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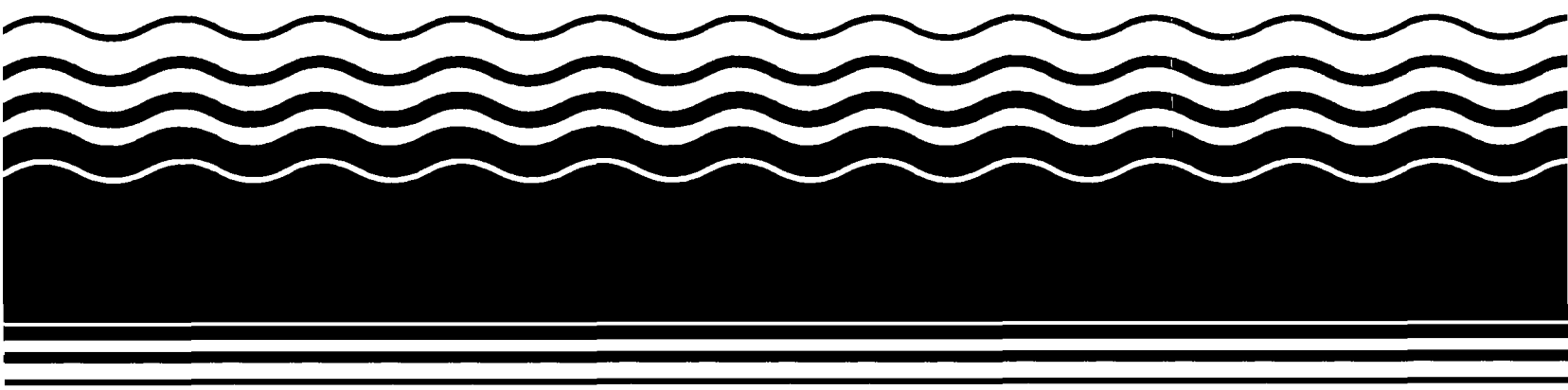
EPA Superfund
Explanation of Significant Difference for the Record of Decision:

Fort Lewis Logistics Center
Tillicum, WA
9/9/1998



EXPLANATION OF SIGNIFICANT DIFFERENCE

for the

DEPARTMENT OF THE ARMY
LOGISTICS CENTER
FORT LEWIS, WASHINGTON

I. Introduction

This document presents an Explanation of Significant Difference (ESD) from the Record of Decision (ROD) for the Logistics Center at Fort Lewis, Washington. The ROD was signed by the U.S. Army (Army), the U.S. Environmental Protection Agency (EPA), and the Washington State Department of Ecology (Ecology) in September 1990.

Site Name and Location:

Logistics Center
Fort Lewis, Washington

The Fort Lewis Logistics Center was placed on the National Priorities List (NPL) in December 1989 under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. The lead agency for the Logistics Center studies and cleanup is the Army. An installation-wide Federal Facilities Interagency Agreement (FFA) between the Army, EPA, and Ecology became effective in January 1990. This FFA provides the framework for management, investigation, and remediation of releases of hazardous substances on Fort Lewis as necessary to protect public health, welfare, and the environment.

This ESD, prepared in accordance with section 117(c) of CERCLA and 40 CFR 300.435c(2)(i), is necessary to document changes to the selected remedy outlined in the ROD. The Army and EPA support the need for this ESD and participated in the decision-making. In accordance with the October 14, 1994 EPA/Ecology agreement, Ecology was provided with a milestone briefing on this ESD.

The selected remedy described in the ROD for the Logistics Center primarily addresses the potential risks posed by volatile organic compound (VOC) contamination in groundwater by reducing the site contamination to levels that are protective of human health and the environment. The goal of the selected remedy is to restore groundwater to its beneficial use, which is a drinking water source. The major components of the selected remedy are:

1. Install groundwater extraction wells capable of capturing the groundwater contaminant plume in the unconfined aquifer.

2. Install on-site groundwater treatment facilities to remove contaminants from the collected groundwater.

3. To expedite groundwater remediation, install groundwater extraction wells near areas of highest concentration of contaminants and discharge treated groundwater upgradient of these extraction wells to facilitate flushing secondary sources from the groundwater.

4. Monitor the groundwater contaminant plume and the extraction/treatment system during groundwater remediation activities to ensure that both groundwater and surface water remediation goals are achieved.

5. Implement administrative and institutional controls that supplement engineering controls and minimize exposure to releases of hazardous substances during remediation.

6. Investigate the lower aquifer(s) to determine the presence of contamination and to evaluate the extent of contamination, if necessary. If contamination is found, a groundwater extraction system will be installed which is capable of capturing the contaminant plume, with subsequent treatment of the extracted groundwater in the on-site treatment facility. The remediation goals specified for the unconfined aquifer will also apply to any contaminated lower aquifers.

7. Perform confirmational soil sampling to ensure that all remaining sources of soil contamination have been identified and characterized.

Items 1 through 3 were completed by installing two groundwater extraction and treatment systems in the unconfined aquifer that became fully operational in August 1995. Items 4 and 5 are ongoing.

To address item 6, an investigation was conducted in 1991-94 to better determine the nature and extent of contamination in the lower aquifer (Salmon Springs aquifer) [1,2]. The study concluded that trichloroethylene (TCE) was the only contaminant to exceed ROD remediation goals, but that the contamination was more widespread than previously thought. An annual monitoring report for 1998 [3] confirmed these findings, and found that TCE concentrations in some lower aquifer wells are actually increasing with time.

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1) "Fort Lewis Logistics Center Lower Aquifer Groundwater Study" Final Technical Memorandum, Ebasco Environmental, Prepared for Seattle District, Army Corps of Engineers, 1993.

2) "Fort Lewis Logistics Center Lower Aquifer Study" Final Addendum to Final Technical Memorandum, Ebasco Environmental, Prepared for Seattle District, Army Corps of Engineers, 1994.

3) "Fort Lewis Logistics Center Remedial Action Monitoring – Second Year Monitoring Report" Woodward-Clyde, Prepared for U.S. Army Corps of Engineers, Seattle District, 1998.

Confirmational soil sampling and other investigation activities were completed in 1993-94 to address item 7 [4, 5]. These studies were aimed at identifying and characterizing hazardous or toxic soil constituents at the East Gate Disposal Yard (EGDY), the Battery Acid Pit, and the Defense Reutilization and Marketing Office (DRMO). Results indicate that the EDGY is the primary source of chlorinated solvent contamination at the Logistics Center.

In 1998, additional wells were installed to the southwest of the EGDY to further delineate the lateral extent of the TCE plume in this area, and to determine whether any additional sources of contamination exist in this area.

New site characterization studies, limited system performance data, and recent information concerning the effectiveness of pump and treat systems have resulted in a reevaluation of the current remediation strategy set forth in the ROD (see detailed discussion in section III).

This ESD addresses enhancements to be implemented in the overall strategy for remediating the site and will become part of the Administrative Record file pursuant to Section 300.825(a)(2) of the National Oil and Hazardous Substance Pollution Contingency Plan (NCP).

II. Summary of Site History, Contamination Problems, and Selected Remedy

Investigations and Findings

In 1985, the Army identified traces of TCE and cis-1,2 dichloroethylene (DCE) in several monitoring wells installed in the unconfined aquifer beneath the Logistics Center. A limited site investigation was performed in 1986 under the Defense Environmental Restoration Program (DERP). During 1986 and 1987, EPA performed a groundwater investigation in and near the city of Tillicum and found that groundwater contamination beneath Tillicum appeared to originate from the Logistics Center. As a result, the Army agreed to study the groundwater plume off the installation as part of the Logistics Center Remedial Investigation (RI). The RI was conducted in 1987-88 and included a field investigation to determine the nature and extent of contamination in soil, groundwater, surface water, and sediments.

The Feasibility Study (FS), completed in May 1990, evaluated remedial action alternatives. The RI and ROD determined that the shallow, unconfined aquifer beneath the Logistics Center is contaminated with VOCs, primarily TCE and DCE, and presents an unacceptable risk to human health and the environment. The source of the VOC contamination was thought to be in or near the EGDY. The individual source sites within the EGDY, however, were not precisely delineated.

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4. "Fort Lewis Logistics Center Limited Field Investigation Confirmational Soil Sampling, Fort Lewis, WA" Final Technical Memorandum, Woodward-Clyde, Prepared for Seattle District, U.S. Army Corps of Engineers, 1993.
5. "Fort Lewis Logistics Center Limited Field Investigation Confirmational Soil Sampling, Fort Lewis, WA" Final Addendum Technical Memorandum, Woodward-Clyde, Prepared for Seattle District, U.S. Army Corps of Engineers, 1995.

The EGDY is located just outside the east gate of the Logistics Center and was used between 1946 and 1960 as a disposal site for waste generated by the Mount Rainier Ordinance Depot. Aerial photograph interpreters estimate 24 trenches were excavated in the yard. The trenches reportedly were used for the disposal of waste TCE and petroleum, oil, and lubricants (POL) from equipment cleaning and degreasing activities. The trenches were subsequently backfilled and are not currently evident.

The Logistics Center is located on an extensive upland glacial drift plain. Investigations have shown that the hydrostratigraphy of the area is quite complex. Generally, the geology consists of sand and gravel deposits with till layers (Vashon Drift) overlying a finer-grained, nonglacial deposit (Kitsap Formation). The Vashon Drift is mostly permeable and contains the unconfined aquifer. The base of the aquifer is the Kitsap Formation, which separates the unconfined aquifer from the Salmon Springs aquifer (also known as the lower aquifer). The unconfined aquifer is continuous across the site. Depth to the water table varies between 7 and 35 ft below land surface near the Logistics Center and groundwater flow is to the west-northwest.

The Salmon Springs aquifer generally lies between 100 and 200 ft below land surface, and in turn, overlies the deeper Puyallup Formation. The Salmon Springs aquifer acts largely as a confined aquifer contained within the Salmon Springs Drift, a sequence of recessional and advance glacial sediments. Groundwater within the aquifer moves generally in the direction of Puget Sound at an average velocity of about 3 ft/day.

Contamination appears to enter the unconfined aquifer at or near the source area and migrates downgradient as a plume, along the axis of the Logistics Center (see Figure 1[6]). TCE concentrations near the source area generally range from 500 to >50,000 micrograms per liter (µg/L). Throughout the main body of the plume, TCE concentrations range from 100 to 200 µg/L. The TCE concentration at the definable leading edge of the plume, adjacent to Interstate Highway 5 (I-5), is 50 µg L. The leading edge of the plume downgradient (under Tillicum) is not well defined.

DCE concentrations near the source area generally range from 100 to >500 µg/L, and from 10 to 50 µg/L throughout the main body of the plume. Vinyl chloride concentrations in the unconfined aquifer have been below detection in all but two source area wells, LC-134 and LC-162.

Remedial Actions

Remedial design and construction for items 1 through 3 of the selected remedy (see pages 1-2) took place in two phases. Phase I included design and placement of the well fields. The Phase I Design Analysis was completed in May 1992. Placement of the well fields was completed in May 1993. Phase II included design and placement of the treatment and recharge systems, and piping. The Phase II Design Analysis was completed in August 1993. Construction of the treatment systems was completed in 1995.

6) "Fort Lewis Logistic Center Remedial Action Monitoring First Annual Monitoring Report" Woodward-Clyde. Prepared for U.S. Army Corps of Engineers, Seattle District, 1997.

Two extraction and treatment systems were constructed, one at each end of the Logistics Center. The downgradient system, known as the I-5 system because of its proximity to the Interstate, was designed to halt further flow of contaminated groundwater across the installation boundaries. This system contains 15 extraction wells located along a line from 150th Avenue to the south end of Tacoma Drive. Recharge occurs through four infiltration galleries (trenches) downgradient of the extraction wells, along the Logistics Center boundary. The upgradient system, known as the East Gate system was designed to remove contaminants directly from the probable source areas. This system is divided into primary and secondary extraction fields. The primary field contains four wells and is located near the intersection of Rainier Drive and East Lincoln Drive; the secondary field contains two wells and is located approximately 1500 ft downgradient of the primary field. Recharge occurs through two infiltration galleries and two recharge wells, located approximately 1000 ft upgradient of the primary extraction field.

Lower Aquifer Study

The lower aquifer study [1, 2], required pursuant to item 6 of the selected remedy, was conducted during the same time period as the remedial design and construction activities. This study confirmed the presence of TCE contamination in the lower aquifer. Groundwater movement from the unconfined aquifer to the lower aquifer through a window, or windows, in the intervening confining layer (Kitsap Formation) was determined to be one source of the lower aquifer contamination. Improperly completed wells may also be a conduit for contaminant migration into the lower aquifer, although the lower aquifer study concluded that this was not a significant source of contamination.

The window, interpreted to be a sandy deltaic sequence that filled in the western margins of a deep trough, is located near the center of the Logistics Center and trends across the groundwater gradient. At a minimum, the window extends from the area near well LC-66D to well LC-69D, a distance of about 1800 ft (see Figure 2). The plume extending into the lower aquifer from this window is not well defined, but is at least as wide as the distance between the two wells (1800 ft), and is at least 3500 ft in length (the distance between wells LC-69D and LC-72D). TCE concentrations in the lower aquifer immediately downgradient of the window are similar to the concentrations in the unconfined aquifer in the area of the window (100 to 180 µg/L). DCE concentrations in the lower aquifer are generally below 10 µg/L. Vinyl chloride concentrations were below detection limits (0.3 and 0.6 µg/L).

Modeling conducted in 1994 indicates that the predicted hydraulic path of the contaminant plume in the lower aquifer is generally west-northwest [1, 2]. The predicted path passes beneath I-5, Camp Murray, American Lake, and North Fort Lewis, and intersects Puget Sound in the vicinity of Southern Cormorant Passage. The distance from the point where the contaminants enter the lower aquifer to the point where the plume path intersects Puget Sound is approximately 5.7 mi. The lower aquifer plume is expected to remain at least 175 ft below land surface throughout its predicted path, beneath the Kitsap Formation.

Since the lower aquifer study was completed, there has been one new well installed in the downgradient plume area (LC-74). This well has provided additional water-level data and gradient information, and a broader definition of the lower aquifer plume. Chemical data collected from this and other wells since the modeling was completed, show that the contamination is distributed along a more southerly flow path than was predicted by the model, and that the plume is still not well bounded by wells along the southerly and downgradient westerly boundaries [3]. The additional water-level data also indicate a more southerly flow direction than that modeled. Therefore, the conclusion that the lower aquifer plume will remain beneath government property all the way to the Puget Sound must be regarded as tentative pending further geochemical analysis and flow modeling.

III. Description of the Significant Differences and the Basis for those Differences

This ESD was determined necessary to document the reasons for enhancing the selected remedy for the unconfined aquifer:

from **using groundwater extraction and treatment in on-site treatment facilities**

to **using innovative technologies to accelerate treatment and/or control of the source area and the contaminant plume in the unconfined aquifer in addition to utilizing groundwater extraction and treatment in on-site treatment facilities. The extraction and treatment systems may be shut down at some time in the future if no longer required.**

and for the lower aquifer:

from **extending the groundwater extraction and treatment in on-site treatment facilities to the lower aquifer at this time**

to **accelerating the cleanup of the unconfined aquifer through source control at the EGDY and the use of innovative technologies in the unconfined aquifer, and conduct additional studies on the transport of contaminants to and through the lower aquifer.**

The factors considered in enhancing the strategy for remediation of the groundwater at the Fort Lewis Logistics Center include:

- New site characterization data
- Performance data on the existing pump and treat systems
- New information on the effectiveness of pump and treat systems in general
- Availability of new and innovative treatment options.

These factors are discussed below.

New Site Characterization Data

New information on both the nature and extent of the solvent contamination at the Fort Lewis Logistics Center has become available [7]. This information coupled with data in the RI has reaffirmed the EGDY and adjacent areas as the primary source of the solvent contamination in the groundwater. Further, the RI indicates that at least 51,000 kg of solvents (largely TCE) may have been disposed to the trenches in the EGDY between 1946 and 1960. Given the current performance of the pump and treat systems, which are removing approximately 650 kg/yr, the minimum time to remediate the TCE contamination is 78 yr. This figure is considerably longer than the 30- to 40-yr period estimated when the ROD was signed. If, in fact, the performance of the pump and treat systems decline with time, as they have at most other sites, the time required will be considerably longer than 78 yr.

Laboratory data and field experience have suggested that dissolved TCE concentrations in excess of about 10,000 µg/L are indicative of the existence of droplets or pools of a pure TCE phase in the subsurface [8]. This pure phase solvent is known as a DNAPL (dense non-aqueous phase liquid). The presence of subsurface DNAPL generally complicates the cleanup of a contaminated site. Because dissolved aqueous TCE concentrations at well LC-136A exceed 10,000 µg/L (up to 80,000 µg/L), it is highly likely that some DNAPL is present in the unconfined aquifer near the EGDY.

Performance Data on the Existing Pump and Treat Systems

The maximum concentration of TCE in groundwater near the EGDY in 1991, before construction of the EGDY pump and treat system, was 2,400 µg/L. A concentration of 24,000 µg/L was detected in well LC-136A, following installation in 1992. After 2 yr of operation, the concentration has increased to as much as 80,000 µg/L in this well. This increasing concentration is further evidence of the existence of some DNAPL at the site. The probable existence of DNAPL coupled with the high groundwater flow rate through the source area resulting from pumping and treating, will likely smear the contamination into a larger area than that which existed before the system began operating. There is also a tendency for dissolved aqueous TCE to diffuse from the more permeable areas of the aquifer where the groundwater flow is occurring to less permeable areas of the aquifer. Thus, there is concern that the areal extent of the contamination will increase as the aquifer re-equilibrates with the new higher aqueous concentrations. This phenomenon will probably also lead to a "rebound" of TCE concentrations in the wells to higher than original concentrations after the extraction wells are turned off.

7) "East Gate Disposal Yard Expanded Site Investigation, Site History and Conceptual Site Model" Woodward-Clyde, Prepared for U.S. Army Corps of Engineers, Seattle District, 1997.

8) Feenstra S. and J.A. Cherry (1996) "Diagnosis and Assessment of DNAPL Sites" in *Dense Chlorinated Solvents and other DNAPL's in Groundwater*, J.F. Pankow and J.A. Cherry, Eds. Waterloo Press, Portland, OR.

Because pump and treat remedies work largely on the dissolved aqueous phase, the presence of DNAPL could further decrease the likelihood that this pump and treat system alone can remediate the contaminant plume. In fact, it could mean that even after pumping and treating long enough to clean up the plume outside the source area, the EGDY system would have to operate indefinitely to keep the plume from re-establishing itself, or to keep the EGDY contamination from acting as a source for the lower aquifer.

The downgradient pump and treat system appears to be limiting the spread of contamination in that direction by providing hydraulic control of the groundwater flow. However, some movement of TCE in the downgradient direction does appear to be continuing. Because of the relatively low concentrations of TCE at the downgradient end of the plume, mass removal rates for TCE by this system are low.

Recent Information on the Effectiveness of Pump and Treat Systems in General

At the time of the ROD, the Army, EPA, and Ecology believed that the selected remedy would restore the unconfined aquifer to its beneficial use as a drinking water source. Since that time, however, information has become available that casts doubt on the ability of a pump and treat system alone to restore an aquifer. The scientific and environmental communities now have a better understanding of the limitations of pump and treat imposed by the physical, hydraulic, and chemical conditions typical of most unconfined aquifers. This new understanding is based on both theoretical considerations, and on the historical performance of numerous pump and treat systems. In most cases, these factors lead to declining performance of the pump and treat system over time, such that the period required to achieve remediation is much longer than originally believed [9], [10], [11].

Availability of New and Innovative Treatment Options

Because of the growing understanding of the limitations of standard remedies such as pump and treat, considerable work in the scientific and environmental communities during the past several years has focussed on developing new, more effective, and less costly alternatives. The innovative technologies include barriers for more effectively containing the spread of contamination. These technologies avoid the high costs of pumping for extended periods, and are less susceptible to those properties of aquifers that lead to declining performance over time. Because many of the new technologies are passive, there is also less danger than with active treatments of worsening the situation by spreading the source or contaminating larger volumes of groundwater. Thus, they offer a better chance of protecting human health and the environment.

9) Mackay, D.M. and J.A. Cherry (1989) "Groundwater Contamination: Pump and Treat Remediation", *Environ. Sci. Technol.*, V. 23, No. 6, 630-636.

10) MacDonald, J.A. and M.C. Kavanaugh (1994) "Restoring Contaminated Groundwater: An Achievable Goal? – The National Research Council's Study of Groundwater Cleanup Alternatives", *Environ. Sci. Technol.*, V. 28, No. 8, 362A-368A.

11) "Superfund: Operations and Maintenance Activities will Require Billions of Dollars" GAO Report to the Ranking Minority Member, Committee on Commerce, House of Representatives, United States General Accounting Office, Washington, D.C., GAO/RCED-95-259, September 1995.

IV. Proposed Approach

The selected remedy in the ROD is being modified to more effectively meet the ROD goal of restoring groundwater to a potential drinking water source. The major components of the enhanced remedy are:

- Conduct an investigation of the EGDY (the source of contamination to the unconfined aquifer) and determine the feasibility of conducting source control measures there.

- Continue to operate, maintain, and monitor the existing groundwater pump and treat systems, and investigate/implement ways to improve the efficiency of those systems.

- Continue the groundwater monitoring program in accordance with the approved monitoring plans; enhance the monitoring program as necessary.

- Decommission groundwater monitoring wells that are screened across water-bearing units.

- Determine the full extent of the contaminant plume in the unconfined aquifer, and improve the understanding of hydrological forces influencing plume migration. This will include adding new groundwater monitoring wells in the unconfined aquifer to the south of the I-5 extraction system, adding shallow and deep well pairs located centrally within the unconfined aquifer plume, and investigating the impact of irrigation practices at Clover Park Technical College. Modify the existing groundwater capture systems as necessary to insure that the plume in the unconfined aquifer is fully contained, or implement alternate remedial measures as needed to mitigate the spread of contamination.

- Investigate new and innovative technologies to reduce the migration of or toxicity of the dissolved contaminant plume in the unconfined aquifer, with an emphasis on measures that may reduce the contamination reaching the lower aquifer. Perform bench-scale, pilot-scale, and full-scale demonstrations of promising technologies. The leading candidates presently being considered are In Situ Redox Manipulation, Enhanced Bioremediation, and Phytoremediation.

- Adjust remedial activities for the lower aquifer to ensure both short- and long-term protection of human health and the environment

    - Install additional monitoring wells to the south of the Logistics Center and other areas as necessary to determine the extent of contamination and direction in which the plume is moving. Add new wells, as appropriate, to the existing groundwater monitoring program.

Conduct a groundwater use survey and inventory covering the area downgradient of the Logistics Center continuing to Puget Sound. Test public or private wells found to be in or near the predicted path of the contaminant plume. If any water-supply well is found to be impacted by the contaminant plume, the Army will immediately implement point of use mitigation and conduct a focussed Feasibility Study leading to a remedial or removal response to the problem.

- Update and enhance, as appropriate, the groundwater model(s) to predict the fate and transport of contaminants in both the upper and lower aquifers.

- Conduct an evaluation of the effects of expedited treatment of the unconfined aquifer and of the EGDY on the transport of contamination to the lower aquifer.

- The Army and EPA will meet approximately once per month to discuss progress of remedial activities at the Logistics Center.

- Using all of the data developed about the site (including the above work), comprehensively re-assess the remedial action and the need for additional remedial action at the site no later than September 2000.

V. Affirmation of the Statutory Determinations

The modified remedies continue to satisfy the requirements of CERCLA section 121. Considering the new information gathered, all parties believe that the remedies 1) remain protective of human health and the environment, 2) comply with Federal and State requirements that were identified in the ROD as applicable or relevant and appropriate to this remedial action at the time the ROD was signed, and 3) are also cost-effective with regard to the risk imposed. In addition, the revised remedies utilize permanent solutions and treatment technology to the maximum extent practicable for this site.

Formal reviews of remedial actions are required to be conducted at least every 5 yr in cases where hazardous substances remain on site above cleanup levels. The purpose of the 5-yr reviews is to determine whether the remedy remains protective of human health and the environment. A 5-yr review for the Logistics Center was last conducted in September 1997. Mainly because of the apparent increasing levels of contaminants in the lower aquifer and the questions regarding the direction that the contaminant plume is moving, EPA will conduct another review no later than September 2000. This review will include a comprehensive assessment of the information that will be collected over the next 2 yr, and a re-evaluation of the remedial action and of the need for additional remedial actions at the site.

VI. Public Participation

A Community Relations Plan (CRP) was prepared in 1987 in accordance with CERCLA, as amended by SARA. The CRP includes establishing information repositories and communication pathways to disseminate information.

This ESD will become part of the Administrative Record File (location noted below) as required by NCP 300.825(a)(2).

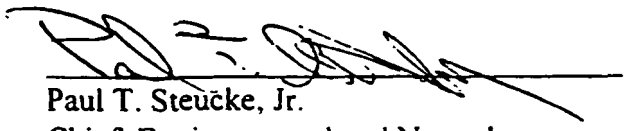
Environmental and Natural Resources Division
ATTN: AFZH-PWE-E, Building 4301
Fort Lewis, WA 98433-9500

Notice will be issued in the Tacoma News Tribune and the Northwest Guardian, that this ESD and contents of the Administrative Record File are available for public viewing. Copies of the ESD will be available to the public at the information repositories listed below.

Pierce County Library
Lakewood Branch
6300 Wildaire Rd. SW
Tacoma, WA 98499

Pierce County Library
Tillicum Branch
14916 Washington Ave. SW
Tacoma, WA 98498

Signature sheet for the foregoing Explanation of Significant Difference for the Fort Lewis Logistics Center between the United States Army and the United States Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.



Paul T. Steucke, Jr.
Chief, Environmental and Natural
Resources Division
Directorate of Public Works
Fort Lewis, Washington

8/28/95
Date

Signature sheet for the foregoing Explanation of Significant Difference for the Fort Lewis Logistics Center between the United States Army and the United States Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.

Randall F. Smith

Randall F. Smith
Director, Environmental Cleanup Office
U. S. Environmental Protection Agency, Region 10
Seattle, Washington

9/9/98
Date

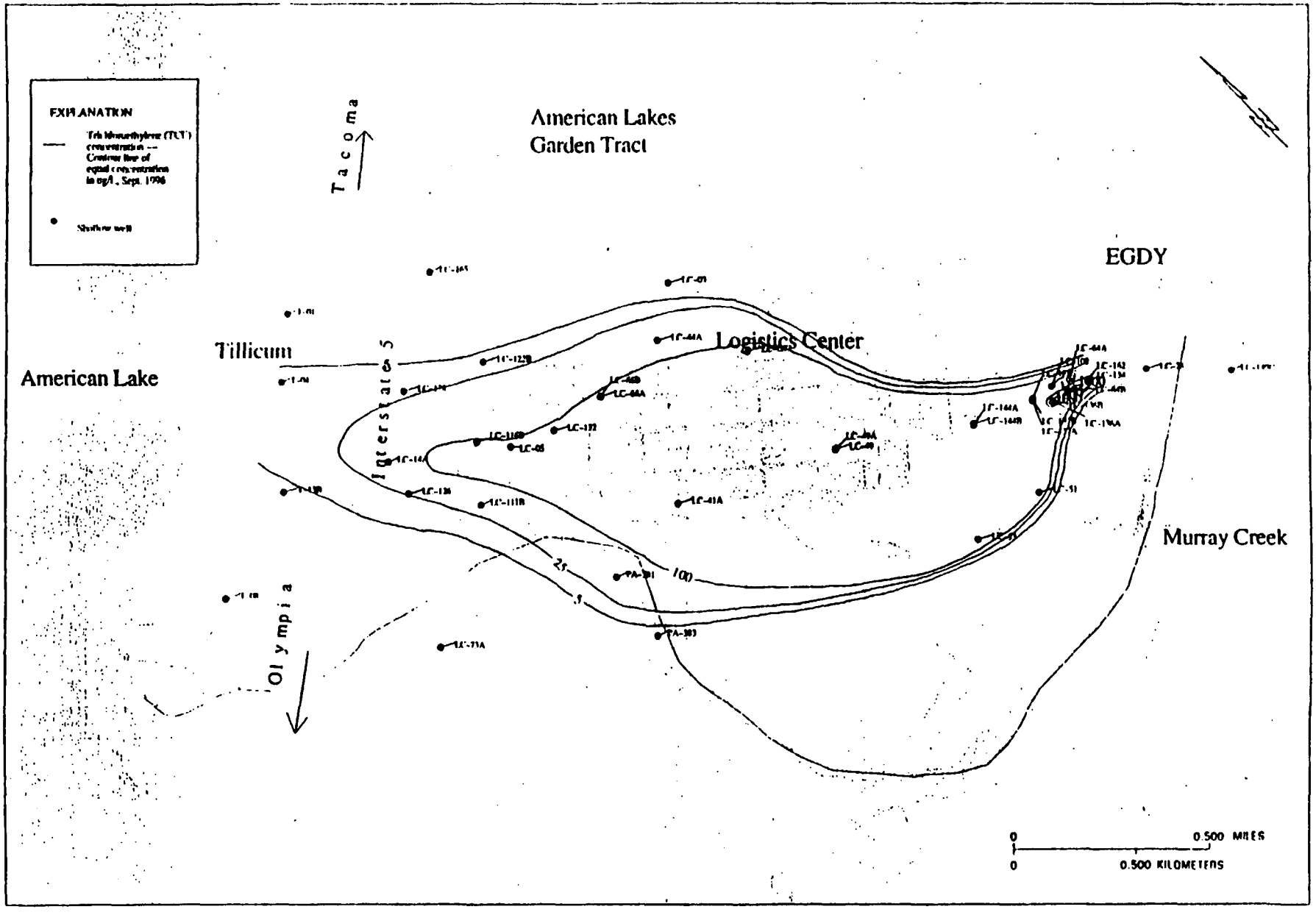


Figure 1. — Concentration of trichloroethylene (TCE) measured in groundwater from the unconfined aquifer (Woodward Clyde, 1997(reference no.6)). near the Logistics Center and East Gate Disposal Yard (EGDY) at Fort Lewis, Washington.

Preliminary, subject to revision

Projection: UTM Zone 10

U.S. Geological Survey, Water Resources Division

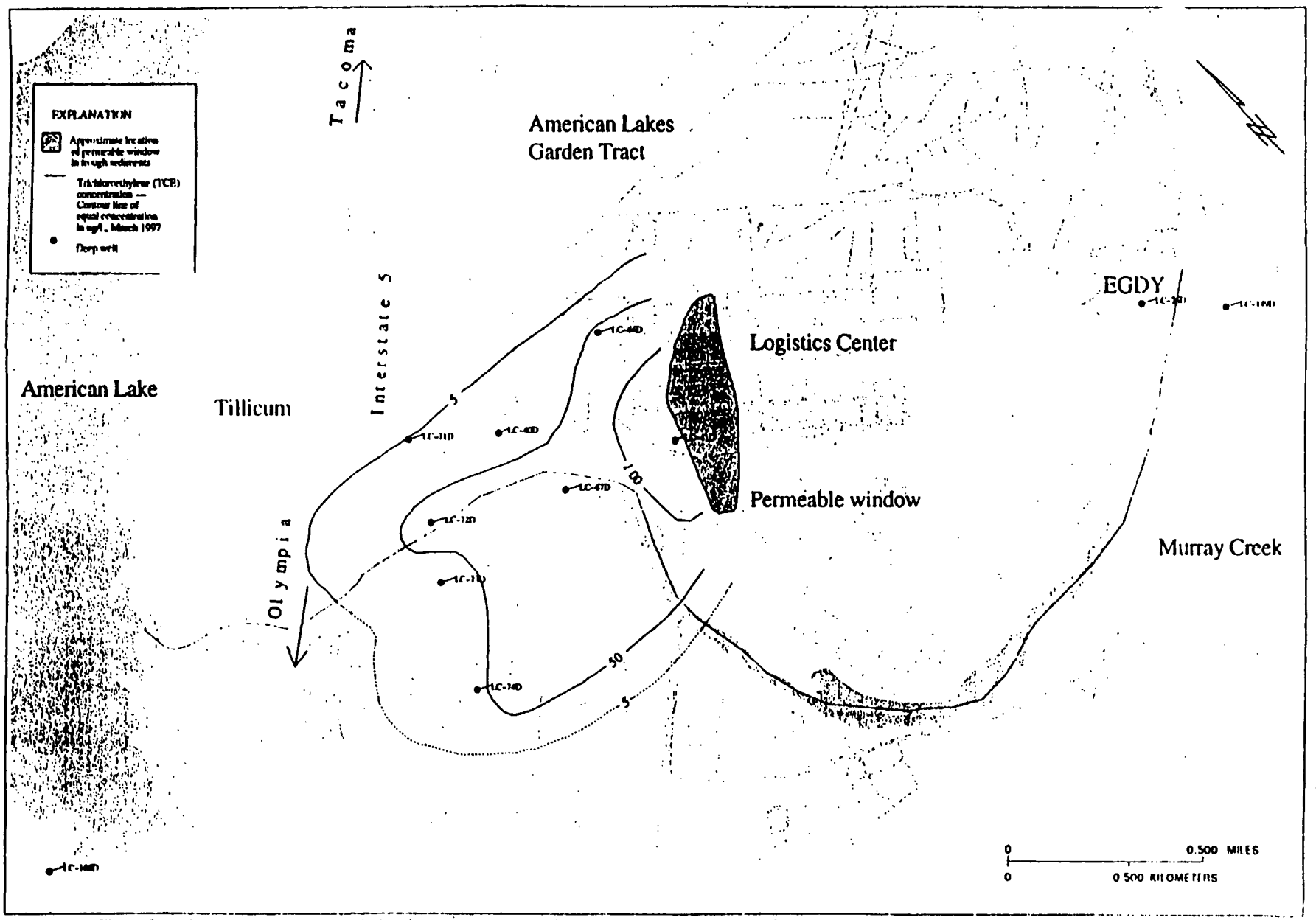


Figure 2. — Location of permeable window in trough sediments (Ebasco Environmental, 1994(reference no. 2)) and concentration of trichloroethylene (TCE) measured in groundwater from the lower aquifer near the Logistics Center and East Gate Disposal Yard (EGDY) at Fort Lewis, Washington. Contours drawn by Marcia Knadle, USEPA, based on data collected in March 1997 by Woodward Clyde.