

- EXPLANATION OF SIGNIFICANT DIFFERENCE

ONALASKA MUNICIPAL LANDFILL SUPERFUND SITE
ONALASKA, WISCONSIN

I. Introduction

The Onalaska site is located in the Township of Onalaska, about 10 miles north of La Crosse, Wisconsin. The 11-acre site includes the 7-acre former Township landfill and is situated 400 feet east of the Black River, near the confluence of the Mississippi and Black Rivers. The Black River is located within the Upper Mississippi River Wildlife and Fish Refuge, a wetlands area which supports numerous migrating species of birds and is also used for hiking, fishing, hunting, and other recreational purposes by area residents and visitors.

The area surrounding the site is generally rural, although several residences are located within 500 feet to the north and to the south of the landfill. A subdivision of about 50 homes is located about 1.25 miles southeast of the site. Agricultural lands are located south of the landfill, and intermittent woods and grasslands border the site to the east.

II. Requirement to Address Significant Change

The lead agency (in this case, U.S. EPA) may determine that a significant change to the selected remedy described in the ROD may be warranted after the ROD is signed. Section 117(c) of CERCLA, requires that:

After adoption of a final remedial action plan (ROD) -

- (1) if any remedial action is taken,
- (2) if any enforcement action under section 106 is taken, or
- (3) if any settlement or consent decree under section 106 or section 122 is entered into,

and if such action, settlement, or decree differs in any significant respects from the final plan, the U.S. EPA shall publish an explanation of the significant differences (ESD) and the reasons such changes were made. (42 U.S.C. §9617(c)).

In this case, the U.S. EPA, after appropriate consultation with the WDNR, has determined that an ESD is appropriate to explain and document modifications made to the performance standards



detailed in the ROD. The modifications resulted from information gathered during the Long Term Remedial Action phase of this action. This ESD document and all of the technical information and data relating to it shall become part of the administrative record for the Site, which is available for viewing, during normal business hours, at the site information repository located at the Holmen and Onalaska public libraries.

III. Background

A. Site History

The Onalaska site was mined as a sand and gravel quarry in the early 1960's. Quarry operations ceased in the mid-1960's and the Town began to use the site as a municipal landfill, although for a time both municipal and chemical wastes were disposed of in the landfill. In 1978, the Wisconsin Department of Natural Resources (WDNR) determined that the landfill operation did not meet state solid waste codes and ordered the Town to close the landfill by September 1980. After disposal operations ceased, the Town capped the landfill in June 1982.

In September 1982, the WDNR sampled four landfill monitor wells and several nearby residential wells for compliance with drinking-water standards. The investigation documented that the sand and gravel aquifer beneath the landfill serves as the primary source of drinking water for area residents and that groundwater contamination had occurred within and around the site. One residential well, located southwest of the landfill, was found to exceed the Federal drinking-water standard for barium (1.0 mg/L). The well sample also contained five organic compounds at concentrations above background levels. A landfill monitor-well sample was found to be contaminated with toluene at a concentration of 14.7 mg/L, which is well above the State groundwater-quality Enforcement Standard (0.343 mg/L) and the federal drinking-water (2.0 mg/L) standard. The Town replaced the contaminated residential well with a deep, uncontaminated well in January 1983.

Pursuant to CERCLA, U.S. EPA inspected the Onalaska site in 1983. Subsequent to the submittal of the Site Inspection report in May 1983, the U.S. EPA placed the site on the National Priorities List (NPL) in September 1984.

Remedial Investigation

U.S. EPA, in consultation with the WDNR, conducted a Remedial Investigation and Feasibility Study (RI/FS) at Onalaska from April 1988 through December 1989. The major findings of the RI included:

- The landfill is the source of groundwater contamination. A groundwater contaminant plume consisting of organic and inorganic compounds had migrated at least 800 feet from the southwestern edge of the landfill. The leading edge of the contaminant plume appeared to be discharging into nearby wetlands and the adjacent Black River.

- The upper groundwater aquifer consists primarily of sand and is approximately 135 feet thick. Local residences utilize this aquifer as a primary source of drinking water.
- The predominant organic compounds of concern included toluene, xylene, 1,1-dichloroethane (1,1-DCA), and trichloroethene (TCE), based upon concentrations and potential impacts to human health and the environment.
- Site soils located above the water table and adjacent to the southwestern edge of the landfill were contaminated with naphtha solvents derived from the landfill. The contaminated soil zone occurred from 11 feet to 15 feet below ground surface and up to 150 feet from the landfill. Soil samples indicated that contaminant levels of up to 550 mg/kg were present and were a continual source of groundwater contamination.
- The original landfill cap had deteriorated and did not meet the landfill closure regulations in effect at the time the landfill closed. The cap was originally to be composed of 2 feet of compacted clay, but the RI showed that the cap is composed of sandy soils in certain portions and that it is only 1-foot thick in other portions.
- Magnetometer anomalies, as well as site records, suggested that up to 1000 55-gallon drums were likely to have been disposed of in the landfill. Although several crushed and empty drums were found in the landfill during excavation of test pits, the RI could not ascertain whether the drums are concentrated in any one area, although it may be likely that many of the drums would be in the same condition as the drums that were found in the test pits.
- The average depth to the water table and the depth of waste disposal is 15 feet. As a result, it is likely that refuse is periodically in direct contact with groundwater. Soil below the water table does not appear to be greatly affected by landfill contaminants, in that the hazardous substances found in the groundwater are soluble. Soluble contaminants would tend to remain dissolved in the groundwater rather than sorbing onto sand particles.
- Potential long-term exposure to low levels of VOCs through the use of private wells in contaminated groundwater and plausible adverse discharges of contaminants to the wetlands and Black River downgradient of the landfill were identified as the principal threats to human health and the environment.

B. Record of Decision

Based on the findings of the RI, U.S. EPA completed a feasibility study (FS) that evaluated remedial alternatives to address migration of the groundwater contaminant plume. U.S. EPA completed the FS in December 1989. U.S. EPA then issued a Record of Decision (ROD) in August 1990 that called for the following actions to mitigate the areas of concern:

- Installation of a landfill cap in accordance with federal and state requirements;
- Installation of a groundwater extraction and treatment system to capture and treat contaminants in the groundwater immediately downgradient of the landfill;
- Installation of an air injection system within the area of soils contamination to enhance the bioremediation of organic contaminants; and
- Implementation of a groundwater, surface water, and sediment monitoring program to ensure the adequacy of the cleanup.

The selected remedy establishes a containment and treatment system to eliminate the principal threat posed to human health and the environment by isolating the source of groundwater contaminants in the landfill and eliminating those in the adjacent soils, preventing the further migration of VOCs in groundwater, and by treating extracted groundwater to acceptable discharge limits.

The selected remedy established cleanup standards for groundwater based on Safe Drinking Water Act Maximum Contaminant Levels (MCLs) and Wisconsin Administrative Rule Chapter NR 140 Enforcement Standards (ES) and Preventive Action Limits (PAL) for groundwater protection. The selected remedy established an estimated cleanup goal of 80 to 95 percent biodegradation of the organic compounds in the soils adjacent to the landfill.

U.S. EPA entered into a Superfund State Contract with WDNR in 1991 which provided that the state would fund 50% of the remedial action. U.S. EPA then began to implement the Remedial Design (RD) and Remedial Action (RA).

The landfill cap construction subcontract was awarded on March 25, 1993, and construction commenced on May 1, 1993. A multi-layer clay cap was installed over the landfill. The cap was completed in November 1993.

The groundwater and soils construction subcontract was awarded on June 11, 1993, and construction began on July 12, 1993. Five groundwater extraction wells were installed downgradient of the landfill and are designed to pump a total of 800 to 1000 gallons per minute. A treatment plant was constructed nearby, where the extracted groundwater is subjected to aeration and pH adjustment (iron precipitation), clarification (iron removal), air stripping (VOC removal), and pH readjustment prior to discharge to the Black River. Temporary activated carbon units were placed in the treatment train prior to discharge as a back-up measure while the treatment plant components underwent a 3-month "shakedown" period. The groundwater extraction and treatment system was completed in June 1994.

Approximately 29 shallow air-injection wells were installed to bioremediate the organic compounds in the contaminated soils adjacent to the landfill. Installation of the biotreatment

system was completed in June 1994. U.S. EPA, in consultation with WDNR, certified that soil remediation activity is complete since it has been demonstrated that the bioremediation system no longer contributes to the cleanup of the contaminated soils.

A pre-final inspection was conducted by the project managers for U.S. EPA and WDNR on June 1, 1994. At that time, it was determined that the landfill cap, groundwater, and bioremediation systems were constructed as designed and that they were operational. Region 5 signed the Onalaska preliminary close-out report (PCOR) on July 29, 1994.

On July 14, 1998 U.S. EPA completed the first Five-Year Review for the site. The review concluded that with the continued implementation of the remedial action, pursuant to the ROD and as designed, the selected remedy remains protective of human health and the environment.

IV. Significant Difference

The purpose of this document is to explain modifications to the selected remedy, as presented in the ROD. Specifically this document addresses changes to the groundwater cleanup standards, bringing the standards up-to-date with current State groundwater cleanup standards. Information obtained during Long-Term Remedial Action (LTRA) phase of the work at the Site necessitated these modifications. The ROD performance standards and the necessary modifications are presented below. U. S. EPA has determined that these modifications are necessary and appropriate. These modifications will not alter the scope of the remedy selected in the August 1990 ROD.

ROD Performance Standard: The 1990 ROD specified a risk based cleanup standard for 1,1-dichloroethane (1,1-DCA) of 0.04 parts per billion (ppb). The 1990 ROD used the following justification for development of that standard:

As previously noted, 1,1-DCA has no Federal drinking-water standard. Ingestion of ground water with a concentration of 1,1-DCA at the State ground-water preventive action limit (PAL) would present a potential excess lifetime carcinogenic risk of 2×10^{-4} , which is an unacceptable risk according to the NCP. Since most of the PALs (for carcinogens) in Ch. NR 140, WAC, would present an excess lifetime carcinogenic risk of 1×10^{-7} , a Ground-Water Cleanup Standard for 1,1-DCA has been derived to present the same risk to ground-water consumers. Thus, once the Ground-Water Cleanup Standards have been met (assuming that it is technically or economically feasible to achieve them), the cumulative risk due to ingestion would be approximately 1×10^{-6} , which is an acceptable risk according to the NCP.

Modification: At the time that the cleanup standard for 1,1-DCA was developed the compound was classified by the U.S. EPA as a B-2 carcinogen (probable human carcinogen) and the State PAL for 1,1-DCA was set at 850 ppb which would present a potential excess lifetime

carcinogenic risk of 2×10^{-4} , which is an unacceptable risk according to the NCP. The cleanup standard was subsequently set at 0.04 ppb.

Since 1990 the U.S. EPA has reclassified 1,1-DCA as type C carcinogen (possible human carcinogen). A review of the information on 1,1-DCA in the U.S. EPA Integrated Risk Information System found that there is no human carcinogenicity data and no quantitative estimate of carcinogenic risk from oral exposure. It is therefore appropriate to establish a cleanup level for 1,1-DCA based upon a non-carcinogenic endpoint. Consistent with other chemicals of concern at this site the cleanup standard for 1,1-DCA shall be established at the current Wisconsin PAL of 85 ug/L

ROD Performance Standard: The 1990 ROD set cleanup standards at the Ch. NR 140, WAC PAL for 10 chemicals of concern. Table 1 lists the chemicals of concern along with the 1990 ROD cleanup standards. The ROD specified that contaminated groundwater would be extracted and treated until analyte specific cleanup levels were achieved.

Modification: Analyte specific cleanup standards were established in the ROD and were based on the 1990 State of Wisconsin PALs. Table 1 lists the 1990 PALs and the PALs currently established by the state of Wisconsin. Several of the PALs have changed since the 1990 ROD was signed. These changes were made by the Wisconsin Natural Resources Board after public hearings, receipt of comments, and/or reviews of available technical information. Based on a comparison of those standards the following site related chemicals will have revised cleanup standards: benzene, TCE, lead, barium, ethylbenzene, and 1,1-DCE. Cleanup standards were not established in the 1990 ROD for manganese and iron because none existed. Since 1990 the State of Wisconsin has established PALs for manganese and iron and those standards are adopted here as cleanup standards for the Site. Wisconsin PALs remain the more stringent of the State or federal chemical-specific applicable, or relevant and appropriate requirements (ARARs) for all chemicals of concern at this site. Table 2 lists the revised cleanup standards for each chemical of concern for this site. While remaining as protective as the 1990 ROD cleanup standards, adopting the current PALs will in the short-term reduce analytical costs at the site and in the long-term may result in a shorter remediation time frame thereby lessening the overall cost of the remedy. For some of the contaminants, such as 1,1-DCA, 1,1,1-TCA, and xylene, cleanup standards have already been met at all of the wells on-site. The 1990 PALs for several chemicals at the site were an order of magnitude lower than standard laboratory detection limits for those chemicals. To demonstrate compliance with the 1990 PALs for benzene, TCE, and 1,1-DCE a lower detection limit would be required. The new PALs would allow the use of standard laboratory detection limits.

V. Affirmation of Statutory Determinations

U.S. EPA believes that the remedy as modified in this ESD remains protective of human health and the environment, complies with federal and State requirements that are applicable or relevant and appropriate to this remedial action, and is cost-effective. In addition, the revised remedy

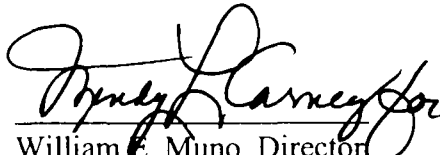
utilizes permanent solutions to the maximum extent practicable for this Site.

VI. State Comment

The State of Wisconsin was consulted regarding these changes and has reviewed this ESD. The State agrees that the modifications to the selected remedy are necessary and appropriate.

VII. Public Participation Activities

This ESD and other documents related to this project are available for public review at the public libraries in Holmen and the City of Onalaska, during normal business hours.



William E. Muno, Director
Superfund Division

9/29/00
Date

**Table 1
Comparison of Cleanup Standards**

Compound	1990 ROD Cleanup Standard (ppb)	Current State Standard² PAL (ppb)	Current State Standard¹ ES (ppb)	Federal Standard³ MCL (ppb)
Benzene	0.067	0.5	5	5
Toluene	68.6	200	1,000	1,000
Xylene	124	1,000	10,000	10,000
TCE	0.18	0.5	5.0	5.0
1,1-DCA	0.04 ⁴	85	850	850
Lead	5.0	1.5	15	50
Arsenic	5.0	5.0	50	50
Barium	200	400	2000	2000
Ethylbenzene	272	140	700	700
1,1,1-TCA	40	40	200	200
1,1-DCE	0.024	0.7	7.0	7.0
Manganese	NA	25	50	NA
Iron	NA	150	300	NA

Notes: ppb: "parts per billion" or ug/L
¹: Enforcement standards (ESs) under Ch. NR 140, WAC
²: Preventative action limits (PALs) under Ch. NR 140, WAC
³: Maximum Contaminant Level (MCLs) under Safe Drinking Water Act
⁴: Health-based cleanup standard consistent with cleanup objectives

**Table 2
Groundwater Cleanup Standards
Onalaska Municipal Landfill**

Compound	Standard (parts per billion)
Benzene	0.5
Toluene	200
Xylene	1000
Trichloroethene	0.5
1,1-Dichloroethane	85
Lead	1.5
Arsenic	5.0 ¹
Barium	400 ¹
Ethylbenzene	140
1,1,1-Trichloroethane	40
1,1-Dichloroethene	0.7
Manganese	25 ¹
Iron	150 ¹
<p>Notes: 1 = Naturally occurring levels of these compounds found at the Onalaska site may be higher than these standards.</p> <p>Section NR 140.28, WAC provides for establishing a (Wisconsin) alternative concentration limit (WCL) if (1) background concentrations exceed preventative action limits (PALs) and/or enforcement standards (Ess) or (2) if it is determined that it is not technically or economically feasible to achieve PALs (see section XII(b)(1)(B)(ii) of the 1990 ROD)</p>	

U.S. ENVIRONMENTAL PROTECTION AGENCY
REMEDIAL ACTION

ADMINISTRATIVE RECORD
FOR
ONALASKA MUNICIPAL LANDFILL SITE
ONALASKA, LA CROSSE COUNTY, WISCONSIN

UPDATE #3
OCTOBER 4, 2000

<u>NO.</u>	<u>DATE</u>	<u>AUTHOR</u>	<u>RECIPIENT</u>	<u>TITLE/DESCRIPTION</u> <u>PAGES</u>
1	01/31/00	CH2M Hill	U.S. EPA 184	Annual Groundwater Quality and Capture Report for 1999 for the Onalaska Municipal Landfill Site
2	05/03/00	U.S. EPA/ Integrated Risk Information System	U.S. EPA 9	U.S. EPA IRIS Substance File: 1,1 Dichloroethane
3	05/03/00	U.S. EPA/ Integrated Risk Information System	U.S. EPA 9	U.S. EPA IRIS Substance File: 1,2 Dichloroethane
4	06/06/00	Garber, K., 2 CH2M Hill	Prendiville, T.; U.S. EPA	Letter re: Recommenda- tions and Issues Raised in the Annual Groundwater Quality and Capture Report for 1999 (1,1-Dichloro- ethane Discussion)
5	08/29/00	Carper, D., 5 WDNR	Prendiville, T., U.S. EPA	E-Mail Transmission re: History of the Preventive Action Limit (PAL) Changes for the Onalaska Municipal Landfill Site