(mg/kg-d)	K E Y	Mutagen y for yes	CANCER CLASS	RfDo (mg/kg-d)	K E Y	SFi 1/(mg/kg-d)	K E Y	RfDi (mg/kg-d)	K E Y	RfC (mg/m3)	K E Y	MCL (ug/l)	CAS No.	Residential Soil (mg/kg)	K E Y	Industrial Indoor Worker w/o Dermal (mg/kg)	K E Y	Industrial-Outdoor Worker Soil (mg/kg)	K E Y	Ambient Air (ug/m^3)	K E Y	Tap Water (ug/l)	K E Y	DAF 1 (mg/kg)
Carbazole	2.0E-02 h						2.0E-02 r							86-74-8	2.4E+01	C	2.9E+02	C	9.6E+01	C	3.4E-01	C	3.4E+00	C	3.0E-02
Carbofuran					5.0E-03 i				5.0E-03 r				4.0E+01	1563-66-2	3.1E+02	N	1.0E+04	N	3.4E+03	N	1.8E+01	N	1.8E+02	N	
Carbon disulfide					1.0E-01 i				2.0E-01 i		7.0E-01 i			75-15-0	7.2E+02	sat	7.2E+02	sat	7.2E+02	sat	7.3E+02	N	1.0E+03	N	2.0E+00
Carbon tetrachloride	1.3E-01 i			B2	7.0E-04 i		5.3E-02 i		5.7E-04 x				5.0E+00	56-23-5	2.4E-01	C	5.3E-01	C	5.8E-01	C	1.3E-01	C	1.7E-01	C	3.0E-03
Carbosulfan					1.0E-02 i				1.0E-02 r					55285-14-8	6.1E+02	N	2.0E+04	N	6.8E+03	N	3.7E+01	N	3.7E+02	N	
Chloral					1.0E-01 i									302-17-0	6.1E+03	N	1.0E+05	max	6.8E+04	N			3.7E+03	N	
Chloranil	4.0E-01 h						4.0E-01 r							118-75-2	1.2E+00	C	1.4E+01	C	4.8E+00	C	1.7E-02	C	1.7E-01	C	
Chlordane	3.5E-01 i			B2	5.0E-04 i		3.5E-01 i		2.0E-04 i				2.0E+00	57-74-9	1.6E+00	C	1.6E+01	C	7.2E+00	C	1.9E-02	C	1.9E-01	C	5.0E-01
Chlorine					1.0E-01 i									7782-50-5	7.8E+03	N	1.0E+05	max	1.0E+05	max			3.7E+03	N	
Chlorine dioxide									5.7E-05 i					10049-04-4							2.1E-01	N	4.2E-01	N	
Chloroacetic acid					2.0E-03 h				2.0E-03 r					79-11-8	1.2E+02	N	4.1E+03	N	1.4E+03	N	7.3E+00	N	7.3E+01	N	
4-Chloroaniline					4.0E-03 i				4.0E-03 r					106-47-8	2.4E+02	N	8.2E+03	N	2.7E+03	N	1.5E+01	N	1.5E+02	N	3.0E-02
Chlorobenzene					2.0E-02 i				1.4E-02 p		5.0E-02 p		1.0E+02	108-90-7	2.7E+02	N	4.6E+02	N	5.0E+02	N	5.2E+01	N	9.1E+01	N	7.0E-02
Chlorobenzilate	2.7E-01 h				2.0E-02 i		2.7E-01 h		2.0E-02 r					510-15-6	1.8E+00	C	2.1E+01	C	7.1E+00	C	2.5E-02	C	2.5E-01	C	
p-Chlorobenzoic acid					2.0E-01 h				2.0E-01 r					74-11-3	1.2E+04	N	1.0E+05	max	1.0E+05	max	7.3E+02	N	7.3E+03	N	
4-Chlorobenzotrifluoride					2.0E-02 h				2.0E-02 r					98-56-6	1.2E+03	N	4.1E+04	N	1.4E+04	N	7.3E+01	N	7.3E+02	N	
2-Chloro-1,3-butadiene					2.0E-02 h				2.0E-03 h					126-99-8	3.6E+00	N	1.2E+01	N	1.3E+01	N	7.3E+00	N	1.4E+01	N	
1-Chlorobutane					4.0E-02 p				4.0E-02 r					109-69-3	7.1E+01	N	2.4E+02	N	2.6E+02	N	1.5E+02	N	2.4E+02	N	
1-Chloro-1,1-difluoroethane					1.4E+01 r				1.4E+01 i		5.0E+01 i			75-68-3	3.4E+02	sat	3.4E+02	sat	3.4E+02	sat	5.2E+04	N	8.7E+04	N	
Chlorodifluoromethane					1.4E+01 r				1.4E+01 i		5.0E+01 i			75-45-6	3.4E+02	sat	3.4E+02	sat	3.4E+02	sat	5.1E+04	N	8.5E+04	N	
Chloroform				B2	1.0E-02 i		8.1E-02 i		1.3E-02 p		4.5E-02 p			67-66-3	2.5E-01	C	5.2E-01	C	5.8E-01	C	8.4E-02	C	1.7E-01	C	3.0E-02
Chloromethane							6.3E-03 h		2.6E-02 i					74-87-3	1.3E+00	C	2.7E+00	C	3.0E+00	C	1.1E+00	C	2.1E+00	C	
4-Chloro-2-methylaniline	5.8E-01 h						5.8E-01 r							95-69-2	8.4E-01	C	9.9E+00	C	3.3E+00	C	1.2E-02	C	1.2E-01	C	
beta-Chloronaphthalene					8.0E-02 i				8.0E-02 r					91-58-7	3.9E+03	N	2.7E+04	N	2.6E+04	N	2.9E+02	N	4.9E+02	N	
o-Chloronitrobenzene	9.7E-03 p				1.0E-03 p		9.7E-03 r		2.0E-05 p		7.0E-05 p			88-73-3	9.0E+00	N	1.4E+01	N	1.6E+01	N	7.3E-02	N	1.5E-01	N	
p-Chloronitrobenzene	6.7E-03 p				1.0E-03 p		6.7E-03 r		1.7E-04 p		6.0E-03 p			100-00-5	5.4E+01	C	1.0E+02	N	1.1E+02	N	6.2E-01	N	1.2E+00	N	
2-Chlorophenol					5.0E-03 i				5.0E-03 r					95-57-8	6.4E+01	N	2.4E+02	N	2.6E+02	N	1.8E+01	N	3.0E+01	N	2.0E-01
2-Chloropropane														75-29-6	1.1E+03	sat	1.1E+03	sat	1.1E+03	sat					
o-Chlorotoluene					2.0E-02 i				2.0E-02 r					95-49-8	1.6E+02	N	5.1E+02	sat	5.1E+02	sat	7.3E+01	N	1.2E+02	N	
Chlorpyrifos					3.0E-03 i				3.0E-03 r					2921-88-2	1.8E+02	N	6.1E+03	N	2.1E+03	N	1.1E+01	N	1.1E+02	N	
Chlorpyrifos-methyl					1.0E-02 h				1.0E-02 r					5598-13-0	6.1E+02	N	2.0E+04	N	6.8E+03	N	3.7E+01	N	3.7E+02	N	
Chromium III					1.5E+00 i								1.0E+02	16065-83-1	1.0E+05	max	1.0E+05	max	1.0E+05	max			5.5E+04	N	
Total Chromium (1/6 ratio Cr VI/Cr III)							4.2E+01 i						1.0E+02	7440-47-3	2.1E+02	C	4.5E+02	C	5.0E+02	C	1.6E-04	C			2.0E+00
Chromium VI				A	3.0E-03 i		2.9E+02 i		2.9E-05 i				1.0E+02	18540-29-9	3.0E+01	C	6.4E+01	C	7.1E+01	C	2.3E-05	C	1.1E+02	N	2.0E+00
Cobalt					2.0E-02 p		9.8E+00 p		5.7E-06 p					7440-48-4	9.0E+02	C	1.9E+03	C	2.1E+03	C	6.9E-04	C	7.3E+02	N	
Coke Oven Emissions			y	A			2.2E+00 i							8007-45-2	1.3E+03	C	8.7E+03	C	9.6E+03	C	9.9E-04	C			
Copper and compounds					3.7E-02 h								1.3E+03	7440-50-8	2.9E+03	N	7.6E+04	N	4.2E+04	N			1.4E+03	N	
Crotonaldehyde	1.9E+00 h						1.9E+00 x							123-73-9	5.3E-03	C	1.1E-02	C	1.3E-02	C	3.5E-03	C	5.9E-03	C	
Cumene (isopropylbenzene)					1.0E-01 i				1.1E-01 i		4.0E-01 i			98-82-8	3.7E+02	N	5.2E+02	N	5.8E+02	N	4.0E+02	N	6.6E+02	N	
Cyanazine	8.4E-01 h				2.0E-03 h		8.4E-01 r		2.0E-03 r					21725-46-2	5.8E-01	C	6.8E+00	C	2.3E+00	C	8.0E-03	C	8.0E-02	C	
Cyanides														n/a											
Barium cyanide					1.0E-01 h									542-62-1	6.1E+03	N	1.0E+05	max	6.8E+04	N			3.7E+03	N	
Calcium cyanide					4.0E-02 i									592-01-8	2.4E+03	N	8.2E+04	N	2.7E+04	N			1.5E+03	N	
Copper cyanide					5.0E-03 i									544-92-3	3.1E+02	N	1.0E+04	N	3.4E+03	N			1.8E+02	N	
Cyanogen					4.0E-02 i									460-19-5	3.1E+03	N	8.2E+04	N	4.5E+04	N			1.5E+03	N	
Cyanogen bromide					9.0E-02 i									506-68-3	7.0E+03	N	1.0E+05	max	1.0E+05	max			3.3E+03	N	
Cyanogen chloride					5.0E-02 i									506-77-4	3.9E+03	N	1.0E+05	max	5.7E+04	N			1.8E+03	N	
Free cyanide					2.0E-02 i								2.0E+02	57-12-5	1.2E+03	N	4.1E+04	N	1.4E+04	N			7.3E+02	N	2.0E+00
Hydrogen cyanide					2.0E-02 i				8.6E-04 i		3.0E-03			74-90-8	2.5E+01	N	3.5E+01	N	3.9E+01	N	3.1E+00	N	6.2E+00	N	
Potassium cyanide					5.0E-02 i									151-50-8	3.1E+03	N	1.0E+05	max	3.4E+04	N			1.8E+03	N	
Potassium silver cyanide					2.0E-01 i									506-61-6	1.2E+04	N	1.0E+05	max	1.0E+05	max			7.3E+03	N	
Silver cyanide					1.0E-01 i									506-64-9	6.1E+03	N	1.0E+05	max	6.8E+04	N			3.7E+03	N	
Sodium cyanide					4.0E-02 i									143-33-9	2.4E+03	N	8.2E+04	N	2.7E+04	N			1.5E+03	N	
Zinc cyanide					5.0E-02 i									557-21-1	3.1E+03	N	1.0E+05	max	3.4E+04	N			1.8E+03	N	
Cyclohexane									1.7E+00 i		6.0E+00			110-82-7	1.4E+02	sat	1.4E+02	sat	1.4E+02	sat	6.3E+03	N	1.3E+04	N	
Cyclohexanone					5.0E+00 i				5.0E+00 r					108-94-1	1.0E+05	max	1.0E+05	max	1.0E+05	max	1.8E+04	N	1.8E+05	N	
Cyhalothrin/Karate					5.0E-03 i				5.0E-03 r					68085-85-8	3.1E+02	N	1.0E+04	N	3.4E+03	N	1.8E+01	N	1.8E+02	N	
Cypermethrin					1.0E-02 i				1.0E-02 r					52315-07-8	6.1E+02	N	2.0E+04	N	6.8E+03	N	3.7E+01	N	3.7E+02	N	
Dacthal					1.0E-02 i				1.0E-02 r					1861-32-1	6.1E+02	N	2.0E+04	N	6.8E+03	N	3.7E+01	N	3.7E+02	N	
Dalapon					3.0E-02 i				3.0E-02 r				2.0E+02	75-99-0	1.8E+03	N	6.1E+04	N	2.1E+04	N	1.1E+02	N	1.1E+03	N	
DDD	2.4E-01 i			B2			2.4E-01 r							72-54-8	2.4E+00	C	2.4E+01	C	1.1E+01	C	2.8E-02	C	2.8E-01	C	8.0E-01
DDE	3.4E-01 i			B2			3.4E-01 r							72-55-9	1.7E+00	C	1.7E+01	C	7.8E+00	C	2.0E-02	C	2.0E-01	C	3.0E+00
DDT	3.4E-01 i			B2	5.0E-04 i		3.4E-01 i		5.0E-04 r					50-29-3	1.7E+00	C	1.7E+01	C	7.8E+00	C	2.0E-02	C	2.0E-01	C	2.0E+00
Diazinon					9.0E-04 h				9.0E-04 r					333-41-5	5.5E+01	N	1.8E+03	N	6.2E+02	N	3.3E+00	N	3.3E+01	N	
Dibenzofuran					2.0E-03 n				2.0E-03 r					132-64-9	1.5E+02	N	2.5E+03	N	1.7E+03	N	7.3E+00	N	1.2E+01	N	

Region 6 Human Health Medium-Specific Screening Levels 2007

Contaminants	TOXICITY INFORMATION													SCREENING LEVELS										
	SFo	K E	Mutagen	CANCER	RfDo	K E	SFi	K E	RfDi	K E	RfC	K E	MCL	CAS No.	Residential	K E	Industrial Indoor Worker w/o Dermal	K E	Industrial-Outdoor Worker	K E	Ambient Air	K E	Tap Water	K E	DAF 1
	1/(mg/kg-d)	Y	y for yes	CLASS	(mg/kg-d)	Y	1/(mg/kg-d)	Y	(mg/kg-d)	Y	(mg/m3)	Y	(ug/l)		Soil (mg/kg)	Y	(mg/kg)	Y	Soil (mg/kg)	Y	(ug/m^3)	Y	(ug/l)	Y	(mg/kg)
1,4-Dibromobenzene					1.0E-02 i				1.0E-02 r					106-37-6	**6.1E+02**	N	**2.0E+04**	N	**6.8E+03**	N	**3.7E+01**	N	**3.7E+02**	N	
Dibromochloromethane	8.4E-02 i			C	2.0E-02 i		8.4E-02 r		2.0E-02 r					124-48-1	**1.0E+00**	C	**2.4E+00**	C	**2.6E+00**	C	**8.0E-02**	C	**1.3E-01**	C	**2.0E-02**
1,2-Dibromo-3-chloropropane	8.0E-01 p		y		2.0E-04 p		2.1E+01 p		5.7E-05 i		2.0E-04 i			96-12-8	**2.6E-03**	C	**1.8E-02**	C	**2.0E-02**	C	**1.0E-04**	C	**2.0E-04**	C	
1,2-Dibromoethane	2.0E+00 i			likely	9.0E-03 i		2.0E+00 i		2.6E-03 i					106-93-4	**2.8E-02**	C	**6.5E-02**	C	**7.0E-02**	C	**3.4E-03**	C	**5.6E-03**	C	
Dibutyl phthalate					1.0E-01 i				1.0E-01 r					84-74-2	**6.1E+03**	N	**1.0E+05**	max	**6.8E+04**	N	**3.7E+02**	N	**3.7E+03**	N	**2.7E+02**
Dicamba					3.0E-02 i				3.0E-02 r					1918-00-9	**1.8E+03**	N	**6.1E+04**	N	**2.1E+04**	N	**1.1E+02**	N	**1.1E+03**	N	
1,2-Dichlorobenzene					9.0E-02 i				6.9E-03 n		2.4E-02 n		6.0E+02	95-50-1	**2.8E+02**	N	**3.7E+02**	sat	**3.7E+02**	sat	**2.5E+01**	N	**4.9E+01**	N	**9.0E-01**
1,3-Dichlorobenzene					3.0E-03 n				2.3E-03 n		8.0E-03 n			541-73-1	**6.9E+01**	N	**1.3E+02**	N	**1.4E+02**	N	**8.3E+00**	N	**1.4E+01**	N	
1,4-Dichlorobenzene	2.4E-02 h				3.0E-02 n		2.4E-02 r		2.3E-01 i		8.0E-01 i		7.5E+01	106-46-7	**3.2E+00**	C	**7.5E+00**	C	**8.1E+00**	C	**2.8E-01**	C	**4.7E-01**	C	**1.0E-01**
3,3-Dichlorobenzidine	4.5E-01 i			B2			4.5E-01 r							91-94-1	**1.1E+00**	C	**1.3E+01**	C	**4.3E+00**	C	**1.5E-02**	C	**1.5E-01**	C	**3.0E-04**
1,4-Dichloro-2-butene	9.3E+00 r						9.3E+00 h							764-41-0	**7.9E-03**	C	**1.8E-02**	C	**2.0E-02**	C	**7.2E-04**	C	**1.2E-03**	C	
Dichlorodifluoromethane					2.0E-01 i				5.7E-02 h					75-71-8	**9.4E+01**	N	**3.1E+02**	N	**3.4E+02**	sat	**2.1E+02**	N	**3.9E+02**	N	
1,1-Dichloroethane					2.0E-01 p				2.0E-01 r					75-34-3	**8.5E+02**	N	**2.3E+03**	sat	**2.3E+03**	sat	**7.3E+02**	N	**1.2E+03**	N	**1.0E+00**
1,2-Dichloroethane (EDC)	9.1E-02 i			B2	2.0E-02 n		9.1E-02 i		1.4E-03 n				5.0E+00	107-06-2	**3.5E-01**	C	**7.7E-01**	C	**8.4E-01**	C	**7.4E-02**	C	**1.2E-01**	C	**1.0E-03**
1,1-Dichloroethylene					5.0E-02 i				5.7E-02 i		2.0E-01 i		7.0E+00	75-35-4	**2.8E+02**	N	**4.3E+02**	N	**4.7E+02**	N	**2.1E+02**	N	**3.4E+02**	N	**3.0E-03**
1,2-Dichloroethylene (cis)					1.0E-02 p				1.0E-02 r				7.0E+01	156-59-2	**4.3E+01**	N	**1.5E+02**	N	**1.6E+02**	N	**3.7E+01**	N	**6.1E+01**	N	**2.0E-02**
1,2-Dichloroethylene (trans)					2.0E-02 i				1.7E-02 p		6.0E-02 p		1.0E+02	156-60-5	**1.2E+02**	N	**1.8E+02**	N	**2.0E+02**	N	**6.3E+01**	N	**1.1E+02**	N	**3.0E-02**
2,4-Dichlorophenol					3.0E-03 i				3.0E-03 r					120-83-2	**1.8E+02**	N	**6.1E+03**	N	**2.1E+03**	N	**1.1E+01**	N	**1.1E+02**	N	**5.0E-02**
4-(2,4-Dichlorophenoxy)butyric Acid (2,4-DB)					8.0E-03 i				8.0E-03 r					94-82-6	**4.9E+02**	N	**1.6E+04**	N	**5.5E+03**	N	**2.9E+01**	N	**2.9E+02**	N	
2,4-Dichlorophenoxyacetic Acid (2,4-D)					1.0E-02 i				1.0E-02 r				7.0E+01	94-75-7	**6.9E+02**	N	**2.0E+04**	N	**8.5E+03**	N	**3.7E+01**	N	**3.7E+02**	N	
1,2-Dichloropropane	6.8E-02 h				1.1E-03 r		6.8E-02 r		1.1E-03 i				5.0E+00	78-87-5	**3.5E-01**	C	**7.7E-01**	C	**8.5E-01**	C	**9.9E-02**	C	**1.6E-01**	C	**1.0E-03**
1,3-Dichloropropene	1.0E-01 i			B2	3.0E-02 i		1.4E-02 i		5.7E-03 i					542-75-6	**7.0E-01**	C	**1.6E+00**	C	**1.7E+00**	C	**4.8E-01**	C	**4.0E-01**	C	**2.0E-04**
2,3-Dichloropropanol					3.0E-03 i				3.0E-03 r					616-23-9	**1.8E+02**	N	**6.1E+03**	N	**2.1E+03**	N	**1.1E+01**	N	**1.1E+02**	N	
Dichlorvos	2.9E-01 i			B2	5.0E-04 i		2.9E-01 r		1.4E-04 i		5.0E-04 i			62-73-7	**1.7E+00**	C	**2.0E+01**	C	**6.6E+00**	C	**2.3E-02**	C	**2.3E-01**	C	
Dicofol	4.4E-01 x						4.4E-01 r							115-32-2	**1.1E+00**	C	**1.3E+01**	C	**4.4E+00**	C	**1.5E-02**	C	**1.5E-01**	C	
Dicyclopentadiene					8.0E-03 p				2.0E-03 p		7.0E-03 p			77-73-6	**4.2E+01**	N	**6.2E+01**	N	**6.9E+01**	N	**7.3E+00**	N	**1.4E+01**	N	
Dieldrin	1.6E+01 i			B2	5.0E-05 i		1.6E+01 i		5.0E-05 r					60-57-1	**3.0E-02**	C	**3.6E-01**	C	**1.2E-01**	C	**4.2E-04**	C	**4.2E-03**	C	**2.0E-04**
Diethylene glycol, monobutyl ether					1.0E-02 p				5.7E-03 p					112-34-5	**6.1E+02**	N	**2.0E+04**	N	**6.8E+03**	N	**2.1E+01**	N	**3.7E+02**	N	
Diethylene glycol, monoethyl ether					6.0E-02 p				8.6E-04 p					111-90-0	**3.7E+03**	N	**1.0E+05**	max	**4.1E+04**	N	**3.1E+00**	N	**2.2E+03**	N	
Di(2-ethylhexyl)adipate	1.2E-03 i			C	6.0E-01 i		1.2E-03 r		6.0E-01 r				4.0E+02	103-23-1	**4.1E+02**	C	**4.8E+03**	C	**1.6E+03**	C	**5.6E+00**	C	**5.6E+01**	C	
Diethyl phthalate					8.0E-01 i				8.0E-01 r					84-66-2	**4.9E+04**	N	**1.0E+05**	max	**1.0E+05**	max	**2.9E+03**	N	**2.9E+04**	N	
Diethylstilbestrol	4.7E+03 h						4.7E+03 r							56-53-1	**1.0E-04**	C	**1.2E-03**	C	**4.1E-04**	C	**1.4E-06**	C	**1.4E-05**	C	
Difenzoquat (Avenge)					8.0E-02 i				8.0E-02 r					43222-48-6	**4.9E+03**	N	**1.0E+05**	max	**5.5E+04**	N	**2.9E+02**	N	**2.9E+03**	N	
1,1-Difluoroethane					1.1E+01 r				1.1E+01 i		4.0E+01 i			75-37-6	**1.0E+05**	max	**1.0E+05**	max	**1.0E+05**	max	**4.2E+04**	N	**6.9E+04**	N	
Diisopropyl methylphosphonate					8.0E-02 i				8.0E-02 r					1445-75-6	**4.9E+03**	N	**1.0E+05**	max	**5.5E+04**	N	**2.9E+02**	N	**2.9E+03**	N	
3,3'-Dimethoxybenzidine	1.4E-02 h						1.4E-02 r							119-90-4	**3.5E+01**	C	**4.1E+02**	C	**1.4E+02**	C	**4.8E-01**	C	**4.8E+00**	C	
Dimethylamine					5.7E-06 r				5.7E-06 x					124-40-3	**6.7E-02**	N	**2.5E-01**	N	**2.7E-01**	N	**2.1E-02**	N	**3.5E-02**	N	
N-N-Dimethylaniline					2.0E-03 i				2.0E-03 r					121-69-7	**1.2E+02**	N	**4.1E+03**	N	**1.4E+03**	N	**7.3E+00**	N	**7.3E+01**	N	
2,4-Dimethylaniline	7.5E-01 h						7.5E-01 r							95-68-1	**6.5E-01**	C	**7.6E+00**	C	**2.6E+00**	C	**9.0E-03**	C	**9.0E-02**	C	
2,4-Dimethylaniline hydrochloride	5.8E-01 h						5.8E-01 r							21436-96-4	**8.4E-01**	C	**9.9E+00**	C	**3.3E+00**	C	**1.2E-02**	C	**1.2E-01**	C	
3,3'-Dimethylbenzidine	2.3E+00 p						2.3E+00 r							119-93-7	**2.1E-01**	C	**2.5E+00**	C	**8.3E-01**	C	**2.9E-03**	C	**2.9E-02**	C	
1,1-Dimethylhydrazine	2.6E+00 x						3.5E+00 x							57-14-7	**1.9E-01**	C	**2.2E+00**	C	**7.4E-01**	C	**1.9E-03**	C	**2.6E-02**	C	
1,2-Dimethylhydrazine	3.7E+01 x						3.7E+01 x							540-73-8	**1.3E-02**	C	**1.5E-01**	C	**5.2E-02**	C	**1.8E-04**	C	**1.8E-03**	C	
Dimethylphenethylamine					1.0E-03 n				1.0E-03 r					122-09-8	**6.1E+01**	N	**2.0E+03**	N	**6.8E+02**	N	**3.7E+00**	N	**3.7E+01**	N	
2,4-Dimethylphenol					2.0E-02 i				2.0E-02 r					105-67-9	**1.2E+03**	N	**4.1E+04**	N	**1.4E+04**	N	**7.3E+01**	N	**7.3E+02**	N	**4.0E-01**
2,6-Dimethylphenol					6.0E-04 i				6.0E-04 r					576-26-1	**3.7E+01**	N	**1.2E+03**	N	**4.1E+02**	N	**2.2E+00**	N	**2.2E+01**	N	
3,4-Dimethylphenol					1.0E-03 i				1.0E-03 r					95-65-8	**6.1E+01**	N	**2.0E+03**	N	**6.8E+02**	N	**3.7E+00**	N	**3.7E+01**	N	
Dimethyl phthalate					1.0E+01 h				1.0E+01 r					131-11-3	**1.0E+05**	max	**1.0E+05**	max	**1.0E+05**	max	**3.7E+04**	N	**3.7E+05**	N	
4,6-Dinitro-o-cyclohexyl phenol					2.0E-03 i				2.0E-03 r					131-89-5	**1.2E+02**	N	**4.1E+03**	N	**1.4E+03**	N	**7.3E+00**	N	**7.3E+01**	N	
1,2-Dinitrobenzene					1.0E-04 p				1.0E-04 r					528-29-0	**6.1E+00**	N	**2.0E+02**	N	**6.8E+01**	N	**3.7E-01**	N	**3.7E+00**	N	
1,3-Dinitrobenzene					1.0E-04 i				1.0E-04 r					99-65-0	**6.1E+00**	N	**2.0E+02**	N	**6.8E+01**	N	**3.7E-01**	N	**3.7E+00**	N	
1,4-Dinitrobenzene					1.0E-04 p				1.0E-04 r					100-25-4	**6.1E+00**	N	**2.0E+02**	N	**6.8E+01**	N	**3.7E-01**	N	**3.7E+00**	N	
2,4-Dinitrophenol					2.0E-03 i				2.0E-03 r					51-28-5	**1.2E+02**	N	**4.1E+03**	N	**1.4E+03**	N	**7.3E+00**	N	**7.3E+01**	N	**1.0E-02**
Dinitrotoluene mixture	6.8E-01 i			B2			6.8E-01 r							25321-14-6	**7.2E-01**	C	**8.4E+00**	C	**2.8E+00**	C	**9.9E-03**	C	**9.9E-02**	C	**4.0E-05**
2,4-Dinitrotoluene					2.0E-03 i				2.0E-03 r					121-14-2	**1.2E+02**	N	**4.1E+03**	N	**1.4E+03**	N	**7.3E+00**	N	**7.3E+01**	N	**4.0E-05**
2,6-Dinitrotoluene					1.0E-03 p				1.0E-03 r					606-20-2	**6.1E+01**	N	**2.0E+03**	N	**6.8E+02**	N	**3.7E+00**	N	**3.7E+01**	N	**3.0E-05**
Dinoseb					1.0E-03 i				1.0E-03 r				7.0E+00	88-85-7	**6.1E+01**	N	**2.0E+03**	N	**6.8E+02**	N	**3.7E+00**	N	**3.7E+01**	N	
di-n-Octyl phthalate														117-84-0											**1.0E+04**
1,4-Dioxane	1.1E-02 i			B2			1.1E-02 r							123-91-1	**4.4E+01**	C	**5.2E+02**	C	**1.7E+02**	C	**6.1E-01**	C	**6.1E+00**	C	
Dioxin (2,3,7,8-TCDD)	1.5E+05 h						1.5E+05 h							1746-01-6	**3.9E-06**	C	**3.8E-05**	C	**1.8E-05**	C	**4.5E-08**	C	**4.5E-07**	C	
Diphenylamine					2.5E-02 i				2.5E-02 r					122-39-4	**1.5E+03**	N	**5.1E+04**	N	**1.7E+04**	N	**9.1E+01**	N	**9.1E+02**	N	
1,2-Diphenylhydrazine	8.0E-01 i			B2			7.7E-01 i							122-66-7	**6.1E-01**	C	**7.2E+00**	C	**2.4E+00**	C	**8.7E-03**	C	**8.4E-02**	C	
Diphenyl sulfone					3.0E-03 p				3.0E-03 r					127-63-9	**1.8E+02**	N	**6.1E+03**	N	**2.1E+03**	N	**1.1E+01**	N	**1.1E+02**	N	
Diquat					2.2E-03 i				2.2E-03 r				2.0E+01	85-00-7	**1.3E+02**	N	**4.5E+03**	N	**1.5E+03**	N	**8.0E+00**	N	**8.0E+01**	N	
Disulfoton					4.0E-05 i				4.0E-05 r					298-04-4	**2.4E+00**	N	**8.2E+01**	N	**2.7E+01**	N	**1.5E-01**	N	**1.5E+00**	N	

Key : i=IRIS p= PPRTV n=NCEA h=HEAST x=WITHDRAWN o=Other DOCUMENTS r=ROUTE EXTRAPOLATION Key : C=CANCER N=NONCANCER sat=SOIL SATURATION max=CEILING LIMIT

Region 6 Human Health Medium-Specific Screening Levels 2007	TOXICITY INFORMATION													SCREENING LEVELS										
Contaminants	SFo 1/(mg/kg-d)	K E Y	Mutagen y for yes	CANCER CLASS	RfDo (mg/kg-d)	K E Y	SFi 1/(mg/kg-d)	K E Y	RfDi (mg/kg-d)	K E Y	RfC (mg/m3)	K E Y	MCL (ug/l)	CAS No.	Residential Soil (mg/kg)	K E Y	Industrial Indoor Worker w/o Dermal (mg/kg)	K E Y	Industrial-Outdoor Worker Soil (mg/kg)	K E Y	Ambient Air (ug/m^3)	K E Y	Tap Water (ug/l)	K E Y	DAF 1 (mg/kg)
1,4-Dithiane					1.0E-02 i				1.0E-02 r					505-29-3	6.1E+02	N	2.0E+04	N	6.8E+03	N	3.7E+01	N	3.7E+02	N	
Diuron					2.0E-03 i				2.0E-03 r					330-54-1	1.2E+02	N	4.1E+03	N	1.4E+03	N	7.3E+00	N	7.3E+01	N	
Endosulfan					6.0E-03 i				6.0E-03 r					115-29-7	3.7E+02	N	1.2E+04	N	4.1E+03	N	2.2E+01	N	2.2E+02	N	9.0E-01
Endothall					2.0E-02 i				2.0E-02 r				1.0E+02	145-73-3	1.2E+03	N	4.1E+04	N	1.4E+04	N	7.3E+01	N	7.3E+02	N	
Endrin					3.0E-04 i				3.0E-04 r				2.0E+00	72-20-8	1.8E+01	N	6.1E+02	N	2.1E+02	N	1.1E+00	N	1.1E+01	N	5.0E-02
Epichlorohydrin	9.9E-03 i			B2	6.0E-03 p		4.2E-03 i		2.9E-04 i					106-89-8	7.8E+00	N	2.6E+01	N	2.9E+01	N	1.0E+00	N	2.1E+00	N	
Ethion					5.0E-04 i				5.0E-04 r					563-12-2	3.1E+01	N	1.0E+03	N	3.4E+02	N	1.8E+00	N	1.8E+01	N	
2-Ethoxyethanol					4.0E-01 h				5.7E-02 i		2.0E-01 i			110-80-5	2.4E+04	N	1.0E+05	max	1.0E+05	max	2.1E+02	N	1.5E+04	N	
2-Ethoxyethanol acetate					3.0E-01 h				3.0E-01 r					111-15-9	1.8E+04	N	1.0E+05	max	1.0E+05	max	1.1E+03	N	1.1E+04	N	
Ethyl acetate					9.0E-01 i				9.0E-01 r					141-78-6	1.9E+04	N	3.7E+04	sat	3.7E+04	sat	3.3E+03	N	5.5E+03	N	
Ethylbenzene					1.0E-01 i				2.9E-01 i		1.0E+00 i		7.0E+02	100-41-4	2.3E+02	sat	2.3E+02	sat	2.3E+02	sat	1.1E+03	N	1.3E+03	N	7.0E-01
Ethyl chloride	2.9E-03 n				4.0E-01 n		2.9E-03 r		2.9E+00 i		1.0E+01 i			75-00-3	3.0E+00	C	6.5E+00	C	7.2E+00	C	2.3E+00	C	3.9E+00	C	
Ethylene diamine					9.0E-02 p				9.0E-02 r					107-15-3	5.5E+03	N	1.0E+05	max	6.2E+04	N	3.3E+02	N	3.3E+03	N	
Ethylene glycol					2.0E+00 i				2.0E+00 r					107-21-1	1.0E+05	max	1.0E+05	max	1.0E+05	max	7.3E+03	N	7.3E+04	N	
Ethylene glycol, monobutyl ether					5.0E-01 i						1.3E+01 i			111-76-2	3.1E+04	N	1.0E+05	max	1.0E+05	max			1.8E+04	N	
Ethylene oxide	1.0E+00 h						3.5E-01 h							75-21-8	1.4E-01	C	3.6E-01	C	3.8E-01	C	1.9E-02	C	2.4E-02	C	
Ethylene thiourea (ETU)	1.1E-01 h				8.0E-05 i		1.1E-01 r		8.0E-05 r					96-45-7	4.4E+00	C	5.2E+01	C	1.7E+01	C	6.1E-02	C	6.1E-01	C	
Ethyl ether					2.0E-01 i				2.0E-01 r					60-29-7	1.8E+03	sat	1.8E+03	sat	7.3E+02	N	1.2E+03	N		
Ethyl methacrylate					9.0E-02 h				9.0E-02 r					97-63-2	1.4E+02	sat	1.4E+02	sat	1.4E+02	sat	3.3E+02	N	5.5E+02	N	
Fenamiphos					2.5E-04 i				2.5E-04 r					22224-92-6	1.5E+01	N	5.1E+02	N	1.7E+02	N	9.1E-01	N	9.1E+00	N	
Fluometuron					1.3E-02 i				1.3E-02 r					2164-17-2	7.9E+02	N	2.7E+04	N	8.9E+03	N	4.7E+01	N	4.7E+02	N	
Fluoride					6.0E-02 i								4.0E+03	16984-48-8	3.7E+03	N	1.0E+05	max	4.1E+04	N			2.2E+03	N	
Fomesafen	1.9E-01 i			C			1.9E-01 r							72178-02-0	2.6E+00	C	3.0E+01	C	1.0E+01	C	3.5E-02	C	3.5E-01	C	
Fonofos					2.0E-03 i				2.0E-03 r					944-22-9	1.2E+02	N	4.1E+03	N	1.4E+03	N	7.3E+00	N	7.3E+01	N	
Formaldehyde	4.60E-02 r				1.5E-01 i		4.6E-02 i		1.5E-01 r					50-00-0	1.1E+01	C	1.2E+02	C	4.2E+01	C	1.5E-01	C	1.5E+00	C	
Formic Acid					2.0E+00 h				8.6E-04 p					64-18-6	1.0E+05	max	1.0E+05	max	1.0E+05	max	3.1E+00	N	7.3E+04	N	
Furan					1.0E-03 i				1.0E-03 r					110-00-9	2.5E+00	N	8.6E+00	N	9.5E+00	N	3.7E+00	N	6.1E+00	N	
Furazolidone	3.8E+00 h						3.8E+00 r							67-45-8	1.3E-01	C	1.5E+00	C	5.0E-01	C	1.8E-03	C	1.8E-02	C	
Furfural					3.0E-03 i				1.4E-02 h					98-01-1	1.8E+02	N	6.1E+03	N	2.1E+03	N	5.2E+01	N	1.1E+02	N	
Glycidaldehyde					4.0E-04 i				2.9E-04 h					765-34-4	2.4E+01	N	8.2E+02	N	2.7E+02	N	1.0E+00	N	1.5E+01	N	
Glyphosate					1.0E-01 i				1.0E-01 r				7.0E+02	1071-83-6	6.1E+03	N	1.0E+05	max	6.8E+04	N	3.7E+02	N	3.7E+03	N	
HMX					5.0E-02 i				5.0E-02 r					2691-41-0	3.1E+03	N	1.0E+05	max	3.4E+04	N	1.8E+02	N	1.8E+03	N	
Heptachlor	4.5E+00 i			B2	5.0E-04 i		4.6E+00 i		5.0E-04 r				1.0E-01	76-44-8	1.1E-01	C	1.3E+00	C	4.3E-01	C	1.5E-03	C	1.5E-02	C	1.0E+00
Heptachlor epoxide	9.1E+00 i			B2	1.3E-05 i		9.1E+00 i		1.3E-05 r				2.0E-01	1024-57-3	5.3E-02	C	6.3E-01	C	2.1E-01	C	7.4E-04	C	7.4E-03	C	3.0E-02
Hexabromobenzene					2.0E-03 i				2.0E-03 r					87-82-1	1.2E+02	N	4.1E+03	N	1.4E+03	N	7.3E+00	N	7.3E+01	N	
Hexachlorobenzene	1.6E+00 i			B2	8.0E-04 i		1.6E+00 i		8.0E-04 r				1.0E+00	118-74-1	3.0E-01	C	3.6E+00	C	1.2E+00	C	4.2E-03	C	4.2E-02	C	1.0E-01
Hexachlorobutadiene	7.8E-02 i			C	2.0E-04 h		7.7E-02 i		2.0E-04 r					87-68-3	6.2E+00	C	7.3E+01	C	2.5E+01	C	8.7E-02	C	8.6E-01	C	1.0E-01
HCH (alpha)	6.3E+00 i			B2			6.3E+00 i							319-84-6	9.0E-02	C	9.1E-01	C	4.0E-01	C	1.1E-03	C	1.1E-02	C	3.0E-05
HCH (beta)	1.8E+00 i			C			1.8E+00 i							319-85-7	3.2E-01	C	3.2E+00	C	1.4E+00	C	3.7E-03	C	3.7E-02	C	1.0E-04
HCH (gamma) Lindane	1.3E+00 h				3.0E-04 i		1.3E+00 r		3.0E-04 r				2.0E-01	58-89-9	4.4E-01	C	4.4E+00	C	1.9E+00	C	5.2E-03	C	5.2E-02	C	5.0E-04
HCH-technical	1.8E+00 i			B2			1.8E+00 i							608-73-1	3.2E-01	C	3.2E+00	C	1.4E+00	C	3.8E-03	C	3.7E-02	C	1.0E-04
Hexachlorocyclopentadiene					6.0E-03 i				5.7E-05 i				5.0E+01	77-47-4	3.7E+02	N	1.2E+04	N	4.1E+03	N	2.1E-01	N	2.2E+02	N	2.0E+01
Hexachlorodibenzo-p-dioxin mixture	6.2E+03 i			B2			4.6E+03 i							19408-74-3	7.8E-05	C	9.2E-04	C	3.1E-04	C	1.5E-06	C	1.1E-05	C	
Hexachloroethane	1.4E-02 i			C	1.0E-03 i		1.4E-02 i		1.0E-03 r					67-72-1	3.5E+01	C	4.1E+02	C	1.4E+02	C	4.8E-01	C	4.8E+00	C	2.0E-02
Hexachlorophene					3.0E-04 i				3.0E-04 r					70-30-4	1.8E+01	N	6.1E+02	N	2.1E+02	N	1.1E+00	N	1.1E+01	N	
Hexahydro-1,3,5-trinitro-1,3,5-triazin	1.1E-01 i			C	3.0E-03 i		1.1E-01 r		3.0E-03 r					121-82-4	4.4E+00	C	5.2E+01	C	1.7E+01	C	6.1E-02	C	6.1E-01	C	
1,6-Hexamethylene diisocyanate					2.9E-06 r				2.9E-06 i					822-06-0	1.7E-01	N	5.8E+00	N	2.0E+00	N	1.0E-02	N	1.0E-01	N	
n-Hexane					1.1E+01 p				2.0E-01 i		7.0E-01 i			110-54-3	1.1E+02	sat	1.1E+02	sat	1.1E+02	sat	7.3E+02	N	1.5E+03	N	
Hexazinone					3.3E-02 i				3.3E-02 r					51235-04-2	2.0E+03	N	6.7E+04	N	2.3E+04	N	1.2E+02	N	1.2E+03	N	
Hydrazine, hydrazine sulfate	3.0E+00 i			B2			1.7E+01 i							302-01-2	1.6E-01	C	1.9E+00	C	6.4E-01	C	3.9E-04	C	2.2E-02	C	
Hydrogen chloride									5.7E-03 i					7647-01-0	1.0E+05	max	1.0E+05	max	1.0E+05	max	2.1E+01	N			
Hydrogen sulfide					3.0E-03 i				5.7E-04 i					7783-06-4	1.8E+02	N	6.1E+03	N	2.1E+03	N	2.1E+00	N	1.1E+02	N	
p-Hydroquinone	5.6E-02 p				4.0E-02 p		5.6E-02 r		4.0E-02 r					123-31-9	8.7E+00	C	1.0E+02	C	3.4E+01	C	1.2E-01	C	1.2E+00	C	
Iron					7.0E-01 p									7439-89-6	5.5E+04	N	1.0E+05	max	1.0E+05	max			2.6E+04	N	
Isobutanol					3.0E-01 i				3.0E-01 r					78-83-1	1.3E+04	N	4.0E+04	sat	4.0E+04	sat	1.1E+03	N	1.8E+03	N	
Isophorone	9.5E-04 i			C	2.0E-01 i		9.5E-04 r		2.0E-01 r					78-59-1	5.1E+02	C	6.0E+03	C	2.0E+03	C	7.1E+00	C	7.1E+01	C	3.0E-02
Isopropalin					1.5E-02 i				1.5E-02 r					33820-53-0	9.2E+02	N	3.1E+04	N	1.0E+04	N	5.5E+01	N	5.5E+02	N	
Isopropyl methyl phosphonic acid					1.0E-01 i				1.0E-01 r					1832-54-8	6.1E+03	N	1.0E+05	max	6.8E+04	N	3.7E+02	N	3.7E+03	N	
Kepone	8.0E+00 p				2.0E-04 p									143-50-0	6.1E-02	C	7.2E-01	C	2.4E-01	C			8.4E-03	C	
Lead	Screening Levels Based on EPA Models, IEUBK (1994) and TRW (1996), Tap Water # = MC												1.5E+01	7439-92-1	4.0E+02		8.0E+02		8.0E+02				1.5E+01		
Lead (tetraethyl)					1.0E-07 i									78-00-2	6.1E-03	N	2.0E-01	N	6.8E-02	N			3.7E-03	N	
Lithium					2.0E-02 x									7439-93-2	1.6E+03	N	4.1E+04	N	2.3E+04	N			7.3E+02	N	
Malathion					2.0E-02 i				2.0E-02 r					121-75-5	1.2E+03	N	4.1E+04	N	1.4E+04	N	7.3E+01	N	7.3E+02	N	
Maleic anhydride					1.0E-01 i				1.0E-01 r					108-31-6	6.1E+03	N	1.0E+05	max	6.8E+04	N	3.7E+02	N	3.7E+03	N	
Manganese and compounds					4.7E-02 i				1.4E-05 i					7439-96-5	3.2E+03	N	4.7E+04	N	3.5E+04	N	5.1E-02	N	1.7E+03	N	

Region 6 Human Health Medium-Specific Screening Levels 2007	TOXICITY INFORMATION													SCREENING LEVELS										
Contaminants	SFo 1/(mg/kg-d)	E Y	Mutagen y for yes	CANCER CLASS	RfDo (mg/kg-d)	E Y	SFi 1/(mg/kg-d)	E Y	RfDi (mg/kg-d)	E Y	RfC (mg/m3)	E Y	MCL (ug/l)	CAS No.	Residential Soil (mg/kg)	E Y	Industrial Indoor Worker w/o Dermal (mg/kg)	E Y	Industrial-Outdoor Worker Soil (mg/kg)	E Y	Ambient Air (ug/m^3)	E Y	Tap Water (ug/l)	E Y	DAF 1 (mg/kg)
Mephosfolan					9.0E-05	h			9.0E-05	r				950-10-7	**5.5E+00**	N	**1.8E+02**	N	**6.2E+01**	N	**3.3E-01**	N	**3.3E+00**	N	
Mepiquat					3.0E-02	i			3.0E-02	r				24307-26-4	**1.8E+03**	N	**6.1E+04**	N	**2.1E+04**	N	**1.1E+02**	N	**1.1E+03**	N	
2-Mercaptobenzothiazole	2.9E-02	n			1.0E-01	n	2.9E-02	r	1.0E-01	r				149-30-4	**1.7E+01**	C	**2.0E+02**	C	**6.6E+01**	C	**2.3E-01**	C	**2.3E+00**	C	
Mercury and compounds					3.0E-04	i							2.0E+00	7487-94-7	**2.3E+01**	N	**6.1E+02**	N	**3.4E+02**	N			**1.1E+01**	N	
Mercury (elemental)									8.6E-05	i	3.0E-04	i		7439-97-6							**3.1E-01**	N	**6.3E-01**	N	**1.0E-01**
Mercury (methyl)					1.0E-04	i								22967-92-6	**6.1E+00**	N	**2.0E+02**	N	**6.8E+01**	N			**3.7E+00**	N	
Methacrylonitrile					1.0E-04	i			2.0E-04	h				126-98-7	**2.1E+00**	N	**8.8E+00**	N	**9.3E+00**	N	**7.3E-01**	N	**1.0E+00**	N	
Methanol					5.0E-01	i			5.0E-01	r				67-56-1	**3.1E+04**	N	**1.0E+05**	max	**1.0E+05**	max	**1.8E+03**	N	**1.8E+04**	N	
Methidathion					1.0E-03	i			1.0E-03	r				950-37-8	**6.1E+01**	N	**2.0E+03**	N	**6.8E+02**	N	**3.7E+00**	N	**3.7E+01**	N	
Methoxychlor					5.0E-03	i			5.0E-03	r			4.0E+01	72-43-5	**3.1E+02**	N	**1.0E+04**	N	**3.4E+03**	N	**1.8E+01**	N	**1.8E+02**	N	**8.0E+00**
Methyl acetate					1.0E+00	h			1.0E+00	r				79-20-9	**2.2E+04**	N	**9.6E+04**	N	**1.0E+05**	max	**3.7E+03**	N	**6.1E+03**	N	
Methyl acrylate					3.0E-02	h			3.0E-02	r				96-33-3	**7.0E+01**	N	**2.3E+02**	N	**2.6E+02**	N	**1.1E+02**	N	**1.8E+02**	N	
2-Methylaniline (o-toluidine)	2.4E-01	h					2.4E-01	r						95-53-4	**2.0E+00**	C	**2.4E+01**	C	**8.0E+00**	C	**2.8E-02**	C	**2.8E-01**	C	
2-Methyl-4-chlorophenoxyacetic acid					5.0E-04	i			5.0E-04	r				94-74-6	**3.1E+01**	N	**1.0E+03**	N	**3.4E+02**	N	**1.8E+00**	N	**1.8E+01**	N	
4-(2-Methyl-4-chlorophenoxy) butyric acid (MC					1.0E-02	i			1.0E-02	r				94-81-5	**6.1E+02**	N	**2.0E+04**	N	**6.8E+03**	N	**3.7E+01**	N	**3.7E+02**	N	
2-(2-Methyl-4-chlorophenoxy) propionic acid					1.0E-03	i			1.0E-03	r				93-65-2	**6.1E+01**	N	**2.0E+03**	N	**6.8E+02**	N	**3.7E+00**	N	**3.7E+01**	N	
2-(2-Methyl-1,4-chlorophenoxy) propionic acid					1.0E-03	i			1.0E-03	r				16484-77-8	**6.1E+01**	N	**2.0E+03**	N	**6.8E+02**	N	**3.7E+00**	N	**3.7E+01**	N	
Methylcyclohexane					8.6E-01	r			8.6E-01	h				108-87-2	**1.4E+02**	sat	**1.4E+02**	sat	**1.4E+02**	sat	**3.1E+03**	N	**5.2E+03**	N	
4,4'-Methylene bis(2-chloroaniline)	1.0E-01	p	y		2.0E-03	p	1.3E-01	h	7.0E-04	r				101-14-4	**1.2E+00**	C	**5.7E+01**	C	**1.9E+01**	C	**1.7E-02**	C	**2.2E-01**	C	
4,4'-Methylene bis(N,N'-dimethyl)ani	4.6E-02	i		B2			4.6E-02	r						101-61-1	**1.1E+01**	C	**1.2E+02**	C	**4.2E+01**	C	**1.5E-01**	C	**1.5E+00**	C	
Methylene bromide					1.0E-02	h			1.0E-02	r				74-95-3	**1.4E+02**	N	**5.5E+02**	N	**5.9E+02**	N	**3.7E+01**	N	**6.1E+01**	N	
Methylene chloride	7.5E-03	i		B2	6.0E-02	i	1.6E-03	i	8.6E-01	h			5.0E+00	75-09-2	**8.9E+00**	C	**2.1E+01**	C	**2.2E+01**	C	**4.1E+00**	C	**4.3E+00**	C	**1.0E-03**
4,4'-Methylenediphenyl isocyanate					1.7E-04	r			1.7E-04	i				101-68-8	**1.0E+01**	N	**3.5E+02**	N	**1.2E+02**	N	**6.2E-01**	N	**6.2E+00**	N	
Methyl ethyl ketone					6.0E-01	i			1.4E+00	i	5.0E+00	i		78-93-3	**3.2E+04**	N	**3.4E+04**	sat	**3.4E+04**	sat	**5.2E+03**	N	**7.1E+03**	N	
Methyl hydrazine	1.1E+00	h					1.1E+00	r						60-34-4	**4.4E-01**	C	**5.2E+00**	C	**1.7E+00**	C	**6.1E-03**	C	**6.1E-02**	C	
Methyl isobutyl ketone					8.0E-02	h			8.6E-01	i	3.0E+00	i		108-10-1	**5.8E+03**	N	**1.7E+04**	sat	**1.7E+04**	sat	**3.1E+03**	N	**2.0E+03**	N	
Methyl mercaptan					5.7E-04	r			5.7E-04	n	2.0E-03	n		74-93-1	**3.5E+01**	N	**1.2E+03**	N	**3.9E+02**	N	**2.1E+00**	N	**2.1E+01**	N	
Methyl methacrylate					1.4E+00	i			2.0E-01	i				80-62-6	**2.2E+03**	N	**2.7E+03**	sat	**2.7E+03**	sat	**7.3E+02**	N	**1.4E+03**	N	
2-Methyl-5-nitroaniline	3.3E-02	h					3.3E-02	r						99-55-8	**1.5E+01**	C	**1.7E+02**	C	**5.8E+01**	C	**2.0E-01**	C	**2.0E+00**	C	
Methyl parathion					2.5E-04	i			2.5E-04	r				298-00-0	**1.5E+01**	N	**5.1E+02**	N	**1.7E+02**	N	**9.1E-01**	N	**9.1E+00**	N	
2-Methylphenol					5.0E-02	x			5.0E-02	r				95-48-7	**3.1E+03**	N	**1.0E+05**	max	**3.4E+04**	N	**1.8E+02**	N	**1.8E+03**	N	**8.0E-01**
3-Methylphenol					5.0E-02	x			5.0E-02	r				108-39-4	**3.1E+03**	N	**1.0E+05**	max	**3.4E+04**	N	**1.8E+02**	N	**1.8E+03**	N	
4-Methylphenol					5.0E-03	h			5.0E-03	r				106-44-5	**3.1E+02**	N	**1.0E+04**	N	**3.4E+03**	N	**1.8E+01**	N	**1.8E+02**	N	
Methyl phosphonic acid					2.0E-02	p			2.0E-02	r				993-13-5	**1.2E+03**	N	**4.1E+04**	N	**1.4E+04**	N	**7.3E+01**	N	**7.3E+02**	N	
Methyl styrene (mixture)					6.0E-03	h			1.1E-02	h				25013-15-4	**1.3E+02**	N	**5.6E+02**	N	**6.0E+02**	N	**4.2E+01**	N	**6.0E+01**	N	
Methyl styrene (alpha)					7.0E-02	h			7.0E-02	r				98-83-9	**6.8E+02**	sat	**6.8E+02**	sat	**6.8E+02**	sat	**2.6E+02**	N	**4.3E+02**	N	
Methyl tertbutyl ether (MTBE)	1.8E-03	o			8.6E-01	r	9.1E-04	o	8.6E-01	i	3.0E+00	i		1634-04-4	**3.2E+01**	C	**7.2E+01**	C	**7.9E+01**	C	**7.4E+00**	C	**1.1E+01**	C	
Metolaclor (Dual)					1.5E-01	i			1.5E-01	r				51218-45-2	**9.2E+03**	N	**1.0E+05**	max	**1.0E+05**	max	**5.5E+02**	N	**5.5E+03**	N	
Mirex	1.8E+00	h			2.0E-04	i	1.8E+00	r	2.0E-04	r				2385-85-5	**2.7E-01**	C	**3.2E+00**	C	**1.1E+00**	C	**3.7E-03**	C	**3.7E-02**	C	
Molybdenum					5.0E-03	i								7439-98-7	**3.9E+02**	N	**1.0E+04**	N	**5.7E+03**	N			**1.8E+02**	N	
Monochloramine					1.0E-01	h			1.0E-01	h				10599-90-3	**6.1E+03**	N	**1.0E+05**	max	**6.8E+04**	N	**3.7E+02**	N	**3.7E+03**	N	
Naled					2.0E-03	i			2.0E-03	r				300-76-5	**1.2E+02**	N	**4.1E+03**	N	**1.4E+03**	N	**7.3E+00**	N	**7.3E+01**	N	
Nickel and compounds					2.0E-02	i								7440-02-0	**1.6E+03**	N	**4.1E+04**	N	**2.3E+04**	N			**7.3E+02**	N	**7.0E+00**
Nickel refinery dust				A			8.4E-01	i						n/a	**1.1E+04**	C	**2.2E+04**	C	**2.5E+04**	C	**8.0E-03**	C			
Nickel subsulfide				A			1.7E+00	i						12035-72-2	**5.2E+03**	C	**1.1E+04**	C	**1.2E+04**	C	**4.0E-03**	C			
Nitrate	**Tap Water Screening Level Based on Infant NOAEL (see IRIS)**												1.0E+04	14797-55-8									**1.0E+04**		
Nitric Oxide					1.0E-01	x								10102-43-9	**6.1E+03**	N	**1.0E+05**	max	**6.8E+04**	N			**3.7E+03**	N	
Nitrite	**Tap Water Screening Level Based on Infant NOAEL (see IRIS)**												1.0E+03	14797-65-0									**1.0E+03**		
2-Nitroaniline					3.0E-03	p			2.9E-05	p				88-74-4	**1.8E+02**	N	**5.9E+03**	N	**2.0E+03**	N	**1.0E-01**	N	**1.1E+02**	N	
Nitrobenzene					5.0E-04	i			5.7E-04	h				98-95-3	**2.0E+01**	N	**1.1E+02**	N	**1.1E+02**	N	**2.1E+00**	N	**3.4E+00**	N	**7.0E-03**
Nitrofurantoin					7.0E-02	h			7.0E-02	r				67-20-9	**4.3E+03**	N	**1.0E+05**	max	**4.8E+04**	N	**2.6E+02**	N	**2.6E+03**	N	
Nitrofurazone	1.5E+00	h					9.4E+00	h						59-87-0	**3.2E-01**	C	**3.8E+00**	C	**1.3E+00**	C	**7.2E-04**	C	**4.5E-02**	C	
Nitrogen dioxide					1.0E+00	x								10102-44-0	**6.1E+04**	N	**1.0E+05**	max	**1.0E+05**	max			**3.7E+04**	N	
4-Nitrophenol					8.0E-03	n			8.0E-03	r				100-02-7	**4.9E+02**	N	**1.6E+04**	N	**5.5E+03**	N	**2.9E+01**	N	**2.9E+02**	N	
2-Nitropropane	9.4E+00	r			5.7E-03	r	9.4E+00	h	5.7E-03	i	2.0E-02	i		79-46-9	**6.8E-02**	C	**6.1E-01**	C	**3.4E-01**	C	**7.2E-04**	C	**1.2E-03**	C	
N-Nitrosodi-n-butylamine	5.4E+00	i		B2			5.6E+00	i						924-16-3	**2.4E-02**	C	**6.2E-02**	C	**6.5E-02**	C	**1.2E-03**	C	**2.0E-03**	C	
N-Nitrosodiethanolamine	2.8E+00	i		B2			2.8E+00	r						1116-54-7	**1.7E-01**	C	**2.0E+00**	C	**6.8E-01**	C	**2.4E-03**	C	**2.4E-02**	C	
N-Nitrosodiethylamine	1.5E+02	i	y	B2			1.5E+02	i						55-18-5	**7.7E-04**	C	**3.8E-02**	C	**1.3E-02**	C	**1.4E-05**	C	**1.4E-04**	C	
N-Nitrosodimethylamine	5.1E+01	i	y	B2	8.0E-06	p	4.9E+01	i						62-75-9	**2.3E-03**	C	**1.1E-01**	C	**3.8E-02**	C	**4.4E-05**	C	**4.2E-04**	C	
N-Nitrosodiphenylamine	4.9E-03	i		B2	2.0E-02	p	4.9E-03	r						86-30-6	**9.9E+01**	C	**1.2E+03**	C	**3.9E+02**	C	**1.4E+00**	C	**1.4E+01**	C	**6.0E-02**
N-Nitroso di-n-propylamine	7.0E+00	i		B2			7.0E+00	r						621-64-7	**6.9E-02**	C	**8.2E-01**	C	**2.7E-01**	C	**9.6E-04**	C	**9.6E-03**	C	**2.0E-06**
N-Nitroso-N-methylethylamine	2.2E+01	i		B2			2.2E+01	r						10595-95-6	**2.2E-02**	C	**2.6E-01**	C	**8.7E-02**	C	**3.1E-04**	C	**3.1E-03**	C	
N-Nitrosopyrrolidine	2.1E+00	i		B2			2.1E+00	i						930-55-2	**2.3E-01**	C	**2.7E+00**	C	**9.1E-01**	C	**3.1E-03**	C	**3.2E-02**	C	
m-Nitrotoluene					2.0E-02	p			2.0E-02	r				99-08-1	**1.6E+03**	N	**4.1E+04**	N	**2.3E+04**	N	**7.3E+01**	N	**1.2E+02**	N	
o-Nitrotoluene	2.3E-01	p			1.0E-02	h								88-72-2	**2.8E+00**	C	**2.5E+01**	C	**1.4E+01**	C			**2.9E-01**	C	

Key : i=IRIS p= PPRTV n=NCEA h=HEAST x=WITHDRAWN o=Other DOCUMENTS r=ROUTE EXTRAPOLATION Key : C=CANCER N=NONCANCER sat=SOIL SATURATION max=CEILING LIMIT

Region 6 Human Health Medium-Specific Screening Levels 2007	TOXICITY INFORMATION													SCREENING LEVELS											
Contaminants	SFo 1/(mg/kg-d)	K E Y	Mutagen y for yes	CANCER CLASS	RfDo (mg/kg-d)	K E Y	SFi 1/(mg/kg-d)	K E Y	RfDi (mg/kg-d)	K E Y	RfC (mg/m3)	K E Y	MCL (ug/l)	CAS No.	Residential Soil (mg/kg)	K E Y	Industrial Indoor Worker w/o Dermal (mg/kg)	K E Y	Industrial-Outdoor Worker Soil (mg/kg)	K E Y	Ambient Air (ug/m^3)	K E Y	Tap Water (ug/l)	K E Y	DAF 1 (mg/kg)
p-Nitrotoluene	1.7E-02 p				1.0E-02 p				1.0E-02 r					99-99-0	3.8E+01	C	3.4E+02	C	1.9E+02	C	3.7E+01	N	4.0E+00	C	
NuStar					7.0E-04 i				7.0E-04 r					85509-19-9	4.3E+01	N	1.4E+03	N	4.8E+02	N	2.6E+00	N	2.6E+01	N	
Octahydro-1357-tetranitro-1357- tetrazocine (H					5.0E-02 i				5.0E-02 r					2691-41-0	3.1E+03	N	1.0E+05	max	3.4E+04	N	1.8E+02	N	1.8E+03	N	
Oryzalin					5.0E-02 i				5.0E-02 r					19044-88-3	3.1E+03	N	1.0E+05	max	3.4E+04	N	1.8E+02	N	1.8E+03	N	
Oxadiazon					5.0E-03 i				5.0E-03 r					19666-30-9	3.1E+02	N	1.0E+04	N	3.4E+03	N	1.8E+01	N	1.8E+02	N	
Oxamyl					2.5E-02 i				2.5E-02 r				2.0E+02	23135-22-0	1.5E+03	N	5.1E+04	N	1.7E+04	N	9.1E+01	N	9.1E+02	N	
Oxyfluorfen					3.0E-03 i				3.0E-03 r					42874-03-3	1.8E+02	N	6.1E+03	N	2.1E+03	N	1.1E+01	N	1.1E+02	N	
Paraquat					4.5E-03 i				4.5E-03 r					4685-14-7	2.7E+02	N	9.2E+03	N	3.1E+03	N	1.6E+01	N	1.6E+02	N	
Parathion					6.0E-03 h				6.0E-03 r					56-38-2	3.7E+02	N	1.2E+04	N	4.1E+03	N	2.2E+01	N	2.2E+02	N	
Pentachlorobenzene					8.0E-04 i				8.0E-04 r					608-93-5	4.9E+01	N	1.6E+03	N	5.5E+02	N	2.9E+00	N	2.9E+01	N	
Pentachloronitrobenzene	2.6E-01 h				3.0E-03 i		2.6E-01 r		3.0E-03 r					82-68-8	1.9E+00	C	2.2E+01	C	7.4E+00	C	2.6E-02	C	2.6E-01	C	
Pentachlorophenol	1.2E-01 i			B2	3.0E-02 i		1.2E-01 r		3.0E-02 r				1.0E+00	87-86-5	3.0E+00	C	4.8E+01	C	1.0E+01	C	5.6E-02	C	5.6E-01	C	1.0E-03
Perchlorate					7.0E-04 i									7601-90-3	5.5E+01	N	1.4E+03	N	7.9E+02	N			<24.5	N	
Permethrin					5.0E-02 i				5.0E-02 r					52645-53-1	3.1E+03	N	1.0E+05	max	3.4E+04	N	1.8E+02	N	1.8E+03	N	
Phenol					3.0E-01 i									108-95-2	1.8E+04	N	1.0E+05	max	1.0E+05	max			1.1E+04	N	5.0E+00
Phenothiazine					2.0E-03 n				2.0E-03 r					92-84-2	1.2E+02	N	4.1E+03	N	1.4E+03	N	7.3E+00	N	7.3E+01	N	
m-Phenylenediamine					6.0E-03 i				6.0E-03 r					108-45-2	3.7E+02	N	1.2E+04	N	4.1E+03	N	2.2E+01	N	2.2E+02	N	
p-Phenylenediamine					1.9E-01 h				1.9E-01 r					106-50-3	1.2E+04	N	1.0E+05	max	1.0E+05	max	6.9E+02	N	6.9E+03	N	
Phenylmercuric acetate					8.0E-05 i				8.0E-05 r					62-38-4	4.9E+00	N	1.6E+02	N	5.5E+01	N	2.9E-01	N	2.9E+00	N	
2-Phenylphenol	1.9E-03 h						1.9E-03 r							90-43-7	2.5E+02	C	2.9E+03	C	9.9E+02	C	3.5E+00	C	3.5E+01	C	
Phosphine					3.0E-04 h				8.6E-05 i		3.0E-04 i			7803-51-2	1.8E+01	N	6.1E+02	N	2.1E+02	N	3.1E-01	N	1.1E+01	N	
Phosphoric acid									2.9E-03 i					7664-38-2							1.0E+01	N	2.1E+01	N	
Phosphorus (white)					2.0E-05 i									7723-14-0	1.6E+00	N	4.1E+01	N	2.3E+01	N			7.3E-01	N	
p-Phthalic acid					1.0E+00 h				1.0E+00 r					100-21-0	6.1E+04	N	1.0E+05	max	1.0E+05	max	3.7E+03	N	3.7E+04	N	
Phthalic anhydride					2.0E+00 i				3.4E-02 h					85-44-9	1.0E+05	max	1.0E+05	max	1.0E+05	max	1.2E+02	N	7.3E+04	N	
Polybrominated biphenyls	8.9E+00 h				7.0E-06 h		8.9E+00 r		7.0E-06 r						5.5E-02	C	6.4E-01	C	2.2E-01	C	7.6E-04	C	7.6E-03	C	
Polychlorinated biphenyls (PCBs)	2.0E+00 i			B2			2.0E+00 r						5.0E-01	1336-36-3	2.2E-01	C	2.9E+00	C	8.3E-01	C	3.4E-03	C	3.4E-02	C	
Aroclor 1016	7.0E-02 i			B2	7.0E-05 i		7.0E-02 i		7.0E-05 r					12674-11-2	3.9E+00	N	8.2E+01	C	2.4E+01	C	9.6E-02	C	9.6E-01	C	
Aroclor 1221	2.0E+00 i			B2			2.0E+00 i							11104-28-2	2.2E-01	C	2.9E+00	C	8.3E-01	C	3.4E-03	C	3.4E-02	C	
Aroclor 1232	2.0E+00 i			B2			2.0E+00 i							11141-16-5	2.2E-01	C	2.9E+00	C	8.3E-01	C	3.4E-03	C	3.4E-02	C	
Aroclor 1242	2.0E+00 i			B2			2.0E+00 i							53469-21-9	2.2E-01	C	2.9E+00	C	8.3E-01	C	3.4E-03	C	3.4E-02	C	
Aroclor 1248	2.0E+00 i			B2			2.0E+00 i							12672-29-6	2.2E-01	C	2.9E+00	C	8.3E-01	C	3.4E-03	C	3.4E-02	C	
Aroclor 1254	2.0E+00 i			B2	2.0E-05 i		2.0E+00 i		2.0E-05 r					11097-69-1	2.2E-01	C	2.9E+00	C	8.3E-01	C	3.4E-03	C	3.4E-02	C	
Aroclor 1260	2.0E+00 i			B2			2.0E+00 i							11096-82-5	2.2E-01	C	2.9E+00	C	8.3E-01	C	3.4E-03	C	3.4E-02	C	
Polynuclear aromatic hydrocarbons																									
Acenaphthene					6.0E-02 i				6.0E-02 r					83-32-9	3.7E+03	N	3.8E+04	N	3.3E+04	N	2.2E+02	N	3.7E+02	N	2.9E+01
Anthracene					3.0E-01 i				3.0E-01 r					120-12-7	2.2E+04	N	1.0E+05	max	1.0E+05	max	1.1E+03	N	1.8E+03	N	5.9E+02
Benz[a]anthracene	7.3E-01 n		y				3.1E-01 n							56-55-3	1.5E-01	C	7.8E+00	C	2.3E+00	C	6.9E-03	C	2.9E-02	C	8.0E-02
Benzo[b]fluoranthene	7.3E-01 n		y	B2			3.1E-01 n							205-99-2	1.5E-01	C	7.8E+00	C	2.3E+00	C	6.9E-03	C	2.9E-02	C	2.0E-01
Benzo[k]fluoranthene	7.3E-02 n		y	B2			3.1E-02 n							207-08-9	1.5E+00	C	7.8E+01	C	2.3E+01	C	6.9E-02	C	2.9E-01	C	2.0E+00
Benzo[a]pyrene	7.3E+00 i		y	B2			3.1E+00 n						2.0E-01	50-32-8	1.5E-02	C	7.8E-01	C	2.3E-01	C	6.9E-04	C	2.9E-03	C	4.0E-01
Chrysene	7.3E-03 n		y	B2			3.1E-03 n							218-01-9	1.5E+01	C	7.8E+02	C	2.3E+02	C	6.9E-01	C	2.9E+00	C	8.0E+00
Dibenz[ah]anthracene	7.3E+00 n		y	B2			3.1E+00 n							53-70-3	1.5E-02	C	7.8E-01	C	2.3E-01	C	6.9E-04	C	2.9E-03	C	8.0E-02
Fluoranthene				D	4.0E-02 i				4.0E-02 r					206-44-0	2.3E+03	N	8.2E+04	N	2.4E+04	N	1.5E+02	N	1.5E+03	N	2.1E+02
Fluorene				D	4.0E-02 i				4.0E-02 r					86-73-7	2.6E+03	N	3.3E+04	N	2.6E+04	N	1.5E+02	N	2.4E+02	N	2.8E+01
Indeno[1,2,3-cd]pyrene	7.3E-01 n		y	B2			3.1E-01 n							193-39-5	1.5E-01	C	7.8E+00	C	2.3E+00	C	6.9E-03	C	2.9E-02	C	7.0E-01
Naphthalene				C	2.0E-02 i				8.6E-04 i		3.0E-03 i			91-20-3	1.2E+02	N	1.9E+02	N	2.1E+02	N	3.1E+00	N	6.2E+00	N	4.0E+00
Pyrene				D	3.0E-02 i				3.0E-02 r					129-00-0	2.3E+03	N	5.4E+04	N	3.2E+04	N	1.1E+02	N	1.8E+02	N	2.1E+02
Prometon					1.5E-02 i				1.5E-02 r					1610-18-0	9.2E+02	N	3.1E+04	N	1.0E+04	N	5.5E+01	N	5.5E+02	N	
Prometryn					4.0E-03 i				4.0E-03 r					7287-19-6	2.4E+02	N	8.2E+03	N	2.7E+03	N	1.5E+01	N	1.5E+02	N	
Propachlor					1.3E-02 i				1.3E-02 r					1918-16-7	7.9E+02	N	2.7E+04	N	8.9E+03	N	4.7E+01	N	4.7E+02	N	
Propanil					5.0E-03 i				5.0E-03 r					709-98-8	3.1E+02	N	1.0E+04	N	3.4E+03	N	1.8E+01	N	1.8E+02	N	
Propargite					2.0E-02 i				2.0E-02 r					2312-35-8	1.2E+03	N	4.1E+04	N	1.4E+04	N	7.3E+01	N	7.3E+02	N	
Propargyl alcohol					2.0E-03 i				2.0E-03 r					107-19-7	1.2E+02	N	4.1E+03	N	1.4E+03	N	7.3E+00	N	7.3E+01	N	
Propazine					2.0E-02 i				2.0E-02 r					139-40-2	1.2E+03	N	4.1E+04	N	1.4E+04	N	7.3E+01	N	7.3E+02	N	
Propiconazole					1.3E-02 i				1.3E-02 r					60207-90-1	7.9E+02	N	2.7E+04	N	8.9E+03	N	4.7E+01	N	4.7E+02	N	
n-Propylbenzene					1.0E-02 n				1.0E-02 r					103-65-1	1.4E+02	N	2.4E+02	sat	2.4E+02	sat	3.7E+01	N	6.1E+01	N	
Propylene glycol					5.0E-01 p				8.6E-04 p					57-55-6	3.0E+04	N	1.0E+05	max	1.0E+05	max	3.1E+00	N	1.8E+04	N	
Propylene glycol, monoethyl ether					7.0E-01 h									111-35-3	4.3E+04	N	1.0E+05	max	1.0E+05	max			2.6E+04	N	
Propylene glycol, monomethyl ether					7.0E-01 h				5.7E-01 i		2.0E+00 i			107-98-2	4.3E+04	N	1.0E+05	max	1.0E+05	max	2.1E+03	N	2.6E+04	N	
Propylene oxide	2.4E-01 i			B2	8.6E-03 r		1.3E-02 i		8.6E-03 i					75-56-9	1.9E+00	C	9.1E+00	C	7.3E+00	C	5.2E-01	C	2.2E-01	C	
Pursuit					2.5E-01 i				2.5E-01 r					81335-77-5	1.5E+04	N	1.0E+05	max	1.0E+05	max	9.1E+02	N	9.1E+03	N	
Pyridine					1.0E-03 i				1.0E-03 r					110-86-1	6.1E+01	N	2.0E+03	N	6.8E+02	N	3.7E+00	N	3.7E+01	N	
Quinoline	3.0E+00 i			likely			1.2E+01 r							91-22-5	1.6E-01	C	1.9E+00	C	6.4E-01	C	5.6E-04	C	2.2E-02	C	
RDX (Cyclonite)	1.1E-01 i			C	3.0E-03 i		1.1E-01 r		3.0E-03 r					121-82-4	4.4E+00	C	5.2E+01	C	1.7E+01	C	6.1E-02	C	6.1E-01	C	

Key : i=IRIS p= PPRTV n=NCEA h=HEAST x=WITHDRAWN o=Other DOCUMENTS r=ROUTE EXTRAPOLATION Key : C=CANCER N=NONCANCER sat=SOIL SATURATION max=CEILING LIMIT

Region 6 Human Health Medium-Specific Screening Levels 2007	TOXICITY INFORMATION													SCREENING LEVELS										
Contaminants	SFo 1/(mg/kg-d)	K E Y	Mutagen y for yes	CANCER CLASS	RfDo (mg/kg-d)	K E Y	SFi 1/(mg/kg-d)	K E Y	RfDi (mg/kg-d)	K E Y	RfC (mg/m3)	K E Y	MCL (ug/l)	CAS No.	Residential Soil (mg/kg)	K E Y	Industrial Indoor Worker w/o Dermal (mg/kg)	K E Y	Industrial-Outdoor Worker Soil (mg/kg)	K E Y	Ambient Air (ug/m^3)	K E Y	Tap Water (ug/l)	K E Y	DAF 1 (mg/kg)
Resmethrin					3.0E-02	i			3.0E-02	r				10453-86-8	1.8E+03	N	6.1E+04	N	2.1E+04	N	1.1E+02	N	1.1E+03	N	
Ronnel					5.0E-02	h			5.0E-02	r				299-84-3	3.1E+03	N	1.0E+05	max	3.4E+04	N	1.8E+02	N	1.8E+03	N	
Rotenone					4.0E-03	i			4.0E-03	r				83-79-4	2.4E+02	N	8.2E+03	N	2.7E+03	N	1.5E+01	N	1.5E+02	N	
Selenious Acid					5.0E-03	i								7783-00-8	3.1E+02	N	1.0E+04	N	3.4E+03	N			1.8E+02	N	
Selenium					5.0E-03	i							5.0E+01	7782-49-2	3.9E+02	N	1.0E+04	N	5.7E+03	N			1.8E+02	N	3.0E-01
Silver and compounds					5.0E-03	i								7440-22-4	3.9E+02	N	1.0E+04	N	5.7E+03	N			1.8E+02	N	2.0E+00
Simazine	1.2E-01	h			5.0E-03	i	1.2E-01	r	2.0E-03	r			4.0E+00	122-34-9	4.1E+00	C	4.8E+01	C	1.6E+01	C	5.6E-02	C	5.6E-01	C	
Sodium azide					4.0E-03	i			4.0E-03	r				26628-22-8	2.4E+02	N	8.2E+03	N	2.7E+03	N	1.5E+01	N	1.5E+02	N	
Sodium diethyldithiocarbamate	2.7E-01	h			3.0E-02	i	2.7E-01	r	3.0E-02	r				148-18-5	1.8E+00	C	2.1E+01	C	7.1E+00	C	2.5E-02	C	2.5E-01	C	
Sodium fluoroacetate					2.0E-05	i			2.0E-05	r				62-74-8	1.2E+00	N	4.1E+01	N	1.4E+01	N	7.3E-02	N	7.3E-01	N	
Sodium metavanadate					1.0E-03	h			1.0E-03	r				13718-26-8	6.1E+01	N	2.0E+03	N	6.8E+02	N	3.7E+00	N	3.7E+01	N	
Strontium, stable					6.0E-01	i								7440-24-6	4.7E+04	N	1.0E+05	max	1.0E+05	max			2.2E+04	N	
Strychnine					3.0E-04	i			3.0E-04	r				57-24-9	1.8E+01	N	6.1E+02	N	2.1E+02	N	1.1E+00	N	1.1E+01	N	
Styrene					2.0E-01	i			2.9E-01	i	1.0E+00	i	1.0E+02	100-42-5	1.7E+03	sat	1.7E+03	sat	1.7E+03	sat	1.1E+03	N	1.6E+03	N	2.0E-01
2,3,7,8-TCDD (dioxin)	1.5E+05	h					1.5E+05	h					3.0E-05	1746-01-6	3.9E-06	C	3.8E-05	C	1.8E-05	C	4.5E-08	C	4.5E-07	C	
1,2,4,5-Tetrachlorobenzene					3.0E-04	i			3.0E-04	r				95-94-3	1.8E+01	N	6.1E+02	N	2.1E+02	N	1.1E+00	N	1.1E+01	N	
1,1,1,2-Tetrachloroethane	2.6E-02	i		C	3.0E-02	i	2.6E-02	i	3.0E-02	r				630-20-6	3.0E+00	C	7.1E+00	C	7.6E+00	C	2.6E-01	C	4.3E-01	C	
1,1,2,2-Tetrachloroethane	2.0E-01	i		C	6.0E-02	p	2.0E-01	i	6.0E-02	r				79-34-5	3.8E-01	C	9.0E-01	C	9.7E-01	C	3.3E-02	C	5.5E-02	C	2.0E-04
Tetrachloroethylene (PCE)	5.4E-01	o			1.0E-02	i	2.1E-02	o	1.1E-01	n	4.0E-01	n	5.0E+00	127-18-4	5.5E-01	C	1.8E+00	C	1.7E+00	C	3.3E-01	C	1.0E-01	C	3.0E-03
2,3,4,6-Tetrachlorophenol					3.0E-02	i			3.0E-02	r				58-90-2	1.8E+03	N	6.1E+04	N	2.1E+04	N	1.1E+02	N	1.1E+03	N	
p,a,a,a-Tetrachlorotoluene	2.0E+01	h					2.0E+01	r						5216-25-1	2.4E-02	C	2.9E-01	C	9.6E-02	C	3.4E-04	C	3.4E-03	C	
Tetrachlorovinphos	2.4E-02	h			3.0E-02	i	2.4E-02	r	3.0E-02	r				961-11-5	2.0E+01	C	2.4E+02	C	8.0E+01	C	2.8E-01	C	2.8E+00	C	
Tetrahydrofuran	7.6E-03	n			2.0E-01	n	6.8E-03		8.6E-02	n	3.0E-01	n		109-99-9	6.4E+01	C	7.5E+02	C	2.5E+02	C	9.9E-01	C	8.8E+00	C	
Thallic oxide					7.0E-05	h								1314-32-5	5.5E+00	N	1.4E+02	N	7.9E+01	N			2.6E+00	N	
Thallium					7.0E-05	i							2.0E+00		5.5E+00		1.4E+02		7.9E+01				2.6E+00	N	4.0E-01
Thallium acetate					9.0E-05	i							2.0E+00	563-68-8	7.0E+00	N	1.8E+02	N	1.0E+02	N			3.3E+00	N	4.0E-01
Thallium carbonate					8.0E-05	i							2.0E+00	6533-73-9	6.3E+00	N	1.6E+02	N	9.1E+01	N			2.9E+00	N	4.0E-01
Thallium chloride					8.0E-05	i							2.0E+00	7791-12-0	6.3E+00	N	1.6E+02	N	9.1E+01	N			2.9E+00	N	4.0E-01
Thallium nitrate					9.0E-05	i							2.0E+00	10102-45-1	7.0E+00	N	1.8E+02	N	1.0E+02	N			3.3E+00	N	4.0E-01
Thallium selenite					9.0E-05	x							2.0E+00	12039-52-0	7.0E+00	N	1.8E+02	N	1.0E+02	N			3.3E+00	N	4.0E-01
Thallium sulfate					8.0E-05	i							2.0E+00	7446-18-6	6.3E+00	N	1.6E+02	N	9.1E+01	N			2.9E+00	N	4.0E-01
Thiobencarb					1.0E-02	i			1.0E-02	r				28249-77-6	6.1E+02	N	2.0E+04	N	6.8E+03	N	3.7E+01	N	3.7E+02	N	
Thiocyanate					2.0E-04	p								N/A	1.2E+01	N	4.1E+02	N	1.4E+02	N			7.3E+00	N	
Tin and compounds					6.0E-01	h								n/a	4.7E+04	N	1.0E+05	max	1.0E+05	max			2.2E+04	N	
Toluene					8.0E-02	i			1.4E+00	i			1.0E+03	108-88-3	5.2E+02	sat	5.2E+02	sat	5.2E+02	sat	5.2E+03	N	2.3E+03	N	6.0E-01
Toluene-2,4-diamine	3.2E+00	h					3.2E+00	r						95-80-7	1.5E-01	C	1.8E+00	C	6.0E-01	C	2.1E-03	C	2.1E-02	C	
Toluene-2,5-diamine					6.0E-01	h			6.0E-01	r				95-70-5	3.7E+04	N	1.0E+05	max	1.0E+05	max	2.2E+03	N	2.2E+04	N	
Toluene-2,6-diamine					3.0E-02	p			3.0E-02	r				823-40-5	1.8E+03	N	6.1E+04	N	2.1E+04	N	1.1E+02	N	1.1E+03	N	
p-Toluidine	1.9E-01	h					1.9E-01	r						106-49-0	2.6E+00	C	3.0E+01	C	1.0E+01	C	3.5E-02	C	3.5E-01	C	
Toxaphene	1.1E+00	i		B2			1.1E+00	i					3.0E+00	8001-35-2	4.4E-01	C	5.2E+00	C	1.7E+00	C	6.0E-03	C	6.1E-02	C	2.0E+00
1,2,4-Tribromobenzene					5.0E-03	i			5.0E-03	r				615-54-3	3.1E+02	N	1.0E+04	N	3.4E+03	N	1.8E+01	N	1.8E+02	N	
Tributyltin oxide (TBTO)					3.0E-04	i								56-35-9	1.8E+01	N	6.1E+02	N	2.1E+02	N			1.1E+01	N	
2,4,6-Trichloroaniline	3.4E-02	h					3.4E-02	r						634-93-5	1.4E+01	C	1.7E+02	C	5.6E+01	C	2.0E-01	C	2.0E+00	C	
1,2,4-Trichlorobenzene					1.0E-02	i			1.1E-03	p	4.0E-03	p	7.0E+01	120-82-1	1.4E+02	N	2.4E+02	N	2.6E+02	N	4.2E+00	N	8.2E+00	N	3.0E-01
1,1,1-Trichloroethane					2.8E-02	n			6.3E-01	p	2.2E+00	p	2.0E+02	71-55-6	1.4E+03	sat	1.4E+03	sat	1.4E+03	sat	2.3E+03	N	8.4E+02	N	1.0E-01
1,1,2-Trichloroethane	5.7E-02	i		C	4.0E-03	i	5.6E-02	i	4.0E-03	r			5.0E+00	79-00-5	8.4E-01	C	1.9E+00	C	2.1E+00	C	1.2E-01	C	2.0E-01	C	9.0E-04
Trichloroethylene (TCE)	4.0E-01	n			3.0E-04	n	4.0E-01	n	1.1E-02	n	4.0E-02	n	5.0E+00	79-01-6	4.3E-02	C	9.2E-02	C	1.0E-01	C	1.7E-02	C	2.8E-02	C	3.0E-03
Trichlorofluoromethane					3.0E-01	i			2.0E-01	h				75-69-4	3.9E+02	N	1.3E+03	N	1.4E+03	N	7.3E+02	N	1.3E+03	N	
2,4,5-Trichlorophenol					1.0E-01	i			1.0E-01	r				95-95-4	6.1E+03	N	1.0E+05	max	6.8E+04	N	3.7E+02	N	3.7E+03	N	1.4E+01
2,4,6-Trichlorophenol	1.1E-02	i		B2			1.1E-02	i						88-06-2	4.4E+01	C	5.2E+02	C	1.7E+02	C	6.2E-01	C	6.1E+00	C	8.0E-03
2,4,5-Trichlorophenoxyacetic Acid					1.0E-02	i			1.0E-02	r				93-76-5	6.1E+02	N	2.0E+04	N	6.8E+03	N	3.7E+01	N	3.7E+02	N	
2-(2,4,5-Trichlorophenoxy) propionic acid					8.0E-03	i			8.0E-03	r				93-72-1	4.9E+02	N	1.6E+04	N	5.5E+03	N	2.9E+01	N	2.9E+02	N	
1,1,2-Trichloropropane					5.0E-03	i			5.0E-03	r				598-77-6	1.5E+01	N	5.1E+01	N	5.7E+01	N	1.8E+01	N	3.0E+01	N	
1,2,3-Trichloropropane	7.0E+00	h			6.0E-03	i	7.0E+00	r	6.0E-03	r				96-18-4	1.4E-03	C	3.1E-03	C	3.4E-03	C	9.6E-04	C	1.6E-03	C	
1,2,3-Trichloropropene					1.0E-02	p			2.9E-04	p	1.0E-03	p		96-19-5	1.6E+00	N	2.2E+00	N	2.5E+00	N	1.0E+00	N	2.1E+00	N	
1,1,2-Trichloro-1,2,2-trifluoroethane					3.0E+01	i			8.6E+00	h				76-13-1	5.6E+03	sat	5.6E+03	sat	5.6E+03	sat	3.1E+04	N	5.9E+04	N	
Triethylamine					2.0E-03	r			2.0E-03	i				121-44-8	2.3E+01	N	8.8E+01	N	9.6E+01	N	7.3E+00	N	1.2E+01	N	
1,2,4-Trimethylbenzene					5.0E-02	p			1.7E-03	p				95-63-6	5.2E+01	N	1.7E+02	N	1.9E+02	N	6.3E+00	N	1.2E+01	N	
1,3,5-Trimethylbenzene					5.0E-02	p			1.7E-03	p				108-67-8	2.1E+01	N	7.0E+01	N	7.8E+01	N	6.2E+00	N	1.2E+01	N	
Trimethyl phosphate	3.7E-02	h					3.7E-02	r						512-56-1	1.3E+01	C	1.5E+02	C	5.2E+01	C	1.8E-01	C	1.8E+00	C	
1,3,5-Trinitrobenzene					3.0E-02	i			3.0E-02	r				99-35-4	1.8E+03	N	6.1E+04	N	2.1E+04	N	1.1E+02	N	1.1E+03	N	
Trinitrophenylmethylnitramine					4.0E-03	p			4.0E-03	r				479-45-8	2.4E+02	N	8.2E+03	N	2.7E+03	N	1.5E+01	N	1.5E+02	N	
2,4,6-Trinitrotoluene	3.0E-02	i		C	5.0E-04	i	3.0E-02	r	5.0E-04	r				118-96-7	1.6E+01	C	1.9E+02	C	6.4E+01	C	2.2E-01	C	2.2E+00	C	
Vanadium					5.0E-03	i								7440-62-2	3.9E+02	N	1.0E+04	N	5.7E+03	N			1.8E+02	N	3.0E+02
Vanadium pentoxide					9.0E-03	i								1314-62-1	7.0E+02	N	1.8E+04	N	1.0E+04	N			3.3E+02	N	3.0E+02

Key : i=IRIS p= PPRTV n=NCEA h=HEAST x=WITHDRAWN o=Other DOCUMENTS r=ROUTE EXTRAPOLATION Key : C=CANCER N=NONCANCER sat=SOIL SATURATION max=CEILING LIMIT

Region 6 Human Health Medium-Specific Screening Levels 2007	TOXICITY INFORMATION													SCREENING LEVELS										
Contaminants	SFo 1/(mg/kg-d)	K E Y	Mutagen y for yes	CANCER CLASS	RfDo (mg/kg-d)	K E Y	SFi 1/(mg/kg-d)	K E Y	RfDi (mg/kg-d)	K E Y	RfC (mg/m3)	K E Y	MCL (ug/l)	CAS No.	Residential Soil (mg/kg)	K E Y	Industrial Indoor Worker w/o Dermal (mg/kg)	K E Y	Industrial-Outdoor Worker Soil (mg/kg)	K E Y	Ambient Air (ug/m^3)	K E Y	Tap Water (ug/l)	K E Y	DAF 1 (mg/kg)
Vinclozolin					2.5E-02	i			2.5E-02	r				50471-44-8	**1.5E+03**	N	**5.1E+04**	N	**1.7E+04**	N	**9.1E+01**	N	**9.1E+02**	N	
Vinyl acetate					1.0E+00	h			5.7E-02	i				108-05-4	**4.3E+02**	N	**1.4E+03**	N	**1.6E+03**	N	**2.1E+02**	N	**4.1E+02**	N	**8.0E+00**
Vinyl bromide	1.1E-01	r			8.6E-04	r	1.1E-01	h	8.6E-04	i	3.0E-03	i		593-60-2	**1.9E-01**	C	**4.2E-01**	C	**4.7E-01**	C	**6.1E-02**	C	**1.0E-01**	C	
Vinyl chloride	7.2E-01	I	special case	A	3.0E-03	i	1.5E-02	i	2.9E-02	i	1.0E-01	i	2.0E+00	75-01-4	**4.3E-02**	C	**8.6E-01**	C	**8.6E-01**	C	**1.6E-01**	C	**1.5E-02**	C	**7.0E-04**
Warfarin					3.0E-04	i			3.0E-04	r				81-81-2	**1.8E+01**	N	**6.1E+02**	N	**2.1E+02**	N	**1.1E+00**	N	**1.1E+01**	N	
m-Xylene					2.0E+00	i			2.9E-02	i	1.0E-01	i		108-38-3	**2.1E+02**	sat	**2.1E+02**	sat	**2.1E+02**	sat	**1.0E+02**	N	**2.1E+02**	N	**1.0E+01**
o-Xylene					2.0E+00	i			2.0E-01	x				95-47-6	**2.8E+02**	sat	**2.8E+02**	sat	**2.8E+02**	sat	**7.3E+02**	N	**1.4E+03**	N	**9.0E+00**
p-Xylene														106-42-3	**3.7E+02**	sat	**3.7E+02**	sat	**3.7E+02**	sat					**1.0E+01**
Xylenes					2.0E-01	i			2.9E-02	i	1.0E-01	i	1.0E+04	1330-20-7	**2.1E+02**	sat	**2.1E+02**	sat	**2.1E+02**	sat	**1.0E+02**	N	**2.0E+02**	N	**1.0E+01**
Zinc					3.0E-01	i								7440-66-6	**2.3E+04**	N	**1.0E+05**	max	**1.0E+05**	max			**1.1E+04**	N	**6.2E+02**
Zinc phosphide					3.0E-04	i								1314-84-7	**2.3E+01**	N	**6.1E+02**	N	**3.4E+02**	N			**1.1E+01**	N	
Zineb					5.0E-02	i			5.0E-02	r				12122-67-7	**3.1E+03**	N	**1.0E+05**	max	**3.4E+04**	N	**1.8E+02**	N	**1.8E+03**	N	

APPENDIX B

FIELD ACTIVITY SUMMARY
FORMER MAYTAG FACILITY
RANSON, WEST VIRGINIA

FIELD ACTIVITY SUMMARY

FORMER MAYTAG FACILITY
RANSON, WEST VIRGINIA

Prepared for:

International Risk Group, LLC
(on behalf of WPM Properties, LLC)
12214 Lakewood Boulevard
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Prepared by:

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Project No. 54578-59077

October 31, 2007

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APPENDICES

1.0 INTRODUCTION

This report presents a summary of site background and activities and protocols used for site investigation activities that were performed at the former Whirlpool/Maytag facility in Ranson, West Virginia (Site). Work activities were performed by Camp Dresser & McKee Inc. (CDM) on behalf of WPM Properties, LLC (WPM) in accordance with the *Supplemental Site Investigation Scope of Work – Former Whirlpool/Maytag Facility Ranson, West Virginia* (Appendix A). This report specifically presents the observed field investigation and sampling activities and protocols that were implemented during the field activities. Project activities were focused on compliance with the data quality objectives (DQOs) prepared for the Site.

1.1 DOCUMENT OVERVIEW

This report is organized into the following sections:

- Section 1.0 provides an introduction, discusses the organization of this report, scope of work (SOW), and discusses the DQOs;
- Section 2.0 summarizes the Site location, history, generalized geology and hydrogeology, and identified environmental conditions;
- Section 3.0 describes field activities performed during this investigation along with limitations to data collection or evaluation and deviations/modifications to the SOW.

1.2 SCOPE OF WORK

The SOW for the supplemental Phase II investigation was outlined in the *Supplemental Site Investigation Scope of Work – Former Whirlpool/Maytag Facility Ranson, West Virginia* (Appendix A). The purpose of this investigation is to confirm the findings from previous Phase II investigations performed by others, as well as investigate areas with environmental conditions, which have not previously been evaluated. The general SOW for the supplemental Phase II investigation includes the following:

- Review previous environmental assessments and field activities at the facility in order to identify areas with outstanding environmental conditions (a summary of this activity is presented in the main body of the Supplemental Phase II Investigation Report);
- Advance investigative soil borings in areas identified as having environmental conditions based on CDM's review of previous environmental assessments and historical data. Utilize field screening techniques and collect soil samples to evaluate the presence of constituents of concern (COC) in the subsurface at each location;
- Install temporary groundwater monitoring wells at each boring location and collect grab groundwater samples to evaluate the presence of COC;

- Prepare tables summarizing the analytical data obtained during this investigation and evaluate the data as they relate to the environmental conditions identified previously (presented in the main body of the Supplemental Phase II Investigation Report);

- Prepare figures to display investigative boring locations and summarize analytical data (presented in the main body of the Supplemental Phase II Investigation Report); and

- Prepare a summary report that documents the findings of the investigation (presented in the main body of the Supplemental Phase II Investigation Report).

1.3 DATA QUALITY OBJECTIVES

The DQOs were established prior to conducting the field activities. A summary of the DQOs and a description of the DQO process are provided in the main body of the Supplemental Phase II Investigation Report.

2.0 SITE BACKGROUND INFORMATION

This section provides a brief description of the Site location, history, and the generalized Site hydrogeology. In addition, a summary of areas identified for additional investigation at the Site is presented.

2.1 SITE DESCRIPTION AND HISTORY

The property for this facility has been occupied by Dixie-Narco since 1957 and is currently leased to several different tenants. All manufacturing operations at the facility ceased in 1991. The Site includes the following features:

- Former Warehouse and office building (approximately 97,000 square feet and presently occupied by AB&C Group);

- Former Assembly building (approximately 56,700 square feet and formerly occupied by Kidde and presently vacant);

- Former Powder Finishing building (approximately 32,000 square feet and presently occupied by the City of Ranson);

- Former Tooling Area building (approximately 3,900 square feet and presently vacant);

- Foundation of former Paint Shop building; and

- Various asphalt and gravel parking areas, loading docks, and roadways.

The topography at the facility is generally flat, sloping slightly to the west and south. In general, the facility is bound by residential properties to the north and west and by commercial properties to the east. B&O Railroad tracks bound the south portion of the property followed by a church and the Boys and Girls Club of Ranson and residential properties.

2.2 SITE GEOLOGY AND HYDROGEOLOGY

The soil lithology at the Site typically consists of shallow (1 to 4 feet) layers of sand, clay, and gravel fill at the surface. Fill layers beneath structures at the Site are generally greater, ranging to as deep as 8 feet. The surface fill is underlain by native materials that have classifications ranging from clay to silt to sand, and combinations thereof (e.g. silty clay, clayey silt, sandy silt, silty sand, etc.). Bedrock was detected at depths ranging from 2 feet to as deep as 21 feet below ground surface (bgs). The major bedrock type observed at the Site is a carbonate-type rock, which includes dolomite and/or limestone.

Although some wet zones were observed within the fill and native materials above bedrock, groundwater or saturated conditions were not detected within this layer. Due to refusal of the GeoProbe at the shallow bedrock, details of bedrock groundwater and flow direction are not available. Previous investigations determined the presence of bedrock groundwater at PSB-23/TW-23, however, this well could not be located during the July 2007 investigation.

2.3 IDENTIFIED ENVIRONMENTAL CONDITIONS

The term environmental condition, as used in this report, refers to an area, incident, process, and/or observed condition which has caused or may have caused the Release of Hazardous Material into the environment. Environmental conditions which required additional investigation and COC were determined based on CDM's review of available data from previous environmental investigations at the facility. Chemicals historically used at the Site include heating oil, gasoline, acetone, and paint. The areas identified for further investigation at the Ranson facility include the former soil stockpile area and each of the former manufacturing buildings (powder finishing building, paint building, assembly building, and tooling building).

3.0 FIELD INVESTIGATION ACTIVITIES

The following field activities were conducted during this investigation:

- Oversight of utility location in the area of proposed borings;
- Advancement of exploratory soil borings using a GeoProbe drill rig;
- Collection of continuous-core soil samples;
- Field screening of soil core samples for COC;
- Collection of soil samples for laboratory analysis
- Installation of temporary groundwater monitoring wells, and;

The subsections that follow provide additional information regarding the field activities described above. Field investigation work was conducted in accordance with the *Supplemental Site Investigation Scope of Work – Former Whirlpool/Maytag Facility Ranson, West Virginia* (Appendix A), except where described in Section 3.5. Protocols utilized during this field investigation include soil boring, soil sampling, and temporary well installation, which are outlined in the Standard Operating Procedures (SOPs) provided in Appendix B.

3.1 SOIL BORINGS AND SAMPLING ACTIVITIES

Prior to investigation activities, the West Virginia One-Call service was contacted by CDM in accordance with West Virginia law regarding appropriate excavation notification to local utilities. CDM personnel marked the locations of planned soil borings prior to the utilities being identified and marked by local utility contractors. Any locations not covered by West Virginia One-Call service were discussed with the onsite representative.

Between July 25 and July 27, 2007, 22 soil borings were advanced by the drilling subcontractor under the supervision of CDM field representatives as indicated in the SOW. Borings were advanced using a GeoProbe direct-push drill rig equipped with a Macro-Core soil sampler. The Macro-Core sampler is equipped with an acetate liner which collects a continuous soil core through each five-foot interval. Lithologic logs of the 22 soil borings were created by the CDM field representative, and visual and olfactory observations of soil conditions related to potential impacts were recorded. Lithologic logs are provided in Appendix C. Observations of lithology and soil conditions are presented in Section 2.2.

Field screening of soil core samples was conducted using a photo-ionization detector (PID) and visual and olfactory indicators. Field screening using the PID was conducted in accordance with the SOP presented in Appendix B. More specifically, PID measurements were conducted by taking an instantaneous PID swipe along the entire five-foot core interval. In the event that a PID swipe reading exceeded background levels, a sample for the specified organic constituents (if applicable) was taken from the core at the discrete depth which recorded the highest PID

reading. In the event that a PID reading did not exceed background levels, the organic constituent sample was taken either at the bottom of the boring core or at the most saturated depth within the core. Since no saturated groundwater was detected at the Site, the majority of samples were collected at the bottom of the boring core. PID measurements are summarized on the lithologic log field sheet for each boring location. Table 3-1 illustrates the soil sampling location and analysis summary for soil borings, including the client ID, sample collection date, and method number and method description.

Immediately after collection, samples were placed in a cooler and maintained at approximately 4°C for transportation to the analytical laboratory. Chain-of-custody procedures and quality assurance/quality control (QA/QC) guidelines were adhered to during sampling activities, which includes the collection of one matrix spike/matrix spike duplicate (MS/MSD) and the collection of two field duplicates for each analyte (approximately 10 percent of the total samples). Soil samples and QA/QC samples were submitted to Severn Trent Laboratories for analysis by methods as outlined in the SOW.

3.2 TEMPORARY MONITORING WELL INSTALLATION ACTIVITIES

Following completion of the soil borings, temporary groundwater monitoring wells were installed in 4 of the 10 specified borings at the Site to allow for collection of groundwater samples. One additional monitoring well was installed in a boring not originally specified in the SOW. Temporary monitoring wells, installed using a GeoProbe direct-push drill rig, consisted of ¾-inch diameter factory-slotted, flush-joint threaded polyvinyl chloride well screen and riser placed into each boring. Screened intervals in the wells ranged approximately 5 to 10 feet bgs. Each of the 5 wells was installed immediately after a full core depth was recovered.

Each boring was abandoned by the drilling subcontractor after completion of field activities. Abandonment consisted of backfilling the borings with leftover soil boring waste and grout, followed by placing a concrete or asphalt seal at the ground surface. Other investigative derived waste (gloves and acetate soil core liners) were disposed of as municipal waste.

3.3 GROUNDWATER LEVEL MEASUREMENT ACTIVITIES

After installation, temporary groundwater monitoring wells were left undisturbed for a period of time (at least 8 hours) sufficient to allow the water level within the well to equilibrate with the surrounding aquifer. Groundwater was not detected within the temporary monitoring wells; therefore, no groundwater level measurements were conducted.

3.4 GROUNDWATER SAMPLING ACTIVITIES

Due the lack of available groundwater at the time of sampling (e.g. the wells were dry), groundwater samples were not collected.

3.5 LIMITATIONS AND DEVIATIONS FROM THE SCOPE OF WORK

Limitations related to data collection at the Site and deviations from the SOW due to unforeseen Site conditions are described as follows:

- PID measurements were not required in the SOW for borings RB-1, RB-2, and RB-7; however, measurements were collected by field personnel.

- Due to the lack of groundwater within borings and limitations of drilling depth due to the presence of shallow bedrock, only 4 out of 10 borings specified to have temporary monitoring wells were actually installed, including RB-12, RB-14, RB-17, and RB-22. A temporary monitoring well was also placed in boring RB-15, although this boring was not specified to have a well in the SOW. Monitoring well installation was determined in the field based on observations of moisture and a potential to sufficiently produce groundwater for sample collection.

- Subsequent to temporary well installation, groundwater was not observed, indicating that the borings did not advance into the water-bearing zone. As such, groundwater samples were not collected at any of the five temporary monitoring wells.

- Existing monitoring well PSB-23/TW-23 was not located during the Supplemental Phase II activities; therefore, no groundwater sample was collected. It is possible that this well location was abandoned, destroyed, or paved over following previous investigative activities.

- The major limitation for assessment of environmental conditions relates to the presence of shallow bedrock across the Site. Soil boring depths were limited to the depth at which bedrock was encountered. As a result, groundwater quality and flow direction could not be determined. This results in a limitation to the assessment of any potential COC in groundwater. The lack of saturated conditions above the bedrock also results in an incomplete understanding of the presence of COC within the aqueous phase.

Table 3-1 - Soil Sampling Location and Analysis Summary

Location	Sample Depth (feet)	Sample ID	Sample Date	Method Number/Description
RB1	4.0	RAN-RB1-040-072607	7/26/2007	Method 6010B/RCRA Total Metals
RB2	4.0	RAN-RB2-040-072607	7/26/2007	
RB3	2.8	RAN-RB3-028-072607	7/26/2007	Method 6010B/RCRA Total Metals, EPA Method 8270C/PAH
RB4	3.2	RAN-RB4-032-072607	7/26/2007	
RB5	15.0	RAN-RB5-150-072607	7/26/2007	
RB6	1.5	RAN-RB6-015-072507	7/25/2007	
RB7	14.8	RAN-RB7-148-072607	7/26/2007	Method 6010B/RCRA Total Metals
RB8	11.0	RAN-RB8-110-072707	7/27/2007	Method 6010B/RCRA Total Metals, EPA Method 8270C/PAH
RB9	17.0	RAN-RB9-170-072707	7/27/2007	
RB10	14.0	RAN-RB10-140-072707	7/27/2007	
RB10	14.0	RAN-RB10-140-072707A*	7/27/2007	
RB11	2.0	RAN-RB11-020-072607	7/26/2007	Method 6010B/RCRA Total Metals, EPA Method 8260B/VOA
RB12	14.0	RAN-RB12-140-072607	7/26/2007	
RB12	14.0	RAN-RB12-140-072607A*	7/26/2007	
RB13	4.2	RAN-RB13-042-072607	7/26/2007	
RB14	11.0	RAN-RB14-110-072507	7/25/2007	Method 6010B/RCRA Total Metals, EPA Method 8260B/VOA, EPA Method 8015B/DRO
RB15	5.8	RAN-RB15-058-072507	7/25/2007	
RB16	3.5	RAN-RB16-035-072507	7/25/2007	
RB17	6.5	RAN-RB17-065-072507	7/25/2007	
RB18	3.5	RAN-RB18-035-072507	7/25/2007	
RB19	7.5	RAN-RB19-075-072507	7/25/2007	
RB20	4.9	RAN-RB20-049-072507	7/25/2007	
RB21	2.5	RAN-RB21-025-072507	7/25/2007	Method 6010B/RCRA Total Metals, EPA Method 8260B/VOA
RB22	6.0	RAN-RB22-060-072507	7/25/2007	

Notes:

* - "A" Indicates that a duplicate sample for QA/QC purposes was collected for the specified analyte

VOA - Volatile organic analysis

PAH - Polycyclic aromatic hydrocarbons

DRO - Diesel range organics

RCRA - Resource Conservation and Recovery Act

APPENDIX A

SCOPE OF WORK

Supplemental Site Investigation Scope of Work – Former Whirlpool/Maytag Facility Ranson, West Virginia

Prepared for:
IRG Assumptions, LLC

Prepared by:
Camp Dresser & McKee, Inc.

July 3, 2007

Introduction

This work plan has been developed by Camp Dresser & McKee, Inc. (CDM) to supplement the CDM proposal and further define the site investigation activities to be performed at the former Whirlpool/Maytag Facility located in Ranson, West Virginia. The proposed work activities and scope of field efforts has been developed based on the findings of previous Phase I and Phase II investigations, review of environmental documentation available for the Ranson facility, and a site visit conducted June 19, 2007.

Site Background

The property for this facility has been occupied by Dixie-Narco since 1957 and is currently leased to several different tenants. All manufacturing operations at the facility ceased in 1991. The site includes the following:

- Former Warehouse and office building (approximately 97,000 square feet and presently occupied by AB&C Group),
- Former Assembly building (approximately 56,700 square feet and formerly occupied by Kidde and presently vacant),
- Former Powder Finishing building (approximately 32,000 square feet and presently occupied by the City of Ranson),
- Former Tooling Area building (approximately square feet and presently vacant),
- Foundation of former Paint Shop building, and
- Various asphalt and gravel parking areas, loading docks, and roadways.

It is CDM's understanding that the former hazardous waste storage building and non-hazardous waste storage building were not included in the property transaction and will not be evaluated as part of this investigation. A site map of Ranson facility is presented as Figure 1.

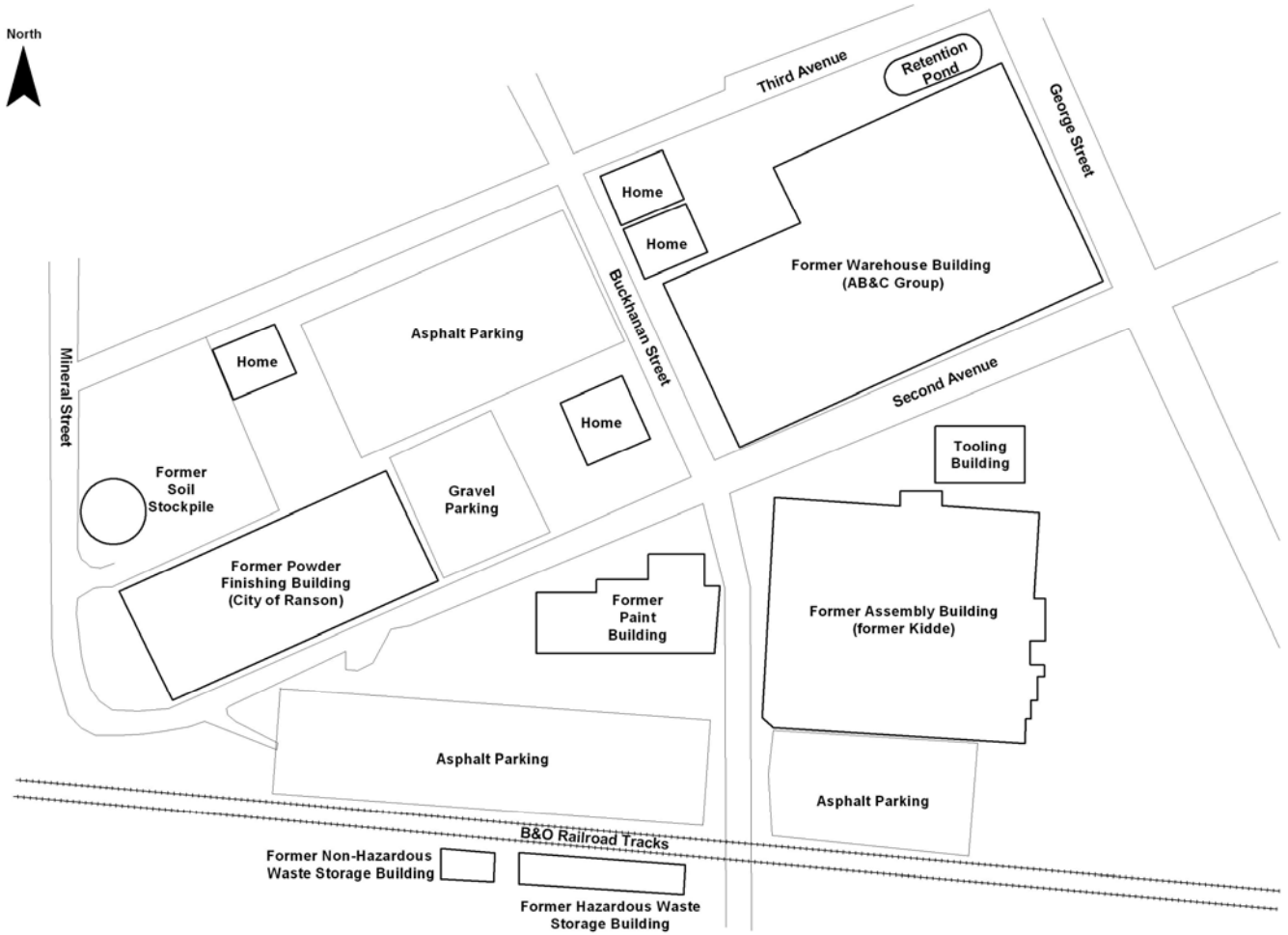
Based on historic data, several investigations of specific waste management areas including the old material storage area, hazardous waste storage building, outdoor storage area for non-hazardous waste, paint shop pretreatment pit, and tooling area building have been investigated. A "No Further Action" closure letter was only available for the hazardous waste storage building.

The topography at the facility is generally flat, generally sloping to the west and south. In general, the facility is bound by residential properties to the north and west and by commercial properties to the east. B&O Railroad tracks bound the south portion of the property followed by a church and the Boys and Girls Club of Ranson and residential properties.

The soil lithology at the site generally consists of 1- to 2-foot layers of sand, clay, and gravel fill underlain by clay. Shallow shale bedrock was encountered at depths ranging from approximately 4 feet below grade. In general, groundwater was not encountered in the clays overlying the shale bedrock.

Supplemental Phase II Investigation Program

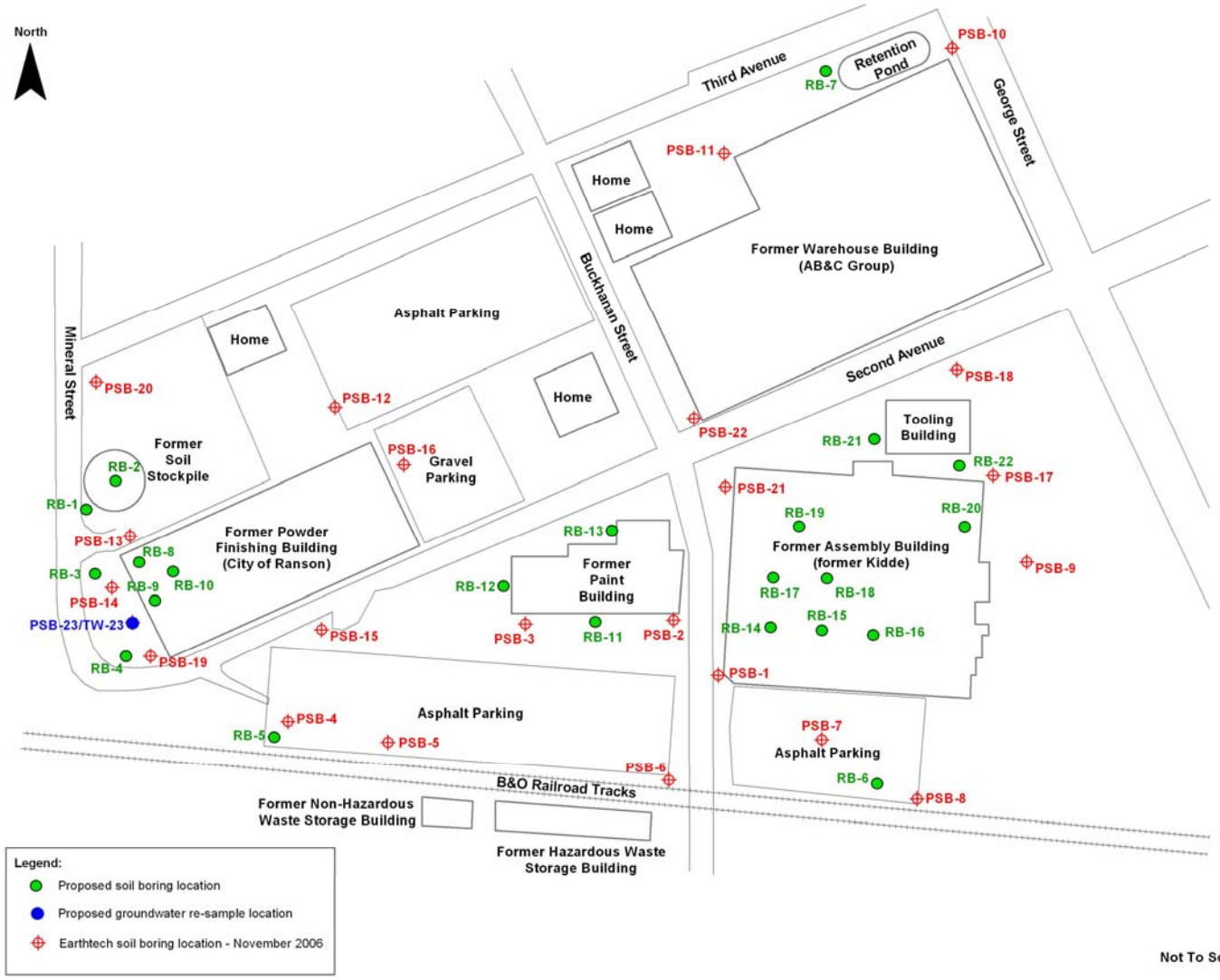
In an effort to further support the preliminary Conceptual Site Model and confirm the findings from the previous limited investigation activities, CDM will implement supplemental Phase II Investigation activities. Figure 2 illustrates the locations of 22 proposed investigative borings to be advanced during the supplemental Phase II activities. Figure 3 illustrates the locations of 10 temporary monitoring well locations. Photographs of the boring locations and direction the photographs were looking toward are presented on Figure 4. The proposed investigation sampling program is summarized on Table 1 and includes advancing 22 soil borings, collecting groundwater samples, if available, from ten of these borings, and collecting one low-flow groundwater sample from an existing monitoring well.



CDM

Figure 1
Site Layout Map
Former Dixie-Narco Facility
Ranson, West Virginia

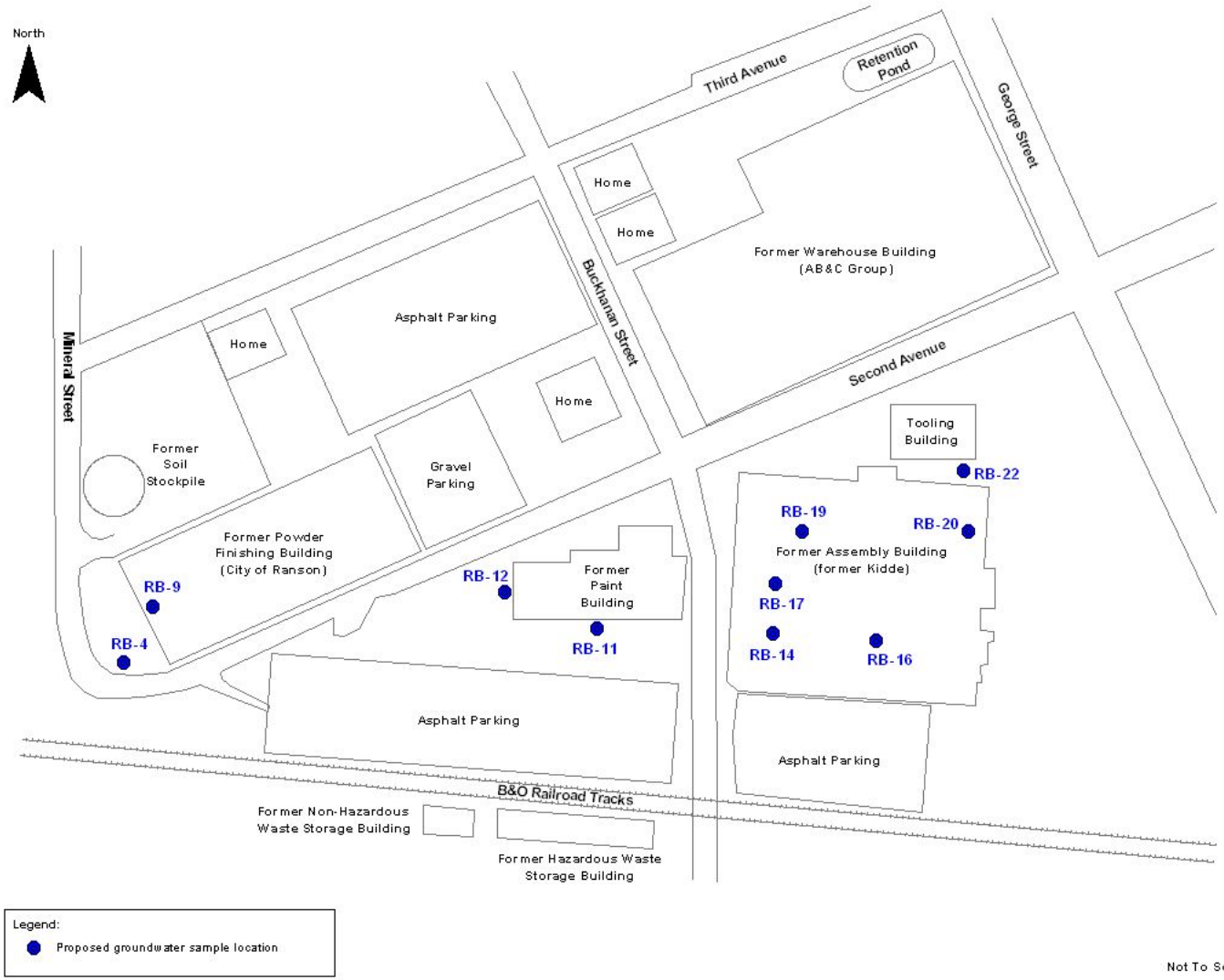
DRAWN: S. PHILLIPS	DATE: 7-3-07	PROJECT NUMBER: 54578-59077
APPV'D: C. MICKEL	REVISED: 7-3-07	



CDM

Figure 2
Boring Location Map
Former Dixie-Narco Facility
Ranson, West Virginia

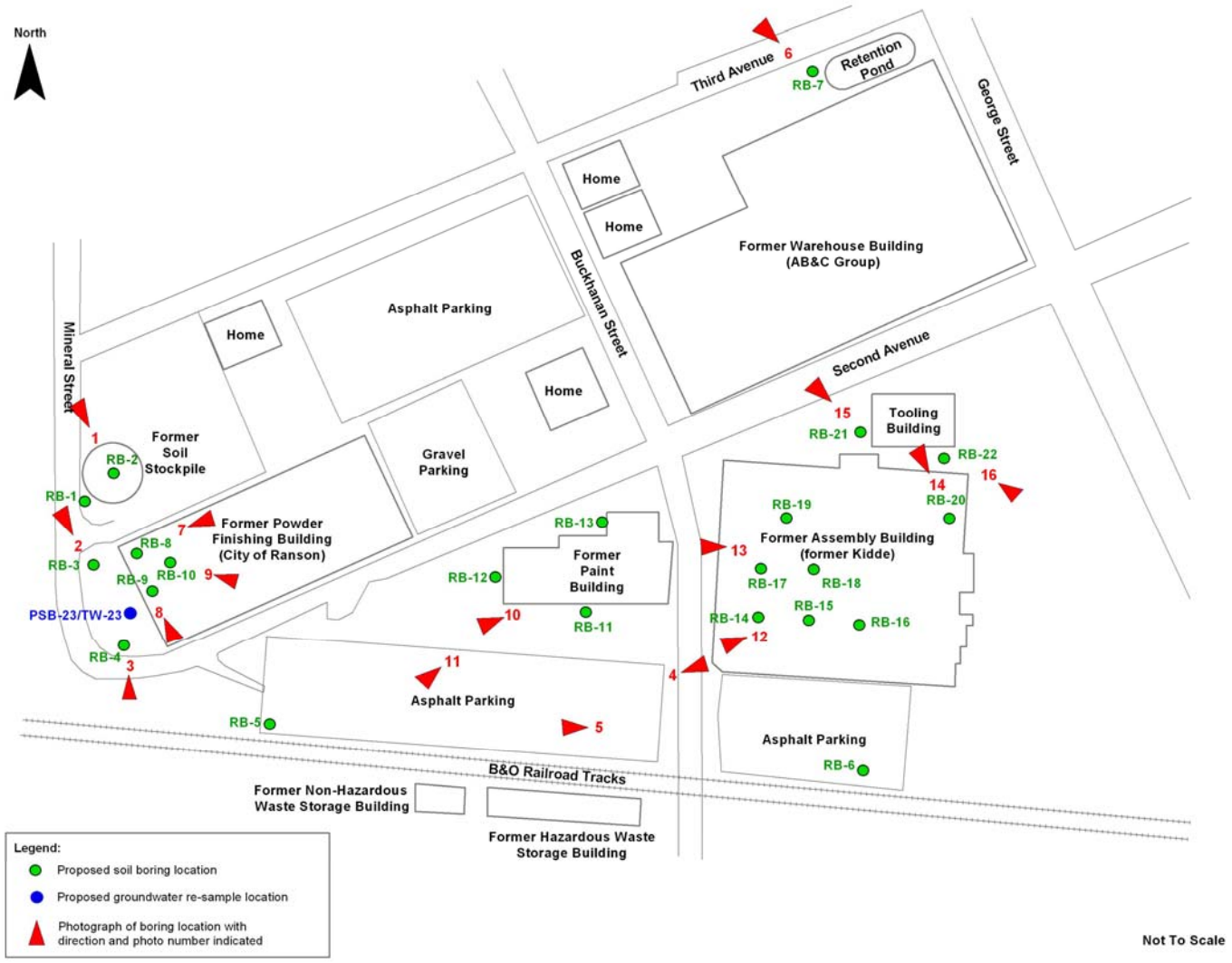
DRAWN: S. PHILLIPS	DATE: 7-3-07	PROJECT NUMBER:
APPV'D: C. MICKEL	REVISED: 7-3-07	54578-59077



CDM

Figure 3
Temporary Monitoring Well Location Map
Former Dixie-Narco Facility
Ranson, West Virginia

DRAWN: S. PHILLIPS	DATE: 7-3-07	PROJECT NUMBER:
APPV'D: C. MICKEL	REVISED: 7-3-07	54578-59077



CDM

Figure 4
Photograph Map
Former Dixie-Narco Facility
Ranson, West Virginia

DRAWN: S. PHILLIPS	DATE: 7-3-07	PROJECT NUMBER:
APPV'D: C. MICKEL	REVISED: 7-3-07	54578-59077

Photographic Record

Client: IRG	**Project Number:** 54578-59077
Project Name: Ranson Facility	**Site Location**: Ranson, West Virginia

Photograph: 1	
Photographer: Sean Phillips	
Date: June 19, 2007	
Comments:	View of location of former soil stockpile (area of boring RB-2) located near the northwest corner of the former Powder Finishing building, looking southeast

Photograph: 2	
Photographer: Sean Phillips	
Date: June 19, 2007	
Comments:	View of west side of the former Powder Finishing building (area of boring RB-3), looking south

Photographic Record

Client: IRG	**Project Number:** 54578-59077
Project Name: Ranson Facility	**Site Location**: Ranson, West Virginia

Photograph: 3

Photographer: Sean Phillips

Date: June 19, 2007

Comments: View of west side of the former Powder Finishing building (area of boring RB-4), looking north

Photograph: 4

Photographer: Sean Phillips

Date: June 19, 2007

Comments: View of location of parking area located south of former Paint Shop building (area of boring RB-5), looking west

Photographic Record

Client: IRG	**Project Number:** 54578-59077
Project Name: Ranson Facility	**Site Location**: Ranson, West Virginia

Photograph: 5	
Photographer: Sean Phillips	
Date: June 19, 2007	
Comments:	View of location of parking area located south of former Assembly Plant building (area of boring RB-6), looking east

Photograph: 6	
Photographer: Sean Phillips	
Date: June 19, 2007	
Comments:	View of location of retention pond located near the northeast corner of the former Warehouse building (area of boring RB-7), looking southeast

Photographic Record

Client: IRG	**Project Number:** 54578-59077
Project Name: Ranson Facility	**Site Location**: Ranson, West Virginia

Photograph: 7

Photographer: Sean Phillips

Date: June 19, 2007

Comments: View of location of floor drain locations within the former Powder Finishing building (area of borings RB-8 and RB-10), looking southwest

Photograph: 8

Photographer: Sean Phillips

Date: June 19, 2007

Comments: View of location of floor drain locations within the former Powder Finishing building (area of boring RB-9), looking northwest

Photographic Record

Client: IRG	**Project Number:** 54578-59077
Project Name: Ranson Facility	**Site Location**: Ranson, West Virginia

Photograph: 9

Photographer:
Sean Phillips

Date:
June 19, 2007

Comments: View of location of floor drain locations within the former Powder Finishing building (area of borings RB-8 and RB-10), looking northwest

Photograph: 10

Photographer:
Sean Phillips

Date:
June 19, 2007

Comments: View of location of former Paint Shop building (area of boring RB-11), looking northeast

Photographic Record

Client: IRG	**Project Number:** 54578-59077
Project Name: Ranson Facility	**Site Location**: Ranson, West Virginia

Photograph: 11	
Photographer: Sean Phillips	
Date: June 19, 2007	
Comments:	View of location of former Paint Shop building (area of borings RB-11 and RB-12), looking northeast

Photograph: 12	
Photographer: Sean Phillips	
Date: June 19, 2007	
Comments:	View of interior of former Assembly Plant building (area of borings RB-14, RB-15, and RB-16), looking northeast

Photographic Record

Client: IRG	**Project Number:** 54578-59077
Project Name: Ranson Facility	**Site Location**: Ranson, West Virginia

Photograph: 13

Photographer: Sean Phillips

Date: June 19, 2007

Comments: View of interior of former Assembly Plant building (area of borings RB-17 and RB-18), looking northeast

Photograph: 14

Photographer: Sean Phillips

Date: June 19, 2007

Comments: View of interior of former Assembly Plant building (area of boring RB-20), looking southeast

Photographic Record

Client: IRG	**Project Number:** 54578-59077
Project Name: Ranson Facility	**Site Location**: Ranson, West Virginia

Photograph: 15	
Photographer: Sean Phillips	
Date: June 19, 2007	
Comments:	View of location of former Tooling Area building (area of boring RB-21), looking southeast

Photograph: 16	
Photographer: Sean Phillips	
Date: June 19, 2007	
Comments:	View of location of former Tooling Area building (area of boring RB-22), looking northwest

Table 1
Investigation Sampling Program
Former Dixie-Narco Facility
Ranson, West Virginia

Boring ID	Operation That Caused Concern	Substance Suspected/Released	Soil Samples	GW Sample (temp well)	GW Sample (perm well)	Quantity of Samples	Temporary Completion	Permanent Completion
RB-1	Former Soil Stockpile	Metals	S2,L4	n/a	n/a	1 soil	No	No
RB-2	Former Soil Stockpile	Metals	S2,L4	L4	n/a	1 soil & 1 GW	Yes	No
RB-3	Metals and PAH Verification	Metals and PAHs	S1,S2,L1,L4	n/a	n/a	1 soil	No	No
RB-4	Metals and PAH Verification	Metals and PAHs	S1,S2,L1,L4	L1,L4	n/a	1 soil & 1 GW	Yes	No
RB-5	Metals and PAH Verification	Metals and PAHs	S1,S2,L1,L4	n/a	n/a	1 soil	No	No
RB-6	Metals and PAH Verification	Metals and PAHs	S1,S2,L1,L4	n/a	n/a	1 soil	No	No
RB-7	Retention Pond	Metals	S2,L4	n/a	n/a	1 soil	No	No
RB-8	Former Powder Finishing – Floor Drains	Metals and PAHs	S1,S2,L1,L4	n/a	n/a	1 soil	No	No
RB-9	Former Powder Finishing – Floor Drains	Metals and PAHs	S1,S2,L1,L4	L1,L4	n/a	1 soil & 1 GW	Yes	No
RB-10	Former Powder Finishing – Floor Drains	Metals and PAHs	S1,S2,L1,L4	n/a	n/a	1 soil	No	No
RB-11	Former Paint Building	BTEX, Solvents & Metals	S1,S2,L2,L3, L4	L2,L3, L4	n/a	1 soil & 1 GW	Yes	No
RB-12	Former Paint Building	BTEX, Solvents & Metals	S1,S2,L2,L3, L4	L2,L3, L4	n/a	1 soil & 1 GW	Yes	No
RB-13	Former Paint Building	BTEX, Solvents & Metals	S1,S2,L2,L3, L4	n/a	n/a	1 soil	No	No
RB-14	Former Assembly Building (presses and cutting)	Hydraulic oil, solvents, and metals	S1,S2,L2,L4,L10	L2,L4,L10	n/a	1 soil & 1 GW	Yes	No
RB-15	Former Assembly Building (presses and cutting)	Hydraulic oil, solvents, and metals	S1,S2,L2,L4,L10	n/a	n/a	1 soil	No	No

Table 1 (continued)
Investigation Sampling Program
Former Dixie-Narco Facility
Ranson, West Virginia

Boring ID	Operation That Caused Concern	Substance Suspected/Released	Soil Samples	GW Sample (temp well)	GW Sample (perm well)	Quantity of Samples	Temporary Completion	Permanent Completion
RB-16	Former Assembly Building (presses and cutting)	Hydraulic oil, solvents, and metals	S1,S2,L2,L4,L10	L2,L4,L10	n/a	1 soil & 1 GW	Yes	No
RB-17	Former Assembly Building (presses and cutting)	Hydraulic oil, solvents, and metals	S1,S2,L2,L4,L10	L2,L4,L10	n/a	1 soil & 1 GW	Yes	No
RB-18	Former Assembly Building (presses and cutting)	Hydraulic oil, solvents, and metals	S1,S2,L2,L4,L10	n/a	n/a	1 soil	No	No
RB-19	Former Assembly Building (presses and cutting)	Hydraulic oil, solvents, and metals	S1,S2,L2,L4,L10	n/a	n/a	1 soil	No	No
RB-20	Former Assembly Building (presses and cutting)	Hydraulic oil, solvents, and metals	S1,S2,L2,L4,L10	L2,L4,L10	n/a	1 soil & 1 GW	Yes	No
RB-21	Former Tooling Building	BTEX, Solvents & Metals	S1,S2,L2,L3, L4	n/a	n/a	1 soil	No	No
RB-22	Former Tooling Building	BTEX, Solvents & Metals	S1,S2,L2,L3, L4	L2,L3,L4	n/a	1 soil & 1 GW	Yes	No
Existing Wells								
PSB-23 /TW-23	Metals and PAH Verification	Metals and PAHs	n/a	n/a	L1, L4	1 GW	n/a	n/a

Notes:

S1 - PID or FID
S2 - Metals using XRF
S3 - VOCs using SDIX SDI Quick Check

L1 - PAH
L2 - TLC VOA 8260B
L3 - BTEX
L4 - RCRA Metals (total)
L5 - RCRA Metals (dissolved)
L6 - Arsenic
L7 - Chromate
L8 - Nickel
L9 - 1,4-Dioxane
L10 - Diesel Range organics (DRO/MRO)
L11 - PCBs (8082a)

APPENDIX B

STANDARD OPERATING PROCEDURES

STANDARD OPERATING PROCEEDURES (SOPs)

INTRODUCTION/PURPOSE

The purpose of these SOPs, prepared for the Former Whirlpool/Maytag Sites, is to establish easily reproducible protocols for use during sampling, data collection, and reporting. The SOPs may be reviewed prior to commencing field activities to insure that the data collected will be well documented, controlled for quality, and collected in an appropriate manner. The SOPs were created according to general standards of practice and with the use of United States Environmental Protection Agency (USEPA) guidelines and methods.

NUMBER	DESCRIPTION
1	UTILITY LOCATION
2	PREPARING TO DRILL
3	SOIL BORINGS
4	BORING LOGS
5	SOIL DESCRIPTIONS
6	SOIL SCREENING USING A PHOTO-IONIZATION DETECTOR (PID) OR FLAME-IONIZATION DETECTOR (FID)
7	BOREHOLE ABANDONMENT
8	SURVEYING BORING LOCATIONS
9	SUBSURFACE SOIL SAMPLING
10	NAPL LEVEL MEASUREMENTS
11	HANDLING SOIL SAMPLES
12	EQUIPMENT DECONTAMINATION
13	GROUNDWATER GRAB SAMPLING
14	GROUNDWATER SAMPLING

SOP 1: UTILITY LOCATION

Prior to beginning any sub-surface work, a thorough utility locate must be performed. Even when performing work above ground, the location of utility lines, pipes, and other structures should be noted and clearly marked. All steps taken to identify utilities should be carefully documented using field notebooks, Utility Locate logs, and photographs. A member of the field team should be present during all phases of the utility locate.

1. Identify the areas in which underground work will be taking place. Information which may be needed includes:
   - Site address and location;
   - Site Coordinates (township, range, section, or UTM location);
   - Property owner's name and address;
   - Name and address of the party performing the subsurface work;
   - The extent and magnitude of the work being performed;
   - Type of equipment being used; and
   - Date(s) of planned work.
2. Contact the site owner, operations manager, or engineer. Inform them that subsurface work will be taking place, and utilities will need to be located. Make arrangements to review any applicable site plans or construction drawings which may show the location of buried utilities.
3. Perform a site walk-through with the property owner or agent. A site engineer, operator, or contractor that has a working knowledge of the site may be able to assist in identifying areas which could contain utilities. Check and do the following:
   - Clearly mark the location of proposed subsurface work using marking paint, stakes, or flagging.
   - Identify pipes entering and leaving nearby buildings. Determine their origins and sub-surface route. Clearly mark the location and route of these utilities using marking paint, stakes, or flagging.
   - Check above and around the location for overhead lines, transformers, pipes, or sensitive equipment. If necessary, install protective fencing, barricades, signs, or flagging to mark these objects.
   - Take photographs of marking and record details of site visit in a field notebook and/or on a Utility Locate log.
4. Call the local "Call Before You Dig" number or equivalent for the area in which the work is being performed. Many public utility companies have hotlines which can be contacted. If possible request that an agent come out with maps or locating equipment to find underground lines. Typically this call must be placed a minimum of 72 to 48 hours prior to starting work. If public agencies do not have lines in the area, or cannot come out to locate lines, contact a private utility locate contractor. As described above, mark all lines using marking paint, stakes, or flagging, and document with photographs and written logs.
5. Be aware that utility locations are often approximate, and regardless of the method used line locations can be off by as much as three or four feet. For this reason **always hand auger or hand dig in areas where utilities are suspected before using equipment.**

****If in doubt, do not dig! Obtain the proper resources or information necessary before proceeding.****

SOP 2: PREPARING TO DRILL

The following should be implemented prior to initiating drilling at the site:

1. Notify the appropriate agencies (local, state, federal) of intent to drill, and apply for any necessary permits. The following information may be required:
   - Site address and location;
   - Site Coordinates (township, range, section, or UTM);
   - Property owner's name and address;
   - Name and address of party installing the well (usually client's);
   - Number and type of borings to be installed (including depth, completion, and abandonment details);
   - Reason for well installation; and
   - Date of planned installation.
2. Obtain access agreements if borings are to be installed on property not owned by the client. Permits will need to be obtained from appropriate government agencies to drill in utility and transportation right of ways.
3. Complete the utilities locate checklist according to SOP 1: UTILITY LOCATION prior to any subsurface work. Arrange to have a private utility locator come to the site if necessary. Insure that at least one member of the field team is present during location activities, and notes and photographs all marked underground and above ground utilities.
4. Develop and/or review the current Health and Safety Plan (HASP) for the site.
5. Schedule drilling company. The following information should be provided:
   - Type, diameter, and total length of auger required;
   - Equipment for well completion or borehole abandonment (bentonite, sand, grout, screen, casing, monuments, well caps, etc). Include number of wells, anticipated total depth, and anticipated screen interval;
   - Sampling requirements and equipment required (split spoons, liners, etc);
   - Decontamination requirements prior to arriving on site and between borings;
   - Provide a copy of the site HASP to the drilling company prior to beginning work; and
   - Request copies of Occupational Safety and Health Administration (OSHA) 40 hour certificates and Cardiopulmonary Resuscitation (CPR)/First Aid certificates for all drillers working on site.
6. Schedule a laboratory and request bottles based on site sampling program.
7. Purchase, rent, or otherwise obtain all other necessary field supplies, including but not limited to:
   - Items indicated on the Field Equipment and Supply Checklist
   - Hand auger and shovel;
   - Photo-ionization Detector (PID)/Flame-ionization Detector (FID) and calibration equipment;
   - Interface probe;
   - Groundwater quality instruments (temperature, conductivity, turbidity, pH, DO, ORP, etc.);
   - Soil boring logs and logging tools (mortar and pestle, knife, pocket penetrometer, color chart, Unified Soil Classification (USC) chart);
   - Ziplock® or similar bags;
   - Assorted Tools;
   - Decontamination equipment (5-gallon buckets, brushes, DI water, Alconox® soap, spray bottles, paper towel, wet wipes);
   - Level D health and safety equipment (fire extinguishers, first aid kit, eyewash, ear plugs, safety glasses, hard hats, steel toe boots);
   - Nitrile gloves;

- Permanent markers;
- Field notebooks;
- Sample bottles and coolers with ice; and
- Disposable bailers and twine.

SOP 3: SOIL BORINGS

Prior to initiating soil boring or drilling activities, pre-drilling activities should be completed per SOP 1: UTILITY LOCATION and SOP 2: PREPARING TO DRILL. All utilities should be clearly marked with paint or flags, and pictures should be taken of markings.

Drilling will be performed using equipment capable of collecting continuous soil samples (split spoon or core) from the ground surface to the bottom of hole. Typical equipment includes hollow stem auger, air or mud rotary, direct push, or percussion drill rigs.

During drilling, the boring will be continuously logged according to SOP 4: BORING LOGS by a qualified geologist or geotechnical engineer. Boring logs should contain all lithologic and geologic information provided by split spoon samples or soil cuttings, as well as any notes on odors, water table level, or drilling conditions encountered. (Drilling Form)

Continuous split spoon samples or soil cores will be collected from each boring per SOP 9: SUBSURFACE SOIL SAMPLING. A sample from each split spoon interval will be placed in a labeled Ziplock® bag and field screened for the presence of Volatile Organic Compounds (VOCs) using either a Photo-ionization Detector (PID) or Flame-ionization Detector (FID). Soil samples will be selected for laboratory analysis based on the results of the PID/FID test, noticeable odors, or staining observed within the sample per the project specific soil sample selection criterion.

Soil cuttings will be stockpiled in such a manner as to keep the site clean, safe, and free of contamination. Cuttings should be continuously screened for the presence of VOCs with a PID or FID, examined for staining or odors, and treated accordingly. Contaminated soils should be stockpiled on plastic sheeting or placed in drums to await proper treatment and/or disposal as outlined in the project-specific waste management protocols. In order to avoid future subsurface contamination, cuttings shall not be used to backfill the boring.

Upon completion of drilling, the borehole should either be abandoned according to SOP 7: BOREHOLE ABANDONMENT or completed as a monitoring point, as directed by Supervisor. Additionally, the boring location should be recorded and/or surveyed according to SOP 8: SURVEYING BORING LOCATIONS.

Boreholes should not be allowed to stand open overnight unless the borehole is of such depth that it cannot be reasonably completed in one work day, a low permeability layer is being evaluated for its potential to produce water, or if directed by Supervisor. Holes left open should be properly marked and protected to prevent contamination from entering or leaving the boring, as well as animals and persons from falling into the hole. Boreholes may remain open to accommodate scheduling issues, sample collection timeframes, pending laboratory results, etc. If required, approval must be granted from facility and the above-listed precautions must be followed.

SOP 4: BORING LOGS

Boring logs are to be completed for every hole drilled at the site, regardless of the boring's purpose. The boring logs should contain, at a minimum, the following information:

1. General Boring information, including:
    - Information requested on the Drilling form
    - Project name and number;
    - Client;
    - Boring name and number;
    - Northing and easting of boring;
    - Drilling/site location;
    - Name of person(s) logging borehole;
    - Date(s) of drilling;
    - Name of drilling company;
    - Make, model, and size of drilling equipment used;
    - Make, model, and condition of equipment used to drive split spoon or perform Standard Penetration Test (SPT);
    - Start and end times of boring;
    - Boring completion data;
    - Total depth of borehole; and
    - Depth to first encountered water.
2. Log should begin with description of surface soils and any material removed to facilitate drilling (asphalt, concrete, gravel, etc).
3. Every foot of boring should be logged or accounted for. Percent recovery should be noted for each split spoon driven, and intervals augured through but not sampled should be noted. Other information recorded, if applicable, should include pocket penetrometer values, blow counts for each 6 inch interval driven, type of sampler used, and the location of samples collected for laboratory analysis.
4. Rock and soils encountered should be logged according to SOP 5: SOIL DESCRIPTIONS. These logs should contain factual observations made in the field rather than opinions or general interpretations (i.e., low permeability, highly contaminated, etc.).
5. Borehole drilling and abandonment details are to be recorded in graphical and/or written form on the boring log and should include, but not be limited, to the following details:
    - Depth and location of bentonite seal;
    - Depth and location of grout seals; and
    - Details of surface completion.
6. The amount and type of borehole abandonment materials used for each boring should be recorded for use in comparing with the drillers logs and/or invoices.
7. The Drilling form should be followed during drilling activities to record the proper information. The Decision Matrix Flow Chart (DMFC) and/or Supervisor will guide the progress of drilling activities.

SOP 5: SOIL DESCRIPTIONS

All soil samples and/or cuttings collected should be logged on a standard boring log (refer to SOP 4: BORING LOGS) and contain as much of the following information as possible. All logging should be performed in accordance with the Unified Soil Classification System and, when possible, the information should be listed in the order given below:

1. Color (use geotechnical gauge or Munsell soil color chart and record current moisture state);
2. Soil type/group name (i.e., clay, silt, silty sand, etc.);
3. Appropriate USCS group symbol (i.e., CL, ML, SM, etc.);
4. Grain size range per USCS (i.e., fine, medium, coarse, etc.);
5. Grain shape (i.e., angular, sub angular, sub rounded, rounded, etc.) of sands and gravels;
6. Consistency (soft, hard, loose, etc.) and plasticity (low, medium, high) of clays and silts; and
7. Additional observations including but not limited to:
    - Organic material and other trace constituents;
    - Secondary mineralization;
    - Oxidation;
    - Contacts;
    - Moisture content (dry, slightly moist, moist, very moist, wet);
    - Odor, with only descriptors being no odor, slight odor, or strong odor; and
    - Staining.

In addition to the above items, the depth of each soil description should be noted along with the total depth of the hole and depth at which groundwater was encountered.

SOP 6: SOIL SCREENING USING A PHOTO-IONIZATION DETECTOR (PID) OR FLAME-IONIZATION DETECTOR (FID)

A Photo-ionization Detector (PID) or Flame-ionization Detector (FID) should be used to field screen soil samples for the presence of Volatile Organic Compounds (VOCs). FIDs typically have a greater measuring range than PIDs, but require more setup and maintenance. The following procedure will work equally well for screening soil samples removed from a borehole or split spoon sampler:

1. Place a small amount of soil into a Ziplock® or similar bag and seal tightly. Label the outside of the bag with the sample name, depth, time, and date. When taking samples from a split spoon which may be used to generate laboratory samples, minimize the time the spoon is opened to avoid the loss of VOCs.
2. Place the Ziplock® bag in a warm environment (in the sun, next to a heating vent, or in an oven), optimally at approximately 100 degrees Fahrenheit. Allow the sample to sit for 15 minutes.
3. Place the bag on a clean work surface (plastic sheeting, etc.) upwind of any exhaust or VOC sources.
4. Insure that the PID/FID has been properly calibrated prior to using. Follow the manufacturers instruction and record the calibration on a Calibration Log form.
5. Open a corner of the Ziplock® bag and insert the tip of the PID/FID probe. Allow the meter to equilibrate, and then record the maximum measured concentration on the boring log or appropriate recording form.
6. As necessary decontaminate the PID/FID probe tip in accordance with SOP 12: EQUIPMENT DECONTAMINATION.

SOP 7: BOREHOLE ABANDONMENT

Following the completion of a borehole, proper abandonment procedures must be followed to insure that a pathway is not left open for subsurface contamination. The following are general guidelines, and should be modified according to any local, state, or federal requirements which apply at the site:

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1. Soil cuttings **will not** be placed back into the borehole.
2. The borehole will be backfilled with bentonite, expanding cement or a mixture of the two. All cement and grout will be installed using the "tremmie pipe" method, in order to insure that seal is continuous from bottom to top. In order to avoid bridging, bentonite pellets should be poured very slowly when working within the water table (approximately 2 to 3 minutes to pour each 50 pound bag).
3. Any cement or bentonite on the surface should be mounded to divert surface runoff away from the abandoned boring.
4. A internal record of the boring abandonment must be made and a report should be prepared for the appropriate government agency, if required.

SOP 8: SURVEYING BORING LOCATIONS

The locations of sampling points may be recorded to different levels of accuracy depending on the intended use of the information gathered. Three levels of surveying accuracy are outlined below, and the appropriate method should be selected and used on a project by project basis.

1. **FIELD SKETCH AND MEASUREMENT** – This method may be used when the location of a sampling and/or boring location is needed without a great deal of accuracy. Enough information is provided to lead a person back to the sampling location, but it gives little information on the location's elevation or relative distance from known locations.
   - Draw a sketch in the field notebook showing the sampling location. Include any buildings, fences, roads, or vegetation which may be used as landmarks in identifying the sample location.
   - Measure the distance from the sample location to a minimum of two reference points. Ideally these points should be at right angles to one another. Include these distances and reference points in the sketch.

2. **HANDHELD GPS UNIT** – A handheld Global Positioning Satellite (GPS) unit can provide a fairly accurate estimate of a sampling or boring location (depending on the unit used to within +/- 3 feet), and some units can also provide an elevation. An advantage to the handheld GPS is that a measured point can be found again in the future without the use of any external reference points. The handheld unit can be used to lead a person back to the coordinates previously recorded for a site. Locations can be recorded in a number of formats (including degrees, minutes, and seconds as well as UTM), and according to a number of reference planes. The information can also be directly uploaded into commercially available GIS mapping software to plot the boring and sampling locations directly on a map. When using a handheld GPS unit the following considerations should be addressed:
   - Know how to properly use the handheld GPS unit. Although handheld GPS units all work on similar principals, their setup and reference planes may differ greatly.
   - Know which reference plane the instrument is set to and pass along this information with the data. Often problems can arise if the points are layered on a map based on a different reference plane.
   - Know the accuracy of the instrument being used. If the accuracy needed is outside it's range, make arrangements for a manual or surveying grade GPS survey to be performed.
   - Record any other settings which would need to be reproduced in order to locate the points in the future. Pass this information along with the data.
   - If possible, check the accuracy of the handheld GPS against a known point, so that inaccuracies may be accounted for.

3. **FORMAL SURVEY** – A formal survey using either a transit or survey grade GPS should be performed by a licensed surveyor to accurately identify sample and well elevations and locations. This information is necessary for determining groundwater elevations, contours, and seasonal fluctuations. The survey should measure both planar coordinates as well as ground elevations. The elevation of a notch in the north side of the casing in all wells should be measured to provide a reference point for measuring depth to groundwater. Surveys should be performed to the following tolerances:
   - Horizontal coordinates should be recorded to the nearest 0.1 foot.
   - Elevations of the ground surface and well casings should be recorded to the nearest 0.01 foot relative to the National Geodetic Datum (mean sea level).

SOP 9: SUBSURFACE SOIL SAMPLING

As outlined in SOP 4: BORING LOGS, continuous split spoon samples will be collected in each soil boring. Field screening will be performed on all split spoon samples using visual, olfactory, and Photo-ionization Detector (PID) or Flame-ionization Detector (FID) screening. Soil samples submitted for laboratory analysis will be based on the project specific soil sample selection criterion. The following procedures are to be followed when collecting sub-surface soil samples for laboratory analysis:

1. Assure that all required information is included on the boring log, and continuously record and log the soils recovered.
2. All sampling equipment, including split spoons and drilling equipment, should be handled with clean, disposable Nitrile gloves. All other appropriate Personal Protective Equipment should also be worn.
3. Upon recovering sampler from borehole, open and initiate field screening. In order to avoid volatilization of volatile organic compounds (VOCs), the sampler should be kept open for as little time as possible, and laboratory samples should be collected as soon after opening as possible.
4. Based on the results of field screening and the project specific soil sample selection criterion, determine if a laboratory sample should be collected, and if so determine which size and type of sample jars are needed. Only new, laboratory certified clean sample jars should be used for collecting soil samples.
5. Fill jars as required by laboratory protocol. As a general rule, headspace should be minimized to reduce volatilization of VOCs.
6. Label jars with a waterproof marker (Sharpie® or similar) and include the project name and number, borehole identification and number, depth interval, date and time of sample collection, analysis to be performed, any preservatives used, and the initials of the person(s) collecting the sample.
7. Record the sampling interval on the boring log.
8. Submit the samples to the laboratory according to all laboratory specified protocols, standard Chain of Custody protocols, and according to SOP 11: HANDLING SOIL SAMPLES.
9. Record the lithology of the remaining soil sample on the boring log.
10. Decontaminate the sampling equipment per SOP 12: EQUIPMENT DECONTAMINATION.
11. Dispose of waste according to project-specific waste disposal protocols.

SOP 10: NAPL LEVEL MEASUREMENTS

Groundwater measurements should always be recorded on the boring logs where it is encountered, along with this any NAPL found in the borings should be noted on the log. Groundwater and NAPL measurement should follow the steps listed below:

1. Record the depth to groundwater on the appropriate form. Note the presence of Light Non-aqueous Phase Liquid (LNAPL) near where groundwater is encountered.
2. If LNAPL is present, record the depth to the top and bottom of the layer.
3. Continue logging, DNAPL is present, record the depth to the top and bottom of the layer.

If large amounts of groundwater are present in the borehole during drilling, the use of an Interface Probe (IP) may be required to determine the presence and subsequent depths of any NAPL. Groundwater and NAPL measurements should then follow the steps listed below:

1. Turn on the interface probe and confirm that it is working by briefly depressing the test button
2. Wearing a clean pair of disposable Nitrile gloves, lower the probe into the borehole, being careful to avoid touching the probe and tape to the side walls or other possibly contaminated surfaces.
3. Measure and record the depth to groundwater on the appropriate form. Check for the presence of Light Non-aqueous Phase Liquid (LNAPL) on the water's surface.
4. Continue lowering the probe to the bottom of the well. Allow the probe to reach the bottom, and then lift up on the tape until the weight of the probe is just felt on the tape. Record the total depth of the well. While the probe is at the bottom of the well, check for the presence of Dense Non-aqueous Phase Liquid (DNAPL).
5. If DNAPL is detected in the bottom of the well, record the top and bottom elevations of the layer.
6. After removing the interface probe, thoroughly decontaminate it according to the procedures outlined in SOP 12: EQUIPMENT DECONTAMINATION. Note that bags and cases provided with interface probes can often become contaminated, and also need to be cleaned and decontaminated periodically.
7. Interface probes should be periodically cleaned and calibrated to insure that the tape is measuring the correct length and that it is properly calibrated for NAPL detection.

SOP 11: HANDLING SOIL AND WATER SAMPLES

In order to insure that water and soil samples remain intact and free from contamination during shipping and transport, the following protocols should be followed:

1. All coolers used to store and transport water and soil samples should be cleaned prior to use. At a minimum, the coolers should be wiped out with a clean cloth moistened with de-ionized water.
2. Any drain plugs or holes in coolers used to transport samples should be taped securely closed.
3. Coolers beings shipped to a laboratory or client should be lined with a clean trash bag to prevent any ice-melt water from leaking out of the cooler. The bag should be sealed with a tight knot.
4. All sampling containers should be tightly closed and properly labeled. Jars or bottles should have screw top lids securely in place, and any samples contained in Ziplock® bags should be double bagged to prevent leakage. Any containers placed in a cooler should appear on a Chain of Custody (COC) form which will travel with the cooler at all times.
5. Glass sample jars and bottles should be well protected to prevent breakage during transport. Place jars and bottles in bubble-wrap bags or wrap with foam or plastic mesh. Volatile Organic Analysis (VOA) vials should either be placed in foam blocks or bubble-wrap bags.
6. All water and soil samples will be placed in coolers with sufficient ice to insure that they remain at a temperature of approximately 4 degrees Celsius throughout the duration of transport.
7. Pack sample coolers in such a way that the movement of bottles and jars is minimized during transport. Fill any voids with additional ice and packing materials (bubble-wrap, foam, etc.). Be aware of the cooler's weight and avoid overfilling. In order to prevent lifting injuries, weight should be kept to less than approximately 50 pounds per cooler.
8. VOA vials should be placed in an inverted position, per United States Environmental Protection Agency (USEPA) guidelines.
9. Prior to shipping a cooler, place the signed COC form in a Ziplock® or similar bag. Write the airbill number and shipping company name in the "Received By" section of the COC form. Place the Ziplock® bag inside the cooler, but outside the trash bag liner.
10. Tape the cooler securely closed using clear packaging tape or equivalent. Place a signed COC seal on the outside of the cooler after it is taped closed. Any shipping labels should be securely attached with adhesive or hang tags.
11. All coolers, sample bottles, and jars, whether empty or full, should remain in the custody of the sampling team at all times. The coolers should be hand delivered by the sampling team to either a laboratory or shipping company (Fed-Ex™ or UPS™).

SOP 12: EQUIPMENT DECONTAMINATION

Any equipment that is not intended for disposal and comes in contact with contaminated material must be thoroughly decontaminated prior to and after each use. Decontamination procedures are listed below for different types of equipment and contamination:

KNOWN OR SUSPECTED NAPL CONTAMINATION:

Regardless of type, equipment that is thought or known to have been in contact with a Non-aqueous Phase Liquid (NAPL) must be decontaminated according to the following procedures:

1. Rinse the equipment thoroughly with de-ionized water to remove any loose debris or chemicals. The equipment may need to be disassembled, if possible, to be properly cleaned.
2. Evenly spray the equipment with laboratory-grade hexane, observing all applicable health and safety procedures (see hexane MSDS sheets).
3. Evenly spray the equipment with laboratory-grade methanol, observing all applicable health and safety procedures (see methanol MSDS sheets).
4. Thoroughly wash the equipment with a 1:100 mixture (2½ tablespoons per gallon) of Alconox® or similar and de-ionized water. The equipment may need to be disassembled and scrubbed to be properly cleaned.
5. Triple rinse the equipment with fresh de-ionized water.

NON-NAPL CONTAMINATED EQUIPMENT:

Equipment that shows no visible signs and is not thought to have come into contact with NAPL should be decontaminated according to the following procedures:

1. Thoroughly wash the equipment with a 1:100 mixture (2½ tablespoons per gallon) of Alconox® or similar and de-ionized water. The equipment may need to be disassembled and scrubbed to be properly cleaned.
2. Triple rinse the equipment with fresh de-ionized water.

DRILLING EQUIPMENT:

Any drilling or subsurface investigation equipment should be decontaminated prior to and after each use. Decontamination procedures should be explained to subcontractors in advance so necessary arrangements can be made. The following steps should be taken to insure drilling equipment is properly decontaminated:

1. To insure that no outside contamination is introduced at the site, drill rigs should arrive in clean, working order. The equipment should be inspected for loose dirt, gas, oil, or hydraulic leaks, and proper safety equipment. Be sure to inspect augers, split spoons, and drill rods.
2. No petroleum based lubricants should be used on parts of the drill rig which come into contact with sampling or drilling equipment.
3. Between uses, split spoons should be thoroughly decontaminated according to the procedures outlined above.
4. Any drilling equipment which becomes contaminated (augers, drill rod, etc.) should be thoroughly cleaned between each hole. This will be accomplished by either steam cleaning or using a high pressure hot water/detergent wash. The method to be used should be based on expected contamination and outlined in the project-specific field plan. Wash water should be disposed of according to the project-specific waste management plan.

DECONTAMINATION VERIFICATION:

In order to verify that decontamination is being performed properly, periodic equipment blanks should be generated and tested. Equipment blanks are typically made by running fresh de-ionized water over or through the equipment and collecting it in sample jars. When equipment blanks are required, a project-specific program should be developed and approved.

SOP 13: GROUNDWATER GRAB SAMPLING

The purpose of this standard operating procedure (SOP) is to provide specific guidance for the procedures to be followed for collecting grab groundwater samples from borings that have not been completed as groundwater monitoring points or piezometers. Guidance for collecting groundwater samples from completed monitoring points and piezometers is presented in SOP # 14.

PROCEDURES

:

1. The monitoring point or piezometer should be identified, and its designation recorded on a Groundwater Sampling field data sheet.

2. Depth to liquid (groundwater and/or light or dense non-aqueous phase liquid [LNAPL or DNAPL]) and total well depth (TD), as appropriate, should be measured and recorded according to the procedures described in SOP # 12.

3. If measurable LNAPL or DNAPL is observed in a well, a groundwater sample will not be collected. Instead, the project manager will be notified, and a free product sample will be collected, if appropriate, according to the procedures described in SOP #19.

4. Water quality field parameters consisting of, at a minimum, temperature, pH, and specific electrical conductance will be recorded prior to collection of samples.

5. If a monitoring point is purged dry prior to meeting the purging criteria described above, it will be marked as 'Dry' and sampled at the end of the day.

6. New nitrile gloves are to be worn during each purging step, and changed between each monitoring point to prevent introduction of external contaminants into the groundwater or groundwater sample, and prevent cross-contamination between monitoring points.

7. Purging and development water will be contained, handled, and transported according to the procedures described in project-specific waste management protocols.

8. Disposable items, such as bailers, rope, cleaning rags, and gloves, will be contained within industrial-grade garbage bags and disposed of in on-site bulk trash containers, unless soiled with free-phase contaminants. Such soiled items will be double contained and disposed of as hazardous waste.

GROUNDWATER SAMPLE COLLECTION

Groundwater samples will be collected using the disposable, polyethylene, bottom filling bailers or low-flow sampling equipment utilized during well purging, unless directed otherwise by the project manager.

1. The following procedures are to be followed for collection of grab samples:

    a. The bailer will be gently lowered into the monitoring point in a manner that minimizes disturbances to the water table, and filled completely.
    b. The bailer will then be carefully removed from the monitoring point and the water will be gently poured from the bailer into the sample containers, to minimize the

volatilization of volatile organic compounds (VOCs). Sampled containers should be filled in the following order:

i. VOC analysis
ii. Semi-VOC analysis
iii. Metals analysis
iv. Phenol analysis
v. Inorganic (cation/anion) water quality analysis

b. Samples collected for total metals analysis will not be filtered in the field.
c. An attempt will be made to fill all sample containers from the same bailer volume, if sufficient groundwater volume is available.
d. Duplicate and split-samples will be collected directly from the same bailer, with each sample receiving equal amounts of groundwater, to ensure sample uniformity.
    i. If a bailer will not hold the volume of water necessary to fill all sample containers, each container will receive an equal amount from each full bailer.
    ii. During the filling of such containers, partially filled sample bottles should be capped and kept out of sunlight, as delays in obtaining adequate sample volume could degrade the quality and representativeness of the samples.
e. Subsequent to collection, samples will be prepared and preserved in accordance with recommended United States Environmental Protection Agency (USEPA) SW-846 procedures and the site-specific scope of work.

2. The oil/water interface probe (IP), water-level indicator (WLI), and stainless steel bailer (if utilized) should be decontaminated with distilled water and Alconox® or equivalent solution as described in SOP 12: EQUIPMENT DECONTAMINATION.

3. Groundwater samples are to be handled and transported in accordance with the procedures described in SOP 11: HANDLING SOIL AND WATER SAMPLES.

SOP 14: GROUNDWATER SAMPLING

The purpose of this standard operating procedure (SOP) is to provide specific guidance for the procedures to be followed for collecting groundwater samples from groundwater monitoring points or piezometers. Guidance for collecting grab groundwater samples from borings is presented in SOP # 13.

CALCULATIONS

1. *Water Column Calculation:* Water Column Height = TD – WL

   (TD = Total Well Depth,
   WL = Measured Water Level)

2. *Casing Volume Calculations*: 2-inch well……. 0.16 gallons/linear foot
   4-inch well……. 0.65 gallons/linear foot

PROCEDURES

The following protocol has been developed to obtain groundwater samples from completed and developed groundwater monitoring points or piezometers, and to provide representative groundwater chemical quality information.

I. Well Purging

2. The monitoring point or piezometer should be identified, and its designation recorded on a Groundwater Sampling field data sheet.

3. The monitoring point should be unlocked, if it has a locking mechanism.

4. The well cap or J-plug is to be removed and placed cap-down to avoid contamination.

5. Depth to liquid (groundwater and/or light or dense non-aqueous phase liquid [LNAPL or DNAPL]) and total well depth (TD), as appropriate, should be measured and recorded according to the procedures described in SOP 10: NAPL LEVEL MEASUREMENTS.

6. If measurable LNAPL or DNAPL is observed in a well, a groundwater sample will not be collected. Instead, the project manager will be notified, and a free product sample will be collected, if appropriate, according to the procedures described in SOP #19.

7. The volume of groundwater in the well casing should be computed based on the equations presented in Section 4.0.

8. Three to five well casing volumes of groundwater will be removed from the monitoring point or piezometer using either a bailer, centrifugal pump, peristaltic pump, or a submersible pump, depending on the depth to water and project specific requirements. In cases where a low-flow bladder pump is utilized, purging quantity will be based on time of purging and water quality parameter stabilization, not volume of groundwater removed.

   a. If using a bailer, either a decontaminated stainless steel or new, disposable polyethylene or poly-vinyl chloride (PVC) bailer should be used. Bailers, string/rope, and all related down hole equipment and supplies will not be allowed to touch contaminated or

potentially contaminated surfaces at any time. Bailers should be gently lowered into the water column to minimize aeration of the water within the well casing.

b. If a pump is used, dedicated or new tubing is to be used for each well. If a generator is needed, it should be placed downwind of the well, in order to prevent possible exhaust gas contamination. Submersible pumps (i.e., Grundfos® RediFlow pumps or low-flow bladder pumps) will be cleaned both inside and out with an Alconox® or equivalent low-phosphate environmental detergent solution, potable water, and then distilled water, before placement in each well and between each well. If applicable, submersible pumps should be running prior to introduction into the subject well to prevent introduction of the remnants of the final distilled water rinse into the well.

c. The intake of the pump should be positioned in the middle of the well screens to ensure that fresh formation water is removed by the pump. If a decrease in the well's water level is detected as a result of pumping, the pumping rate should be decreased. In no case should the pump be placed lower than ten feet below the static water level measured in the well. The pump extraction rate should be kept at a minimum (large enough to overcome hydraulic head) in order to limit groundwater drawdown in the well.

9. If the well has been purged or developed recently, the water level (i.e., the volume of water in the casing) may not have yet recovered or returned to its static condition. This does not require a change in the purging procedures described herein. Although the actual column of water in the casing under such conditions is less than normally encountered, the removal of three to five times this volume is normally sufficient to provide samples for analysis that are representative of water from the surrounding formation.

10. Water quality field parameters consisting of, at a minimum, temperature, pH, and specific electrical conductance will be recorded subsequent to the purging of each volume of groundwater from the well, or at approximately five-minute intervals in the case of low-flow pumping.

11. Stable readings of the final two (i.e., 2nd and 3rd well casing volume when bailing, or 2nd and 3rd five-minute purging interval, when using low-flow sampling equipment) consecutive water quality parameter measurements will be obtained for each parameter prior to sample collection. Parameter measurements will be considered stable when pH, electrical conductivity, and temperature readings have stabilized to within +/- 0.2 standard units, 10 percent, and 2.0 degrees Fahrenheit, respectively. If each parameter has not yet met the stabilization criteria subsequent to the removal of the 3rd well casing volume or five-minute pumping period, a 4th volume will be removed. Up to a maximum of 5 well casing volumes, or five-minute pumping intervals, will be removed from the monitoring point, if necessary. Subsequent to the removal of the 5th volume, samples will be collected as described in Section II.

12. If a monitoring point is purged dry prior to meeting the purging criteria described above, it will be marked as ‘Dry’ and sampled at the end of the day, as described in Section II.

13. New nitrile gloves are to be worn during each purging step, and changed between each monitoring point to prevent introduction of external contaminants into the groundwater or groundwater sample, and prevent cross-contamination between monitoring points.

14. Purging and development water will be contained, handled, and transported according to the procedures described in project-specific waste management protocols.

15. Disposable items, such as bailers, rope, cleaning rags, and gloves, will be contained within industrial-grade garbage bags and disposed of in on-site bulk trash containers, unless soiled with free-phase contaminants. Such soiled items will be double contained and disposed of as hazardous waste.

GROUNDWATER SAMPLE COLLECTION

Groundwater samples will be collected using the disposable, polyethylene, bottom filling bailers or low-flow sampling equipment utilized during well purging, unless directed otherwise by the project manager.

1. Subsequent to purging, the groundwater level of the monitoring point will be measured and compared to the pre-purging groundwater level. Samples will be collected only if the post-purging water column is at least 80 percent of the original water column.

2. In low yielding monitoring points that recover to less than 80 percent of their static level within 15 minutes subsequent to purging, the post-purging water level will be recorded, and the monitoring point will be sampled at the end of the day. If there is not enough water to collect a full set of samples, the monitoring point will be considered dry, and sampling efforts for the monitoring point will be ended. The monitoring point will be labeled as "Dry" on the Groundwater Sampling field data sheet.

3. If the water column in the monitoring point has recovered to at least 80 percent of the pre-purging height, or the monitoring point is being sampled at the end of the day, the following procedures are to be followed:

    a. The bailer will be gently lowered into the monitoring point in a manner that minimizes disturbances to the water table, and filled completely.
    b. The bailer will then be carefully removed from the monitoring point and the water will be gently poured from the bailer into the sample containers, to minimize the volatilization of volatile organic compounds (VOCs). Sampled containers should be filled in the following order:
        i. VOC analysis
        ii. Semi-VOC analysis
        iii. Metals analysis
        iv. Phenol analysis
        v. Inorganic (cation/anion) water quality analysis

    c. Samples collected for total metals analysis will not be filtered in the field.
    d. An attempt will be made to fill all sample containers from the same bailer volume, if sufficient groundwater volume is available.
    e. Duplicate and split-samples will be collected directly from the same bailer, with each sample receiving equal amounts of groundwater, to ensure sample uniformity.
        vi. If a bailer will not hold the volume of water necessary to fill all sample containers, each container will receive an equal amount from each full bailer.
        vii. During the filling of such containers, partially filled sample bottles should be capped and kept out of sunlight, as delays in obtaining adequate sample volume could degrade the quality and representativeness of the samples.
    f. Subsequent to collection, samples will be prepared and preserved in accordance with recommended United States Environmental Protection Agency (USEPA) SW-846 procedures and the site-specific Sampling and Analysis Plan (SAP).

4. Upon completion of sampling, the well cap or J-plug will be securely put in place, the well will be locked, and the sampling materials removed from around the well.

5. The oil/water interface probe (IP), water-level indicator (WLI), and stainless steel bailer (if utilized) should be decontaminated with distilled water and Alconox® or equivalent solution as described in SOP 12: EQUIPMENT DECONTAMINATION.

6. Groundwater samples are to be handled and transported in accordance with the procedures described in SOP 11: HANDLING SOIL AND WATER SAMPLES.

APPENDIX C

LITHOLOGIC LOGS

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-1 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB1-040-072607
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.4 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
Run 1		Sandy SILT w/clay lt. brown, loose, dry ↓ Refusal @ 4' →	1100		2.8'	0.4 ↓		NA		
			1105	040		0.5			Metals	TD = 4-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 009

Thin veneer of soil (fill?) over bedrock
NW corner of Build #76

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-2 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB2-040-072607
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.4 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
Run 1		Fill/sandy GRAVEL, lt. brown, dry	1045		3.1'	0.4		NA		
						0.5				
						0.6				
		(blk. Zone 3 to 3.2')				0.5				
		Refusal @ 4' →	1055	040					Metals	
										TD = 4-ft
see comment below										

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 002

Soil Pile Area - Native soil @ 3.2' silty CLAY (CL) reddish/yellow, slt. Moist.

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-3 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB3-028-072607
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.4 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
Run 1		silty GRAVEL, some clay lt. brown to red, dry (fill?) Refusal @ 2.8' → on bedrock (dolomite)	1108 1120	 028	1.5' ↓	0.5 ↓		NA	 PAH, Metals	 TD = 2.8-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: Photo 010
West side of building #76 (Fill over bedrock)

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-4 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB4-032-072607
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.5 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
Run 1		Sandy SILT w/gravel, (fill - ?), dry	1130		1.9'	0.5 0.6 0.5		NA		
		Refusal @ 3.2' → Dolomite in cutting shoe	1140	032		0.5			PAH Metals	TD = 3.2-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 011
SW side of Build. #76. Note: 55-gal drum left on site from previous investigation (?) no markings.

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-5 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB5-150-072607
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.5 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		2" Asphalt w/~12" of compacted gravel	1200		2.1'	0.5		NA		
Run 1		Sand and Gravel Fill to ~11'								
	5				1.8'	0.6 0.5				
Run 2										
					3.4'	0.4				
		Native (?)								
Run 3		Silty CLAY (tr. Gravel) (CL) to (SM), reddish/ yellow (terra rosa), dry to slt. Moist								
	15	Refusal @ 15" →	1220	150		0.5			PAH, Metals	TD = 15-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 007
SW corner of South Parking Lot - 3 offsets due to concrete slab under (see property map).

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-6 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB6-015-072507
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.3 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		Thin soil veneer over bedrock	1440		1.9"	0.3		NA		
Run 1		Refusal @ 2.1' →	1450	015					PAH, Metals	TD = 2.1-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 002

SE corner of South Parking Lot. First attempt @ RB-6 hit refusal @ 1.5'. Carbonate outcrops seen in railroad cut 25' to the south. Attempted 3 different offsets ranging from 1.5 to 2.1 feet TD.

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1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-7 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB7-148-072607
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.3 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment
	Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	Details
Run	1	4.9	2" Asphalt over slag fill material consists of gravelly SAND w/silt, lt. brown to dark brown @ 4.3', dry	1000		3.8'	0.3				
Run	2		Silty CLAY (CL), reddish brown to red/ yellow (terra rosa) w/minor cherty gravel dry			5'	0.4 0.3				
			Moist to wet @ 11'			3.9'	0.3				
Run	3		Minor vertical fracture				0.5				
			Refusal @ 14.8' →	1020	148		0.4		0.3	Metals	MS/MSD
											TD = 14.8-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 012

* West side of North Retention Basin
Extra Volume collected for MS/MSD

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-8 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB8-110-072707
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG @ 0.1 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		6" concrete w/rebar	0815		1.8'	0.1		NA		
Run	1	Fill - sand and gravel compacted, dry to 4.2'								
		Clayey SILT (SM)			3.2'	0.0				
5		yellow/brown to red/brown, dry				0.1				
Run	2	Weathered Rock Texture @ 7.5 to 8.0 feet								
					0.9'				PAH,	
	3	Refusal @ 11' → Limestone/Dolomite rock in cutting tool	0840	110		0.2			Metals	TD = 11-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES:

In Metals Building #76

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-9 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB9-170-072707
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.3 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
Run 1		6" concrete w/rebar Fill - compacted sand and gravel to 8', dry	0910		2.2'	0.3		NA		
					3.4'	0.2				
Run 2		Silty CLAY (SC/CL) some fine sand, brown/dark brown 8 to 10'			4.9'	0.3 0.4 0.2				
Run 3		Limonitic zones ir (?) weathered rock SH. Moist @ 14'			2.0'	0.3				
Run 4		Refusal @ 17' →	0940	170					PAH, Metals	TD = 17-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES:

In Metals Building #76

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-10 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB10-140-072707
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.2 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		6" concrete w/rebar	0845		3.1'	0.2		NA		
Run 1		Fill - compacted sand and gravel to 7.5', dry								
					3.9'	0.2				
Run 2										
		Clayey SILT (SM/ML), some rock frag. black to reddish brown (degraded hydrocarbon?) dry Note: color			4'	0.1				
Run 3		change to yellow/brown (?) @ 12'				0.3				
						0.2				
		Refusal @ 14' →	0900	140					PAH, Metals	
										TD = 14-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES:

* Duplicate Collected - RAN-RB10-140-072707A 0905
In Metals Building #76

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-11 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB11-020-072607
DATE:
DRILL RIG: GEOPROBE 66 DT
DRILLING METHOD:
SAMPLING EQUIPMENT: Dual Tube/Sieve

BKG = 0.1 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
Run 1		Silty SAND (Fill) w/slag in cutting shoe, dry	0805		2.4'	0.1				
		Refusal @ 2.5' →	0815	020				0.1	VOC, BTEX, Metals	TD = 2.5-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 004

South side of Former Paint Building - Offsets ranged 15' in different directions w/TD ~ 2.5' MAX.

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID:	RB-12	**SITE:**	RANSON, WV
BORING LOCATION:	RAN-RB12-140-072607		
DATE:	7/25/2007	**DRILL RIG:**	GEOPROBE 66 DT
DRILLING METHOD:		**SAMPLING EQUIPMENT:**	Dual Tube/Sieve

BKG = 0.2 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
Run 1		6" concrete w/ compacted gravels silty CLAY (CL), very soft, moist (poor recovery)	0830		0.3'	0.3				
						0.4				
						0.3				
					4.3'					
5		gravelly CLAY, (GC/SC) with sand, reddish/brown to yellow @ ~11' change associated w/relic and								
Run 2		rock texture								
					4.0'	0.2				
10		Wet @ 11'								
Run 3										
									Dup. VOC,	
		Refusal @ 14' →	0850	140				0.3	BTEX, Metals	TD = 14-ft
15										
20										
25										

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 006

	West side of former paint building in loading dock area.
*	Duplicate - [RAN-RB12-140-072607A] 0855 hours.
	Temp well completed to 14' TD (3/4" ø PVC w/10' of 10-slot screen)
	Abandoned 7/27/07 dry after 24 + hours

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-13 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB13-042-072607
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.3 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
Run 1		2" concrete gravelly CLAY (GC), soft, reddish/yellow, dry to moist	0910		3.2'	0.9 1.3 14.9 29.5				
5		Refused @ 4.2' → on carbonate bedrock	0920	042		64.8		2750.0	VOC, BTEX' Metals	TD = 4.2-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 005
North side of former paint building. Note: color change to greyish/white @ 4'.

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-14 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB14-110-072507
DATE:
DRILL RIG: GEOPROBE 66 DT
DRILLING METHOD:
SAMPLING EQUIPMENT: Dual Tube/Sieve

BKG = 0.1 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		8" concrete and base	1015		3"	0.1				
Run 1		clayey SILT (ML), (degraded hydrocarbon) no odor, dry to moist				0.3				
					3.5'	0.4				
Run 2		Sandy SILT (SM) some clay, reddish yellow, wet @ 7.0' native, to silty CLAY @ 10' (Dolomite Fragments)				0.5				
						0.5		0.3		
		Refusal @ 11'	1035	110	0.6'	0.3			VOC, BTEX, Metals	TD = 11-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES:

	In Former Assembly Building #74 (see property map).
*	Temp well completed to 11' TD (3/4" ø PVC w/5' of 10 - slot screen). Abandoned 7/27/07 dry after 48 hrs.

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-15 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB15-058-072507
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.3 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		8" concrete w/base	1135		2.8'	0.3				
Run 1		silty CLAY (CL/SC), med. Stiff, mottled [blk stain - no odor 2.0 to 2.5', dry]				0.4				
						0.6		0.6		
5		clayey SILT (SC), wet @ 5.6								
		Refusal @ 5.8' →	1140	058	0.8'	0.4			PAH, BTEX, Metals	
Run 2										TD = 5.8-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES:

Inside Former Assembly Building #74 (see property map)

* Temp well completed to 5.5' TD (3/4" ø PVC w/5' of 10 - slot screen).
Abandoned 7/27/07 dry after 48+ hrs.

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-16 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB16-035-072507
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.3 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		8" concrete w/base	1045		3.6'	0.3				
Run 1		silty SAND (SM) with rock frags, black to reddish brown; dry								
			1055	035		0.6		0.5	VOC,	Sampled @ slt. Higher
5		sandy SILT (SC), w/clay red/brown, dry			1.5'	0.3			BTEX, Metals	PID reading
Run 2		Refusal @ 7' →								
			1100			0.2				TD = 7-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES:

Inside Former Assembly Building #74 (see property map)

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID:	RB-17	**SITE:**	RANSON, WV
BORING LOCATION:	RAN-RB17-065-072507		
DATE:	7/25/2007	**DRILL RIG:**	GEOPROBE 66 DT
DRILLING METHOD:		**SAMPLING EQUIPMENT:**	Dual Tube/Sieve

BKG = 0.0 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		8" concrete w/base	0935		3.4	0.0				
Run 1		silty CLAY (CL/SC), med. stiff, mottled, w/ relic and bedrock texture, @7.0', reddish yellow,								
		dry to moist			2.5'					
Run 2		[Moist to wet @6.5] to 6.9']							VOC, BTEX,	
		Refusal @ 8' →	0950	065		0.1		0.1	Metals	Sampled Sat. Zone TD = 8-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES:

In Former Assembly Building #74 (see property map)

* Temp well completed to 8' TD (3/4" ø PVC w/5' of 10 - slot screen).
Abandoned 7/27/07 dry after 48+ hrs.

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-18 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB18-035-072507
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.4 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
Run 1		8" concrete w/base SILT, some clay (ML) and rock frags.	1205		1.8	0.4 0.5				
		Refusal @ 3.5' → Carbonate rock in cutting shoe	1215 1215	035				0.4	VOCs, Metals, DRO/MRO	TD = 3.5-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES:

In Former Assembly Building (see property map)

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-19 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB19-075-072507
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.0 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		8" concrete w/base	0900		2.4	0.2				
Run 1		compacted gravel silty CLAY (CL), dark red/brown, med. Stiff, dry				0.0				
5		Limonite @ 5 - 6.5'			1.6'	0.0				
Run 2										
		Refusal @ 7.5' →	0925	075		0.0		0.1	VOCs, Metals, DRO/MRO	TD = 7.5-ft
10										
15										
20										
25										

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES:

Inside Former Assembly Building #74 (see property map)

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-20 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB20-049-072507
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.3 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		6" concrete and base	1110		2.4'	0.3				
Run 1		silty CLAY w/rock								
		dolomite (?) frag (GC)								
		breciated, red/yellow				0.2				
		dry								
		↓			↓					
		Refusal @ 4.9' →	1120	049		0.4		0.4	VOCs, Metals, DRO/MRO	TD = 4.9-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES:

Inside Former Assembly Building #74 (see property map).

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-21 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB21-025-072507
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.4 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
0		Dense Grade Aggregate silty CLAY w/rock~ 1.5' (DGA)	1410		2.9'	0.4				
Run 1		Clayey GRAVEL (GC) fill - ?, iron stain, dry	1425	025		0.5 0.3		0.4	VOCs, BTEX, Metals	Sampled finest grain material
5		Refusal @ 4.75' – → bedrock			Frm 7-25-07					TD = 4.75-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 003

Driller listens for "ringing" on rods when encountering refusal and can usually tell if on bedrock or concrete.
SW side of Block Building.

Camp Dresser & McKee, Inc
1331 17th Street, Suite 1200
Denver, Colorado 80202

BORING ID: RB-22 **SITE:** RANSON, WV
BORING LOCATION: RAN-RB22-060-072507
DATE: 7/25/2007 **DRILL RIG:** GEOPROBE 66 DT
DRILLING METHOD: **SAMPLING EQUIPMENT:** Dual Tube/Sieve

BKG = 0.4 ppm

Lithology			Observations with Depth			Analytical Results According to Depth				Boring Abandonment Details
Depth From	Depth To	Description	Time	Sample Interval	Recovery	PID (head)	Bag Inter.	PID (bag)	Lab Sample	
		DGA - 0 to 3"	1310		2.2'	0.4				
		Asphalt residue 2"								
Run 1		silty CLKAY (CL), very								
		Stiff w/residue								
		red/bm, moist								
		Dolomite @ 6.0', wet			0.9'	0.6		0.3	VOCs,	
Run 2		Refusal @ 6.2' →	1330	060		0.3			BTEX, Metals	TD = 6.2-ft

GUIDE:
Material Description to include: Color; grain size; texture; moisture content; odor

NOTES: PHOTO 001

* Temp well completed to 6' TD (3/4" ø PVC w/5' 10-slot screen)
Abandoned 7/27/07 dry after 324 hours.

NE side of Block Building.

APPENDIX C

LABORATORY ANALYTICAL DATA REPORTS
(PROVIDED ON CD-ROM)

APPENDIX D

HISTORICAL DOCUMENT SUMMARY
FORMER WHIRLPOOL/MAYTAG FACILITY
RANSON, WEST VIRGINIA

Title	Date
Sampling Plan for Tool Area at Dixie Narco , ERM, Inc	October 14, 1991
Investigation of Old Materials Storage Area at Dixie Narco , ERM, Inc	April 24, 1992
Powder Finishing, Deburring, and Sheet Metal Area Investigations at Dixie Narco , ERM, Inc	April 27, 1992
Additional Site Investigations-Old Material Storage Area and Powder Finishing Building (Exterior), Former Dixie Narco , ERM, Inc	October 23, 1992
ERM letter "Comment on Presence of Methylene Chloride in Soil Sample S5 - Closure Report for Hazardous Waste Storage Building"	May 9, 1995
Further Investigation of the Outdoor Storage Area of Non-Hazardous Waste, ERM	July 6, 1995
Risk-Based Concentration Table, Roy L. Smith	October, 1995
WVEP Letter "Former Hazardous Waste Storage Building - Dixie-Narco Inc. Facility - Ranson, WV"	February 22, 1996
Remediation Activities, Paint Shop Pretreatment Pit and Tooling Area	March, 1996
Risk Assessment - Old Materials Storage Area , Former Dixie Narco, Inc. Facility - Ranson, West Virginia	March 12, 1996
Remediation Activities - Hazardous Waste Storage Building - Former Dixie Narco Inc. Facility, Ranson, WV, ERM	November 1996
WVEP Letter response/NFR letter "Former Hazardous Waste Storage Building - Dixie-Narco Inc. Facility - Ranson, WV"	January 15, 1997
Updated Level I Environmental Site assessment , Former Dixie Narco Facility, ERM	March, 1997
Closure Report for Hazardous Waste Storage Building, Former Dixie-Narco, Inc. Facility	February, 1995
RCRA Large Quantity Generator (LQG) Biennial Report	2003
Draft Subsurface Investigation	December 2006
Phase I Environmental Site Assessment Update, Former Dixie Narco Facility, Earth Tech	December 22, 2006
Phase II Work Plan , Earth Tech	November, 2006
Phase II Environmental Site Assessment - Whirlpool Corporation, Former Dixie-Narco, Ranson, West Virginia , Earth Tech	December, 2006

Note

The term "Documents" herein described refers to documents that have been provided by Maytag/Whirlpool, requested by CDM from the Maytag archives, are reference within another document, or have been included (copied) within another document. Note that not all letters and/or correspondence items have been included.

APPENDIX E

CLOSURE LETTERS AND NO FURTHER ACTION DETERMINATIONS CONTENTS SUMMARY

RANSON, WEST VIRGINIA

Title	Date
Remediation Activities: Hazardous Waste Storage Building	November, 1996
Closure Report - Hazardous Waste Storage Building - Dixie Narco Inc. Facility, Ranson, WV	February, 1995
WVEP Letter "Former Hazardous Waste Storage Building - Dixie-Narco Inc. Facility - Ranson, WV"	February 22, 1996
WVEP Letter response/NFR letter "Former Hazardous Waste Storage Building - Dixie-Narco Inc. Facility - Ranson, WV"	January 15, 1997
Remediation Activities: Paint Shop Pretreatment Pit and Tooling Area	March, 1996
Risk Assessment: Old Material Storage Area	March 12, 1996
ERM letter "Comment on Presence of Methylene Chloride in Soil Sample S5 - Closure Report for Hazardous Waste Storage Building"	May 9, 1995

ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

REPORT

Remediation Activities

Hazardous Waste Storage Building

Former Dixie Narco Inc. Facility Ranson, WV

November 1996

Prepared for:

Mr. Douglas R. Wilson
Corporate Director Environment
Maytag Corporation
403 W. Fourth Street N.
Newton, Iowa 50208

Prepared by:

ERM-EnviroClean, Inc.
Suite 208
20120 Route 19 North,
Cranberry Twp., Pennsylvania 16066
Ph. (412) 772-1022

TABLE OF CONTENTS

1.0 INTRODUCTION

This report documents the environmental remediation activities performed at the Hazardous Waste Storage Building (HWSB) at the former Dixie Narco, Inc. facility located in Ranson, WV. The remediation activities were performed in accordance with the remediation plan approved by the West Virginia Department of Environmental Protection (WVDEP) through correspondence dated 26, April 1996.

The environmental remediation activities consisted of the excavation of approximately 10 tons of lead contaminated soils from beneath the concrete floor of the HWSB. The soil was transported to an appropriately permitted hazardous waste disposal facility.

The remediation activities were performed at the request of the WVDEP, subsequent the discovery of soil contamination. The soil contamination was identified through a subsurface soil investigation that was performed as part of closure activities for the HWSB.

2.0 BACKGROUND

The HWSB is a pre-engineered steel building with a concrete floor, approximately 24'x61' in size . The building was used to store hazardous waste and some virgin materials at the Dixie Narco facility. These materials included;

- paint residue containing lead, chromium, and cadmium,
- spent and virgin methylene chloride,
- spent 1,1,1 Trichloroethane,
- spent and virgin xylene,
- spent and virgin butyl carbitol,
- wastewater treatment sludge,
- SP 330 (mineral spirits),
- SP 711 (chlorinated solvent mixture),
- and hydrated lime.

There has been no history of spills or releases onto the pad from the container storage of the materials listed above. At the time closure activities were initiated, all stored materials were removed from the HWSB.

Closure of the HWSB was initiated by submission of the "Closure Plan for Hazardous Waste Storage Building" (November of 1991) to the WVDEP.

The Closure Plan was approved and implementation of the plan proceeded in November of 1994. Initial closure activities involved inspection of the buildings floor slab, decontamination of the building's interior, and sampling of the soils beneath the floor. After completion of the initial closure activities, Maytag submitted a Closure Report to the WVDEP requesting clean closure of the HWSB. The WVDEP denied Maytag's request for clean closure though correspondence dated 22 June 1995 and requested additional subsurface soil sampling be conducted.

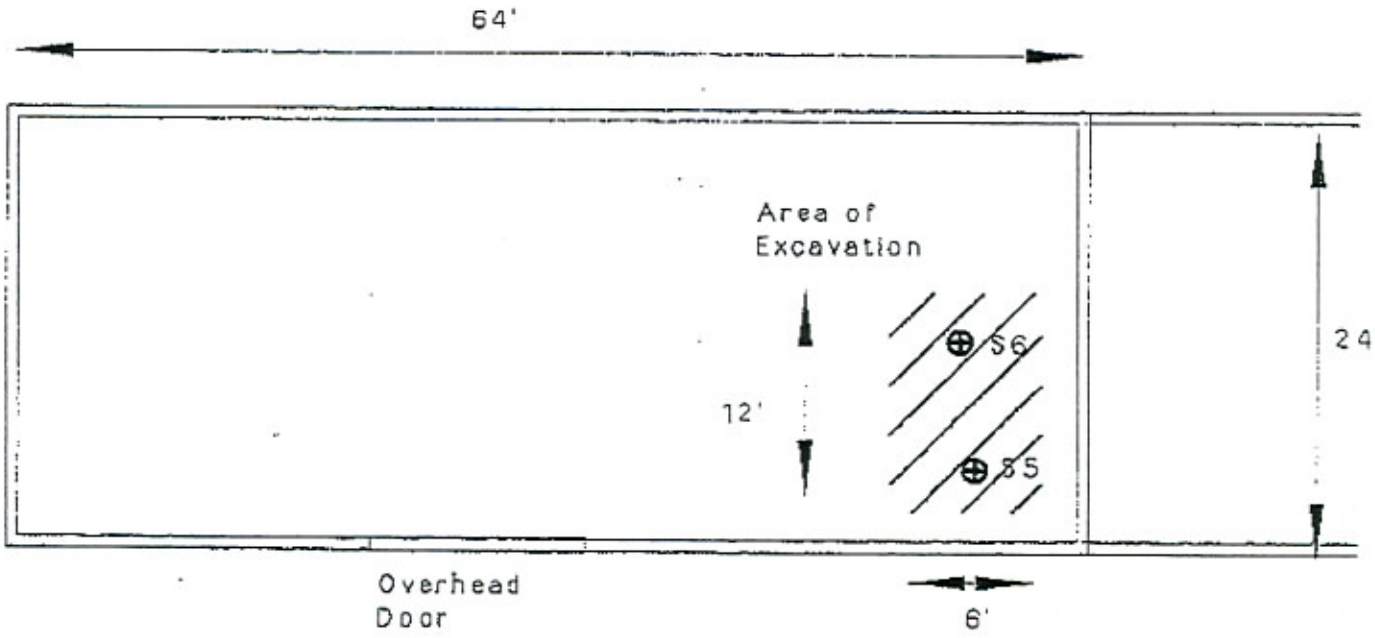
Maytag performed additional subsurface soil sampling in November of 1995 and submitted the results to the WVDEP. The results of the additional sampling indicated elevated levels of Total Lead for samples designated S5 and S6 (330 and 350 ppm respectively). A TCLP Lead analysis was performed on soil sample S6, which indicated leachable lead levels in excess of the 5 mg/l limit. Therefore, the WVDEP requested excavation and removal of the concrete and soil in the area of samples S5 and S6.

3.0 *REMEDIATION ACTIVITIES*

On 23 September 1996, ERM collected a composite sample of the material to be excavated from beneath the concrete floor of the HWSB for the purpose of waste characterization and pre-approval for disposal. The composite waste sample was collected by cutting through the concrete floor in two areas to collect two representative soil samples from a depth of approximately 1.5 feet below ground surface. The samples were collect using a bucket auger. Based on the results of previous soil sampling and the analysis of the composite waste sample, the material was classified as a D008 Hazardous Waste.

On 8 October 1996, ERM returned to the site and excavated soil and concrete from an area 6' x 12' x 3' deep in dimension, and including sample locations S5 and S6. A diagram depicting the area of the excavation area is provided as Figure 1. Photographs were taken throughout the course of remediation activities and are provided in Appendix A.

After excavation was complete, ERM collected two composite samples from the floor and walls of the excavation to confirm that the 5 mg/l cleanup level for TCLP Lead was achieved. The floor-composite sample was generated from four discrete samples collected from the floor of the excavation. Similarly, the wall-composite sample was generated from four discrete samples; one from each of the four walls of the excavation. All samples were collected and placed directly into laboratory supplied jars and sent to Antech, Ltd. Analytical Laboratories in Export, PA with



N

Approximated Scale
1"=10'

Figure 1: Hazardous Waste
Storage Bldg.
Former Dixie Narco, Inc. Facility
Ranson, WV

Drawn By:
J. Thompson
Date: 11/14/96

ERM EnviroClean, Inc.
Suite 208 20120 Rt 19N
Cranberry Twp. PA 15066

ERM

the appropriate chain of custody documentation. The floor- composite and wall-composite samples were submitted to the laboratory for TCLP Lead analysis. The eight discrete samples were also submitted to the laboratory and held pending the results of the composite samples. The analytical results for both of the composite samples were determined to be less than the 5 mg/l cleanup level and are provided in Table 1 below. The analytical laboratory reports are provided in Appendix B.

Table 1: Analytical Results

Sample Designation	Sample Type	Result TCLP Lead (mg/l)	Regulatory Limit (mg/l)
1W	grab	-	5.0
2W	grab	-	5.0
3W	grab	-	5.0
4W	grab	-	5.0
W-Comp.	composite	0.13	5.0
1F	grab	-	5.0
2F	grab	-	5.0
3F	grab	-	5.0
4F	grab	-	5.0
F- Comp.	composite	0.19	5.0

W= Wall, F= Floor

On 9 October 1996, the excavated soil was loaded into a roll-off container and transported to Envotech Management Systems in Belleville, Michigan with the appropriate hazardous waste manifest. The hazardous waste manifests were sign by a representative of ERM acting on behalf of Maytag Corp. granted through limited power of attorney. The Limited Power of Attorney document is included in Appendix D. The hazardous waste manifest is included in Appendix C. Approximately 10 tons of material, primarily composed of soil and concrete, was removed from the site.

Following excavation and load-out of the waste material, the excavation was backfilled to subgrade with compacted crushed stone. The concrete floor was then restored with approximately eight inches of new concrete.

4.0 *CONCLUSIONS*

The information provided in this reports documents Maytag's successful execution of the approved remediation plan for the HWSB. The 5 mg/l TCLP Lead cleanup standard set forth by the WVDEP was attained as indicated by the analytical results of the confirmation samples.

Based on the successful execution of the approved remediation plan and the previous execution of all provisions of the approved Closure Plan for Hazardous Waste Storage Building, Maytag requests that the WVDEP grant clean closure of the HWSB at the former Dixie Narco, Inc., facility and declare that no further action is required.

FILE COPY

DIVISION OF ENVIRONMENTAL PROTECTION
1356 Hansford Street
Charleston, WV 25301-1401

GASTON CAPERTON
GOVERNOR

LAIDLEY ELI MCCOY, PH. D.
DIRECTOR

February 22, 1996

Mr. Douglas R. Wilson
Corporate Director Environment
Maytag Corporation
403 West Fourth Street North
Newton, Iowa 50208

RE: **Former Hazardous Waste Storage Building**
Dixie-Narco, Inc. Facility - Ranson, WV

Dear Mr. Wilson:

This letter is in response to your letter dated February 13, 1996 questioning why the West Virginia Division of Environmental Protection (WVDEP) uses the TCLP Method for determining clean-up levels and the rationale for requiring corrective action at the facility. The WVDEP currently accepts total constituent analysis and EPA Risk Based Concentrations (RBC) for screening purposes only. The only method acceptable to grant clean closure for a facility is the TCLP Method. While all of the samples collected from beneath the Hazardous Waste Storage Building were below the RBC level of 400 mg/kg of total lead for residential areas, the sample at 19 to 24 inches at sample location S-6 had a TCLP value of 33 mg/l which is an order of magnitude greater than the clean-up target of 5 mg/l.

The rationale for requiring corrective action at the storage building is that the floor of the building contains numerous cracks which would permit any liquids released inside the building to percolate through the underlying contaminated soil and pose a threat to the groundwater. The WVDEP is requiring Maytag to remove and dispose of all materials and soils exceeding the 5 mg/l level from beneath the storage building so that clean closure of this facility can be confirmed.

DIVISION OF ENVIRONMENTAL PROTECTION
1356 Hansford Street
Charleston, WV 25301-1401

CECIL H. UNDERWOOD
GOVERNOR

LAIDLEY ELI McCOY, Ph.D.
DIRECTOR

January 15, 1997

Mr. Douglas R. Wilson,
Corporate Director Environment
Maytag Corporation
403 West Fourth Street, North
Newton, Iowa 50208

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

RE: **Former Hazardous Waste Storage Building**
Dixie-Narco, Inc. Facility - Ranson, WV

Dear Mr. Wilson:

This letter is in response to your letter dated December 17, 1996 requesting a review of the November 1996 Remediation Activities Report for the Former Hazardous Waste Storage Building, Dixie-Narco, Inc. Facility - Ranson, West Virginia and the issuance of a clean closure letter for the facility. The use of the term "clean closure" under RCRA regulations is restricted to the clean closure of a RCRA permitted facility which would not apply to the facility described in the report. The report documents that the lead contaminated soil has been removed from the site and properly disposed of at the Envotech Management Services, Inc. facility in Belleville, Michigan. Confirmation samples collected from the walls and floor of the excavation contained lead levels below the TCLP level of 5 mg/kg for classification as a hazardous waste.

As the Chief of the Office of Waste Management, I hereby state that, based upon the information provided to this agency by Maytag Corporation and its representatives, **no further remedial action** is required at the site known as the Former Hazardous Waste Storage Building, Dixie-Narco, Inc. Facility - Ranson, West Virginia. Maytag Corporation is to be commended for its efforts in the site assessment and remediation work performed at this location. Those efforts are appreciated, as are any and all efforts to prevent similar future situations from occurring. Thank you, and if you have questions please contact Assistant Chief H. Michael Dorsey at **(304) 558 5989.**

Sincerely,

B. F. Smith, P.E.
Chief

DHH/BFS

cc: H. Michael Dorsey, Asst. Chief
David H. Hight, ERS
Stanley Moskal, Inspector Supervisor
John Hando, Inspector

If you have any further questions on please contact David Hight at 558-2505 or if you wish to arrange a meeting to discuss the issues contact Ruthann Fowler at the same phone number.

Sincerely,

H. Michael Dorsey
Assistant Chief, CME

/dhh

cc: David Hight, Environmental Specialist
John Hando, Inspector

FINAL REPORT

Remediation Activities

Paint Shop Pretreatment Pit and Tooling Area

Former Dixie Narco Inc. Facility Ranson, WV

March 1996

Prepared for:

Mr. Douglas R. Wilson
Corporate Director Environment
Maytag Corporation
403 W. Fourth Street N.
Newton, Iowa 50208

Prepared by:

ERM-EnviroClean, Inc.
Suite 208
20120 Route 19 North,
Cranberry Twp., Pennsylvania 16066
Ph. (412) 772-1022

1.0 INTRODUCTION

The following report documents the environmental remediation activities performed at the former Dixie Narco, Inc. facility (the Site) by ERM-EnviroClean, Inc. (ERM) between 2 November 1995 and 13 December 1995. Site remediation activities were performed in the Paint Shop Pretreatment Pit Area and the Tooling Area. A site map of the former Dixie Narco Facility is presented on the following page as Figure 1.

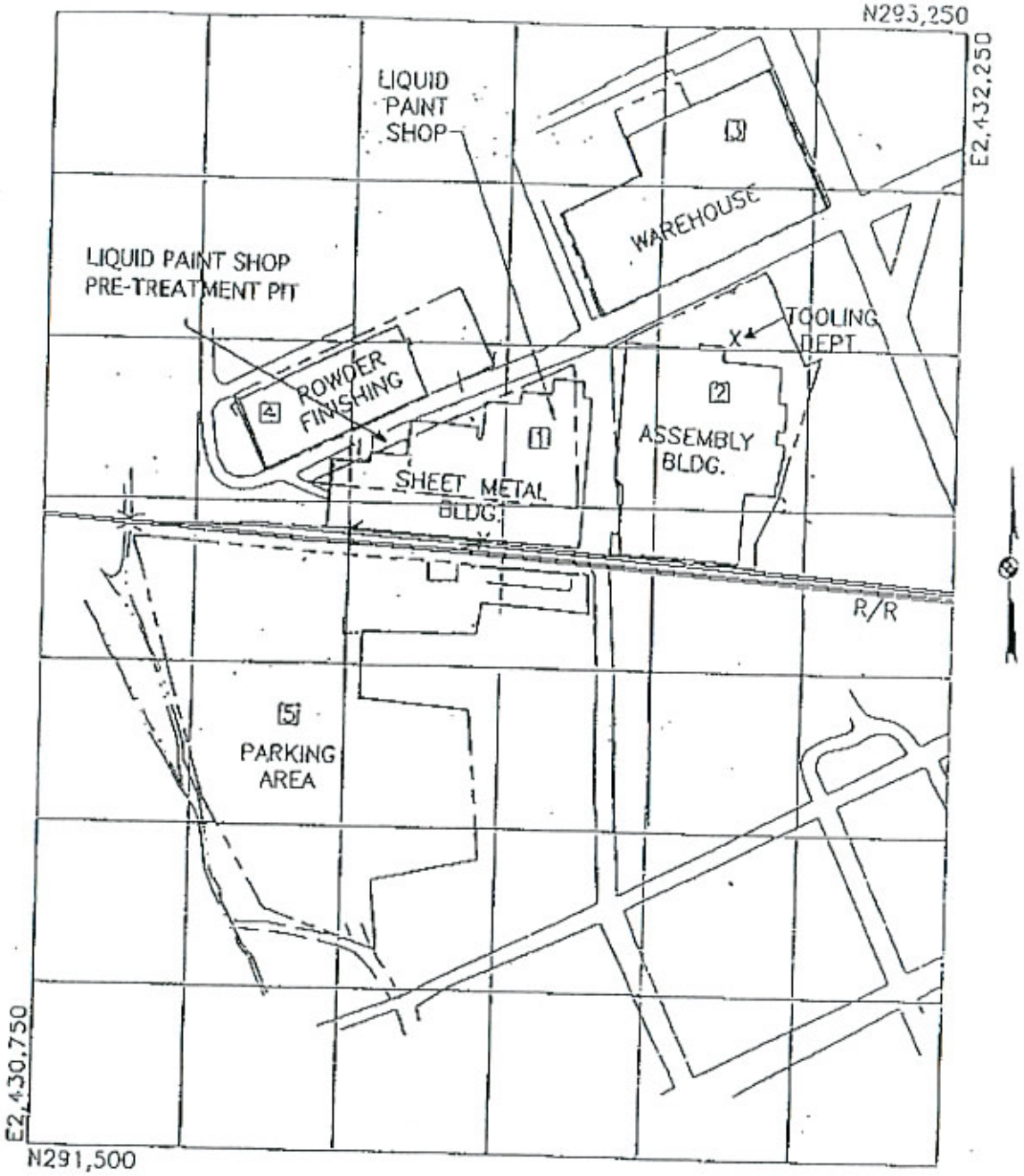
2.0 BACKGROUND

The work described in this report was performed based on information gathered by ERM during Phase II site investigation activities. The following reports are referenced:

- "Investigation of Paint Shop and Pretreatment Pit" 24 April 1994,
- "Pretreatment Pit Sludge Waste Characterization Review" 7 January 1992, and
- "Sampling Plan for the Tooling Area" 14 October 1994

The paint shop pretreatment pit was formerly utilized to pretreat wastewater prior to discharge to the Charlestown POTW. The paint shop utilized paint booths where sheet metal parts were coated with paint that reportedly contained benzene, xylene, cadmium, chromium, lead, zinc, and possibly 1,1,1 trichloroethane. Previously, the pretreatment pit was cleaned and any sludges present were removed and properly disposed. Soil sampling around the pretreatment pit indicated the presence of metals at elevated levels. The location of sampling points and the analytical results are provided in Appendix F.

The Tooling Department included a machine shop where compounds containing tetrachloroethylene; a solvent containing, methylene chloride, perchloroethylene, and petroleum distillates; and 1,1,1 Trichloroethane were used. A soil gas survey was conducted in the area just outside of the Tooling Department and elevated levels of volatile hydrocarbon compounds were detected. The results of the soil gas survey are presented in Appendix F.



LEGEND

——— DIXIE NARCO INC., PROP.

SCALE: 1" = 250'

SITE MAP FORMER DIXIE NARCO FACILITY Ranson, WV	Figure 1
ERM ERM-Midwest, inc. Environmental Resources Management	

After evaluation of the soil and soil gas sampling results for the areas described above, it was decided that soil excavation would be performed in the Paint Shop Pretreatment Pit Area and the Tooling Area. USEPA region III industrial use risk based standards were used as the clean up criteria for the Paint Shop Pretreatment Pit Area and the Tooling Area.

3.0 *REMEDIATION ACTIVITIES*

The following section includes descriptions of the remediation activities in the Paint Shop Pretreatment Pit and the Tooling area. A photographic log was maintained throughout the course of field activities and is included in Appendix A.

3.1 *Paint Shop Pretreatment Pit*

ERM mobilized a field crew and equipment to the former Dixie Narco Facility on 2 November 1995 and prepared for excavation of the paint shop pretreatment pit. Prior to excavation activities, ERM cleared the area of large vegetation and debris and also dismantled the air conditioning unit adjacent to the pretreatment pit. ERM utilized a local HVAC subcontractor, AirTech, to properly decommission the cooling unit.

Removal of Water from Pit

After the immediate work area was cleared, ERM pumped approximately 600 gallons of water that was present in the pretreatment pit into eleven 55 gallon drums. The drums were labeled and a composite sample of the water was collected and sent to Antech Ltd. for analysis. A composite sample was also sent to the selected disposal vendor, Environmental Services of America, Inc.-NES Division (ENSA-NES), for waste approval. The samples were placed into a cooler, packed with ice or cold packs, and delivered via overnight courier to the laboratory and disposal vendor. The analytical results of the waste characterization are included in Appendix C. The drums were staged in an area adjacent to the excavation until disposal could be arranged.

Excavation of Pit

Following removal of the water from the Pit, ERM began excavating the pretreatment pit and surrounding soils. The excavated soil was staged on plastic sheeting in the loading dock driveway to the west of excavation area. A diagram of the pretreatment pit work area is presented as Figure 2.

ERM excavated the northern, western, and southern masonry block walls of the pit. The east wall of the pit could not be excavated because a concrete slab walkway, approximately 18 inches thick, was present over the top of this area. The walkway extended approximately 9 feet to the east of the pit where it connects with the footer of the adjacent building.

The soil to the south of the pit was excavated approximately five feet in the horizontal direction until the footer of the adjacent building was encountered. The surrounding soil adjacent to the west and north walls of the pit was excavated to approximately two feet in the horizontal direction.

ERM excavated the concrete slab base of the pit and the soil immediately below. The soil below the slab was excavated to a maximum depth of approximately two feet or to bedrock (whichever was encountered first). Bedrock was encountered within two feet of the slab in some areas.

Collection of Confirmation Samples

Following excavation activities, five soil samples were collected from the floor and walls of the excavation and analyzed for TCL Volatiles, TCL Semi-volatiles, and TAL Metals. The samples were placed into a cooler, packed with ice or cold packs, and delivered via overnight courier to Antech Ltd. Analytical Laboratories in Export, PA for analysis. The locations of the soil samples are provided in Figure 2. The analytical results from the soil samples are summarized in Table 1 in comparison to the industrial use risk based screening levels. The laboratory reports and chain of custody documentation are included in Appendix B.

ERM reviewed the results of the soil sampling and determined that the USEPA industrial use risk based clean-up levels were achieved with the exception of one constituent. Beryllium was detected in each sample at a concentration above the USEPA industrial use risk based standard of 1.3 mg/kg. ERM believes that the levels of Beryllium are elevated background levels and likely to be unrelated to the presence of the other contaminants in the soil. Therefore, ERM does not believe the presence of Beryllium will warrant further excavation of soil.

Prior to backfilling the excavation, ERM installed a PVC pipe to connect the pretreatment pit influent and effluent pipes. The pipe was installed to maintain drainage of storm water from roof drains to the sewer. The excavation was then backfilled with crushed stone.

Disposal of Pit Water

The 11 drums of "Pretreatment Pit Water" were picked up for disposal on 13 December 1995. The water was characterized as non-hazardous and disposed through ENSA-NES. The material characterization sheet and the Bill of Lading are included in Appendix D. Representatives of ERM signed the Bill of Lading on behalf of Maytag for the disposal of the drummed water.

3.2 *Tooling Area*

Prior to field activities, ERM planned to excavate two perceived "hot spots" that were identified based on previous Soil Gas Survey conducted in the Tooling Area. During excavation activities, the soil contamination was found to be more extensive than anticipated based on field screening with an Organic Vapor Analyzer.

Soil Excavation and Confirmation Sampling

The entire tooling area was excavated to a depth of 3-4 feet. The excavated soil was staged, and covered in plastic sheeting, in an area adjacent to the excavation. After excavation was completed, eight (8) samples were collected from floor and walls of the excavation and analyzed for TCL Volatiles, TCL Semivolatiles, and TAL Metals. The samples were placed into a cooler, packed with ice or cold packs, and delivered via overnight courier to Antech Ltd. Analytical Laboratories in Export, PA for analysis. The analytical results from the soil samples are summarized in Table 2 in comparison to the industrial use risk based screening levels. The excavation was then backfilled with crushed stone. A diagram of the Tooling Area, illustrating the area of excavation and sample locations, is presented in Figure 3.

The analytical results were reviewed and ERM determined that the industriial use risk based cleanup levels had been achieved with the exception of Beryllium. As in the Pretreatment Pit area, Beryllium was detected in each sample at a concentration above the USEPA industrial use risk based standard of 1.3 mg/kg. ERM believes that the levels of Beryllium are elevated background levels and likelcy to be unrelated to the presence of the other contaminants in the soil. Therefore, ERM does not believe the presence of Beryllium will warrant further excavation of soil.

3.3 *Soil Characterization and Disposal*

A total of 139.55 tons of contaminated soil and concrete were excavated from the Pretreatment Pit area and the Tooling area. The soil was staged

adjacent to each area and contained in plastic sheeting. Two composite samples of the waste material (one from each area) were collected for waste characterization analysis. The samples were placed into a cooler, packed with ice or cold packs, and delivered via overnight courier to Antech Ltd. Analytical Laboratories in Export, PA for analysis. The waste characterization results for each area are included in Appendix C.

Based on the analytical results and the fact that the waste was derived from a spent solvent, the soil was classified and disposed of as an "F-listed hazardous waste, which met treatment standards" (eg. suitable for direct landfilling). The soil from both areas was considered one waste stream after the waste characterization was determined. Soil disposal was subcontracted through Resource Management, Inc. (RMI). The soil was transported to Wayne Disposal, Inc. in Belleville, MI. for ultimate disposal. Copies of the Waste Manifests and Certificates of Disposal are included in Appendix E. The original generator copy of the Hazardous Waste Manifests were previously sent to Maytag Corp.

The soil was loaded into dump trailers for transportation to the disposal facility on 11 and 13 December 1995. A total of eight truck loads of contaminated waste material were transported from the site to the dispoal facility. The waste manifests were signed by representatives of ERM on behalf of Maytag Corporation. ERM was granted "Limited Power of Attorney" by Maytag through the "Limited Power of Attorney" document which is included in Appendix D.

4.0 CONCLUSIONS

ERM excavated soil contamination from the Paint Shop Pretreatment Pit Area and Tooling Area that was identified during previous Phase II Environmental Investigations at the Facility. Post excavation samples were collected and analyzed for TCL Volatiles, TCL Semi-Volatiles, and TAL Metals.

Results of the post excavation sampling indicated that USEPA industrial use risk based screening levels were achieved in every sample and for all constituents with the exception of Beryllium. Beryllium was detected in every sample collected at a level above the industrial use risk based screening level of 1.3 mg/kg. ERM believes that the levels of Beryllium are elevated background levels and likeley to be unrelated to the presence of the other contaminants in the soil. Therefore, ERM does not believe the presence of Beryllium warrants further excavation of soil.

A total of 139.55 tons of waste material, classified as an F-listed hazardous waste which met treatment standards, were excavated and transported to Wayne Disposal, Inc. in Belleville, MI. Eleven drums of non-hazardous waste water from the Pretreatment Pit were removed from the site for disposal by ENSA-NES.

REPORT

Maytag Corporation

Risk Assessment
Old Material Storage Area
Former Dixie Narco, Inc. Facility
Ranson, West Virginia

12 March 1996

Environmental Resources Management, Inc.
20120 Route 19 North, Suite 208
Cranberry Township, Pennsylvania 16066

ERM

TABLE OF CONTENTS

LIST OF TABLES

1.0 INTRODUCTION

At the request of Maytag Corporation (Maytag), ERM-EnviroClean, Inc. (ERM) prepared a risk assessment (RA) for the Old Materials Storage Area (OMSA) of the former Dixie Narco, Inc. site in Ranson, West Virginia. The RA was undertaken by Maytag to evaluate the potential risk to human health posed by concentrations of polynuclear aromatic hydrocarbons (PNAs) in soil at the Dixie Narco site.

1.1 BACKGROUND

1.1.1 Site History

The subject site is a former area where solvents were stored and managed. OMSA was an outdoor storage area located along the outside northern wall of the Paint Shop Section of the Dixie Narco Site. Based on conversations with site personnel, the present Sheet Metal Shop was constructed adjacent to the Paint Shop and over the former OMSA area in approximately 1977. The floor slab in the new Sheet Metal Shop is approximately 3 feet above the existing Paint Shop floor slab. Fill materials have been placed over the former existing grade where the materials were stored and managed.

1.1.2 Summary of Site Investigations

1.1.2.1 Early Investigations

On 9 October 1991 and 17 March 1992, ERM representatives conducted preliminary investigations including soil gas surveys at the OMSA. The sample locations of the Old Material Storage Area were identified by Dixie Narco. The sampling points were marked with painted numerals on the floor slab above the areas where solvents were stored and managed at the site. Results of the preliminary investigations and the subsequent soil gas survey at the OMSA indicated the presence of volatile organic materials in the soils beneath the concrete floor (ERM, 1992).

On March 17, 1992, ERM personnel arrived on site and began screening each area using a soil gas probe and an Organic Vapor Analyzer (OVA). In order to accomplish this, a hole was drilled through the concrete and the soil gas probe was used to penetrate the soils. An SKC pump was connected to the soil gas probe to pull air from the hole to the OVA. The

OVA was used to measure the organic vapor that the SKC pump pulled through the soil gas probe. Background levels of the air in the building and the pump were measured just prior to performing each soil gas vapor analysis. The background levels were subtracted from the OVA reading to more closely approximate the OVA levels measured on the air from the soil gas probe. After removing the soil gas probe from the sampling hole, a check at the top of each open borehole was made. The soil gas probe was decontaminated between each sampling point using an Alconox wash and a distilled water rinse.

In total, six borings were advanced through the floor of the Old Materials Storage Area), and eight OVA readings were taken during the sampling investigation. The OVA readings taken ranged from 8.5 to 56 ppm. All of the soil borings monitored showed elevated OVA readings above background. The most elevated OVA readings recorded were 56 and 35 ppm at borings 3 and 4, respectively.

The findings from this soil gas survey suggest that materials formerly stored and managed at this location are present in the soils. Sampling of the soils for volatiles and semivolatiles were required to determine the specific compounds present and their concentration.

1.1.2.2 *Soil Sampling Investigation*

On 24 March 1992, ERM conducted an additional investigation of the OMSA. These additional investigations were performed to expand upon the investigations previously conducted at the former Dixie Narco site. In particular, the objective of these investigations was to identify the compound or compounds most likely causing the elevated Organic Vapor Analyzer (OVA) readings at the OMSA and to determine the horizontal and vertical extent of soil contamination in the vicinity of the OMSA. Soil gas readings obtained from beneath the OMSA indicated the presence of organic vapors above background levels. These findings suggest that materials formerly stored and managed at the location were present in the underlying soils.

A series of soil sample borings were advanced in the vicinity of previously installed soil gas borings. Sampling was conducted of near-surface soils (1.0 to 3.5-feet) and subsurface soils (3.5 to 6.0-feet) below ground surface (BGS) or to auger refusal, whichever came first. No sampling was performed in the first foot because of concrete penetration. A total of seven soil samples were obtained from six sampling locations (due to early auger refusal in 5 of the sample borings). Sample location numbers and depth intervals are listed in Table 1.

Table 1. Soil sampling data.

SAMPLE NUMBER	SAMPLE DEPTH	SAMPLE LOCATION
634-11-01	1.0' to 3.5'	5
634-11-02	3.5' to 6.0'	5
634-11-03	1.0' to 3.5'	2
634-11-04	1.0' to 2.5'	1
634-11-05	1.0' to 2.5'	3
634-11-06	0.5' to 1.5'	4
634-11-07	0.5' to 1.5'	6

Following compositing, each soil sample was transferred to the appropriate laboratory-supplied sample containers, sealed, labeled, placed in an ice chest with the proper Chain-of-Custody documentation and chilled to 4° Celsius. Because of early auger refusal, all samples were submitted for Target Compound List (TCL) analysis of Volatile Organic Compound (VOC) and Semi-Volatile Organic Compound (SVOC) analysis.

1.2 *REPORT ORGANIZATION*

The RA performed for the Dixie Narco site involved two key steps:

- An evaluation of the available analytical data characterizing concentrations of PNAs in soil; and
- An evaluation of the opportunity for exposure to these concentrations by human populations.

These tasks are described in the following sections. The remainder of this report is organized as follows:

- Section 2 reviews and summarizes the data collected during previous investigations;
- Section 3 identifies the potential exposure pathways associated with soil at the Dixie Narco site, and discusses the opportunity for potential exposure by human populations;
- Section 4 presents the summary and conclusions; and,
- Section 5 provides the references cited.

2.0 DATA EVALUATION

All available soils analytical data for the Dixie-Narco site were reviewed and summarized for use in this RA. In addition, analytical data for soil were compared to media-specific health-based screening levels to identify which constituents, if any, are present at levels of potential concern, based on the protection of human health. A discussion of the available data and the results of the comparison to screening levels is presented in the following subsections.

2.1 REVIEW OF AVAILABLE DATA

The sources of available analytical data were the previous ERM reports prepared in 1991 and 1992 for the OMSA.

The sampling investigation focused on the identification of TCL VOCs and TCL SVOCs which may have been stored or disposed of in the OMSA. The laboratory analytical results are summarized in Table 2. The TCL VOC analysis did not indicate VOC concentrations, above the 1995 residential-use health-based screening levels, in any sample however, VOCs were detected in all soil samples. TCL SVOC analysis indicated the presence of various Polynuclear Aromatic Hydrocarbons (PNAs) in the 1 to 3.5 foot sample (sample 634-11-01) and in the 3.5 to 6 foot sample (sample 634-11-02), both at location 5. However, only the 1 to 3.5 foot sample (634-11-01) indicated concentrations above 1995 residential-use health-based screening levels. Compounds detected above the screening levels were: pyrene, benzo(a)anthracene, benzo(b)fluoranthene, dibenz(a,h)anthracene, benzo(a)pyrene, and indeno(1,2,3-cd)pyrene. Only benzo(b)fluoranthene, benzo(a)pyrene, and dibenz(a,h)anthracene exceeded the industrial-use health-based screening levels. Additionally, three compounds (2-methylnaphthalene, acenaphthylene, and dibenzofuran) with no set screening levels were detected in this samples. Because the lower sample at location 5 (sample 634-11-02) indicated no detection above screening levels, ERM believes the vertical and horizontal extent of contamination has been determined at the OMSA.

2.2 COMPARISON TO HEALTH-BASED SCREENING LEVELS

The analytical data for soil were compared to media-specific health-based screening levels to identify which constituents, is any, are present at levels of potential concern, based on the protection of human health. In

TABLE 2
LABORATORY ANALYTICAL RESULTS
OLD MATERIALS STORAGE AREA
FORMER DIXIE NARCO, INC. FACILITY
RANSON, WEST VIRGINIA

Laboratory Analytical Results	Sample Number						
CONSTITUENT	634-11-01	634-11-02	634-11-03	634-11-04	634-11-05	634-11-06	634-11-07
TCL Volatiles (EPA 3/90 SOW)	Dry Wt. (ug/kg)	Dry Wt. (ug/kg)	Dry Wt. (ug/kg)	Dry Wt. (ug/kg)	Dry Wt. (ug/kg)	Dry Wt. (ug/kg)	Dry Wt. (ug/kg)
Acetone	17	36	27		35	29	120
2-Butanone							23
Tetrachloroethene			30	28			
Ethylbenzene							13
Xylene (total)					23		110
Subtotal	17	36	57	28	58	29	266
TCL Semi-Volatiles (3/90 SOW)							**
Napthalene	1100						
2-methylnaphthalene	1200						
Acenaphthylene	740						
Acenaphthene	1400						
Dibenzofuran	1600						
Fluorene	2900	420					
Phenanthrene	15000	1800					
Anthracene	2800						
Carbozole	1600						
Fluoranthene	13000	1700					
Pyrene	14000	2500					
Butyl benzyl phthalate						1200	
Benzo (a) anthracene	7100	1000					
*Bis (2-ethylhexyl) phthalat	740	4300	610	990	780	1100	
Chrysene	6100	1100					
Benzo (b) fluoranthene	10000	1200					
Benzo (a) pyrene	4300						
Ideno (1,2,3-cd) pyrene	3200	490					
Dibenz (a,h) anthracene	510						
Benzo (ghi) perylene	2700						
Subtotal	90590	14510	610	990	780	2300	
Moisture (% by wt.)	31	19.3	16.3	10.4	13.4	13.5	15.7

* Bis(2-Ethylhexyl) phthalate was detected in the method blank at a concentration of 730.0 ug/kg. The blank value was not subtracted from the analytical result.

** Insufficient sample was available to perform TCL Semi-Volatile Analysis.

If no result reported indicates no detection above the limit of quantitation.

reviewing the results of this comparison, it should be noted that the health-based screening levels used in the analysis are predicated on the assumption that there is the opportunity for routine exposure to constituents. As discussed in the following section, there is very limited opportunity for exposure to constituents associated with the Dixie Narco site. For this reason, it should be emphasized that the use of health-based screening levels in the Dixie Narco evaluation provides a very conservative analysis, and is included to provide perspective regarding the significance of constituent concentrations.

Currently, there are no promulgated standards or cleanup criteria for soil in West Virginia. Therefore, to evaluate the reported concentrations in soil, the maximum concentration of each constituent was compared to the chemical-specific health-based screening levels (i.e., screening levels) developed by the Senior Toxicologist for US EPA Region III (US EPA Region III, October 1995). Analytical data were compared to screening levels developed for evaluation of direct contact exposures under both residential and industrial use scenarios.

Table 3 presents the results of the screening evaluation for soil. As shown on this table, five reported constituent concentrations (benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene) exceeded the health-based screening levels developed for residential land use but only benzo(b)fluoranthene, benzo(a)pyrene, and dibenz(a,h)anthracene exceeded the industrial-use health-based screening levels. Thus, based on the results of previous investigation, constituents are not present at levels of potential concern under these exposure scenarios. That is, even if the concentrations were present in shallow soils (where the opportunity for routine direct contact), they would not represent a potential concern, based upon a comparison to health-based screening levels developed by US EPA Region III. It should be emphasized that these constituents are not present in shallow soils, but are located one to six feet beneath a concrete pad and building and that the potential opportunity for direct contact with these soils in nonexistent; exposure to these soils should only be expected to occur if the building and concrete pad were removed and the soils exposed at depth (e.g., exposure by workers could occur during repair or maintenance of utility lines or during removal of the concrete pad), which would be an infrequent event. Additionally, the removal workers would be appropriately clothed and equipped to eliminate the possibility of exposure.

Table 3. Comparison of Soil Concentrations to RBLs (in mg/kg).

Constituent (sample #)	Concentration	Residential RBL	Industrial RBL
acetone (07)	0.12	7800	200000
2-butanone (07)	0.023	47000	1000000
tetrachloroethene (03)	0.03	12	110
ethylbenzene (07)	0.013	7800	200000
xylene (total) (07)	0.11	160000	1000000
naphthalene	1.1	3.1	82000
2-methylnaphthene	1.200		
acenaphthylene	0.740		
acenaphthene	1.4	4.700	120000
dibenzofuran	1.8	310	8200
fluorene	2.9	3100	82000
phenanthrene	15		
anthracene	2.8	23000	610000
carbazole	1.6	32	290
fluoranthene	13	3100	82000
pyrene	14	2300	61000
butyl benzyl phthalate (06)	1.2	16000	410000
benzo(a)anthracene	*7.1*	*0.880*	7.800
bis(2-ethylhexyl)phthalate	4.300	46	410
chrysene	6.1	88	780
benzo(b)fluoranthene	*10*	*0.880*	7.800
benzo(a)pyrene	*4.3*	*0.088*	*0.780*
indeno(1,2,3-cd)pyrene	3.2	*0.880*	7.800
dibenz(a,h)anthracene	*0.91*	*0.088*	0.780
benzo(ghi)perylene	2.7		

Note: The maximum concentrations were detected in sample 634-11-01, unless otherwise noted in parenthesis, between 1 and 6 feet below the concrete pad.

2.3 *CONCLUSIONS*

Based on the results of this analysis, the following conclusions are drawn:

- Low ppm levels of polynuclear aromatic hydrocarbons (PNAs) were detected in subsurface soil samples; these samples were collected between 1 and 6 feet below a concrete pad and fill material underlying the Sheet Metal Shop building.

- Concentrations of five PNAs ((benzo(a)anthracene, benzo(b) fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene) exceeded the residential land use health-based screening levels developed while only benzo(b) fluoranthene, benzo(a)pyrene, and dibenz(a,h)anthracene exceeded the industrial land use health-based screening levels.

- There is currently no direct contact with the soils beneath the concrete pad, fill material, and Sheet Metal Shop building and it is the intention of the property owners to retain the existing concrete pad after possible razing of the building. Therefore, an evaluation of direct contact exposures indicates that, even if routine exposures to the soils occurs, unacceptable levels of risk would not be associated with direct contact to on-site soils in OMSA.

3.0 MEDIA PATHWAYS ANALYSIS

In order to further evaluate the potential risks associated with concentrations in soil at the Dixie Narco site, a media pathways analysis was performed. This analysis had two objectives:

- To evaluate the potential for human populations to be exposed to concentrations reported in the soil samples from the site, and
- To identify the types of exposures which could reasonably be expected to occur.

To accomplish these objectives, potential exposure pathways were evaluated for soils and consideration was made of the environmental fate processes associated with the concentrations.

3.1 SOILS

Four primary exposure/migration pathways may be associated with soil, as listed below:

- Direct contact with soils (i.e., incidental ingestion and dermal contact);
- Inhalation of volatiles and fugitive dust released to air;
- Stormwater runoff to adjacent surface water bodies (and subsequent use or contact with surface water/sediment); and
- Leaching of constituents to ground water (and subsequent use of ground water as a residential or industrial water supply).

The PNA contaminated soils at the Dixie Narco site are confined to the subsurface (i.e., present at depth of greater than one foot beneath a concrete pad). Because of the localized nature of the PNAs beneath the concrete pad, routine direct contact with soils, release of volatiles and fugitive dust to air, and surface runoff are not considered exposure pathways of potential concern. The PNAs have not been detected at depth and impact on ground water in the area is not suspected. Thus, no exposure pathways exist for the PNAs to a human receptor as long as the concrete pad remains intact.

3.2 *CONCLUSIONS*

An evaluation of potential exposure pathways for PNAs in soils was conducted. Because the PNAs are localized beneath a concrete pad at the OMSA these materials are not accessible to a human population nor have they appeared to migrate to ground water. Therefore, exposure pathways were not identified for this site.

4.0 SUMMARY AND RECOMMENDATIONS

Based on the results of the analysis presented in this report, the following summary points and conclusions may be drawn:

- Low levels of volatiles and semivolatile (primarily PNAs) were reported in the subsurface soil samples; these samples are beneath a concrete pad at depths of 1 to 6 feet.

- Only benzo(a)anthracene, benzo(b)fluoranthene, benzo(a)pyrene, indeno(1,2,3-cd)pyrene, and dibenz(a,h)anthracene exceeded the residential health-based screening levels developed by US EPA Region III. Only benzo(b)fluoranthene, benzo(a)pyrene, and dibenz(a,h)anthracene exceeded the industrial-use health-based screening levels. All other compounds detected on site were below these residential levels for evaluation of direct contact exposures, indicating that, even in the event that routine exposure to soils were to occur, no unacceptable levels of risk would be associated with direct contact of soils.

- The opportunity for direct contact with these soils is limited; exposure to these soils would only be expected to occur during excavation (e.g., exposure by workers could occur during repair or maintenance of utility lines), which would be an infrequent event, or removal of the concrete pad.

- Other exposure pathways of potential concern do not exist for the on-site soils.

Thus, based on the evaluation presented in this report, concentrations of PNAs in soils do not present a potential risk to human populations, and no further action is indicated at this time. The concrete pad should be maintained so that future exposure does not occur.

5.0 REFERENCES

ERM, Inc. 14 October 1991. Sampling Plan for Tool Area at Dixie Narco, Inc. Ranson, WV. (project number 634-01).

ERM, Inc. 24 April 1992. Investigation of Old Materials Storage Area Dixie Narco, Inc. Ranson, WV. (project number 634-04).

ERM, Inc. 27 April 1992. Powder Finishing, Deburring, and Sheet Metal Area Investigations Dixie Narco, Inc. Ranson, WV. (project number 634-01).

ERM, Inc. 23 October 1992. Additional Site Investigations - Old Material Storage Area and Powder Finishing Building (Exterior) , Former Dixie Narco, Inc. Facility Ranson, WV (project number 634-11).

US EPA. 1995. Risk-Based Concentration Table, October 1995, prepared by Roy L. Smith, Ph.D., Senior Toxicologist, Region III.

A MEMBER OF THE ENVIRONMENTAL RESOURCES MANAGEMENT GROUP

Closure Report

Hazardous Waste Storage Building
Dixie Narco Inc. Facility
Ranson, WV

February 1995

Prepared by:

ERM-EnviroClean, Inc.
20120 Route 19 North, Suite 208
Cranberry Twp., Pennsylvania 16066

Prepared for:
Maytag Corporation
403 W. Fourth Street N.
Newton, Iowa 50208

ERM

1.0 INTRODUCTION

The Maytag-Dixie Narco, Inc. facility in Ranson, West Virginia is currently inactive and contains a hazardous waste storage building that was recently closed in accordance with an approved closure plan and applicable state and federal regulations. ERM-EnviroClean, Inc. (ERM) performed the closure in November 1994. This report describes the specific procedures employed in the closure of building and presents the analytical results of soil samples collected from beneath the building's foundation.

1.1 BACKGROUND

The hazardous waste storage building is an approximately 24 foot by 61 foot metal building with concrete flooring which has historically been used to store hazardous waste and some virgin materials. These materials include: paint containing lead, cadmium and chromium; spent and virgin methylene chloride; spent 1,1,1-trichloroethane; spent and virgin xylene; spent and virgin butyl carbitol; wastewater treatment sludge; mineral spirits; chlorinated solvent mixtures; and hydrated lime. There has reportedly been no history of spills from the building.

The building's concrete floor (containment pad) measures approximately eight inches in thickness and is underlain with a plastic liner and stone base. A containment wall/dike is present around the entire perimeter of the pad with the exception of a ten foot access way at the southern entrance of the building. The containment wall is constructed of masonry block and has approximate dimensions of eight inches thick by eight inches high. In addition to the diking structure, a floor drain-collection trench lies along the southern portion of the containment pad and is designed to collect any spilled material. The trench drains to a concrete sump west of the building. Both the sump and trench system are reported to meet NFPA requirements.

2.0 CLOSURE ACTIVITIES

2.1 Inspection

Prior to initiating closure activities, the containment pad and diking structure were inspected by an independent professional engineer registered with the State of West Virginia for the presence of visible waste residue and damage such as cracks and gaps. Mr. Richard Ruckman, PE, accompanied by Mr. Norm Wilt of Maytag and Mr. John Thompson of ERM, conducted the inspection on 7 November 1994. At the time of the initial inspection no waste or virgin chemicals were being stored in the building. According to Mr. Ruckman's inspection report, which is provided as Attachment 1 to this document, no visible waste residue was observed on the pad or dike walls, however, several cracks and gaps, ranging from 1/16 inch to 1/2 inch in width, were identified. The most significant damage was present on the northeast corner of the pad, and appeared to have been caused by settling of the floor slab.

2.2 Decontamination

Decontamination of the hazardous waste storage building was performed on 14 - 16 November 1994, and consisted of washing the entire interior of the building including the floor, diking structure and trench system using a hot, high pressure water and detergent followed by a clean water rinse. To ensure that contaminants were not released to underlying soils during the decontamination process, the cracks and gaps identified in the inspection report were sealed with a mortar mix prior to commencing decontamination activities. All decontamination fluids were collected and contained. Wastes generated during the decontamination process included one 55-gallon drum of rinse water and one 55-gallon drum of general debris.

2.3 Soil Sampling

As specified in the approved closure plan, a subsurface investigation was conducted to determine whether contaminants had migrated below the building. The investigation consisted of collecting five soil samples from below the stone base of the building. The sample locations were selected in accordance with the approved closure plan. As specified in the closure plan, a grid was established over the entire floor of the building. Following the marking of the grid, five representative grids were selected

and one sample was collected from the center of each. Figure 2-1 depicts the grid and the five sample locations.

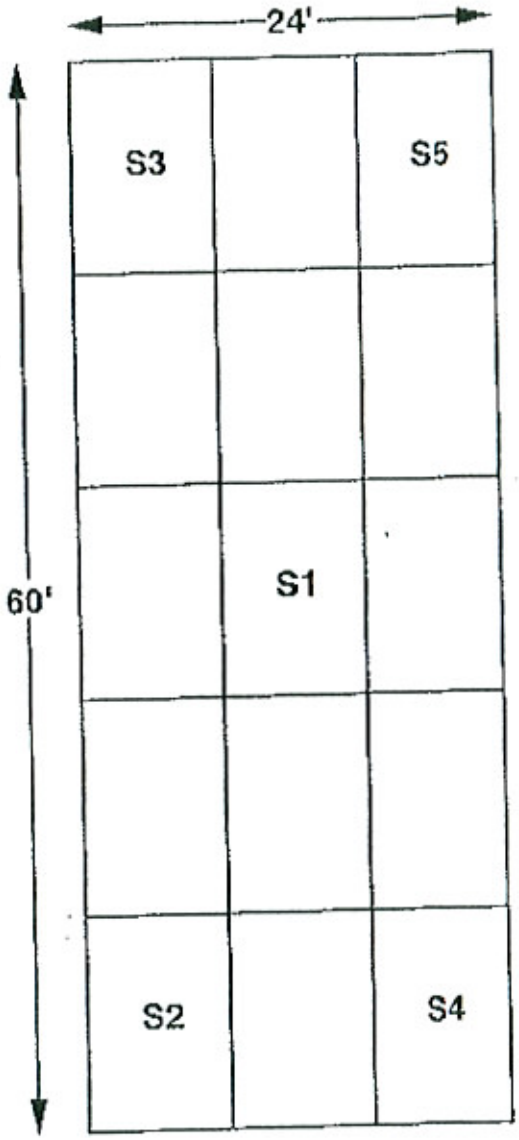
To collect the samples, access holes were cut through the 8 inch concrete pad and the 4 inch stone base using a core drill. A sample of the soil immediately beneath the stone base was collected from each location using a hand auger. The samples were removed from the hand auger and placed directly into laboratory-supplied containers. All of the samples were then placed into a cooler, packed with ice or cold packs, and delivered via overnight courier to Antech Ltd. Analytical Laboratories in Export, PA for analysis. A chain-of-custody was completed and included with the samples. A copy of the chain-of-custody is provided in Attachment 2. After the soil samples were collected the five access holes were sealed using mortar mix.

Prior to collecting each sample, all sampling equipment was decontaminated using the following steps to minimize the potential for cross-contamination:

- tap water wash;
- Alconox solution wash;
- deionized water rinse;
- methanol rinse;
- double deionized water rinse; and
- air dry.

3.0 *RESULTS*

The soil samples were analyzed for the following constituents: total cadmium, total chromium, total lead, total xylene, methylene chloride, and 1,1,1-trichloroethane. A summary of the results is provided in Table 3-1, with the laboratory data sheets provided in Attachment 3. Chromium and lead were detected in various concentrations in all five samples, cadmium was detected in four samples, and methylene chloride was detected in one sample. Xylene and 1,1,1-trichloroethane were not present above method detection limits in any of the samples.



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W.O. # 99496.00.01	Drawn by/date: C. Noga 12/27/94 Scale: 1 inch = 1 foot	Figure 2-1 Sampling Grid Dixie Narco, Inc. Ranson, West Virginia	ERM

Table 3-1
Analytical Results of Soil Samples

Parameters	USEPA Method	S1	S2	S3	S4	S5
Total Cadmium (mg/kg)	7130	0.51	<0.20	0.23	0.21	1.6
Total Chromium (mg/kg)	7191	7.2	13	11	4.3	5.1
Total Lead (mg/kg)	7421	69	21	9	38	330
Total Xylenes (ug/kg)	8020	<5.0	<5.0	<5.0	<5.0	<5.0
Methylene chloride (ug/kg)	8240	<5.0	<5.0	<5.0	<5.0	25
1,1,1-Trichloroethane (ug/kg)	8240	<5.0	<5.0	<5.0	<5.0	<5.0

4.0 *DISPOSAL OF WASTE GENERATED DURING DECONTAMINATION*

Two (2) fifty-five gallon drums of waste were generated during decontamination activities - one drum of decontamination rinse water and one drum of general debris (trash). Two - one quart composite samples from each drum were collected and shipped to Northeast Environmental Services of America, Inc. (NES) for waste approval prior to disposal. The decontamination rinse water (MCS No. P1192-98-AOO1) was approved as a non-hazardous wastewater and the general debris (MCS No. P1192-93-A002) was approved as a non-hazardous solid waste. The approved material characterization sheets are provided in Attachment 4. The two drums of waste were picked up by NES on 25 January 1995 for disposal and the Bill of Lading was signed by Norm Wilt of Maytag. A copy of the Bill of Lading is also included in Attachment 3.

5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on execution of the approved closure plan and the results of underlying soil analysis, ERM recommends a clean closure of the Hazardous Waste Storage Building at the Dixie Narco, Inc. Facility in Ranson, WV.

The recommendation for clean closure is based upon two issues which are described below.

1. ERM reviewed USEPA OSWER Directive # 9355.4-12 (Revised Interim Soil Lead Guidance for CERCLA and RCRA Corrective Action Facilities) with respect to the total soil lead concentration of 330 ppm. The directive recommends a screening level of 400 ppm based upon residential soil use. Concentrations below this level would likely not require additional investigation under the residential use scenario. This facility is a commercial/industrial operation which yields a lower human exposure.
2. The soil is present under and 8 inch concrete pad and therefore not accessible to a population. Additionally, the leachability of the compounds detected in the soil samples should be greatly reduced because of the impermeable concrete pad.

A clean closure of the storage building would seem appropriate based upon the limited potential for human exposure, concrete pad reducing leachability, and the highest soil lead concentration below the screening level of 400 ppm recommended by the USEPA.

ENVIRONMENTAL

MAY 15 1995

DOUGLAS R. WILSON
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9 May 1995

Doug Wilson
Corporate Director Environment
Maytag Corp.
403 W. Fourth Street North
Newton, IA 50208

RE: Comment on Presence of Methylene Chloride in Soil Sample S5
Closure Report for Hazardous Waste Storage Building
Dixie Narco, Inc. Facility
Ranson, WV

Dear Mr. Wilson

At your request, ERM-EnviroClean, Inc. (ERM) is providing this letter to address the presence of methylene chloride in soil sample S5 which was collected from below the concrete floor slab at the former Hazardous Waste Storage Building at the referenced facility. The results of the soil samples are provided in Table 3.1 of the Closure Report.

The presence of methylene chloride in sample S5 at 25 µg/kg is well below the USEPA's risk based screening level of 760 mg/kg in soil at industrial sites. It is also below the corresponding screening level of 85 mg/kg in soil for residential use. ERM-EnviroClean, Inc. consulted USEPA Region III "Risk Based Concentration Table, January - June 1995" issued on March 7, 1995 to determine the screening level stated above.

If you have any questions regarding the information provided above or need additional information, please contact me at 412/772-1022.

Sincerely,

John C. Thompson
Project Manager

cc: D. Guzik, S. Porfido, and, B. Robertson

MAYTAG

Maytag Corporation
403 West Fourth Street North
Newton, Iowa 50208
Tel: 515-792-8000

June 2, 1995

Mike Dorsey
Office of Waste Management
WVDEP
1356 Hansford Street
Charleston, WV 25301

Subject: Closure Report for Hazardous Waste Storage Building
Former Dixie-Narco, Inc. Facility
North Lawrence Street
Ranson, WV 25438

Dear Mr. Dorsey:

Attached is a copy of the Closure Report for the referenced Hazardous Waste Storage Building. Closure activities were performed by ERM EnviroClean, Inc. (ERM) in accordance with the approved Closure Plan. Execution of the Closure Plan included inspection of the building's floor, decontamination of the building's interior, and sampling of the soil beneath the concrete floor. Based on execution of the plan and results of soil sampling, Maytag recommends a clean closure of the Hazardous Waste Storage Building.

The results of soil analysis are presented in the Closure Report. Notably, lead was detected at a maximum concentration of 330 mg/kg. The presence of the lead was considered in conjunction with USEPA screening levels and risk based issues in the recommendation for a clean closure. ERM has also addressed methylene chloride in the attached letter.

Sincerely,

Douglas R. Wilson
Corporate Director Environment

Attachments