



0075439

**CHAIR:**

Tom O'Brien  
503-231-6223

**VICE-CHAIR:**

Dan Landeen  
208-843-7375

**ADMINISTRATIVE**

**SECRETARY:**

Teri Elzie  
509-372-9108

**COUNCIL MEMBERS &  
REPRESENTATIVES:**

Confederated Tribes of  
the Umatilla Indian  
Reservation  
Vacant

Nez Perce Tribe  
Dan Landeen

State of Oregon  
Department of Energy  
-Susan Coburn Hughes

State of Washington  
Department of Ecology  
-Larry Goldstein

Department of Fish and Wildlife  
-Lauri Vigue  
-Jay McConnaughey

U.S. Department of Energy  
James Zeisloft, Jr.

U.S. Department of the Interior  
Preston Sleeper  
Bureau of Land Management  
-Jake Jakabosky  
U.S. Fish and Wildlife Service  
-Tom O'Brien

Yakama Nation  
Tom Zeilman

November 16, 2000

Tom Fitzsimmons, Director  
Washington State Department of Ecology  
P.O. Box 47600  
Olympia, WA 98504-7600

**TRANSMITTAL OF PREASSESSMENT SCREEN DETERMINATION FOR THE  
HANFORD 1100 AREA NATIONAL PRIORITY LIST SITE**

Dear Mr. Fitzsimmons:

The Natural Resource Damage Assessment (NRDA) regulations contained in 43 CFR, Part 11(a) state, "Before beginning any assessment efforts under this part, the authorized official shall complete a preassessment screen and make a determination as to whether an assessment under this part shall be carried out." To assist those officials who may be authorized to make this determination with regards to the Hanford 1100 Area National Priority List Site, the Hanford Natural Resource Trustee Council (HNRTC) completed an 1100 Area Preassessment Screen Determination (PAD). The HNRTC is hereby providing this document to you for your use in making the required determination for the 1100 Area.

It is the finding of the HNRTC that natural resource injury has occurred or may be occurring at waste sites within the 1100 Area. However, the HNRTC has decided not to proceed with a damage assessment. The finding represents the consensus opinion of the HNRTC and each authorized official shall make the determination for his or her individual trustee agency. If each of the authorized officials agree with the finding of the HNRTC, it is our intent to transmit the PAD to the U.S. Department of Energy, Richland Operations Office under the Council's letterhead. We therefore request that you inform us of your determination as soon as it is completed or within 30 days of the date of this letter. We look forward to hearing from you and thank you for your cooperation in this matter.

Sincerely,

Thomas F. O'Brien, Chair  
Hanford Natural Resource Trustee Council

TFO:tle

Attachment: 1100 Area Preassessment Determination

**RECEIVED**  
JAN 15 2008

**EDMC**

**Preassessment Screen Determination  
For the  
Hanford 1100 Area (National Priority List) Site**

**I. Purpose and Introduction**

This document is submitted in accordance with 43 C.F.R. Part 11, requiring the authorized officials of Federal and State agencies and Indian Tribes which are natural resource trustees under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) to issue a Preassessment Screen Determination (PAD) before proceeding with a Natural Resources Damage Assessment (NRDA). The Hanford natural resource trustees who participated in the preparation of this PAD are: the Nez Perce Tribe, Yakama Indian Nation, Confederated Tribes of the Umatilla Indian Nation, the United States Department of the Interior represented by the U.S. Fish and Wildlife Service (USFWS) and the Bureau of Land Management (BLM), the United States Department of Energy (DOE), the State of Oregon, and the State of Washington represented by the Departments of Ecology and Fish and Wildlife.

This PAD must document that certain criteria, as specified in 43 C.F. R. & 11.23(c) have been met. A preassessment screen is intended only "to provide a rapid review of readily available information" on trust natural resources that have been injured or potentially injured by releases of hazardous substances. The format of this PAD represents the preassessment screen process described in C.F.R. 43 Part 11.

**A. Readily Available Information Used in the Determination Process**

A summary document entitled, *Information on Hazardous Substance Releases Within The Former 1100 Area NPL* (USFWS et al., 1998) was prepared to assist the trustees in their completion of this PAD. The summary document discusses the CERCLA remedial investigation, remedial actions, and final close-out for each site within the 1100 Area NPL. Data from the three studies listed below were also used to complete the PAD.

**A.1 USFWS Study**

In 1998, the USFWS conducted a Level III Preacquisition Environmental Contaminants Survey on the Hanford North Slope and Arid Lands Ecology Reserve (ALE) which included 1100-IU-1 (Roy, 1998). The USFWS collected darkling beetles, bird eggs and other biota on the ALE at the Horseshoe landfill. Analysis of the collected biota revealed DDE contamination. Based on their analysis of the findings of the study, USFWS concluded that the residual DDE at the Horseshoe Landfill poses a high risk to migratory birds.

**A.2 DOE Study**

In the spring of 1999, DOE conducted a reassessment of residual DDT at three waste sites on the North Slope and at the Horseshoe Landfill on ALE. Investigators collected insects and bird eggs. Analysis of the collected biota revealed DDE contamination in concentrations similar to those detected in the USFWS study. Based on their analysis of the findings of the study, DOE concluded that the residual DDE at the Horseshoe Landfill posed little or no risk to migratory birds.

### **A.3 State of Washington**

In the fall of 1999, the State of Washington collected three surface soil samples at Horseshoe Landfill. The analysis of these samples indicated that DDT contamination above the predetermined human health clean-up level still exists in the sampled landfill soils.

## **II. Information on the Site and Releases**

### **A. General Site & 1100 Area History**

The Hanford Site is a 560-square mile federal facility located along the Columbia River in south central Washington, situated north and west of the cities of Richland, Kennewick, and Pasco. The Hanford Site was established during World War II as part of the Army's Manhattan Project to produce plutonium for nuclear weapons. Hanford Site operations began in 1943 with DOE facilities located throughout the Site and the City of Richland. Certain portions of the Site are known to have cultural significance to the Columbia Basin Indian tribes. Some sites at Hanford are eligible for listing or have been listed in the National Register of Historical Places.

Since time immemorial, the First Americans have been a part of the natural ecosystem of Hanford. Archaeological records show that use and occupation of parts of Hanford extend back at least 13,000 years. From generation to generation, knowledge concerning the use of indigenous plants as natural and spiritual medicines has been passed down by tribal elders. To this day, the elders continue to teach that spiritual value is inherent in all natural resources, from the waters which give life, the foods that provide sustenance, the language and place names that provide continuity between generations and recognition of the ancestral homelands, to the landscape that provides wholeness and shelter for all life forms. Natural resources remain an integral and inseparable part of tribal culture.

Following the coming of Euro Americans, use of the Hanford site by indigenous peoples was severely curtailed, but not extinguished. The Nez Perce Tribe, the Confederated Tribes of the Umatilla Indian Reservation, and the Yakama Indian Nation all have important rights recognized and guaranteed in the Treaties of 1855. In addition, the Yakama Indian Nation and the the Confederated Tribes of the Umatilla Indian Reservation, in the Treaties of 1855, ceded the land on which Hanford is located to the United States. The Tribes continue to view all of Hanford as a cultural reserve with abundant natural resources and critical habitats as well as many sites of significant historical and spiritual importance to the Yakama, Umatilla, and Nez Perce peoples.

The Hanford Site is divided into designated areas. Designated locations for identification include the 100, 200, 300, 400, 600, 700, 1100, and 3000 Areas. The 1100 Area is mainly located in the southeast corner of the Hanford Site, directly adjacent to the City of Richland. It also includes the ALE, which is a natural reserve. The majority of the 1100 Area is essentially an industrial area, which has served as a central warehousing, vehicle maintenance, and employee transportation center for the Hanford Site.

Contaminants released in the 1100 Area have typically been associated with vehicle maintenance or releases from storage facilities. From an ecological standpoint, large portions of the 1100 Area are highly disturbed due to the presence of these facilities. The principle reason the 1100 Area was listed on the NPL was that it is located near the City of Richland's drinking water wells.

In 1969, DOE created the ALE, which set aside these lands for the study of the native ecosystems of Southeastern Washington. ALE is located in a portion of the southwestern area of Hanford, covering 120 square miles. The chief features of ALE are the Cold Springs Valley and Rattlesnake Ridge. These lands were originally acquired to provide a safety and security buffer around Hanford's nuclear facilities located north of highway 240. The ALE Reserve is considered one of the largest, undisturbed, native shrub-steppe ecosystems remaining in Washington.

In 1988, the Hanford Site was scored using the Environmental Protection Agency's (EPA) Hazard Ranking System. As a result of the scoring, the Hanford Site was added to the National Priorities List (NPL) as four separate sites (1100 Area, 100 Area, 200 Area, and 300 Area). The 1100 Area includes portions of the 600, 700, and 3000 Areas and Arid Lands Ecology Reserve (ALE). Once listed on the NPL, the 1100 area was further divided into four operable units (OU), a grouping of individual waste management units based primarily on geographic area and common waste sources. The 1100 OU included 1100-EM-1, 1100-EM-2, 1100-EM-3 and 1100-IU-1.

The 1100-EM-1 OU had been a central warehousing, vehicle maintenance, and transportation distribution center since the 1950's. Specific operations included vehicle, bus, and railroad maintenance, petroleum product storage, gasoline station services, bus and rail systems operations, storage of excess construction, maintenance and administrative materials, storage of hazardous and flammable construction materials, destruction of classified materials, and landfill operations.

The 1100-EM-2 OU, prior to 1950, consisted of a few small farms. The 1171 building was built in the early 1950's with primary operations consisting of vehicle and equipment maintenance. The OU also served as a warehousing and transportation distribution center. The 1100-EM-3 OU, prior to 1943, was agricultural land near the former town of Fruitvale. In 1943, temporary office buildings were built to support the construction and engineering operations at Hanford. Throughout the 1940's, the OU and surrounding lands were used as office space and as an off-loading and warehousing area for construction supplies. By 1951, most of the temporary buildings were replaced with permanent structures, many of which exist today. The OU was also part of a large military camp, Camp Hanford, and contained automotive repair and maintenance shops, gasoline storage and dispensing stations, an artillery repair and maintenance shop, laundry and dry cleaning services, a cold storage area, warehouses, a bakery, troop barracks, and administrative offices. During the last 25 to 30 years, the OU supported offices and warehouse facilities for Hanford construction activities. Other activities included paint and sandblast operations, vehicle maintenance and repair, hazardous material storage, Resources Conservation and Recovery Act (RCRA) waste accumulation areas, fabrication shops, radio maintenance, and radiograph and research administrative offices .

The 1100-IU-1 OU, prior to 1942, consisted of a few homesteads and natural gas wells. During the 1950's, a Nike missile launch facility and control center were established at the base and crest of Rattlesnake Ridge, respectively. These facilities were established by the Department of Defense (DOD) to defend Hanford from air assaults until 1961. Maintenance of the missile batteries in a combat ready status required the storage, handling, and disposal of missile components as well as solvent, fuels, hydraulic fluids, paints, and other materials. Some of the Nike buildings were later converted into the headquarters of the ALE laboratory managed by the Pacific Northwest Laboratory, to study the ecology of the ALE Reserve. Operations at the ALE laboratory ceased in 1995. Currently, ALE is managed by the U.S. Fish and Wildlife Service.

In anticipation of the NPL listing, DOE, EPA, and Washington Department of Ecology (Ecology), entered into a Federal Facility Agreement and Consent Order (commonly referred to as the Tri-Party Agreement or TPA) in May of 1989. The TPA established a procedural framework and schedule for developing, implementing, and monitoring remedial response actions at Hanford. The agreement also addresses Resource Conservation and Recovery Act (RCRA) compliance and permitting.

#### **B. Relevant Operations At or Near the 1100 Area**

Seimens Power Corporation owns property that abuts the 1100 Area, next to Horn Rapids Landfill. The owner and/or corporate entity of this property has undergone several name changes. Previous designations include Exxon Nuclear Fuels, Advanced Nuclear Fuels, and Seimens Nuclear Power. The only documented usage of trichloroethylene (TCE) near the present day contaminant plume beneath the Horn Rapids Landfill was at the Seimens Power Corporation Lagoon area. TCE is a degreasing compound that was commonly used in the 1960s and 1970s during the installation of lagoon liners, and to clean the liner in preparation for bonding overlapping liner sections together.

The Hanford Site is one of seven National Environmental Research Parks (NERP). The ALE Reserve is designated as a Research Natural Area (RNA) and constitutes the single largest tract in the federal RNA system for Oregon and Washington. The ALE provides opportunities for researchers, students, and educators to study and observe a relatively large and undisturbed ecosystem. The RNA designation supports the purpose of the NERP program to provide a protected area for research demonstrations and education in ecology. In addition, ALE's RNA status provides protection for rare plant communities designated by the state of Washington's Natural Heritage Plan. The ALE currently contains eight element occurrences for the state of Washington which are based on their extremely high quality habitat. The ALE Reserve is currently managed by USFWS. The 1100-IU-1 is located within the ALE Reserve.

#### **C. Time, Quantity, Duration, and Frequency of Releases of Hazardous Substances**

The hazardous substances released in the 1100 Area are listed in Table 1. Hazardous substance release(s) at 1100-EM-1, 1100-EM-2, 1100-EM-3, and 1100-IU-1 are difficult to pinpoint because of the long history of multiple activities at these sites. Operations in the 1100-EM-1 started in the 1950's; however, development and usage of specific waste sites occurred at different times. Operations began

at 1100-EM-2 in 1950. Operations at 1100-EM-3 began in 1943. Details on the time, duration, and frequency of the releases are not available. Quantities of the releases are based on the data gathering that occurred during the 1100 cleanup process. Volumes of the soil excavated as a result of the hazardous substance releases are listed in Table 1.

The groundwater at 1100-EM-1 is contaminated from historical releases of TCE. TCE concentrations (110 ppb, maximum concentration) are currently above the maximum contaminant level (MCL) concentration of 5 ppb. These contaminants are found within well-defined plumes beneath and northeast of the Horn Rapids Landfill. The source of the TCE release has been documented to be from Seimens Power Corp. during the installation of their lagoon liners. Activities involving the use of TCE occurred between 1978 through 1988. The most numerous liner installation and repair efforts occurred during three time periods around the years 1979, 1983, and 1987 to 1988.

The release of hazardous substances at 1100-IU-1 occurred during the active maintenance and operation of the Nike facilities between 1950 and 1961. Details on the time, duration, and frequency of the releases are not available. Quantities of the releases are based on data gathered during the 1100 cleanup process. Volumes of the soil excavated as a result of the hazardous substance releases are listed in Table 1.

#### **D. Additional Hazardous Substances Potentially Released From the Site**

The CERCLA process as applied to the 1100 Area operable units included a combination of limited field investigations with focused feasibility studies and remedial investigations with feasibility studies. This process focused on characterizing hazardous substance releases in soils. No sampling of biological media was performed. Consequently, potential releases from the site via biological transport were not evaluated.

#### **E. Potentially Responsible Parties (PRP).**

PRPs under CERCLA, 42 U.S.C. § 9607, include (1) the U.S. Department of Energy (DOE), (2) DOE contractors, (3) the U.S. Department of Defense (DOD) and (4) Seimens Power Corporation.

#### **F. Damages Excluded From Liability**

None of the damages excluded from liability under CERCLA, as defined by CERCLA Section 107 (f)(i), apply to the 1100 Area operable units.

### **III. Preliminary Identification of Resources Potentially At Risk**

#### **A. Preliminary Identification of Pathways**

Exposure and potential exposure pathways that were identified at 1100 EM-1, EM-2, EM-3 and IU-1 included: groundwater, vegetation, soil, and wildlife.

### **1100-EM-1**

Groundwater was identified as a pathway of contaminant exposure. Groundwater at Horn Rapids landfill contains TCE and gross beta above the MCLs. A number of substances were present below the MCL but above background (DOE/RL-98-46,). An environmental exposure and toxicity assessment and a qualitative ecological risk assessment evaluated potential biological exposure pathways. These assessments did not include biological sampling.

### **1100-EM-2**

One well in this operable unit contained chromium above the MCL. EPA contributed the presence of chromium in this well to the high level of suspended solids in the well water and the well construction material. No biological pathway determinations have been conducted in this operable unit.

### **1100-EM-3**

No biological pathway determinations have been conducted in this operable unit. Recent testing of groundwater near Richland's northern well field detected very low levels of tritium in three monitoring wells.

### **1100-IU-1**

Pathways identified for DDT and metabolites in investigations conducted after the remedial action include soil, insects, small mammals and migratory birds. Select soils in this operable unit exceed the predetermined human health clean up level for DDT.

## **B. Exposed Areas**

Table 1 lists the volumes of soil excavated to meet predetermined cleanup levels. The total volume of soil excavated within the 1100 Area is 4,643 cubic meters. In addition, the State of Washington sampling within the Horseshoe Landfill has revealed DDT contamination above the human health cleanup standard in soils outside of the excavated area.

### **1. Areas Where Hazardous Substances Are Known to Have Spread**

No sampling has been performed beyond the established waste site boundaries (except for the DDT control site sampling, where no contamination was detected).

### **2. Areas To Which Hazardous Substances Have Likely Spread Via Pathways**

DDT has been documented in invertebrates, small mammals and bird eggs at the Horseshoe Landfill and may have been spread from the landfill via biological transport.

### **3. Areas of Potential Indirect Effect**

As stated above, it is possible that DDT could have been spread from the site by invertebrates, small mammals and birds. Small mammals and birds are prey items for such highly mobile species such as badgers, coyotes, and raptors. Due to the contaminant dispersion that would result from any biological transport, it is unknown whether the DDT at the concentrations detected in the Horseshoe Landfill could cause any indirect effects.

#### **C. Exposed Water Estimate**

TCE is the only known hazardous substance released within the 1100 Area that has exposed a measurable area of groundwater. The TCE plume is located beneath and to the northeast of the Horn Rapids Landfill. The exposed area, delineated using a contour line of the 5 ug/l MCL, was 144 acres for 1996, and 131 acres using 1997 data.

The 1100 Area Record of Decision (ROD) established the remedial action for the TCE plume to be natural attenuation. Groundwater modeling indicated that the TCE plume is expected to attenuate below the MCL of 5 ug/l by the year 2017.

#### **D. Estimates of Concentrations**

Table 1 identifies the hazardous substances released in the 1100 Area along with their maximum concentrations.

#### **E. Potentially Affected Resources**

##### **1. Resources**

Natural Resources injured or potentially injured include, but are not limited to the following:

1. Soil
2. Geological Resources
3. Resident and Migratory Birds
4. Mammals
5. Invertebrates
6. Ground Water
7. Reptiles
8. Vegetation
9. Upland wildlife habitat
10. Other biological resources

## 2. Services Provided

Services provided by these natural resources have included, but are not limited to the following:

1. Cultural, spiritual and religious use
2. Ceremonial and medicinal uses
3. Traditional food gathering
4. Habitat for trust species, including foraging, shelter, migratory pathways, and breeding and rearing areas
5. Recreational opportunities within public right of ways.

## IV. Determination For Pursuing An Assessment

The criteria for proceeding with a damage assessment and the determination as to whether or not all of the criteria have been met are as follows.

1. *A release of a hazardous substance or substances has occurred within the 1100 Area operable unit waste sites.*

This criteria has been met (See Table 1 and Section 1. A.).

2. *Natural Resources for which the Nez Perce Tribe, Yakama Indian Nation, Confederated Tribes of the Umatilla Indian Nation, the United States Department of the Interior), the State of Oregon, and the State of Washington may assert trusteeship under CERCLA have been or are likely to have been adversely affected by the release(s).*

This criteria has been met (See Sections E.1. and E.2.).

3. *The quantity and concentration of the released hazardous substances are sufficient to potentially cause injury to identified natural resources.*

This criteria has been met (See Table 1.).

4. *Data sufficient to pursue an assessment are readily available or likely to be obtained at reasonable cost.*

See response to Criteria #5.

5. ***Response actions carried out do not sufficiently remedy the injury to natural resources without further action.***

The trustees believe that natural resource injury has occurred or may be occurring at waste sites within the 1100 Area. However, for various reasons cited among the trustees, the trustees have decided not to proceed with a damage assessment. The trustees, with the exception of DOE, do find that residual contamination within the 1100 Operable Unit waste sites indicates the need for a long-term, post-cleanup biomonitoring program to ensure natural resources are not adversely affected.

## REFERENCES

- 43 CFR 11, "Natural Resource Damage Assessments," Code of Federal Regulations, as amended.
- DOE-RL, 1998, Information on Hazardous Substance Releases Within the 1100 Area, DOE/RL-98-46, U. S. Department of Energy, Richland Operations Office, Richland, Washington.
- Linville, J.K., K.A. Gano and S.G. Weiss, 1999. *Reassessment of Residual DDE on Three Remediated Hanford North (Wahluke) Slope Waste Sites and at the Horseshoe Landfill, Hanford Washington*. Bechtel Hanford Inc.
- Roy, R.R., 1998, Report of the Preliminary Findings of the Level III Preacquisition Environmental Contaminants Survey for the Hanford North (Wahluke) Slope and the Arid Lands Ecology Reserve, Hanford Reservation, Washington, U.S. Fish and Wildlife Service, Upper Columbia River Basin Field Office, Moses Lake, Washington.

**Table 1. Summary of the Hazardous Substances Released**

**1100-EM-1 OPERABLE UNIT**

Site	Hazardous Substances Released	Soil UTL (1)	Maximum Concentration (ppm) (Pre-Remedy)	Clean up Level (ppm)	Confirmatory Sample Concentration Range (ppm)	Volume of Soil Excavated
Battery Acid Pit	Copper	19.11	37.9	(2)		
	Lead	12.64	266			
	Mercury	0.10	0.39 (3)			
	Nickel	19.00	20.9			
	Sodium	241.52	479			
	Zinc	62.20	100 (3)			
	Acetone	0.022	0.026			
	Paint & Solvent Pit	chromium	12.94	16.8	(2)	
Copper		19.11	24.4			
Lead		12.64	94.6			
manganese		355	366 (3)			
Sodium		241.52	374			
Thallium		0.39	0.48			
Xylene		0.005	0.006			
Zinc		50.4	54.9 (3)			
chloro-benzene		0.005	0.006			
methylene chloride		0.005	0.042			
Toluene		0.005	0.011			
trichloroethene		0.005	0.006			
tetrachloro-ethene		0.005	0.035			
4,4'-DDT		0.033	0.057			
4,4'-DDE		0.033	0.042			
Antifreeze & Degreaser Pit	chromium	12.94	14.0	(2)		

	Thallium	0.39	0.40			
	Lead	12.64	26.4			
	copper	19.5	31.7 (3)			
	cobalt	16.8	17.8 (3)			
	Sodium	419	999 (3)			
	Zinc	50.4	60 (3)			
	manganese	355	381 (3)			
	Acetone	0.043	0.092			
	2-butanone	0.011	0.017			
	methyl chloride	0.005	0.120			
	Toluene	0.005	0.006			
Antifreeze Tank	arsenic	2.92	5.8 (3)	(2)		
	beryllium	0.27	0.93 (3)			
	Copper	19.5	19.8 (3)			
	Lead	5	5.7 (3)			
	Silver	0.54	2.0 (3)			
	sodium	419	726 (3)			
	Thallium	0.41	0.48 (3)			
	Zinc	50.4	63.8 (3)			
	Ethylene glycol		2.6			
Discolored Soil Site	Lead	12.64	22.1		(4)	
	Zinc	62.20	111		(4)	
	heptachlor	0.017	0.065		(4)	
	alpha chlordane	0.170	1.00		(4)	
	gamma chlordane	0.158	0.86		(4)	
	BEHP	0.690	25,000	71	0.108 - 10.4	70 cu. meters
	TCA	0.005	0.035		(4)	
	4,4'-DDE	0.033	0.17		(4)	

	Acetone	0.043	0.190		(4)	
	2-butanone	0.011	0.069		(4)	
	methylene chloride	0.005	0.020		(4)	
	Toluene	0.005	0.008			
	di-n-octyl-phthalate	0.690	46		(4)	
Horn Rapids Landfill	antimony	3.70	15.6			
	Arsenic	2.92	6.6 (3)			
	beryllium	0.74	1.3			
	cadmium	0.36	2.4 (3)			
	Cobalt	16.8	42.5 (3)			
	Copper	19.5	1280 (3)			
	chromium	47.3	1250 (3)		(4) 284 (5)	
	Cyanide	0.52	0.56			
	Lead	5	854 (3)			
	Mercury	0.10	1.3			
	Nickel	26	557 (3)		(4)	
	Selenium	0.39	0.97			
	Silver	0.54	7.7 (3)			
	Thallium	0.41	0.46 (3)			
	Zinc	50.4	3160 (3)			
	Acetone	0.022	0.200 (3)			
	2-butanone	0.011	0.035			
	methylene chloride	0.005	0.043			
	Toluene	0.005	0.016			
	4-nitrophenol	3.300	3.800			
	beta-BHC	0.017	0.094		(4)	
	PCE	0.005	0.006			
	total PCBs	1.510	100.550	5	ND - 3.117	1,224 cu.

						meters
	aroclor-1254	0.340	0.640 (3)		ND	
	aroclor-1248	0.170	100		ND - 3.04	
	BEHP	0.350	1.000 (3)			
	naphthalene		1.10			
	alpha chlordane	0.170	0.77		(4)	
	heptachlor		0.02		(4)	
	Endosulfan II	0.033	0.110		(4)	
	Endrin	0.033	0.28		(4)	
	Endrin ketone	0.033	0.140		(4)	
	Dieldrin	0.033	1.20		(4) 0.072 (5)	
	4,4'-DDT	0.033	0.52		(4) 0.45 (5)	
	4,4'-DDD	0.033	0.26			
	4,4'-DDE	0.033	1.2		(4)	
	potassium permanganate	NA	82,000		(4)	
	chromium (6)	0.0078	NA		0.004 - 0.023	
	TCE (6)	NA	0.110	0.005	0.075 - 0.014	
Ephemeral Pool	lead	12.64	54.2			
	Zinc	62.20	67.5			
	PCBs	1.510	42.0	1	0.065 - 1.04	115 cu. meters
	Endosulfan II	0.033	0.16		(4)	
	Endrin	0.033	0.039		(4)	
	heptachlor	0.017	0.029			
	alpha chlordane	0.170	1.10			
	gamma chlordane	0.158	1.70			

**1100-EM-2 OPERABLE UNIT**

Site	Hazardous	Soil UTL	Maximum	Clean up	Confirmatory	Volume of
------	-----------	----------	---------	----------	--------------	-----------

	Substances Released	(1)	Concentration (ppm) (Pre-Remedy)	Level (ppm)	Sample Concentration Range (ppm)	Soil Excavated
Tar Flow Area	Lead	12.64	404	250	2.87 - 5.4	1,155 cu. meters (8)
	TPH (7)	NA	80,000	200	< 100	
Well 699-S41-E12	chromium (6)	0.0024	0.872		0.168	

### 1100-EM-3 OPERABLE UNIT

Site	Hazardous Substances Released	Soil UTL (1)	Maximum Concentration (ppm) (Pre-Remedy)	Clean up Level (ppm)	Confirmatory Sample Concentration Range (ppm)	Volume of Soil Excavated
1240 French Drain	chromium	12.94	949	400	4.06 - 10.3	98 cu. meters (8)
	Lead	12.64	619	240	1.54 - 4.53	
	PCBs	1.510	<1			
1240 Suspect Spill Area	Lead	12.64	44,200	250	3.27 - 5.59	69 cu. meters

### 1100-IU-1 OPERABLE UNIT

Site	Hazardous Substances Released	Soil UTL (1)	Maximum Concentration (ppm) (Pre-Remedy)	Clean up Level (ppm)	Confirmatory Sample Concentration Range (ppm)	Volume of Soil Excavated
Control Center Disposal Pits	Lead	12.64	1,450	N/A		
Missile Bunker Sump	PCBs (9)	NA	150 ug/100 sq. cm	10 ug/100 sq. cm	<0.1 - 3.0	
Missile Bunker Discharge Ditch	PCBs	NA	>1-<10 onsite ND offsite			
Horseshoe Landfill	DDT	0.033	945	1.0	<1 - 1.7	1,912 cu. meters
	DDD	0.033	360		<1	(4)

	DDE	0.033	27.2		<1	(4)
	butyl-benzyl phthalate	NA	18			
	diethyl phthalate	NA	0.190			
	BEHP	0.0350	14			
Elevator Doors	PCBs (9)	NA	330 ug/100 sq. cm	10 ug/100 sq. cm	None	

(1) Soil UTL corresponds to surface or subsurface values depending upon where the contaminant was located

(2) No Response Action required at the Site

(3) Subsurface concentration, below 2' (all other values are surface concentrations, 0-2' depth)

(4) Excavated incidental to site cleanup, but not included in confirmatory sampling

(5) Maximum concentration of hazardous substance outside of the designated cleanup area

(6) Groundwater value (mg/l)

(7) Non-Hazardous Substance cleanup

(8) Volume resulted from multiple contaminant cleanup levels

(9) Not a Release to the Environment

## Hazardous Substances

### 1100-EM-1

#### Battery Acid Pit

copper	lead	sodium
mercury	nickel	zinc

#### Paint and Solvent Pit

chromium	copper	tetrachloroethene
sodium	thallium	manganese
lead	chlorobenzene	4,4'-DDE
xylene	1,1-dichloroethane	
zinc	4,4'-DDT	

#### Antifreeze and Degreaser Pit

chromium	thallium	
lead	copper	cobalt
zinc	manganese	

#### Antifreeze Tank

arsenic	copper	lead
silver	sodium	thallium
zinc	ethylene glycol	

#### Horn Rapids Landfill

##### Phase I Hazardous Substances:

chromium	4,4'-DDE
lead	4,4'-DDT
alpha chlordane	naphthalene

##### Phase II Hazardous Substances:

Endrin  
Dieldrin  
Endosulfan II

heptachlor                      aroclor-1254                      total PCBs  
PCE  
2-methylnaphthalene  
aroclor-1248  
TCE

Ephemeral Pool

lead                      zinc                      aroclor-1260  
Endosulfan II                      Endrin                      heptachlor  
alpha-chlordane                      gamma-chlordane

**1100-EM-2**

Tar Flow Area

lead

**1100-EM-3**

1240 French Drain

Lead                      Chromium  
PCBs

1240 Suspect Spill Area

Lead

**1100-IU-1**

Control Center Disposal Pits

Lead

Missile Bunker Sump

- PCBs

Acid Neutralization Pit

PCBs

Missile Bunker Discharge Ditch

- PCBs

Horshoe Landfill Site

- DDT

Elevator Doors

- PCBs