United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R05-90/125
August 1990

EPA

Superfund Record of Decision:

Onalaska Municipal Landfill, WI

50272-101

REPORT DOCUMENTATION PAGE	1. REPORT NO. EPA/ROD/R05-90/125	2.	3. Recipient's Accession No.

4. Title and Subtitle
SUPERFUND RECORD OF DECISION
Onalaska Municipal Landfill, WI
First Remedial Action - Final

5. Report Date
08/14/90

6.

7. Author(s)

8. Performing Organization Rept. No.

9. Performing Orgainization Name and Address

10. Project/Task/Work Unit No.

11. Contract(C) or Grant(G) No.
(C)
(G)

12. Sponsoring Organization Name and Address
U.S. Environmental Protection Agency
401 M Street, S.W.
Washington, D.C. 20460

13. Type of Report & Period Covered
800/000

14.

15. Supplementary Notes

16. Abstract (Limit: 200 words)

The 11-acre Onalaska Municipal Landfill site includes a 7-acre landfill owned by the Township of Onalaska, which is located in central-western Wisconsin. The Black River and its associated wetlands are 400 feet west of the site and lie within a wildlife and fish refuge. The site was operated as a sand and gravel quarry until the late 1960s, when it was converted and used as a municipal landfill until 1980. Although the site was primarily used to dispose of municipal wastes, solvent wastes were also disposed onsite until 1976. Approximately 320,000 gallons of liquid solvent waste and approximately 1,000 drums of solvent waste were either burned with other trash onsite or poured directly into holes for burial in the southwestern portion of the landfill. The Township capped the landfill in 1982, but subsequent onsite investigations revealed ground water contamination within and around the site. Ground water flows beneath the landfill, where it comes into contact with solvents leaking from the solvent disposal area. The ground water flows in a southwesterly direction and a ground water contaminant plume has migrated from the southwestern edge of the landfill and appears to be discharging into the wetlands. This Record of Decision addresses two operable
(See Attached Sheet)

17. Document Analysis a. Descriptors
Record of Decision - Onalaska Municipal Landfill, WI
First Remedial Action - Final
Contaminated Media: soil, gw
Key Contaminants: VOCs (benzene, toluene, xylenes, TCE), other organics (PAHs), metals (arsenic, lead)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 107
	20. Security Class (This Page) None	22. Price

(See ANSI-Z39.18) *See Instructions on Reverse*

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

)stract (Continued)

units, the ground water plume and the contaminated soil adjacent to the southwestern portion of the landfill, which is a major source of ground water contamination. The primary contaminants of concern affecting the soil and ground water are VOCs, including benzene, toluene, xylenes, and TCE; other organics including PAHs; and metals including arsenic and lead.

The selected remedial action for this site includes in-situ bioremediation of the solvent-contaminated soil and, if feasible, a portion of the landfill debris; pumping and treatment of the ground water plume using aeration, clarification, and filtration, followed by discharge of the treated ground water into the Black River and onsite disposal of the sludge generated during the treatment process; reconstruction of the landfill cap and installation of a passive methane gas venting system to control the gas buildup under the cap; ground water monitoring; and implementation of institutional controls including deed restrictions limiting ground water and surface water use. The estimated present worth cost for this remedial action is $8,000,000, which includes an annual O&M cost of $164,000 for 30 years.

PERFORMANCE STANDARDS OR GOALS: Chemical-specific soil cleanup standards were not provided but will be established once the reduction rate for bioremediaiton has been determined during the pilot-scale test. Currently, the estimated cleanup goal is an 80-95 percent reduction of the organic contaminant mass in the soil. Ground water at the landfill waste boundary will meet SDWA MCLs or non-zero MCLGs. Chemical-specific cleanup standards for the ground water beyond the site boundary are based on State leanup levels and include benzene 0. 067 ug/1, toluene 68.6 ug/1, xylenes 124 ug/1, TCE .18 ug/1, arsenic 5 ug/1, and lead 5 ug/1. The reconstructed cap is projected to reduce the rate of precipitation infiltration by 80 percent, thereby minimizing contaminant migration toward the ground water.

RECORD OF DECISION

SELECTED REMEDIAL ALTERNATIVE
FOR THE

ONALASKA MUNICIPAL LANDFILL SITE
LACROSSE COUNTY, WISCONSIN

Statement of Basis and Purpose

This decision document presents the selected remedial action for the Onalaska Municipal Landfill Site, LaCrosse County, Wisconsin, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), and, to the extent practicable, the National Contingency Plan (NCP). This decision is based on the administrative record for this site. (The attached index identifies the items that comprise the administrative record upon which the selection of the remedial action is based.)

Assessment of the Site

Actual or threatened releases of hazardous substances from this site, if not addressed by implementing the response action in this Record of Decision, may present an imminent and substantial endangerment to public health, welfare, or the environment.

Description of the Selected Remedy

The selected remedy is a final remedy, and it uses treatment to address the principal threats at the site - the ground-water contaminant plume and a major source of ground-water contamination (the naphtha-contaminated soils). The selected remedy also addresses the long-term, low-level threat posed by the landfill contents and consists of the following components:

-Extraction and treatment of the ground-water contaminant plume to meet Federal drinking-water standards and State ground-water quality standards. The treated water shall be discharged into the adjacent Black River in compliance with the substantive requirements of the Wisconsin Pollutant Discharge Elimination System (WPDES);

-Reconstruction of the landfill cover (cap) in compliance with Chapter NR 504.07, Wisconsin Administrative Code (WAC) landfill closure requirements;

-Implementation of enhanced, *in situ* bioremediation in the naphtha-

contaminated soils and, if feasible, within a portion of the landfill debris. The estimated target cleanup goal for bioremediation is 80-95 percent reduction of the mass of organic contaminants. A treatability study and a pilot-scale test will be performed to determine the Soil Cleanup Standard for bioremediation;

-Periodic monitoring of the ground-water contaminant plume;

-Imposition of deed restrictions limiting surface and ground-water use at the site; and,

-Continued reliance on State institutional controls governing ground-water use within the proximity of landfills and the development of landfills.

Statutory Determinations

The selected remedy is protective of human health and the environment, complies with Federal and State requirements that are legally applicable or relevant and appropriate to the remedial action, and is cost-effective. This remedy utilizes permanent solutions and alternative treatment technology, to the maximum extent practicable, and satisfies the statutory preference for remedies that employ treatment that reduces toxicity, mobility, or volume as a principal element.

Because this remedy will result in hazardous substances remaining on-site above health-based levels, a review will be conducted within five years after commencement of the remedial action to ensure that the remedy continues to provide adequate protection of human health and the environment.

State Concurrence

The State of Wisconsin concurs with the selected remedy. The Letter of Concurrence is attached to this Record of Decision.

FOR Valdas V. Adamkus
Regional Administrator

8/14/90
Date

ADMINISTRATIVE RECORD INDEX
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	2	00/00/00	Letter requesting the state of Wisconsin to provide site specific ARARs by June 15, 1989	B.Constantelos,USEPA	P.Didier,WDNR	Correspondence	1
	3	75/07/23	Letter re: Note stating acceptance of industrial chemicals and acids from a manufacturing plant nearby with landfill application attached	J.Miller,WDNR	C.Pierce,Onalaska Chairman	Correspondence	2
	3	75/09/12	In response to letter dated 8/14/75 re: waste with "Waste Review Form" attached	R.Berry,Outers Lab.,Inc.	J.Miller,WDNR	Correspondence	3
	3	79/05/01	Letter re:information regarding the soil analyses performed on potential sources of final cover material for Onalaska Landfill	R.Cooley,Warzyn Engineering	G.Mitchell,WDNR	Correspondence	4
	1	80/11/19	Letter re:approval of two feet of clay soil as final cover for the landfill, rather than one foot of clay plus one foot of sand soil	J.Boettcher,WDNR	C.Pedretti,Town Chairman	Correspondence	5
	14	87/03/30	Letter re: Request for Information Pursuant to Section 104(e) of CERCLA and Section 3007 of RCRA, for Onalaska Municipal Landfill in Onalaska,WI	B.Constantelos,USEPA	Town of Campbell	Correspondence	6
	8	87/04/28	Letter re: Request for Information Onalaska Municipal Landfill	R.Torrito,Continental Can Company,Inc.	J.Haff,USEPA	Correspondence	7
	22	87/07/10	Responses of Metallics,	M.Ehrsan,Hoen,Sheenan,	M.Hay,USEPA	Correspondence	8

ADMINISTRATIVE RECORD INDEX
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			Inc. to the Request for information of EPA with cover letter attached	et.al.			
	17	88/07/21	Sampling Summary Sheets (Analytical Reports)	National Environmental Testing, Inc.	Roy F. Weston/USEPA	Correspondence	9
	12	88/09/26	Letter re:Site Assessment, with photographs attached	S.Springer,Weston-Sper	S.Faryan,USEPA	Correspondence	10
	3	88/10/10	Letter re:USEPA Access to W8582 CTH I Property, with Consent for Access to Property Form Attached	P.Andrews,USEPA	P.Smith	Correspondence	11
	3	88/10/17	Letter re:USEPA Access to W8582 CTH I Property, with Consent for Access to Property Form Attached	P.Andrews,USEPA	B.P.Conservation Club	Correspondence	12
	3	88/10/20	Letter re:USEPA Access to W8672 CTH I Property, with Consent for Access to Property Form Attached	P.Andrews,USEPA	R.Hubley	Correspondence	13
	3	88/10/20	Letter re:USEPA Access to W8647 Sportsman Club, with Consent for Access to Property Form Attached	P.Andrews,USEPA	R.Ackerman	Correspondence	14
	3	88/10/20	Letter re:USEPA Access to W8625 Sportsman Club, with Consent for Access to Property Form attached	P.Andrews,USEPA	C.Russel	Correspondence	15
	4	89/03/13	Letter re:USEPA Access to property adjacent to Onalaska	P.Andrews,USEPA	K.Pedretti	Correspondence	16
	21	89/03/28	Transmittal letter	P.Smith,CH2M Hill	K.Adler,USEPA	Correspondence	17

ADMINISTRATIVE RECORD INDEX
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			with Draft Geophysical Survey Technical Memo				
	2	89/04/07	104(e) Request for Information	M.Gade,USEPA		Correspondence	18
	36	89/04/07	Letters re: Request for Information Pursuant to Section 104(e) of CERCLA and Section 3007 of RCRA, for Onalaska Municipal Landfill, Onalaska,WI	M.Gade,USEPA	Onark Industries	Correspondence	19
	1	89/04/28	Letter confirming extension granted by EPA to respond to request for information	K.Euclide,Atty. for Onark Industries	P.Andrews,USEPA	Correspondence	20
	18	89/06/07	Transmittal letter, with various letters to residents re: residential well sampling, stating that water is safe to consume	K.Adler,USEPA	R.Schmidt,WDNR	Correspondence	21
	24	89/08/31	Letters to PRPs (Trempealeau Electric, Continental Can Co., Heileman's Brewing Co., L.B.White Co.) re: Request for Information Pursuant to Section 104 of CERCLA	P.Andrews,USEPA	Various PRPs	Correspondence	22
	3	89/10/03	Letter responding to 9/6/89 letter requesting information	W.Quinlisk,L.B.White Co.	P.Andrews,USEPA	Correspondence	23
	2	89/10/12	Letter to resident re:well samples, advising that well not be used for drinking water purposes	K.Adler,USEPA	Ackerman Residence	Correspondence	24
	18	89/10/13	General Notice Letter (with attachment)	M.Niedergang,USEPA	Chairman,Town of Onalaska	Correspondence	25

ADMINISTRATIVE RECORD INDEX
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

E/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	1	89/10/19	Letter notifying US DOI of USEPA's intent to enter into negotiations with PRPs concerning site remediation; stating that RI/FS began in April, 1988; preliminary meeting with PRPs is scheduled for 12/7/89	K.Adler,USEPA	S.Huff,US DOI	Correspondence	26
	1	89/10/25	Letter giving notice that Town of Onalaska wishes to negotiate a resolution of its potential responsibility; wants to be involved with response activities	D.Dunn, Atty.	K.Adler/P.Andrews-US EPA	Correspondence	27
		89/12/11	Letter stating that conducting a preliminary natural resources survey would be appropriate for soliciting review of the site; recommending remediation include groundwater treatment	J.Smith,US DOI	K.Adler,USEPA	Correspondence	28
	1	90/02/12	Letter re:Warzyn Engineering's review of the RI/FS, stating that until review is complete, the Town will not be in a position to determine feasibility of performing the chosen remedy	J.Watson-Gardner, Carton & Douglas	P.Andrews,USEPA	Correspondence	29
	9	78/06/27	Memo re:Standard Hydrogeologic Review for Onalaska Sanitary Landfill	D.Voight,WDNR	B.Glebs,WDNR	Memorandum	30
		83/06/08	Transmittal memo with Preliminary Assessment	T.Pachovicz, ecology and environment	File/USEPA Region V	Memorandum	31

ADMINISTRATIVE RECORD INDEX
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

3/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	2	89/02/22	Action Memorandum: Authorization to Fully Fund the RI/FS at the site	B.Constantelos,USEPA	V.Adamkus,USEPA	Memorandum	32
	20	89/03/27	Action Memorandum re:Authorization for Initial Funding for the RI/FS, with RI/FS Statement of Work and Community Relations Statement of Work Attached	B.Constantelos,USEPA	V.Adamkus,USEPA	Memorandum	33
	1	89/03/30	Memo re:3/27/89 site visit, stating quality of work at site is good, as well as interpretations of data collection	R.Schmidt,WDNR	D.Lundberg,WDNR	Memorandum	34
	1	89/04/18	Memo re:Review (and Comments) on Onalaska Draft Geophysical Survey Technical Memo	M.Vendl,USEPA	K.Adler,USEPA	Memorandum	35
	2	89/04/27	Memo re:Audit of CH2M Hill's Close Support Laboratory,to evaluate methodology used for Onalaska	C.Ross,USEPA	M.Miedergang,USEPA	Memorandum	36
	2	89/05/05	Memo re:Residential Well Sample Results	P.Smith,CH2M Hill	USEPA	Memorandum	37
	1	89/05/30	Memo re:Onalaska Residential Well Samples, stating that none of the contaminants exceed the primary drinking water standards, but two do exceed secondary levels (iron and manganese)	D.Jordan-Izaguirre, ATSDR	K.Adler,USEPA	Memorandum	38
	2	89/11/29	Action Memorandum re:Supplemental Funding for RI/FS	K.Adler,USEPA	Official File	Memorandum	39

ADMINISTRATIVE RECORD INDEX
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

T/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	3	89/12/26	Transmittal memo with estimated capital costs for the proposed alternative	P.Smith,CH2M Hill	K.Adler,USEPA	Memorandum	40
	1	90/01/10	Memo re:Onalaska Landfill,Wisconsin RCRA Final Cover Requirements	K.Brener,Chief RCRA Permitting Branch	M.Tyson,USEPA	Memorandum	41
	2	90/02/08	Memo re:Onalaska 1/31/90 update meeting trip report	S.Pastor,USEPA Community Relations	File	Memorandum	42
	4	90/02/23	Memo re:Organizational Meeting with Onalaska PRPs on 12/7/89 in LaCrosse, WI	P.Andrews,USEPA	File	Memorandum	43
		89/05/16	Article: "Former Dump Site Should Be Fenced Off: Report"	Tribune Environment Reporter		Newspaper Article	44
	16	00/00/00	Onalaska Municipal Landfill,Onalaska WI, Information Requests Questions of Outers Lab.,Inc. with Affidavit attached	Outers Lab.,Inc.	USEPA	Other	45
	9	00/00/00	Onalaska Municipal Landfill Information Requests Instructions	M.Justus,USEPA	Outers Lab.,Inc.	Other	46
	15	89/06/12	Information Requests Questions(and Answers) of Outers Laboratories, with Affidavits attached	USEPA	Outers Laboratories,Inc.	Other	47
	44	00/00/00	In-Field Conditions Report; Town of Onalaska Sanitary Landfill	Warzyn Engineering	WDNR/USEPA	Reports/Studies	48
		77/07/21	Reports of the waste material being dumped into the Town landfill	M.Hagel,Clerk for Town of Onalaska	J.Miller,WDNR	Reports/Studies	49

ADMINISTRATIVE RECORD INDEX
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

B/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			by Bill's Pumping Service with cover letter attached				
	39	87/06/10	Report on the Town of Onalaska landfill site area with cover letter attached	C.Pedretti,Town of Onalaska,Chairman	M.Justus,USEPA	Reports/Studies	50
	149	88/09/02	RI/FS Final Work Plan	CH2M Hill	USEPA	Reports/Studies	51
	23	88/10/24	Community Relations Plan	CH2M Hill	USEPA	Reports/Studies	52
	9	88/12/29	Preliminary Health Assessment	ATSDR	USEPA	Reports/Studies	53
	357	89/01/12	Quality Assurance Project Plan for the RI/FS	CH2M Hill	USEPA	Reports/Studies	54
	4	89/04/12	Preliminary Health Assessment (12/29/88)	Wisconsin Division of Health	ATSDR	Reports/Studies	55
	242	89/12/00	Public Comment Feasibility Study Report	CH2M Hill	USEPA	Reports/Studies	56
	181	89/12/22	RI Report Volume I	CH2M Hill	USEPA	Reports/Studies	57
	408	89/12/22	RI Report Volume II	CH2M Hill	USEPA	Reports/Studies	58

GUIDANCE DOCUMENTS INDEX
ONALASKA, WISCONSIN
Guidance Documents are available for review at
USEPA Region V-Chicago IL

TITLE	AUTHOR	DATE
Superfund Public Health Evaluation Manual	OSWER #9285.4-1	86/10/01
Superfund Federal-Lead Remedial Project Management Handbook	OSWER #9355.1-1	86/12/01
Interim Guidance on Superfund Selection of Remedy	OSWER #9355.0-19	86/12/24
Data Quality Objectives for Remedial Response Activities:Development Process	OSWER #9355.0-7B	87/03/01
Quality Criteria for Water 1986	USEPA-Office of Water Regulations	87/05/01
Guid[illegible]s and Specifica[illegible]s for Preparing Quality Assurance Program Documentation	USEPA-QA Management Staff	87/06/01
RI/FS Improvements	OSWER #9355.0-20	87/07/23
Remedial Action Costing Procedures Manual	USEPA	87/10/01
Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA (interim final guidance for the work plan)	OSWER #9355.3-01	88/04/00
Superfund Exposure Assessment Manual	OSWER #9285.5-1	88/04/01
RI/FS Improvements Follow-up	OSWER #9355.3-05	88/04/25
Community Relations in S[illegible]und: A Handb[illegible]	OSWER #9230.0-038	88/06/01

GUIDANCE DOCUMENTS INDEX
ONALASKA, WISCONSIN
Guidance Documents are available for review at
USEPA Region V-Chicago IL

TITLE	AUTHOR	DATE
CERCLA Compliance with Other Laws Manual	OSWER #9234.1-01	88/08/08

ADMINISTRATIVE RECORD SAMPLING/DATA INDEX
ONALASKA MUNICIPAL LANDFILL, WI
DOCUMENTS NOT COPIED, MAY BE REVIEWED AT THE
USEPA REGION V OFFICES, CHICAGO, ILLINOIS.

DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE
89/00/00	Raw Data Package for Sampling at the Site from April-August,1989 (Review of Region V CLP Data;Chemical Analysis Data Sheets; Inorganic Analysis Data Sheets;Analytical Report;Pesticide Organics Analysis Data Sheets)	CH2M Hill	USEPA	Sampling/Data
89/04/12	Various Volatile Organics Analysis Data Sheets and Sample Reports for March, 1989	USEPA-Central Regional Laboratory	Data Users	Sampling/Data
89/04/27	Transmittal memo with various organic compound analyses for residential well sampling	CH2M Hill	USEPA	Sampling/Data

USEPA ADMINISTRATIVE RECORD INDEX - UPDATE #1
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

E/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
	1	90/03/07	Letter re: Concerned resident disagrees with the proposed cleanup plan for Onalaska site	J.Fitzpatrick	S.Pastor-USEPA	Correspondence	1
	1	90/03/17	Letter re: The Town of Onalaska on behalf of the PRP coalition requests that the public comment period for the Feasibility Study be extended to May 4, 1990	J.Watson-Gardner,Carton & Douglas	P.Andrews-USEPA	Correspondence	2
	1	90/03/27	Letter re: Due to requests of the community, U.S.EPA is extending its comnit period through May 4, 1990	K.Adler-USEPA	S.Pastor-USEPA	Correspondence	3
	1	90/03/30	Letter re: Writing to state some serious concerns pertaining to EPA's Feasibility Study and Proposed Plan addressing contamination at the Onalaska, WI	B.Rude-State Senator	S.Pastor-USEPA	Correspondence	4
	1	90/04/01	Letter re: The Board of Directors of the Holmen Area Civic and Commerce Association discussed the problems and solutions presented by the Onalaska Site	K.Spreuer-Holmen Area Civic & Commerce Assn., Inc.	S.Pastor-USEPA	Correspondence	5
	3	90/04/02	Letter forwarding copies of letters received in the public comment period for the Onalaska Health Assessment	J.Hayward-State of WI\Dept. of Health and Social Services	S.Pastor-USEPA	Correspondence	6
	1	90/04/24	Letter re: Concerned resident wishes to	S.Paar	S.Pastor-USEPA	Correspondence	7

USEPA ADMINISTRATIVE RECORD INDEX - UPDATE #1
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			express his opinion on the EPA solution to the Onalaska site; agrees that buying and restricting the landsite is a good alternative				
	6	90/04/28	Letter re: Public Comment Statement concerning the Onalaska Municipal Landfill Superfund Site, with conclusions regarding the EPA Proposed Plan for Remediation	S.Heidel	Concerned Party	Correspondence	8
	1	90/04/28	Letter re: Concerned resident expresses his concerns about the Town of Onalaska Landfill	C.Pierce	S.Pastor-USEPA	Correspondence	9
	1	90/04/30	Letter re: LaCrosse County Conservation Alliance comments on the proposed plan for remedial action for the Onalaska Municipal Landfill Superfund Site	M.Meinking-LaCrosse County Conservation Alliance	S.Pastor-USEPA	Correspondence	10
	2	90/04/30	Letter re: Concerned that the recommended actions for the Onalaska site are exceeding further than is necessary to protect human health and the environment, with the reasons listed	S.Gunderson-Congress of the U.S.,House of Reps.	S.Pastor-USEPA	Correspondence	11
	2	90/05/01	Letter re: Residents concerned with possible contamination of the surrounding ground waters and the wetlands	F.Funk-Frederick R. Funk	S.Pastor-USEPA	Correspondence	12
	4	90/05/02	Letter re: Comments on Proposed Cleanup	D.Dale,Pres.-Metallics, Inc.	Adler-USEPA,Schmidt-WDNR	Correspondence	13

USEPA ADMINISTRATIVE RECORD INDEX - UPDATE #1
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

TE/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			of Onalaska Landfill				
	2	90/05/02	Letter re: Concerned resident writing about the town of Onalaska dump	J.Donovan-Concerned Resident	S.Pastor-USEPA	Correspondence	14
	2	90/05/03	Letter re: Comments by Blount, Inc./Onark regarding the RI/FS for Onalaska, WI Municipal Landfill	M.Sheldon-Blount,Inc.	Adler-USEPA, Schmidt-WDNR	Correspondence	15
	2	90/05/03	Letter re: Concerned residents express their unequivocal disapproval of the U.S.EPA's proposed plan SGW for remedial action at the Onalaska Municipal Landfill	W.Viehl & M.Viehl	S.Pastor-USEPA	Correspondence	16
	7	90/05/03	Letter re: Town of Onalaska - Comment on Proposed Plan for Remedial Action at the Onalaska Municipal Superfund Site	C.Pedretti-Chairman, Town of Onalaska	Schmidt-WDNR, Adler-USEPA	Correspondence	17
	28	90/05/04	Letter re: Warzyn Engineering Inc. reviewed the draft RI/FS and proposal plan and are submitting the following comments for the Onalaska Municipal Landfill site	G.Asbury-Warzyn Engr.	Adler-USEPA, Schmidt-WDNR	Correspondence	18
	2	90/02/08	Memo re: Onalaska 1/31/90 update meeting trip report	S.Pastor-USEPA	File thru T.Lesser	Memorandum	19
	4	90/02/23	Memo re: Organizational Meeting with Onalaska PRPs on December 7,1989, in LaCrosse, WI	P.Andrews-USEPA	File	Memorandum	20
	1	00/00/00	Concerned residents' comments on the cleanup alternatives	G.Flether-Concerned resident	S.Pastor-USEPA	Other	21

USEPA ADMINISTRATIVE RECORD INDEX - UPDATE #1
ONALASKA MUNICIPAL LANDFILL
ONALASKA, WISCONSIN

:E/FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
			and Proposed Plan for a final cleanup remedy for the Onalaska site				
	6	00/00/00	Concerned residents' comments on the cleanup alternatives and Proposed Plan for a final cleanup remedy for the Onalaska site	Concerned Residents	S.Pastor-USEPA	Other	22
	14	90/03/04	Concerned residents' comments on the cleanup alternatives and Proposed Plan for a final cleanup remedy for the Onalaska site	Concerned Residents	S.Pastor-USEPA	Other	23
	3	90/03/14	Concerned residents' comments on the cleanup alternatives and Proposed Plan for a final cleanup remedy for Onalaska site	Concerned Residents	S.Pastor-USEPA	Other	24
	133	90/03/14	Transcript of the Public Hearing for Onalaska Municipal Landfill Superfund Site regareding the Proposed Plan for Remedial Action	T.Johnson-Court Reporter	USEPA	Other	25
	1	90/04/11	Concerned resident's comments on the cleanup alternatives and Proposed Plan for a final cleanup remedy for the Onalaska site	T.Carrar	S.Pastor-USEPA	Other	26

ADMINISTRATIVE RECORD INDEX
ONALASKA MUNICIPAL LANDFILL - UPDATE #2
ONALASKA, WISCONSIN

FRAME	PAGES	DATE	TITLE	AUTHOR	RECIPIENT	DOCUMENT TYPE	DOCNUMBER
1		90/06/06	Letter confirming a request to delay Record of Decision on Onalaska Wisconsin Landfill until June 29th.	Gunderson, S.	Adamkus, V.	correspondence	1
1		90/06/08	Conversation record: Response to ORAC - 154 requesting VVA postpone ROD Decision on Onalaska until June 29, 1990	M.Canavan-Congressional Liaison	Kennedy, D.	phone records	2

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES
Carroll D. Besadny
Secretary
Box 7921
Madison, Wisconsin 53707

May 31, 1990

IN REPLY REFER TO: 4440

O: WMD
CC: RF
FREEMAN

Mr. Valdas Adamkus, Regional Administrator
U.S. Environmental Protection Agency
Region V
230 South Dearborn Street
Chicago, IL 60604

SUBJECT: Selected Superfund Remedy
Onalaska Landfill Superfund Site
Onalaska, Wisconsin

Dear Mr. Adamkus:

The purpose of this letter is to inform you that our Agency concurs with the proposed final remedy for the Onalaska Landfill Superfund site. The proposed final remedy, identified as Alternatives 3LF and 5GW, as described in the Record of Decision includes:

1) Bioremediation of naptha contaminated vadose zone soils in the southwest portion of the site;

2) Groundwater remediation via pump and treat for the purposes of groundwater restoration and discharge of the treated groundwater to the Black River; and

3) Capping the landfill site with a multimedia cap and gas venting system, in accordance with current State specifications.

The costs of the selected remedy are estimated to be

Capitol Costs - 1) and 2): $3,600,000
3): $1,500,000

Operation Costs - 1) and 2): $150,000
3): $14,000

We understand that your staff and contractors, or the potentially responsible parties will develop the major design elements of the bioremediation and

groundwater pump and treat system in close consultation with my staff during the predesign and design phases of the project. We also understand that if the potentially responsible parties do not agree to fund the remedy, the State of Wisconsin will contribute 50% of the remedial action costs. In addition to cost sharing on the remedy, we acknowledge our responsibility for operation and maintenance of this system after the initial 10 year operation and maintenance period, as required by the Superfund law. We note that at the conclusion of the bioremediation, the State wishes to enter into a cooperative agreement with your Agency to implement the cap design and construction for this site as a State-lead action.

As always, thank you for your support and cooperation in addressing the contamination problem at this site. If you have any questions regarding this matter, please contact Mr. Paul P. Didier, Director of the Bureau of Solid and Hazardous Waste Management at (608) 266-1327.

Sincerely,

C. D. Besadny
Secretary

CDB:RS

cc: Lyman Wible - AD/5
Paul Didier - SW/3
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Sue Bangert - SW/3
Don Winter - WD
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Mary Pat Tyson - EPA Region V
Jon Dikinis - EPA Region V

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

ONALASKA MUNICIPAL LANDFILL SITE
LACROSSE COUNTY, WISCONSIN

AUGUST 1990

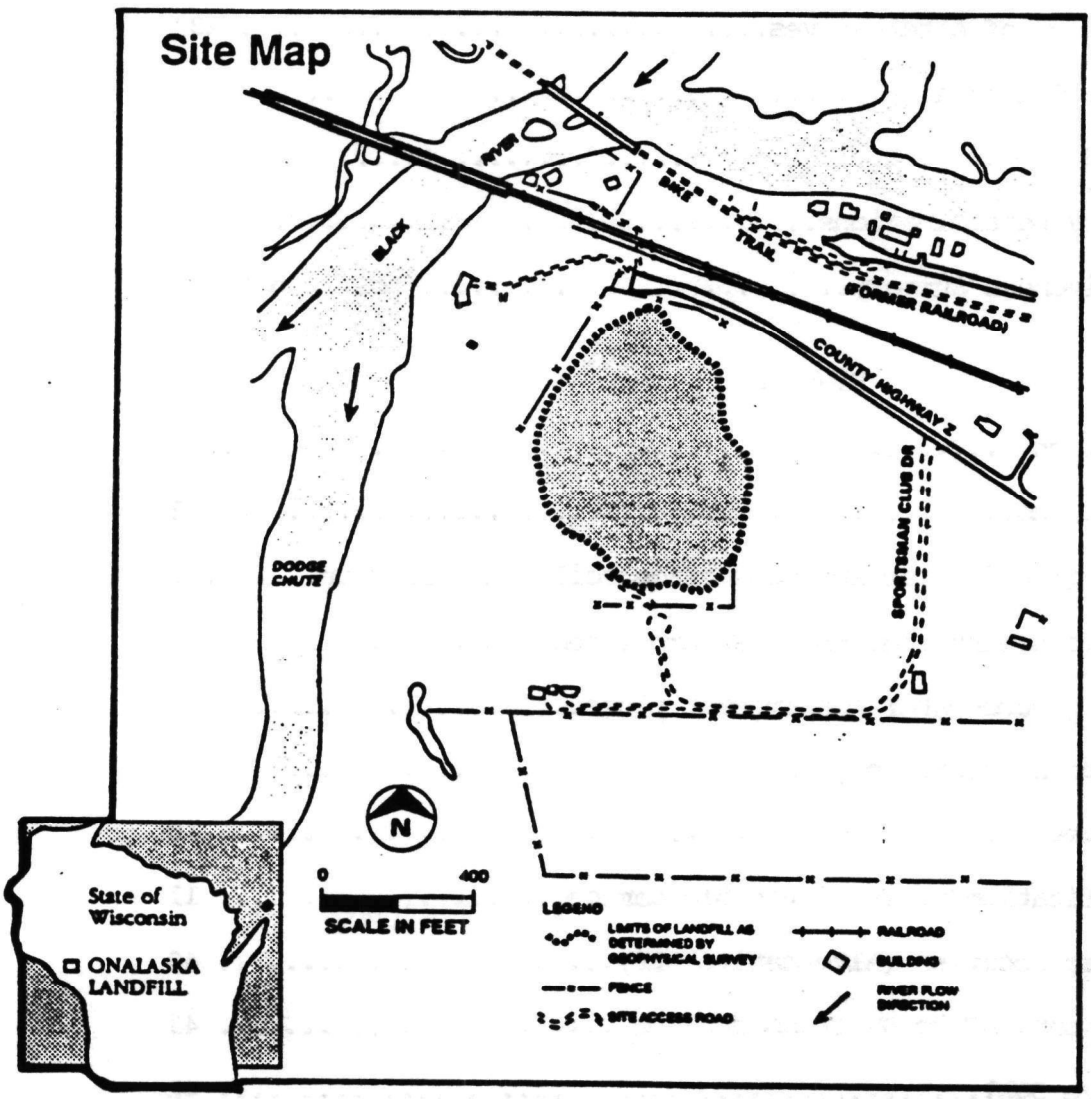

TABLE OF CONTENTS

Figures

Tables

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

ONALASKA MUNICIPAL LANDFILL SITE
LACROSSE COUNTY, WISCONSIN

I. Site Location and Description

The Onalaska Municipal Landfill ("Onalaska") site is located in the Township of Onalaska ("Town"), approximately 10 miles north of the City of LaCrosse, Wisconsin. The 11-acre site, which includes the 7-acre landfill, is situated 400 feet east of the Black River, near the confluence of the Mississippi and Black Rivers (see Figure 1a). The

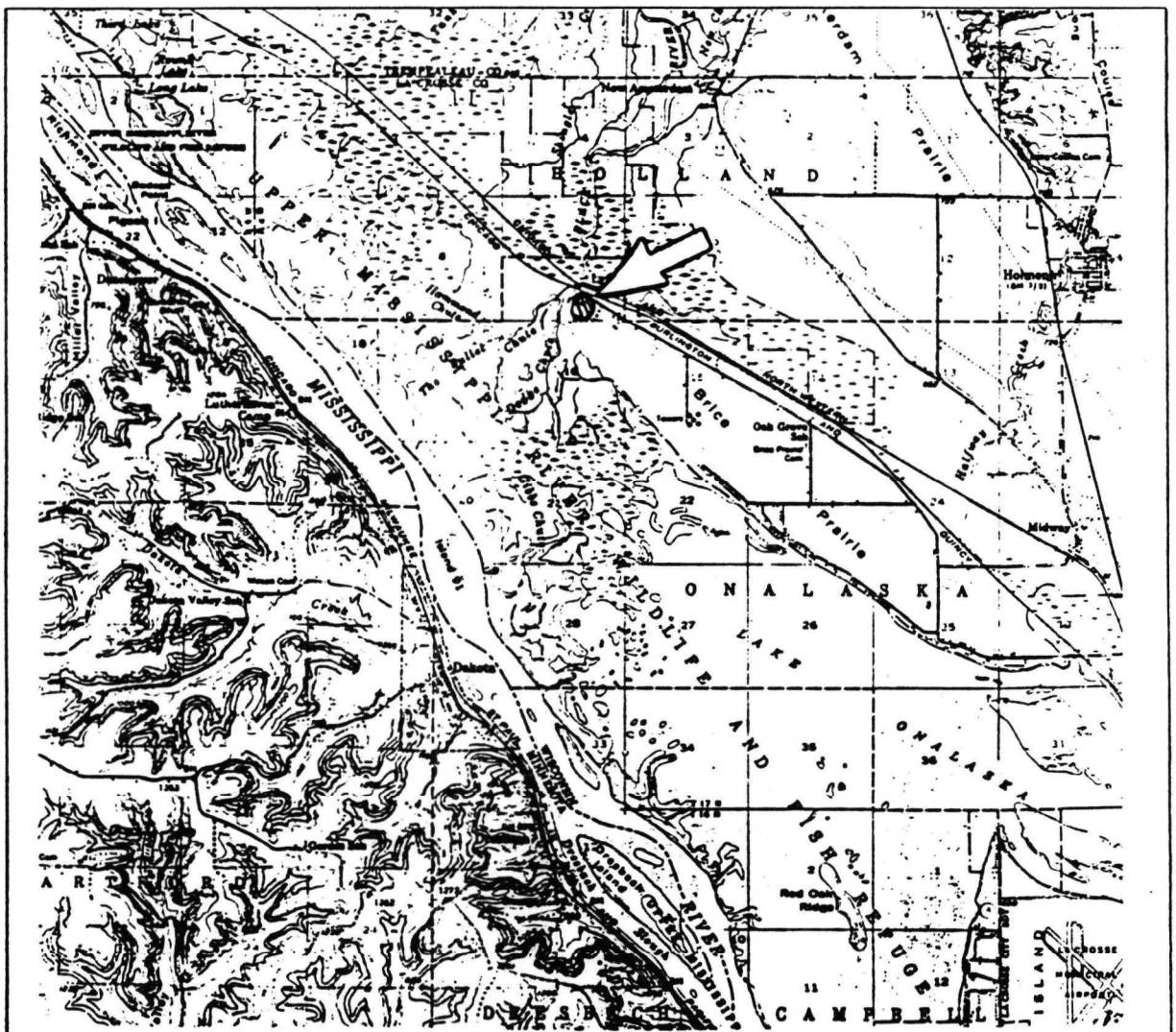

Figure 1a. Site location. (Scale: 1 inch = 1.5 miles)

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.

Although the surrounding area is generally rural, several residences are located to the north and to the south within 500 feet of the landfill. A subdivision of about 50 homes is located about 1.25 miles southeast of the site. The sand and gravel aquifer is the source of drinking water for the local residences. Several private wells were sampled as a part of the Remedial Investigation (Figure 1b). Agricultural lands are located south of the landfill, and intermittent woods and grasslands border the site to the east.

The landfill was covered ("capped") with a 2-foot, clayey soil layer and was revegetated after it was closed in 1980. Although evidence of frost damage has been found, no wastes have yet been exposed. As a part of the closure requirements, four monitor wells were installed in the sand and gravel aquifer beneath the landfill (Figure 1b). The monitor wells have

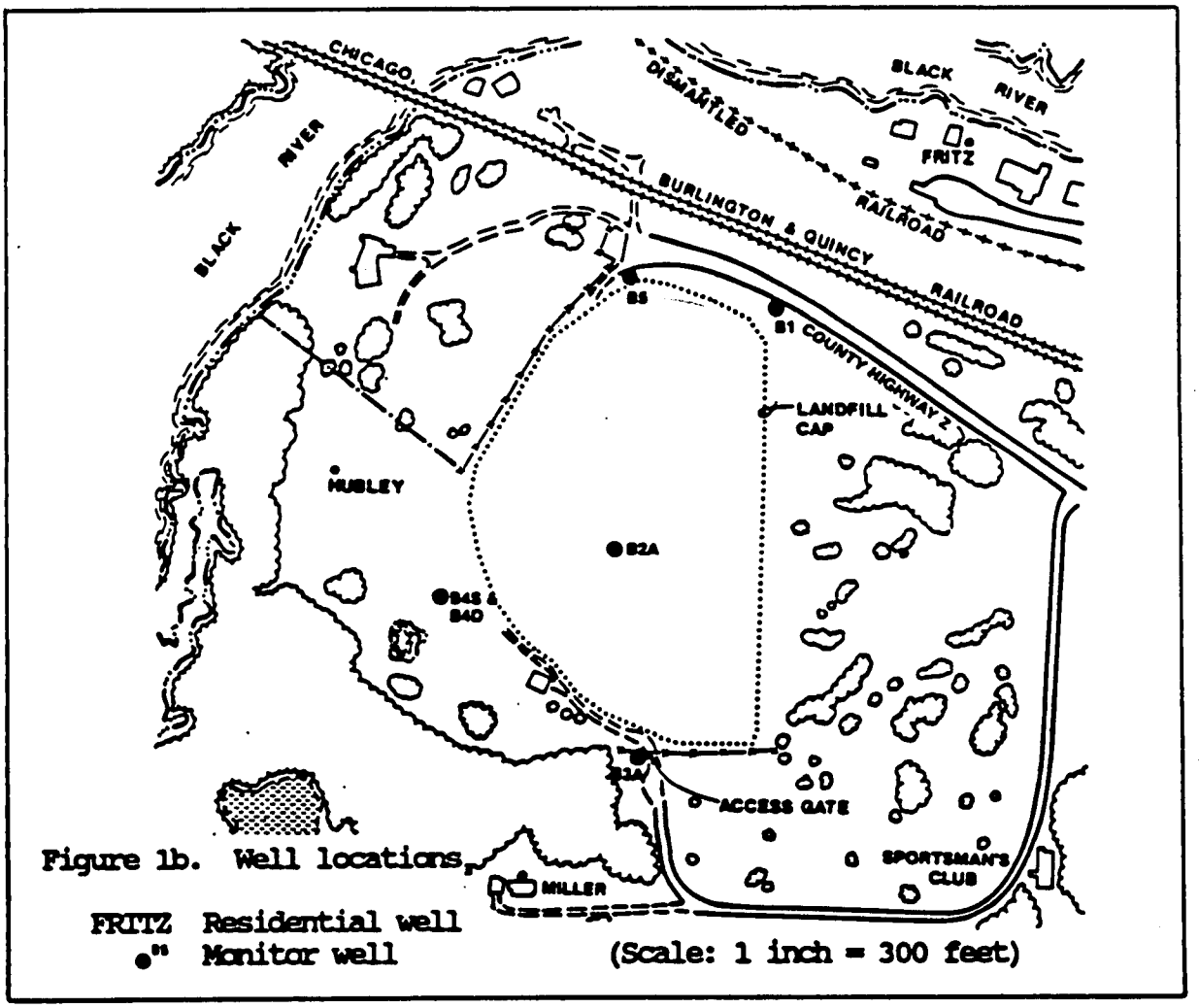

Figure 1b. Well locations.

been sampled periodically since 1982. A storage shed maintained by the Town near the entrance of the landfill is the only structure present.

II. Site History

The Onalaska site was mined as a sand and gravel quarry in the early 1960's. After quarry operations ceased in the mid-1960's, the Town began to use the site as a landfill. Once the Wisconsin Department of Natural Resources (WDNR) received authority to regulate landfills in 1969, the Town was granted a license to use the former quarry as a municipal landfill. However, both municipal and chemical wastes were disposed of in the landfill. In 1978, after determining that the landfill operation did not meet State solid waste codes, the WDNR ordered the Town to close the landfill by September 1979. Subsequently, the closure order was modified to extend the deadline to September 1980, at which time disposal operations ceased. The final landfill cap was placed on the landfill in June 1982.

In September 1982, the WDNR sampled the four landfill monitor wells, and nearby residential wells, for compliance with drinking-water standards. The investigation documented that ground-water 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 water 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 ground-water 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 the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), the United States Environmental Protection Agency (U.S. EPA) inspected the 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.

III. Enforcement History

In 1987, the U.S. EPA and the WDNR proceeded with negotiations with several potentially responsible parties (PRPs) regarding the conduct of the Remedial Investigation and Feasibility Study (RI/FS). Negotiations were unsuccessful, and the U.S. EPA, in consultation with the WDNR, commenced the RI/FS in April 1988. In October 1989, the U.S. EPA sent General Notice Letters regarding potential liability to the first four PRPs listed below. In August 1990, Special Notice Letters regarding negotiations for the conduct of the proposed remedy were sent to all five of the PRPs:

-The Town of Onalaska (Owner/operator)
-Metallics, Inc. (Solvent waste generator)
-Outers Laboratories, Inc. (Solvent waste generator)
-Omark Industries, the successor corporation to Outers Laboratories, Inc.
-State of Wisconsin: Department of Agriculture

IV. Community Participation

Pursuant to Sections 113(k)(2)(b)(i-v) and 117 of CERCLA, the Onalaska community has participated in the remedy selection process, in that:

-Prior to any public meeting, a press release was sent out to the local media and an advertisement announcing the meeting was placed in the LaCrosse Tribune, a local paper of general circulation;

-A public meeting ("kick-off") was held in October 1988, announcing the scope of the RI/FS;

-A letter was sent out to the public and press, updating them on the progress of the project as of October 1989;

-A public meeting was held in January 1990, announcing the findings of the RI/FS;

-The two site information repositories have been kept up to date with site documents. An administrative record containing the RI and FS reports and other documents was placed in a site repository. Several site documents were also kept at the Onalaska Town Hall, pursuant to citizen requests;

-A Proposed Plan for remedial action was released for public comment and placed into the Administrative Record on March 5, 1990, with the 30-day comment period scheduled to end on April 4, 1990. A Notice of Availability of the Proposed Plan was published in the LaCrosse Tribune prior to the release of the Proposed Plan;

-A public meeting was held on March 14, 1990, in the site proximity, at which the U.S. EPA and the WDNR presented the Proposed Plan to the community and received oral comments (which are addressed in the attached Responsiveness Summary). A transcript was kept of the public meeting and placed in the administrative record and site repositories;

-In response to a timely request by citizens of the Town of Onalaska, the comment period was extended to May 4, 1990. An advertisement was placed in the LaCrosse Tribune announcing the comment period extension; and,

-The U.S. EPA has received written comments regarding the Proposed Plan which are addressed in the Responsiveness summary.

V. Scope of the Selected Remedy

The selected remedy is the final remedial alternative to be implemented at the Onalaska site, encompassing all areas of concern at the landfill. The principal threats at the site are considered to be the ground-water contaminant plume and a contaminated soil zone adjacent to the

southwestern portion of the landfill, which is a major source of ground-water contamination. The landfill itself is considered to be a low-level, long-term threat to human health and the environment, primarily as a further source of ground-water contamination.

VI. Summary of Site Characteristics

A. Background

The Onalaska site was primarily used for disposal of municipal waste. According to landfill records kept by the Town, several industrial generators used the landfill to dispose of waste solvents consisting of residuals from the cleaning of paint spray equipment, guns and metal, and machine shop equipment. Lesser quantities of waste products containing hazardous substances, including chlorinated hydrocarbons, were also disposed of. Other waste types brought to the site include can washings (consisting of water and an amine soap believed to be biodegradable) derived from aluminum can manufacturing, small amounts of pesticides, solid wastes, and paint and ink residues.

A major portion of the solvent wastes brought to the site were naphtha-based, consisting primarily of a high-flash (point) naphtha and "Stoddard" solvent, a naphtha-based solvent with a lower flash point. These solvents tend to consist of aromatic and "straight-chain" hydrocarbons plus a small percentage of the "BEXT" compounds (benzene, ethylbenzene, xylene, and toluene). The naphtha compounds are less dense than water and are slightly soluble, therefore they tend to float on top of the ground-water table, rather than sinking, and tend to dissolve in water fairly slowly.

Solvent wastes were burned along with other trash on-site for a short period of time. After the WDNR banned open burning in 1971, the Town was directed to pour the liquid wastes into pre-excavated holes for immediate burial. Generally, waste solvents were placed in the south-western portion of the landfill.

Initially, the industrial generators transported the solvent wastes in 55-gallon drums which were either emptied for reuse, or buried if damaged or leaking. Later, the solvents were hauled in 500-gallon tank trucks. By April 1976, however, naphtha-based solvents were no longer being disposed of at the landfill as the generators had begun reclaiming the solvent for reuse. By this time, though, an estimated 320,000 gallons of waste solvent had been taken to the site for disposal.

B. Remedial Investigation

Based upon previous investigations by the WDNR and the U.S. EPA and upon available site records, the Remedial Investigation (RI) was directed at the following:

-Delineating the areal extent, direction and rate of flow, and the chemical composition of the ground-water contaminant plume emanating from the landfill;

-Determining the location(s), number, and condition of buried drums;

-Determining levels of soil contamination within and around the landfill;

-Determining the condition of the current cap; and,

-Determining the impact of the ground water and soil contamination on human health and the Black River environment.

The RI goals were met through a program of monitor-well installations and sampling, soil borings and sampling, geophysical investigations (electroconductivity and magnetometer surveys), trench excavation in the landfill (test pits), cap investigations, and surface water and sediment sampling in the wetlands environment.

The following conditions were observed at the Onalaska site:

1. Most of the time during the year the ground water at the site is moving in a south-southwesterly direction, towards the wetlands and the Black River, at an average rate of flow of 69 feet per year, with a range of 55 feet per year to 110 feet per year. For a few months during the year, during high ground-water table conditions, the ground-water flow is towards the south-southeast.

2. The landfill has been, and continues to be, a source of ground-water contamination. A ground-water contaminant plume consisting of both organic and inorganic compounds has migrated at least 800 feet from the southwestern edge of the landfill. The leading edge of the contaminant plume apparently is discharging into the wetlands (see Figure 2a). The highest concentration of contaminants is located in the southwestern portion of the site, which correlates with the industrial solvent disposal area in the landfill. The upper 10 feet to 20 feet of the aquifer contains the highest levels of contaminants, with lower concentrations found at depths of 50 feet to 70 feet (see Figure 2b).

a. Inorganic Contaminants

The primary inorganic compounds of concern, in relation to human health and environmental concerns, are barium and arsenic. Iron may also be a problem in that it may exceed discharge criteria in the extracted water 2unless treatment is tailored to iron removal. Barium concentrations ranged from 11 ug/L to 2760 ug/L in site monitor wells. Arsenic concentrations ranged from non-detection to 68 ug/L. At the Onalaska site, naturally occurring levels of barium and arsenic were found to be

approximately 340 ug/L and 10 ug/L, respectively. Figure 2c displays the extent of the inorganic ground-water contaminant plume.

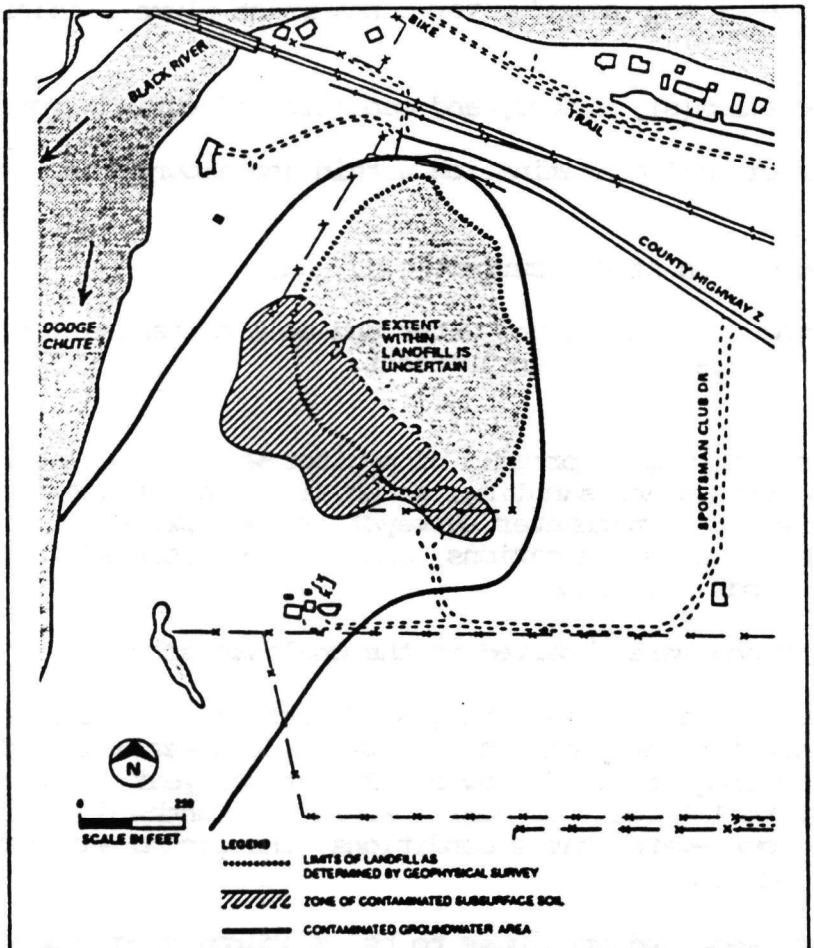

Figure 2a. Extent of ground-water and sub-surface soil contamination.

b. Organic Contaminants

The predominant organic compounds of concern include toluene, xylene, 1,1-dichloroethane (1,1-DCA), and trichloroethene (TCE), based upon potential impacts to human health and the environment. Concentrations of these chemicals are noted in Figures 2d and 2e.

3. Site soils located above the water table and adjacent to the southwestern edge of the landfill are contaminated with naphtha solvents (hereinafter referred to as "naphtha-contaminated soils" or "contaminated soils"). The contaminated soil zone occurs from 11 feet to 15 feet below ground surface and up to 150 feet from the landfill (Figures 2a and 2b). The contaminants, consisting of (in part) the BEXT compounds, originate in the landfill and are floating on the ground water. Ground water flows beneath the landfill, where it comes in contact with the naphtha solvents which are leaking from the disposal area, and leaves the

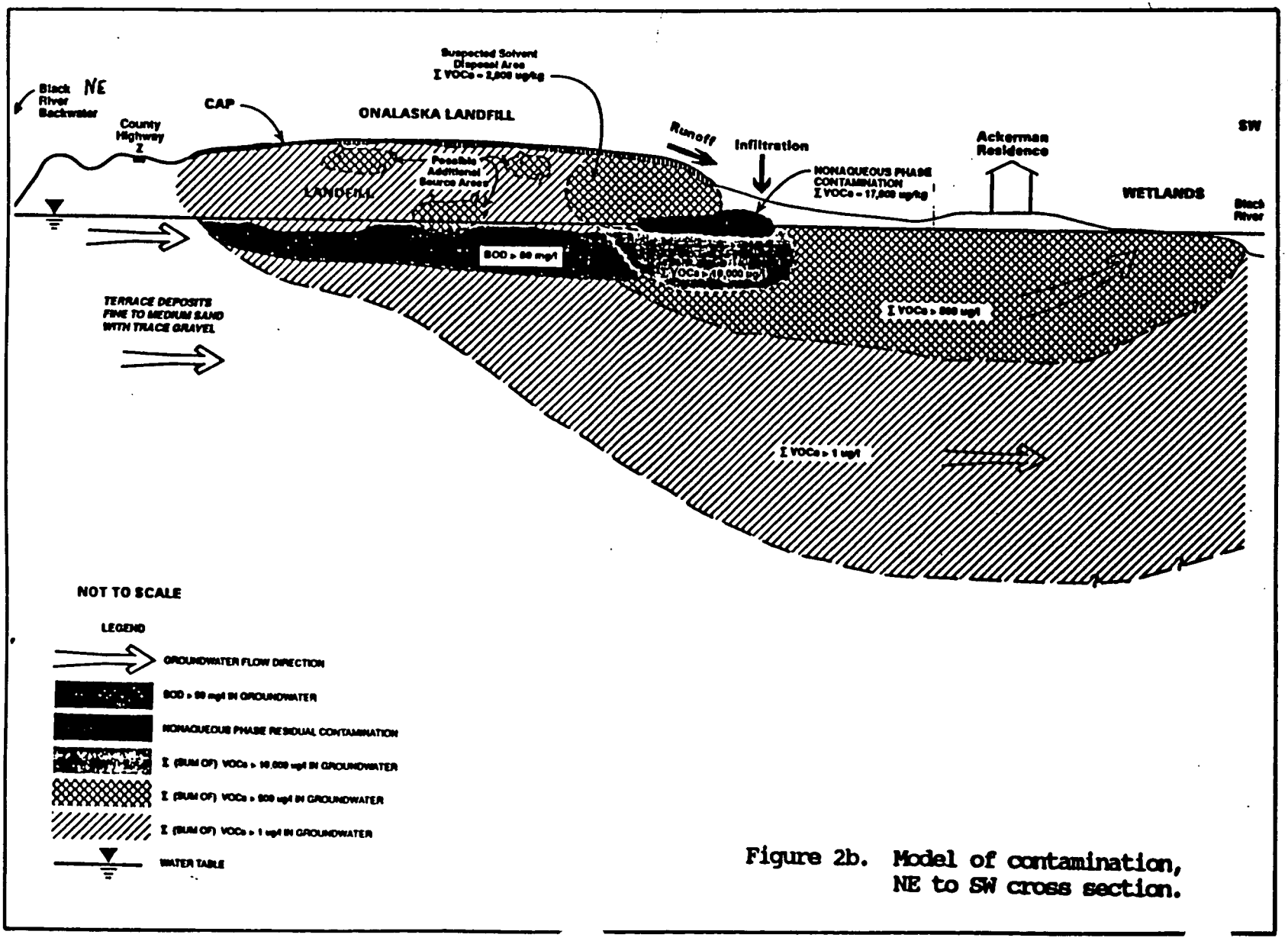

Figure 2b. Model of contamination, NE to SW cross section.

site in a southwesterly direction. The ground water carries the floating hydrocarbon layer with it as it moves off-site.

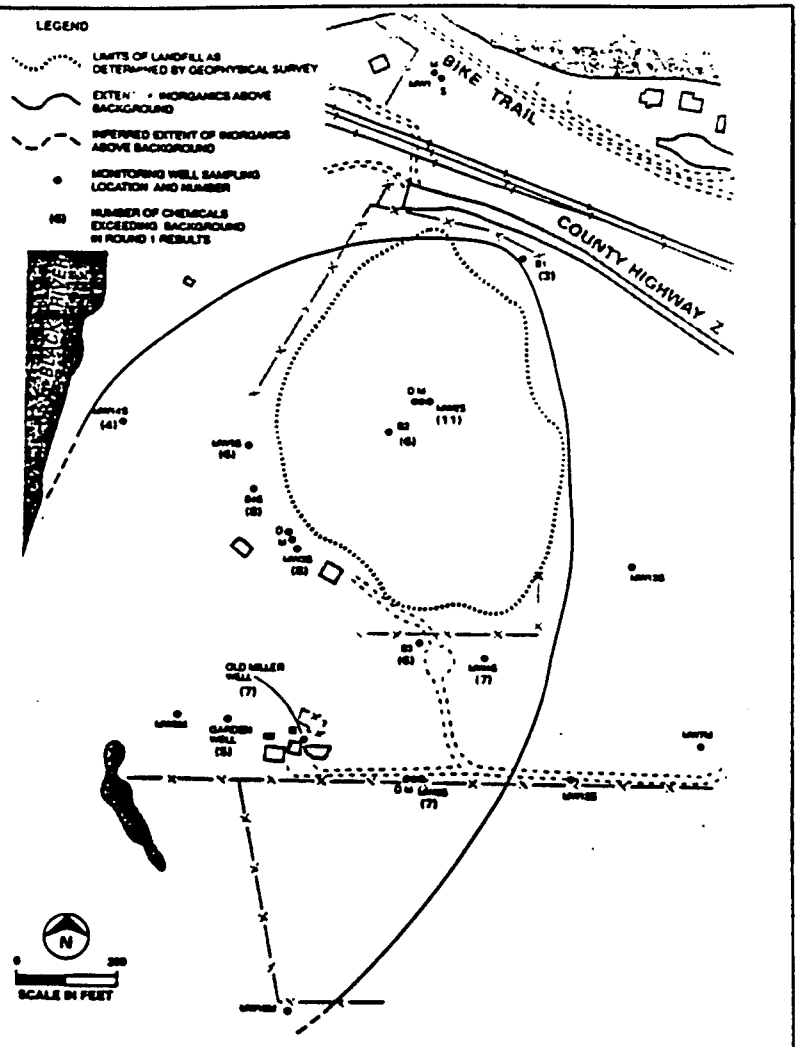

Figure 2c. Inorganic ground-water contaminant plume.

Natural seasonal fluctuations of the ground-water table are reflected by the 11-foot to 15-foot zone. Normal ground-water depth is 15 feet below the surface, during the spring the water table rises to 11 feet below the surface. As the water table rises and falls, the oily contaminants floating on top of the water table also rise and fall and tend to sorb onto the soil and remain behind as a continual ground-water contaminant source. Soil samples obtained from soil borings placed close to the landfill indicated that naphtha-contaminant levels of up to 550,000 ug/kg are present in the soil. The highest level of BEXT compounds detected in the soil in this area was 41,000 ug/kg.

4. The landfill cap has deteriorated and does not meet the landfill closure regulations in effect at the time the site closed. The cap was

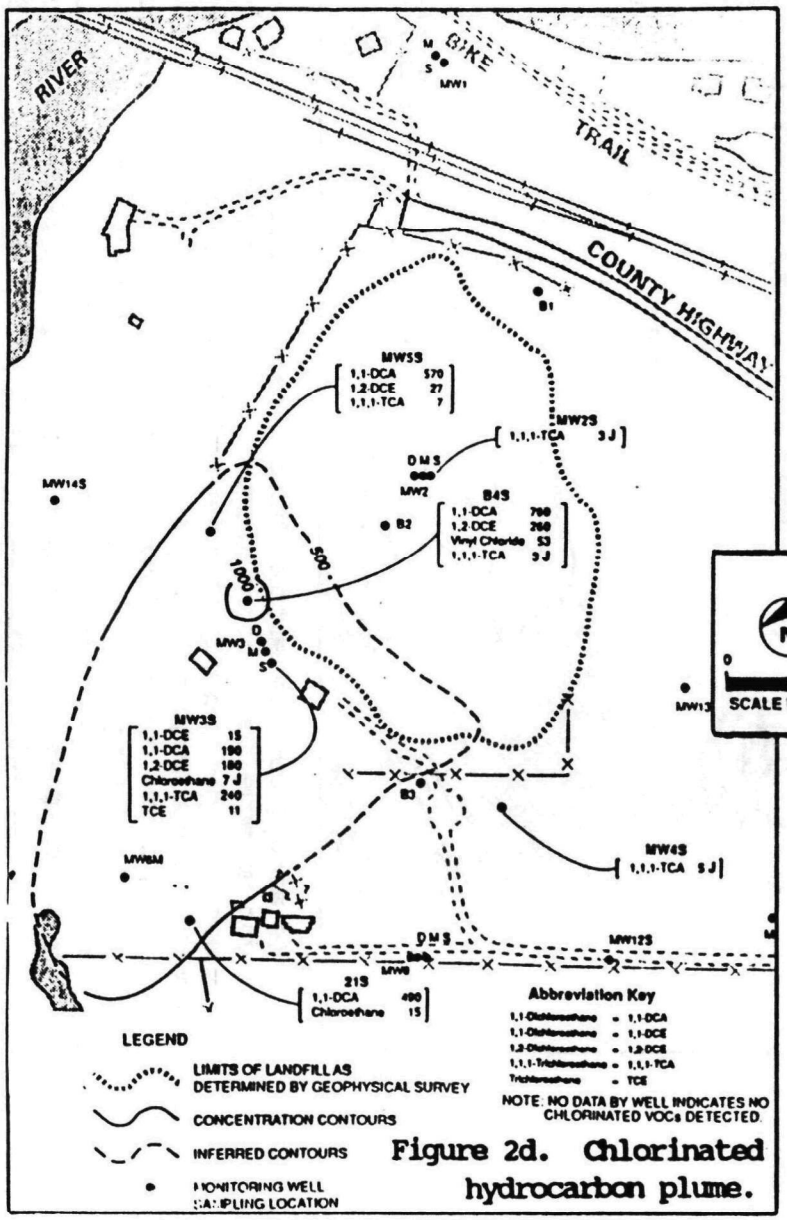

Figure 2d. Chlorinated hydrocarbon plume.

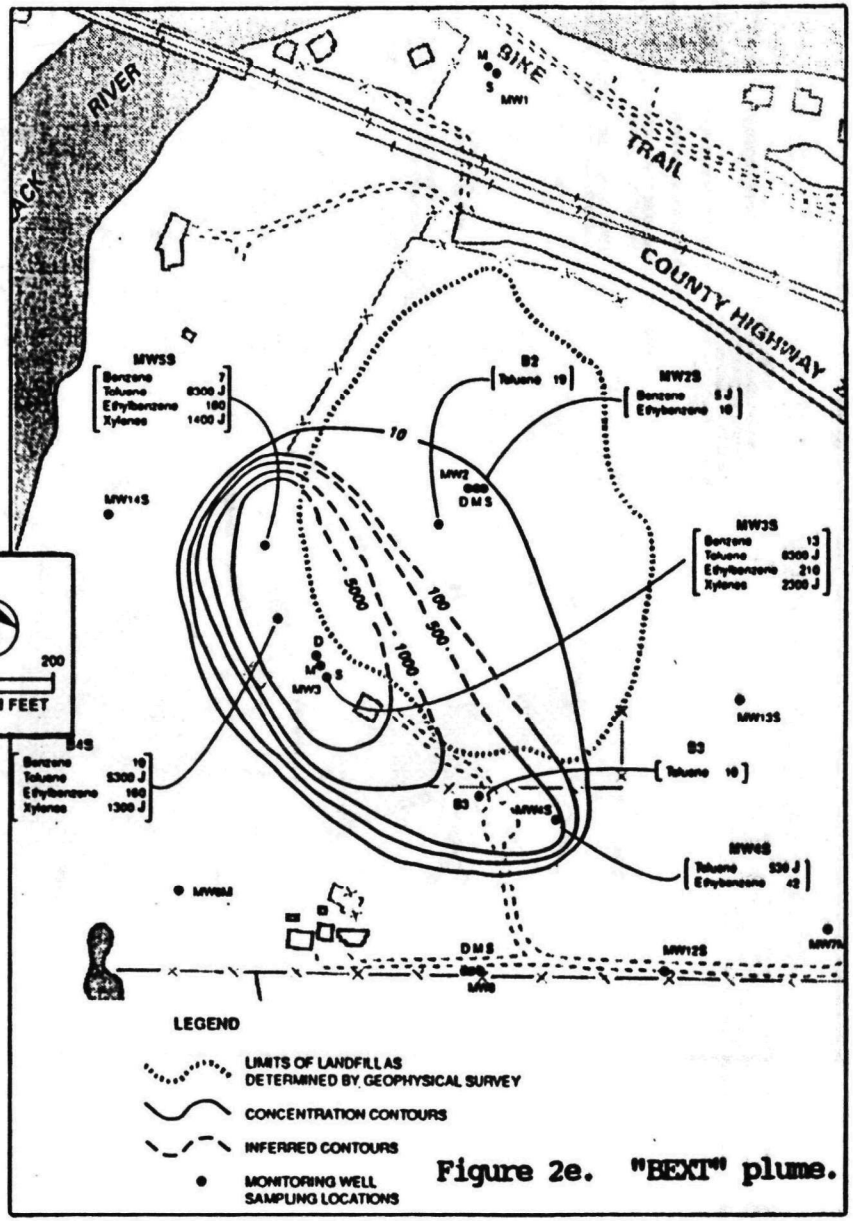

Figure 2e. "BEXT" plume.

originally to be composed of 2 feet of compacted clay to conform with Chapter NR 180, Wisconsin Administrative Code (WAC). The cap investigations have shown that the cap is composed of sandy soils in certain portions and that it is only 1-foot thick in other portions. The area of the landfill containing the floating naphtha layer is overlain by the most permeable layer of cap soils, thereby allowing water to infiltrate through the contaminant mass and leach contaminants into the ground water. As mentioned above, evidence of frost damage has been detected by the cap investigations. Animal burrows and erosion due to surface water run-off have damaged the cap perimeter (see Figure 3).

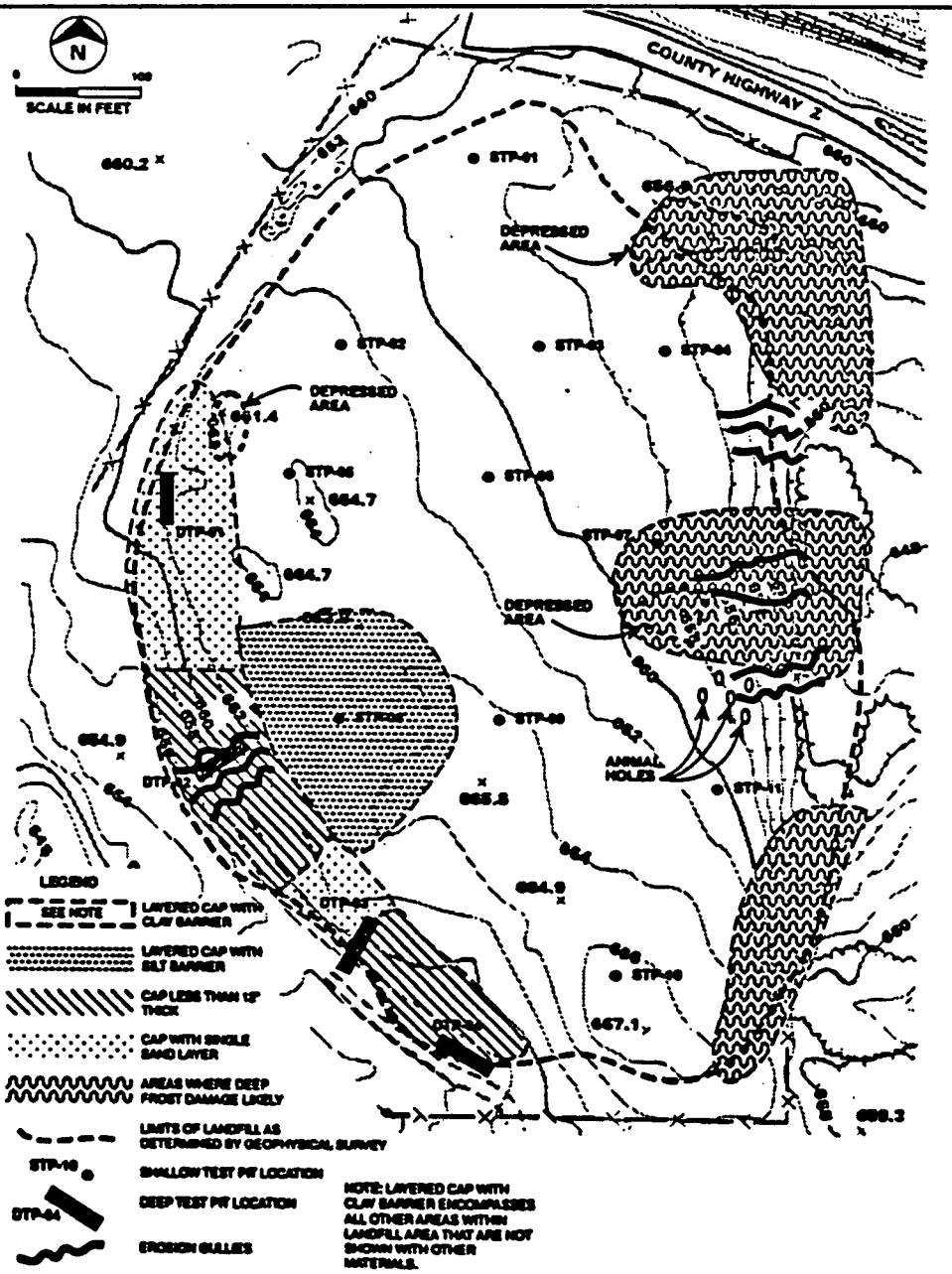

Figure 3. General cap classification and areas of visible damage.

5. Several crushed and empty 55-gallon drums were found in the landfill during the test pit task. Magnetometer anomalies, as well as site records, suggest that up to 1000 drums are likely to be in the landfill. As mentioned above, the solvent wastes were transported in 55-gallon drums which were either emptied for reuse, or buried if damaged or leaking. However, this RI could not ascertain that the drums are concentrated in any one area, and it may be likely that many of the drums are in the same condition as the drums which were found in the test pits.

6. 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 ground water. Soil below the water table does not appear to be greatly affected by landfill contaminants, in that the hazardous substances found in the ground water are soluble. The soluble contaminants would tend to remain dissolved in the ground water rather than sorbing onto the sandy soil deposits.

7. Landfill refuse contains pesticide residuals, based on sampling data and site records. While pesticides are not expected to be very mobile, they are considered to be a long-term threat given that they are readily bioaccumulated by aquatic life, and that the ground-water contaminant plume is discharging into the wetlands.

VII. Summary of Site Risks

Pursuant to the NCP, a baseline risk assessment was performed based on unaltered conditions at the site, as contemplated by the no-action alternative (see Section 4 of the RI report). The no-action alternative assumes that no corrective action will take place and that no site use restrictions, such as fencing, zoning, and drinking water restrictions, will be imposed. The risk assessment then determines actual or potential risks or toxic effects the chemical contaminants at the site pose under current and feasible future land-use assumptions. As detailed in the RI report, the following assumptions were made:

-No remedial actions will be taken;

-Ground-water use restrictions off-site provided for in Ch. NR 112, WAC will not be effective over the long-term (since variances provided for in section NR 112.04, WAC have been granted in the past, and may be granted in the future, to the existing State restriction (section NR 112.07(2)(q)) on the installation of drinking water supply wells within 1200 feet of a landfill, and at least one well exists within the 1200-foot zone);

-No development of the landfill itself will occur due to State restrictions (section NR 506.08(5), WAC) and geotechnical limitations;

-Adjacent off-site development may occur in the future; and,

-Ground-water contaminant concentrations will not decrease over time, due

to the presence of the contaminants in the vadose zone.

A. Chemicals of Concern and Toxicity Assessment

Forty-nine chemicals on the U.S. EPA Target Compound List (TCL) were detected in water or soil samples at the site. In addition, 29 tentatively identified compounds (TIC's) were also detected. As discussed in the RI report, the risk assessment process allows for this massive list of compounds to be pared down to a more manageable list of Chemicals of Concern (see Table 1). The inclusion of each indicator chemical in Table 1 was based on its relative concentration, frequency of detection, and toxic effects, as well as whether an environmental standard or criteria (such as a Federal drinking-water standard) exists for the chemical. Inclusion of a compound on the list of Chemicals of Concern indicates that remedial controls that may be applied to a site should mitigate exposure to the compound in ground water, soils, surface water, or in the wetlands.

Six of the chemicals of concern are non-carcinogens, and the remainder are potential or known human carcinogens (cancer-causing agents). Acute (short-term at high concentrations) or chronic (long-term at low concentrations) exposure to each of the chemicals of concern leads to various toxic effects (documented in Table 4-5 of the RI report).

Table 1

Chemicals of Concern
Onalaska Municipal Landfill

Non-Carcinogens	Carcinogens
Toluene	Benzene
Xylene	Arsenic
Barium	Trichloroethene (TCE)
Ethylbenzene	1,1-Dichloroethane (1,1-DCA)
Lead	1,1-Dichloroethene (1,1-DCE)
1,1,1-Trichloroethane (1,1,1-TCA)	

B. Human Health Exposure Pathways

The following exposure pathways have been identified as being potential or actual exposure pathways of primary concern for protection of human health at the Onalaska site:

-Potential current and future use of contaminated ground water for drinking, bathing, and other household uses;

-Potential future ingestion of and/or dermal contact with on-site soils

containing chemicals of concern; and,

-Potential future direct contact with contaminated surface waters or sediments due to recreational use of the Black River wetlands area.

The only exposure pathway determined to be of significance to the environmental risk analysis was the ground-water discharge of contaminants to the Black River wetlands. Both aquatic life, and any consumers of the affected aquatic life including humans, could be exposed to site chemicals.

1. Ground-Water Use

The only well drawing contaminated water from the sand and gravel aquifer at this time is a garden well (MW 21-S) located to the southwest of the landfill. This well is used occasionally by the home-owners to water the garden, and intermittently by hikers as a drinking water source. No well used primarily as a drinking-water source is currently contaminated by site chemicals.

The Town has replaced the contaminated residential well with a well installed in the sandstone aquifer to a depth of 207 feet. The sandstone aquifer, encountered at an average depth of 140 feet, lies beneath, and is most likely in direct communication with, the sand and gravel aquifer. It is unlikely that it would be adversely affected by landfill contaminants (Figure 2b); very slight to no measurable downward vertical gradients in the sand and gravel aquifer were seen during the RI, consequently, as seen in Figure 2b, the majority of site contaminants have tended to migrate horizontally rather than vertically. However, the sand and gravel aquifer, including the portion that lies beneath the landfill, is a Class IIA water source, as defined in U.S. EPA's Guidelines for Ground-Water Classification Under the EPA Ground-Water Protection Strategy (December 1986). A Class IIA aquifer is an aquifer that is currently in use, but does not meet the criteria to categorize it as a Class I aquifer (e.g., an irreplaceable source). The sand and gravel aquifer is currently being utilized as a drinking water source upgradient of the landfill and could be used as a drinking-water source downgradient of the landfill.

2. Landfill Waste Materials

The cap has been subjected to erosion and contains numerous animal boreholes which, along with the nature of the cap materials (as constructed), aids in ground-water contamination by providing conduits for precipitation infiltration. The conduits allow a large amount of water to infiltrate through the landfill waste materials and leach contaminants out of the waste towards the ground water. The potential for animal population exposure to waste materials and/or contaminants exists, as evidenced by the boreholes in the cap.

No airborne migration of contaminants due to cap deterioration has been

detected. State regulations (Ch. NR 506, WAC) which limit development of former landfills and practical issues, such as land subsidence and methane gas migration, reduce the potential for the cap or the site to be disturbed. While there is evidence that the current cap has undergone significant erosion since its construction, there are no detectable levels of contaminants being exposed at this time. However, given the current rate of erosion and recognizing the limitations to sampling all surface areas of the site, it is possible that waste materials and/or contaminants could be exposed in the future. In particular, inorganic contaminants (heavy metals) and pesticides would be of potential concern given the direct contact possibilities to human and animal populations in the future.

3. Surface Conditions

Under future conditions, any surface water runoff carrying contaminants from the landfill would not be expected to reach the Black River wetlands. Although the surrounding areas are lower in elevation than the landfill, the general low slope of the sandy and well-vegetated soils adjacent to the landfill suggest that runoff from the landfill would not carry contaminants very far from the site nor to the Black River.

C. Risk Pathways and Calculations for Human Health Exposure

Using data generated during the RI, the U.S. EPA conducts a site-specific baseline risk assessment to characterize the current and potential threats to human health and the environment posed by site contaminants. The individual and cumulative threats posed by contaminant migration into ground water, air, soils, surface water, or bioaccumulating in the food chain are evaluated in the risk assessment. The results of the risk assessment establish acceptable exposure levels for the Chemicals of Concern, which are then used to develop remedial alternatives in the FS.

Toxic substances may pose certain types of hazards to human and/or animal populations. Typically, hazards to human health are expressed as carcinogenic risks and non-carcinogenic toxic effects. Carcinogenic risk, numerically presented as an exponential factor (e.g., 1×10^{-6}), is the increased chance a person may have in contracting cancer in his or her lifetime due to exposure to a Chemical of Concern over his or her lifetime. For example, a 1×10^{-6} risk due to a lifetime of drinking water with a Chemical of Concern in it means that the a person's chance of contracting cancer due to drinking the water over his/her lifetime is increased by 1 in 1 million. The U.S. EPA attempts to reduce risks at Superfund sites to a range of 1×10^{-4} to 1×10^{-6} (1 in 10,000 to 1 in 1 million), with an emphasis on the lower end (1×10^{-6}) of the scale.

The Hazard Index, an expression of non-carcinogenic toxic effects, measures whether a person is being exposed to adverse levels of non-carcinogens. Any hazard index value greater than 1.0 suggests that a non-carcinogen potentially presents an unacceptable toxic effect.

1. Ground Water

Each Chemical of Concern exceeds either State ground-water quality standards or Federal drinking-water standards, except for 1,1-dichloroethane (1,1-DCA), which has no Federal drinking-water standard. Table 2 lists selected site monitor wells and the associated risks due to the potential ingestion of contaminated ground water from these wells. The standard risk assessment assumption that an individual, weighing 70 kilograms (154 pounds) and ingesting contaminated water (in that well) at the rate of 2 liters per day for his or her 70-year lifetime, was used to determine the potential risks. The risk calculation results from individual monitor wells represent a range of potential risks due to ingestion and dermal absorption of contaminants in the ground water. The highest chemical concentrations in individual wells represent a "worst-case" scenario risk due to potential ground-water use.

Table 2

Summary of Ground-Water Use Risks: Selected Monitor Wells
Onalaska Municipal Landfill

Monitor Well	Excess Carcinogenic Risk	Hazard Index
MW 02-S*	6×10^{-6}	0.8
MW 02-M*	——	1.1
MW 03-S	8×10^{-4}	2.5
MW 03-M	3×10^{-3}	1.8
MW 04-S	3×10^{-6}	0.7
MW 05-S	1×10^{-3}	3.8
MW 06-M	9×10^{-5}	1.5
MW 21-S	1×10^{-3}	2.1

*Landfill wells

As shown in Table 2, at the Onalaska site the target carcinogenic risk range is exceeded in three monitor wells and the target hazard index is exceeded in six monitor wells. Thus, the ground-water contaminant plume is a principal threat, since the potential carcinogenic risk at the site (maximum of 3×10^{-3}) exceeds the target carcinogenic risk range that the NCP considers to adequately protective (1×10^{-4} to 1×10^{-6}), and the potential hazard index (maximum of 3.8) exceeds the target level (1.0).

2. Soils and Landfill Waste Materials

The risks posed by exposure to the naphtha-contaminated soils or the landfill waste materials were calculated based on standard ingestion rates for soils: over a 5-year time period a 70-kg individual may visit the site once per week and accidentally ingest 0.1 grams of soil per visit. Dermal absorption of contaminants from soils was assumed to present a much lower risk in comparison to ingestion and, therefore, no quantitative calculations were made.

Since no contaminated soils or landfill waste materials are exposed at this time, they do not pose a direct-contact threat at present. Moreover, if the contaminated soils were to be exposed in the future, due to site development or to cap erosion, the associated potential risks are very slight. Under the erosion scenario, periodic trespass on-site was assumed, which resulted in a negligible carcinogenic risk of 7×10^{-10} and a hazard index of less than 1. Residential development of the site, although implausible, would yield an estimated carcinogenic risk of 7×10^{-8} and a hazard index of less than 1.

However, the naphtha-contaminated soil is considered to be a principal threat at the site. The naphtha is mobile and is not easily contained, plus it is a continual source of contamination for the ground water. Uncertainties associated with the landfill investigation have determined that the landfill is a low-level, long-term threat. The RI cannot possibly investigate the entire landfill with test pits or surface sampling points. Also, future cap erosion could expose waste materials which would pose unacceptable hazards to human health or the environment.

3. Surface Water and Sediments

The ground-water contaminant plume is apparently discharging into the Black River wetlands, although no site-derived organic chemicals had been detected in the limited number of surface water and sediment samples taken during the RI. The present human health risks associated with this pathway apparently are at protective levels. Future contaminant discharge levels may increase, but the volume of flow in the Black River is such that dilution is projected to greatly decrease probable concentrations, as would volatilization of the organic compounds. Very low risks to humans due to exposure are projected, and a quantitative value was not calculated. Impacts of organic chemicals on aquatic life were evaluated in the environmental assessment section of the risk assessment (see below).

The inorganic sampling data for surface water and sediment samples taken during the RI were unusable due to analytical laboratory difficulties, rendering the risk assessment inconclusive. Although it is generally difficult to determine exactly where a ground-water contaminant plume is discharging into surface water bodies, based on the results of the organic sampling data, there does not seem to be adverse risks posed by organic chemicals to human receptors at these sampling points in the

Black River and the wetlands at this time.

Inorganic compounds (e.g., heavy metals such as barium), however, would tend to accumulate in sediments once they have reached surface waters. Changes in pH and oxidation potential would tend to precipitate metals as insoluble hydroxides or carbonates, making them available for bioaccumulation by plant or aquatic species. Inorganic compounds are apparently discharging to the wetlands at this time. Over the long-term, adverse human exposure may be a likely scenario due to consumption of affected species.

D. Environmental Analysis

1. Upper Mississippi River Wildlife and Fish Refuge

The Onalaska site is adjacent to the Upper Mississippi River Wildlife and Fish Refuge (Figure 1a). The refuge, designated by the Fish and Wildlife Service (U.S. Department of the Interior), contains a wide variety of wildlife, including numerous species of migrating birds. The area is used for fishing, hiking, and other recreational purposes by local residents and visitors.

2. Natural Areas

The WDNR has identified five critical habitat, or "natural areas," near the site (see Figure 4-6 of the RI). Each area contains significant natural communities including emergent aquatics, flood plain forest, and cattail-bulrush, to name a few. One area to the north of the site is known as the Black River Bottoms Natural Area. This area contains two fish species (the pugnose minnow and the weed shiner) listed as special concern species, for which some problem of abundance or distribution is suspected but not yet proven. The Bullet Chute of the Black River is home to the pirate perch, mud darter, and the pugnose minnow, all of which are special concern species, and the starhead topminnow, a state-endangered fish species. These species occur downstream or near the area affected by site activity. The Black River Bottoms Natural Area supports a wide variety of native and migratory species. In addition, the Black River, Mississippi River, and Lake Onalaska all support abundant populations of game fish.

3. Surface Water and Wetlands

Inorganic compounds, which tend to migrate in the ground-water contaminant plume more rapidly than organic compounds, are contained in the leading edge of the plume. These compounds are of principal concern in relation to the surface water and wetlands. Bioaccumulation of certain chemicals associated with the landfill, such as DDT and/or heavy metals, may present a concern for terrestrial and aquatic life over the long-term. This site, as noted above, is adjacent to an area set aside (the Upper Mississippi River Wildlife and Fish Refuge) for migratory birds, which are known to be negatively impacted by pesticides and heavy

metals. In addition, humans could become secondary receptors of contaminants as a result of bioaccumulation, if they were to consume affected game species. Short-term inorganic chemical impacts cannot be projected at this time, since the inorganic data collected during the RI were unusable.

Organic chemicals associated with the landfill were not detected in the limited number of surface water and sediment samples taken in the wetlands area. It is very difficult to locate where ground water is discharging into surface water, therefore, organic chemical impact on aquatic life cannot be discerned at this time.

Under future conditions, the concentrations of chemicals of concern, as well as pesticides derived from the landfill, are expected to increase and have exceedances of acute toxicity water quality criteria for the surface water and wetlands according to Wisconsin Water Quality Criteria (WWQC). Chronic water quality criteria are expected to be exceeded in the wetlands, but due to dilution, chronic criteria are not expected to be exceeded in the Black River. In addition, Federal Ambient Water Quality Criteria (AWQC) for Protection of Aquatic Life may be exceeded for several chemicals (cadmium, chromium[+6], and zinc). Although, under modelled conditions, dilution by the Black River flow could drop the projected concentrations below the Federal criteria, the major concerns at this site include bioaccumulation of site-derived chemical compounds over the long-term and the uncertainties associated with both the present and future levels of contaminants discharging into an environmentally sensitive area.

VIII. Rationale for Action

The U.S. EPA considers several sources of information in determining whether or not to take action at a site. Based on the data gathered in the RI, the U.S. EPA performs a risk assessment to determine if adverse conditions currently or potentially threaten human health and/or the environment. The U.S. EPA also evaluates site conditions in relation to Federal and State environmental statutes and policies, in addition to the statutory mandates promulgated in CERCLA and the goals and expectations identified in the NCP. The primary criteria with respect to the Onalaska site are presented below.

A. Risk Summary

Additive excess lifetime carcinogenic risks calculated for ingestion of contaminated ground water ranged from 3×10^{-3} in monitor well MW-3M and 1×10^{-3} in monitor wells MW-05S and MW-21S (the garden well), to 6×10^{-6} in MW-02S, which was installed through the landfill. Risk calculations do not include arsenic, as the naturally occurring (background) levels of arsenic are comparable to the risk values derived from landfill chemical compounds. Only MW-03M appears to have arsenic significantly (at 68 ug/L) above naturally occurring values (10 ug/L). If the chemical concentrations from each of the monitor wells within the

ground-water contaminant plume were averaged, one may derive the "most-probable" risk due to ingestion of contaminated ground water. The mean carcinogenic risk for contaminated ground-water use was calculated to be 3×10^{-4} (excluding arsenic) based primarily on benzene and 1,1-DCA concentrations. The potential risk posed by ingestion of the ground-water contaminants, under both the worst-case and most-probable scenarios, exceed the target acceptable risk range of 1×10^{-4} to 1×10^{-6}, and thus present unacceptable potential risks to human health.

Additive hazard indices exceed 1.0 in six monitoring wells, although few individual chemicals' hazard indices exceed 1.0. The most notable exceedances are in MW-05S and in MW-21S, in which the additive hazard indices were calculated to be 3.8 and 2.1, respectively (primarily due to 1,1-DCA). Hazard indices above 1.0 are unacceptable.

B. Environmental Standards Not Met at the Site

In addition to posing unacceptable risks to receptors, the Onalaska site does not meet certain applicable or relevant and appropriate Federal or State environmental standards at this time.

1. Cap

The existing landfill cap does not meet section NR 504.07, WAC, the current State landfill closure requirements, which have been determined to be relevant and appropriate for this site. In part, section NR 504.07, WAC requires that the cap be composed of a 2-foot layer of compacted clay overlain by a frost-protective soil layer (see section XII(b)(3) - ARARs).

2. Ground Water

Table 3A lists the Chemicals of Concern and their corresponding federal drinking-water standards (Maximum Contaminant Levels (MCLs) or Maximum Contaminant Level Goals (MCLGs)) and the State ground-water quality standards, both enforcement standards (ES) and preventive action limits (PALs), which are discussed in section XII(b)(1). These values entail the Preliminary Ground-Water Cleanup Standards for the Onalaska site.

C. Ground-Water Protection Goals

1. The National Contingency Plan

The U.S. EPA's ground-water protection goal has been set forth in the NCP:

> "The national goal of the remedy selection process is to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste" (Section 300.430(a)(1)(i)).

Table 3A

Preliminary Ground-Water Cleanup Standards
Onalaska Municipal Landfill

Compound	Maximum Concentration	State Standard[1]	State Standard[2]	Federal Standard[3]
Benzene	13 ppb	0.67 ppb	0.067 ppb	5 ppb
Toluene	20,000 ppb	343 ppb	68.6 ppb	2,000 ppb
Xylene	2,300 ppb	620 ppb	124 ppb	10,000 ppb[4]
TCE	14 ppb	1.8 ppb	0.18 ppb	5 ppb
1,1-DCA	800 ppb	850 ppb	85 ppb	0.04 ppb[5]
Lead	207 ppb	50 ppb	5 ppb	50 ppb
Arsenic	68 ppb	50 ppb	5 ppb	50 ppb
Barium	2,760 ppb	1000 ppb	200 ppb	1000 ppb
Ethylbenzene	230 ppb	1360 ppb	272 ppb	680 ppb[4]
1,1,1-TCA	450 ppb	200 ppb	40 ppb	200 ppb
1,1-DCE	15 ppb	0.24 ppb	0.024 ppb	7 ppb

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

The NCP details that the U.S. EPA

> "expects to return usable ground waters to their beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site. Whenever restoration of ground waters is not practicable, (the U.S.) EPA expects to prevent further migration of the plume, prevent exposure to the contaminated ground water, and evaluate further risk reduction" (Section 300.430(a)(1)(iii)(F)).

Also, the NCP considers the use of institutional controls to limit exposures to hazardous substances in the ground water:

> "(The U.S.) EPA expects to use institutional controls such as water use and deed restrictions to supplement engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants....The use of institutional controls shall not substitute for active response measures as the sole remedy unless such response measures

are determined not to be practicable..." (Section 300.430(a)(1)(iii)(D)).

2. State of Wisconsin

The State's ground-water protection goals are set forth in Chapter 160, Wisconsin Statutes (Wis. Stats.), which applies to all ground waters in the State. (The State's ground-water quality standards are set forth in Ch. NR 140, WAC.) Chapter 160, Wis. Stats., and Ch. NR 140, WAC, are utilized by all State agencies which regulate facilities, practices, or activities that may affect ground-water quality. Consistent with these statutes, the remedial alternatives evaluated in the FS must achieve adequate protection of human health and the environment (when implemented), and protect the ground-water resources of the State.

3. Cleanup Standards

Table 3A presents the Preliminary Ground-Water Cleanup Standards for the Onalaska Municipal Landfill, based on the consideration of the potential risks to consumers of contaminated ground water and on the consideration of Federal and State ground-water protection goals and ground-water quality standards. Table 3B, Ground-Water Cleanup Standards, lists the most stringent ground-water cleanup levels from Table 3A and contains the remediation goals to be met when implementing the ground-water remedy at the Onalaska site. Except for 1,1-DCA, as discussed below, Table 3B contains the preventive action limits (PALs) for the Chemicals of Concern at the site.

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.

(If it becomes apparent that it is not technically or economically feasible to achieve a (State) PAL, then a (Wisconsin) alternative concentration limit (WACL) may be considered consistent with the exemption criteria of section NR 140.28, WAC. Except where the background concentration of a compound exceeds the (State) enforcement standard (ES), the WACL established may not exceed the ES for that compound. If WACLs are established for all Chemicals of Concern, the maximum levels established would be enforcement standards, and the maximum cumulative carcinogenic risk would be approximately 1×10^{-5}, which is an acceptable risk according to the NCP. See section XII(b)(1)(B)(ii), below.)

Table 3B

Ground-Water Cleanup Standards
Onalaska Municipal Landfill

Compound	Standard
Benzene	0.067 ppb
Toluene	68.6 ppb
Xylene	124 ppb
Ethylbenzene	272 ppb
Arsenic[1]	5 ppb
Barium[1]	200 ppb
Lead	5 ppb
Trichloroethene	0.18 ppb
1,1-Dichloroethane	0.04 ppb
1,1,1-Trichloroethane	40 ppb
1,1-Dichloroethene	0.024 ppb

Notes: 1 = Naturally occurring levels for these compounds found at the Onalaska site may be higher than these standards.

Section NR 140.28, WAC, provides for establishing a (Wisconsin) alternative concentration limit (WACL) if (1) background concentrations exceed preventive 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)).

D. Summary

Actual or threatened releases of hazardous substances from this site, if not addressed by implementation of the response action selected by this Record of Decision, may present an imminent and substantial endangerment to public health, welfare, or the environment. Therefore, based on the findings in the RI report and the discussion above, a Feasibility Study (FS) was performed to focus the development alternatives to address the principal and low-level threats at the site. The FS report documents the evaluation of the magnitude of site risks, site-specific applicable or relevant and appropriate requirements (ARARs), and the requirements of CERCLA and the NCP, especially the ground-water protection policy, in the derivation of remedial alternatives for the Onalaska site.

IX. Description of Alternatives

The Onalaska site was divided into two parts, or "operable units," to

effectively evaluate the site problems in the FS. The first operable unit deals with the landfill, and the second operable unit deals with the ground-water contaminant plume and the contaminated soil. The two operable units are addressed separately but are intended to be addressed in conjunction with each other. Different remedial alternatives were evaluated to address the principal and low-level threats posed by each operable unit. The alternatives passing initial screening and considered for detailed analysis in the FS are presented below.

A. Landfill Operable Unit

Although the NCP reaffirms U.S. EPA's preference for permanent solutions to Superfund site problems through the use of treatment technologies, the preamble to the NCP contemplates that many remedial alternatives may be impractical for certain sites due to severe implementability problems or prohibitive costs (e.g., treatment of the content of an entire large municipal landfill). The Feasibility Study (FS) was thus directed at containment rather than treatment of the landfill contents, due to the size of the landfill and because no "hot spots" within the landfill could be discerned during the RI. The alternatives analyzed were as follows:

1LF: No-Action
2LF: Cap Repair and Upgrade
3LF: Multilayer Cap (Landfill Only)
4LF: Multilayer Cap (Landfill and Contaminated Soil Zone)

1. Alternative 1LF: No-Action

Under the No-Action alternative, no active response would occur, other than inspection and grass cutting. The current rate of precipitation infiltration, through the cap and landfill waste towards the ground water, is projected to increase in the future as frost damage, animal burrowing, and erosion continues. No reduction of the rate of leaching of contaminants to the ground water would be provided by this alternative, thus no risk reduction would result from this action. An institutional control, which regulates the development of landfills, under section NR 506.08, WAC would be relied upon to augment cap effectiveness. WDNR approval must be given to any activities which would disturb the landfill.

The grass cutting and cap inspection program under Alternative 1LF would cost $1000 per year.

2. Alternative 2LF: Cap Repair and Upgrade

Under Alternative 2LF, the areas of the existing cap that are damaged and/or do not comply with the original closure specifications under Ch. NR 180, WAC (a minimum of 2 feet of compacted clay) would be repaired and upgraded to meet the original design plans. The currently minimal

risks associated with exposure to landfill contaminants would be further reduced as the cap is repaired and upgraded. The upgraded cap is projected to reduce the rate of precipitation infiltration by 30 percent, reducing the rate of ground-water contamination as compared to Alternative 1LF.

Site operation and maintenance would consist of periodic inspections and repair of the cap as well as grass cutting. A drawback to this alternative, and to the current cap since neither contains a frost protection layer, is that damage due to freeze/thaw cycles would not tend to be apparent during the visual inspections and, therefore, would probably not be repaired. Thus, precipitation would continue to degrade the cap as well as continue the migration of contaminants to the ground water. The institutional control described under Alternative 1LF would also apply.

Alternative 2LF would take 2 months to construct. The capital cost is $390,000 (to repair and upgrade the cap) and the Operation and Maintenance cost is $3,200 per year. The present worth* is projected at $440,000.

3. Alternative 3LF: Multilayer Cap (Landfill Only)

Under Alternative 3LF, a new multilayer cap which meets the requirements of section NR 504.07, WAC would be constructed over the 7-acre landfill. The multilayer cap would consist of (from bottom to top) a grading layer, a minimum 2-foot compacted clay barrier layer, and a frost-protective layer consisting of a gravel drainage layer, a soil layer, and a minimum 6-inch topsoil layer with surface vegetation. A minimum of 3.5 feet of frost-protection layer is required in the LaCrosse area, as the maximum recorded frost depth is seen to be approximately this thickness. A passive methane gas venting system would also be installed to control gas build-up under the multilayer cap. As above, the currently minimal risks associated with landfill contaminant exposure would be further reduced relative to 1LF. The multilayer cap is projected to reduce the rate of precipitation infiltration by 80 percent in comparison to Alternative 1LF, minimizing the migration of contaminants towards the ground water.

Site operation and maintenance would consist of grass cutting, regular inspections, flushing of drainage lines, and repair of damaged areas. Freeze/thaw damage to the clay barrier layer would not be expected to occur due to the minimum 3.5 feet of frost protection. The institutional control described under Alternative 1LF would also apply.

Alternative 3LF would take up to 6 months to construct. The capital cost is $1,500,000 (to construct the cap) and the Operation and Maintenance cost is $14,000 per year. The present worth is projected at $1,700,000.

*Present worth calculations are based on a 5 percent discount rate and a 30-year Operations and Maintenance period.

4. Alternative 4LF: Multilayer Cap (Landfill and Contaminated Soil)

Under Alternative 4LF, a new multilayer cap meeting section NR 504.07, WAC requirements, would be constructed over the landfill and the adjacent contaminated soil. The cap, constructed of the same components as in 3LF, would also cover approximately 4 acres adjacent to the southwest portion of the site. As above, the rate of precipitation infiltration would be reduced in the landfill by 80 percent, in comparison to Alternative 1LF, minimizing the migration of contaminants out of the landfill towards the ground water. The rate of infiltration through the naphtha-contaminated soil would be reduced by 40 percent, which would help to reduce the rate of contaminant loading into the ground water, but would also tend to increase the length of time for contaminant loading into the ground water by a principal threat.

Alternative 4LF would take up to 9 months to construct. Using the same maintenance program as in Alternative 3LF, the capital cost is $2,300,000 (to construct the cap) and the Operation and Maintenance cost is $23,000 per year. The present worth is projected to be $2,600,000. The institutional control described under Alternative 1LF would also apply.

B. Ground-Water Operable Unit

The objective of the ground-water operable unit is to achieve Federal drinking-water standards under the Safe Drinking Water Act and State ground-water quality standards under Ch. NR 140, WAC ("Ground-Water Cleanup Standards"). Ground-water operable unit alternatives analyzed to address the principal threats at the site ranged from No-Action to ground water extraction and treatment with treatment of the naphtha-contaminated soil. The alternatives analyzed were as follows:

1GW: No-Action
2GW: Slurry Wall and Cap
3GW: Ground Water Extraction/Passive Treatment
4GW: Ground Water Extraction/Active Treatment
5GW: Alternative 4GW Plus Bioremediation of Soils
6GW: Alternative 4GW Plus Thermal Treatment of Soils

1. Alternative 1GW: No-Action

Under Alternative 1GW, no action would be taken to control the ground-water contaminant plume emanating from the site nor would the contaminated soils be addressed. The institutional controls promulgated under Ch. NR 112, WAC (see ARARs - Section XII) would be relied upon for prevention of ingestion of contaminated ground water, even though variances could be granted which would allow the installation of a well within 1200 feet of the landfill. Monitoring of the ground-water contaminant plume would be implemented to guard against potentially significant discharges of contaminants to the surface water and sediments of the Black River. Impacts to the Black River and the wetlands would

not be controlled or mitigated with this alternative and future remedial action may be necessary if adverse levels of contaminants are detected in the surface water or sediments.

Risks due to the potential ingestion of contaminated water are not projected to decrease as continual contaminant loading to the ground water would occur. Ground-Water Cleanup Standards are not expected to be met within 100 years or more. The ground-water contaminant plume would also be expected to spread further towards the southeast over time, due to the seasonal southeasterly ground-water flow component.

Three new monitor wells would be added to the current monitor well network requiring a capital cost of $100,000. Installation would take 3 months, and the ground-water contaminant plume would be monitored for 30 years with an Operation and Maintenance cost of $63,000 per year. The present worth is projected at $1,100,000.

2. Alternative 2GW: Slurry Wall and Cap

Under Alternative 2GW, the contaminant sources contributing to the ground-water plume would be contained by a slurry wall and a multilayer cap. The slurry wall would encircle the landfill and the naphtha-contaminated soil. Contaminated ground water outside of the slurry wall, which is apparently discharging to the wetlands at present, would be allowed to continue to discharge at acceptable levels (i.e., below Water Quality Criteria (WQC) - see Section XII(b)(1)(C)). As in Alternative 1GW, if adverse levels of site contaminants are found to be discharging to the wetlands, additional remedial work may need to be performed. The cap would be constructed as described in Alternative 4LF. Ground-water monitoring would be performed to assess the degree to which contamination attenuation is proceeding. The institutional controls outlined for Alternative 1GW would also be applied.

After the contaminant source is contained, the ground-water quality is projected to improve over time, by natural attenuation (discharge of contaminants at adequately protective levels to the wetlands and dilution by ground water), to eventually meet Federal drinking-water standards. This would result in an estimated ten-fold reduction in potential risks (from 1×10^{-3} to 1×10^{-4}). However, even though it may take about 30 years to meet Federal drinking-water standards, it is unlikely that State ground-water quality standards could be achieved during this time frame.

The capital cost for Alternative 2GW is $3,900,000. The Operation and Maintenance cost is $80,000 per year (to maintain the slurry wall and cap as well as to monitor the ground-water contaminant plume for 30 years). The present worth is projected at $5,100,000. The slurry wall and cap would take 1 year to construct.

3. Alternative 3GW: Ground Water Extraction/Passive Treatment

Under Alternative 3GW, a series of extraction wells would be constructed to remove contaminated ground water from the leading edge of the plume. The extraction well network would be designed to be constructed near the point where the ground water apparently discharges into the wetlands, in order to capture the contaminant plume prior to its discharge into the wetlands.

The extraction wells would extract approximately 170 gallons per minute (GPM). The contaminated water would be treated by cascading it over a series of small rock or concrete apron waterfalls (a form of "passive" air stripping) to promote volatilization of organic compounds prior to discharge to the Black River. Discharge of the treated water shall meet the substantive requirements of a WPDES permit. It is possible to use this type of treatment system at this time, since the concentrations of contaminants in the leading edge of the ground-water contaminant plume are less than the ground water closer to the landfill.

It may be possible that a more "active" method of treatment would be needed in the future. Higher concentrations of contaminants will migrate towards the extraction well network, perhaps causing discharge criteria to be exceeded. Chapter NR 140, WAC requirements of preventing a continuing release of contaminants above standards at the point of standards application would thus not be met by this alternative.

The ground-water extraction/treatment network would be operated until Ground-Water Cleanup Standards are met in 30 years or more. The institutional controls described under Alternative 1GW would be applied as well. This would result in a risk reduction from the currently unacceptable level of 1×10^{-3} to an acceptable level of approximately 1×10^{-6} in 30 years or more.

Alternative 3GW would take much longer to reach Ground-Water Cleanup Standards than Alternative 2GW, if at all, since the soil contaminants will not be addressed (either contained as in Alternative 2GW, or treated as in Alternatives 5GW and 6GW, below) and contaminants would continue to leach into the ground water.

Ground-water monitoring would be performed to assess the degree to which contaminant cleanup is occurring. Alternative 3GW would take 6 months to construct and would be operated for 30 years or more. The capital cost is $520,000 (to construct the extraction well network and treatment system) and the Operation and Maintenance cost is $80,000 per year. The present worth is projected at $1,700,000.

4. Alternative 4GW: Ground Water Extraction/Active Treatment

Under Alternative 4GW, a series of extraction wells would be constructed to remove contaminated ground water at an approximate rate of 170 GPM from beneath the contaminated soil near the southwest portion of the

landfill. Treatment of the contaminated water would consist of aeration, clarification, and filtration prior to discharge to the Black River in compliance with the substantive requirements of a WPDES permit. The extraction well network would intercept the ground-water contaminant plume near the major source of contamination, but the leading edge of the ground-water contaminant plume would continue to apparently discharge acceptable levels of contaminants into the wetlands. If the discharge levels exceed WQC, then additional ground-water extraction may need to be performed in the area targeted for ground-water extraction in Alternative 3GW. Sludge produced (primarily iron) from the treatment process would be disposed of in an appropriate facility.

The extraction and treatment system would be operated until Ground-Water Cleanup Standards are met in an estimated 5 years to 30 years or more. This would provide a risk reduction from the current unacceptable level of 1×10^{-3} to the acceptable level of approximately 1×10^{-6}. Ground-water monitoring would be performed to assess the degree of contaminant cleanup and to ensure that contaminant levels apparently discharging from the leading edge of the plume to the wetlands remain below unacceptable levels. The institutional controls described under Alternative 1GW would be applied.

Alternative 4GW would take 6 months to construct. The capital cost is $1,800,000 and the Operation and Maintenance cost is $150,000 per year. The present worth is projected at $4,200,000.

5. Alternative 5GW: Alternative 4GW Plus Bioremediation of Soils

Under Alternative 5GW, the ground-water extraction and treatment system described in Alternative 4GW would be implemented and the institutional controls outlined under Alternative 1GW would be applied. An innovative technology, in situ, enhanced biological remediation, would be applied to the naphtha-contaminated soils. Bioremediation is implemented by injecting oxygen into the contaminated soil zone and applying water and nutrients to the surface soil. The treatment accelerates the natural biodegradation of the organic compounds in the contaminant mass and would be performed primarily to reduce the principal threat posed by organic contaminants which are leaching into the ground water.

The FS estimated that bioremediation would destroy a minimum of 80 percent of the naphtha compounds (i.e., organics) in the soils up to a maximum of 95 percent of the naphtha compounds. The estimated Cleanup Goal for the soils, if implementing the bioremediation component of Alternative 5GW, would therefore be 80-95 percent reduction of the solvent mass. A laboratory bench-scale treatability study, and a pilot-scale test, would be conducted to determine the most efficient parameters (e.g., oxygen demand, nutrient levels) for the conduct of bioremediation. The treatability study would also establish the maximum percentage reduction of the organic compounds in the soils that the remedy may be capable of achieving. The pilot-scale test would establish the Best Technologically Achievable ("BTA") reduction rate for the organic

compounds. Once the BTA reduction rate is established, it shall become the Cleanup Standard for the soil contaminants in lieu of the estimated Cleanup Goal of 80-95 percent reduction.

The removal of the principal threat posed by the contaminated soils would help the ground-water extraction and treatment system achieve Federal drinking-water standards in less time than Alternative 4GW. As in Alternative 4GW, once Ground-Water Cleanup Standards are met, the potential risk of ground-water consumption would fall from the current unacceptable level of 1×10^{-3} to an acceptable level of approximately 1×10^{-6} in 5 years to 30 years.

It is anticipated that, after five years of operation of the ground-water extraction and treatment system, 95 percent of the ground-water contaminants will have been removed from the ground-water contaminant plume intercepted by the extraction wells. It is also anticipated that bioremediation and containment will prevent the spread of unacceptable levels of contaminants off-site. The ground-water quality will be evaluated in increments of 5 years to determine if the remedial action objectives have been met. Ground-water quality will be evaluated to determine whether or not it is technically or economically feasible to achieve (State) PALs. In addition, the ground-water quality will be evaluated to determine if the anticipated reduction in contaminants has been sufficient to modify the "active" aeration treatment system (e.g., air stripper) to a "passive" aeration treatment system (e.g., a cascade system). Such a determination will be based upon WPDES discharge requirements and the chemical characteristics of the ground water to be treated.

Following up to 6 months of treatability and pilot-scale testing, the bioremediation component of Alternative 5GW would be constructed in 6 months and is expected to be implemented for two 200-day treatment seasons. The capital cost for the entire remedy is $3,600,000 and the Operation and Maintenance cost is $150,000 per year. The present worth is projected at $6,000,000.

Since the naphtha layer is within the landfill as well, the treatability study would be aimed at determining if bioremediation could be implemented within a portion of the landfill at the same time. If implemented, the capital cost for entire remedy is $4,200,000 and the Operation and Maintenance cost is $164,000 per year. The present worth is projected at $6,800,000.

6. Alternative 6GW: Alternative 4GW Plus Thermal Treatment of Soils

Under Alternative 6GW, the ground-water extraction and treatment system of Alternative 4GW would be implemented and the institutional controls described under Alternative 1GW would be applied. An estimated 17,000 cubic yards of the naphtha-contaminated soils would be excavated and thermally treated off-site. No contaminated refuse within the landfill would be excavated and treated. Two thermal treatment alternatives were

considered - asphalt incorporation and roasting. In either case, the contaminated soils are excavated and transported to a local asphalt plant for treatment.

The soil could be incorporated into a hot asphalt mixture and used for paving, or the soil could be placed into asphalt production ovens and roasted. If incorporated into asphalt, some organic compounds may evaporate while the less volatile organic compounds are solidified or incorporated into the asphalt mixture. Incorporation of the contaminated soil into asphalt constitutes recycling and therefore Land Disposal Restrictions (see Section XII(b)(3)(i)) would not apply.

The roasting process would heat the soils to separate the volatile organic compounds (VOCs) from the soils and discharge them to the atmosphere. The less volatile hydrocarbons would not be entirely removed. The Target Cleanup Goal for roasting would be 99 percent removal of VOCs, and a reduction of Total Petroleum Hydrocarbons (TPH) to 10 mg/kg. The treated soils would be replaced on-site. However, roasting may not constitute Best Demonstrated Available Technology ("BDAT") under the Land Disposal Restriction rules. Replacement of the soils on-site would not be allowed until BDAT is applied or a waiver is granted.

As with Alternative 5GW, the implementation of either thermal soil treatment is intended to reduce the amount of contaminants leaching into the ground water. This would help the ground-water extraction and treatment system to reach Ground-Water Cleanup Standards in less time than Alternative 4GW (in an estimated 5 years to 30 years). Once Ground-Water Cleanup Standards are met, the current unacceptable risk level of 1×10^{-3} would be reduced to an acceptable level of approximately 1×10^{-6}.

Once local demand for asphalt is identified, Alternative 6GW would take 2 months to 3 months to excavate and treat the soils. As in Alternatives 4GW and 5GW, ground-water extraction and treatment would be implemented for 5 years to 30 years. The capital cost for Alternative 6GW is $3,700,000 and the Operation and Maintenance cost is $150,000 per year. The present worth is projected to be $6,100,000.

C. Application of Alternatives

Although the remedial alternatives are discussed separately for each operable unit, in some instances the implementation of any one remedy for the ground-water operable unit may directly influence the selection of a remedy for the landfill operable unit. For example, Alternative 2GW, which contains the landfill and contaminated soils with a slurry wall, would require a cap which covers the entire area enclosed by the slurry wall. The only landfill remedy which provides this option would be Alternative 4LF. Similarly, Alternative 4LF would tend not to be implemented with either Alternative 5GW or Alternative 6GW, as the latter alternatives address the principal threat posed by the naphtha-

contaminated soils. It may not be necessary to cap the naphtha-contaminated soils area once the soils have been treated.

X. Comparative Analysis of Alternatives: The Nine Criteria

In accordance with the NCP, the relative performance of each alternative is evaluated using the nine criteria (Section 300.430(e)(9)(iii) as a basis for comparison. An alternative providing the "best balance" of tradeoffs with respect to the nine criteria is determined from this evaluation.

A. Threshold Criteria

1. Overall Protection of Human Health and the Environment

Overall protection of human health and the environment addresses whether a remedy eliminates, reduces, or controls threats to human health and to the environment. The major exposure pathways of concern at the Onalaska site are the potential ingestion of contaminated ground water, and the exposure to or ingestion of contaminated surface water and/or sediments in the Black River and the wetlands adjacent to the site. Based upon these pathways of concern, the landfill alternatives were evaluated on their ability to reduce precipitation infiltration through the landfill, which reduces the levels of contaminants leaching into the ground water. The ground-water alternatives were evaluated on the basis of their ability to remove contaminants from the aquifer to reach acceptable risk levels and to reduce the levels of hazardous substances discharging into the wetlands. Increased rates of precipitation infiltration through the landfill do not contribute to returning the aquifer to its beneficial uses within a reasonable time frame.

a. Landfill Alternatives

Over the long-term, Alternatives 1LF (No Action) and 2LF (Cap Upgrade) do not provide adequate protection of human health and the environment since freeze/thaw, erosion, and animal burrowing would continue to damage the cap. The condition of the present cap demonstrates that a frost protection layer is necessary to maintain cap integrity over time. The maintenance of cap integrity over time is critical with respect to both direct contact exposure of wastes by human and environmental receptors, as well as protection of the ground water through minimization of precipitation infiltration through the landfill. With diminished cap integrity, organic, metallic, and pesticide contaminants detected in the landfill wastes would continue to be carried to the ground water at unacceptable rates. In addition, more toxic or concentrated wastes in areas of the landfill not investigated could either be exposed or carried to the ground water.

While Alternative 2LF may provide an initial reduction in precipitation infiltration over the short-term, and thus decreasing the amount of contaminants leaching into the ground water, its effectiveness will

decrease over time. The upgraded cap would be subject to the same degradational forces the current cap is subjected to and precipitation infiltration would be expected to increase in the future. Impacts on surface water and the wetlands due to ground-water degradation would be expected to continue.

Since Alternatives 3LF and 4LF (section NR 504.07, WAC cap) provide for a cap with a frost protection layer, not only would they tend to provide a superior barrier to direct contact, but they would decrease the rate of precipitation infiltration through the landfill wastes by approximately 80 percent. Frost, erosional, and animal burrow damage to the clay barrier layer would be minimized, decreasing the direct conduits for precipitation infiltration through the landfill and decreasing the rate of contaminant leaching from the waste mass into the ground water. Thus, Alternatives 3LF and 4LF are protective of human health and the environment over the long term.

The difference between Alternative 3LF and Alternative 4LF is that Alternative 3LF would not reduce the amount of precipitation infiltration through the naphtha-contaminated soils. Alternative 4LF would reduce precipitation infiltration through the contaminated soils by approximately 40 percent, reducing the rate of loading of contaminants into the ground water.

b. Ground-Water Alternatives

Alternatives 1GW (No Action) and 2GW (Containment) are not protective of human health and the environment over the long term. Alternatives 3GW through 6GW provide adequate protection of human health and the environment and use treatment to remove hazardous substances from the ground water and/or naphtha-contaminated soils. The use of treatment remedies where practicable is anticipated by the NCP (Section 300.430(a)(1)(iii)(A)).

Alternative 1GW is not protective of the environment, since it does not limit the release of contaminants at levels exceeding water quality criteria in the surface water or wetlands. In addition Alternative 1GW is not protective of human health, for it would rely solely upon potentially ineffective institutional controls to prevent the ingestion of contaminated ground water. The NCP (Section 300.510(c)(1) recognizes that the U.S. EPA may not have the authority to implement institutional controls and requires that the State assure that any institutional controls implemented as part of a remedial action are reliable and in place after operation and maintenance has begun. The State does not have the authority to prevent the installation of drinking-water wells, as a variance procedure currently exists under Ch. NR 112, WAC. This is evidenced by the existence of two wells within 1200 feet of the landfill that have received such a variance and by the garden well which is located within the ground-water contaminant plume.

Alternative 2GW would also rely on institutional controls to prevent the ingestion of contaminated ground water, and would act to contain the

source of contaminants and allow the ground-water quality to improve via natural attenuation. Alternative 2GW is not protective at this site in that the containment will likely be breached over the long term. Since natural attenuation, instead of treatment, is employed to cleanup the aquifer, Ground-Water Cleanup Standards would not be met within a reasonable time frame.

Alternative 3GW provides for treatment to address the ground water at the perimeter of the contaminant plume, but it does not address the naphtha-contaminated soils adjacent to the southwest portion of the landfill. This alternative would be protective in that ground-water contaminant discharge to the surface water and wetlands would be minimized due to extraction and treatment of the ground water. However, it would also tend to draw more highly contaminated ground water from the site towards the extraction wells, increasing the likelihood that a more active ground-water treatment system may be necessary to replace the passive ground-water treatment system in the future.

Alternatives 4GW through 6GW provide for the long term protection of human health and the environment, while meeting the goals and expectations of the Superfund program. As detailed above, the stated programmatic goal of the U.S. EPA, as expressed in the NCP, is to select remedies that are protective over time and "minimize untreated waste" (Section 300.430(a)(1)(i). The NCP contemplates that the U.S. EPA will use "treatment to address the principal threats at a site, wherever practicable" (Section 300.430(a)(1)(iii)(A). Alternatives 3GW and 4GW, while providing treatment to address the ground water, do not address the contaminant mass in the soils adjacent to the southwest portion of the landfill.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)

This criterion evaluates whether an alternative meets applicable or relevant and appropriate requirements set forth in Federal, or more stringent State, environmental standards pertaining to the site or proposed actions. (The selected remedy section (Section XI) discusses ARARs for the site.) This section only notes those ARARs not addressed (if any) by an alternative.

a. Landfill Alternatives

Alternatives 1LF and 2LF do not meet the current section NR 504.07, WAC landfill requirements for landfill closure, which has been determined to be relevant and appropriate for this site. Alternatives 3LF and 4LF would meet section NR 504.07, WAC requirements and would also meet the requirements of 40 Code of Federal Regulations (CFR) Part 264.310(a)(1-5), which are RCRA Subtitle C landfill closure regulations.

b. Ground-Water Alternatives

Alternatives 1GW through 3GW would not comply with Ch. NR 140, WAC, in that they do not prevent the continued release of contaminants at levels exceeding standards at the point of standards application. In addition, it is unlikely that these alternatives would result in compliance with acute water quality criteria in surface water or the wetlands, or chronic water quality criteria in the wetlands. Alternatives 4GW through 6GW would comply with Ground-Water Cleanup Standards within a reasonable time frame, as well as with water quality criteria in surface water and the wetlands.

Under Alternative 6GW, the roasting method of thermal treatment of the naphtha-contaminated soils would not meet the RCRA criterion for the permanent destruction of contaminants, known as the destruction removal efficiency (DRE). A DRE of 99.99 percent is required for treatment technologies (incinerators) if the waste is removed and treated (40 CFR 264.343). Incorporation of the soil into asphalt is considered to be recycling and DRE requirements would not apply.

B. Primary Balancing Criteria

3. Long-Term Effectiveness/Permanence

This criterion evaluates the ability of an alternative to maintain protection of human health and the environment along with the degree of certainty that the alternative will prove successful.

a. Landfill Alternatives

Alternatives 1LF and 2LF do not provide long-term effectiveness or permanence since no frost protection layer is provided for the cap. Rapid cap deterioration, which leads to an increased rate of precipitation infiltration, will occur without such a barrier, as seen in the current cap. Alternatives 3LF and 4LF provide the best long-term effectiveness of the landfill alternatives as they relate to the cleanup, since the cap design includes a frost-protective layer which prevents freeze/thaw cap damage and reduces the likelihood of animal burrowing through the clay barrier liner. This would allow the ground-water treatment system to successfully meet Ground-Water Cleanup Standards due to the reduction of precipitation infiltration through the landfill waste.

b. Ground-Water Alternatives

Alternatives 1GW and 2GW do not provide adequate protection from ingestion of contaminated ground water over the long-term. In addition, Alternatives 1GW and 2GW do not maintain protection over the long term of the surface water and wetlands environment. Alternatives 3GW through 6GW

would provide adequate long-term effectiveness as each would continue to extract contaminated ground water until Ground-Water Cleanup Standards are met.

The FS projected that the ground-water extraction and treatment system under Alternative 5GW may attain the Ground-Water Cleanup Standards in the ground water within 5 years to 30 years. However, ground-water quality will be evaluated in increments of 5 years to determine if the remedial action objectives have been met. If, after the ground-water operable unit has been operating for a minimum of 5 years, it becomes apparent that it is not technically or economically feasible to achieve a preventive action limit (PAL), then a (Wisconsin) alternative concentration limit (WACL) may be established. (A WACL may be established for a compound prior to the 5-year review where the background concentration of that compound exceeds the PAL and/or ES for that compound.) Except where the background concentration of a compound exceeds the enforcement standard (ES), the WACL established may not exceed the ES for that compound (see section XII(b)(1)(B)(ii)).

If, during the implementation of the remedy, it becomes apparent that it is technically impracticable to achieve the Ground-Water Cleanup Standards, including any WACL established as discussed above, then the U.S. EPA, in consultation with the State, may then consider the use of alternate methods of controlling the ground-water contaminant plume or source to achieve the standards. If those alternate methods are found not to attain Ground-Water Cleanup Standards (including any WACL established), then a CERCLA waiver may be considered.

4. Reduction of Toxicity, Mobility, or Volume Through Treatment

This criterion evaluates treatment technology performance in the reduction of chemical toxicity, mobility, or volume.

a. Landfill Alternatives

Landfill operable unit alternatives do not contemplate treatment to reduce toxicity, mobility, or volume of wastes, since the landfill is a low-level, long-term threat to human health and the environment.

b. Ground-Water Alternatives

As detailed above, the stated programmatic goal of the U.S. EPA, as expressed in the NCP, is to select remedies that are protective over time and "minimize untreated waste" (Section 300.430(a)(1)(i). The NCP contemplates that the U.S. EPA will use "treatment to address the principal threats at a site, wherever practicable" (Section 300.430(a)(1)(iii)(A). Alternatives 3GW and 4GW, while providing treatment to address the ground water, do not address the contaminant mass in the soils adjacent to the southwest portion of the landfill.

Alternative 5GW is the only alternative that will result in the reduction in the toxicity, mobility, or volume of a contaminant through treatment. Bioremediation would destroy organic compounds in the naphtha-contaminated soils adjacent to the landfill. Treatment of the ground water only transfers contaminants to the atmosphere where they can be photo-oxidized. Soil roasting (Alternative 6GW) also emits chemicals to the atmosphere without destruction.

5. Short-Term Effectiveness

Short-term effectiveness considers the time to reach cleanup objectives, and the risks an alternative may pose to site workers, the community, and the environment during remedy implementation. This criterion also considers the reliability and effectiveness of any mitigative measures taken during remedy implementation to control those short-term risks.

a. Landfill Alternatives

Alternatives 3LF and 4LF provide the most significant short-term effects to the community during cap construction, due to the projected level of construction activity. Alternative 2LF would provide a less significant impact in comparison, due to the reduced level of cap reconstruction. Noise, dust, VOC-emission, and construction and vehicular accident rates may pose short-term threats to site workers and/or the community during cap construction. Capping is a standard engineering process and standard safety precautions would be undertaken to reduce the likelihood of accidents. Dust and VOC-emission controls would reduce short-term impacts to site workers and local residents. The use of erosion controls will mitigate any short-term effects posed by potential siltation problems to the Black River during cap construction.

b. Ground-Water Alternatives

Alternative 2GW may provide the greatest impact on the community due to the greatly increased truck traffic projected during construction of the cap and slurry wall. Alternative 5GW may temporarily expose the community to low levels of contaminants during implementation of the bioremediation component, in that the air injection blowers may cause VOCs to be exhausted to the atmosphere. Alternatives 3GW through 6GW would discharge contaminants to the atmosphere via aeration during the water treatment process. No alternative would be allowed to proceed if air emissions exceed State or Federal air quality standards. Emission controls may be added to the treatment system(s) to ensure that chemical emissions are at protective levels. Standard health and safety requirements would protect site workers and the community from short-term exposure to hazardous substances. The discharge of treated water to the Black River will be in accordance with WPDES discharge criteria, which are set at protective levels.

Alternatives 1GW and 2GW would discharge contaminants to the wetlands for over 30 years. Although no alternative is projected to meet Ground-Water

Cleanup Standards within 30 years, Alternatives 4GW through 6GW are projected to remove the majority (approximately 95 percent) of contaminants in 5 years. Alternative 3GW would take 15 years to remove the majority of the contaminants.

The estimated rate of ground-water extraction for Alternatives 3GW through 6GW would not be expected to adversely affect the Black River wetlands. Computer modelling of the ground-water regime indicates that, during low river flow conditions, the ground-water table may be expected to be lowered by 1.2 inches to 3.6 inches at most, with no drawdown expected during flood conditions. The natural water table fluctuation at the site is 4 feet, which is very high in relation to the projected drawdown due to ground-water extraction.

6. Implementability

This criterion considers the technical and administrative feasibility of implementing an alternative.

a. Landfill Alternatives

No significant implementation problems are projected for Alternatives 1LF through 4LF. Cap materials are expected to be obtainable from nearby sources and construction methods are rather straightforward.

b. Ground-Water Alternatives

Implementation of the slurry wall (Alternative 2GW) is dependent upon the compatibility of construction materials with the naphtha. Implementation of Alternative 6GW (asphalt incorporation) depends upon local demand for asphalt. Ground-water discharge after treatment would need to meet the substantive requirements of a WPDES permit (see Section XII(b)(3)(ii)).

Bioremediation, an innovative technology, is expected to be practicable in the vadose zone soil, but treatability testing would be needed to evaluate its effectiveness in the landfill portion. The NCP and CERCLA contain an expectation that innovative technologies be used at site cleanups when such technology offers the potential for comparable or superior treatment or implementability, less adverse impacts than other approaches, or lower costs for similar levels of performance for demonstrated technologies. At this site, in situ bioremediation offers a low-cost, comparable treatment alternative which provides less adverse impacts in comparison to excavation and incineration of the soils.

Institutional controls are considered to be effective over the short-term, but not over the long-term. The ground-water institutional controls to prevent the installation of drinking-water wells within 1200 feet of a landfill are not enforceable by the State.

7. Cost

Table 4 compares the capital, Operation and Maintenance, and present worth costs of implementing the various alternatives at the site.

Table 4

Estimated Costs of Remedial Action
Onalaska Municipal Landfill

Alternative	Capital	O&M	Present Worth
1LF (No Action)	$ 0	$ 1,000	$ 16,000
2LF (Upgrade Cap)	$ 390,000	$ 3,200	$ 440,000
3LF (Multilayer)	$1,500,000	$ 14,000	$1,700,000
4LF (Multilayer)	$2,300,000	$ 23,000	$2,600,000
1GW (No Action)	$ 100,000	$ 63,000	$1,100,000
2GW (Slurry Wall)	$3,900,000	$ 80,000	$5,100,000
3GW (Perimeter)	$ 520,000	$ 80,000	$1,700,000
4GW (On-Site)	$1,800,000	$150,000	$4,200,000
5GW (Bioremediate)	$3,600,000	$150,000	$6,000,000
5GW*(Landfill)	$3,900,000	$150,000	$6,300,000
6GW (Thermal)	$3,700,000	$150,000	$6,100,000

Note: O&M = Operation and Maintenance
5GW* = Bioremediation in Landfill

C. Modifying Criteria

8. State Acceptance

The State of Wisconsin is in agreement with the U.S. EPA's analyses and recommendations presented in the RI/FS and the Proposed Plan. The State concurs with the selected alternative (presented in Section XI, below).

9. Community Acceptance

Community reaction to the Proposed Plan is mixed. Since the Town is a potentially responsible party, most of the dissenting commentors regard cost as a higher priority than actual or potential protection of human health or the environment. Generally, those who think that some form of remedial action should be implemented believe that either lesser alternatives (e.g., 3GW rather than 5GW) should be implemented or that

the proposed plan be implemented solely under the sponsorship of the WDNR and the U.S. EPA. These concerns are addressed in the Responsiveness Summary (Section XIII).

XI. SELECTED REMEDY

As provided in CERCLA and the NCP, and based upon the evaluation of the RI/FS and the nine criteria, the U.S. EPA has selected Alternatives 3LF and 5GW as the method providing overall effectiveness proportional to its costs to adequately protect human health and the environment against exposures at the site.

Under Alternative 3LF, the cap shall be placed on the landfill (see Figure 4) in compliance with the current requirements of section NR 504.07, WAC for closure of solid waste disposal facilities. The cap shall consist of a grading layer, a minimum 2-foot clay layer (compacted to a permeability of 1 x 10^{-7} cm/s or less), a gravel drainage layer, a

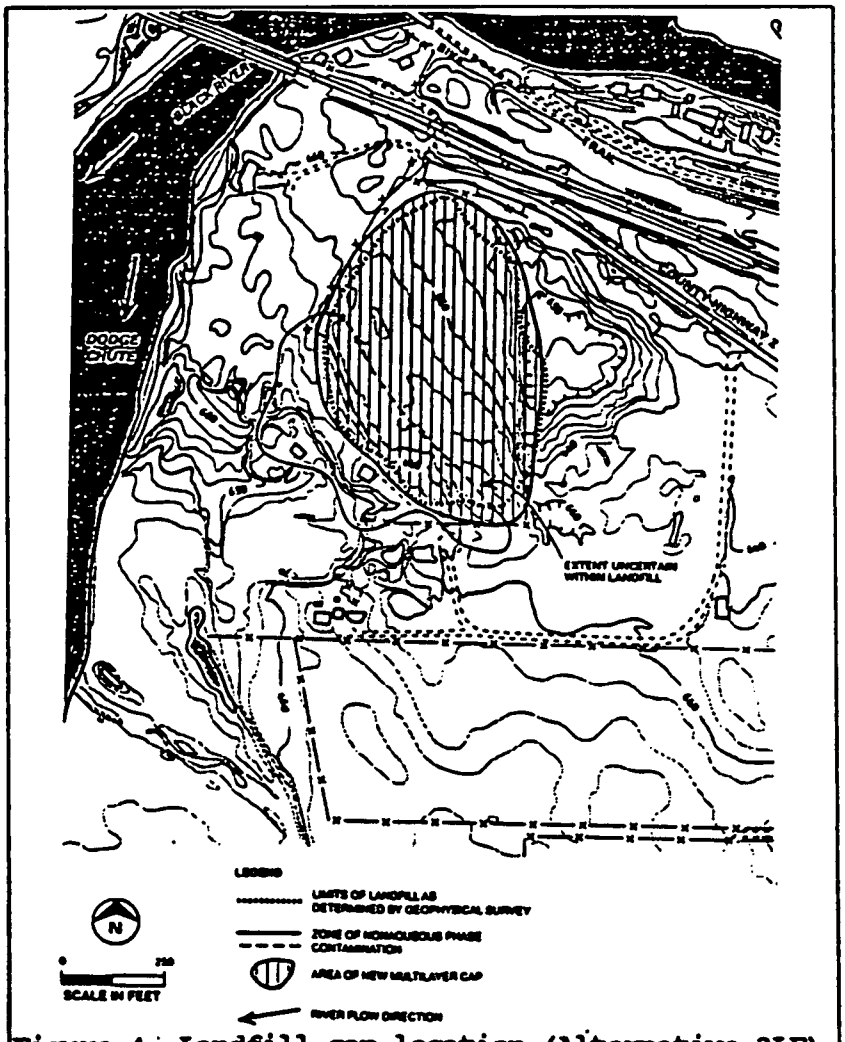

Figure 4. Landfill cap location (Alternative 3LF).

frost protective soil layer, and a minimum 6-inch topsoil layer. A passive, methane gas venting system shall be constructed within the cap as well (see Figure 5). It is projected that the cap would be constructed after the bioremediation component of the remedy has been completed, unless bioremediation within the southwestern portion of the landfill is impracticable. If so, the cap may be installed concurrently with bioremediation.

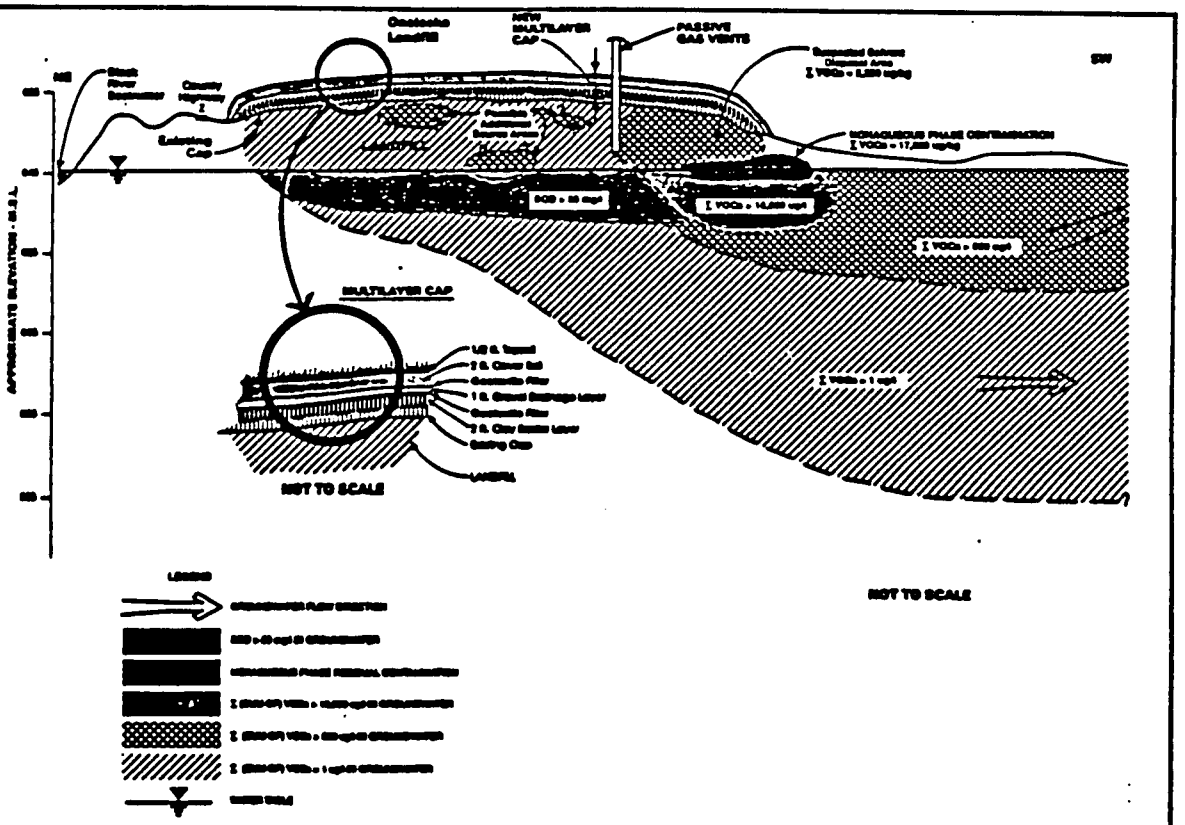

Figure 5. Multilayer cap schematic, NE to SW cross section.

Under Alternative 5GW, ground water shall be extracted (see Figure 6 for locations of extraction wells) until (1) Federal Maximum Contaminant Levels (MCLs) or non-zero Maximum Contaminant Level Goals (MCLGs), promulgated under the Safe Drinking Water Act are met in the ground-water contaminant plume at the landfill waste boundary and (2) the more stringent State standards promulgated in Ch. NR 140, WAC, are met at any point beyond the property boundary or beyond the 3-dimensional design management zone, whichever is closer to the waste boundary.

The extracted ground water shall be treated on-site and discharged to the Black River in compliance with the substantive requirements of a WPDES permit.

It is projected that the ground-water extraction and treatment system may attain the Ground-Water Cleanup Standards in the ground water within 5 years to 30 years. However, ground-water quality will be evaluated in

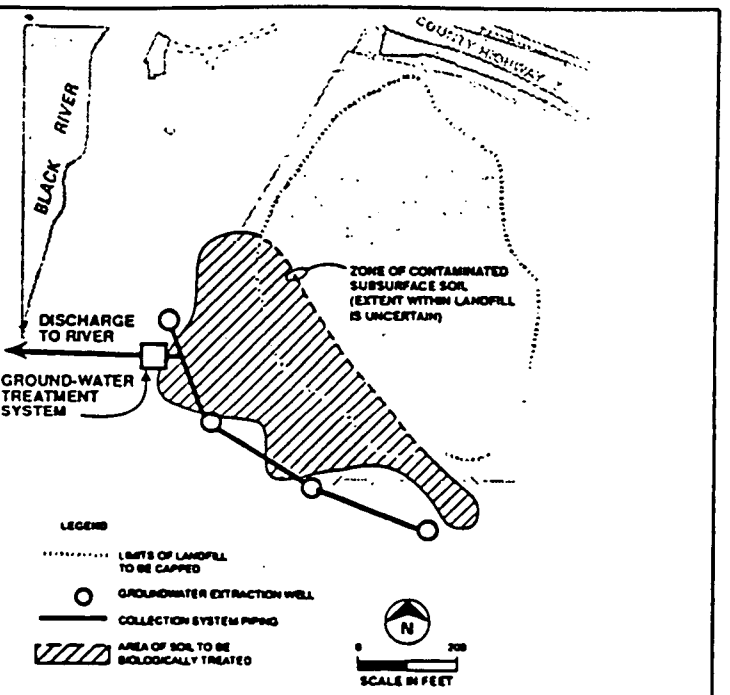

Figure 6. Ground water extraction and treatment system location, area of subsurface soil and landfill debris to be bioremediated.

increments of 5 years to determine if the remedial action objectives have been met. If, after the ground-water operable unit has been operating for a minimum of 5 years, it becomes apparent that it is not technically or economically feasible to achieve a preventive action limit (PAL), then a (Wisconsin) alternative concentration limit (WACL) may be established. (A WACL may be established for a compound prior to the 5-year review where the background concentration of that compound exceeds the PAL and/or enforcement standard (ES) for that compound.) Except where the background concentration of a compound exceeds the ES, the WACL established may not exceed the ES for that compound (see section XII(b)(1)(B)(ii)).

If, during the implementation of the remedy, it becomes apparent that it is technically impracticable to achieve the Ground-Water Cleanup Standards, including any WACL established as discussed above, then the U.S. EPA, in consultation with the State, may then consider the use of alternate methods of controlling the ground-water contaminant plume or source to achieve the standards. If those alternate methods are found not to attain Ground-Water Cleanup Standards (including any WACL established), then a CERCLA waiver may be considered.

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 $.2 \times 10^{-4}$, 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 residual potential carcinogenic risk due to ground-water ingestion is estimated to be approximately 1×10^{-6} (excluding the naturally occurring arsenic levels), and the cumulative Hazard Index is estimated to be less than 1.0.

Bioremediation, an innovative technology, shall be implemented in the naphtha-contaminated soils (and in the southwestern portion of the landfill, if viable) for a minimum of two 200-day treatment seasons until the Cleanup Standard is met (see Figure 6). Currently, the estimated Cleanup Goal is 80-95 percent reduction of the organic contaminant mass in the soils. The treatability study shall determine the maximum degradation rate expected for the technology and the pilot-scale test shall determine the Cleanup Standard which shall be met by this technology. CERCLA and the NCP both favor the use of innovative technologies if they are potentially able to provide for comparable risk reduction, at a lower cost, and at less adverse impact than proven technologies in treating the wastes. Accordingly, bioremediation is favored over thermal roasting (Alternative 6GW) due to the potential benefits of bioremediation (no excavation needed, permanent destruction of waste) versus roasting or asphalt incorporation (excavation with air emissions, transportation of wastes, no permanent destruction).

The cap is being implemented in conjunction with the ground-water remedy. A main purpose of the cap is to reduce the rate of precipitation infiltration through the landfilled-wastes towards the ground water, reducing the amount of contaminants leaching from the landfill. The ground-water remedy will address the both the present ground water and soil contamination, plus any future contamination estimated to emanate from the landfill.

Institutional controls would be relied upon to provide additional effectiveness to the remedy. Chapter NR 506, WAC regulates the development of landfills. Chapter NR 112, WAC helps to prevent the ingestion of contaminated ground water in the proximity of landfills.

XII. Statutory Determinations

The selected remedy must satisfy the requirements of Section 121(a-e) of CERCLA to:

a. Protect human health and the environment;
b. Comply with ARARs;
c. Be cost-effective;
d. Utilize permanent solutions and alternate treatment technologies to the maximum extent practicable; and,

e. Satisfy a preference for treatment as a principle element of the remedy.

The implementation of Alternatives 3LF and 5GW at the Onalaska site satisfies the requirements of CERCLA as detailed below:

a. Protection of Human Health and the Environment

Implementation of the selected alternatives will reduce and control potential risks to human health posed by exposure to contaminated ground water. Extraction and treatment of contaminated ground water to meet Ground-Water Cleanup Standards will reduce the potential excess cancer risk to approximately 1×10^{-6} and reduce the Hazard Index to less than 1.0. Institutional controls will provide short-term effectiveness for the prevention of drinking contaminated ground water until Ground-Water Cleanup Standards are met. The selected remedy also protects the environment by reducing the potential risks posed by site chemicals discharging to surface water (the Black River) and the wetlands.

Capping the landfill, in addition to reducing the any potential further risk posed by exposure to landfill contaminants, will reduce precipitation infiltration through the cap by an estimated 80 percent, and maintain that rate of reduction over time. Ground-water contaminant loading will thus be reduced. Bioremediation of the naphtha-contaminated soils will also reduce ground-water contaminant loading.

No unacceptable short-term risks will be caused by implementation of the remedy. The community, and site workers, may be exposed to noise and dust nuisances during construction of the cap. Vehicular accident occurrences may rise due to the projected increase in volume of truck traffic in hauling capping materials to the landfill. Bioremediation and air stripping should not present short-term risks due to VOC air emissions if not properly designed and monitored. Standard safety programs should manage any short-term risks. Dust control measures and VOC-emission controls would mitigate those risks as well.

The permanent solutions to the principal threats to human health and the environment at the site outweigh the minimal short-term impacts of the remedial components. The risks due to ingestion of contaminated ground water would be reduced to acceptable levels once the principal threats have been addressed. Once the cap is installed there would be no need to replace or upgrade it as Alternative 2LF would likely require.

b. Compliance With ARARs

The selected remedy will comply with the Federal and/or State, where more stringent, applicable or relevant and appropriate requirements (ARARs) listed below:

1. Chemical-specific ARARs

Chemical-specific ARARs regulate the release to the environment of

specific substances having certain chemical characteristics. Chemical-specific ARARs typically determine the extent of cleanup at a site.

A. Soils/Sediments

No chemical-specific standards exist for soils and sediments. However, the State may calculate organic contaminant concentrations for soils based on surface water quality criteria (under Ch. NR 105, WAC) to ensure protectiveness of the environment. The results of the calculations would yield chemical-specific cleanup goals for the soils and sediments that are factors "to be considered" in designing a protective remedy at this site.

B. Ground Water

i. Federal ARARs

Maximum Contaminant Levels (MCLs), and to a certain extent, Maximum Contaminant Level Goals (MCLGs), the Federal drinking water standards promulgated under the Safe Drinking Water Act (SDWA), are applicable to municipal water supplies servicing 25 or more people. At the Onalaska site, MCLs and MCLGs are not applicable, but are relevant and appropriate, since the sand and gravel aquifer is a Class IIA source which could potentially be used for drinking (see Table 3A) in the area of concern (the contaminant plume). MCLGs are relevant and appropriate when the standard is set at a level greater than zero (for non-carcinogens), otherwise, MCLs are relevant and appropriate. The point of compliance for Federal drinking water standards is at the boundary of the landfilled-wastes.

ii. State ARARs

The State of Wisconsin is authorized to administer the implementation of the Federal SDWA. The State has also promulgated ground-water quality standards in Ch. NR 140, WAC, which the WDNR is consistently applying to all facilities, practices, and activities which are regulated by the WDNR and which may affect ground-water quality in the State. Chapter 160, Wis. Stats., directs the WDNR to take action to prevent the continuing release of contaminants at levels exceeding standards at the point of standards application. Ground-water quality standards established pursuant to Ch. NR 140, WAC, may be preventive action limits (PALs), enforcement standards (ESs), and/or (Wisconsin) alternative concentration limits (WACLs). Preventive action limits (PALs) and enforcement standards (ESs) contained in section NR 140.10, WAC, for the Chemicals of Concern are listed in Table 3A. PALs (and ESs) are generally more stringent than corresponding Federal standards and, therefore, are relevant and appropriate to the Onalaska site.

Consistent with the exemption criteria of section NR 140.28, WAC, a (Wisconsin) alternative concentration limit (WACL) may be established to modify the preventive action limit (PAL) if it is determined that it is

not technically and economically** feasible to achieve the PAL for a specific substance. Except where the background concentration of a compound exceeds the enforcement standard (ES) and consistent with the criteria in section NR 140.28(4)(B), the WACL that is established may not exceed the ES for that compound.

The point of standards application for PALs and ESs (or WACLs) consistent with section NR 140.22, WAC, is any point beyond the property boundary or any point beyond the design management zone, whichever is closer to the waste boundary, or any point of present ground water use.

The implementation of the selected remedy at the Onalaska site will be in compliance with Ch. NR 140, WAC, in that preventive action limits (PALs) will be met unless (Wisconsin) alternative concentration limits (WACLs) are established pursuant to the criteria in section NR 140.28, WAC, in which case the WACLs will be met.

C. Surface Water

i. Federal ARARs

Surface water quality standards for human health and aquatic life protection were developed under the Clean Water Act (CWA) Section 304. The Federal Ambient Water Quality Criteria (AWQC) are non-enforceable guidelines that set pollutant concentration limits to protect surface waters that are applicable to point source discharges, such as from industrial or municipal wastewater streams. At a Superfund site, the Federal AQWC would not be applicable except for pretreatment requirements for discharge of treated water to a Publicly Operated Treatment Works (POTW). CERCLA (Section 121(d)(1)) requires the U.S. EPA to consider whether AWQC would be relevant and appropriate under the circumstances of a release or threatened release, depending on the designated or potential use of ground water or surface water, the environmental media affected by the releases or potential releases, and upon the latest information available. Since the aquifer is a current (upgradient of the landfill) and potential (downgradient of the landfill) source of drinking water, and treated water will be discharged to the Black River, AQWC adopted for drinking water and AWQC for protection of freshwater aquatic organisms are relevant and appropriate to the point source discharge of the treated water into the Black River.

**A determination of technical or economic infeasibility may be made after five years of operation of the ground water extraction system if it becomes apparent that the contaminant level has ceased to decline over time and is remaining constant at a statistically significant level above the PAL (or any WACL established due to high background concentrations) in a discrete portion of the area of attainment, as verified by multiple monitor wells.

ii. State ARARs

Section 303 of the CWA requires the State to promulgate state water quality standards for surface water bodies, based on the designated uses of the surface water bodies. CERCLA remedial actions involving surface water bodies must ensure that applicable or relevant and appropriate state water quality standards are met. The State has promulgatedWisconsin Water Quality Criteria (WWQC) under Ch. NR 105, WAC, based on the Federal AWQC developed by U.S. EPA. The Black River is designated as a warm water sport fish community under Ch. NR 105, WAC. The warm water sport fish WWQC are therefore applicable to the maintenance of surface water quality impacted by the discharge of treated ground water from the site.

In addition, Ch. NR 102, WAC establishes an antidegradation policy for all waters of the State and it establishes water quality standards for use classifications. Chapter NR 102, WAC would be applicable to actions that involve discharges to the Black River in that discharges must meet water quality standards.

2. Location-specific ARARs

Location-specific ARARs are those requirements that relate to the geographical position of a site. These include:

i. Federal ARARs

Both RCRA (40 CFR 264.18(b) - hazardous waste storage - flood plain) and Executive Order 11988 - Protection of Flood Plains, are applicable to the site due to its location within the mapped 100-year flood plain (648.5 feet above mean sea level) of the Black River. These regulations would require that the ground-water treatment system be located above this elevation and be protected from erosional damage.

Executive Order 11990 - Protection of Wetlands is an applicable requirement to protect against the loss or degradation of wetlands. As presented above, ground-water modelling has shown that the estimated extraction rate for Alternative 5GW will not be expected to have an adverse effect on the Black River wetlands.

The Scenic Rivers Act (16 USC 1271, Section 7(a)) is applicable to the site. Since the Black River is designated for recreational use, this provision requires that the selected remedy should avoid taking or assisting in any action that will have an adverse effect on the scenic river.

ii. State ARARs

Chapter NR 112, WAC, which requires that no drinking water wells be located within 1200 feet of a landfill, unless a variance is obtained from the WDNR, is applicable to the site. Chapters NR 506 and NR 540, WAC, which regulate the development of landfills also are applicable to

this site.

Chapter NR 27, WAC, the State Endangered and Threatened Species Act, and Ch. NR 29, WAC, the State Fish and Game Act, are State endangered resource laws which protect against the "taking" or harming of endangered or threatened wildlife resources in the area. These would be applicable to the remedial action, in that the poisoning of endangered or threatened species by site contaminants could be considered by the WDNR to be a "taking."

3. Action-specific ARARs

Action-specific ARARs are requirements that define acceptable treatment and disposal procedures for hazardous substances.

i. Federal ARARs

Since the Onalaska Landfill was closed prior to November 1980 (in September 1980), RCRA requirements are not applicable unless RCRA-listed or characteristic hazardous wastes are excavated and managed (treated, disposed, or stored), as defined by RCRA, during the cleanup. In its pure form, waste naphtha is a characteristic waste (ignitibility) and therefore certain RCRA Subtitle C requirements would be relevant and appropriate if the naphtha waste was excavated and managed. In its present form (mixed with soil and debris), the waste naphtha would not be expected to exhibit this characteristic. RCRA Land Disposal Restrictions ("LDR" or "Land Ban") would, therefore, not be applicable since no "placement" would be occurring at this site. Although LDR would be relevant, they would not be appropriate since the waste does not currently exhibit the characteristic of ignitibility.

The only manner in which the selected remedy may store or dispose of hazardous waste is when, or if, the ground-water treatment system requires emission control units to capture or contain volatile organics derived from aeration of the contaminated ground water. The RCRA waste generation and temporary storage regulations under 40 CFR Part 262 would then be applicable to that action. For example, activated carbon canisters utilized as emission controls would be managed, when spent, as a listed (F005) waste.

For landfill closure, RCRA Subtitle C requirements are not applicable since the hazardous wastes of concern were disposed of prior to November 1980, but would be relevant and appropriate as considered by the NCP (Section 300.400(g)(2). At the Onalaska site, the hazardous substances in the landfill are sufficiently similar to listed and/or characteristic RCRA wastes and therefore Subtitle C is relevant. A Subtitle C cover is well suited to the site since this type of cap would aid in the reduction of precipitation infiltration through the landfill contents, which would be protective of the ground water. Thus, a Subtitle C cover is appropriate.

The landfill closure requirements are listed in 40 CFR 264.310(a)(1-5). In part, (40 CFR) 264.310(a)(1) requires the final cover must be designed and constructed to minimize the migration of liquids through the landfill. Also, 264.310(a)(5) requires that the cover must have a permeability less than or equal to the permeability of any bottom liner system or natural subsoils present. However, in satisfying 264.310(a)(5), a cover as required by the regulations might not be sufficiently impermeable to minimize the migration of liquids as required in 264.310(a)(1). Therefore, the policy of the Office of RCRA is to follow, whenever possible, the design standards in Final Covers on Hazardous Waste Landfills and Surface Impoundments, EPA/530-SW-89-047, July 1989, a RCRA technical guidance document for the design of landfill caps. A flexible membrane liner (FML) is an integral component of such a RCRA Subtitle C cap. However, this guidance is not an ARAR; rather a factor "to be considered" in designing a protective remedy.

The cap proposed for the Onalaska site consists of a grading layer, a minimum 2-foot compacted clay layer, a gravel drainage layer, a frost protective soil layer, and a minimum 6-inch topsoil layer. These components satisfy the requirements of RCRA Subtitle C and also section NR 504.07, WAC (see below). In designing the Onalaska cap, the Hydrologic Evaluation of Landfill Performance (HELP) model was run to determine the estimated reduction of precipitation infiltration through the landfill. The estimated reduction of water infiltration with the Alternative 3LF (section NR 504.07, WAC) cap is 80 percent; the RCRA Subtitle C guidance cap is estimated to show a 99.9 percent reduction of infiltration. Each cap design, therefore, satisfies 264.310(a)(1). Since the landfill waste is periodically in contact with the ground water at the site, and, since ground water is to be extracted from an area adjacent to the landfill and treated, the U.S. EPA has determined that it is not technically advantageous and, therefore, not appropriate to install a FML at this site.

Additional Federal action-specific ARARs are found in the FS.

ii. State ARARs

The State of Wisconsin is authorized to implement the requirements of RCRA. Chapter NR 504, WAC is applicable to the closure of (currently) permitted solid waste landfills in the State. Since the Ch. NR 504, WAC closure requirements are sufficiently similar to the requirements for closure of current landfills in the State, Ch. NR 504, WAC requirements are relevant for the Onalaska site. Chapter NR 504, WAC requirements are well-suited for the Onalaska site due to the reduction of precipitation infiltration and the long-term effectiveness offered by the frost protection layer. Thus, Ch. NR 504, WAC, the current solid waste landfill closure requirements, are also appropriate for this site. Section NR 504.07, WAC calls for the landfill cover to be composed of a grading layer, a minimum 2-foot clay layer with a permeability of 1×10^{-7} cm/s, a frost-protective soil layer, and a minimum 6-inch topsoil layer.

In addition to the cap design requirements of Ch. NR 504, WAC, the State is authorized to implement the National Pollutant Discharge Elimination System (NPDES) program. For discharge of treated water, the applicable or relevant and appropriate requirements are dependent on the point of discharge. The substantive requirements of a Wisconsin Pollutant Discharge Elimination System (WPDES) permit, under Ch. NR 220, WAC, would be applied to the discharge of the treated water into the Black River, since the discharge point is considered to be on-site. Subject to the approval of the U.S. EPA, effluent limits for surface water discharge will be established by the WDNR. Ch. NR 220, WAC requires that the effluent limits be based on the application of best available treatment technology (BAT) prior to discharge.

Chapter 147, Wisconsin Statutes, is also applicable to treated water to be discharged to the Black River. These regulations state that no discharge shall contain quantities of listed pollutants greater than that would remain after subjecting the water to best available technology economically achievable (BATEA).

Chapter NR 445, WAC regulates air emissions from treatment technologies and is applicable to point source emissions from industrial facilities. Since air strippers may emit hazardous substances in the form of VOCs, section NR 445.04, WAC is relevant and appropriate for the remedy. The need for emission control technology shall be evaluated based on requirements of Ch. NR 445, WAC. If air stripper emissions are projected to exceed standards at the landfill property boundary, the point of compliance, then vapor control technology such as vapor phase activated carbon will be included in the treatment system to bring air emissions into compliance.

Chapter NR 102, WAC, may also be considered an action-specific ARAR (see discussion above). Additional State action-specific ARARs are found in the FS.

c. Cost-effectiveness

Cost-effectiveness compares the effectiveness of an alternative in proportion to its cost of providing its environmental benefits. Table 4 lists the costs associated with the implementation of the remedies.

1. Landfill Alternatives

Alternative 1LF is the least expensive alternative, but it does not provide adequate protection or effectiveness over the long-term and it also does not meet State landfill closure requirements. Alternatives 3LF and 4LF are initially more expensive than Alternative 2LF, due to the cap design, but they provide better precipitation infiltration reduction rates than Alternative 2LF, and they meet current landfill closure requirements. Alternative 2LF would provide some reduction of precipitation infiltration over the short-term, but it would be subjected to the same damage already experienced by the present cap and, thus,

costly repairs are more likely. Additionally, Alternative 2LF does not meet current landfill closure requirements.

2. Ground-Water Alternatives

Alternative 1GW is the least expensive of the ground-water remedies, but it does not provide adequate protection of human health and the environment. Alternative 2GW provides only containment of the landfill and contaminated soils at nearly the same cost as the permanent treatment provided by bioremediation in Alternative 5GW. Alternative 3GW provides relatively inexpensive ground-water extraction and treatment, but over a long period of time. Alternatives 4GW through 6GW provide more expensive ground-water treatment than Alternative 3GW, but operating times may be much shorter than in Alternative 3GW and are therefore more cost-effective.

Thus, the selected remedy is the most cost-effective remedy, in that the permanent treatment offered by Alternative 5GW (bioremediation), along with ground-water treatment, costs nearly the same as the containment option offered by Alternative 2GW. Since permanent treatment of the naphtha-contaminated soils is being implemented under Alternative 5GW, Alternative 3LF is the only cost-effective option that complies with Federal and State landfill-closure ARARs. The extra cap area afforded by Alternative 4LF is not needed since the naphtha-contaminants will be addressed by bioremediation.

Implementation of Alternative 5GW would be cost-effective, in comparison to implementation of Alternative 4GW, since Alternative 5GW attacks both principal threats at the site (the ground-water contaminant plume and a main source of contamination, the naphtha-contaminated soils). Alternative 4GW only addresses the ground water, consequently, it would be expected to take much longer to reach Ground-Water Cleanup Standards than Alternative 5GW. And, the less expensive "passive" aeration treatment method may be employed much sooner during implementation of the ground-water component of Alternative 5GW than in Alternative 4GW.

Implementation of Alternatives 3GW and 4LF, instead of Alternatives 5GW and 3LF, while being less expensive in terms of present worth, does not provide for the statutory preference of treatment as a principal element nor the same level of protection of human health and the environment as Alternatives 5GW and 3LF. Alternatives 5GW and 3LF would restore the beneficial uses of the aquifer much sooner than Alternatives 3GW and 4LF. Thus, the implementation of Alternatives 3GW and 4LF would not be cost effective.

d. Utilization of Permanent Solutions and Alternative Treatment Technologies or Resource Recovery Technologies to the Maximum Extent Practicable

The selected remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable ("MEP"). This finding was made after evaluation of the protective and ARAR-compliant

alternatives for the Onalaska site remedial action and comparison of the "trade-offs" (advantages vs. disadvantages) among the remedial alternatives with respect to the five balancing criteria (see above).

Once the threshold criteria of protection of human health and the environment and ARARs-compliance were satisfied, the key criteria used in remedy selection for the Onalaska site were long-term effectiveness; reduction of toxicity, mobility, and volume ("TMV") through treatment; short-term effectiveness; and cost). The priority given to long-term effectiveness and to reduction of TMV at the site is consistent with U.S. EPA policy established in the NCP. This policy states that long-term effectiveness and reduction of TMV through treatment are generally the key decision factors to be considered at Superfund sites.

The selected remedy's long-term effectiveness and its ability to reduce the TMV of hazardous substances was weighed against its short-term effectiveness aspects in relation to the remaining alternatives. In general, the selected remedy does involve a small degree of risk to site workers and to the community in that there would be movement and treatment of hazardous substances during implementation in order to minimize the long-term effects those substances would have on human health and the environment.

There may be minimal risks associated with the hauling of materials for cap construction. Any risks posed by such action will be mitigated by attempting to secure local materials to construct the cap and to employ standard dust control measures during construction. With respect to VOC-emissions during treatment of the ground water and soils, effective air monitoring would ensure that air standards established to protect human health and the environment are met. Emission controls may be utilized, if necessary, to meet those standards. Short-term risks due to the discharge of treated ground water to the Black River would be minimized by ensuring that the treated water meets discharge criteria, which are established to protect human health and the environment as well.

1. Landfill Alternatives

The FS report indicates that it is not practicable to utilize a permanent treatment technology on the low-level, long-term threat posed by the landfill contents. Although a cap is not a permanent solution to the low-level threat, it does provide adequate protection from exposure to the wastes. More importantly it provides adequate protection to the ground water by using a barrier to precipitation infiltration through the landfill, which reduces the rate of contaminant loading into the ground water.

The State has concurred with the selection of Alternative 3LF as the preferred containment remedy for the landfill operable unit.

2. Ground-Water Alternatives

Alternative 5GW provides a greater degree of long-term effectiveness and

permanence than the other ground-water alternatives considered for the site. Ground-water extraction and treatment and bioremediation will utilize treatment to permanently address the principal threats posed by the ground-water contaminant plume and the organic wastes in the contaminated soils. By conducting bioremediation on the naphtha-contaminated soils, a major ground-water contaminant source will be significantly reduced. It is estimated that bioremediation treatment will destroy an estimated 80-95 percent of the organic contaminants in the soils, thus reducing the amount of contaminant loading to the ground water and to surface water and the wetlands. The long-term goal of the ground-water treatment system will be to reduce the levels of contaminants in the ground water to meet Ground-Water Cleanup Standards. The short-term goal of the treatment system is to control the source of contamination in order to mitigate the actual or potential impacts of the ground-water contaminants on the surface waters and wetlands.

The remaining ground-water alternatives either do not permanently address the principal threats or do provide the same relative performance as Alternative 5GW (Alternative 6GW) but without reduction of TMV through treatment:

-Alternative 1GW does not provide adequate protection to human health and the environment, as considered by the NCP. Alternative 1GW does not treat the principal threats.

-Alternative 2GW does not treat the principal threats. It merely contains the contaminated soils and allows the ground-water contaminant plume to naturally attenuate, for the same cost as the treatment options offered by Alternative 5GW or 6GW.

-Alternatives 3GW and 4GW address only the ground-water contaminant plume without permanently addressing or treating the principal threat posed by the naphtha-contaminated soils. Thus, rising ground-water levels and precipitation infiltration through the soils would continue to leach contaminants into the ground water.

-Alternative 6GW addresses the principal threats to the same degree as Alternative 5GW, but the treatment does not destroy the organic wastes in the soils, it merely transfers them to the atmosphere. Excavation and transportation of the contaminated soils may also present unacceptable short-term effects to site workers and/or the community.

The State has concurred with selection of Alternative 5GW as the preferred ground-water operable unit alternative.

3. Summary

The combination of treatment and engineering and institutional controls will minimize the residual threats remaining on-site as well as minimize the reliance on long-term controls (such as capping) to achieve protectiveness. Negative short-term impacts during implementation of the

remedy will be minimized by health and safety measures. The State has concurred with the selection of the preferred remedy. Community acceptance is addressed in the responsiveness summary.

e. Preference for Treatment as a Principal Element

The principal threats at the Onalaska site are the ground-water contaminant plume, due to the potential use of the contaminated water as a drinking water source, and the naphtha-contaminated soils, since the naphtha-contaminants are highly concentrated and mobile wastes which cannot be reliably contained. Alternative 5GW is the only alternative to satisfy the statutory preference for treatment as a principal element of the remedy - through bioremediation of the ground-water contaminant source (permanent treatment) and through extraction (and treatment) of the ground-water contaminant plume to achieve Ground-Water Cleanup Standards. Since the landfill does not appear to contain "hot spots", satisfaction of the preference for treatment as a principal element of the landfill portion of the remedy is not applicable.

XIII. Responsiveness Summary

This Responsiveness Summary has been prepared to meet the requirements of Sections 113(k)(2)(B)(iv) and 117(b) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986 (CERCLA), which requires the United States Environmental Protection Agency (U.S. EPA) to respond "...to each of the significant comments, criticisms, and new data submitted in written or oral presentations" on a proposed plan for remedial action. The Responsiveness Summary addresses concerns expressed by the public, potentially responsible parties (PRPs), and governmental bodies in the written and oral comments received by the U.S. EPA and the State regarding the proposed remedy for the Onalaska site.

A. Overview

1. Background/Proposed Plan

The Onalaska site is located in the Township of Onalaska ("Town"), approximately 10 miles north of the City of LaCrosse, Wisconsin. The 11-acre site, which includes the 7-acre landfill, 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 Remedial Investigation (RI) identified several areas of concern at the site: two principal threats[1] which are the ground water contaminant plume and the naphtha-contaminated soils, a major contaminant source, and the landfill which is considered to be a low-level, long-term threat[2] to human health and the environment. The Feasibility Study (FS) evaluated ten cleanup alternatives in order to address the areas of concern. The proposed plan for remedial action included:

-Extraction and treatment of the ground water contaminant plume, with discharge of the treated water to the adjacent Black River in accordance with the substantive requirements of the Wisconsin Pollutant Discharge Elimination System (WPDES) program;

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[1]Principal threats are characterized by waste that cannot be reliably controlled in place, such as liquids, highly mobile materials (e.g., solvents), and high concentrations of toxic compounds (e.g., several orders of magnitude above levels that allow for unrestricted use and unlimited exposure) (55 Fed. Reg. 8703).

[2]The site contains large volumes of low concentrations of material (55 Fed. Reg. 8703).

-Reconstruction of the landfill cap to meet current State landfill closure requirements (under Chapter NR 504, Wisconsin Administrative Code (WAC)); and,

-Bioremediation of the naphtha-contaminated soils adjacent to the landfill.

Continued reliance on institutional controls (e.g., deed restrictions and State regulations), in conjunction with engineering controls (e.g., fencing), would aid in the prevention of the ingestion of contaminated ground water and the contact with landfill contents.

2. Public Comment Period

A public comment period was held from March 5, 1990 to May 4, 1990 to allow interested parties to comment on the Proposed Plan, in accordance with Section 117 of CERCLA. On March 19, 1990 a public hearing was held in Holmen, Wisconsin, at which the U.S. EPA and the Wisconsin Department of Natural Resources (WDNR) presented the Proposed Plan, answered questions, and accepted comments from the public. During the comment period, the U.S. EPA received approximately 35 written and several verbal comments concerning the Proposed Plan.

B. Community Involvement

Public interest regarding the site has intensified since March 5, 1990, when local officials and residents learned of the scope of the preferred remedy. Several key areas of community concern are as follows:

ISSUE #1: While most local officials and residents believe that the ground-water aquifer in the proximity of the landfill is contaminated, they do not believe that a current health risk exists, since no one is drinking the contaminated water at this time. Many residents have expressed the belief that institutional controls alone would be adequate to protect human health at this site.

ISSUE #2: Based on ground-water monitoring results, the ground water contaminant plume is apparently discharging into the wetlands adjacent to the Black River, which flows along the western and northern edges of the site. Currently, no levels of organic contaminants have been measured in the wetlands and the Black River. Many local residents and officials believe that ground-water monitoring is sufficient to maintain adequate protectiveness.

ISSUE #3: The projected cost of the remedial action is seen to be too high in light of the perceived low risks the site may currently pose. The Town is a PRP (owner-operator) and does not maintain a sufficient tax base to fund the cleanup.

ISSUE #4: Local officials are concerned about the effect the cost of the

proposed cleanup of the Onalaska site might have on the economic well-being of both the Town and several local businesses which were identified as PRPs. Specifically, the concerns are that the Town tax base is shrinking partially due to recent annexations by adjacent municipalities. The cost of the cleanup may be too great to be borne by the affected businesses, which could impact local employment opportunities in the area.

Based on discussions with local officials and residents during the public hearing on March 19, 1990, questions regarding Issues #1 and #3 seemed to receive the greatest emphasis, followed by Issue #4 and then Issue #2. In addition, there is a concern regarding the Town's role as a PRP, which stems from its owner/operator status of the landfill. (The Town owns the landfill and operated it from 1969 until 1980 when the State determined that use of the landfill should be discontinued.) The landfill was operated in accordance with a license granted by the WDNR, and the Town feels that the WDNR should be liable for the cleanup, rather than its citizens.

The above concerns have been addressed in the following section:

C. Summary of Significant Comments

The public comments regarding the Onalaska site are organized into the following categories:

1. Summary of comments from the local community, including comments concerning the FS and Proposed Plan, and comments that address the Superfund program in general;

2. Summary of comments from PRPs; and,

3. Summary of comments from governmental bodies, including a U.S. Congressman, a State Senator, the LaCrosse County Health Department, the LaCrosse County Board, and the U.S. Fish and Wildlife Service.

Many of the comments below have been paraphrased in order to effectively summarize them in this document. The reader is referred to the public meeting transcript and written comments which are available at the two public information repositories at the public libraries in Holmen and the City of Onalaska.

1. Local Community

a. Comments favoring the proposed plan

Two local residents submitted written comments in support of the cleanup alternatives preferred by the U.S. EPA and the WDNR. One indicated that the cleanup alternatives "are necessary so our clean water or wetlands

do not get contaminated" and the other expressed a concern for the potentially harmful effects that bioaccumulation may pose to wildlife and humans. Both commenters felt that the Superfund and the WDNR, rather than residents of the Town, should have to pay for the cleanup.

Response

The support for the proposed plan is acknowledged. However, it should also be noted that Congress (CERCLA, Section 107(a)) has determined that those entities who owned and/or operated a Superfund site, as in the case of the Town, are potentially liable for repayment of site response costs the U.S. EPA has incurred or will incur in the future. The Town and other PRPs at this site will be given the opportunity to voluntarily conduct the remedial action(s) selected.

In light of this, the Town may potentially be held responsible for the cleanup costs, as would any person or business which generated the hazardous substances that were brought to the landfill. It was the intent of Congress that the Superfund would pay for cleanup costs of sites at which PRPs are unable to pay or no longer exist. At the Onalaska site, if there is no agreement with the PRPs to perform the remedy, the U.S. EPA and the State have the option of funding the remedy up front, on an equal cost-sharing basis, or issuing an Administrative Order under CERCLA (Section 106(2)) to the PRPs to conduct the cleanup. The Agencies would then have the option of recovering the costs through litigation in the future.

b. Comments in favor of a modified plan

Two written comments were submitted in support of a modified proposed plan. The commenters independently recommended that Alternatives 4LF (multilayer cap over the landfill and naphtha-contaminated soils) and 3GW (perimeter ground water extraction and treatment) be implemented rather than Alternatives 3LF and 5GW. They recommended that the landfill be completely fenced as well.

Response

The support for a landfill cap which greatly reduces precipitation infiltration through the landfill and which meets State and Federal landfill closure requirements is noted. However, under the authority of CERCLA and in accordance with the National Contingency Plan (NCP), the U.S. EPA is charged with the task of implementing a cleanup remedy which, in addition to protecting human health and the environment and meeting applicable or relevant and appropriate requirements (ARARs), uses treatment of contamination as a principal element of the remedy where practicable, and is cost effective (CERCLA, Section 121(d)). The U.S. EPA and WDNR believe that the preferred remedy satisfies these criteria, in that:

1. Capping the naphtha-contaminated soils does not permanently treat the principal threat of continual ground-water contamination. Capping merely reduces the rate of precipitation infiltration through the contaminated soils, which slows down the rate of ground-water contamination, but does not stop it. According to the FS report, the ground-water flow beneath the landfill is projected to continue to leach contaminants from the contaminated soils towards the ground water for a long period of time (greater than 30 years) if the contaminants are not removed.

2. The use of bioremediation in the contaminated soils provides for permanent cleanup, through treatment, of a large source of ground-water contamination. In addition, operation of the on-site ground-water extraction and treatment system is expected to address a major portion of the second principal threat, the contamination in the ground water, within a relatively short period of time (less than 5 years when combined with bioremediation). Once the major contaminant source is addressed, it may be possible to meet Federal drinking water standards and perhaps most State ground-water quality standards much sooner in comparison to the use of the perimeter ground-water extraction and treatment system of Alternative 3GW. It would be more cost effective to run the on-site extraction and treatment system for a short period of time versus running the perimeter system over a long period of time.

3. The use of the perimeter extraction well network may tend to pull the more highly contaminated ground-water plume towards the wells. The higher concentrations of contaminants may then require a more expensive treatment system to remove the chemicals to reach discharge criteria.

The U.S. EPA and the WDNR consider the use of a fence (to prevent further dumping at the former landfill and to also prevent vehicular traffic upon the cap surface) to be a practical suggestion. The Agencies will evaluate the use of one of several types of fences to deter these harmful uses of the site, but not prevent beneficial uses (e.g., hiking, wildlife grazing) of the land.

c. Comments which support a portion of the proposed plan

One written comment was received which seemed to favor a "new cap." Otherwise, the commenter believes that while Alternative 5GW may "take 5 to 30 years to clean the contaminated aquifer.... It has been said that nature can do the same thing in the same amount of time." The commentor, therefore, favors the use of institutional controls, stating that ground-water treatment is not "necessary and practical."

Response

While the Agencies can not assume that the commentor's "new cap" is meant

to be support for the multi-layer cap presented in Alternatives 3LF or 4LF, we must disagree with the commentor's assessment of the need for ground-water treatment at the site. The goal of the Superfund program is detailed in the NCP:

> "The national goal of the remedy selection process is to select remedies that are protective of human health and the environment, that maintain protection over time, and that minimize untreated waste" (Section 300.430(a)(1)(i)).

In addition, the U.S. EPA's ground-water protection goal has been set forth in the NCP, in which the Agency has determined that it

> "expects to return usable ground waters to their beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site. Whenever restoration of ground waters is not practicable, (the U.S.) EPA expects to prevent further migration of the plume, prevent exposure to the contaminated ground water, and evaluate further risk reduction" (Section 300.430(a)(1)(iii)(F)).

The NCP also considers the use of institutional controls to limit exposures to hazardous substances in the ground water:

> "(The U.S.) EPA expects to use institutional controls such as water use and deed restrictions to <u>supplement</u> engineering controls as appropriate for short- and long-term management to prevent or limit exposure to hazardous substances, pollutants, or contaminants.... The use of institutional controls shall not substitute for active response measures as the sole remedy unless such response measures are determined not to be practicable..." (Section 300.430(a)(1)(iii)(D)).

Finally, State ground-water protection regulations, under Ch. NR 140, WAC, require that actions be taken to prevent the continual releases of contaminants above applicable standards to the ground water at the point of standards application.

Therefore, the following points must be made in response to the comment:

1. As stated in the RI report, the <u>potential</u> lifetime carcinogenic risk of ground-water use at the site is as high as 3 in 1,000 (3×10^{-3}). The risk range of 1 in 10,000 to 1 in 1,000,000 (1×10^{-4} to 1×10^{-6}) has been set forth in the NCP to be adequately protective of human health;

2. As detailed above, the U.S. EPA is expected to restore drinking water aquifers to their beneficial uses where practicable;

3. State laws are ARARs at this site as well as Federal laws; and,

4. Institutional and engineering controls are to be used in conjunction with active response measures where practicable (such as ground-water

treatment) to maintain adequate protectiveness of human health.

Thus, since there is a potential risk to consumers of the ground water, ground-water standards have been exceeded, and ground-water treatment is practicable in this area, ground-water treatment is necessary and practical for this site. It cannot be said that natural attenuation will achieve cleanup goals in the same amount of time as the ground-water remedy. If the source of ground-water contamination is eliminated, the U.S. EPA estimates that the present contaminant plume may be expected to attenuate in about 50 years. Otherwise, it is estimated that ground-water standards would be exceeded for well over 50 years if nothing is done at this site. The Agencies believe that 50 years or more is an unacceptably long time to pose potential risks to receptors, when the NCP provides an expectation that usable ground waters will be returned to their "beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the site" (55 Fed. Reg. 8702).

d. Comments which favor limited or no action

i. Written comments

Many written comments were received which support Alternatives 2LF (cap upgrade) and 1GW (no action), one suggesting that the Agencies continue to only monitor rather than disturb the site. The commentors' recommended alternative to ground-water extraction and treatment is for the Town to obtain the water rights to the affected properties and hold the rights in perpetuity. Several different reasons were given by some of the commenters, ranging from no perceived human health threat to an economic threat to the PRPs if the Proposed Plan is implemented. Some of the more detailed comments are excerpted below.

A. "As I understand it, the EPA solution to the problem is to dig up or pump the tainted water out and clean it. The process is to last 30 years. I also understand that by natural cleaning the process will take care of itself in 50 years. I also understand that the cleaning of the site by EPA could be more hazardous to the environment and clean up workers than to leave the site clean itself."

Response

One part of the U.S. EPA/WDNR solution to the Onalaska site problems is to pump out contaminated ground water and treat it in order to reach the goals set forth in CERCLA, the NCP, and State law. The ground-water extraction and treatment program is estimated to run for 5 years to 30 years. As detailed above, in response to a previous comment, the national goal of the Superfund program is to achieve protection of human health and the environment. As expressed in the NCP, treatment is the preferred method of attaining protectiveness, wherever practicable (55 Fed. Reg. 8703). The NCP, Ch. NR 140, WAC, and Ch. 160, Wisconsin

Statutes, are very clear in their respective ground-water protection strategies and goals. As above, the NCP provides the expectation that contaminated ground waters would be returned to their beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of a site.

"Natural cleaning" is not expected to occur in only 50 years. If there were no further sources of ground-water contamination, natural attenuation may be expected to reduce the level of contaminants in the present plume to protective levels (in terms of Federal drinking-water standards) within that time period, but State ground-water quality standards still would not be met. However, there are several sources of further ground-water contaminants (e.g., the naphtha-contaminated soil, the landfill contents), and natural attenuation would not be expected to reduce ground-water contaminant levels to adequately protect human health and the environment for much greater than 50 years. Thus, "natural cleaning" does not meet the intent of State and Federal ground-water protection policies and law, nor does it meet Superfund program requirements.

Although the determination as to whether a remedy is protective of human health and the environment requires consideration of the acceptability of any short-term or cross-media impacts that may be posed during implementation of a remedial action (55 Fed. Reg. 8701), the Agencies must disagree with the assessment that this cleanup would be more harmful to the environment and cleanup workers. Removing the chemicals of concern from the ground water and soils enhances the wetlands rather than degrades them. Comparing risk calculations for construction activities to ground-water consumption risks cannot be done. Construction work entails voluntary risks of on-the-job injuries when working with heavy equipment. Even so, standard safety precautions will be taken, both as a matter of common sense and as a matter of law, to protect workers and the community during construction. Consumption of contaminated ground water is an involuntary risk assumed by humans and wildlife, as is the potential destruction of wetland habitats.

B. One group of commentors cited the Health Assessment (February 1990) prepared by the Wisconsin Department of Health, which stated "The site does not pose a current significant risk to Public Health," and "The Division of Health concludes that this site is not of Public Health concern, since under current conditions humans are not being exposed to significant levels of hazardous substances." The group is concerned with the "enormous burden" which may be placed on the Town's taxpayers and local PRPs if the Proposed Plan is carried out.

Response

The purpose of the Health Assessment (HA) is to evaluate present health threats to gauge the need for immediate action at Superfund sites (such as emergency removal of contamination, evacuation of residents, etc.). The HA is a separate process from the Superfund Risk Assessment, which

examines current and potential health effects and future potential health effects at Superfund sites. The Onalaska HA also states (see HA, page 7) that the site "could be of potential concern" due to the existence of contaminated ground water and buried drums. Future exposures would in fact be a concern if "remedies for the site were not carried out." Thus, while no one is currently using the contaminated water, the potential use of the water is a concern, which U.S. EPA, the WDNR, and the Wisconsin Division of Health believe warrants clean-up action.

The U.S. EPA and the WDNR understand the problems the Town and other local PRPs face in regard to the cleanup cost burden. Environmental cleanups can be costly, but if the cleanup occurs today rather than in the future, both environmental and cost benefits would be realized.

C. One commenter addressed many different concerns and concluded that:

1. The upgrading of the landfill cap (NR504) "is not warranted and is not mandated by the Wisconsin DNR...," since greater control of leachate production would be achieved with the cap upgrade (Alternative 2LF) for a lower cost than a NR504 cap. Also, since the landfill was previously closed under NR180, there is no statute requiring NR504 to be met at the site as well.

2. Bioremediation should not be implemented since it is an emerging technology and it should be more thoroughly tested before being used at the Onalaska site.

3. The Health Assessment shows the site not to be a Public Health concern, and ground-water treatment as proposed is not warranted. Volatilization of contaminants into the air during treatment may pose a risk.

4. The contaminants should be allowed to remain in the landfill site and naturally degrade over time unless they become a significant risk. At that time, a suitable, thoroughly tested technology could be employed at the Onalaska site.

Another comment was received which supported the above commentor's position.

Response

1. The FS does state that Alternative 2LF would achieve good leachate control rates at a lower cost than Alternative 3LF. However, the FS further states that Alternative 2LF would still be subject to freeze/thaw damage and animal burrowing, which would render the upgraded cap as porous as the current cap. Therefore, Alternative 3LF, which provides 80 percent water infiltration reduction over the life of the cap versus an initial high of 30 percent for Alternative 2LF after construction, is the cost-effective alternative. Freeze/thaw and animal burrowing would not be expected to damage the clay barrier layer in

Alternative 3LF due to the presence of the frost protection layer.

Although the cap was to have met Ch. NR 180, WAC landfill closure standards, it clearly does not meet these requirements.

2. Section 121(b)(1) of CERCLA mandates the U.S. EPA to use "alternative treatment technologies...to the maximum extent practicable." The U.S. EPA expects bioremediation, an innovative technology, to be practicable in the naphtha-contaminated soils, since the RI report has assessed that much of the organic chemical mass in the naphtha-contaminant layer is biodegradable and that site conditions are favorable for implementation. The U.S. EPA does recommend that a laboratory treatability study be performed to determine the extent that bioremediation would reduce the organic chemical mass at the site.

The NCP and CERCLA contain an expectation that innovative technologies be used for site cleanups when such technology offers the potential for comparable or superior treatment or implementability, less adverse impacts than other approaches, or lower costs for similar levels of performance of demonstrated technologies. Bioremediation would permanently address the organic contaminants in the soils, providing less impact to site workers and the community than excavation, transportation, and thermal treatment of the soils, at nearly the same cost as thermal roasting.

3. As stated above, the HA does recognize the potential risk due to contaminated ground-water consumption. The U.S. EPA and the WDNR have also shown an unacceptable risk is posed by consumption of contaminated ground water. Discharge of contaminated ground water to the Black River wetlands may cause environmental damage in addition to human health risks. The Agencies believe that ground-water treatment as proposed would be adequately protective by reducing risks to acceptable levels once Ground Water Cleanup Standards are met. The treatment system air emissions will be monitored to ensure that any air emissions comply with Federal and State standards and that adequate protection is achieved.

4. The site contaminants present a significant potential risk to ground-water consumers at this time. As set forth in CERCLA and the NCP, the intent of the Superfund program to actively clean up sites where significant actual or potential risks exist, not to merely monitor until a bad situation becomes worse. As discussed above, suitable technology exists to address the site problems. In addition, State ground-water laws require that action be taken to prevent the continued release of contaminants above standards at the point of standards application. Since the ground-water table is high at this site, ground-water extraction and treatment is found to be the most practicable method to comply with this requirement. Thus, ground-water cleanup action is necessary and warranted at the site.

D. One commenter was concerned with the expense of the cleanup and stated that the "Town should just fence the place forever." The commenter felt that the cleanup will cause more damage than if the site is left alone,

and that the site should have never been placed on the Superfund list.

Response

A site fence will be considered in the final design of the remedy, but it will not protect the ground water from the contaminants that are leaching out of the landfill nor will a fence protect the wetlands or surface water where contaminated ground water is discharging. Clearly, the ground-water protection goals stated in the NCP and in State law require action to alleviate the potential problems presented by the site. As stated earlier, the cleanup will enhance the environment rather than degrade it.

E. One comment was received which indicated that little movement of contaminants has occurred, that only one well was found to be contaminated, and that no contaminants were found in the wetlands. Therefore, the commenter felt that only ground-water monitoring is warranted at the site. Also, bioremediation was implied to be "experimental," and opposition was expressed to the implementation of both ground-water extraction and treatment and bioremediation.

Response

The U.S. EPA agrees that little migration of some of the organic contaminants has yet occurred; however, the naphtha contaminants have migrated as far in the sand and gravel aquifer as they would be expected to migrate in the amount of time since the landfill closed. This is one reason why natural attenuation is not favored at this site. Inorganic contaminants, such as chloride and barium, tend to move much faster than organic contaminants. The limited extent of sampling in the wetlands did not reveal any site-related organic contamination, and inorganic data were unusable due to laboratory problems. However, the rate of migration of some inorganic compounds is such that wetlands contamination remains a plausible consideration. Bioremediation was discussed above (C.2). The U.S. EPA believes that ground-water treatment and bioremediation of the naphtha-contaminated soils are both necessary and practicable at this site.

F. One comment was received from the LaCrosse County Conservation Alliance in support of an "adequate cap," institutional controls, and ground-water monitoring. The Alliance sees the "proposed bioremediation and ground-water pumping projects...as potentially undermining the public's confidence in federal and state environmental programs."

Response

The U.S. EPA and the WDNR believe that the proposed remedy is the cost-effective method to protect human health and the environment at the Onalaska site. To ignore the NCP, CERCLA, and State law in implementing a cleanup remedy would tend to undermine the public's confidence in Federal and State environmental programs.

ii. Oral Comments

The only oral comments given at the public hearing were in support of Alternatives 2LF (cap upgrade) and 1GW (ground-water monitoring, institutional controls), also known as the "Town proposal." The Town prepared a technical discussion of the conclusions of the FS. These concerns are addressed in the PRP comment section. Again, the focus was on high cost to the Town and other PRPs, rather than protection of ground-water and surface-water quality and the wetlands. These concerns have been previously addressed.

e. Miscellaneous comments.

i. Written Comments

A. Two commentors indicated that they believe the WDNR should pay for the cleanup since the WDNR licensed the landfill. One indicated that the U.S. EPA and "those who put the waste there" should help pay as well. While one of the commentors did not offer an alternate cleanup suggestion, the other did recommend that the site be fenced and that the Town purchase the surrounding acreage and, presumably, the accompanying water rights.

Response

The WDNR notes that the Onalaska Landfill was licensed when the State's landfill regulatory program was in its infancy. There were very few restrictions on the disposal of industrial wastes at landfills at that point in time. The Onalaska Landfill was licensed to operate using technologies and under conditions considered to be acceptable at that time. The operating license that was issued for the landfill did not constitute a guarantee by WDNR that the landfill would not cause environmental contamination. The issuance of an operating license only meant that the licensing requirements in effect at that time had been complied with. WDNR's issuance of an operating license does not make the WDNR liable for the cost of remedial action at the Onalaska site nor at any other site under similar circumstances.

The question of U.S. EPA's obligation to help pay the cleanup bill has previously been addressed. We also note that those parties who brought the hazardous substances to the site are potentially liable for the cleanup of the site, as CERCLA intended. Again, the NCP calls for institutional controls to be used in conjunction with active response measures in regard to site cleanups and protection of human health and the environment.

B. Two commentors indicated that they did not think that they should pay for a cleanup since they were not living in the Town when the dump was open and that they did not bring any waste to the dump. In addition, they recommended that only ground-water monitoring be performed, since no

one is drinking the water, and that the Agencies should take action in the future if need be.

Response

The Agencies understand the situation the Town residents find themselves in. The Town is a PRP since CERCLA considers the owner/operator of a site to be a PRP. As discussed above, there is a significant potential risk posed by site conditions, and monitoring of the situation will not be adequately protective.

C. One commenter thought that the cost of the cleanup was high in relation to the size of the landfill and its short operating lifetime. The commenter cited other area landfills which were used over a longer period of time by industrial waste generators. If these other landfills, one of which apparently dumped trash into "the river," do not pose a problem, the commenter wondered how this one could.

Response

The WDNR notes that there are numerous municipally owned landfills across the State that accepted industrial waste (e.g., Algoma, Janesville, Tomah). These landfills are being addressed through one of three programs: the Federal Superfund, the State Environmental Response and Repair Program, or the State solid waste authorities. Several other landfills in the Onalaska area are being investigated as potential Superfund sites.

The cost of a cleanup does not generally correlate to the size or operating life of a facility. Typically, costs are derived from the concentration and types of contaminants present at a site, and from the risks posed to actual or potential receptors by the contamination.

D. One commenter questioned "how can the WDNR enforce laws without any liability or guarantee to the public? They can make a contract but do not have to honor it." Also, the commenter feels that under bioremediation, any "air-borne pollution" caused by operation of the technology would cause acid rain.

Response

The question of WDNR liability has been previously addressed. The limited amount of volatile chemicals released under the bioremediation alternative would not tend to cause acid rain. Rather, acid rain is suspected to be caused by sulfur and nitrogen oxide emissions from automobile exhaust and from coal-burning power plant emissions. If air emissions at the site are a problem, then emission controls may be placed on the system.

E. One commenter wrote twice. The first comment objected to the high cost of the cleanup since the Town and the PRPs could not bear the cost.

The commenter mentioned that alternate proposals exist, but did not elaborate. The second comment reiterated previous comments regarding no perceived health risks at the site and questioned whether the Agency was "trying to make the Town an example" or whether the Agency was "really convinced this is a problem."

Response

The U.S. EPA and the WDNR understand the problem facing the Town in regard to potential liability for cleanup. The Town's ability to pay will be gauged and considered during cleanup discussions with all the PRPs. As previously mentioned, there are numerous municipal landfills in the State that are Superfund sites that have municipalities as PRPs. If the PRPs are unwilling or unable to implement the remedy, then the U.S. EPA and the State have the option of performing the remedy at which time the Agencies will share equally in the cost of cleanup at this site.

Contamination at this site poses unacceptable risks, thus the Agencies are trying to rectify a potential problem so that the land and ground water can be returned to a useful purpose and so surface water and wetlands are not negatively impacted.

The U.S. EPA and the State are grateful for the help they have received from the Town during the remedial investigation, and are hopeful that cooperation between the Town and the Agencies will continue.

F. One commenter believes that the dumpsite need not be disturbed and that soil makes a great filter, so "why not let nature takes it course" and filter the contaminants out naturally. The commenter thinks that disturbing the site poses a greater threat due to spillage and accidents and that $6 million is too high a price to pay for cleanup.

Response

Again, the NCP policy of ground-water restoration and protection, as well as Federal and State law, would require the U.S. EPA to examine a practicable way of cleaning up the sand and gravel aquifer at Onalaska. The sand and gravel in the aquifer contain little "filtering capability," as seen by the length of the contaminant plume and by the concentrations of contaminants in the plume. Thus, ground-water extraction would be protective and would enhance the wetlands rather than contribute to their degradation. (Please refer to previous responses for a more complete explanation.)

G. One commenter believes that the list of PRPs should be expanded to all users of the dump. Additionally, the commenter states that, although the Town constructed an inadequate cap, the WDNR approved the cap; however, the commenter did not draw any conclusions from the line of reasoning. The commenter was also concerned about the release of volatile organic compounds (VOCs) into the atmosphere from the air stripper, wondering whether the concentrations of pollutants in the ground-water table are in excess of discharge limits at this time.

Response

The current list of PRPs includes all entities that, to the best of the U.S. EPA's knowledge, are responsible for the hazardous substances which were dumped at the site. The U.S. EPA will continue to investigate to determine if other PRPs exist. Both the Town, as owner/operator of the landfill, and a few private firms, as generators of the hazardous substances, are represented.

Air stripping releases VOCs into the atmosphere, where they are subject to photo-degradation. However, the U.S. EPA and the WDNR will monitor the emission levels to ensure that no standards are exceeded. Currently, levels of pollutants in the ground water are higher than surface-water discharge standards, which is one reason why treatment of the contaminated ground water is needed prior to discharge.

H. One commentor, in addition to the comment discussed in section (c)(i) above, expressed a desire to compare the problem or risks at Onalaska to problems posed by failing septic systems or runoff from area farm lands. The commenter thought area residents should focus cleanup efforts in those areas instead if they are as potentially dangerous as the "toxins that are escaping from the landfill."

Response

As the commenter acknowledged in the letter, the Superfund program has no jurisdiction to address the other two categories listed above. However, the Agencies are actively involved in environmental protection from all sources of pollution, not just from Superfund sites. The risks posed by the contamination at the Onalaska Landfill warrant the action proposed by the Agencies under the jurisdiction of CERCLA.

I. One commenter expressed concern with the high cost of the proposed cleanup, as it would be a financial burden on the population of the Town. The commenter also expressed concern with the health risks posed by the proposed VOC-emissions from the air stripper and bioremediation, in respect to implementing Alternatives 2LF and 1GW. Lastly, the commenter expressed an interest in having the "perpetrators" assume the major financial burden but did not wish to see them go out of business, inquiring as to the time frame for payment of the costs.

Response

The U.S. EPA and the State are aware of the potential burden the cost of the cleanup may pose on the Town residents and the other PRPs. The Agencies will be evaluating the fiscal viability of the Town and the PRPs in relation to potential response costs, and the U.S. EPA will take the evaluation into account during discussions with the PRPs regarding remedy implementation. If the Town and PRPs are unable to immediately fund the remedial action at this site, U.S. EPA municipal settlement policy provides for a consideration of repayment of Federal costs over time.

As previously discussed, possible VOC emissions from the air stripper and/or bioremediation would be monitored during the cleanup. Emission controls would be placed on the equipment if a problem was detected and could not be corrected.

J. One commenter expressed "unequivocal disapproval" with the implementation of Alternative 5GW. Disapproval was based on cost of the remedy and the perception that remediation risks would be higher than the potential risks posed by the site: The commenter stated that citizens who live in the Town now would be bearing the cost of the cleanup of wastes due to "the lack of proper technology" during disposal operations and that bioremediation may emit VOCs, jeopardizing the health of the 40,000 users of the nearby bike trail. Finally, the commenter noted that the proposed plan allowed, under Alternative 4GW, the leading edge of the plume to safely discharge to the wetlands, and questioned "why is a multi-million dollar action plan being proposed?"

Response

The U.S. EPA and the WDNR proposed that Alternatives 3LF and 5GW be implemented at Onalaska since these alternatives were found to be the most cost-effective methods of protecting human health and the environment, meeting ARARs, and providing permanent treatment to the maximum extent practicable. Cost is only an issue when distinguishing between equally protective remedial choices.

The U.S. EPA and the WDNR will evaluate the bioremediation system for VOC emissions so that there are no unacceptable risks. Emission control equipment, such as activated carbon canisters, would be added to the system to purify exhaust gases emitted by the system, if monitoring warrants that action.

The Proposed Plan noted that the levels of contaminants in the leading edge of the plume were not seen to exceed Surface Water Quality Criteria at this time. This is due, in part, to the limited number of sampling points in the wetlands and to unusable inorganic data. Thus, the entire plume did not need to be extracted. However, as contaminant levels increase, as they are projected to do if nothing is done, the ground water in this area may need to be extracted and treated. The area of the plume closest to the landfill is of greater concern at this time.

K. One commenter expressed a belief that the U.S. EPA should continue to monitor the site and not "begin cleanup if monitoring doesn't show spreading of the contaminated ground water or subsoil." The commenter is "not convinced that it is a serious threat at this time," stating that the cleanup proposal may be overreaction to the situation.

Response

As discussed above, CERCLA and the NCP direct the U.S. EPA to protect human health and the environment. Ground-water monitoring proved the

ground-water contaminant plume is spreading. The potential risk due to ingestion of the most-contaminated water is 3 in 1,000 (3×10^{-3}), an unacceptable risk. Additionally, the contaminant plume threatens the quality of the Black River wetlands. Treatment can reduce the risks to a protective level.

L. One commenter expressed the belief that both Alternatives 1LF and 1GW should be adopted, writing that "there is probably more contamination coming down the Black River from upstream than will ever get into the river from the landfill."

Response

As discussed earlier, Alternative 1GW is not protective of human health or the environment. The NCP recognizes that institutional controls should be implemented in conjunction with active response measures where practicable, as at Onalaska. Alternative 1LF does little to prevent the leaching of contaminants from the landfill into the ground water, which has been shown to be a principal threat.

Alternatives 1LF and 1GW also do not meet ARARs, as discussed in the FS and the Proposed Plan.

M. One commenter did not agree with the implementation of Alternative 5GW since "the public health risk is not that significant to warrant the cleanup process recommended" by the Agencies. Concern was expressed for the risks posed by the cleanup process to the site workers, nearby residents, and users of the bike trail. Also, the commenter felt that no guarantee of effectiveness was given by the Agencies for Alternative 5GW and that the U.S. EPA would free the Town from future liability if 5GW was not effective. The commenter proposed that Alternatives 2LF and 1GW, the Town's proposal, be implemented.

Response

The NCP details that the Superfund program shall achieve an adequate level of protectiveness at Superfund sites. This adequate level has been defined as a lifetime carcinogenic risk range of 1 in 10,000 to 1 in 1,000,000 (1×10^{-4} to 1×10^{-6}). The potential risk associated with the ingestion of contaminated water from the contaminant plume is estimated to be 3 in 1000 (3×10^{-3}), which is an unacceptable risk. In addition, the U.S. EPA must protect the environment, which the commenter has not addressed. The Agencies are concerned with the long-term effects of contaminants on environmental species in the Black River and the wetlands.

The Agencies feel that the alternatives proposed are the best to apply to achieve protection of human health and the environment. The Agencies have evaluated the potential effectiveness of bioremediation and believe that benefits of contaminant destruction would be gained from its implementation. The overall effectiveness of bioremediation will be evaluated on a small scale first and then at the site if successful on a

small scale. Again, air emissions will be monitored; controls will be used if emissions are a problem.

N. Three commentors asked that "the taxpayers' money" not be wasted by cleaning up the site. One suggested that the Agencies "keep an eye on the site and if it starts causing a problem then do something."

Response

Although the Superfund is generally not funded by the public, as discussed above, the Agencies disagree that implementation of Alternatives 5GW and 3LF would be a waste of the taxpayers' money. In addition to the potential risks identified at the site, the Agencies must point out that it would be a good investment to handle the problem now, rather than in the future. It would be more expensive to mitigate the problem once left to cause wider-spread or more substantial harm to the area than if the contamination was addressed at this time. We note the extremely high cost of wetland restoration should contamination continue to be released.

ii. Oral comments

One commenter requested that the "politician who wrote the law" be present to answer to the public in regard to the cost of cleanup. However, the commenter did not present an alternative to the proposed plan.

Response

The Agencies note that CERCLA was developed and debated by numerous politicians, who heard from many industries, environmental groups, and citizens. The Superfund law is intended to make those responsible for environmental problems pay for environmental remediation. We also acknowledge the high cost of remediation and that prevention of pollution is always more cost effective.

2. Potentially Responsible Parties

a. Comments favoring limited or no action.

i. Written comments

A. Metallics, Incorporated ("Metallics"), expressed its belief that:

a. The cost of the proposed cleanup is excessive and would be a burden to the company;

b. Other entities, such as the Wisconsin Department of Agriculture, should be liable as well;

c. The cleanup would be less protective of human health than the Town's proposal (to purchase the affected property and upgrade the cap); and,

d. The WDNR should waive ARARs if it is going to be consistent with its landfill ground-water standards policy.

Response

The Agencies understand the burden that Metallics faces in regards to its potential liability at the site. The U.S. EPA and the WDNR also acknowledge the steps Metallics has taken to mitigate its own environmental problems, especially when Metallics began recycling its spent solvents on a voluntary basis. CERCLA, however, has determined that generators of hazardous substances at a Superfund site are potentially liable for response costs at the site. Thus, the Wisconsin Department of Agriculture is being investigated in regards to its potential liability at the Onalaska site. Other entities, such as nearby Towns, have brought only non-hazardous substances (i.e., municipal trash) to the landfill and therefore are not PRPs.

The WDNR has consistently applied Ch. NR 140, WAC, which requires that the Department take action to prevent the continuous releases of contaminants that exceed standards at the point of standards application. As discussed above, the action necessary at the Onalaska site includes ground-water extraction and treatment and covering the landfill with a multilayer cap. In addition, the U.S. EPA has the final authority to determine ARARs at a site.

B. Omark Industries ("Omark") expressed a concern that the potential costs of cleanup do not yield adequate benefits in light of the "limited risk the site poses." Omark recommended that the Town's proposal be implemented instead, since it would protect human health and the environment at a more reasonable cost than the preferred remedy.

Response

As discussed above, the site poses a risk of 3 in 1,000 (3×10^{-3}) to potential consumers of the contaminated ground water, which is not a "limited risk," but an unacceptable risk. Simply monitoring the ground-water plume would not be protective of human health and the environment nor would it comply with Federal and State ARARs or the Superfund mandates and expectations. Alternative 3LF provides better precipitation infiltration protection with a cap not subject to damage from frost and meets landfill closure regulations. Thus, the multilayer cap provides better long-term effectiveness than the cap upgrade proposed by the Town.

C. The Town of Onalaska submitted two sets of comments. One set, submitted directly by the Town, summarized the points made by Warzyn Engineering Inc. ("Warzyn"), its consultant, and recommended that the Town's proposed remedy be implemented instead. The second set, which was technical in nature, was submitted directly by Warzyn on behalf of

the Town, Metallics, and Omark.

Town of Onalaska

The Town discussed the history of the landfill, emphasizing that the Town has complied with all WDNR directives as to the operation of the landfill. Specific comments in support of its belief that the Proposed Plan is too costly and is unnecessary to protect human health and the environment include:

1. The multilayer cap is technically unnecessary and may prolong cleanup efforts at the site. The repair and maintenance of the existing cap will prevent direct contact at less cost. The current cap aids in the natural flushing and degradation of wastes.

2. Ground-water treatment and bioremediation is inappropriate, unreasonable, and technically deficient. Natural attenuation and biological degradation is occurring at the site. No threat of public exposure to existing contamination in the ground water or soils exists. Bioremediation is not a proven technology.

3. Institutional controls coupled with ground-water monitoring are more reasonable and cost effective.

4. The Town proposes to develop a ground-water monitoring program to ensure the safety of human health and the environment and to allow the U.S. EPA and WDNR to institute further action, if warranted.

5. The Town's proposal is consistent with the NCP, and is tailored to site considerations and should be adopted. No unacceptable risks are posed by natural attenuation. No public/private wells are impacted by the site. Future impacts would be prevented by the purchase of the affected properties south of the landfill.

6. The contamination has been present in the landfill for 20 years and is not adversely impacting the Black River, confirming that no long-term threat exists.

7. The Town's proposal is in compliance with ARARs in that Ch. NR 140, WAC should not be applied to abandoned landfills. The Point of Standards for measurement of contamination would be the entire area if the Town purchased the property.

8. It is technically impractical to meet NR 140 requirements, and the U.S. EPA should grant a waiver. Twenty years of natural attenuation has proven successful in treating wastes. Ground-water treatment would duplicate this at great expense.

9. If the proposed plan is implemented, there would be an inconsistent application of ARARs at this landfill in comparison with the rest of the State.

10. The remedy cost and community acceptance were not fully considered. Economic realities have been ignored by the U.S. EPA and the WDNR in pursuit of a cleanup remedy.

11. The Town has run the landfill according to the directives from WDNR. The WDNR is at fault for the deficiencies identified with the cap.

12. The U.S. EPA and WDNR agree that an approved RCRA cap is unnecessary at this site, but they insist on one anyway. Hundreds of landfills exist in the State, and none is subjected to the same level of remediation as at Onalaska.

Responses

(Note: Many of the above comments have been previously addressed in greater detail. Please refer to those responses as well as to what is provided below.)

1. Direct contact with the landfill waste is not the major issue driving the need for the multilayer cap. The multilayer cap has been determined by the U.S. EPA to be relevant and appropriate[3] in that it is needed to reduce the rate of infiltration through the waste to reduce the rate of leaching of contaminants into the ground water. In addition, the preferred cap provides better long-term effectiveness. Freeze/thaw cycles damage caps not provided with frost protection, as evidenced in the cap installed at Onalaska. The reason for using landfills for waste disposal is not to let nature "flush away" contaminants but to contain them.

2. Since bioremediation is an emerging technology, a laboratory-scale and possibly a pilot-scale test to assure its effectiveness will be performed prior to full-scale implementation at the site. Superfund law does not preclude the use of innovative technology at Superfund sites, rather it encourages the use of innovative technologies where practicable. The NCP specifically addresses this (55 Federal Register 8702, March 8, 1990) by favoring the use of innovative technologies where they may provide comparable or superior treatment or implementability, less adverse impacts than other approaches, or lower costs for similar levels of performance than for demonstrated technologies, as discussed above.

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[3]The relevancy and appropriateness of RCRA requirements is based on the circumstances of the release, including properties of the waste, its composition and matrix, the characteristics of the site, the nature of the release or threatened release from the site, and the nature and purpose of the requirements themselves. For example, the mobility of the waste, among other factors, may be a key concern in evaluating whether the RCRA requirement that the cap used in closing a landfill be less permeable than the bottom liner (40 CFR 264.310(a)(5)) is relevant and appropriate (55 Fed. Reg. 8763).

While the soil contaminants pose little direct contact threat to human health and the environment, they do pose a long-term threat to the ground-water quality, which in turn poses a risk of 3 in 1,000 (3×10^{-3}) to potential consumers. This is evidence that insufficient natural attenuation is occurring at the site.

3. As previously discussed, the NCP anticipates that the U.S. EPA will implement institutional controls in conjunction with active response measures where practicable. Ground-water treatment and bioremediation are practicable at the Onalaska site.

4. Ground-water extraction and treatment is a proven method to reduce unacceptable risks to consumers and is warranted at this site to restore the aquifer to its beneficial uses. A monitoring program will be developed to ensure that ground-water contamination is adequately addressed.

5. Institutional controls could be used to prevent exposures to releases of hazardous substances and to supplement engineering controls, but shall not be substituted for active response measures as the sole remedy unless active response measures are determined to be not practicable. Cecil Miller's well was impacted by site contaminants, as is the Ackerman's garden well. The fact that these wells exist proves that institutional controls alone are not protective over the long term.

6. According to the RI report, the contaminants have migrated about as far as they would be expected to in 20 years. Impacts in the Black River that have not been observed after only 20 years offers no proof of adequate protectiveness. High concentrations of contaminants are found close to the landfill and are migrating away from it towards the wetlands. The limited number of sampling points in the wetlands and the unusable inorganic data contribute to the uncertainty of adequate protectiveness of ground-water monitoring.

7. If the Town were to obtain the properties south of the landfill, the point of standards application for Enforcement Standards under Ch. NR 140, WAC would then be 300 feet from the landfill waste. Ground-water quality standards would still be exceeded at that point, in violation of Ch. NR 140, WAC.

8. The Agencies do not agree that it is impossible to meet ground-water standards by the extraction and treatment method. The U.S. EPA fully expects that the preferred remedy will achieve Federal ARARs compliance. However, the effectiveness of the treatment system will be evaluated every 5 years as to whether Ch. NR 140, WAC standards can be met.

9. The WDNR is consistently applying Ch. NR 140, WAC at Superfund sites in Wisconsin. As stated above, the WDNR is required to take action to prevent the continual releases of contaminants at levels above standards at the point of standards application. At the Onalaska Landfill, the multilayer cap and ground-water extraction and treatment are necessary to

comply with Ch. NR 140, WAC. There are many other landfill sites in Wisconsin which are Superfund sites where similar action is taking place or will take place to comply with this regulation (e.g., Janesville, Tomah, Algoma).

10. The expense of the remedy and community acceptance has been considered by the Agencies. The U.S. EPA and the State believe that the preferred remedy is protective of human health and the environment, is cost effective, meets ARARs, and uses permanent treatment remedies to the maximum extent practicable. The Town's proposal does not meet all the necessary criteria for remedy selection at Superfund sites.

11. The Agencies acknowledge and appreciate the cooperative efforts of the Town in the operation of the landfill. However, as discussed previously, the WDNR is not liable for cleanup costs at this site, as neither Federal nor State law imposes liability on regulatory agencies that license landfills.

12. Although the Ch. NR 504, WAC cap meets all the statutory requirements of a RCRA Subtitle C cap, it is preferred because the multilayer cap is sufficiently similar to those placed on current State solid-waste landfills under current State landfill closure requirements, and it is well suited to reduce precipitation infiltration through the landfill.

As discussed previously, there are many other landfills in the State being addressed in a similar fashion to the Onalaska site, or are being evaluated for inclusion on the Superfund list for future investigation and remediation.

Warzyn Engineering, Inc. ("Warzyn")

Warzyn submitted comments which reiterated the Town's position but in greater detail. Specifically:

a. Landfill Cap

1. The RI/FS percolation estimates may be conservatively low.

2. The range of percolation estimates for each capping alternative will not substantially affect the overall water balance of the site, since the ground-water flow through the refuse may be 9000 gallons/day.

3. The NR504 cap requirements are not relevant and appropriate to existing closed landfills.

4. To further reduce risk potential, the site should be fenced to restrict public access.

5. The use of an NR504 cap would limit infiltration, which would slow down the flushing of the waste and extend the duration of a ground water treatment program.

6. The additional costs of upgrading or replacing the cap are not justified given that increased protection has not been quantified.

b. Ground Water

7. The Ackerman well is an illegal construction. New well construction is impossible due to existing Wisconsin regulations which prohibit construction of a well within 1,200 feet of a landfill.

8. A measurable impact on surface-water quality is unlikely to emerge in the future. Given the rate of ground-water flow and the long period of time that the waste has been in place, a detrimental impact should have become evident by now. This supports Alternative 1GW.

9. Natural attenuation is a more cost-effective method of ground-water cleanup and should be the preferred alternative.

10. Bioremediation has not been sufficiently evaluated to determine effectiveness.

11. By placing the title of the affected property in public hands, the institutional controls will be permanent.

12. The proposed monitoring program is excessive.

c. Remedy selection

13. The direct contact with waste pathway is the only documented risk at the site.

14. Pump and treat systems do not reach health-based levels. It makes no sense to expend large sums of money to treat contaminated ground water mechanically, when the same process has been occurring naturally.

15. The remedy selection seems to be based merely on the fact that contamination is present. The remedy selection should be based on the mitigation of unacceptable risks in a cost-effective manner.

16. The risks presented by cap construction are greater than the risks the remedy is mitigating.

17. The selection of the cap and ground-water remedies are mainly driven by State ARARs, for which the U.S. EPA can and should grant a waiver.

In summary, the Proposed Plan is less protective of human health, needlessly protective of the environment, and excessively costly. The Town's proposal is the proper alternative.

Responses

1. The assumptions and method of analysis of the cap percolation rates

are discussed in the RI/FS (see Appendix C of the RI). The U.S. EPA and the WDNR stand by the work.

2. The maximum ground-water flow through refuse is calculated to be 9500 gallons per day, based on maximum water table conditions (during spring run off). The average flow would be much lower, estimated to be 4800 gallons per day. However, the ground water flows through a maximum of 2 feet of refuse, whereas the infiltration (percolation) rate of the existing cap (860 gallons per day) flows through the entire thickness of the refuse (15 to 20 feet). This effectively raises the amount of contaminants the infiltration reaches to nearly equal that of the ground-water flow, which means that reduction of infiltration is an important consideration at this site.

3. The existing cap was to have met Ch. NR 180, WAC landfill closure requirements. The RI has shown that the cap does not meet these requirements and, therefore, was either not closed properly or not properly maintained. As stated previously, multilayer caps are typically required at closed landfills with Ch. NR 140, WAC exceedances. Municipal landfills are capped by a low permeability cover provided with frost protection. Thus, the Ch. NR 504, WAC cap is relevant. The Ch. NR 504, WAC cap is technically justified since it would reduce the rate of infiltration through the landfill debris, which would enable the ground water to be cleaned-up to protective levels. Thus, the Ch. NR 504, WAC cap is appropriate for this site.

4. Risks due to potential contact with surface contaminants by site users were calculated to be below action levels, thus a site fence is not necessary to further reduce risks. A fence may be necessary to protect site users from remedial equipment and also to prevent further dumping, vehicular traffic on the cap, or vandalism at the site.

5. The minimization of infiltration is an important objective, since reduction of infiltration rates reduces contaminant loading to the ground water. Relating the rate of infiltration reduction to ground-water treatment time is not entirely possible since the amount of contaminant mass in the landfill is unknown. Generally, the less contaminant mass loading into the ground water, the shorter the time frame for ground-water cleanup to reach protective levels.

6. The increased protection to human health and the environment due to cap construction cannot be quantified as alluded to above (response 5). On a qualitative basis, the lower the infiltration rate, the less contaminant mass loading into the ground water.

7. The fact that the Ackermans' garden well exists is a good argument that institutional controls can not be the sole measure of protection at this site. The Ackermans' drinking-water well was installed in accordance with Ch. NR 112, WAC under a WDNR variance (October 12, 1980).

8. The elapsed time since disposal of the hazardous substances is about

20 years. Given grpund-water velocity (70 feet/year) and retardation coefficients (1.12 to 5.54) for some of the principal organic pollutants, these pollutants should have migrated from 1,250 feet to 250 feet from the landfill. These distances correspond well to observed conditions at the site. Since the Dodge Chute of the Black River is about 1000 feet from the landfill, many of the organic contaminants would not be expected to have reached the river in 20 years. It is possible that the continued contaminant migration could result in increased contaminant levels discharging to the river.

9. The existence of 1,1-dichloroethane (1,1-DCA) in the Ackermans' garden well, 20 years after disposal, at a concentration presenting a potential risk of 3 in 1,000 (3×10^{-3}) suggests that natural attenuation alone has not met ground-water protection goals.

10. Bioremediation has been evaluated by the U.S. EPA and is considered to be effective for certain applications. Its specific applicability to conditions at the site will require treatability testing prior to any full-scale implementation.

11. As previously discussed, the NCP anticipates that the U.S. EPA will restore usable aquifers to their beneficial uses within the shortest time period practicable and also implement institutional controls in conjunction with active response measures where technically practicable. Institutional controls (e.g., deed restrictions) are not enforceable and, thus, are not protective.

12. Revisions to the ground-water monitoring program, depending on earlier results, will be considered after the initial 5-year monitoring period. If found to be excessive or inadequate, it is likely that the number of analytes and/or the frequency of monitoring could be changed at that time.

13. Direct contact with waste has been shown to be a low risk at the site. The RI/FS has also documented the unacceptable risks due to contaminated ground-water ingestion.

14. As previously discussed, pump and treat methods are more reliable to attempt to reach health-based levels than natural attenuation. Although natural biological degradation is likely to be occurring (in particular, to toluene and xylene), the existence of adverse levels of contaminants in the ground water 20 years after disposal indicates that it cannot be the sole method of cleanup.

15. The selection of the remedy is based upon the unacceptable risks borne by potential consumption of the contaminated ground water, not merely because contamination is present. That is why the entire landfill is not being treated. The proposed remedy does mitigate unacceptable risks in a cost-effective manner which is also protective of human health and the environment, as required by CERCLA.

16. Voluntary risks due to cap construction are not directly comparable

to the involuntary risks presented by contaminated ground-water consumption. Air emissions may be mitigated by emission controls, if necessary. Thus, the remedy is protective over the long-term.

17. Selection of the cap remedy was influenced by the need to reduce infiltration through the landfill in a cost-effective manner and to meet Federal and State ARARs. Both Federal drinking-water standards and State ground-water quality standards are exceeded at this site. State ground-water quality law requires that action be taken to prevent the continual release of contaminants above standards into the ground water at the point of standards application. The multilayer cap and ground-water extraction and treatment are necessary to bring the site into compliance with not only State law but Federal law.

18. The Town's proposal does not meet all the criteria called for by CERCLA, the NCP, and State law. It supplies no treatment alternative. Institutional controls are not protective. Restoration of the beneficial uses of the aquifer is not provided for in the shortest time practicable. Thus, the Proposed Plan is the preferred remedy for this site.

ii. Oral comments.

(Representatives of the Town, including Warzyn, gave the above comments orally at the public meeting as well.)

3.

a. Comments in favor of a portion of the proposed plan.

i. Written comments

A. The U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service commented on behalf of the U.S. Department of the Interior (U.S. DOI). The U.S. Fish and Wildlife Service, upon receipt of the RI report, recommended that, at a minimum, ground-water extraction and treatment be implemented at the site.

Response

Alternative 5GW includes ground-water extraction and treatment as a principal part of the remedy.

b. Comments favoring limited or no action.

i. Written comments

A. LaCrosse County Health Department/LaCrosse County Board

The Director of the LaCrosse County Health Department indicated that,

based on the Health Assessment prepared by the Wisconsin Department of Health, he thought "more contamination or health problems would occur if the existing site was disturbed" and recommended that "the site be left as a sleeping dog." The County Board Chairman agreed.

Response

Presuming that "a sleeping dog" means No Action, the Agencies must disagree with the opinion that nothing should be done at this site. In fact, the Health Assessment (HA) confirmed the findings of the RI/FS Risk Assessment, in that the HA recognized that a potential health threat exists if the contaminated ground water were used for drinking. The Agencies' ground-water protection strategies, which have been discussed above, clearly anticipate that active response measures are necessary and practicable at this site.

B. State Senator Brian Rude

Senator Rude expressed concern over the scope of the Proposed Plan in light of two of the nine criteria - cost and community acceptance. He requested that the Proposed Plan be altered after taking into account the "financial and environmental concerns of the Town."

Response

Community acceptance of the remedy seems to be based on the cost, since the Town (thus its residents) is a PRP. The NCP directs the U.S. EPA to evaluate cost only when deciding between different remedies which provide the same level of protection or risk reduction (55 Fed. Reg. 8728).

C. U.S. Congressman Steve Gunderson

Congressman Gunderson expressed his concern with the scope of the Proposed Plan, in that it goes "much further than necessary to protect human health and the environment." Specifically:

1. The RI/FS report clearly shows that an expenditure of $6 million does not improve the ground water to the point where it is usable for human consumption.

2. The extent of ground-water contamination is small in comparison to the ground-water problems (apparently) being experienced by the City of LaCrosse.

3. The possibility of exposure increases due to air emissions and surface-water discharge of treated water, and the ground water will still be undrinkable.

4. An NR504 cap is expensive and carries a greater degree of risk to

workers and to the community, based on the RI/FS report.

5. Superfund allows for no action. Corrective actions are not necessary when the following conditions occur (Section 121(d)(2)(B)(ii)):

a. There are known and projected points of entry of ground water into surface water;

b. There is or will be no statistically significant increase in contaminant concentrations measurable or predicted to be measurable in the receiving surface water; and,

c. The remedial action includes enforceable measures that preclude human exposure.

The above conditions appear to be met at the Onalaska site, thus, Alternative 1GW may meet federal chemical-specific ARARs according to the RI/FS report.

6. In summary, the Town's proposal seems to be the best alternative. Presently the contaminants are isolated from human contact, and, with the above precautions, they would remain isolated and keep the level of risk low. The RI/FS report shows that little or no action is justified in this case.

Response

In keeping with CERCLA, the NCP, and State statutes, the U.S. EPA and WDNR Proposed Plan protects human health and the environment, meets ARARs, is cost effective, and uses treatment to the maximum extent practicable. The Town's proposal does not meet the Agencies' environmental mandate:

1. According to the RI/FS report, treatment of the ground water and naphtha-contaminated soils may enable the site to meet Federal drinking-water standards and State ground-water quality standards in the shortest period of time practicable, while no action would not.

2. The size of the contaminant plume is not the issue. The issue is whether the Proposed Plan meets the intent of CERCLA, the NCP, and Federal and State law. Comparison of the ground-water situation at the City of LaCrosse to that at the Onalaska site is, therefore, not directly possible. However, if additional areas in the City of LaCrosse warrant action through the Superfund program, any remedial action implemented in those areas will have to meet the same criteria as the Onalaska site.

3. As stated earlier, air emissions will be monitored, and controlled if necessary.

4. Construction risks to workers are of a voluntary nature and cannot be compared to the involuntary risks of ingestion of contaminated ground water. Construction of the multilayer cap is to reduce infiltration and

to meet State ARARs. If the risk was unacceptable, no State landfill would be capped in this manner.

5. As mentioned previously, the fact that a drinking-water well was placed within the exclusion zone is an indication that institutional controls can not be relied upon over the long term. With respect to the Section 121(d)(2)(B)(ii) criteria, it must be noted that:

a. The Agencies do not have complete assurance as to where ground water is discharging;

b. The Agencies cannot prove that no statistically significant increase of contaminant concentrations will occur due to natural attenuation; and,

c. The institutional controls proposed above are not sufficiently protective, as discussed above.

Additionally, Section 121 does not call for "No Action" if these criteria were met. Instead, the U.S. EPA may develop Alternate Concentration limits (ACLs) for ground-water cleanup. Moreover, the NCP also expects that if the Section 121 criteria were met, the U.S. EPA must also determine whether ground water treatment is practicable (55 Fed. Reg. 8754) to reach MCLs or other protective levels. The Agencies have determined that ground water treatment is practicable at this site.

Both Federal drinking-water standards and State ground-water quality standards, having been determined to be ARARs, must be met upon completion of the remedial action. CERCLA considers more stringent State standards to be ARARs in addition to Federal standards.

6. The RI/FS, in fact, shows that little or no action is not justified in light of the circumstances. Environmental receptors have been ignored by the Town's proposal, as well as potential human receptors.

Summary

Although several written comments were received in support of the proposed plan, the majority of comments have been in support of limited or no action. These comments seem to be based on economic reasoning rather than on environmentally protective reasoning. Many commentors did not fully consider the potential risk of ingestion of contaminated ground water or of contamination impacting the Black River wetlands, but rather focused on actual risk. The U.S. EPA must focus on actual and potential uses of resources when determining whether a remedy is adequately protective of human health and the environment.

The Town and the rest of the PRPs find themselves in a difficult position, trying to be both environmentally and fiscally responsible. The Town's limited tax base affects both sides of the equation, however. Notwithstanding, the Agencies believe that, based on Federal and State

environmental law, regulations, policies, and goals, it is prudent to meet the challenges head on rather than waiting for the situation to worsen before acting.

The U.S. EPA and the State will need to continue to work closely with the Town during remedy implementation.