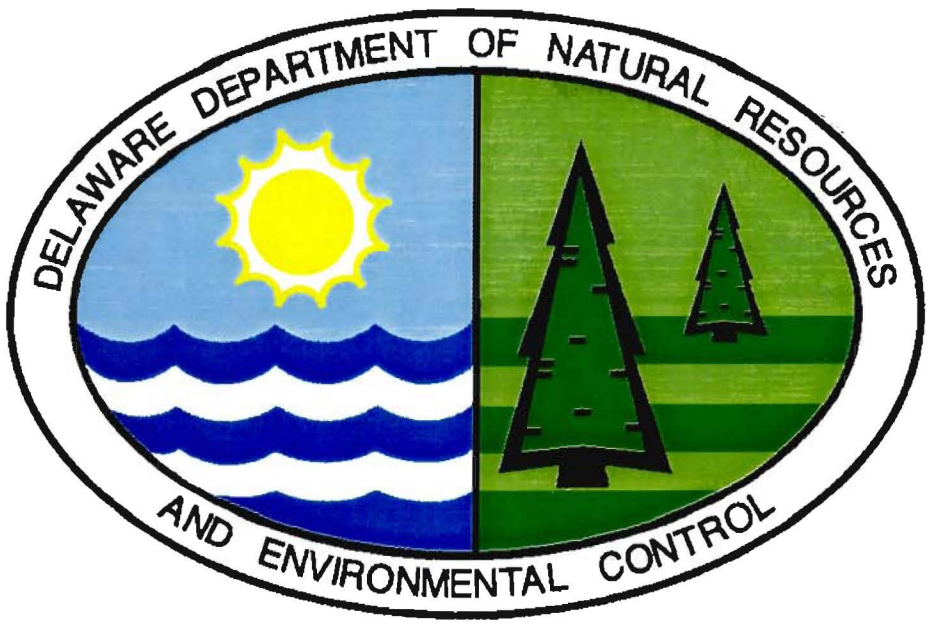
FINAL PLAN OF REMEDIAL ACTION

Jackson Pit – Operable Unit 1
Lewes, Delaware

DE - 0149



February 2003

Delaware Department of Natural Resources & Environmental Control
Division of Air and Waste Management
Site Investigation and Restoration Branch

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APPENDICIES

1.0 INTRODUCTION

Jackson Pit is located southwest of the town of Lewes in Sussex County, Delaware (Figure 1). This final plan of remedial action (final plan) will address a 5.05 acre portion of the 21.54 acre lot, which DNREC is referring to as operable unit 1 (OU-1). Mr. Mark Slaughter recently purchased OU-1 (site). The adjacent parcel, which includes the actual borrow pit and waste disposal areas, will be referred to as operable unit 2 (OU-2), and will be addressed separately at a later date. OU-1 is bordered by Route 276 to the northwest, OU-2 to the west, and crop land and wooded area to the south.

DNREC performed a facility evaluation (FE) on the site in November 1997. The purpose of the FE was to: 1) collect additional information from the site and review information from previous environmental investigations, 2) understand the nature and extent of any soil and/or groundwater contamination at the site, and 3) evaluate risks to public health, welfare and the environment associated with any identified contamination. Mr. Mark Slaughter desires to obtain a Certification of Completion of Remedy (COCR) from DNREC upon completion of all required tasks for OU-1.

This document is the Department's final plan for the site. It is based on the results of the previous investigations performed at the site. This final plan is issued under the provisions of the Hazardous Substance Cleanup Act, 7 Del. C. Chapter 91 (HSCA) and the Regulations Governing Hazardous Substance Cleanup (Regulations). It presents the Department's assessment of the potential health and environmental risk posed by the site.

In accordance with Section 12 of the Regulations, DNREC provided notice to the public and an opportunity for the public to comment on the proposed plan of remedial action (proposed plan). During the comment period of January 2, 2003 through January 21, 2003, DNREC received no comments on the proposed plan, and can subsequently issue this final plan of remedial action (final plan). The final plan designates the selected remedy for the site. All prior investigations of the site, the proposed plan, and the final plan will constitute the remedial decision record.

Section 2 presents a summary of the site description, site history and previous investigations of the site. Section 3 provides a description of the remedial investigation results. Section 4 presents a discussion of the remedial objectives. Section 5 presents the final plan of remedial action for OU-1. Section 6 discusses public participation requirements. Section 7 is the declaration portion of the final plan.

2.0 SITE DESCRIPTION AND HISTORY

This site is located southwest of the Town of Lewes in Sussex County, Delaware and is accessible from Route 275 heading southeast from Five Points. The site occupies approximately 5.05 acres of land and consists of one parcel, Sussex County tax parcel #378.09. It is bordered by Route 276 to the northwest, an adjacent parcel, which includes the actual borrow pit and waste disposal areas to the west and crop land and wooded area to the south (Figure 2). Fill dirt, tree stumps and vegetative material had been placed on the site. DNREC's Solid Waste Branch gave permission to store this material temporarily on-site. Adjacent to OU-1 is a borrow pit and open area containing piles of wood debris, asphalt, and concrete. There is also a landfill area

located on OU-2. On-site toward the north, a low, wet area is apparent with no visible debris present.

The nearest water supply well is located approximately 400 feet to the southwest. Residential homes with domestic wells are located along Route 276, approximately 1,000 feet northwest of the landfill area. A public water supply well for a residential development is located approximately 1,500 feet southwest of the landfill area. The Town of Lewes operates five municipal wells located along Route 9, approximately one mile northeast of the site.

2.1 Site and Project History

Mr. Harland Jackson acquired the 21.54-acre lot (OU-1 and OU-2) during the early 1960s. He operated a garbage dump, on the adjacent parcel, for many years after the site was used as a borrow pit. Dumping occurred from at least the 1970s until 1982. Numerous debris fires occurred at the dumpsite during the late 1970s. Department approval was given to dispose of tree stumps, lumber and masonry materials until 1993. Specific areas contain buried household waste. During operation, sewage disposal trucks were witnessed entering the site landfill area by local residents. In recent years, the owners have maintained minimal security to restrict illegal dumpers, however, only a limited amount of dumping has occurred.

In 2002, Mark Slaughter contacted DNREC, and performed additional groundwater monitoring on OU-1, and submitted the results to DNREC. Mr. Slaughter intends to redevelop the property for townhouses.

3.0 INVESTIGATION RESULTS

DNREC conducted an extensive review of past investigations prepared for the property (OU-1 and OU-2), as discussed below.

3.1 Preliminary Assessment

In October 1986, a preliminary assessment (PA) was performed by the DNREC. No environmental samples were collected during the PA. Based on the results of the PA, no further action was recommended.

3.2 Site Investigation

In September 1988, NUS Corporation conducted a site inspection (SI) under contract from the U.S. Environmental Protection Agency (EPA). The SI report indicates that during the 1970s, only household garbage, wood, and brick debris was dumped at the site. Glass bottles, cans, plastics, and various household trash items were exposed in an area approximately 100 feet long by 25 feet wide. According to a DNREC representative, prior to the SI, approximately 15 to18 feet of fill material was placed at the property. At the time, the property was leveled from sand and gravel disposal and grading that had occurred.

Only one background soil sample (CK 249/MCJ 125) was taken on the site referred to as OU-1, but additional soil sampling did occur on the adjacent parcel, OU-2. The analytical results from

the SI indicated that the results for the background soil sample identified the presence of 1,1-dichloroethane (0.006 milligrams per kilogram or mg/kg) and toluene (0.009 mg/kg), but at concentrations that are well below the current Uniform Risk Standards (URS) for unrestricted use (i.e., residential use) of the property, of 780 mg/kg and 650 mg/kg, respectively.

3.3 Facility Evaluation

A facility evaluation (FE) was conducted by DNREC in November 1997. The FE work plan called for DNREC to perform the following tasks:

- Install shallow, groundwater monitoring wells and collect groundwater samples from the unconfined aquifer; and
- Excavate test pits of the waste disposal areas and collect soil/waste samples, including one background soil sample.

3.3.1 Soils

On OU1, DNREC excavated seven test pits and took soil samples for laboratory analysis (Figure 3). In test pit number 11 (TP-11), benzo(a)pyrene (0.37 mg/kg) and iron (2,660 mg/kg) exceeded the unrestricted URS of 0.09 mg/kg and 2,300 mg/kg, respectively, for subsurface soil in samples collected at depths of 3-10 feet below ground surface. There were no other exceedences found in the soil samples from the remaining test pits.

3.3.2 Groundwater

On OU-1, DNREC installed one monitoring well from which was collected one groundwater sample. Manganese (234 micrograms per liter or μg/L), aluminum (417 μg/L), and total chromium (14.3 μg/L), exceeded the URS of 50 μg/L, 200 μg/L, and 11 μg/L, respectively, for groundwater in monitoring well number one (MW-1).

3.3.3 Summary

The results of the investigations indicated contaminants were detected on OU-1 at levels exceeding the URS based on unrestricted land use. Specifically, in TP-11, benzo(a)pyrene and iron exceeded the standards for subsurface soil in the soil samples collected at depths of 3-10 feet below ground surface.

Manganese, aluminum, and total chromium exceeded the URS for groundwater in MW-1. It is important to note that aluminum and manganese are naturally occurring elements in Delaware's groundwater and their URS values found in DNREC's remediation standards guidance documents are based on National Secondary Drinking Water Regulations (NSDWR). NSDWRs are non-enforceable guidelines regulating contaminants that may cause cosmetic effects (such as skin or tooth discoloration) or aesthetic effects (such as taste, odor, or color) in drinking water, and do not pose a human health risk.

3.4 Additional Groundwater Sampling

At the request of Mark Slaughter, Environmental Solutions Group, Inc. (ESG) collected additional groundwater samples from the monitoring wells located at OU-1. Prior to sampling, ESG consulted DNREC on the contaminants of concern in the groundwater found on this property. These included: chromium, pesticides and PCBs. Initial samples taken from MW-1 and MW-2 on March 6, 2002, were analyzed by Lancaster Laboratories, Inc. of Lancaster, PA. The only contaminants detected in the groundwater samples were: total chromium and the pesticide, p,p- DDD. An elevated level of total chromium was also detected in MW-1. Both groundwater wells were resampled to speciate the concentrations of trivalent and hexavalent chromium. The results from this round of sampling showed no evidence in either well of elevated levels of hexavalent or trivalent chromium. MW-2 was found to contain an detectable level of p,p-DDD. However, the concentration of the pesticide found was 0.036 μg/L, which is below the URS value of 0.30 μg/L. PCBs were present in the samples at or below their detection limits. The results from the second round of sampling were used in DNREC's risk analysis.

3.5 Risk Evaluation

Based on applying DNREC's Site Specific Risk Calculator, using the highest soil contaminant concentrations which were found in soil sample TP-11, OU-1 does not pose a risk to human health that would require a remedial action under the HSCA program. The calculated risk was 2.89×10^{-6}, which is less than 1×10^{-5}, the accepted risk allowed by the Department's HSCA Regulations. Therefore, remedial action for soils is not necessary.

The Site Specific Risk Calculator was also used for an evaluation of the risk posed by the contaminants present in the groundwater in MW-1 and MW-2. The results were based on the highest concentration of each contaminant found in either of the two wells and were shown to present a cancer risk greater than 1×10^{-5}. The calculated cancer risk posed was 2.21×10^{-6}, which is less than the acceptable level of risk of 1×10^{-5}. The calculated non-carcinogenic risk posed was 0.11, which does not exceed the Hazard Index of 1.0. PCBs were not detected above their respective detection limits and were not considered a contaminant of concern in the risk evaluation.

In addition, DNREC has determined that marginal degradation of groundwater quality exists in the unconfined aquifer that may be attributable to background or naturally occurring conditions. This conclusion is different from the conclusion in the 1997 FE report, that the buried debris was the likely source of degradation of groundwater quality. As questions remain concerning the oxidation state of chromium in the groundwater, DNREC intends to restrict groundwater use in the area as a precautionary measure.

4.0 REMEDIAL ACTION OBJECTIVES

According to Section 8.4(1) of the Regulations, site-specific remedial action objectives (RAOs) must be established for all plans of remedial action. The Regulations provide that DNREC set objectives for land use, resource use, and cleanup levels that are protective of human health and the environment.

Qualitative objectives describe, in general terms, what the ultimate result of the remedial action, if necessary, should be. The following qualitative objective is determined to be appropriate for the site:

- Prevent human exposure to groundwater which may be contaminated due to the uncertainty associated with detections of chromium and p, p- DDD.

This objective is consistent with the proposed use of the site for townhouses, Sussex County zoning policies, state regulations governing water supply, and worker health and safety.

Quantitative objectives define specific levels of remedial action to achieve protection of human health and the environment. Based on the above qualitative objectives, the quantitative objectives will be to ensure that future site users such as residents, construction workers, visitors, and trespassers do not come in contact with soils and groundwater that contain constituents which exceed a cumulative cancer risk of $1x10^{-5}$.

5.0 FINAL PLAN OF REMEDIAL ACTION

Based on DNREC's evaluation of the site information and the above remedial action objectives, the recommended action for the site will include the following:

- DNREC will establish a groundwater management zone (GMZ) within six weeks of adopting the final plan. The GMZ will prohibit groundwater withdrawals at this site;

- The property owner shall place a deed restriction on OU-1, no longer than ninety days following DNREC's adoption of the final plan. The deed restriction will prohibit the installation of any water wells on, or groundwater usage at the site without prior written approval of DNREC, and will identify OU-1 as located within a GMZ; and

- DNREC recommends that the property owner remove any non-hazardous solid waste found on the property during regrading activities on OU-1. However, if any evidence of soil contamination and/or hazardous substances/wastes are identified during the site clearing and regrading, then the owner must notify DNREC pursuant to 7 Del. C. § 6028. If a release of a hazardous substance is found, further action pursuant to the regulations governing hazardous substance cleanup may be required.

6.0 PUBLIC PARTICIPATION

The Department actively solicited public comments or suggestions on the proposed plan of remedial action. The public comment period began on, January 2, 2003 and ended at the close of business January 21, 2003. No comments were received during the public comment period.

7.0 DECLARATION

This final plan of remedial action for the Jackson Pit OU-1 site is protective of human health, welfare, and the environment and is consistent with the requirements of the Delaware Hazardous Substance Cleanup Act.

John Blevins, Director
Division of Air and Waste Management

2/25/03
Date

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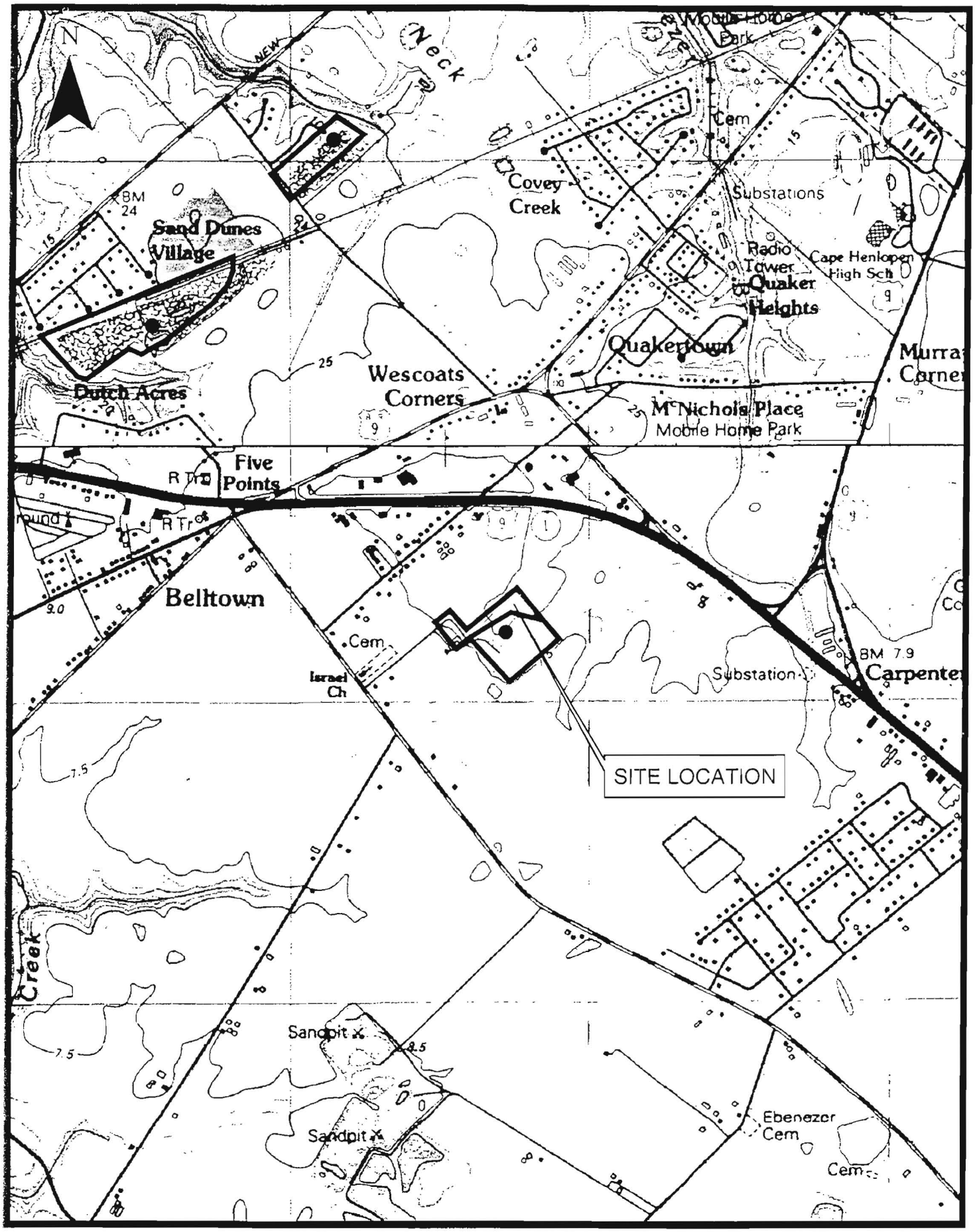
Figure 1: SITE LOCATION



JACKSON PIT OU1

0.25 0.125 0 0.25 0.5 0.75 Miles

Figure 2: AERIAL PHOTOGRAPH

JACKSON PIT OU1

1 inch equals 187.50 feet

0 75 150 300 450 600
Feet

Figure 3: SAMPLE LOCATION MAP

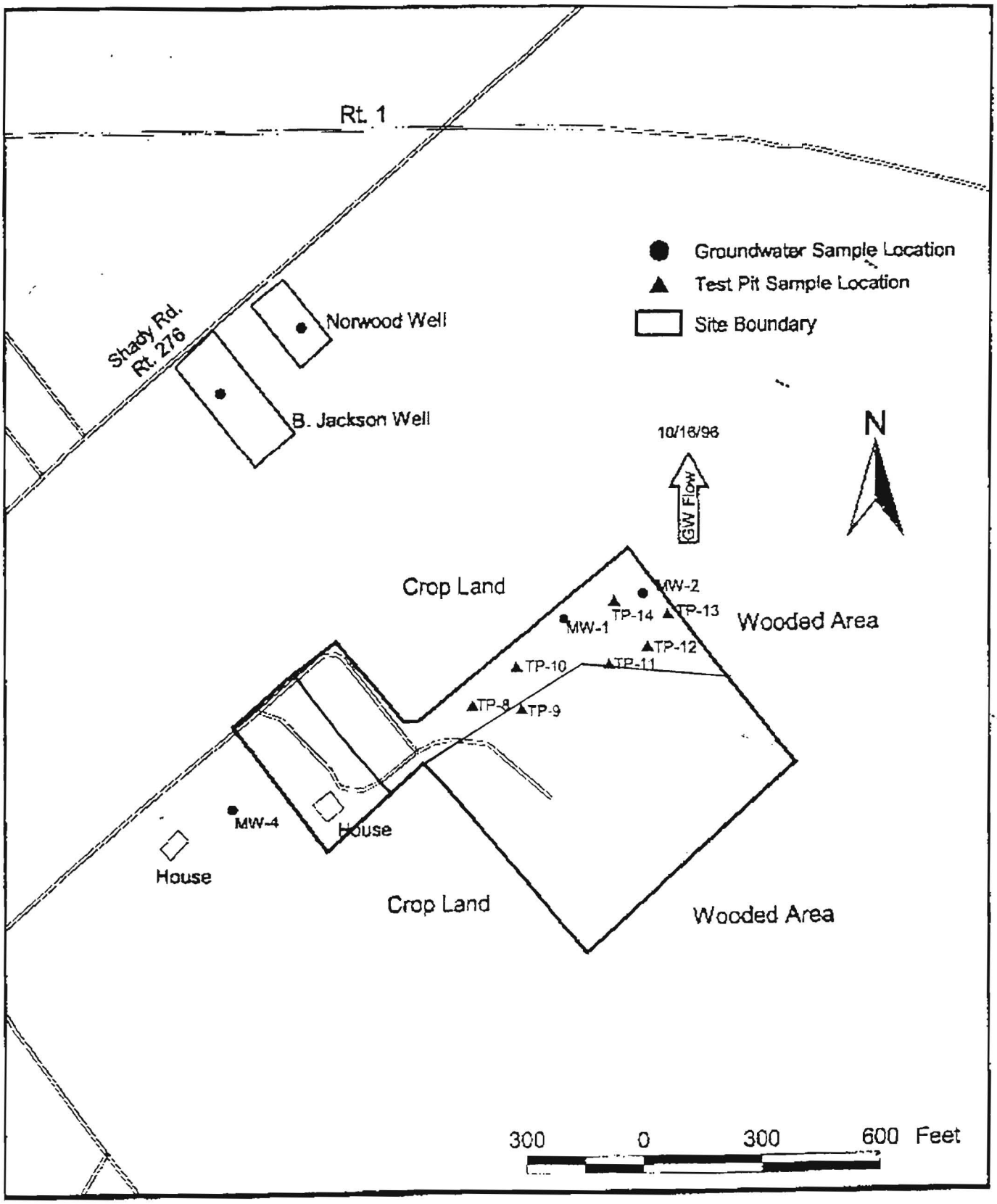


Figure 3 : Sample Location Map

JACKSON PIT: MW-1

Groundwater Sample collected on March 6, 2002

	REPORTED RESULT (mg/L)	URS VALUE (mg/L)		DETECTION LIMIT (mg/L)
Barium	0.172	2		0.1
Chromium	0.0316	0.1		0.03
Lead	< 0.0088	0.015		0.0088
	(µg/L)	(µg/L)		(µg/L)
Alpha BHC (HCH)	< 0.010	0.01		0.01
Beta BHC (HCH)	< 0.010	0.04		0.01
Gamma BHC -Lindane (HCH)	< 0.010	0.2		0.01
Delta BHC (HCH)	< 0.010	0.01 (Strictest from other BHCs)		0.01
Heptachlor	< 0.010	0.4	PQL = 0.01	0.01
Aldrin	< 0.010	0.004		0.01
Heptachlor Epoxide	< 0.010	0.2		0.01
p,p-DDE	< 0.021	0.2		0.021
p,p-DDD	< 0.021	0.3		0.021
p,p-DDT	< 0.021	0.2		0.021
Dieldrin	< 0.021	0.004	PQL = 0.02	0.021
Endrin	< 0.021	2		0.021
Chlordane	< 0.52	2		0.52
Toxaphene	< 1.0	3		1
Endosulfan II	< 0.062	22 (Total Endosulfan)		0.062
Endosulfan I	< 0.010	22 (Total Endosulfan)		0.01
Endosulfan Sulfate	< 0.021	22 (Total Endosulfan)		0.021
Endrin Aldehyde	< 0.021	2 (Endrin)		0.021
PCB-1016	< 0.52	0.1 (RBC)*		0.52
PCB-1221	< 1.0	0.03	PQL = 1.0	1
PCB-1232	< 0.52	0.03	PQL = 0.52	0.52
PCB-1242	< 0.52	0.03	PQL = 0.52	0.52
PCB-1248	< 0.52	0.03	PQL = 0.52	0.52
PCB-1254	< 0.52	0.03	PQL = 0.52	0.52
PCB-1260	< 0.52	0.03	PQL = 0.52	0.52
Methoxychlor	< 0.10	40		0.1

	REPORTED RESULT (µg/L)	URS VALUE (µg/L)		DETECTION LIMIT (µg/L)
Total Chromium	< 30.0			30
Trivalent Chromium	< 30.0	100		30
Hexavalent Chromium	< 10.0	11		10

JACKSON PIT: MW-2

Groundwater Sample collected on March 6, 2002

	REPORTED RESULT (mg/L)	URS VALUE (mg/L)		DETECTION LIMIT (mg/L)
Barium	< 0.100	2		0.1
Chromium	< 0.0300	0.1		0.03
Lead	< 0.0088	0.015		0.0088
	(µg/L)	(µg/L)		(µg/L)
Alpha BHC (HCH)	< 0.010	0.01		0.01
Beta BHC (HCH)	< 0.010	0.04		0.01
Gamma BHC -Lindane (HCH)	< 0.010	0.2		0.01
Delta BHC (HCH)	< 0.010	0.01 (Strictest from other BHCs)		0.01
Heptachlor	< 0.010	0.4	PQL = 0.01	0.01
Aldrin	< 0.010	0.004		0.01
Heptachlor Epoxide	< 0.010	0.2		0.01
p,p-DDE	< 0.021	0.2		0.021
p,p-DDD	0.036	0.3		0.021
p,p-DDT	< 0.021	0.2		0.021
Dieldrin	< 0.021	0.004	PQL = 0.02	0.021
Endrin	< 0.021	2		0.021
Chlordane	< 0.52	2		0.52
Toxaphene	< 1.0	3		1
Endosulfan II	< 0.063	22 (Total Endosulfan)		0.062
Endosulfan I	< 0.010	22 (Total Endosulfan)		0.01
Endosulfan Sulfate	< 0.021	22 (Total Endosulfan)		0.021
Endrin Aldehyde	< 0.021	2 (Endrin)		0.021
PCB-1016	< 0.52	0.1 (RBC)*		0.52
PCB-1221	< 1.0	0.03	PQL = 1.0	1
PCB-1232	< 0.52	0.03	PQL = 0.52	0.52
PCB-1242	< 0.52	0.03	PQL = 0.52	0.52
PCB-1248	< 0.52	0.03	PQL = 0.52	0.52
PCB-1254	< 0.52	0.03	PQL = 0.52	0.52
PCB-1260	< 0.52	0.03	PQL = 0.52	0.52
Methoxychlor	< 0.10	40		0.1

	REPORTED RESULT (µg/L)	URS VALUE (µg/L)		DETECTION LIMIT (µg/L)
Total Chromium	< 30.0			30
Trivalent Chromium	< 30.0	100		30
Hexavalent Chromium	< 10.0	11		10

JACKSON PIT (unrestricted use, subsurface soil, non-critical water resource area)

Soil

TABLE 1

Constituent	Sample Value (mg/kg)			URS Value (mg/kg)
	TP-10	TP-11	TP-14	
Aluminum	616	2750	1500	7800
Calcium		4460		
Chromium		24.4	2.5	270
Copper		34		310
Iron	270	**2660**	2090	2300
Lead		66.5	9	400
Manganese		65.1	20.1	160
Mercury		0.1		10
Zinc		195		2300

TABLE 2

Constituent	Sample Value (mg/kg)			URS Value (mg/kg)
	TP-10	TP-11	TP-14	
Toluene	0.026			650

TABLE 3-2

Constituent	Sample Value (mg/kg)			URS Value (mg/kg)
	TP-10	TP-11	TP-14	
Diethylphthalate	0.1	0.17		1000

denotes exceedence of URS value

JACKSON PIT (unrestricted use, subsurface soil, non-critical water resource area)

Soil

TABLE 3-3

Constituent	Sample Value (mg/kg)			URS Value (mg/kg)
	TP-10	TP-11	TP-14	
Phenanthrene		0.58	0.14	1000
Fluoranthene		0.18		310
Pyrene		0.24		230
Benzo(a)anthracene		0.21		0.9
Chrysene		0.34		87
s(2-Ethylhexyl)phthalate		0.048		46
Benzo(b)fluoranthene		0.23		0.9
Benzo(a)fluoranthene		0.12		9
Benzo(a)pyrene		**0.37**		0.09
ndeno(1,2,3-cd)Pyrene		0.18		0.9
Benzo(g,h,i)perylene		0.63		

TABLE 3-4

Constituent		Sample Value (mg/kg)		URS Value (mg/kg)
	TP-10	TP-11	TP-14	
Heptachlor		0.001		0.1
Heptachlor epoxide		0.021		0.07
Dieldrin		0.018		0.04
4,4-DDE		0.02		2
4,4-DDD		0.013		3
4,4-DDT		0.038		2
alpha-Chlordane		0.045		
gamma-Chlordane		0.052		

denotes exceedence of URS value

Command Buttons

Click to learn about this application

Click here to calculate risk

Click on this to filter results

Click to remove results filter

DNREC SITE-SPECIFIC STANDARD CALCULATOR FOR MULTIPLE ANALYTES May, 1999 Version

Site Concentrations Table

Calculated Cancer Risk

Totals By Category: 2.89E-06 | 0.00E+00 | 0.00E+00

Maximum in Each Category: 1.27E-06 | 0.00E+00 | 0.00E+00

Calculated Noncancer Risk

Totals By Category: 0.11 | 0.00 | 0.00

Maximum in Each Category: 0.07 | 0.00 | 0.00

Contaminant Name	CAS Number	Ground Water Concentration ug/L	Soil Concentration (Restricted Use) mg/kg	Soil Concentration (Unrestricted Use) mg/kg	Ground Water Ingestion Cancer Risk	Soil-Related Cancer Risk (Restricted Use)	Soil-Related Cancer Risk (Unrestricted Use)	Ground Water Ingestion Noncancer Risk	Soil-Related Noncancer Risk (Restricted Use)	Soil-Related Noncancer Risk (Unrestricted Use)
METALS										
ALUMINUM	7429905									
ANTIMONY	7440360									
ANTIMONY TETROXIDE	1332816									
ARSENIC	7440382									
BARIUM	7440393	172						0.07		
BERYLLIUM	7440417									
CADMIUM-WATER	7440439									
**CHROMIUM III	16065831	15						0.00		
**CHROMIUM VI	18540299	5						0.05		
COBALT	7440484									
COPPER	7440508									
IRON	7439896									
LEAD		No Risk Calculated for this Analyte						No Risk Calculated for this Analyte		
MANGANESE	7439965									
MERCURY (INORGANIC)	7439976									
NICKEL	7440020									
SELENIUM	7782492									
SILVER	7440224									
THALLIUM	7440280									
TITANIUM	7440326									
TITANIUM DIOXIDE	13463677									
URANIUM (SOLUBLE SALTS)										
VANADIUM	7440622									
VANADIUM SULFATE	16785812									
ZINC	7440666									
CYANIDES										
CALCIUM CYANIDE	592018									
COPPER CYANIDE	544923									
CYANAZINE	21725462									
CYANIDE (FREE)	57125									

Contaminant Name	CAS Number	Ground Water Concentration ug/L	Soil Concentration (Restricted Use) mg/kg	Soil Concentration (Unrestricted Use) mg/kg	Ground Water Ingestion Cancer Risk	Soil-Related Cancer Risk (Restricted Use)	Soil-Related Cancer Risk (Unrestricted Use)	Ground Water Ingestion Noncancer Risk	Soil-Related Noncancer Risk (Restricted Use)	Soil-Related Noncancer Risk (Unrestricted Use)
CYANOGEN	460195									
CYANOGEN BROMIDE	506683									
CYANOGEN CHLORIDE	506774									
HYDROGEN CYANIDE	74908									
POTASSIUM CYANIDE	151508									
POTASSIUM SILVER CYANIDE	506616									
SILVER CYANIDE	506649									
SODIUM CYANIDE	143339									
ZINC CYANIDE	557211									
VOLATILE COMPOUNDS										
**1,3-DICHLOROBENZENE	541731									
**ACETONE	67641									
**ACETONITRILE	75058									
**BROMOFORM	75252									
**CHLOROBENZENE	108907									
**CHLOROMETHANE	74873									
**DIMETHYLAMINE	124403									
1,1,1-TRICHLOROETHANE	71556									
1,1,2,2-TETRACHLOROETHANE	79345									
1,1,2-TRICHLOROETHANE	79005									
1,1-DICHLOROETHANE	75343									
1,2-DIBROMO-3-CHLOROPROPANE	96128									
1,2-DIBROMOETHANE	106934									
1,2-DICHLOROBENZENE	95501									
1,2-DICHLOROETHANE	107062									
1,2-DICHLOROPROPANE	78875									
1,3-DICHLOROPROPENE	542756									
1,4-DICHLOROBENZENE	106467									
2-HEXANONE	591786									
4-CHLOROANILINE	106478									
BENZENE	71432									
BIS(2-CHLOROISOPROPYL)ETHER	108601									
BROMODICHLOROMETHANE	75274									
BROMOMETHANE	74839									
CARBON DISULFIDE	75150									
CARBON TETRACHLORIDE	56235									
CHLOROETHANE	75003									
CHLOROFORM	67663									
CIS-1,2-DICHLOROETHENE	156592									
ETHYLBENZENE	100414									
METHYLENE CHLORIDE	75092									
N-PROPYLBENZENE										
STYRENE	100425									
TERT-BUTYLBENZENE	98066									

Contaminant Name	CAS Number	Ground Water Concentration ug/L	Soil Concentration (Restricted Use) mg/kg	Soil Concentration (Unrestricted Use) mg/kg	Ground Water Ingestion Cancer Risk	Soil-Related Cancer Risk (Restricted Use)	Soil-Related Cancer Risk (Unrestricted Use)	Ground Water Ingestion Noncancer Risk	Soil-Related Noncancer Risk (Restricted Use)	Soil-Related Noncancer Risk (Unrestricted Use)
TETRACHLOROETHENE	127184									
TOLUENE	108883									
TRANS-1,2-DICHLOROETHENE	156605									
TRICHLOROETHENE	79016									
VINYL CHLORIDE	75014									
XYLENES	1330207									
M-XYLENE	108383									
O-XYLENE	95476									
P-XYLENE	106423									
POLYNUCLEAR AROMATIC HYDROCARBONS										
**ACENAPHTHENE	83329									
**ANTHRACENE	120127									
**FLUORENE	86737									
**NAPHTHALENE	91203									
Phenanthrene					No Risk Calculated for this Analyte			No Risk Calculated for this Analyte		
**PYRENE	129000									
2-METHYLNAPHTHALENE	91576									
BENZ[A]ANTHRACENE	56553									
BENZO[A]PYRENE	50328									
BENZO[B]FLUORANTHENE	205992									
BENZO[K]FLUORANTHENE	207089									
CHRYSENE	218019									
DIBENZ[A,H]ANTHRACENE	53703									
FLUORANTHENE	206440									
INDENO[1,2,3-C,D]PYRENE	193395									
POLYCHLORINATED BIPHENYLS										
AROCLOR-1016	12674112									
AROCLOR-1221	11104282									
AROCLOR-1232	11141165									
AROCLOR-1242	53469219									
AROCLOR-1248	12672296									
AROCLOR-1254	11097691									
AROCLOR-1260	11096825									
PESTICIDES	na									
**HEPTACHLOR	76448									
**HEPTACHLOR EPOXIDE	1024573	0.005			6.79E-07					
**TOXAPHENE	8001352									
ALDRIN	309002	0.005			1.27E-06					
DDD	72548	0.036			1.29E-07					
DDE	72559	0.0105			5.33E-08					
DDT	50293	0.0105			5.33E-08					
DIELDRIN	60571									
ENDOSULFAN	115297	0.031						0.00		
ENDRIN	72208									

Contaminant Name	CAS Number	Ground Water Concentration ug/L	Soil Concentration (Restricted Use) mg/kg	Soil Concentration (Unrestricted Use) mg/kg	Ground Water Ingestion Cancer Risk	Soil-Related Cancer Risk (Restricted Use)	Soil-Related Cancer Risk (Unrestricted Use)	Ground Water Ingestion Noncancer Risk	Soil-Related Noncancer Risk (Restricted Use)	Soil-Related Noncancer Risk (Unrestricted Use)
METHOXYCHLOR	72435									
SEMI-VOLITALE COMPOUNDS	na									
**1,2,4,5-TETRACHLOROBENZENE	95943									
**1,2,4-TRIBROMOBENZENE	615543									
**1,4-DIBROMOBENZENE	106376									
**2,4-D	94757									
**2-CHLOROPHENOL	95578									
**ACETALDEHYDE	75070									
**ACRYLONITRILE	107131									
**ANILINE	62533									
**BIS(2-CHLOROETHYL)ETHER	111444									
**BROMOPHOS	2104963									
**CHLORAL	75876									
**CROTONALDEHYDE	123739									
**DINOSEB	88857									
**DISULFOTON	298044									
**EPICHLOROHYDRIN	106898									
**ETHYLENE OXIDE	75218									
**HEXACHLOROBENZENE	118741									
**HEXACHLOROBUTADIENE	87683									
**HEXACHLOROCYCLOPENTADIENE	77474									
**HEXACHLOROETHANE	67721									
**METHYL ISOBUTYL KETONE (4-METHYL-2-PENTANONE)	108101									
**MIREX	2385855									
**MONOCHLORAMINE	10599903									
**N-NITROSO-DI-N-BUTYLAMINE	924163									
**P,A,A,A-TETRACHLOROTOLUENE	5216251									
**PENTACHLOROBENZENE	608935									
**PENTACHLORONITROBENZENE	82688									
**RONNEL	299843									
**TETRAETHYLLEAD	78002									
**TETRAHYDROFURAN	109999									
1,1,1,2-TETRACHLOROETHANE	630206									
1,1,2-TRICHLORO-1,2,2-TRIFLUOROETHANE	76131									
1,1,2-TRICHLOROPROPANE	598776									
1,1-DICHLOROETHENE	75354									
1,1-DIMETHYLHYDRAZINE	57147									
1,2,3-TRICHLOROPROPANE	96184									
1,2,3-TRICHLOROPROPENE	96195									
1,2,4-TRICHLOROBENZENE	120821									
1,2,4-TRIMETHYLBENZENE	95636									
1,2-DIMETHYLHYDRAZINE	540738									
1,2-DINITROBENZENE	528290									

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1,2-DIPHENYLHYDRAZINE	122667									
1,3,5-TRIMETHYLBENZENE	108678									
1,3,5-TRINITROBENZENE	99354									
1,3-DINITROBENZENE	99650									
1,4-DINITROBENZENE	100254									
1,4-DIOXANE	123911									
1,4-DITHIANE	505293									
1-BUTANOL	71363									
1-CHLOROBUTANE	109693									
2-(2,4,5-TRICHLOROPHENOXY)PROPIONIC ACID	93721									
2-(2-METHYL-4-CHLOROPHENOXY)PROPIONIC ACII	93652									
2,3,4,6-TETRACHLOROPHENOL	58902									
2,3,7,8-TETRACHLORODIBENZODIOXIN	1746016									
2,3-DICHLOROPROPANOL	616239									
2,4,5-T	93765									
2,4,5-TRICHLOROPHENOL	95954									
2,4,6-TRICHLOROANILINE	634935									
2,4,6-TRICHLOROPHENOL	88062									
2,4,6-TRINITROTOLUENE	118967									
2,4-DICHLOROPHENOL	120832									
2,4-DIMETHYLANILINE	95681									
2,4-DIMETHYLANILINE HYDROCHLORIDE	21436964									
2,4-DIMETHYLPHENOL	105679									
2,4-DINITROPHENOL	51285									
2,4-DINITROTOLUENE	121142									
2,6-DIMETHYLPHENOL	576261									
2,6-DINITROTOLUENE	606202									
2-CHLORO-1,3-BUTADIENE	126998									
2-ETHOXYETHANOL	110805									
2-METHYL-4-CHLOROPHENOXYACETIC ACID (MCP	94746									
2-METHYL-5-NITROANILINE	99558									
2-METHYLANILINE	95534									
2-METHYLPHENOL	95487									
2-NITROANILINE	88744									
2-PHENYLPHENOL	90437									
3,3'-DICHLOROBENZIDINE	91941									
3,3'-DIMETHOXYBENZIDINE	119904									
3,3'-DIMETHYLBENZIDINE	119937									
3,4-DIMETHYLPHENOL	95658									
3-METHYLPHENOL	108394									
4-(2,4-DICHLOROPHENOXY)BUTYRIC ACID	94826									
4-(2-METHYL-4-CHLOROPHENOXY) BUTYRIC ACID	94815									
4,4'-METHYLENE BIS(2-CHLOROANILINE)	101144									
4,4'-METHYLENE BIS(N,N'-DIMETHYL)ANILINE	101611									

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4,6-DINITRO-2-METHYLPHENOL	534521									
4,6-DINITRO-O-CYCLOHEXYL PHENOL	131895									
4-AMINOPYRIDINE	504245									
4-CHLORO-2-METHYLANILINE	95692									
4-METHYLPHENOL	106445									
4-NITROPHENOL	100027									
ACETOCHLOR	34256821									
ACETOPHENONE	98862									
ACROLEIN	107028									
ACRYLAMIDE	79061									
ALACHLOR	15972608									
ALAR	1596845									
ALDICARB	116063									
ALDICARB SULFONE	1646884									
ALPHA-HCH	319846	0.005			4.70E-07					
ALPHA-METHYLSTYRENE	98839									
AMINODINITROTOLUENES										
ANTIMONY PENTOXIDE	1314609									
ANTIMONY TRIOXIDE	1309644									
ASSURE	76578148									
ATRAZINE	1912249									
AZOBENZENE	103333									
BAYGON	114261									
BAYTHROID	68359375									
BENTAZON	25057890									
BENZALDEHYDE	100527									
BENZENETHIOL	108985									
BENZIDINE	92875									
BENZOIC ACID	65850									
BENZYL ALCOHOL	100516									
BENZYL CHLORIDE	100447									
BETA-CHLORONAPHTHALENE	91587									
BETA-HCH	319857	0.005			1.34E-07					
BIPHENYL	92524									
BIS(2-ETHYLHEXYL)PHTHALATE	117817									
BIS(CHLOROMETHYL)ETHER	542881									
BORON	7440428									
BUTYLATE	2008415									
BUTYLBENZYLPHTHALATE	85687									
CAPROLACTAM	105602									
CARBARYL	63252									
CARBAZOLE	86748									
CARBOSULFAN	55285148									
CHLORANIL	118752									

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CHLORDANE	57749									
CHLORINE	7782505									
CHLOROACETIC ACID	79118									
CHLOROBENZILATE	510156									
CHLORPYRIFOS	2921882									
CHLORPYRIFOS-METHYL	5598130									
CUMENE	98828									
CYCLOHEXANONE	108941									
CYHALOTHRIN/KARATE	68085858									
CYPERMETHRIN	52315078									
DACTHAL	1861321									
DALAPON	75990									
DI(2-ETHYLHEXYL)ADIPATE	103231									
DIAZINON	333415									
DIBENZOFURAN	132649									
DIBENZOFURAN	132649									
DIBROMOCHLOROMETHANE	124481									
DIBUTYLPHTHALATE	84742									
DICAMBA	1918009									
DICHLORODIFLUOROMETHANE	75718									
DICHLORVOS	62737									
DICOFOL	115322									
DICYCLOPENTADIENE	77736									
DIETHYLENE GLYCOL, MONOETHYL ETHER	111900									
DIETHYLPHTHALATE	84662									
DIETHYLSTILBESTROL	56531									
DIFENZOQUAT (AVENGE)	43222486									
DIISOPROPYL METHYLPHOSPHONATE (DIMP)	1445756									
DIMETHYLPHTHALATE	131113									
DINITROTOLUENE MIX										
DIOCTYLPHTHALATE	117840									
DIPHENYLAMINE	122394									
DIQUAT	85007									
DIURON	330541									
Endothal	145733				No Risk Calculated for this Analyte			No Risk Calculated for this Analyte		
ETHION	563122									
ETHYL ACETATE	141786									
ETHYL ETHER	60297									
ETHYL METHACRYLATE	97632									
ETHYLENE DIAMINE	107153									
ETHYLENE GLYCOL	107211									
ETHYLENE THIOUREA	96457									
FENAMIPHOS	22224926									
FLUOMETURON	2164172									

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FLUORINE	7782414									
FOMESAFEN	72178020									
FONOFOS	944229									
FORMALDEHYDE	50000									
FORMIC ACID	64186									
FURAN	110009									
FURAZOLIDONE	67458									
FURFURAL	98011									
GAMMA-HCH (LINDANE)	58899	0.005			9.71E-08					
GLYCIDALDEHYDE	765344									
GLYPHOSATE	1071836									
HEXABROMOBENZENE	87821									
HEXACHLORODIBENZODIOXIN MIX	19408743									
HEXACHLOROPHENE	70304									
HEXANE	110543									
HEXAZINONE	51235042									
HMX	2691410									
HYDRAZINE	302012									
HYDROGEN SULFIDE	7783064									
HYDROQUINONE	123319									
ISOBUTANOL	78831									
ISOPHORONE	78591									
ISOPROPALIN	33820530									
ISOPROPYL METHYL PHOSPHONIC ACID	1832548									
LITHIUM	7439932									
MALATHION	121755									
MALEIC ANHYDRIDE	108316									
MEPHOSFOLAN	950107									
MEPIQUAT CHLORIDE	24307264									
MERCURIC CHLORIDE	7487947									
METHACRYLONITRILE	126987									
METHANOL	67561									
METHIDATHION	950378									
METHYL ACETATE	79209									
METHYL ACRYLATE	96333									
METHYL ETHYL KETONE (2-BUTANONE)	78933									
METHYL HYDRAZINE	60344									
METHYL METHACRYLATE	80626									
METHYL PARATHION	298000									
METHYL TERT-BUTYL ETHER	1634044									
METHYLENE BROMIDE	74953									
METHYLMERCURY	22967926									
METHYLSTYRENE MIX	25013154									
METOLACHLOR (DUAL)	51218452									

Contaminant Name	CAS Number	Ground Water Concentration ug/L	Soil Concentration (Restricted Use) mg/kg	Soil Concentration (Unrestricted Use) mg/kg	Ground Water Ingestion Cancer Risk	Soil-Related Cancer Risk (Restricted Use)	Soil-Related Cancer Risk (Unrestricted Use)	Ground Water Ingestion Noncancer Risk	Soil-Related Noncancer Risk (Restricted Use)	Soil-Related Noncancer Risk (Unrestricted Use)
M-NITROTOLUENE	99081									
MOLYBDENUM	7439987									
M-PHENYLENEDIAMINE	108452									
N,N-DIMETHYLANILINE	121697									
NALED	300765									
N-BUTYLBENZENE	104518									
NITRATE	14797558									
NITRIC OXIDE	10102439									
NITRITE	14797650									
NITROBENZENE	98953									
NITROFURANTOIN	67209									
NITROFURAZONE	59870									
NITROGEN DIOXIDE	10102440									
NITROGLYCERIN	55630									
N-NITROSODIETHANOLAMINE	1116547									
N-NITROSODIETHYLAMINE	55185									
N-NITROSODIMETHYLAMINE	62759									
N-NITROSODIPHENYLAMINE	86306									
N-NITROSODIPROPYLAMINE	621647									
N-NITROSO-N-ETHYLUREA	759739									
N-NITROSO-N-METHYLETHYLAMINE	10595956									
N-NITROSOPYRROLIDINE	930552									
NUSTAR	85509199									
O-CHLORONITROBENZENE	88733									
O-CHLOROTOLUENE	95498									
O-NITROTOLUENE	88722									
O-PHENYLENEDIAMINE	95545									
ORYZALIN	19044883									
OXADIAZON	19666309									
OXAMYL	23135220									
OXYFLUORFEN	42874033									
PARAQUAT DICHLORIDE	1910425									
PARATHION	56382									
P-CHLOROBENZOIC ACID	74113									
P-CHLORONITROBENZENE	100005									
PENTACHLOROPHENOL	87865									
PERMETHRIN	52645531									
PHENOL	108952									
PHOSPHINE	7803512									
PHOSPHORUS (WHITE)	7723140									
PHTHALIC ANHYDRIDE	85449									
P-NITROTOLUENE	99990									
POLYBROMINATED BIPHENYLS										
POLYCHLORINATED BIPHENYLS	1336363									

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POLYCHLORINATED TERPHENYLS	61788338									
POLYNUCLEAR AROMATIC HYDROCARBONS:										
P-PHENYLENEDIAMINE	106503									
P-PHTHALIC ACID	100210									
Picloram	1918021				No Risk Calculated for this Analyte			No Risk Calculated for this Analyte		
PROMETON	1610180									
PROMETRYN	7287196									
PROPACHLOR	1918167									
PROPANIL	709988									
PROPARGITE	2312358									
PROPYLENE GLYCOL	57556									
PROPYLENE GLYCOL, MONOETHYL ETHER	52125538									
PROPYLENE GLYCOL, MONOMETHYL ETHER	107982									
P-TOLUIDINE	106490									
PURSUIT	81335775									
PYRIDINE	110861									
QUINOLINE	91225									
RDX	121824									
RESMETHRIN	10453868									
ROTENONE	83794									
SEC-BUTYLBENZENE	135988									
SELENIOUS ACID	7783008									
SIMAZINE	122349									
SODIUM AZIDE	26628228									
SODIUM DIETHYLDITHIOCARBAMATE	148185									
STRONTIUM, STABLE	7440246									
STRYCHNINE	57249									
TECHNICAL HCH	608731									
TETRYL	479458									
THALLIC OXIDE	1314325									
THALLIUM ACETATE	563688									
THALLIUM CARBONATE	6533739									
THALLIUM CHLORIDE	7791120									
THALLIUM NITRATE	10102451									
THALLIUM SULFATE (2:1)	7446186									
THIOBENCARB	28249776									
THIOCYANATE										
TIN	7440315									
TOLUENE-2,4-DIAMINE	95807									
TOLUENE-2,5-DIAMINE	95705									
TOLUENE-2,6-DIAMINE	823405									
TOTAL 1,2-DICHLOROETHENE	540590									
TRIBUTYLTIN OXIDE	56359									
TRICHLOROFLUOROMETHANE	75694									

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TRIMETHYL PHOSPHATE	512561									
VANADIUM PENTOXIDE	1314621									
VINCLOZOLIN	50471448									
VINYL ACETATE	108054									
WARFARIN	81812									
ZINC PHOSPHIDE	1314847									
ZINEB	12122677									
Petroleum Hydrocarbons										
C5 through C8 Aliphatic Hydrocarbons					No Risk Calculated for this Analyte			No Risk Calculated for this Analyte		
C9 through C12 Aliphatic Hydrocarbons					No Risk Calculated for this Analyte			No Risk Calculated for this Analyte		
C9 through C18 Aliphatic Hydrocarbons					No Risk Calculated for this Analyte			No Risk Calculated for this Analyte		
C19 through C36 Aliphatic Hydrocarbons					No Risk Calculated for this Analyte			No Risk Calculated for this Analyte		
C9 through C10 Aromatic Hydrocarbons					No Risk Calculated for this Analyte			No Risk Calculated for this Analyte		
C11 through C22 Aromatic Hydrocarbons					No Risk Calculated for this Analyte			No Risk Calculated for this Analyte		

** = denotes a change since the original February 1998 version