United States
Environmental Protection
Agency

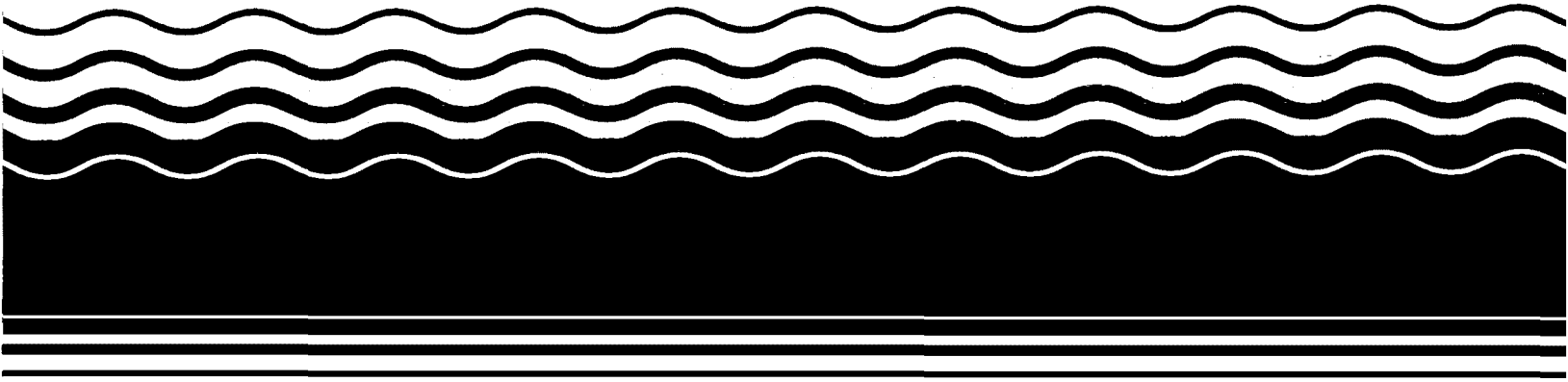
Office of
Emergency and
Remedial Response

EPA/ROD/R10-93/065
August 1993

EPA

Superfund Record of Decision:

Umatilla Army Depot (Lagoons) (Operable Unit 5), OR



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SUPERFUND RECORD OF DECISION
Umatilla Army Depot (Lagoons) (Operable Unit 5), OR
Third Remedial Action

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800/800

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PB94-964613

16. Abstract (Limit: 200 words)

The 5-acre Umatilla Army Depot (Operable Unit 5) site is part of a 19,700-acre military installation located approximately 10 miles west of Hermiston, in both Morrow and Umatilla Counties, Oregon. This installation was established in 1941 as an Army Ordnance Depot to store and handle munitions. Land use in the area is predominantly agricultural, with approximately 1,000 residents in each of the bordering farm communities of Umatilla and Irrigon. Hermiston, with a population of approximately 10,000 residents, is the largest local population center. The local residents use the estimated 1,470 wells, located within a 4-mile radius of the site, to obtain their domestic and irrigation water supply, and three municipal water systems to obtain their drinking water supply. Due to its large size, the number of sites, and the variety of potential contaminants, the installation was divided into eight OUs. From 1950 to 1968, prior to its use as a landfill, OU5 was operated as a gravel pit. Since 1968, the Army has operated the landfill and, in 1979, received a landfill permit from the State. Materials disposed of at the site include garbage, demolition debris, asbestos from brake linings, dried sludge from the sewage treatment plant, explosives sludge, and possibly ash from the Deactivation Furnace. Over the past 15 years, several investigations have been conducted at the installation. In 1988, the initial field

(See Attached Page)

17. Document Analysis a. Descriptors
Record of Decision - Umatilla Army Depot (Lagoons) (Operable Unit 5), OR
Third Remedial Action
Contaminated Medium: None
Key Contaminants: None

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 53
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(See ANSI-Z39.18) *See Instructions on Reverse*

OPTIONAL FORM 272 (4-77)
(Formerly NTIS-35)
Department of Commerce

Abstract (Continued)

investigation for OU5 was conducted, which indicated contamination of ground water in the vicinity of the landfill with slightly elevated levels of organic compounds, inorganics, and metals. Subsequent investigations did not confirm the presence of the organic compounds; however, they did confirm the presence of elevated levels of one inorganic compound and metals in ground water. Although organic contamination was not detected in subsequent rounds of sampling, the potential health risks associated with these contaminants were evaluated, along with the health risks associated with inorganics and metals. A 1992 ROD addressed the Explosive Washout Lagoons Soils, as OU2. Two 1993 RODs addressed the Deactivation Furnace and the Inactive Landfills, as OUs 1 and 8, respectively. Future RODs will address ground water across the installation and three additional OUs. This ROD addresses the Active Landfill at the installation, as OU5. Results of site evaluations indicated that contamination associated with the Active Landfill does not pose any unacceptable risks to human health and the environment; therefore, there are no contaminants of concern affecting this site.

The selected remedy for this site is no action because site investigations indicated that contamination associated with this site poses no threat to human health or the environment. The site is scheduled for closure within the next two years and will be subject to State closure requirements that include capping, post-closure ground water monitoring for five years, and restrictions preventing excavation and construction at the site. There are no present worth or O&M costs associated with this no action remedy.

PERFORMANCE STANDARDS OR GOALS:

Not applicable.

Defense Environmental
Restoration Program

Record of Decision
Final

Umatilla Depot Activity
Active Landfill
Operable Unit

Revision 1
March 1993

In accordance with Army Regulation 200-2, this document is intended by the Army to comply with the National Environmental Policy Act (NEPA) of 1969.

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Figures

Tables

Acronyms and Abbreviations

ADA	Amunition Demolition Activity
ALOU	Active Landfill Operable Unit
ARARs	Applicable or Relevant and Appropriate Requirements
BRAC	Base Realignment and Closure
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
CFR	Code of Federal Regulations
CPF	Cancer Potency Factor
DoD	Department of Defense
2,4-DNT	2,4-Dinitrotoluene
2,6-DNT	2,6-Dinitrotoluene
EPA	Environmental Protection Agency
FFA	Federal Facilities Agreement
FS	Feasibility Study
MSL	Mean Sea Level
NA	Not Applicable
NCP	National Contingency Plan
NPL	National Priorities List
ODEQ	Oregon Department of Environmental Quality
OU	Operable Unit
PCBs	Polychlorinated-biphenyls
RCRA	Resource Conservation and Recovery Act
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine (Royal Demolition Explosive)
RfD	Reference Dose
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act of 1986
TAL	Target Analyte List
TRC	Technical Review Committee
UMDA	U.S. Army Depot Activity at Umatilla
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency

Section 1

Declaration of the Record of Decision

Site Name and Location

U.S Army Depot Activity, Umatilla
Active Landfill Operable Unit
Hermiston, Oregon 97838-9544

Statement of Basis and Purpose

This Decision Document presents the selected no-action remedial alternative for the Active Landfill Operable Unit at the U.S. Army Depot Activity, Umatilla (UMDA) in Hermiston, Oregon (Figure 1). This alternative was chosen in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986, and to the extent practicable, the National Contingency Plan (NCP) (40 CFR Part 300 et seq., 1992; and 55 Federal Register 8666, March 1990), as amended. This decision is based on information contained in the administrative record file for this site.

The remedy was selected by the U.S. Army (Army) and the U.S. Environmental Protection Agency (EPA). The State of Oregon Department of Environmental Quality (ODEQ) was given the opportunity to participate in the review and decision process and concurs with the selection of a no-action remedy for this site.

Description of the Selected Remedy

The Active Landfill Operable Unit (ALOU) is one of eight operable units at UMDA. The other operable units are: Explosives Washout Lagoons Soils; Deactivation Furnace Soils; Inactive Landfills; Explosives Washout Lagoons Ground Water; Ammunition Demolition Activity (ADA) Area; Miscellaneous UMDA Sites; and Explosives Washout Plant (Building 489). Four of these operable units are at the Record of Decision (ROD) stage, the rest are still in the Remedial Investigation/Feasibility Study (RI/FS) process. The four operable units at the ROD stage are: the Explosives Washout Lagoons Soils (which has a signed final ROD); the Deactivation Furnace Soils; the Inactive Landfills; and the five acre Active Landfill, which is addressed in this ROD.

The Army, EPA, and ODEQ have selected "No Action" as the remedy for the Active Landfill Operable Unit at UMDA, in Hermiston, Oregon. This selection was made based upon information generated during the RI which indicates that the site does not pose an unacceptable threat to human health and/or the environment. The landfill is scheduled to: cease receipt of municipal waste in 1993; cease receipt of all materials in 1994; and go through formal closure in accordance with ODEQ regulations in late 1994. A low

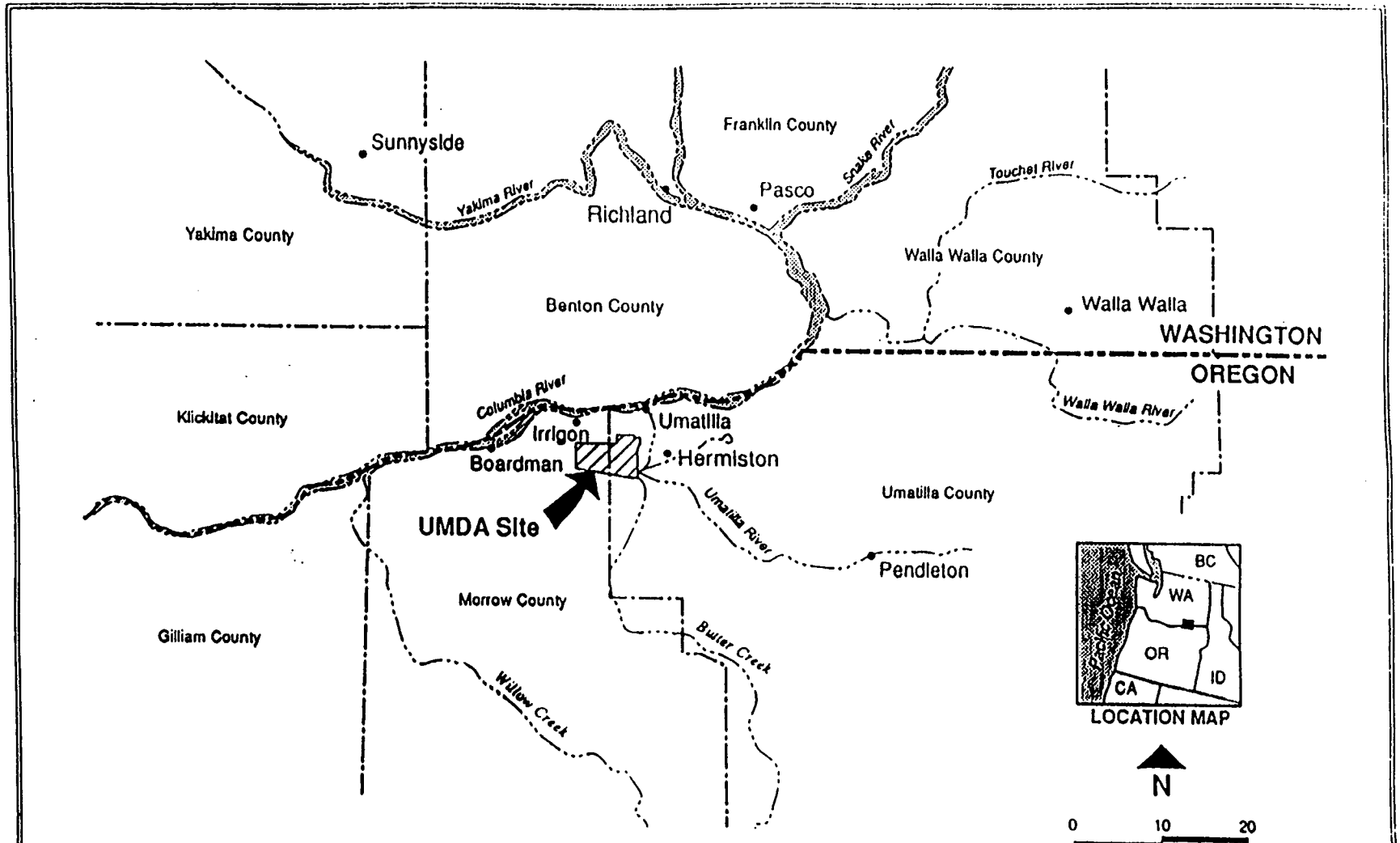

Figure 1 Facility Location Map

PREPARED FOR: UMATILLA			SOURCE: Explosives Washout Lagoons Soils Operable Unit, Umatilla Depot Activity, Record of Decision, Sept. 1992	TITLE: FACILITY LOCATION MAP UMATILLA DEPOT ACTIVITY
DATE: Sept.1992	SCALE: AS SHOWN	DWG NO. 67062-010		

permeability soil cap will be placed on the landfill and ground water at the site will be monitored for a minimum of five years after closure of the landfill to ensure that the landfill does not have a significant negative effect on local ground water quality.

Declaration Statement

Data gathered during the RI of the ALOU, and the results of the evaluation of that data in the human health risk assessment, indicate that the ALOU in its current condition does not pose an unacceptable risk to human health or the environment. The data also indicate that future residential land use at the site would not result in an unacceptable risk to public health or the environment. It has therefore been determined that remedial activities are not necessary to ensure the protection of human health and the environment at the ALOU. It has also been determined that a five-year review of the selected remedy will be performed. The ground water quality data collected over a five year monitoring period, as required by Oregon State Solid Waste Regulation, will be evaluated and interpreted to assure that the landfill has no negative affect on ground water quality; and that the selected remedy is sufficiently protective of human health and the environment.

0.4.5

Lead and Support Agency Acceptance of the Record of Decision, U.S. Army Depot Activity Umatilla, Active Landfill Operable Unit December 1992

Signature sheet for the foregoing Record of Decision for the Active Landfill Operable Unit final action at the U.S. Army Depot Activity at Umatilla by the U.S. Army and the U.S. Environmental Protection Agency, with the concurrence of the State of Oregon Department of Environmental Quality.

Moses Whitehurst Jr.
Lieutenant Colonel Moses Whitehurst Jr.,
Commander, U.S. Army Depot Activity, Umatilla

17 August 1993
Date

Lead and Support Agency Acceptance
of the Record of Decision,
U.S. Army Depot Activity Umatilla,
Active Landfill Operable Unit
December 1992

Signature sheet for the foregoing Record of Decision for the Active Landfill Operable Unit final action at the U.S. Army Depot Activity Umatilla by the U.S. Army and the U.S. Environmental Protection Agency, with the concurrence of the State of Oregon Department of Environmental Quality.

Gerald A. Emison
Acting Regional Administrator, Region 10
U.S. Environmental Protection Agency

8-10-93
Date

Lead and Support Agency Acceptance
of the Record of Decision,
U.S. Army Depot Activity Umatilla,
Active Landfill Operable Unit
December 1992

Signature sheet for the foregoing Record of Decision for the Active Landfill Operable Unit final action at the U.S. Army Depot Activity at Umatilla by the U.S. Army and the U.S. Environmental Protection Agency, with the concurrence of the State of Oregon Department of Environmental Quality.

Frederic J. Hansen
Director
Oregon Department of Environmental Quality

1-4-93
Date

Note: The State of Oregon's Letter of Concurrence is appended to this Record of Decision.

Lead and Support Agency Acceptance of the Record of Decision, U.S. Army Depot Activity Umatilla, Active Landfill Operable Unit

Signature sheet for the foregoing Record of Decision for the Active Landfill Operable Unit final action at the U.S. Army Depot Activity at Umatilla between the U.S. Army and the U.S. Environmental Protection Agency, with the concurrence of the State of Oregon Department of Environmental Quality.

Lewis D. Walker

Lewis D. Walker
Deputy Assistant Secretary of the Army
(Environment, Safety, and Occupational Health)

12/29/92

December 1992

Section 2

Decision Summary

This Decision Summary provides an overview of the characteristics of the Active Landfill Operable Unit (ALOU) at the U.S. Army Depot Activity, Umatilla (UMDA), and the environmental assessment activities that have been performed. The rationale used to choose the selected remedy is then presented.

2.1 Site Name, Location, and Description

UMDA is located in Morrow and Umatilla Counties in rural, northeastern Oregon. UMDA is approximately 10 miles west of Hermiston; one to two miles west of the Umatilla River; 175 miles east of Portland; and two miles south of the Columbia River. The town of Hermiston, with approximately 10,000 residents is the largest local population center. Irrigon and Umatilla which border UMDA to the northwest and northeast, respectively, are farming communities of less than 1,000 residents each (Figure 1).

Topography across UMDA rises gently to the south with distance from the Columbia River. Elevations range from 410 feet Mean Sea Level (MSL) near the northwest corner, to 660 feet (MSL) to the southwest. The most significant geologic feature at the site is Coyote Coulee which trends southwest-northeast across the eastern half of UMDA. It is a sedimentary structure, a sand wave, deposited during a historic catastrophic flooding event. The site is located on relatively permeable glaciofluvial sedimentary deposits consisting of fine to coarse sand and gravel with increasing silt with depth. The sand and gravel deposits are underlain by the Columbia River Basalt Group. The area can be characterized as semi-arid, receiving only eight to nine inches of precipitation annually. The relatively low precipitation in conjunction with the high permeability of the geologic material present result in very minimal surface drainage. There are no streams or surface water bodies at UMDA. Man-made canals built to recharge local ground water are the most prevalent small scale surface water features in the local area.

UMDA was originally established as an Army ordnance depot in 1941 for the purpose of storing and handling munitions. Access is currently restricted to military personnel and authorized contractors. However, the conventional ordnance storage mission at UMDA has been transferred to another installation as part of the Department of Defense (DoD) Base Realignment and Closure (BRAC) program. Under this program, it is possible that the Army will eventually close the site after the scheduled Chemical Stockpile Demilitarization mission is completed; ownership could then be relinquished to another governmental agency or private interest. Light industry is considered to be the most likely future land use scenario; future residential use is also a possibility.

Land use surrounding the UMDA facility is primarily agricultural. Regional crops include potatoes, alfalfa, corn, wheat, onions, asparagus, apples, grapes, and watermelons. There are also some cattle and hog farms. The influence of the agricultural activities on UMDA is most pronounced in the southern portions of UMDA where the

direction of ground water flow is observed to vary 180 degrees from its natural northern direction when nearby irrigation wells are pumping. In addition, agricultural activities are believed to be responsible for the elevated nitrate concentrations observed in the ground water at UMDA.

Approximately 1,470 wells have been identified within a four-mile radius of UMDA, the majority of which are used for domestic and irrigation water. Three municipal water systems (Hermiston, Umatilla and Irrigon) draw from ground water within a four-mile radius of UMDA. The Columbia River is a major source of potable and irrigation water and is also used for recreation, fishing and the generation of hydroelectric power. The principal use of the Umatilla River is irrigation.

The ALOU is comprised of one five acre disposal area located in the northeastern portion of UMDA, near the eastern border, in a former gravel pit approximately one-half mile east of the Coyote Coulee. The disposal area consists of a depression of approximately fifty feet in depth. The landfill is located between areas known at UMDA as storage igloo blocks E and D, respectively (Figure 2).

The Army has operated the landfill since 1968. The ODEQ issued a landfill permit to the Army in 1979. The permit was renewed in 1982. Municipal waste from the UMDA facility is disposed at the site and covered on a weekly schedule. Debris generated by maintenance such as clearing and renovation activities are also brought to the site occasion. The number of personnel and extent of activity at UMDA have been significantly reduced over the last 20 years, thereby reducing the volume of material placed in the landfill. The peak work force present at UMDA was when the active landfill was first opened. During the Vietnam conflict, approximately 1,000 people were employed at UMDA. However, by 1970 the work force began to decline and by 1987 the work force had fallen to 3 military and 250 civilian employees. Presently there are about 200 people employed at UMDA.

A more complete description of UMDA and the ALOU can be found in the RI report which is part of the Administrative Record for this operable unit. The Administrative Record is available to the public through the information repositories which are located at the Umatilla Depot Activity Public Affairs Office, the Hermiston Public Library, and at EPA Oregon Operations Office in Portland, Oregon.

2.2 Site History and Enforcement Activities

2.2.1 Site History

The Active Landfill at UMDA has been open and receiving waste since 1968. Formerly, during the period from 1950 through 1968, the ALOU was operated as a gravel pit. Materials disposed at the site include garbage, demolition debris, asbestos from brake linings, dried sludge from the sewage treatment plant, and possibly ash from the Deactivation Furnace and explosives sludges.

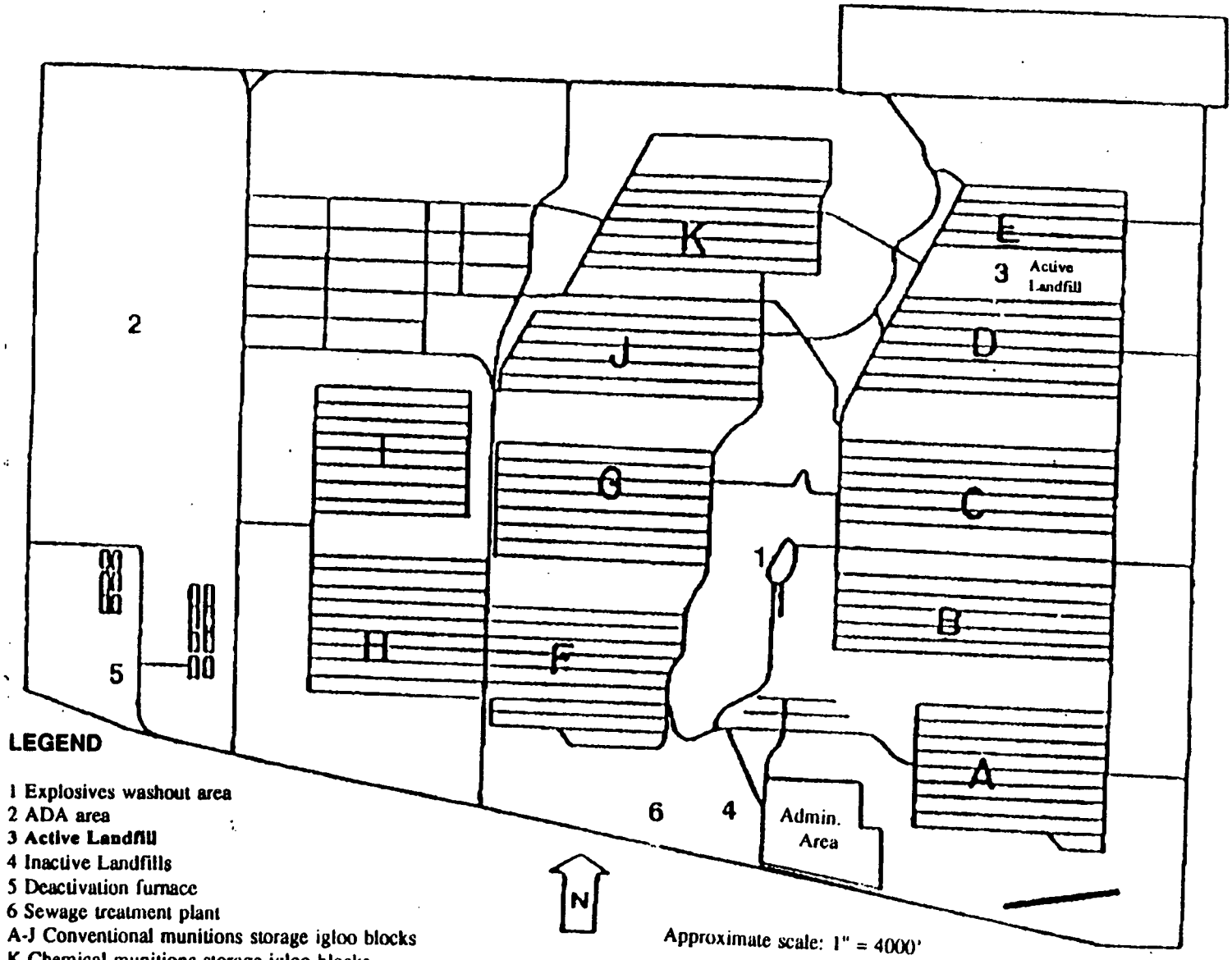

Figure 2: Overview of UMDA Layout
(Base map source: USATHAMA)

UMDA was included in the Army's Installation Restoration Program in October 1978. An Initial Installation Assessment was performed in December 1978, to evaluate the potential for past and present base operations to affect general environmental quality at and around the base. This investigation mentioned the ALOU, but did not recommend any further action.

In 1985, the Army submitted an application to the EPA for approval of plans to construct and operate an incinerator for chemical munitions destruction. To receive approval, EPA required that corrective actions be taken at the site of all previous releases of hazardous materials that had occurred at UMDA. EPA conducted a Resource Conservation and Recovery Act (RCRA) Facility Assessment to identify all areas that may require corrective action. EPA released a final report in July 1987, summarizing their results. This report listed the active landfill as one of the areas that should be addressed. In response, the Army and Argonne National Laboratory jointly developed a work plan to address the EPA's concerns.

Based primarily on contamination discovered at the Explosives Washout Lagoons, (a site being addressed in another operable unit at the base), UMDA was placed on the National Priorities List (NPL) in July of 1987. In 1989, a Federal Facilities Agreement (FFA) was signed formally identifying the Army as the lead organization responsible for taking environmental response actions at UMDA. The FFA provided the framework for the response actions and specified 33 sites, identified by EPA during their RCRA Facility Assessment, that required action. Since that time, the Army has been working with various environmental engineering and consulting firms to ensure that all of the identified sites are characterized and appropriate corrective actions are taken.

The Active Landfill will cease receipt of municipal waste on October 9, 1993, but may receive treated soil from the Deactivation Furnace Area until late 1994. The Army is in the process of designing a closure plan for the landfill in accordance with its permit and ODEQ Solid Waste regulations and guidance. In general, the landfill will be covered by a cap of compacted soil that will be a minimum of 18 inches in thickness. The cap must have a permeability no greater than 10^{-5} cm/second.

2.2.2 Enforcement Activities

There have been no enforcement actions taken regarding this site.

2.3 Highlights of Community Participation

A Public Involvement and Response Plan for UMDA was prepared in May of 1990 to meet the public participation requirements of CERCLA. This plan includes a general discussion of the site and community background, and outlines the goals and objectives of the public involvement plan. Activities designed to ensure that the public is adequately informed of UMDA environmental conditions include, for example:

- Public meetings to discuss issues of concern and project activities. Thus far, two public meetings have been held to discuss the progress of the environmental investigation of the UMDA.

- Technical Review Committee (TRC) meetings, to keep local officials and interested parties informed. The TRC is made up of local officials, as well as local interested citizens. These meetings have been held, one every quarter, since February of 1989. There have been 15 such meetings to date.

- Written communication, fact sheets and press releases to inform the public of milestones achieved in the environmental investigation of UMDA, request their participation in TRC meetings or community interviews or inform them of remedial activities, public meetings or any other items of note.

- Interviews of local citizens to determine their level of awareness of site activities.

- Public comment periods of not less than 30 days on proposed remedial actions.

- A local information repository (the administrative record) available for the public to review.

A summary of the ALOU Proposed Plan was presented to the TRC on August 12, 1992. The Proposed Plan was released for a 30-day public comment period extending from August 31, 1992 to September 30 1992. A public meeting was held at the Armand Larive Junior High School in Hermiston on September 15, 1992 to solicit input on the no action alternative proposed for the site. At the meeting, a summary of the results of the RI was presented and representatives from the Army, EPA, ODEQ, and Arthur D. Little, Inc. (an environmental engineering consulting firm) gave the public an opportunity to ask questions about the site and the proposed remedial alternative. A responsiveness summary which should include comments received and the Army's response(s) is attached at the end of this document. However, no comments or questions were received during the comment period. The remedy documented in this ROD has not been modified from the preferred alternative presented in the Proposed Plan.

2.4 Scope and Role of the Operable Unit or Response Action

Due to its large size, the variety of potential contaminants and the number of discrete sites, UMDA has been divided into the following eight Operable Units (OUs):

- Inactive Landfills OU;
- Active Landfill OU;
- Explosives Washout Lagoons Ground Water OU;
- Ammunition Demolition Activity (ADA) Area Sites OU;
- Miscellaneous UMDA Sites OU;
- Explosives Washout Plant (Building 489) OU;
- Explosives Washout Lagoons Soils OU; and
- Deactivation Furnace Soils OU.

This ROD addresses the Active Landfill OU. A preferred remedy has also been selected for three of the other OUs. The soils at the Deactivation Furnace Soils OU are contaminated with metals, primarily lead. The proposed remedy will require that soils

containing 500 mg/kg or more of lead be excavated and treated by stabilization/ solidification. The option currently proposed for the treated soil is disposal in the Active Landfill.

A no-action remedy has been selected for the Inactive Landfills OU. Data gathered during the RI indicates that actions to protect human health and the environment are not necessary.

The Explosives Washout Lagoons Soils OU was the subject of a final ROD in September 1992 that selected composting to remediate the explosives-contaminated soils. The rest of the OUs at UMDA are currently at the remedial alternative evaluation and feasibility study phase of activity.

This ROD addresses the Active Landfill at UMDA. Based on the results of the RI, which includes the results of the risk assessment, the Army, EPA and ODEQ determined that the ALOU did not pose an unacceptable risk to human health or the environment; consequently, a FS of possible remedial alternatives was not necessary. It was decided that sufficient information had been collected during the RI to justify proceeding directly to the Proposed Plan.

Because the landfill was determined not to pose a significant threat or to be a significant source of contaminants, the Army, EPA, and ODEQ have selected no-action as the final remedy for this OU. Although no further action will be taken under CERCLA, the site is scheduled to be closed and capped in accordance with ODEQ requirements over the next two years. As part of ODEQ closure requirements, ground water quality around the site will be monitored for a minimum of five years after closure to ensure that it is not being negatively affected by the landfill.

2.5 Summary of Site Characteristics

Over the last 15 years, several environmental investigations have been performed at UMDA. There have been two significant efforts directed specifically at the Active Landfill. These investigations consisted of both record and field investigations.

The records investigations included review of aerial photographs of the site dating from 1950 through 1980 and existing files and disposal records to gather information on general site activities. Interviews of former UMDA employees were also conducted to better define the materials disposed at the site.

The initial field investigation was performed in 1988 and involved the installation and sampling of four ground water monitoring wells (Figure 3). These wells were installed into the alluvial aquifer. The samples were analyzed for the presence of explosives, volatile organic compounds, semi-volatile organic compounds, pesticides, priority pollutant metals, cyanide, and several inorganic indicator compounds. Because the landfill is currently active, and will soon cease receipt of waste and be capped, soil samples were not collected. The data they would provide would be of limited value because the landfill constituents are not distributed homogeneously throughout.

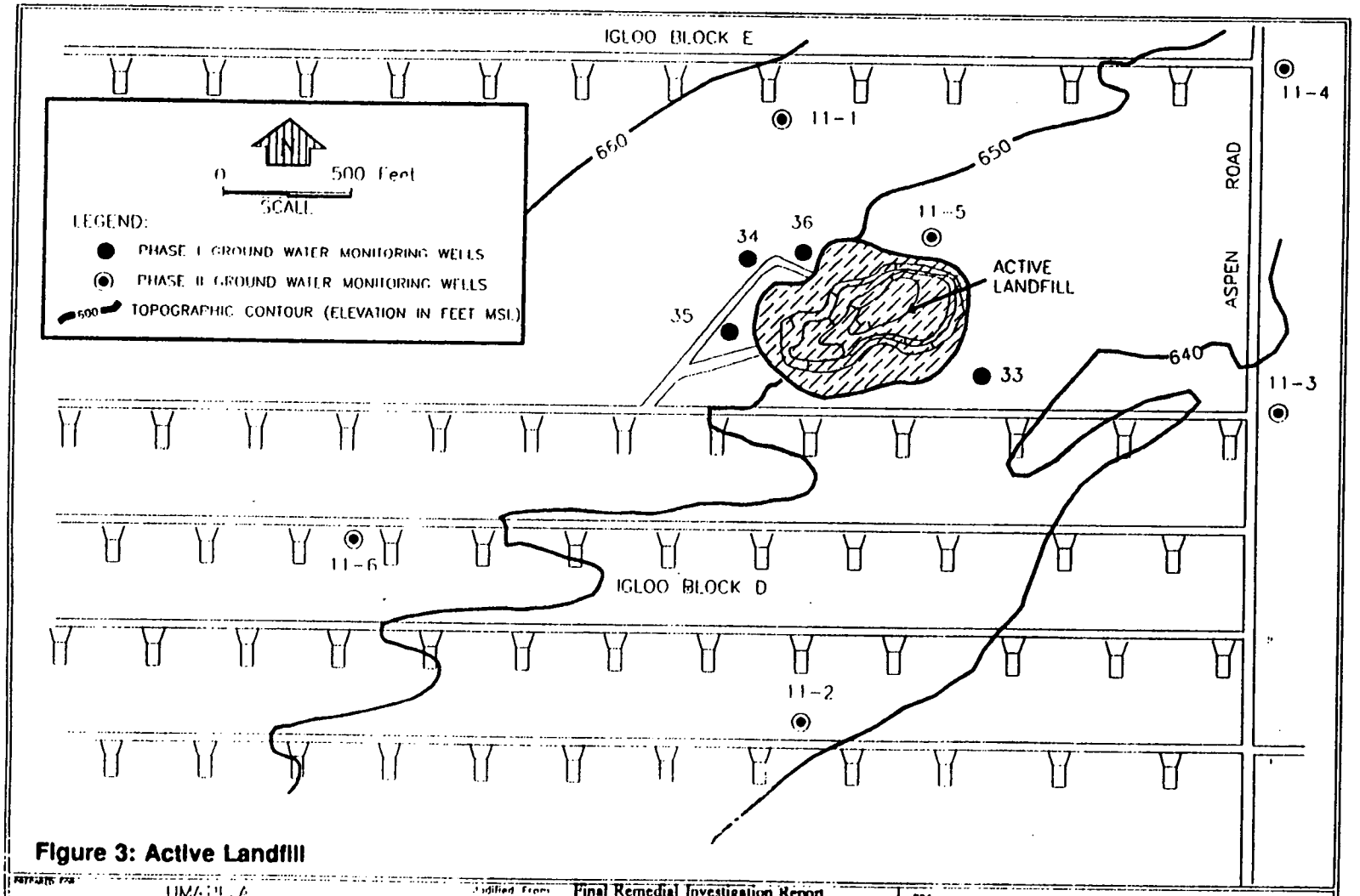

Figure 3: Active Landfill

UMATILLA	Modified From: Final Remedial Investigation Report for the Umatilla Depot Activity, Hermiston, OR, August, 1992		ACTIVE LANDFILL

Therefore, the samples would not be representative of general site conditions. Further, the cap will effectively prohibit contact and exposure to the soil eliminating any potential risk the soil may otherwise have presented to the public or the environment. Also, because this is a landfill site, and to maintain integrity of the cap that will be installed, future excavation and building construction would not be allowed.

Ground water was measured at a depths ranging from 152 to 161 feet below the ground surface (elevations ranging from 487 to 502 feet MSL), and was determined to flow towards the north. It was also determined that the local irrigation systems do not have an affect on ground water flow directions at the ALOU. Several contaminant compounds were detected at trace concentrations, but the source of these compounds could not conclusively be determined. Analytical results are presented in Table 1.

The first field investigation report was completed in 1988. The conclusions of that report are summarized as follows:

- All four ground water monitoring wells contain elevated concentrations of nitrate/nitrite; and three wells contained selenium at concentrations exceeding drinking water standards.

- Trace concentrations of RDX and cyanide were detected in two monitoring wells; MW-33 (the upgradient well) and MW-35. Tetryl was detected at trace concentrations in MW-35. The fact that the contaminants were detected both up and downgradient indicates they may be coming from another source.

- Cyanide was detected at trace concentrations in MW-33a and MW-35.

- Several heavy metals were detected at concentrations slightly elevated above background, but below drinking water standards.

- Two ground water monitoring wells, MW-33 and MW-35 were found to contain unknown semi-volatile compounds.

- The ground water is believed to be under confined conditions indicating that if the landfill did release contaminants to the subsurface, they would be prevented from reaching the ground water. This conclusion was based on the fact that ground water elevations were observed to increase after well installation, indicating that the aquifer was under pressure.

- The active landfill does not appear to present a significant source of contaminants to ground water. The trace contaminant concentrations detected at the active landfill are believed to be coming from other sources within the UMDA or from off-site farming operations.

To further define the source and extent of the nitrate/nitrite and selenium, and to verify the presence of trace concentrations of explosives, supplemental ground water investigation activities were recommended.

TABLE 1

Contaminants Detected in Ground Water in the Active Landfill Area
Phase I Investigation
(concentrations in ug/L)

	Sample Location and Date					
Contaminant	MW-33a 6/18/88	MW-34 6/19/88	MW-35 6/19/88	MW-36 6/18/88	TP-ALb 6/19/88	FB-ALc 6/20/88
Explosives		None			N/A	None
RDX	1.34		<0.63	2.06		
Tetryl	<0.66		2.22	<0.66		
Nitrate/Nitrite	14,300	12,600	12,600	12,600	N/A	<5,000
Cyanide	22.1	<16.0	20.5	<16.0	N/A	<16.0
VOAs	None	None	None	None	None	
Chloroform						16.0
BNAs		None		None	N/A	None
UNK595	N/D		2.10			
UNK597	N/D		13.0			
UNK602	N/D		6.0			
UNK605	N/D		123			
UNK608	5.00		N/D			
UNK611	N/D		202			
UNK623	N/D		23.0			
TOC	2,800	2,100	4,700	4,900	N/A	2,400
Metals					N/A	
Ag	<0.19	<0.19	<0.19	<0.19		<0.19
As	<5.00	<5.00	<5.00	<5.00		<5.00
Be	<0.103	<0.103	<0.103	<0.103		<0.103
Cd	<5.10	<5.10	<5.10	<5.10		<5.10
Cr	<37.5	<37.5	<37.5	<37.5		<37.5
Cu	7.72	5.47	10.5	12.8		3.86
Hg	<0.17	<0.17	<0.17	<0.17		<0.17
Ni	<9.6	<9.6	38.8	12.1		10.8
Pb	6.77	4.95	6.37	5.46		5.46
Sb	<5.00	<5.00	<5.00	<5.00		<5.00
Se	<5.00	32.3	24.5	14.3		<5.00
Tl	<5.00	<5.00	<5.00	<5.00		<5.00
Zn	1,200	2,110	2,100	1,200		1,600

Notes:

None = Group of analytes not detected above detection limits
N/A = Analyte or group of analytes not analyzed
N/D = Analyte not detected above detection limit
Source: Final Remedial Investigation Report, August, 1992

a = Upgradient well
b = Trip blank
c = Field (rinse) blank
UNK = Unknown

The second phase of investigation included the installation of six additional ground water monitoring wells. These wells were placed to better define background ground water quality, and to assist in determining if the elevated concentrations of compounds were due to the landfill or regional background conditions (Figure 3). All of the ground water monitoring wells were installed into the alluvial aquifer.

The six new wells and the four existing wells were sampled during two additional sampling events. Depths to ground water ranged from 140 to 152 feet below grade, and elevations ranged from 491 to 520 feet MSL. The additional data points revealed that ground water was flowing to the west-northwest. The second investigation also determined that ground water does not exist under confined conditions in the alluvial aquifer under investigation.

A second and third round of ground water sampling activities was performed at all 10 wells. Analyses performed on the ground water samples include: Target Analyte List (TAL) inorganics (which includes metals, nonmetallic elements and cyanide), volatile organic compounds, semi-volatile organic compounds, pesticides, polychlorinated-biphenyls (PCBs), explosives and nitrate/nitrite. Analytical results from the second and third sampling event are presented in Table 2. Trace concentrations of several contaminant compounds were detected. However, cyanide, RDX, and tetryl were not detected during the second and third event, indicating that these compounds may not be present. In fact, no explosives were detected during the second or third sampling event. Ten of the wells were found to contain low concentrations of unknown semi-volatile compounds/tentatively identified compounds (TICs). It was determined that some small portion of the TICs detected may be attributed to the landfill. The results confirm that nitrate/nitrite, vanadium, and selenium are elevated. The results also confirm that the downgradient concentrations of these compounds are consistent with the upgradient concentrations indicating that the landfill is not the source of these compounds. An overall summary and interpretation of the data from all three sampling events is presented in Table 3.

The Army did not anticipate finding significant contamination at this site. The majority of materials disposed at the site were non-hazardous and/or can be classified as household refuse. This, in conjunction with the fact that there is very little precipitation at the site, has apparently resulted in negligible negative impact on the local environment.

In general, results of the supplemental investigation found that the slightly elevated concentrations of several compounds were in fact the result of background ground water quality. The State is currently conducting a study of local ground water quality, specifically with respect to nitrate/nitrite, vanadium, and arsenic which appear to be elevated throughout the area. However, it was determined during the RI that the landfill may be contributing a small amount of nitrate/nitrite to the ground water, but that the off-post contribution of nitrate/nitrite from agricultural activities is thought to be much more significant than the amount of nitrate/nitrite coming from the landfill. The RI also determined that the low concentrations of TICs detected in the ground water may be due to the landfill, and are neither significant nor a matter of concern.

TABLE 2

Ground Water Analytical Results
Phase 2 Investigation
Active Landfill

GW Data - 10/7/91									
MAP ID		11-1	11-1	11-2	11-2	11-2	11-3	11-3	
SITE ID		G11A001	G11B001	G11A002	G11A002D	G11B002	G11A003	G11B003	
FIELD ID		MWK7*122	MWK7*123	MWK7*124	UMWK7*88	UMWK7*89	UMWK7*90	UMWK7*94	
S. DATE		22-Oct-90	23-Jan-91	04-Nov-90	04-Nov-90	18-Feb-91	21-Oct-90	21-Jan-91	
DEPTH		162.0	162.0	137.0	137.0	137.0	116.0	116.0	
MATRIX		CGW	CGW	CGW	CGW	CGW	CGW	CGW	
UNITS	*CRLs*	UGL	UGL	UGL	UGL	UGL	UGL	UGL	*COMPARISON CRITERIA*
TAL Inorganics									
ANTIMONY (GFAA)	*3.03*	LT 3.03	3.3	LT 3.03	LT 3.03	LT 3.03	LT 3.03	LT 3.03	*5*
ARSENIC	*0.25*	LT 2.54	2.99	15.1	15	20.4	5.97	6.18	*50*
BARIUM	*5*	91.6	102	58.5	70.8	46.8	168	156	*1000*
CALCIUM	*500*	43000	42000	69815	63655	70842	46000	42000	*NSA*
CHROMIUM	*6*	13.8	13.3	15.9	18.2	25.5	LT 6.02	LT 6.02	*100*
COPPER	*8.1*	LT 8.09	LT 8.09	LT 8.09	LT 8.09	56.1	LT 8.09	LT 8.09	*1300*
CYANIDE	*2.5*	LT 2.5	LT 2.5	LT 2.5	LT 2.5	LT 2.5	LT 2.5	LT 2.5 G	*NSA*
IRON	*42.7*	LT 38.8	LT 38.8	136	LT 38.8	LT 38.8	LT 38.8	LT 38.8	*300*
LEAD (GFAA)	*1.26*	LT 1.26	LT 1.26	1.95	1.41	LT 1.26	LT 1.26	LT 1.26	*15*
MAGNESIUM	*500*	29000	28000	54656	51619	58704	27000	23000	*NSA*
MANGANESE	*2.75*	30.6	3.54	9.19	10.8	LT 2.75	4.13	LT 2.75	*50*
POTASSIUM	*375*	2930	2660	5641	5698	4052	3200	3520	*NSA*
SELENIUM	*3.02*	30.9	[58.3]	[71.1]	[72.1]	[63.9]	LT 3.02	3.41	*50*
SODIUM	*500*	41400	34600	47799	45388	43501	20500	17400	*100000*
VANADIUM (GFAA)	*3.82*	[40]	[49.1]	[34.7]	[36.4]	[44.7]	[58]	[67.4]	*20*
ZINC	*21.1*	LT 21.1	LT 21.1	LT 21.1	LT 21.1	75	LT 21.1	LT 21.1	*5000*
Explosives									
RDX	*2.11*	LT 2.11	LT 2.11	LT 2.11	LT 2.11	LT 2.11	12.3 U	5.32 U	*10*
TETRYL	*0.556*	LT 0.556	LT 0.556	LT 0.556	LT 0.556	LT 0.556	LT 0.556	LT 0.556	*52.5*
TCL VOAs									
CHLOROFORM	*0.5*	LT 0.5	LT 0.5	LT 0.5	2.05	LT 0.5	LT 0.5	LT 0.5	100
TOLUENE	*0.5*	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	1000
TRICHLOROFLUOROMETHANE	*1.4*	LT 1.4	7.21	LT 1.4	LT 1.4	LT 1.4	LT 1.4	LT 1.4 T	10000
VOA TICs									
TRICHLOROTRIFLUOROETHANE	*NA*	ND	30 S	ND	ND	ND	ND	ND	NSA
TCL BNAs									
2,4-DNT	*4.5*	LT 4.5	LT 4.5	LT 4.5	LT 4.5	LT 4.5	LT 4.5	LT 4.5	0.18
2,6-DNT	0.79	LT 0.79	LT 0.79	LT 0.79	LT 0.79	LT 0.79	LT 0.79	LT 0.79	0.007
BIS(2-ETHYLHEXYL) PHTHALATE	4.8	LT 4.8	LT 4.8	LT 4.8	LT 4.8	LT 4.8	LT 4.8	LT 4.8	4

TABLE 2 (cont.)

Ground Water Analytical Results
Phase 2 Investigation
Active Landfill

GW Data - 10/7/91									
MAP ID		11-1	11-1	11-2	11-2	11-2	11-3	11-3	
SITE ID		G11A001	G11B001	G11A002	G11A002D	G11B002	G11A003	G11B003	
FIELD ID		MWK7*122	MWK7*123	MWK7*124	UMWK7*88	UMWK7*89	UMWK7*90	UMWK7*94	
S. DATE		22-Oct-90	23-Jan-91	04-Nov-90	04-Nov-90	18-Feb-91	21-Oct-90	21-Jan-91	
DEPTH		162.0	162.0	137.0	137.0	137.0	116.0	116.0	
MATRIX		CGW	CGW	CGW	CGW	CGW	CGW	CGW	
UNITS	*CRLs*	UGL	UGL	UGL	UGL	UGL	UGL	UGL	*COMPARISON CRITERIA*
BNA TICs									
CAPROLACTAM	*NA*	ND	ND	ND	ND	[300 S]	ND	ND	*17.5*
CYCLOPENTANONE	*NA*	ND	ND	ND	ND	8 S	ND	ND	*NSA*
HEXACOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	*NSA*
PENTACOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	*NSA*
TETRACOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	*NSA*
TOTAL UNKNOWN TICs	*NA*	(2) 13	ND	ND	ND	(2) 13	ND	ND	*NSA*
Other Inorganics									
NITRATE/NITRITE	10	[16000]	[15000]	[15000]	[15000]	[17000]	[16000]	[15000]	10000

TABLE 2 (cont.)

Ground Water Analytical Results
Phase 2 Investigation
Active Landfill

GW Data - 10/7/91									
MAP ID		11-4	11-4	11-4	11-5	11-5	11-6	11-6	
SITE ID		G11A004	G11B004	G11B004D	G11A005	G11B005	G11A006	G11B006	
FIELD ID		MWK7*122	MWK7*123	MWK7*124	UMWK7*88	UMWK7*89	UMWK7*90	UMWK7*94	
S. DATE		30-Oct-90	14-Feb-91	14-Feb-91	22-Oct-90	18-Feb-91	22-Oct-90	23-Jan-91	
DEPTH		132.0	132.0	132.0	158.0	158.0	159.0	157.0	
MATRIX		CGW	CGW	CGW	CGW	CGW	CGW	CGW	
UNITS	*CRLs*	UGL	UGL	UGL	UGL	UGL	UGL	UGL	*COMPARISON CRITERIA*
TAL Inorganics									
ANTIMONY (GFAA)	*3.03*	LT 3.03	LT 3.03	4.02	LT 3.03	3.21	LT 3.03	LT 3.03	*5*
ARSENIC	*0.25*	LT 2.54	3.2	3.09	5.01	4.69	LT 2.54	5.44	*50*
BARIUM	*5*	135	135	135	71.9	74.6	70.1	72.3	*1000*
CALCIUM	*500*	26694	24641	24641	29000	28747	40000	32000	*NSA*
CHROMIUM	*6*	LT 6.02	LT 6.02	LT 6.02	6.34	6.78	LT 6.02	LT 6.02	*100*
COPPER	*8.1*	LT 8.09	LT 8.09	LT 8.09	LT 8.09	22.8	LT 8.09	LT 8.09	*1300*
CYANIDE	*2.5*	LT 2.5	LT 2.5	LT 2.5	LT 2.5	LT 2.5	LT 2.5	LT 2.5	*NSA*
IRON	*42.7*	LT 38.8	LT 38.8	LT 38.8	LT 38.8	LT 38.8	LT 38.8	LT 38.8	*300*
LEAD (GFAA)	*1.26*	LT 1.26	LT 1.26	5.21	LT 1.26	LT 1.26	LT 1.26	LT 1.26	*15*
MAGNESIUM	*500*	12753	12348	11943	19000	22267	29000	25000	*NSA*
MANGANESE	*2.75*	11.2	LT 2.75	LT 2.75	13.8	4.29	40.8	16.1	*50*
POTASSIUM	*375*	4030	3689	3337	3360	3610	4630	4180	*NSA*
SELENIUM	*3.02*	LT 3.02	LT 3.02	LT 3.02	3.41	4.15	4.26	4.9	*50*
SODIUM	*500*	16038	14361	13836	41300	44549	26500	21400	*100000*
VANADIUM (GFAA)	*3.82*	[68.9]	[74.3]	[74.8]	[58.6]	[69.5]	17.3	[49]	*20*
ZINC	*21.1*	LT 21.1	LT 21.1	LT 21.1	LT 21.1	28.7	LT 21.1	LT 21.1	*5000*
Explosives									
RDX	*2.11*	LT 2.11	LT 2.11	LT 2.11	LT 2.11	LT 2.11	3.84 U	4.72 U	*10*
TETRYL	*0.556*	LT 0.556	LT 0.556	LT 0.556	LT 0.556	LT 0.556	LT 0.556	LT 0.556	*52.5*
TCL VOAs									
CHLOROFORM	*0.5*	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	100
TOLUENE	*0.5*	LT 0.5	LT 0.5	LT 0.5	LT 0.5	2.35	LT 0.5	0.892	1000
TRICHLOROFLUOROMETHANE	*1.4*	LT 1.4	LT 1.4	LT 1.4	LT 1.4	LT 1.4	LT 1.4	6.71	10000
VOA TICs									
TRICHLOROTRIFLUOROETHANE	*NA*	ND	ND	ND	ND	ND	ND	30 S	NSA
TCL BNAs									
2,4-DNT	*4.5*	LT 4.5	LT 4.5	LT 4.5	LT 4.5	LT 4.5	LT 4.5	LT 4.5	0.18
2,6-DNT	0.79	LT 0.79	LT 0.79	LT 0.79	LT 0.79	LT 0.79	LT 0.79	LT 0.79	0.007
BIS(2-ETHYLHEXYL) PHTHALATE	4.8	LT 4.8	LT 4.8	LT 4.8	LT 4.8	LT 4.8	[10]	LT 4.8	4

TABLE 2 (cont.)

Ground Water Analytical Results
Phase 2 Investigation
Active Landfill

GW Data - 10/7/91									
MAP ID		11-4	11-4	11-4	11-5	11-5	11-6	11-6	
SITE ID		G11A004	G11B004	G11B004D	G11A005	G11B005	G11A006	G11B006	
FIELD ID		MWK7*122	MWK7*123	MWK7*124	UMWK7*88	UMWK7*89	UMWK7*90	UMWK7*94	
S. DATE		30-Oct-90	14-Feb-91	14-Feb-91	22-Oct-90	18-Feb-91	22-Oct-90	23-Jan-91	
DEPTH		132.0	132.0	132.0	158.0	158.0	159.0	157.0	
MATRIX		CGW	CGW	CGW	CGW	CGW	CGW	CGW	
UNITS	*CRLs*	UGL	UGL	UGL	UGL	UGL	UGL	UGL	*COMPARISON CRITERIA*
BNA TICs									
CAPROLACTAM	*NA*	ND	ND	ND	[20 S]	10 S	ND	ND	*17.5*
CYCLOPENTANONE	*NA*	ND	ND	ND	ND	ND	ND	ND	*NSA*
HEXACOSANE	*NA*	ND	30 s	ND	ND	ND	ND	ND	*NSA*
PENTACOSANE	*NA*	ND	30 s	ND	ND	ND	ND	ND	*NSA*
TETRACOSANE	*NA*	ND	30 s	ND	ND	ND	ND	ND	*NSA*
TOTAL UNKNOWN TICs	*NA*	ND	(7) 123	ND	(3) 25	(6) 43	(3) 238	(5) 32	*NSA*
Other Inorganics									
NITRATE/NITRITE	10	5000	4900	4700	10000	[11000]	10000	8800	10000

TABLE 2 (cont.)

Ground Water Analytical Results
Phase 2 Investigation
Active Landfill

GW Data - 10/7/91									
MAP ID		MW-33	MW-33	MW-34	MW-34	MW-35	MW-35	MW-36	
SITE ID		G11A033	G11B033	G11A034	G11B034	G11A035	G11B035	G11A036	
FIELD ID		MWK7*122	MWK7*123	MWK7*124	UMWK7*88	UMWK7*89	UMWK7*90	UMWK7*94	
S. DATE		30-Oct-90	17-Feb-91	22-Oct-90	22-Jan-91	22-Oct-90	22-Jan-91	30-Oct-90	
DEPTH		161.0	161.0	165.0	165.0	161.0	161.0	161.0	
MATRIX		CGW	CGW	CGW	CGW	CGW	CGW	CGW	
UNITS	*CRLs*	UGL	UGL	UGL	UGL	UGL	UGL	UGL	*COMPARISON CRITERIA*
TAL Inorganics									
ANTIMONY (GFAA)	*3.03*	[6.16]	LT 3.03	4.91	[5.62]	[7.23]	LT 3.03	LT 3.03	*5*
ARSENIC	*0.25*	5.97	4.05	5.01	5.65	8	8.32	6.72	*50*
BARIUM	*5*	54.6	52	56.9	57.4	28.8	35	28.2	*1000*
CALCIUM	*500*	33881	29774	52000	54000	49000	48000	35934	*NSA*
CHROMIUM	*6*	8.53	8.45	16.9	18.6	15.2	26.6	10.2	*100*
COPPER	*8.1*	15.8	LT 8.09	LT 8.09	LT 8.09	LT 8.09	LT 8.09	LT 8.09	*1300*
CYANIDE	*2.5*	LT 2.5	LT 2.5	LT 2.5	LT 2.5	LT 2.5	LT 2.5	LT 2.5	*NSA*
IRON	*42.7*	LT 38.8	LT 38.8	LT 38.8	LT 38.8	LT 38.8	LT 38.8	LT 38.8	*300*
LEAD (GFAA)	*1.26*	LT 1.26	4.12	LT 1.26	3.58	LT 1.26	LT 1.26	LT 1.26	*15*
MAGNESIUM	*500*	17308	15688	43000	40000	33000	34000	28340	*NSA*
MANGANESE	*2.75*	5.36	8.24	LT 2.75	LT 2.75	LT 2.75	LT 2.75	LT 2.75	*50*
POTASSIUM	*375*	4347	4745	815	1710	2260	1130	3235	*NSA*
SELENIUM	*3.02*	3.62	3.51	33.1	[69.1]	14.1	24.1	22.2	*50*
SODIUM	*500*	49057	41195	31600	27800	36400	34800	33333	*100000*
VANADIUM (GFAA)	*3.82*	[51.7]	[46.4]	[53.2]	[56.2]	[49]	[61.7]	[58.5]	*20*
ZINC	*21.1*	LT 21.1	LT 21.1	LT 21.1	LT 21.1	LT 21.1	LT 21.1	LT 21.1	*5000*
Explosives									
RDX	*2.11*	21 U	LT 2.11	LT 2.11	LT 2.11	9.98 U	16.8 U	14 U	*10*
TETRYL	*0.556*	LT 0.556	LT 0.556	LT 0.556	LT 0.556	LT 0.556	LT 0.556	LT 0.556	*52.5*
TCL VOAs									
CHLOROFORM	*0.5*	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	LT 0.5	100
TOLUENE	*0.5*	LT 0.5	2.35	LT 0.5	1.08	LT 0.5	1.37	LT 0.5	1000
TRICHLOROFLUOROMETHANE	*1.4*	LT 1.4	LT 1.4	LT 1.4	8.02	LT 1.4	LT 1.4	LT 1.4 T	10000
VOA TICs									
TRICHLOROTRIFLUOROETHANE	*NA*	ND	ND	ND	30 ST	ND	ND	ND	NSA
TCL BNAs									
2,4-DNT	*4.5*	LT 4.5	LT 4.5	[7.86]	LT 4.5	LT 4.5	LT 4.5	LT 4.5	0.18
2,6-DNT	0.79	LT 0.79	LT 0.79	[0.917]	LT 0.79	LT 0.79	LT 0.79	LT 0.79	0.007
BIS(2-ETHYLHEXYL) PHTHALATE	4.8	LT 4.8	[9.09]	[18.2]	LT 4.8	LT 4.8	LT 4.8	LT 4.8	4

TABLE 2 (cont.)

Ground Water Analytical Results
Phase 2 Investigation
Active Landfill

GW Data - 10/7/91									
MAP ID		MW-33	MW-33	MW-34	MW-34	MW-35	MW-35	MW-36	
SITE ID		G11A033	G11B033	G11A034	G11B034	G11A035	G11B035	G11A036	
FIELD ID		MWK7*122	MWK7*123	MWK7*124	UMWK7*88	UMWK7*89	UMWK7*90	UMWK7*94	
S. DATE		30-Oct-90	17-Feb-91	22-Oct-90	22-Jan-91	22-Oct-90	22-Jan-91	30-Oct-90	
DEPTH		161.0	161.0	165.0	165.0	161.0	161.0	161.0	
MATRIX		CGW	CGW	CGW	CGW	CGW	CGW	CGW	
UNITS	*CRLs*	UGL	UGL	UGL	UGL	UGL	UGL	UGL	*COMPARISON CRITERIA*
BNA TICs									
CAPROLACTAM	*NA*	ND	ND	ND	[30 S]	ND	ND	ND	*17.5*
CYCLOPENTANONE	*NA*	ND	ND	ND	ND	ND	ND	ND	*NSA*
HEXACOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	*NSA*
PENTACOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	*NSA*
TETRACOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	*NSA*
TOTAL UNKNOWN TICs	*NA*	ND	(1) 4	(5) 153	(1) 93	(2) 30	ND	ND	*NSA*
Other Inorganics									
NITRATE/NITRITE	10	[16000]	[16000]	[13000]	[12000]	[16000]	[15000]	[13000]	10000

TABLE 2 (cont.)

Ground Water Analytical Results
Phase 2 Investigation
Active Landfill

GW Data - 10/7/91				
MAP ID		MW-36	MW-36	
SITE ID		G11B036	G11B036D	
FIELD ID		MWK7*122	MWK7*123	
S. DATE		17-Feb-91	17-Feb-91	
DEPTH		161.0	161.0	
MATRIX		CGW	CGW	*COMPARISON*
UNITS	*CRLs*	UGL	UGL	*CRITERIA*
TAL Inorganics				
ANTIMONY (GFAA)	*3.03*	LT 3.03	LT 3.03	*5*
ARSENIC	*0.25*	4.48	5.22	*50*
BARIUM	*5*	20.1	21.4	*1000*
CALCIUM	*500*	37988	34908	*NSA*
CHROMIUM	*6*	LT 6.02	LT 6.02	*100*
COPPER	*8.1*	LT 8.09	LT 8.09	*1300*
CYANIDE	*2.5*	LT 2.5	LT 2.5	*NSA*
IRON	*42.7*	LT 38.8	LT 38.8	*300*
LEAD (GFAA)	*1.26*	LT 1.26	9.54	*15*
MAGNESIUM	*500*	29352	26316	*NSA*
MANGANESE	*2.75*	5.08	5.85	*50*
POTASSIUM	*375*	3519	3451	*NSA*
SELENIUM	*3.02*	20.8	21.3	*50*
SODIUM	*500*	29979	30503	*100000*
VANADIUM (GFAA)	*3.82*	[51.4]	[50.7]	*20*
ZINC	*21.1*	52.3	56.5	*5000*
Explosives				
RDX	*2.11*	LT 2.11	LT 2.11	*10*
TETRYL	*0.556*	LT 0.556	LT 0.556	*52.5*
TCL VOAs				
CHLOROFORM	*0.5*	LT 0.5	LT 0.5	100
TOLUENE	*0.5*	4.61	6.18	1000
TRICHLOROFLUOROMETHANE	*1.4*	LT 1.4	LT 1.4	10000
VOA TICs				
TRICHLOROTRIFLUOROETHANE	*NA*	ND	ND	NSA
TCL BNAs				
2,4-DNT	*4.5*	LT 4.5	LT 4.5	0.18
2,6-DNT	0.79	LT 0.79	LT 0.79	0.007
BIS(2-ETHYLHEXYL) PHTHALATE	4.8	[4.45]	[4.55]	4

TABLE 2 (cont.)

Ground Water Analytical Results
Phase 2 Investigation
Active Landfill

GW Data - 10/7/91				
MAP ID		MW-36	MW-36	
SITE ID		G11B036	G11B036D	
FIELD ID		MWK7*122	MWK7*123	
S. DATE		17-Feb-91	17-Feb-91	
DEPTH		161.0	161.0	
MATRIX		CGW	CGW	*COMPARISON*
UNITS	*CRLs*	UGL	UGL	*CRITERIA*
BNA TICs				
CAPROLACTAM	*NA*	ND	ND	*17.5*
CYCLOPENTANONE	*NA*	20 S	20 S	*NSA*
HEXACOSANE	*NA*	ND	20 S	*NSA*
PENTACOSANE	*NA*	ND	ND	*NSA*
TETRACOSANE	*NA*	ND	20 S	*NSA*
TOTAL UNKNOWN TICs	*NA*	(4) 21	(6) 88	*NSA*
Other Inorganics				
NITRATE/NITRITE	10	[13000]	[13000]	10000

GT = Greater Than
LT = Less Than
NA = Not Available
ND = Not Detected
NSA = No Standard Available
NT = Not Tested
S = Results Based on Internal Standards
TICs = Compounds for Which No Standard for Identification Exists
U = Unconfirmed
[ ] = Detected concentration exceeds comparison criterion
Source: Final Remedial Investigation Report, August, 1992

TABLE 3

Summary and Interpretation of Ground Water Analytical Data

ACTIVE LANDFILL

Compounds detected only once and/or at trace concentrations:

Cyanide
Explosives:
RDX
Tetryl

Compounds tentatively identified, but not confirmed present at trace concentrations:

2,4-DNT
2,6-DNT

Compounds detected that are sampling or laboratory artifacts:

Bis(2-Ethylhexly)Phthalate
BNA TICs:
Caprolactam
Cyclopentanone
Hexacosane
Pentacosane
Tetracosane
Volatile Organics:
Chloroform
Toulene
Trichlorofloromethane
Trichlorofluoroethane

Compounds detected that are thought to be attributed to the landfill:

Nitrate/Nitrite
*Several unidentified semi-volatile organic compounds**

Compounds detected at elevated concentrations that were found to be elevated regionally:

Arsenic
Nitrate/Nitrite
Selenium
Vanadium

* The unidentified semi-volatile compounds are not listed as EPA Priority Pollutants
Source: Final Remedial Investigation Report, August, 1992

Since there are no water supply wells at the ALOU, there are no current pathways that would result in human exposure to the low concentrations of contaminants in the ground water. In addition, the landfill is located within an area that is fenced with limited access, eliminating any potential exposure to the disposed material.

2.6 Summary of Site Risks

This section summarizes the human health risks and environmental impacts associated with exposure to site contaminants and provides potential remedial action criteria.

2.6.1 Human Health Risks

A baseline risk assessment was conducted during the 1992 RI to determine the potential risk the site would pose to human health and the environment if no clean-up activities were performed. A risk assessment consists of several steps. The first step is an exposure analysis where potential pathways by which someone might be exposed to a compound are identified. If there are no exposure pathways, there is no risk. Second, a list of compounds ("contaminants of concern") is developed. These are the compounds that will be considered in the risk calculations. They are chosen based on their concentration and potential toxicity. For this risk assessment, the contaminants were selected to be "contaminants of concern" if they were found to be above background or present at elevated concentrations. Compounds found to be elevated due to naturally occurring conditions, with the exception of nitrate/nitrite, were also included to produce a more conservative risk estimate. Once the contaminants of concern are identified, a toxicity assessment is performed. Assumptions and data from toxicological studies on humans and animals are used to quantify the potential toxicity or potency of a particular compound. In addition, the calculations are performed to protect the most sensitive population and contain conservative assumptions on, for example, duration and magnitude of exposure. As such, there is uncertainty associated with risk assessments. They should not be considered a predictive tool, but an instrument for determining relative priorities for clean-up of contaminated sites.

All of this information is combined to perform the human health risk evaluation, where the potential risk to human health posed by the site is quantified. A hazard index is generated for potential noncarcinogenic effects, and a cancer risk level is generated for potential carcinogenic contaminants. In general, a hazard index of less than one indicates that even the most sensitive population is not likely to experience adverse health effects. The cancer risk level is expressed as a probability and indicates the additional chance that an individual will develop cancer over a lifetime of exposure. EPA's acceptable risk range for cancer is 1×10^{-4} to 1×10^{-6}; or one additional chance in ten thousand to one additional chance in one million that a person will contract cancer if they are exposed to a site for 30 years.

2.6.1.1 Exposure Analysis. The populations at risk of exposure to this site were identified by considering both current and future use scenarios. A detailed risk analysis of the current land use scenario was not evaluated for several reasons:

- Access to the landfill is limited to UMDA personnel. Because the landfill is active, only those individuals who operate the landfill are expected to have the most significant exposure to the ALOU;

- The landfill receives garbage only once a week and that material is covered, further limiting the potential for exposure;

- The landfill will cease receipt of municipal waste in approximately one year (October 1993), and receipt of all waste in 1994, and then proceed to closure, effectively removing any potential for exposure to the materials at the landfill; and

- No water supply wells presently exist at the landfill, therefore there is no current potential for exposure to ground water.

In summary, risks associated with current land use were not evaluated because the potential for, and duration of exposure was expected to be small. In addition, an evaluation of risk associated with residential land use of this site will generate the most conservative risk estimate. If the risk assessment showed residential use of the site to be acceptable, that indicates all other potential scenarios, including the current land use, is also acceptable. Therefore, the population hypothetically exposed to the contaminants was site residents.

Exposure to contaminated soil was determined not to be of concern and was not addressed in the human health risk assessment. Currently, the site is secured and only accessible to UMDA personnel. UMDA personnel are present at the landfill only once weekly during refuse disposal. The personnel present are in vehicles/equipment associated with landfill operations and remain in those vehicles while they are at the landfill. The active disposal area is covered with clean fill weekly after disposal activities are complete. Therefore, there are no significant current exposures to soil at the ALOU. The landfill is scheduled to close and be capped in accordance with state and federal regulations, eliminating any potential future exposure pathways. In addition, because the site has been operated as a landfill, any post-closure activities that would degrade the integrity of the cap will not be permitted, ensuring that there will be low or limited potential for future exposure.

The potential risks associated with a future residential land use were analyzed in detail. The exposure routes that were evaluated include:

- Drinking ground water from beneath the landfill;

- Showering with ground water from beneath the landfill; and

- Eating crops that were irrigated with ground water from beneath the landfill.

2.6.1.2 Contaminant Identification. Although tentatively identified semi-volatile organic compounds and nitrate/nitrite compounds were the only contaminants determined to be associated with the landfill in the RI report, they were not included in the compounds identified for the Risk Assessment. This is because the semi-volatile compounds were only tentatively identified, and their detection is generally considered

questionable. Nitrate/nitrite was discounted because the contribution from off-post sources related to agricultural activities are much more significant so the concentrations detected at the landfill were determined to be background. The compounds that were evaluated in the risk assessment, and the concentrations of those chemicals are listed in Table 4. These compounds, although determined not to be associated with the landfill, and not to be of concern, were carried through the risk assessment to generate a more conservative risk estimate.

Health effects criteria for the compounds of concern are listed in Table 5. Included are the Cancer Potency Factor and Reference Dose for the appropriate compounds. Cancer Potency Factors (CPFs) have been developed by EPA's Carcinogenic Assessment Group for estimating excess lifetime cancer risks associated with exposure to potentially carcinogenic chemicals. CPFs, which are expressed in units of (mg/kg-day), are multiplied by the estimated intake of a potential carcinogen, in mg/kg-day, to provide an upper-bound estimate of the excess lifetime cancer risk associated with exposure at that intake level. The term "upper bound" reflects the conservative estimate of the risks calculated from the CPF. Use of this approach makes underestimation of the actual cancer risk highly unlikely, Cancer Potency Factors are derived from the results of human epidemiological studies or chronic animal bioassays to which animal-to-human extrapolation and uncertainty factors have been applied.

Reference Doses (RfDs) have been developed by EPA for indicating the potential for adverse health effects from exposure to chemicals exhibiting noncarcinogenic effects. RfDs, which are expressed in units of mg/kg-day, are estimates of lifetime daily exposure levels for humans, including sensitive individuals. Estimated intakes of chemicals from environmental media (e.g., the amount of a chemical ingested from contaminated drinking water) can be compared to the RfD. RfDs are derived from human epidemiological studies or animal studies to which uncertainty factors have been applied (e.g., to account for the use of animal data to predict effects on humans). These uncertainty factors help ensure that the RfDs will not underestimate the potential for adverse noncarcinogenic effects to occur.

As indicated above, there is a significant level of uncertainty associated with risk assessments. However, the information that is used in a risk assessment is generally biased to ensure that a conservative, overestimation of risk will be generated, rather than an underestimation.

2.6.1.3 Risk Evaluation. Table 6 presents the risk factor and hazard index values associated with each exposure pathway, broken down by compound. Tables 7 through 9 present the risk factor and hazard index estimates by compound for each pathway. Results of the risk evaluation show that ground water ingestion poses the largest potential risk at this site. Arsenic, a naturally occurring element, is primarily responsible for the risk. However, even with the inclusion of arsenic in the evaluation, the cancer risk is within the acceptable risk range established by the NCP (1×10^{-4} - 1×10^{-6}). The non-cancer risk for this site is slightly above the acceptable threshold of 1. However, removing arsenic, selenium and vanadium, which have been determined to represent background, from the risk calculations reduces the associated risk well below a level of concern.

TABLE 4

Occurrence and Distribution of Compounds Evaluated in the Active Landfill Risk Assessment

COMPOUND	UNIT	Frequency of Detection	Percent Positive Detections	Range of Sample Detection Limits	Range of Detected Concentrations	Upper 95 Percent Confidence Limit (a)	Location of Max. Conc.	Comparison Conc.	Criteria Type	Number of Exceedance
TAL Inorganics										
ANTIMONY	UGL	6 / 20	30	3 - 3.03	3.21 - 7.23	3.05	MW-35	1	Bkgd	6
ARSENIC	UGL	14 / 20	70	2.54 - 5	2.99 - 20.4	7.51	11-2	1	Bkgd	14
BARIUM	UGL	16 / 16	100	DLNA	20.1 - 102	67.5	11-1	59	Bkgd	6
CHROMIUM	UGL	13 / 20	65	6.02 - 37.5	6.34 - 26.6	16.3	MW-35	1	Bkgd	13
COPPER	UGL	7 / 20	35	8.09 - 8.09	5.47 - 56.1	13.9	11-2	1	Bkgd	7
CYANIDE	UGL	2 / 20	10	2.5 - 16	20.5 - 22.1	6.36	MW-33	--	NSA	NA
LEAD	UGL	7 / 20	35	1.26 - 1.26	1.95 - 6.77	2.93	MW-33	5	Bkgd	3
SELENIUM	UGL	19 / 20	95	5 - 5	3.41 - 71.1	34.2	11-2	1	Bkgd	19
VANADIUM	UGL	16 / 16	100	DLNA	17.3 - 69.5	54.7	11-5	--	NSA	NA
ZINC	UGL	3 / 16	19	21.1 - 21.1	28.7 - 75	26.5	11-2	40	Bkgd	2
Explosives										
RDX	UGL	2 / 20	10	0.63 - 2.11	1.34 - 2.06	1.18	MW-36	--	NSA	NA
TETRYL	UGL	1 / 20	5	0.556 - 0.66	2.22 - 2.22	0.55	MW-35	--	NSA	NA
TCL Semivolatiles										
2,4-DNT	UGL	1 / 20	5	4.5 - 10	7.86 - 7.86	3.69	MW-34	--	NSA	NA
2,6-DNT	UGL	1 / 20	5	0.79 - 10	0.917 - 0.917	2.07	MW-34	--	NSA	NA

(a) = Upper 95 percent confidence limit on the arithmetic mean. Calculated assuming one-half the detection level as the concentration for those samples in which a given analyte was not detected
Bkgd = The maximum detected concentration in background ground water
DLNA = Detection Level Not Available. The detection levels could not be ascertained because constituents were detected in all relevant samples
NA = Not Applicable
NSA = No Standard Available for Compound
TAL = Target Analyte List
TCL = Target Compound List
TIC = Tentitively Identified Compound
UGL = ug/L
Source: Final Human Health Baseline Risk Assessment, August, 1992

Table 5

Summary of Toxicity Criteria for the Contaminants of Concern at the Active Landfill

Chemicals	RfDo (mg/kg/day)	UF	Confidence	Critical Effect	RfDi (mg/kg/day)(as)	UF	Confidence	Critical Effect
TAL Inorganics								
Antimony	4.0E-04	1000	Low	Longevity, blood glucose levels; serum cholesterol	ND	--	--	--
Arsenic	3.0E-04	3	Medium	Hyperpigmentation, keratosis vascular complications	UR	--	--	--
Barium	7.0E-02	3	Medium	Hypertension	1.4E-04	1000	--	Fetotoxicity
Chromium VI(c)	5.0E-03	500	Low	NOAEL; highest level tested	6.0E-07	1000	--	Nasal mucosa atrophy
Copper	3.7E-02	1	Low	MCL	1.0E-02	--	Low	--
Lead	IUBK Model (see text)			Neurotoxicity in children	ID	--	--	--
Selenium	5E-03	3	High	Selenosis: Mottled teeth, blood and CNS disorders	ID	--	--	--
Vanadium	7.0E-03	100	Low	NOAEL; highest level tested	ND	--	--	--
Zinc	2.0E-01(i)	100	--	Anemia	ND	--	--	--
Cyanide (free)	2.0E-02	100(j)	Medium	Weight loss, thyroid effects; demyelination	ND	--	--	--
Explosives								
RDX	3.0E-03	100	High	NOAEL; higher levels associated with prostate inflammation, tremors, hepatic and renal effects	ND	--	--	--
Tetryl	1.0E-02	10,000	Low	Blood coagulation defects, hepatic lesions and necrosis	ND			--

Table 5 (cont.)

Summary of Toxicity Criteria for the Contaminants of Concern at the Active Landfill

Chemicals	SFo 1/(mg/kg/day)	Types of Cancer	SFI 1/(mg/kg/day)	Types of Cancer	Weight-of-Evidence Class	Sources
TAL Inorganics						
Antimony	ND	..	ND	..	..	1,1,1,1
Arsenic	1.75E+00	Skin cancers	1.4E+01	Lung cancers	A	1,1,1,1
Barium	ND	..	ND	..	..	1,2,1,1
Chromium VI(c)	ND	..	4.2E+01	Lung tumors	A	1,2,1,1
Copper	ND	..	ND	..	D	3,3,1,1
Lead	ID	Renal tumors	ID	Digestive tract; respiratory system, peritoneum	B2	4,4,1,1
Selenium	ID	..	ID	..	D	1,1,1,1
Vanadium	ND	..	ND	..	..	2,1,1,1
Zinc	ND	..	ND	..	D	2,1,1,1
Cyanide(free)	ND	..	ND	..	D	1,1,1,1
Explosives						
2,4-DNT	6.8E-01	Hepatocellular carcinomas; mammary fibroadenomas	ND	..	B2	5,1,1,1
2,6-DNT	6.8E-01	Hepatocellular carcinomas; mammary fibroadenomas	ND	..	B2	5,1,1,1
Tetryl	ND	..	ND	..	..	6,..,..

Table 5 (cont.)

Summary of Toxicity Criteria for the Contaminants of Concern at the Active Landfills

Footnotes:

(aa) - Inhalation reference doses were calculated from reference air concentrations (RFCs) assuming that a standard 70kg human inhales 20 cubic meters of air/day (USEPA, 1989b). Limitations of these assumptions are discussed in the uncertainty section of the text.

(a) - Source codes are listed below. The 4 values shown in this column are the sources for the oral Rfd, the inhalation RfD, the oral slope factor, and the inhalation slope factor, respectively.

(1) USEPA, 1991d.
(2) USEPA, 1991e.
(3) USEPA, 1991g.
(4) USEPA, 1991k.
(5) Brower, 1992.
(6) USEPA, 1990.
(7) Ris, 1992.
(8) Ris, 1991.
(9) Poirier, 1992.

(c) - Values for hexavalent chromium are used in this risk assessment.

(f) - Listed value is for the soluble salts of nickel.

(g) - Listed values are for nickel refinery dust and nickel subsulfide, respectively. Most conservative value (e.g., nickel subsulfide) used in this Baseline RA.

(i) - Under RfD/RfC Work Group review.

(j) - A modifying factor of 5 was used to reflect tolerance to cyanide when administered in food.

(p) - The UF confidence level, and basis for the RfDo for aluminum are unknown. However, exposure to aluminum has been associated with neurological effects.

"--" - Not applicable.

Acronyms:

RfDo	Oral reference dose
UF	Uncertainty factor
RfDi	Inhalation reference dose
SFo	Oral slope factor
SFi	Inhalation slope factor
ND	No data
ID	Insufficient data available
UR	Under review
NOEL	No observable effect level
NOAEL	No observable adverse effect level (see Appendix B)
MCL	Maximum contaminant level
CNS	Central nervous system
RfC	Reference concentration (see Appendix B)
CRAVE	Carcinogen Risk Assessment Verification Endeavor (see Appendix B)

Source: Final Human Health Baseline Risk Assessment, August 1992.

TABLE 6

Multiple Pathway Potential Carcinogenic Risks and Noncarcinogenic Hazards at the Active Landfill Future Residential Land Use Scenario

Pathway Number	Pathway Description	Risk	Hazard Index
5	Ingestion of Ground Water	2E-04	2E+00
7	Dermal Absorption of Ground Water Contaminants During Showering	3E-07	6E-04
12	Consumption of Crops	6E-06	2E-02
Total		**2E-04**	**2E+00**

Source: Final Human Health Baseline Risk Assessment, August, 1992

TABLE 7

Potential Carcinogenic Risks and Noncarcinogenic Hazards
Due to Ingestion of Ground Water at the Active Landfill
Future Residential Land Use Scenario

Analyte	Carcinogenic Intake (mg/kg/day)	Slope Factor 1/(mg/kg/day)	Risk
Antimony	--	--	--
Arsenic	8.82E-05	1.75E+00	2E-04
Barium	--	--	--
Chromium	--	--	--
Copper	--	--	--
Lead	--	--	--
Selenium	--	--	--
Vanadium	--	--	--
Zinc	--	--	--
Cyanide	--	--	--
2,4-DNT	4.33E-05	6.8E-01	3E-05
2,6-DNT	2.43E-05	6.8E-01	2E-05
RDX	1.39E-05	1.1E-01	2E-06
Tetryl	--	--	--
Total			**2E-04**

Analyte	Noncarcinogenic Intake (mg/kg/day)	Reference Dose (mg/kg/day)	Hazard Quotient
Antimony	8.36E-05	4.0E-04	2E-01
Arsenic	2.06E-04	3.0E-04	7E-01
Barium	1.85E-03	7.0E-02	3E-02
Chromium	4.47E-04	5.0E-03	9E-02
Copper	3.81E-04	3.7E-02	1E-02
Lead	8.03E-05	**	**
Selenium	9.37E-04	5.0E-03	2E-01
Vanadium	1.50E-03	7.0E-03	2E-01
Zinc	7.26E-04	2.0E-01	4E-03
Cyanide	1.74E-04	2.0E-02	9E-03
2,4-DNT	1.01E-04	2.0E-03	5E-02
2,6-DNT	5.67E-05	1.0E-03	6E-02
RDX	3.23E-05	3.0E-03	1E-02
Tetryl	1.51E-05	1.0E-02	2E-03
Total			**2E+00**

"--" Not calculated because contaminant is not considered a carcinogen or potency factor is not available

"**" Reference dose not available

Source: Final Human Health Baseline Risk Assessment, August, 1992

[illegible]

Table 8: Potential Carcinogenic Risks and Noncarcinogenic Hazards Due to Dermal Absorption of Ground Water Contaminants at the Active Landfill Future Residential Land Use Scenario

Analyte	Carcinogenic Intake (mg/kg/day)	Slope Factor 1/(mg/kg/day)	Risk
2,4DNT	2.80E-07	6.8E-01	2E-07
2,6DNT	1.32E-07	6.8El-01	9E-08
RDX	8.24E-09	1.1E-01	9E-10
Tetryl	--	--	--
Total			**3E-07**

Analyte	Noncarcinogenic Intake (mg/kg/day)	Reference Dose (mg/kg/day)	Hazard Quotient
2,4-DNT	6.53E-07	2.0E-03	3E-04
2,6-DNT	3.09E-07	1.0E-03	3E-04
RDX	1.92E-08	3.0E-03	6E-06
Tetryl	1.28E-08	1.0E-02	1E-06
Total			**6E-04**

"--" Not calculated because contaminant is not considered a carcinogen or potency factor is not available.

Source: Final Human Health Baseline Risk Assessment, August, 1992.

TABLE 9

Potential Carcinogenic Risks and Noncarcinogenic Hazards
Due to the Consumption of Crops at the Active Landfill
Future Residential Land Use Scenario

Analyte	Carcinogenic Intake (mg/kg/day)	Slope Factor 1/(mg/kg/day)	Risk
Antimony	--	--	--
Arsenic	1.41E-08	1.75E+00	2E-08
Barium	--	--	--
Chromium	--	--	--
Copper	--	--	--
Lead	--	--	--
Selenium	--	--	--
Vanadium	--	--	--
Zinc	--	--	--
Cyanide	--	--	--
2,4-DNT	5.52E-06	6.8E-01	4E-06
2,6-DNT	3.13E-06	6.8E-01	2E-06
RDX	1.99E-06	1.1E-01	2E-07
Tetryl	--	--	--
Total			**6E-06**

Analyte	Noncarcinogenic Intake (mg/kg/day)	Reference Dose (mg/kg/day)	Hazard Quotient
Antimony	xx	4.0E-04	xx
Arsenic	3.29E-08	3.0E-04	1E-04
Barium	xx	7.0E-02	xx
Chromium	1.79E-08	5.0E-03	4E-06
Copper	xx	3.7E-02	xx
Lead	1.61E-08	**	**
Selenium	xx	5.0E-03	xx
Vanadium	xx	7.0E-03	xx
Zinc	xx	2.0E-01	xx
Cyanide	xx	2.0E-02	xx
2,4-DNT	1.29E-05	2.0E-03	6E-03
2,6-DNT	7.29E-06	1.0E-03	7E-03
RDX	4.65E-06	3.0E-03	2E-03
Tetryl	1.99E-06	1.0E-02	2E-04
Total			**2E-02**

"--" Not calculated because contaminant is not considered a carcinogen or potency factor is not available

"**" Reference dose not available

"xx" Quantitative information on uptake factors not available

Source: Final Human Health Baseline Risk Assessment, August, 1992

2.6.1.4 Human Health Risk Characterization Summary. In general, compounds determined to be present at background concentrations as well as compounds attributed to the landfill were included in the risk assessment. Future residential land use was the scenario evaluated. This evaluation estimated the potential risk associated with drinking and showering with water from a well installed beneath the landfill and eating crops grown at the site over a long period of time, for both adults and children. These assumptions were made to generate a very conservative, worst case, risk estimate. Based upon the results of the risk assessment, it was decided that the landfill does not pose an unacceptable risk to human health.

While sampling was not performed to verify the contents of the active landfill, documentation of materials disposed in the landfill exists. Soil sampling was not performed since it could not effectively characterize the landfill which was continually being changed by ongoing installation landfilling operations. However, this is not believed to be a significant exposure pathway because the site will be closed and capped in accordance with State solid waste landfill requirements, thus precluding any exposure to the landfill contents. State requirements also prohibit any activities detrimental to cap integrity, ensuring that future exposure to potential contamination in the landfill will not occur. In addition, this usage restriction, and notification of the site's past use as a landfill, must be added to the deed for this property.

2.6.2 Environmental Risks

Preliminary results of the assessment indicate that the most contaminated sites at UMDA are causing only limited negative impact on the local ecological environment. The ecological risk assessment was performed for UMDA to determine the potential for the site to negatively affect site animal or vegetative populations. This assessment did not specifically address the ALOU, but focused on the potential effects associated with the most seriously contaminated sites at UMDA. It was assumed that this would provide a most conservative estimate of potential negative ecological effects.

The potential for negative ecological impact associated with the ALOU is considered minor. The most significant potential risk associated with the site results from ground water ingestion, and there is no potential ecological exposure route to ground water. If there were any potential risk associated with the refuse disposed at the site, it will be eliminated once the site is capped.

2.7 Description of the "No-Action" Alternative

The Army, EPA and ODEQ have agreed that results of the environmental investigations and the human health risk assessment performed at the ALOU demonstrate that it does not pose a significant risk to human health and the environment. In addition, the landfill is scheduled to stop receipt of municipal waste on October 9, 1993, but may receive treated soil from the Deactivation Furnace Area until late 1994. The landfill will be capped and closed in accordance with Oregon State Solid Waste Regulations which require a low permeability cap consisting of 18 inches of compacted soil with a permeability no greater than 10^{-5} cm/second. Ground water monitoring, which is also required by Oregon State Solid Waste Regulations, will be performed for five years after closure to ensure that the landfill does not constitute a source of contamination. Based on this information, it was decided that a "No-Action" remedial remedy is sufficiently protective of human health and the environment.

In choosing the no further action alternative, EPA reserves its authority to perform additional response actions should new information necessitate such a decision.

2.8 Documentation of Significant Changes

The remedy documented in this ROD is the same as the preferred alternative presented in the Proposed Plan for the ALOU. The final remedy has not undergone any significant changes, however the schedule for closing the Active Landfill has been extended from late 1993 to late 1994.

Section 3

Responsiveness Summary

The final component of the ROD is the Responsiveness Summary, which serves two purposes. First, it provides the agency decision makers with information about community preferences regarding the remedial alternatives and general concerns about the site. Second, it demonstrates to members of the public how their comments were taken into account as a part of the decision-making process.

Historically, community interest in the UMDA installation has centered on the impacts of installation operations on the local economy. Interest in the environmental impacts of UMDA activities has typically been low. Only the proposed chemical demilitarization program, which is separate from CERCLA remediation programs, has drawn substantial comment and concern.

As part of the installation's community relations program, the UMDA command assembled in 1988 a TRC composed of elected and appointed officials and other interested citizens from the surrounding communities. Quarterly meetings provide an opportunity for UMDA to brief the TRC on installation environmental restoration projects and to solicit input from the TRC. The TRC was briefed on August 12, 1992 on the scope and results of the supplemental investigation and the methodology of the preferred alternative presented in the proposed plan. The response received from the TRC was positive.

Notice of the public comment period, public meeting, and availability of the Proposed Plan was published in the *Hermiston Herald*, the *Tri-City Herald*, and the *East Oregonian* in September 1992.

The Proposed Plan for the Active Landfill Operable Unit was released to the public on August 31, 1992. The public comment period started on that date and ended on September 30, 1992. The documents constituting the administrative record were made available to the public at the following locations: UMDA Building 1, Hermiston, Oregon; the Hermiston Public Library, Hermiston, Oregon; and the EPA Office in Portland, Oregon.

A public meeting was held at Armand Larive Junior High School, Hermiston, Oregon, on September 15, 1992, to inform the public of the preferred alternative and to seek public comments. At this meeting, representatives from UMDA, USATHAMA, EPA, ODEQ, and Arthur D. Little, Inc. presented the proposed remedy. Approximately ten persons from the public and media attended the meeting.

No comments or questions regarding the proposed alternative, either verbal or written, were received by UMDA, EPA, or ODEQ during the public meeting or during the comment period.

Appendix 1

State of Oregon's Letter of Concurrence

Oregon

DEPARTMENT O
ENVIRONMENTA
QUALITY

OCTOBER 20, 1992

Ms. Dana Rassmussen
Regional Administrator
U. S. Environmental Protection Agency
1200 Sixth Avenue
Seattle, WA 98101

Re: Umatilla Depot Activity
Active Landfill Operable Unit
Record of Decision

Dear Ms. Rassmussen:

The Oregon Department of Environmental Quality (DEQ) has reviewed the draft Record of Decision, for the Active Landfill Operable Unit at the U.S. Army's Umatilla Depot Activity. I am pleased to advise you that DEQ concurs with the no-action remedy recommended by EPA and the Army. I find that this alternative is protective, and to the maximum extent practicable is cost effective, uses permanent solutions and alternative technologies, is effective and implementable. Accordingly, it satisfies the requirements of ORS 465.315, and OAR 340-122-040 and 090.

It is understood that the active landfill will be properly closed under the Solid Waste Disposal Permit issued by this Department, and in accordance with the Department's solid waste management regulations. DEQ's closure requirements for this site have not yet been finalized, but will likely include a low permeability soil cap, and groundwater monitoring for a minimum of five years after closure.

If you have any questions concerning this matter, please contact Mr. William Dana of the Department's Environmental Cleanup Division, at (503) 229-6530.

Sincerely,

Fred Hansen
Director

WD:m
SITE\SM35\SM4681
cc: Lewis D. Walker, DOD
LTC. William McCune, UMDA
Harry Craig, EPA-000
Bill Dana, SRS, DEQ

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