RECORD OF DECISION

SELECTED REMEDIAL ACTION FOR THE STOUGHTON CITY LANDFILL SITE STOUGHTON, WISCONSIN

SITE NAME AND LOCATION

Stoughton City Landfill Site
Stoughton, Wisconsin

STATEMENT OF BASIS AND PURPOSE

This decision document presents the selected remedial action for the Stoughton City Landfill Site ("SCL Site") in Stoughton, Wisconsin, chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and, to the extent practicable, the National Contingency Plan (NCP). The decision is based on the Administrative Record for the SCL Site. The attached index identifies the items which comprise the Administrative Record upon which the selection of the remedial action is based.

The State of Wisconsin has been consulted and concurs with the selected remedial action.

ASSESSMENT OF THE SITE

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

DESCRIPTION OF SELECTED REMEDY

The selected remedial action will be the final remedial action at the Site. The remedy will address Site risks through placement of cap over the landfill area which meets the requirements of ch. NR 504, Wis. Adm. Code, in order to minimize the infiltration of

precipitation through the in-place wastes; extraction and above-ground treatment of contaminated groundwater to the west of the Site unless additional monitoring indicates that groundwater extraction is not required to achieve compliance with the State's ch. NR 140 groundwater quality standards; and excavation and consolidation of wastes in contact with groundwater along the southeastern and northeastern sections of the Site. The major components of the selected remedial action include:

* Site security measures including the placement of a fence around the entire Site perimeter;

* Placement of a solid waste disposal facility cap (NR 504 cap) over the Site;

* Extraction and treatment of contaminated groundwater, unless additional monitoring indicates that groundwater extraction is not required to achieve compliance with the State's ch. NR 140, Wis. Adm. Code, groundwater quality standards, and subsequent discharge to the Yahara River of the treated groundwater in compliance with Wisconsin Pollution Discharge Elimination System (WPDES) effluent limitations;

* Excavation of wastes in contact with groundwater in the southeastern and northeastern sections of the Site, and consolidation of these wastes under the cap;

* Land use restrictions to prevent the installation of a well within 1200 feet of the property boundary and to prevent residential development of the Site;

* Long-term groundwater monitoring to confirm the effectiveness of the other components of the selected remedial action.

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. The remedy utilizes permanent solutions and alternative treatment (or resource recovery) technologies 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, with respect to the groundwater component of the selected remedy. However, because treatment of the principal threats of the Site was not found to be practicable, this remedy does not satisfy the preference for treatment 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.

Valdas V. Adamkus
Regional Administrator

9/30/91
Date

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
STOUGHTON CITY LANDFILL SITE
STOUGHTON, WISCONSIN
****
TABLE OF CONTENTS

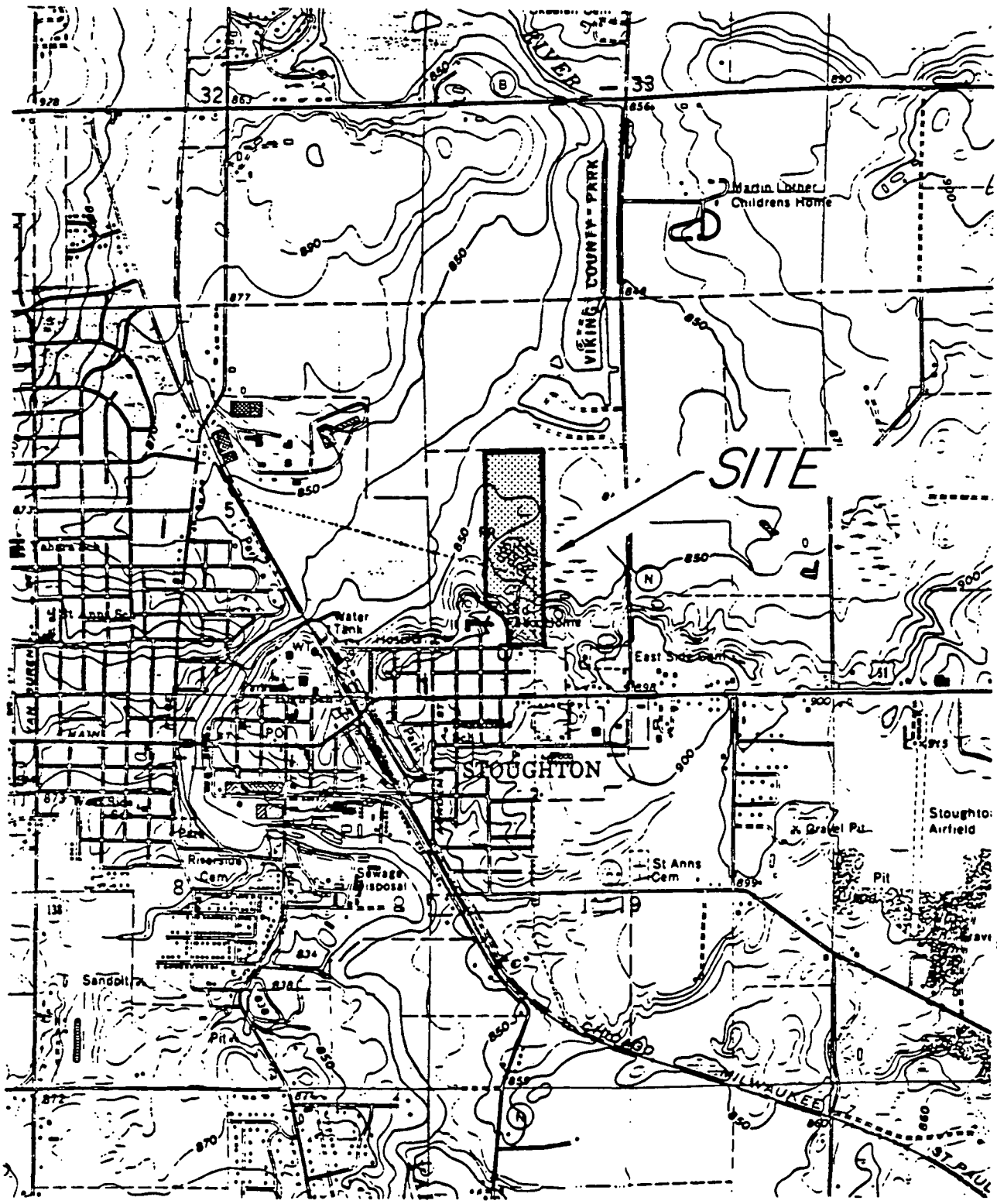
SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
Stoughton City Landfill Site
DANE COUNTY, WISCONSIN

I. SITE LOCATION AND DESCRIPTION

The Stoughton City Landfill Site is located in the northeast portion of Stoughton approximately 13 miles southeast of Madison, in Dane County, Wisconsin. (Figure 1-1.) The property containing the landfill Site encompasses approximately 27 acres and occupies portions of the W 1/2 of the SW 1/4 and the SW 1/4 of the NW 1/4 of Section 4, T.5N., R.11E. Although the landfill property originally occupied approximately 40 acres, landfilling has occurred on only about 15 acres of the property. Since 1982, land exchanges between the City and the owner of an adjacent property have modified the original property boundaries (Figure 1-3).

Figures 1-4 and 3-2 show existing Site conditions and topography, respectively. A wetland area that existed in the southeast portion of the current property boundary was the initial area of waste disposal. Wetlands occur adjacent to the southeast portion of the Site, in the north portion of the Site, and west of the Site along the Yahara River. The Yahara River is located west of the Site and comes within approximately 400 feet of the Site at its closest distance. The 100-year flood stage near the Site is 843 feet above mean sea level. The area of the Site in which waste disposal practices took place is elevated with respect to the flood stage (see Figure 3-3). Approximately 1/8 of the Site (the northeastern section which consists of wetlands) is situated within the 100-year floodplain of the Yahara River (see Figure 3-2 which shows lowland area of Site with respect to flood stage, i.e., elevation 843 above MSL). The nearest developed land occurs along Amundson Parkway, the Site access road to the south, where residential homes have been built. A more extensive residential area occurs approximately 1/4 mile south of the Site, where the City street grid pattern begins. The land immediately adjacent to the southern Site boundary remains undeveloped. There is no developed land in the vicinity of the Site to the west, north or east.

Surface water flow patterns indicate radial flow outward from the Site. Surface water runoff over most of the northern portion of the property flows to the drainage ditch in the north-central portion of the Site. This drainage ditch originates east of the Site and also receives flow from the wetland adjacent to the southeast portion of the property and land east of County Highway N. Surface water in the southwestern portion of the Site flows toward the drainage ditch along the southern property boundary,



APPROXIMATE SCALE (ft)

1000 0 1000 2000

Ref.: USGS, 7.5 - MINUTE STOUGHTON QUADRANGLE, DANE CO., WISCONSIN

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FIGURE 1-1

SITE LOCATION MAP

STOUGHTON CITY LANDFILL

STOUGHTON, WISCONSIN

DRAWN: JDG	DATE: 3/6/90	PROJECT NUMBER: 6885-002
APPVD:	REVISED:	DRAWING NUMBER:

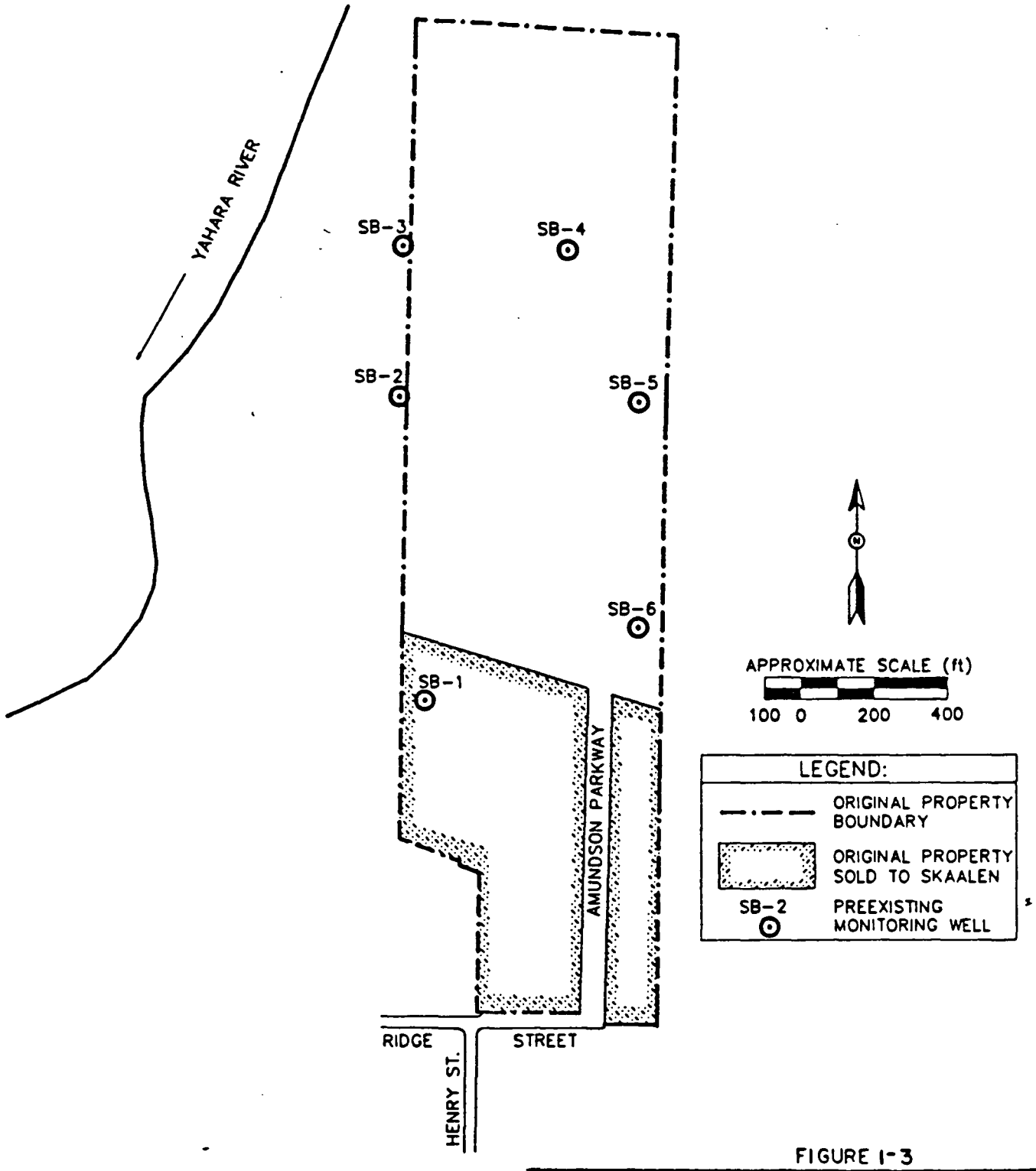

FIGURE 1-3

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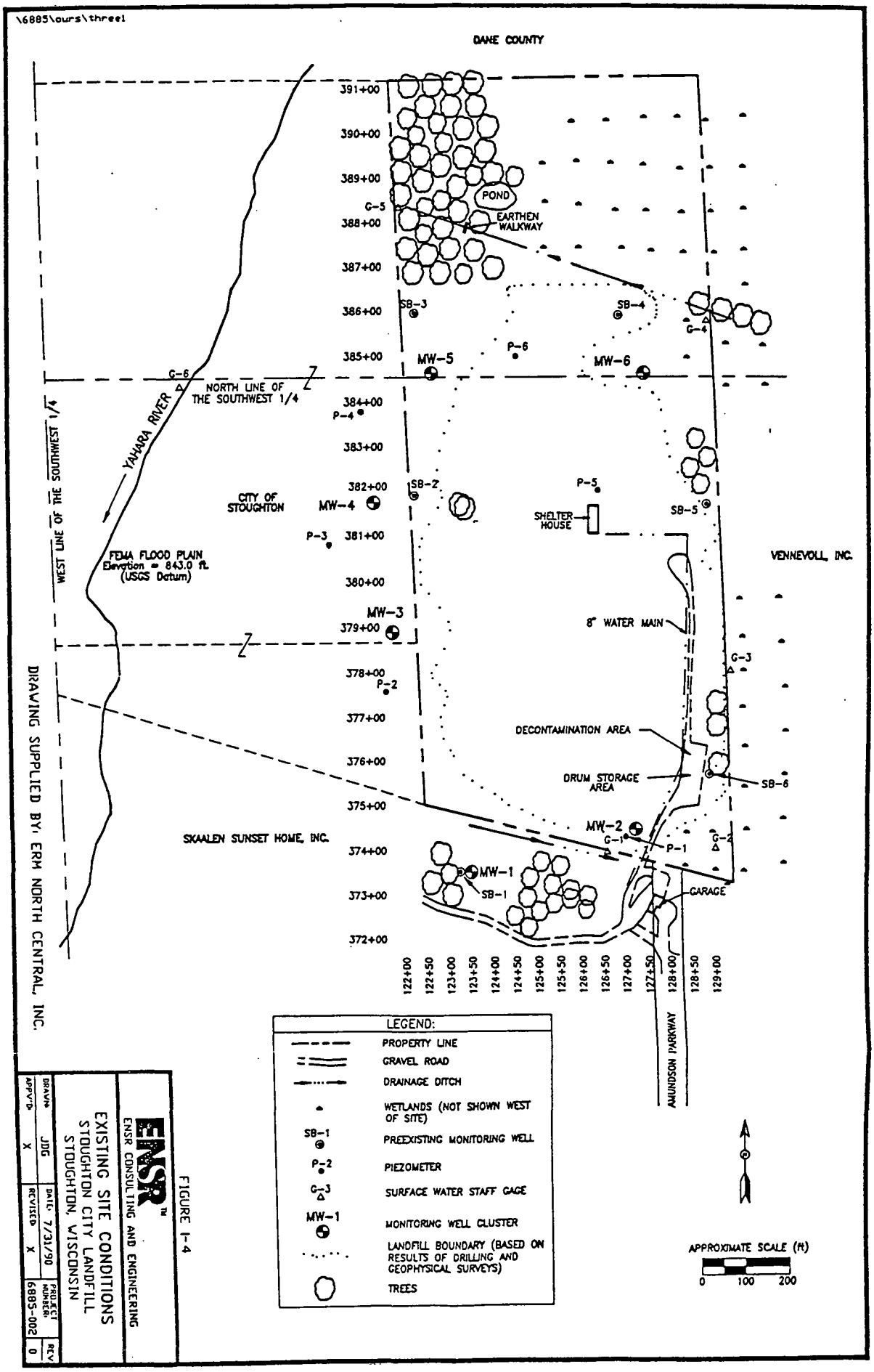
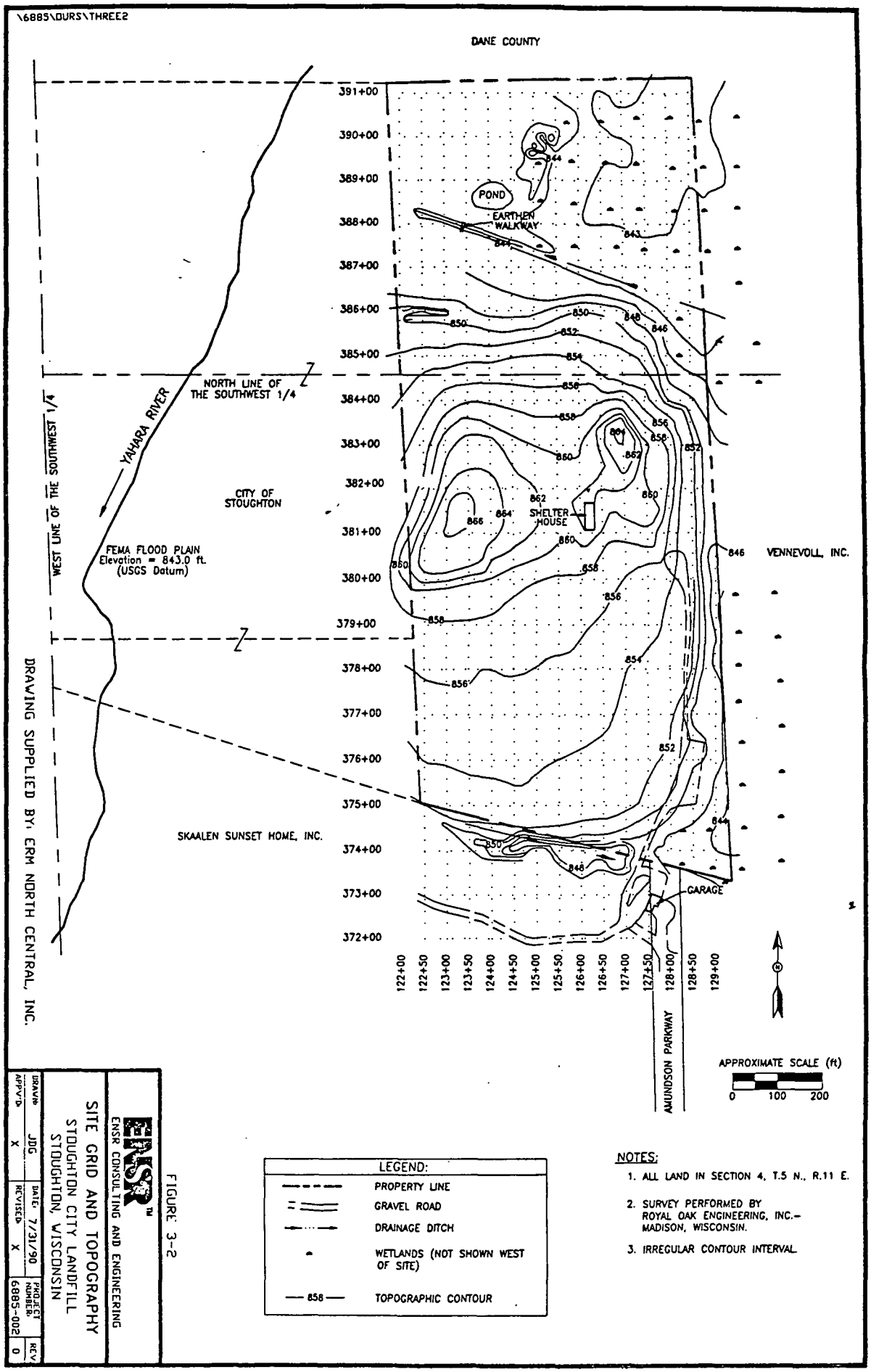
PREEXISTING MONITORING WELL LOCATIONS

STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN

DRAWN: HWW	DATE: 7/31/90	PROJECT NUMBER: 6885-002
APP'VD:	REVISED:	DRAWING NUMBER:


\6885\ours\three1
DANE COUNTY
391+00
390+00
389+00
388+00
387+00
386+00
385+00
384+00
383+00
382+00
381+00
380+00
379+00
378+00
377+00
376+00
375+00
374+00
373+00
372+00
POND
EARTHEN WALKWAY
G-5
SB-3
SB-4
G-4
P-6
MW-5
MW-6
G-6
NORTH LINE OF THE SOUTHWEST 1/4
YAHARA RIVER
P-4
WEST LINE OF THE SOUTHWEST 1/4
CITY OF STOUGHTON
MW-4
SB-2
P-5
SHELTER HOUSE
SB-5
P-3
FEMA FLOOD PLAIN
Elevation = 843.0 ft.
(USGS Datum)
VENNEVOLL, INC.
MW-3
8" WATER MAIN
G-3
P-2
DECONTAMINATION AREA
DRUM STORAGE AREA
SB-6
MW-2
G-1
P-1
G-2
SKAALEN SUNSET HOME, INC.
MW-1
SB-1
GARAGE
AMUNDSON PARKWAY
122+00
122+50
123+00
123+50
124+00
124+50
125+00
125+50
126+00
126+50
127+00
127+50
128+00
128+50
129+00
LEGEND:
PROPERTY LINE
GRAVEL ROAD
DRAINAGE DITCH
WETLANDS (NOT SHOWN WEST OF SITE)
SB-1 PREEXISTING MONITORING WELL
P-2 PIEZOMETER
G-3 SURFACE WATER STAFF GAGE
MW-1 MONITORING WELL CLUSTER
LANDFILL BOUNDARY (BASED ON RESULTS OF DRILLING AND GEOPHYSICAL SURVEYS)
TREES
APPROXIMATE SCALE (ft)
0
100
200
DRAWN JDG
APP'VD X
DATE 7/31/90
REVISED X
PROJECT NUMBER 6885-002
REV. 0
EXISTING SITE CONDITIONS
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN
ENSR CONSULTING AND ENGINEERING
FIGURE 1-4
DRAWING SUPPLIED BY: ERM NORTH CENTRAL, INC.

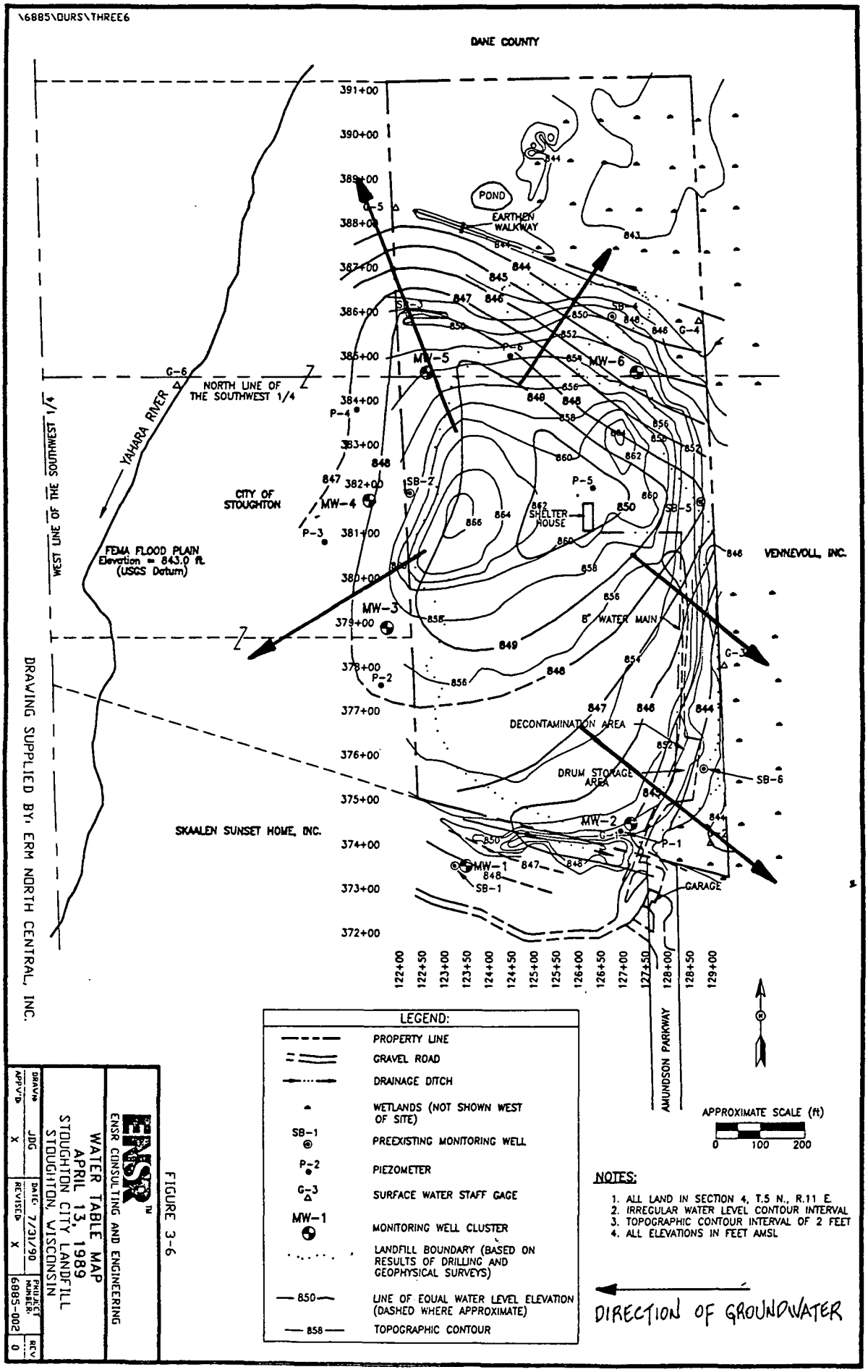

\6885\DURS\THREE2
DANE COUNTY
391+00
390+00
389+00
388+00
387+00
386+00
385+00
384+00
383+00
382+00
381+00
380+00
379+00
378+00
377+00
376+00
375+00
374+00
373+00
372+00
POND
EARTHEN WALKWAY
NORTH LINE OF THE SOUTHWEST 1/4
WEST LINE OF THE SOUTHWEST 1/4
YAHARA RIVER
CITY OF STOUGHTON
FEMA FLOOD PLAIN
Elevation = 843.0 ft.
(USGS Datum)
SHELTER HOUSE
VENNEVOLL, INC.
SKAALEN SUNSET HOME, INC.
GARAGE
AMUNDSON PARKWAY
122+00
122+50
123+00
123+50
124+00
124+50
125+00
125+50
126+00
126+50
127+00
127+50
128+00
128+50
129+00
APPROXIMATE SCALE (ft)
0
100
200
DRAWING SUPPLIED BY: ERM NORTH CENTRAL, INC.
LEGEND:
PROPERTY LINE
GRAVEL ROAD
DRAINAGE DITCH
WETLANDS (NOT SHOWN WEST OF SITE)
858
TOPOGRAPHIC CONTOUR
NOTES:
1. ALL LAND IN SECTION 4, T.5 N., R.11 E.
2. SURVEY PERFORMED BY ROYAL OAK ENGINEERING, INC.- MADISON, WISCONSIN.
3. IRREGULAR CONTOUR INTERVAL.
ENSR CONSULTING AND ENGINEERING
SITE GRID AND TOPOGRAPHY
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN
DRAWN: JDG
APP'VD: X
DATE: 7/31/90
REVISED: X
PROJECT NUMBER: 6885-002
REV: 0
FIGURE 3-2

which drains toward the wetlands adjacent to the southeastern portions of the Site. Surface water in the south-central and southeastern portions of the property drains directly to the wetlands. In summary, most of the surface water drains to wetlands east and north of the Site and eventually flows to the Yahara River via a drainage ditch. A small portion of the west-central area of the Site drains directly into the wetlands adjacent to the Yahara River. (Figure 3-3).

Surficial deposits in the vicinity of the Site include ice-contact stratified deposits and lacustrine plain sediments (Mickelson and McCartney, 1979). Ice-contact stratified deposits generally include significant sand and gravel deposits and land forms such as kames and eskers. These deposits occupy higher ground within the landfill and south of it. Lacustrine plain or glacial lake-bottom sediments are generally composed of fine-grained silt and clay. Some sand is present near former shorelines and stream inlets. These areas are often flat, poorly drained, and show evidence of peat accumulation. Lacustrine plain deposits occupy the southeast portion of the current property boundary, which was initially developed for waste disposal, and the low-lying ground adjacent to the east, north, and west portion of the Site. Lacustrine plain sediments are generally overlain by younger marsh deposits.

Surficial deposits in the vicinity of the Site are underlain by glacial outwash that was deposited in the preglacial Yahara River Valley. Approximately 150 to 250 feet of unconsolidated glacial sediments are reported to overlie Cambrian sandstone bedrock in the vicinity of the Site (Cline 1965). These unconsolidated sediments consist mostly of stratified and sorted sand and gravel. Some of the outwash in the eastern two-thirds of the county is reported by Cline to contain boulders.

Regional groundwater flow is toward the Yahara River, which serves as a groundwater discharge. Groundwater flow in the surficial aquifer is radial beneath the Site. (Figure 3-6). Average aquifer characteristics of the surficial aquifer are: 1. horizontal flow gradient = 1.36E-02 ft/ft; 2. vertical flow gradient = 2.79E-02 ft/ft (upward); 3. hydraulic conductivity = 15.6 ft/day; and 4. horizontal groundwater velocity = 0.604 ft/day. There are variations around the Site from location to location. For instance, the hydraulic conductivity at monitoring well clusters 3 and 4 is approximately 20.6 ft/day, the average horizontal gradient is 9.11E-03 ft/ft, and the average vertical gradient is virtually zero. Along the southeastern section of the Site, at monitoring well cluster 2, there is an upward vertical gradient of 0.13 ft/ft. The two aquifers are hydraulically connected. Municipal Well #3 is situated about 3000 ft west of the Site and is set in the sandstone bedrock, as an open pipe from roughly 210 ft below ground surface to 940 ft below ground surface.



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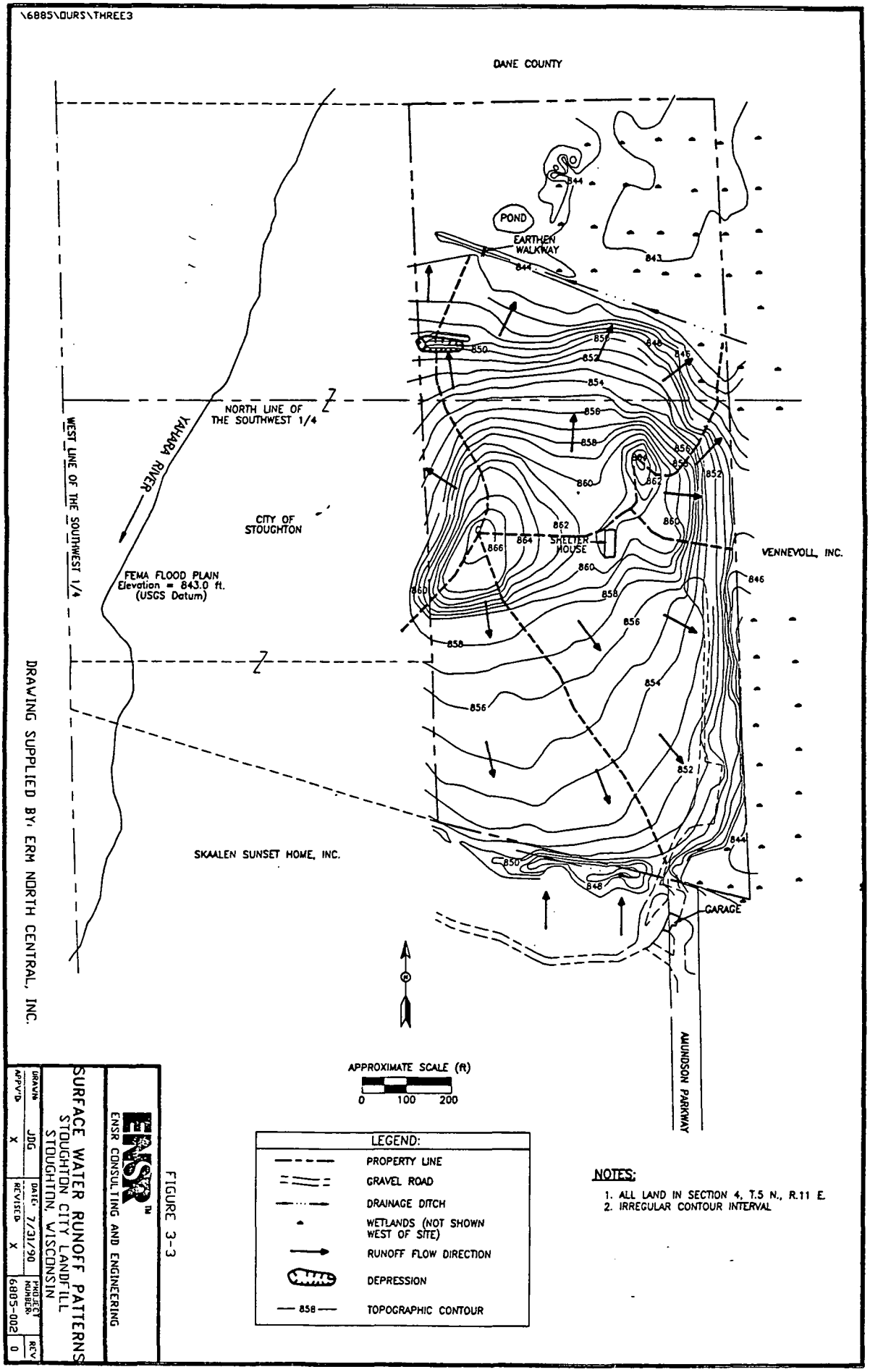
WATER TABLE MAP
APRIL 13, 1989
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN

DRAWN	DATE	PROJECT NUMBER	REV.
JDG	7/31/90	6985-002	0
APPVD	REVISED		
X	X		

FIGURE 3-6


\6885\OURS\THREE3
DANE COUNTY
POND
EARTHEN WALKWAY
NORTH LINE OF THE SOUTHWEST 1/4
WEST LINE OF THE SOUTHWEST 1/4
YAHARA RIVER
CITY OF STOUGHTON
FEMA FLOOD PLAIN Elevation = 843.0 ft. (USGS Datum)
SHELTER HOUSE
VENNEVOLL, INC.
SKAALEN SUNSET HOME, INC.
GARAGE
AMUNDSON PARKWAY
APPROXIMATE SCALE (ft)
0 100 200
LEGEND:
PROPERTY LINE
GRAVEL ROAD
DRAINAGE DITCH
WETLANDS (NOT SHOWN WEST OF SITE)
RUNOFF FLOW DIRECTION
DEPRESSION
858 TOPOGRAPHIC CONTOUR
NOTES:
1. ALL LAND IN SECTION 4, T.5 N., R.11 E.
2. IRREGULAR CONTOUR INTERVAL
DRAWING SUPPLIED BY: ERM NORTH CENTRAL, INC.
ENSR CONSULTING AND ENGINEERING
SURFACE WATER RUNOFF PATTERNS
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN
DRAWN JDG
APP'VD X
DATE 7/31/90
REVISED X
PROJECT NUMBER 6885-002
REV 0
FIGURE 3-3

II. SITE HISTORY

The City of Stoughton purchased the original 40-acre Site in July 1952, and annexed it in September 1952, when landfill operation began at the Site. Between 1952 and 1969, the Site was operated as an uncontrolled dump Site. During this time, refuse was usually burned or covered by dirt. In 1969, the Site began operation as a State-licensed landfill. In 1977, the Wisconsin Department of Natural Resources (WDNR) required that the Site be closed according to State regulations. Closure activities included construction of a trash transfer station, placement of cover material borrowed from the northwest portion of the Site and from agricultural areas, application of topsoil also derived from an agricultural area, and seeding. From 1978 to 1982 only brick, rubble, and similar construction materials were accepted at the Site while closure work was performed. The landfill was officially closed in 1982.

Common municipal waste and both dry and liquid wastes were disposed at the Stoughton City Landfill. Dry waste included sludge materials, empty rejected metal spray containers (used for storing multi-purpose lubricants), and used appliances. Some sludge materials containing 2-butanone, acetone, tetrahydrofuran, toluene, and xylene mixtures, were disposed at the Site from 1954 until 1962. During this period, the liquid wastes were commonly poured over garbage and burned. It was also reported that some liquid wastes were poured down holes drilled to test auger drilling equipment in the west-central portion of the landfill.

The Stoughton City Landfill is currently an inactive facility. Vehicular access to the Site is controlled by a set of gates that are kept locked at all times. In addition, snow-fencing was installed along the southern property boundary upon initiation of the RI. Warning signs were placed along the snow-fencing and on signposts installed on the west, north, and east property boundaries.

The Site was placed on the National Priorities List (NPL) in June 1986. In March 1988, Uniroyal Plastics, Inc. and the City of Stoughton (the Potentially Responsible Parties or PRPs) entered into an Administrative Order by Consent ("AOC" or "the Order") with U.S. EPA and WDNR for the conduct of a Remedial Investigation and Feasibility Study (RI/FS). ERM - North Central was originally contracted by the PRP's to conduct all work related to the RI/FS. ERM was replaced by ENSR Consulting and Engineering in 1990 to complete all remaining tasks of the RI/FS.

RI field activities began in March 1989. The first round of groundwater monitoring occurred in May and June 1989. Routine analyses were run for Target Compound List (TCL) inorganics and organics as well as for non-standard volatile organics, tetrahydrofuran (THF), trichloroflouromethane and dichlorodiflouromethane. A second round of groundwater sampling

occurred in May and June 1990. At that time, background surface water and sediment samples were taken from the wetlands east of the Site and from the area between the Yahara River and western edge of the Site. The results of the RI field sampling are summarized in Table 5-1.

An ecological Site assessment was conducted by U.S. EPA in May 1991. A preliminary ecological assessment was subsequently prepared in July 1991. The results of that preliminary assessment are as follows; "

> The wetlands surrounding the landfill are the main points of exposure for ecological receptors; they currently receive leachate discharge and in the past received surface water runoff from the landfill. Because the Site occurs in a relatively undeveloped area, a wide variety and number of terrestrial and aquatic organisms may be exposed to the Site contaminants. The wetlands and woods surrounding the Site provide excellent habitat for many species of birds, mammals, reptiles, amphibians, and invertebrates. Comparison of unfiltered surface water samples with criteria and other data indicate potential risks to aquatic life from Site-related contamination at SL-1 and SL-2, immediately adjacent to the southeast part of the landfill in leachate discharge areas, and possible risks to sediment-dwelling organisms at SL-1, SL-2, SL-7, and SL-8."

The preliminary report goes on to recommend that aquatic and whole-sediment toxicity tests and community surveys be conducted to assess the actual impact to organisms in the wetlands east of the Site. The report also states, "Remedial actions planned or suggested for the landfill that adequately control contaminated groundwater release from the Site should be sufficiently protective of aquatic biota."

Feasibility Study (FS) activities began in November 1989 with the submittal of the Alternatives Array Document. A draft FS was submitted on January 17, 1991. The Final FS was submitted to U.S. EPA and WDNR in June 1991. The Final FS was placed into the Site repository prior to the start of the public comment period. Attached to the FS were comments provided by U.S. EPA and WDNR which highlighted deficiencies with the document in the areas of presentation of current Site conditions, human health risks, risks to the environment, and rationale for remedy selection.

III. ENFORCEMENT HISTORY

U.S. EPA sent Information Request Letters pursuant to Section 104 of CERCLA on August 1, 1987 to the City of Stoughton, Uniroyal, Bjoin Transfer, IKI, and City Disposal. Based on the responses and other evidence, only Uniroyal, a generator and transporter, and the

Table 5-1 (page 1 of 4)

SUMMARY OF RESULTS OF WASTE AND
ENVIRONMENTAL MEDIA SAMPLE ANALYSES
Stoughton City Landfill
Stoughton, Wisconsin

CHEMICAL	WASTE (ug/kg) (i.e., @ MW2, MW6) Freq*	WASTE (ug/kg) (i.e., @ MW2, MW6) Detected Range	SOIL (ug/kg) Freq	SOIL (ug/kg) Detected Range	GW (ug/l) Freq	GW (ug/l) Detected Range
VOLATILE ORGANICS						
Benzene	1/6	2.0J				
2-butanone						
Chloroform	1/6	1.0J				
1,2-dichloroethene (cis and trans)					1/36	8.0
1,2-dichloroethene (trans only)						
Ethyl benzene						
Toluene						
Xylenes (total)					3/36	1.0J
Dichlorodifluoromethane					7/42	16J - 240J
Trichlorofluoromethane					6/42	6.4J - 24J
Tetrahydrofuran					6/44	27 - 660J
Tentatively identified compounds:						
Dichloromethane					1/30	38J
SEMIVOLATILE ORGANICS						
Benzoic acid					1/36	2.0J
Benzyl alcohol						
Bis(2-ethylhexyl)phthalate	4/6	95J - 600000J			3/36	2.0J - 44J
Butyl benzyl phthalate	1/6	230J				
Di-n-butyl phthalate	1/6	39J				
Di-n-octyl phthalate						
Acenapthene	1/6	72J				
Acenapthylene	1/6	88J				
2-methyl napthalene	1/6	52J				
Napthalene	1/6	180J				
Pentachlorophenol					1/36	3.0J
Anthracene	1/6	210J				
Benzo(a)anthracene	3/5	46J - 480				
Benzo(b)fluoranthene (coelutes w/ Benzo(k)fluoranthene)	4/6	120J - 730J				
Benzo(g,h,i)perylene	4/6	54J - 210J				
Benzo(a)pyrene	4/6	72J - 370J				
Chrysene	4/6	63J - 340J				
Dibenzo(a,h)anthracene	1/6	71J				
Fluoranthene	4/6	53J - 700				
Fluorene	1/6	160J				
Ideno(1,2,3-cd)pyrene	4/6	43J - 180J				
Phenanthrene	2/6	860 - 1800J				s
Pyrene	2/6	61J - 570				
Tentatively identified compounds:						
Alkane	1/2	2160J	3/5	250J - 590J		
Carboxylic acids						
Polyaromatic hydrocarbon	2/2	260J - 4310J				
Unknown hydrocarbons					1/30	340J
Adipate						
Aldol condensates					1/30	2J
Benzene derivative	1/2	170J				
N-butyl benzene sulfonamide					1/30	14J
N,N-diethyl, 1,3-methylbenzamide					2/30	18J - 36J
1-(ethyloxy)pentane						
Phosphoric acid derivative	1/2	17,610J				
Phthalate esters	1/2	4,910J				
Sulfur molecule	1/2	450J				
Vitamin E						
PESTICIDES/PCBs						
4,4'-DDD	1/6	270				

Table 5-1 (page 2 of 4)

SUMMARY OF RESULTS OF WASTE AND
ENVIRONMENTAL MEDIA SAMPLE ANSLYSES
Stoughton City Landfill
Stoughton, Wisconsin

CHEMICAL	SW (ug/l)		SEDIMENT (ug/kg)		AIR (ppm)	
	Freq	Detected Range	Freq	Detected Range	Freq	Detected Range
VOLATILE ORGANICS						
Benzene					1/7	0.06
2-butanone			1/9	8.0J		
Chloroform					1/7	0.02
1,2-dichloroethene (cis and trans)					1/7	0.04
1,2-dichloroethene (trans only)					1/7	0.08
Ethyl benzene						
Toluene						
Xylenes (total)						
Dichlorodifluoromethane	2/16	1.5J - 3				
Trichlorofluoromethane						
Tetrahydrofuran						
Tentatively identified compounds:						
Dichloromethane						
SEMIVOLATILE ORGANICS						
Benzoic acid			3/9	100J - 2800J(b)		
Benzyl alcohol			1/9	170J		
Bis(2-ethylhexyl)phthalate			7/9	68J - 590J(b)		
Butyl benzyl phthalate						
Di-n-butyl phthalate						
Di-n-octyl phthalate			1/9	58J		
Acenapthene						
Acenapthylene						
2-methyl napthalene						
Napthalene						
Pentachlorophenol						
Anthracene						
Benzo(a)anthracene						
Benzo(b)fluoranthene (coelutes w/ Benzo(k)fluoranthene)			1/9	64J		
Benzo(g,h,i)perylene						
Benzo(a)pyrene						
Chrysene			1/9	66J		
Dibenzo(a,h)anthracene						
Fluoranthene			1/9	110J		
Fluorene						
Ideno(1,2,3-cd)pyrene						
Phenanthrene			1/9	69J		
Pyrene			2/9	72J - 82J		
Tentatively identified compounds:						
Alkane			7/9	580J - 9300J		
Carboxylic acids	1/7	54J	1/9	10600J(b)		
Polyaromatic hydrocarbon			1/9	1300J		
Unknown hydrocarbons			8/9	3880J - 67130J(b)		
Adipate			1/9	470J		
Aldol condensates						
Benzene derivative						
N-butyl benzene sufflonamide						
N,N,-diethyl,1,3-methyl benzamide						
1-(ethyloxy)pentane			1/9	360J		
Phosphoric acid derivative						
Phthalate esters						
Sulfur molecule			1/9	3,900J		
Vitamin E			3/9	970J - 4,100J		
PESTICIDES/PCBs						
4,4'-DDD						

Table 5-1 (page 3 of 4)

SUMMARY OF RESULTS OF WASTE AND
ENVIRONMENTAL MEDIA SAMPLE ANALYSES
Stoughton City Landfill
Stoughton, Wisconsin

CHEMICAL	WASTE (mg/kg) [B] (i.e., @ MW2, MW6)		SOIL (mg/kg) [B]		GW (ug/l) [B]	
	Freq	Detected Range	Freq	Detected Range	Freq	Detected Range
INORGANICS						
Aluminum					1/15	131J
Antimony	1/2	15.8J			2/15	33.2J - 33.6J
Arsenic					6/15	1.4J - 5.2J
Barium					3/15	352 - 391
Beryllium	1/2	0.37J				
Cadmium	1/2	27				
Chromium	1/2	40J			1/15	8J
Cobalt						
Copper						
Lead	1/2	460J			1/15	3.6J
Manganese					5/15	873 - 2330
Mercury	1/2	0.62				
Nickel					2/15	19.6J - 20.1J
Selenium					1/5	7.4J
Vanadium						
Zinc						
Calcium	1/2	35,200J	3/7	68,400 - 108,552	3/15	167,000 - 175,000
Magnesium			3/7	38,400 - 39,922	3/15	79,300 - 83,400
Potassium			1/7	611	12/15	17,200 - 156,000
Iron						

Table 5-1 (page 4 of 4)

SUMMARY OF RESULTS OF WASTE AND
ENVIRONMENTAL MEDIA SAMPLE ANALYSES
Stoughton City Landfill
Stoughton, Wisconsin

CHEMICAL	SW (ug/l) [B] Freq	SW (ug/l) [B] Detected Range	SEDIMENT (mg/kg) [B] Freq	SEDIMENT (mg/kg) [B] Detected Range
INORGANICS				
Aluminum	6/7	162J - 12,600		
Antimony				
Arsenic	7/7	2.8J - 7.3J		
Barium	4/7	294 - 457		
Beryllium				
Cadmium			4/9	1.6J - 23.3J
Chromium	4/7	6.8J - 16.5		
Cobalt	4/7	5.1J - 16.3J		
Copper	1/7	33.9		
Lead	4/7	15.2J - 68.6J	1/9	172J
Manganese	5/7	792J - 4,480	1/9	746J
Mercury				
Nickel	2/7	42.3J - 51.2J		
Selenium				
Vanadium	4/7	23.3J - 54.2		
Zinc	4/7	127J - 327J		
Calcium	3/7	134,000 - 154,000		
Magnesium	2/7	123,000 - 125,000		
Sodium				
Potassium	7/7	5,440 - 49,100		
Iron	5/7	5,530 - 46,600J		

NOTES: *Frequency based on number of detections for investigative, field duplicate, matrix spike, and matrix spike duplicate sample analyses. Samples not analyzed (NA), flagged as R, or background samples were not included in the frequency determination.

Frequency based on number of detections above quantitation limits for all sampling rounds. Chemicals based on investigative field replicate, matrix spike, and matrix spike duplicate sample analyses.

J - Indicates an estimated value.

[B] denotes that values were compared to background; only those in excess of twice background are presented as detections.

(b) denotes compound was also detected in background samples.

City of Stoughton, the owner/operator, were issued special notice under Section 122 of CERCLA for the RI/FS. No further evidence has been discovered which would indicate that anyone other than these two entities should be sent special notice letters (SNL's) for RD/RA.

On March 29, 1988 and April 15, 1988, the Secretary of the WDNR and Director of U.S. EPA Region V's Waste Management Division, respectively, signed a CERCLA 106 Administrative Order by Consent with Uniroyal and the City of Stoughton stipulating the undertaking of a Remedial Investigation and Feasibility Study (RI/FS) for the purposes of determining the nature and extent of the threat to the public health or welfare or the environment due to the release or threatened release of hazardous substances or contaminants from the Site and to evaluate appropriate remedial action alternatives to prevent or mitigate the migration or release of hazardous substances or contaminants from the Site.

The signed Order underwent a mandatory 30 day public comment period shortly thereafter. No comments were received during public comment and the Order became effective on May 2, 1988.

IV. COMMUNITY PARTICIPATION

Pursuant to Sections 113(k)(2)(b)(i-v) and 117 of CERCLA, the Stoughton 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 Stoughton Hub Courier, a local paper of general circulation;

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

* The three 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 at the Stoughton Public Library.

* A Proposed Plan for remedial action was released for public comment and placed into the Administrative Record on July 12, 1991 with the 30-day comment period ending August 12, 1991. A Notice of Availability of the Proposed Plan was published in the Stoughton Hub Courier prior to the release of the Proposed Plan;

* A public meeting was held on July 24, 1991, in the Site proximity, at which the U.S. EPA and the WDNR presented the Proposed Plan, as well as the findings of the RI/FS 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;

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

V. SCOPE AND ROLE OF REMEDIAL ACTIVITIES

Due to the complexity of the environmental setting and the potential for the primary contaminant, tetrahydrofuran (THF), to move throughout the aquifer, the response action will focus on controlling the source of contamination (i.e., the landfill contents), extracting and treating the contaminated groundwater unless U.S. EPA determines after further investigation it is not necessary to meet clean-up goals, and protecting the adjacent wetlands by reducing the leaching of iron and other metals into them.

The landfilled waste is classified as a low level threat waste, which will be contained on Site. Treatment of the landfill contents is inappropriate because of the size of the landfill and the absence of known "hot spots" (i.e., areas of concentrated hazardous substances) that represent a principal threat. Contaminated groundwater will be treated prior to discharge to the Yahara River, unless further investigative work indicates that groundwater extraction and treatment will not be necessary.

The goal of the Superfund 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. The Site-specific clean-up goals for the SCL Site are:

* To minimize direct contact with the wastes;

* To minimize the further movement of contaminants to groundwater by reducing the amount of precipitation which infiltrates the landfill;

* To contain the movement of contaminants in the groundwater in order to prevent contaminants from leaving the Site boundary;

* To extract and treat groundwater to meet State water quality discharge limits;

* To restore the groundwater to State groundwater quality standards.

A total of eight remedial alternatives, including the No Action Alternative, were developed for the final version of the FS.

These alternatives were screened and compared to each other and evaluated with respect to the Nine Evaluation Criteria set forth in the NCP. The Proposed Plan presented an evaluation of nine alternatives, which included U.S. EPA's preferred remedy. This decision document reflects the Agency's selected alternative which is the preferred remedy identified in the Proposed Plan with a contingency regarding the groundwater component of the remedy (see Section IX of this ROD).

VI. SUMMARY OF SITE CHARACTERISTICS

The boundaries of the landfill were defined using geophysical surveys and information obtained from a review of historical aerial photographs. The south boundary was modified based on drilling performed later in the RI. Figure 1-4 shows the landfill boundary defined as part of the RI. An estimated 218,000 cubic yards of waste are in place at the landfill.

A variety of VOCs were measured in the soil gas survey conducted across the landfill. Dichlorodifluoromethane was detected at greatest concentrations and was most widely distributed across the landfill. Other VOCs, including trans-1,2-dichloroethene, trichloroethene, toluene, tetrahydrofuran, benzene, and total xylenes, were also detected. Many of these constituents were concentrated in the west-central portion of the landfill; however, high concentrations of the various compounds were localized in other areas across the landfill.

Refuse was apparently initially deposited in wetlands in the southeast portion of the Site, and then later in the extreme north portion of the landfill. In the southeast area, the refuse is saturated to a maximum thickness of approximately 5 feet. The degree of refuse saturation is less in the north portion of the Site.

The landfill was closed in 1982 according to then applicable State regulations. Closure activities included the placement of cover material. Cover materials encountered during well installation and the soil gas survey were clay or silty clay; however, a detailed cap study was not conducted as part of the RI. In general, the condition of the cover material appears to be sound. An exception to this is along a small portion of the east landfill boundary where animal holes exist. Some metallic waste is visible in these animal holes.

A total of three rounds of groundwater sampling and analysis were performed at monitoring well locations shown on Figure 1-8; however, metals were determined only for one sampling round (Round 1) and Target Compound List (TCL) organics for two sampling rounds (Rounds 1 and 2). All monitoring wells are screened in sand and gravel deposits with the exception of MW-2S

which is screened in refuse and lacustrine plain sediments (silty and sandy clay). The presence of potential contamination in the bedrock aquifer was not previously evaluated as part of the RI. Such an evaluation will take place during the additional work activities.

Results of the RI indicated that groundwater to the west of the Site is contaminated with tetrahydrofuan (THF) in concentrations which exceed the State Enforcement Standard by more than one order of magnitude (660 µg/l vs. 50 µg/l). Limited sampling and analyses were conducted on the waste itself, and the results did indicate the presence of polynuclear aromatic hydrocarbons (PAH's) and pthalates. PAH's were found within several times the Contract Required Quantification Limit (CRQL) for a variety of compounds. Bis(2-ethylhexyl) phthalate, (BEHP), was detected in waste in concentrations as high as 600,000 µg/kg. Sediments in the eastern wetlands were found to contain elevated levels of aluminum, calcium and magnesium. PAH's, phthalates, benzoic acid, cadmium and lead were found in low concentrations in sediment samples taken from the wetlands southeast of the Site.

Tetrahydrofuran was measured at MW-3D at concentrations above the Wisconsin enforcement standard (50 µg/L) during all three sampling rounds. Tetrahydrofuran was also measured in one sampling round at MW-4D and MW-5S above the Wisconsin preventive action limit (PAL) concentration (10 µg/L). There are presently no Federal drinking water standards for THF.

Trichlorofluoromethane was measured in MW-5S and MW-5D during all sampling rounds at concentrations below the Wisconsin PAL (698 µg/L).

Dichlorodifluoromethane was detected in MW-3D, MW-5S, and MW-5D in concentrations from 16 µg/L to 240 µg/L during some sampling rounds. No Federal groundwater standards exist for dichlorodifluoromethane. The State does have an interim recommended PAL of 300 µg/L for this compound.

Bis(2-ethylhexyl)phthalate was measured during some sampling rounds at MW-3D and MW-4D at low concentrations. Pentachlorophenol and benzoic acid were detected at very low concentrations in MW-6S and MW-6D, respectively, during one sampling round.

Elevated concentrations of metals were detected in various shallow and deep monitoring wells located in all directions away from the Site, excluding the northeast direction. The concentration of arsenic (5.2 µg/L) was marginally above the PAL of 5 µg/L in MW-2S in one replicate sample. The highest concentration of barium in MW-2S (293 µg/L) was also above the PAL of 200 µg/L. The hydraulic gradient is vertically upward at MW-2S and MW-2D, toward the adjacent wetlands. The concentration

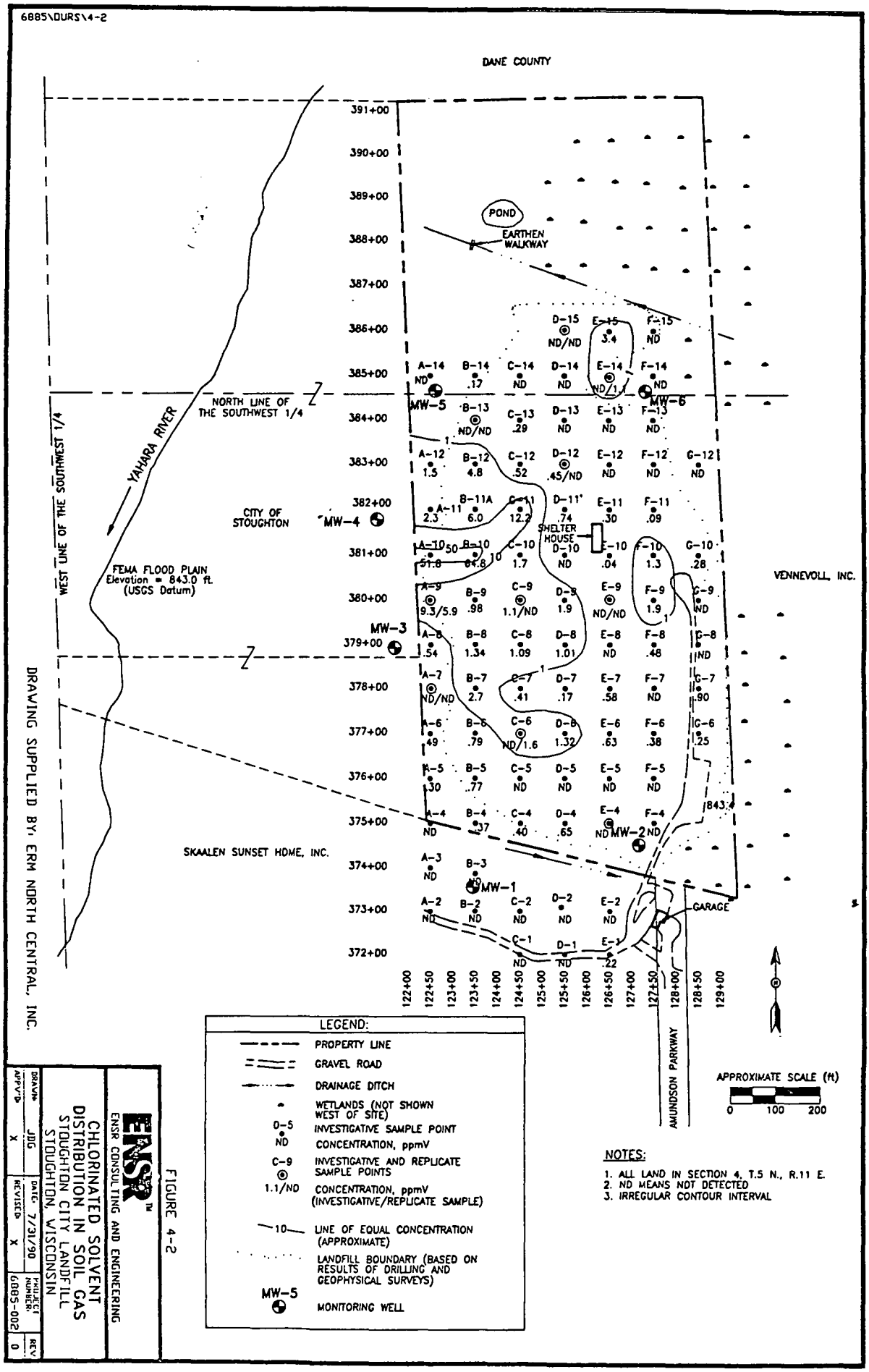


FIGURE 4-2

CHLORINATED SOLVENT DISTRIBUTION IN SOIL GAS
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN

ENSR CONSULTING AND ENGINEERING

DRAWN	JDG	DATE: 7/31/90	PROJECT NUMBER: 6885-002	REV. 0
APP'VD	X	REVISED X		

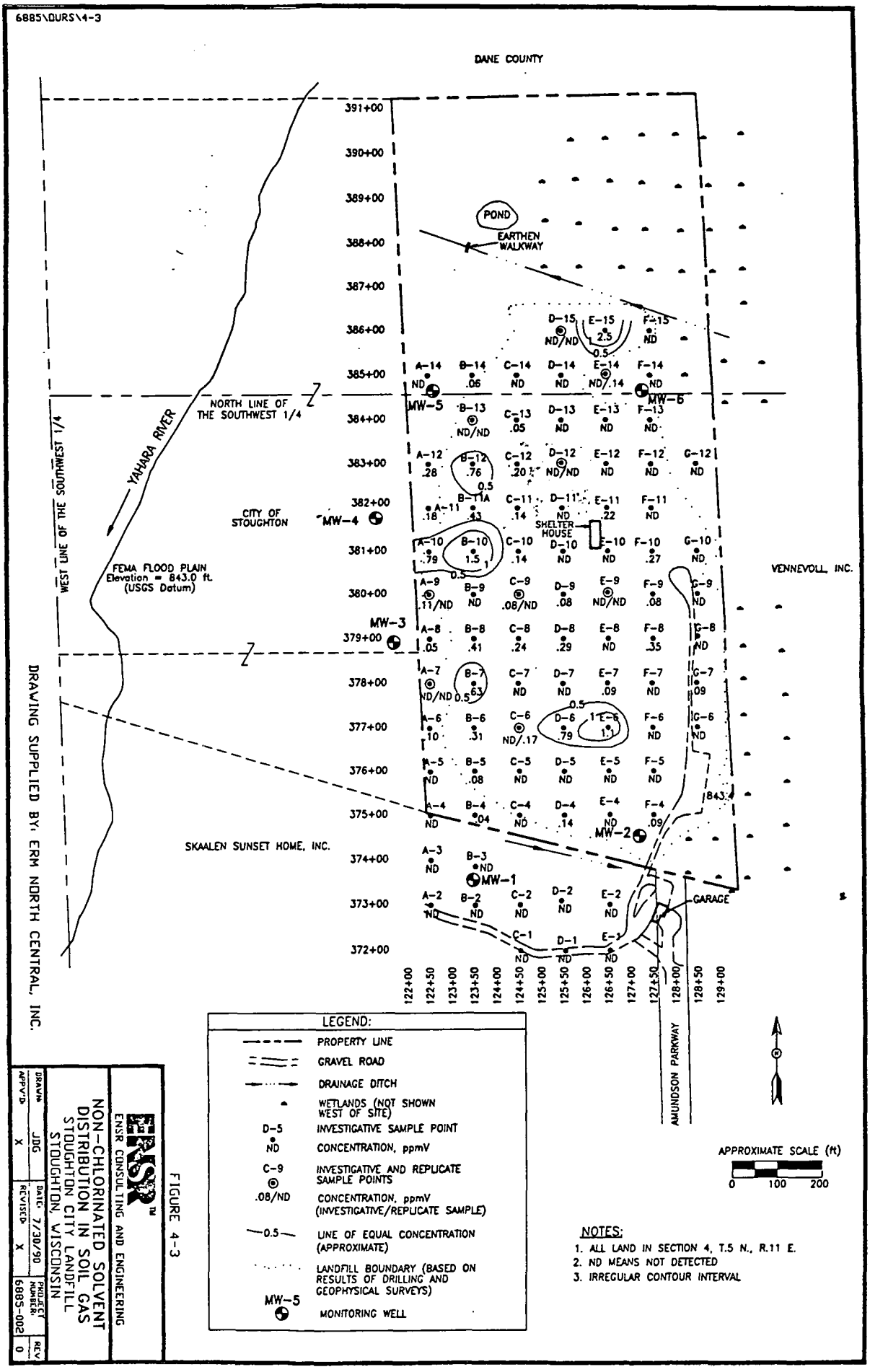


FIGURE 4-3

ENSR CONSULTING AND ENGINEERING

NON-CHLORINATED SOLVENT DISTRIBUTION IN SOIL GAS
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN

DRAWN	APP'VD.	DATE	REVISED	PROJECT NUMBER	REV.
JDG	X	7/30/90	X	6885-002	0

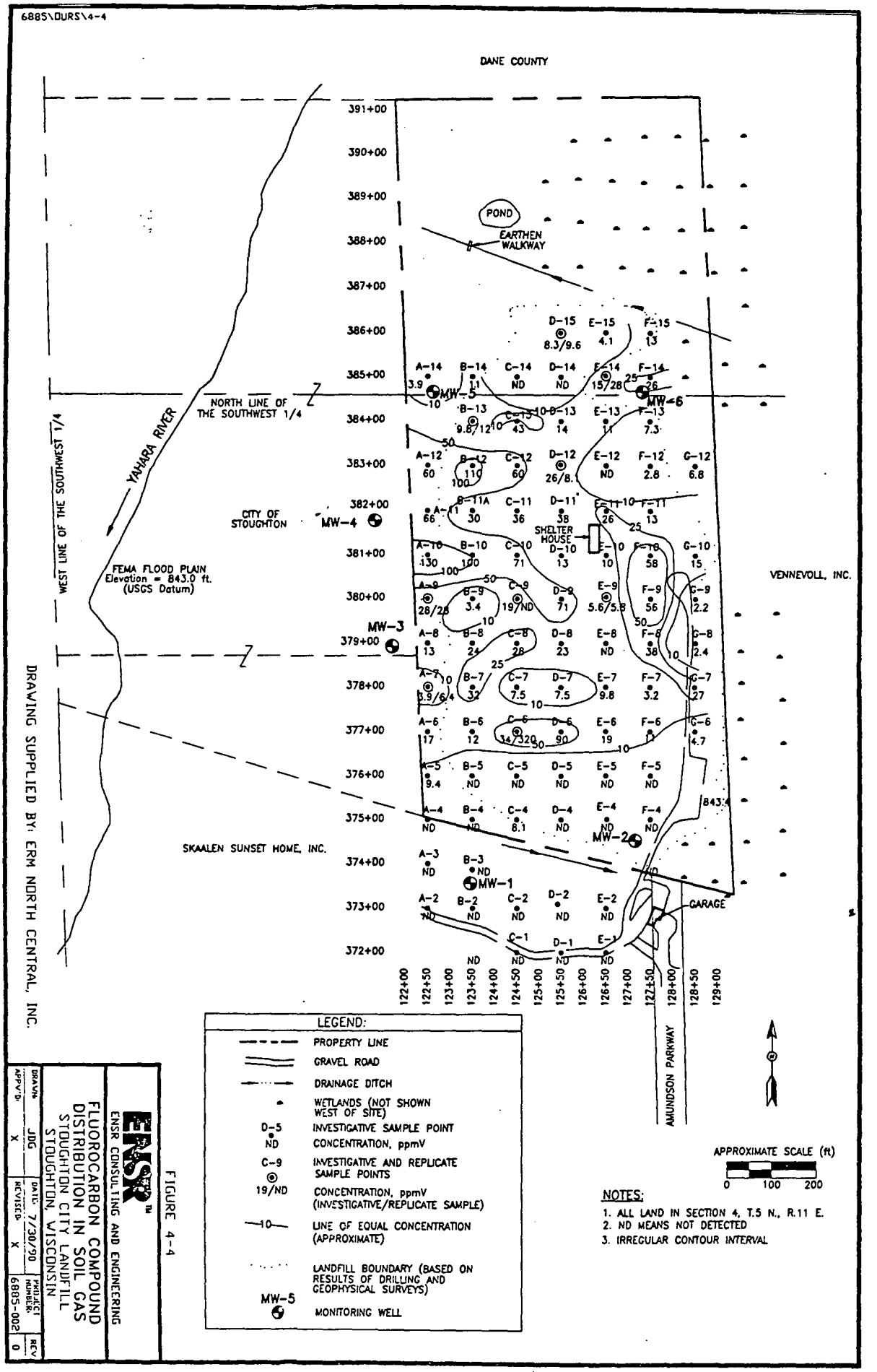


FIGURE 4-4

ENSR CONSULTING AND ENGINEERING

FLUOROCARBON COMPOUND DISTRIBUTION IN SOIL GAS
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN

DRAWN	DATE	PROJECT NUMBER	REV.
JDG	7/30/90	6885-002	0
APP'VD.	REVISED		
X	X		

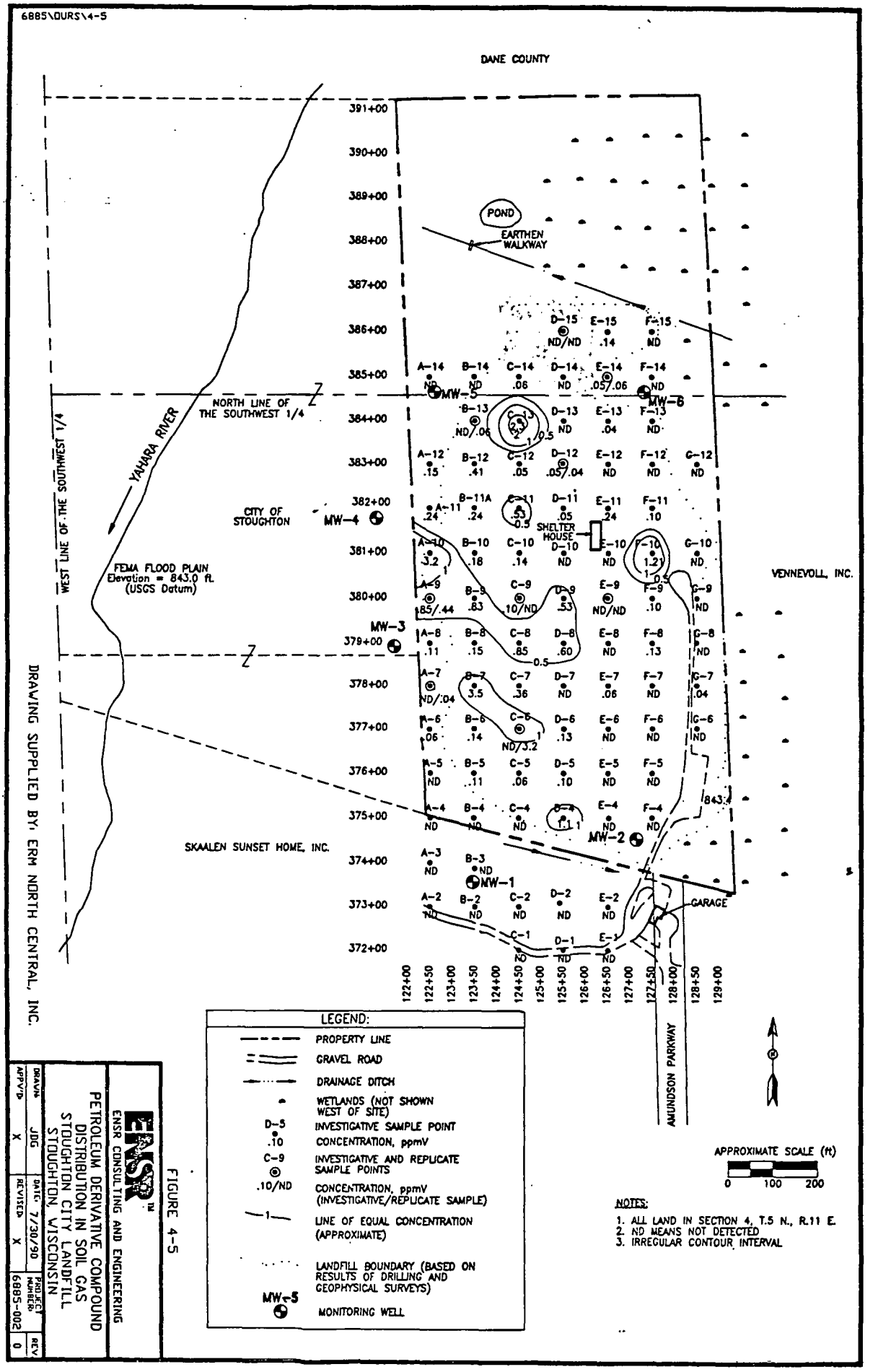


FIGURE 4-5

PETROLEUM DERIVATIVE COMPOUND DISTRIBUTION IN SOIL GAS
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN

ENSR CONSULTING AND ENGINEERING

DRAWN	DATE	PROJECT NUMBER	REV
JDG	7/30/90	6885-002	0
APP'VD	REVISED		
X	X		

of barium was above the PAL at MW-1S; however, this concentration was not significantly above background. Selenium was detected above the PAL in upgradient well MW-1S. Chromium was measured in MW-4D below the limit of quantification but above the PAL. Concentrations of the following constituents were above the Wisconsin groundwater quality standards: iron (in MW-2S, MW-3S, MW-4D, and MW-5D) and manganese (all, including the background well). Iron was also above the standard in the private well sampled for background purposes. These public welfare standards are not health related, but rather are for aesthetics (e.g., color and fixture staining).

In the wetlands east of the Site, zinc, lead, copper and iron are present in concentrations which exceed the State chronic toxicity criteria for surface water.

Soil gas survey results indicated the presence of low level volatile organics. (Figures 4-2 to 4-5).

Four VOCs were detected at low concentrations at one ambient air sampling point located just north of MW-2 (see Figures 4-7 and 4-8). These VOCs were not detected in a replicate sample at this location. The VOCs detected and their respective concentrations in parts per million (ppm) were: 1,2-Dichloroethene (0.06 ppm); ethyl benzene (0.02 ppm); xylene (0.08 ppm); and toluene (0.04 ppm).

Groundwater flow in the surficial aquifer is radial beneath the Site. Regional groundwater flow is west toward the Yahara River. Groundwater flow in the bedrock aquifer is toward the west.

VII. SUMMARY OF HUMAN HEALTH 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. 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. The risk assessment was approved by U.S. EPA, in consultation with WDNR. Subsequent to this approval it was determined that the reference dose (RfD) for THF as used in the BRA was incorrect, thereby resulting in under-calculated Site risks. The risks were subsequently recalculated using the RfD as provided by the Environmental Criteria and Assessment Office (ECAO), which is 0.002 mg/kg-day (versus the 0.068 mg/kg-day RfD used in the original risk assessment). The revised risk calculations included the following assumptions:

* No remedial actions will be taken;

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

* Groundwater contaminant concentrations will not decrease over time and the future residential scenario would involve the consumption of contaminated water from MW-3D (where the highest concentrations of THF were detected) over an adult lifetime.

An assessment of the health risks associated with target compounds identified in the RI was carried out and presented in the risk assessment, which was submitted in final form in June 1991. Various exposure scenarios were evaluated. The maximum carcinogenic risks from the Site (considered for both the single, worst-case well approach and reasonable maximum risk associated with the 95% upper confidence level [UCL]) were within the Agency allowable risk range. The highest total Site risk for the worst well approach was 9.7E-05. The cumulative lifetime adult hazard index was determined to be 1.4, of which 1.2 was as a result of inhalation of volatile organic compounds in the air above the Site. Because of an error in the ingestion reference dose used for THF, the final baseline risk assessment submitted by the PRPs underestimated potential non-carcinogenic Site risks.

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 suggests that a non-carcinogen potentially presents an unacceptable toxic effect.

Based on the risk assumptions and routes of exposure, ingestion of the waste, direct skin contact and ingestion of contaminants in the surface water and sediment, direct skin contact with and ingestion of contaminated soil, drinking contaminated groundwater at the landfill, and breathing air at the landfill), the contaminants at the Stoughton City Landfill could result in unacceptable non-carcinogenic risks such as impaired organ function in both adults and children.

Using the correct reference dose for THF, the maximum cumulative non-carcinogenic risk was determined by U.S. EPA to be 9.5 (adult HI), which is outside the acceptable range for non-carcinogenic risk. These risks were based on future residential land use scenarios within close proximity to the Site and on future groundwater use at the Site. In addition to being outside of U.S. EPA's acceptable risk range, there are also chemical-specific Applicable or relevant and appropriate requirement (ARAR) exceedances at the Site.

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 x 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 x 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. U.S. EPA considers risks at Superfund Sites in excess of 1 x 10^{-4} to be unacceptable.

Under current conditions, the group most likely to come into contact with Site contaminants would be individuals involved in recreational activities in the wetlands. These individuals could be exposed to contaminants in the surface water and sediment through direct skin contact and ingestion. The estimates of potential risk were based on the following scenarios. Adults were assumed to be extensively exposed to the contamination for four days annually for 30 years. Children were assumed to be extensively exposed for seven days annually for five years. Children are especially vulnerable to contaminated soil and water for several reasons. They spend more time outside playing, and they are more likely to put dirty objects or fingers in their mouths, thereby ingesting contaminated soil. Their bodies are still developing, and because of their lower body weight, a smaller amount of contamination can have an effect.

Direct skin contact with sediment could cause a potential increase in the risk of cancer of four potential additional cases of cancer in every one million people exposed. Ingesting sediment and direct skin contact with surface water on Site would not pose an unacceptable risk to exposed individuals.

If people were to be involved in recreational activities at the landfill, they could potentially be exposed to Site contaminants through ingestion of or direct skin contact with the waste and contaminated soil, and breathing contaminated air at the landfill. However, the risks from such exposure is less than U.S. EPA's level of concern.

Additionally, if people were to drink the contaminated groundwater at the landfill, the potential increase in the risk of cancer posed would amount to eight additional cases of cancer in every 100,000 people exposed.

The highest cancer risk at the Stoughton City Landfill Site is eight potential additional cases of cancer in 100,000 people exposed to it. Therefore, the lifetime cancer risks associated with the SCL Site are not considered unacceptable.

STOUGHTON LANDFILL
SUMMARY OF REVISED RISK CALCULATIONS STO-SUMS.WK1

EXPOSURE ROUTE	Adult Hazard Index	Child Hazard Index	Lifetime Cancer Risk	
SURFACE WATER				
Ingestion	NE	NE	NE	
Dermal Exposure	4.8E-06	1.4E-05	2.6E-11	
SEDIMENT				
Ingestion	4.6E-04	7.0E-03	7.4E-08	
Dermal Exposure	1.2E-02	1.3E-01	2.2E-07	
WASTE				
Ingestion	1.4E-06	2.1E-05	9.7E-08	
Dermal Exposure	8.7E-06	5.4E-05	2.9E-07	
SOIL				
Ingestion	2.0E-08	3.0E-07		
Dermal Exposure	5.4E-07	5.6E-06		
AIR				
Inhalation	1.6E+00	4.8E+00		PRP
Inhalation	9.9E-01	3.1E+00		EPA
SUBTOTAL				
Ingestion	4.6E-04	7.0E-03	1.7E-07	
Dermal Exposure	1.2E-02	1.3E-01	5.1E-07	
Inhalation	1.6E+00	4.8E+00		PRP
Inhalation	9.9E-01	3.1E+00		EPA
GROUNDWATER				
RME (95% UCL)				
Ingestion				
W	1.8E+00	3.0E+00	7.9E-05	PRP
NE	5.3E-02	8.6E-02		PRP
SE	7.7E-02	1.3E-01	7.4E-05	PRP
Dermal				
W	3.0E-03	4.3E-03	2.0E-09	PRP
NE	4.5E-02	6.5E-02		PRP
SE	1.4E-06	2.0E-06	1.3E-09	PRP
MAX @ INDIVIDUAL WELLS				
Ingestion				
W @ MW-3D	9.5E+00	1.5E+01	3.9E-05	EPA
NE @ MW-5S	5.3E-02	8.5E-02		EPA
SE @ MW-2S	1.3E-01	2.1E-01	9.7E-05	EPA
Dermal				
W @ MW-3D	6.2E-04	1.0E-03	7.2E-11	EPA
NE @ MW-5S	1.7E-03	2.7E-03		EPA
SE @ MW-2S	8.5E-08	1.4E-07	6.2E-11	EPA

STOUGHTON LANDFILL
SUMMARY OF REVISED RISK CALCULATIONS STO-SUMS.WK1

EXPOSURE ROUTE	Adult Hazard Index	Child Hazard Index	Lifetime Cancer Risk	
SUBTOTAL INCLUDING GW				
RME (95% UCL)				
Ingestion				
W	1.8E+00	3.0E+00	7.9E-05	PRP
NE	5.3E-02	9.3E-02	1.7E-07	PRP
SE	7.8E-02	1.3E-01	7.4E-05	PRP
Dermal				
W	3.4E-03	1.1E-02	1.7E-07	PRP
NE	4.5E-02	7.2E-02	1.7E-07	PRP
SE	4.6E-04	7.0E-03	1.7E-07	PRP
Inhalation	1.6E+00	4.8E+00		PRP
MAX @ INDIVIDUAL WELLS				
Ingestion				
W @ MW-3D	9.5E+00	1.5E+01	3.9E-05	EPA
NE @ MW-5S	5.3E-02	9.2E-02	1.7E-07	EPA
SE @ MW-2S	1.3E-01	2.2E-01	9.7E-05	EPA
Dermal				
W @ MW-3D	1.1E-03	8.0E-03	1.7E-07	EPA
NE @ MW-5S	2.2E-03	9.7E-03	1.7E-07	EPA
SE @ MW-2S	4.6E-04	7.0E-03	1.7E-07	EPA
Inhalation	9.9E-01	3.1E+00		EPA
TOTAL INCLUDING GW				
RME (95% UCL)				
Ing + Derm + Inh				
W	3.4E+00	7.8E+00	7.9E-05	PRP
NE	1.7E+00	4.9E+00	3.4E-07	PRP
SE	1.6E+00	4.9E+00	7.4E-05	PRP
MAX @ INDIVIDUAL WELLS				
Ing + Derm + Inh				
W @ MW-3D	1.0E+01	1.8E+01	3.9E-05	EPA
NE @ MW-5S	1.0E+00	3.2E+00	3.4E-07	EPA
SE @ MW-2S	1.1E+00	3.3E+00	9.7E-05	EPA
MAXIMUM RISK	1.0E+01	1.8E+01	9.7E-05	
minimum risk	1.0E+00	3.2E+00	3.4E-07	

NE = Not Evaluated

However, the Site does pose unacceptable non-cancerous risks, as groundwater ingestion from monitoring well 3-D over the course of an adult lifetime will result in a hazard index of 9.5.

For a summary of carcinogenic and non-carcinogenic Site risks, refer to Table STO-SUMS.WK1.

VIII. RATIONALE FOR ACTION

During the course of an RI/FS, the U.S. EPA requires that a risk assessment be prepared according to U.S. EPA policy and guidelines. For the SCL Site, PRP contractors prepared a Baseline Risk Assessment under the 1988 RI/FS Administrative Order. This risk assessment provides the Agency with a basis for taking a response action to protect human health and welfare, and the environment. The risk assessment which incorporated available Site information is consistent with U.S. EPA policy and guidance, although as noted above, some revision to the risk tables have been made by the Agency subsequent to the receipt and approval of the document. The risk assessment and revised risk calculations provide an estimate of the human health problems which could potentially result if contaminated groundwater is left untreated. As noted below, the Site does pose unacceptable non-carcinogenic risks to populations which may be exposed to THF in groundwater at the Site.

A. Risk Summary

Additive hazard indices exceed 1.0 in MW-3D, due to the presence of THF at high levels. The maximum worst-case well resulted in a lifetime HI of 9.5. Hazard indices above 1.0 are unacceptable.

Additive excess lifetime carcinogenic risks calculated for ingestion of contaminated groundwater were found to be within the acceptable risk range. Overall excess lifetime carcinogenic risks for all exposure routes were determined for reasonable worst case (i.e., 95% upper-bound confidence interval) and single worst-case well approaches. In each approach, cumulative Site risks did not exceed 1×10^{-4}, therefore cancer risks are not unacceptable.

In addition, an ecological assessment was conducted by U.S. EPA Region V which indicated potential adverse effects to aquatic organisms as a result of contaminants leaching into the wetlands adjacent to the Site's eastern border.

B. Environmental Standards Not Met at the Site

In addition to posing unacceptable risks to receptors, the Stoughton 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.

2. Groundwater

State groundwater quality standards are exceeded in the surficial aquifer beneath the western border of the Site. One sample collected during the RI indicated a high THF concentration at MW-3D of 660 µg/L, compared to the State's Enforcement Standard (ES) of 50 µg/L, and Preventive Action Limit (PAL) of 10 µg/L.

C. Groundwater Protection Goals

1. The National Contingency Plan

The U.S. EPA's groundwater 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)).

The NCP details that the U.S. EPA

> "expects to return usable groundwaters to their beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the Site. Whenever restoration of groundwaters is not practicable, (the U.S.) EPA expects to prevent further migration of the plume, prevent exposure to the contaminated groundwater, 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 groundwater:

> "(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 groundwater protection goals are set forth in Chapter 160, Wisconsin Statutes (Wis. Stats.), which applies to all groundwater in the State. (The State's groundwater 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 groundwater 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 groundwater resources of the State.

3. Clean-up Standards

The clean-up standards for groundwater are the State Preventive Action Limits (PALs), as set forth in ch. NR 140, Wis. Adm. Code. Additional clean-up standards consistent with the NCP and the ROD may be specified by U.S. EPA, in consultation with WDNR, for other contaminants detected during monitoring which lack a NR 140 numeric standard. These clean-up standards apply to those contaminants found during the RI phase which exceeded PALs, as well as any contaminants which are found to exceed PALs during groundwater monitoring. The PAL for THF is 10 µg/L; the ES for THF is 50 µg/L.

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. Except where the background concentration of a compound exceeds the State enforcement standard (ES), the WACL established may not exceed the ES for the contaminant.

The NCP provides that remediation levels should generally be attained at or beyond the edge of the waste management area when waste is left in place. In order to determine whether or not groundwater extraction will be required to achieve compliance with State NR 140 groundwater quality standards, sample results from all wells in the monitoring program shall be considered when evaluating the groundwater quality of the Site.

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 of alternatives to address the risks 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 in the derivation of remedial alternatives for the Stoughton Site.

IX. DOCUMENTATION OF SIGNIFICANT CHANGES

The Responsiveness Summary attached hereto addresses the comments received during the 30 day public comment period on the Proposed Plan. The Proposed Plan recommended excavation and consolidation of saturated waste along the eastern boundary of the Site, placement of an NR 504 solid waste cap over the landfill, groundwater extraction, treatment and discharge to the Yahara River, land use restrictions and long-term groundwater monitoring as the principal elements of the remedial action. This alternative is listed as Alternative 7 in the Description of Alternatives, Section X.

In response to public comments, U.S. EPA, in consultation with the State, has concluded that additional investigation of the extent of the THF contaminant plume and further sampling to determine current concentrations of THF in the groundwater is warranted. The information obtained from the additional investigations will be used to assess whether the extraction and treatment of groundwater as proposed in Alternative 7 is required to meet State groundwater quality standards and to comply with the requirements of the NCP. Therefore, this Record of Decision selects a response action which will consist of the following components: NR 504 cap; groundwater extraction and treatment to achieve NR 140 groundwater quality standards, unless (after further investigation of the extent of the contaminant plume and the concentrations of contaminants) U.S. EPA, in consultation with the State, determines that groundwater extraction and treatment is not required to meet State groundwater quality standards and to comply with the requirements of the NCP; excavation of all the saturated waste and its consolidation with the other landfill waste; continued monitoring of the groundwater; fencing; and land-use restrictions as far as practicable. This alternative is identified as Alternative 7A in Section X, Description of Alternatives.

Because of Site-specific circumstances at the Stoughton City Landfill Site, the following criteria will be used to determine whether or not groundwater extraction and treatment is required:

1. State groundwater quality standards will be presumed to be met without groundwater extraction and treatment if, within 12 months after the effective date of this ROD, no sample from any monitoring well indicates the attainment or exceedance of any PAL.

2. If there is an attainment or exceedance of an ES in any sample collected during the 12-month period after the effective date of this ROD, groundwater extraction and treatment will be initiated in compliance with a schedule to be determined by U.S. EPA, in consultation with the State, unless a Groundwater Assessment Report is submitted to U.S. EPA and the State by the PRPs within 12 months after the effective date of this ROD which evaluates all new and pre-existing groundwater monitoring data for the Site, and U.S. EPA, in consultation with the State, determines that: (1) It is probable that no PAL will be attained or exceeded at or beyond the edge of the NR 140 design management zone (DMZ) or the property boundary, whichever is closer to the waste boundary, ten (10) years after the effective date of this ROD; and (2) In the absence of groundwater extraction and treatment, the remedy selected in this ROD will still be protective of public health and the environment, taking into account any contaminants detected in the groundwater at and beyond the waste boundary. If U.S. EPA determines, in consultation with the State, that the criteria set forth in this paragraph are met, groundwater monitoring will continue as otherwise required, for at least thirty years after waste consolidation and the completion of cap construction. At any time during, or at the end of, the first five (5) years of groundwater monitoring, following waste consolidation and completion of cap construction, U.S. EPA, in consultation with the State, may require subsequent Groundwater Assessment Report(s) which shall evaluate all monitoring results obtained to date, to determine whether or not State groundwater quality standards, including source control requirements, will be complied with, within ten (10) years after the effective date of this ROD. If at any time U.S. EPA, in consultation with the State, determines that, based on monitoring results, that State groundwater quality standards will not be met unless additional action is taken, groundwater extraction and treatment will be initiated and will continue until PALs are no longer attained or exceeded at any monitoring point at or beyond the waste boundary, or until an alternative concentration limit (ACL) established pursuant to NR 140.28, is no longer attained or exceeded at any monitoring point at or beyond the waste boundary.

3. If a PAL is attained or exceeded but there is no attainment or exceedance of any ES within 12 months after the effective date

of this ROD, groundwater extraction and treatment will not be required at that time. However, groundwater monitoring will continue as otherwise required, for a minimum of thirty (30) years after waste consolidation and completion of cap construction. If at any time monitoring reveals that State groundwater quality standards will not be met within ten (10) years after the effective date of this ROD unless additional action is taken, groundwater extraction and treatment will be initiated and continue until PALs are no longer attained or exceeded at any monitoring point at or beyond the waste boundary, or until an ACL established pursuant to NR 140.28, is no longer attained or exceeded.

X. DESCRIPTION OF ALTERNATIVES

The major objective of the FS and the Proposed Plan was to evaluate remedial alternatives consistent with the goals and objectives of CERCLA, as amended by SARA.

1. Alternative 1: No-Action

The no action includes no further activities at the Site other than a long-term program of groundwater monitoring. The frequency of groundwater monitoring would be on a quarterly basis and would involve the monitoring wells installed during the RI/FS. The groundwater samples collected would be analyzed for the current parameters as well as Target Compound List (TCL) volatile and semivolatile organics, Target Analyte List (TAL) inorganics, tetrahydrofuran, dichlorofluoromethane, and trichlorofluoromethane. This groundwater monitoring program would be implemented as part of all six alternatives on a quarterly basis.

Under the No-Action alternative, no active response would occur, other than long-term groundwater monitoring. The current rate of precipitation infiltration, through the cap and landfill waste towards the groundwater and surface 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 groundwater would be provided by this alternative, thus no risk reduction would result from this action. Monitoring of the groundwater contaminant plume would be implemented to monitor potentially significant impacts to the City wells and potential discharges of contaminants to the surface water and sediments of the Yahara River and adjacent wetlands.

Initial capital costs are estimated to be $5,000. Operation and Maintenance (O&M) costs associated with sampling events and analytical work are estimated at $134,600 annually. Therefore,

over 30 years, this alternative would cost $2.1 million to implement, on a net present value (NPV) basis.

2. Alternative 2: Cap Repair and Upgrade

This alternative would combine repair and upgrade of the existing cap with fencing of the landfill boundary to restrict access, and deed restrictions to prevent the installation of wells in the affected area and to prohibit construction over the completed landfill cap. Fencing, use restrictions and additional groundwater monitoring are common elements in all of the alternatives except the No Action alternative. These actions would reduce the potential for exposure to soils and solid waste in the landfill. The upgraded cap would also minimize the amount of precipitation infiltration throughout the landfill.

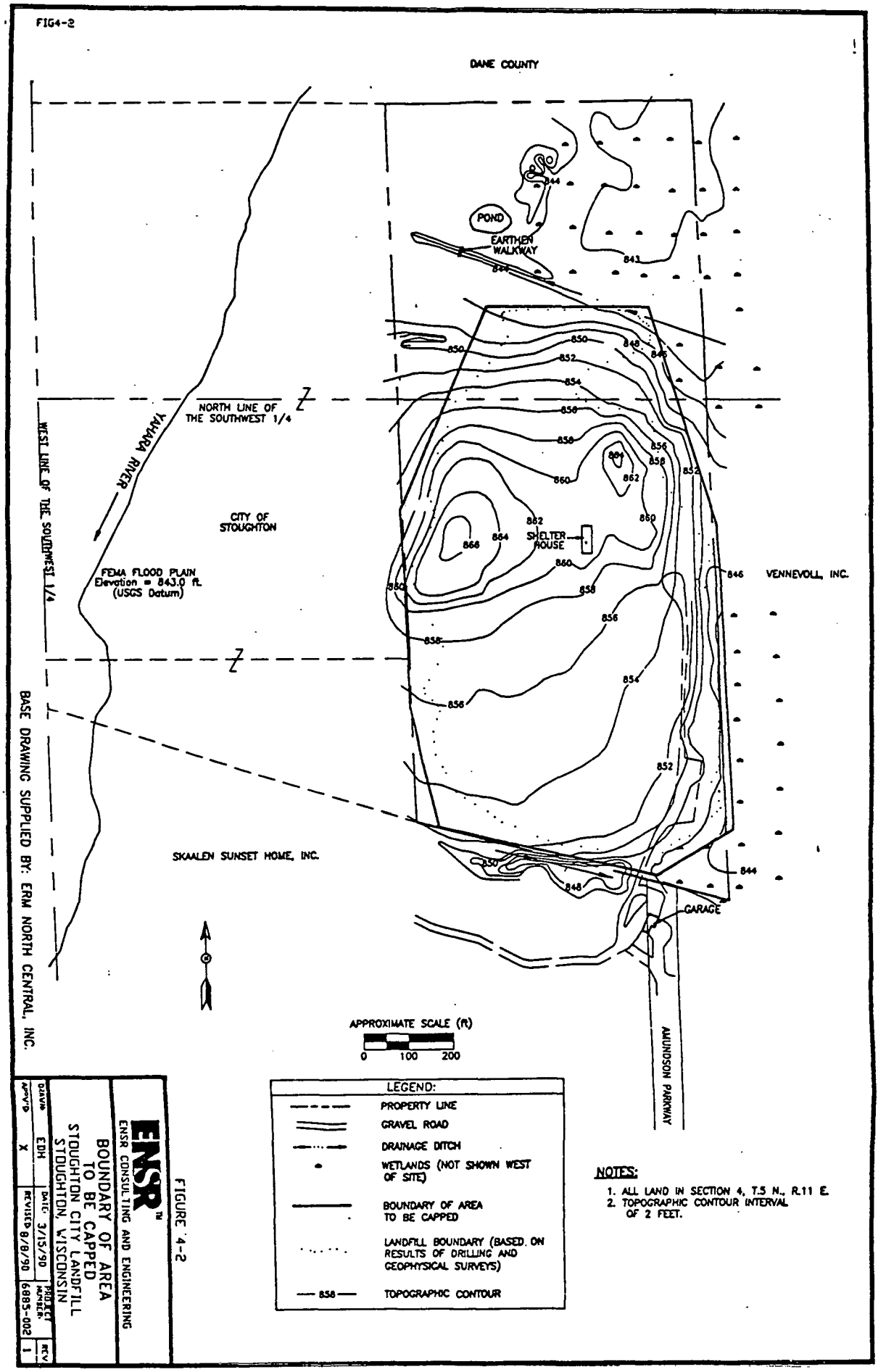
Prior to repair, the cap would have to be investigated to assess its overall condition. Soil borings to determine the thickness and materials used in construction of the cap would be required as part of this investigation. Any erosion, depressions, cracks, or animal holes would also be documented.

After assessment of its condition, affected areas of the cap would be repaired or upgraded to ensure that all areas where waste disposal occurred were covered with 2 feet of compacted clay and 6 inches of topsoil consistent with WAC NR 506.08(3) regulations. The compacted clay would have a permeability of 1 x 10^{-7} cm/sec. The permeability and thickness of this layer would be equivalent to the hydraulic barrier layer required under current Wisconsin regulations for solid waste facilities. The east edge of the landfill extends to the property boundary. When repairing the cap in this area, it will be necessary to extend the cap past the landfill property boundary. The potential need for a gas venting system following cap repair will also be considered. The total area of cap repair under this alternative is 17.6 acres. Regrading in some areas using imported fill will be required including the relatively flat area in the vicinity of the landfill shelter that has been identified as the primary groundwater recharge area. The repaired cap would also be revegetated.

Acceptable sections of the existing cap disturbed during cap repair would also be revegetated. Fencing would be installed around the capped area to prevent access, further minimizing the potential for contact with soils and waste in the landfill.

Cyclone fencing, with a locking gate at the landfill entrance, would be used. By restricting access, wear on the cap could also be reduced.

FIG4-2



BASE DRAWING SUPPLIED BY: ERM NORTH CENTRAL, INC.

ENSR™
ENSR CONSULTING AND ENGINEERING

BOUNDARY OF AREA TO BE CAPPED
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN

DRAWN	DATE	PROJECT NUMBER	REV
EDH	3/15/90	6885-002	1
APPVD	REVISED 8/8/90		
X			

FIGURE 4-2

SOLID WASTE FACILITY CAP

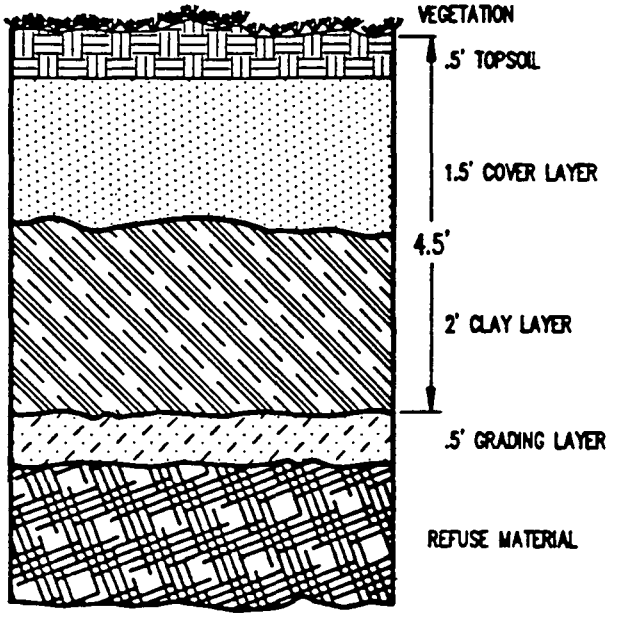


FIGURE 4-3

ENSR™
ENSR CONSULTING AND ENGINEERING

MULTILAYER CAP SECTION
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN

DRAWN: R.D.JOHNSON	DATE: 6/20/91	PROJECT NUMBER:	REV.
APPV'D: X	REVISED: X	6885-002	0

6885\68850006 6/20/91

Groundwater use in the area would be prevented by obtaining deed restrictions on the use and placement of wells in the affected area.

This alternative would cost $2.2 million for initial capital costs, and $146,600 annually for O&M. Therefore, over 30 years, this alternative would cost $4.4 million (NPV) to implement.

3. Alternative 3: Solid Waste Cap

This alternative would include placing a new multilayer clay cap over the entire landfill area. This cap would meet the requirements for the Wisconsin NR 504.07 regulations concerning cover systems for solid waste disposal facilities. Regrading of certain parts of the landfill using imported fill would be required. The area to be capped is seen in Figure 4-2. No portion of the Site situated within the flood plain would be capped; only the elevated waste disposal area would be capped.

After preparing the surface, a multilayer clay cap would be installed. The areal extent of the cap would be the same as for the repaired or upgraded cap described in Alternative 2. The cap to be installed would consist of a 0.5-foot grading layer, a 2-foot clay barrier layer, a minimum 1.5-foot cover layer, and a vegetated 0.5-foot topsoil layer. The grading layer would be constructed from the existing cap. The clay barrier layer is required to have a compacted permeability of 1×10^{-7} cm/sec or less. (Figure 4-3).

A passive gas extraction system to collect gas from beneath the cap would be required. The need for treatment of air emissions from this system can only be determined based on actual Site data when the system is installed. For the purpose of this evaluation, it is assumed that minimal air emission controls will be required. Although this assumption may impact the cost to operate and maintain a capping system, it is assumed that equal cost impact will be encountered by all capping alternatives. Thus comparison of costs between alternatives is not affected and the potential for an overinflated operating cost is avoided.

The landfill boundary would be fenced to restrict access. Groundwater monitoring and use deed restrictions, as described under Alternatives 1 and 2, respectively, would also be implemented as part of this alternative.

This alternative would cost $3 million for initial capital costs and $146,600 annually for O&M costs. Therefore, over 30 years, this alternative would cost $5.2 million (NPV) to implement.

4. Alternative 4A: Solid Waste Cap with Physical Barrier

The details of cap construction and related issues would be the same as those discussed for Alternative 3, however, the area of the cap would be less under this alternative. Gas control would be as described for Alternative 3. Two primary areas of the landfill contain saturated solid waste. To prevent the discharge of leachate from saturated solid waste to the adjacent wetlands, an interceptor trench and slurry wall would be constructed between these areas and the wetlands. Figure 4-4 shows the location of the interceptor trenches and slurry walls. The interceptor trenches would be approximately 10 to 15 feet deep and be backfilled with porous granular material. The trenches would be dewatered by extraction wells installed in the trench backfill material. Recovered leachate would be treated in a leachate treatment system. Treatability studies would be required to characterize the leachate and design a treatment system.

A cap consisting of compacted clay would be constructed over the slurry wall to prevent desiccation and cracking. A conceptual drawing of the interceptor trench and slurry wall is depicted in Figure 4-5.

Prior to the construction of the interceptor trenches and slurry walls, a subsurface investigation would be conducted. The investigation would define the limits of the saturated refuse, define the geology of the Site underlying the refuse, and determine the physical characteristics of the soils under the refuse. This information would be used to complete the detailed engineering design of the trenches and walls.

This alternative would cost $6.9 million for initial capital costs and $351,600 annually for O&M costs. Therefore, over 30 years, this alternative would cost $12.4 million (NPV) to implement.

5. Alternative 4B: Solid Waste Cap with Consolidation of Waste and Physical Barrier

This alternative is similar to Alternative 4A, but includes an option for excavating saturated solid waste and consolidating it in other areas on the landfill where it would be capped along with the rest of the waste within the disposal area. For an approximate area of waste relocation, see Figure 4-6. Excavation of this material prior to installation of the interceptor trenches and slurry walls may decrease further the amount of leachate discharging to the adjacent wetland compared to installing the trenches and slurry walls without excavation.

Prior to excavation, facilities and equipment would be constructed to dewater the saturated refuse. The facilities

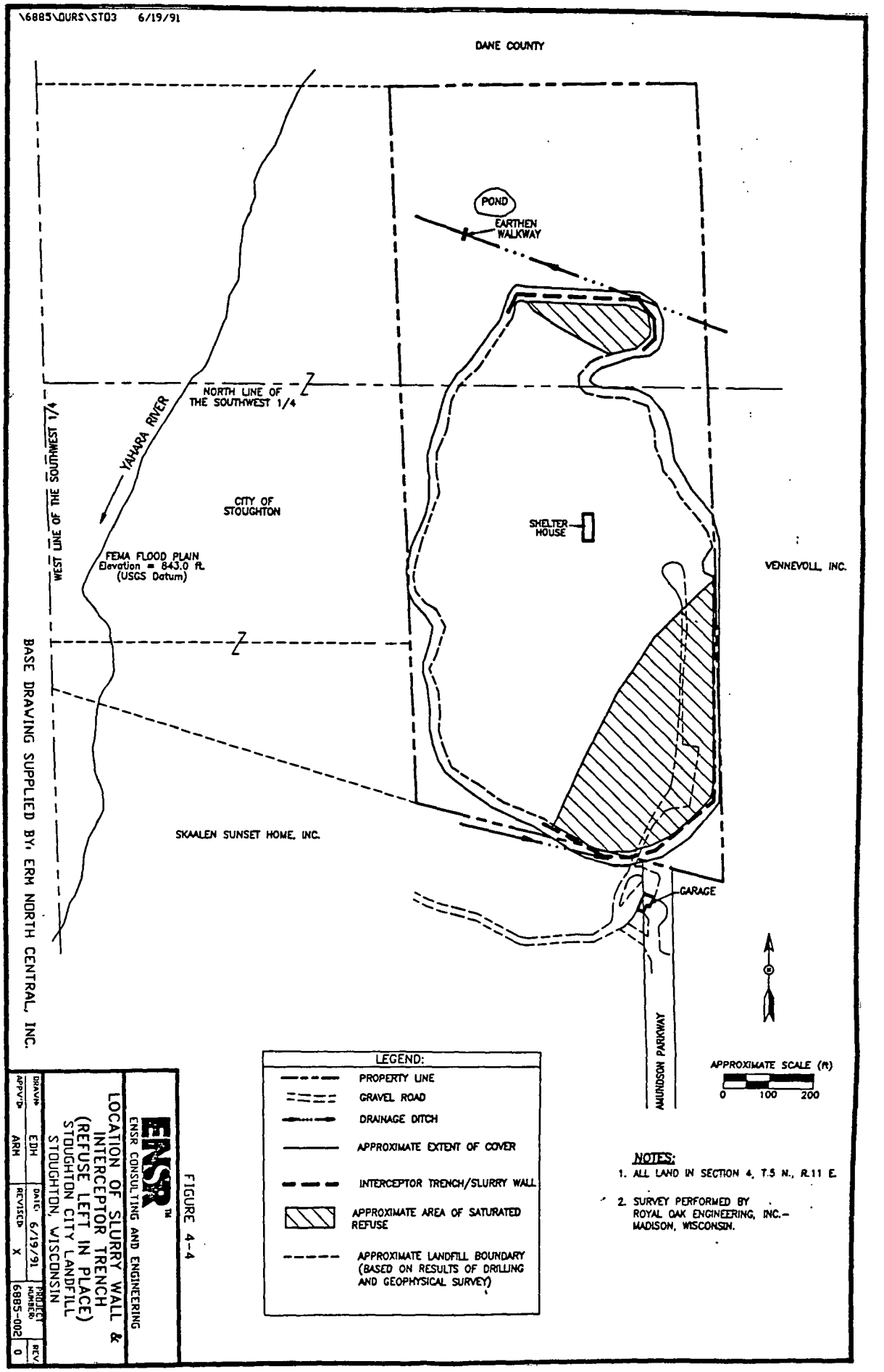
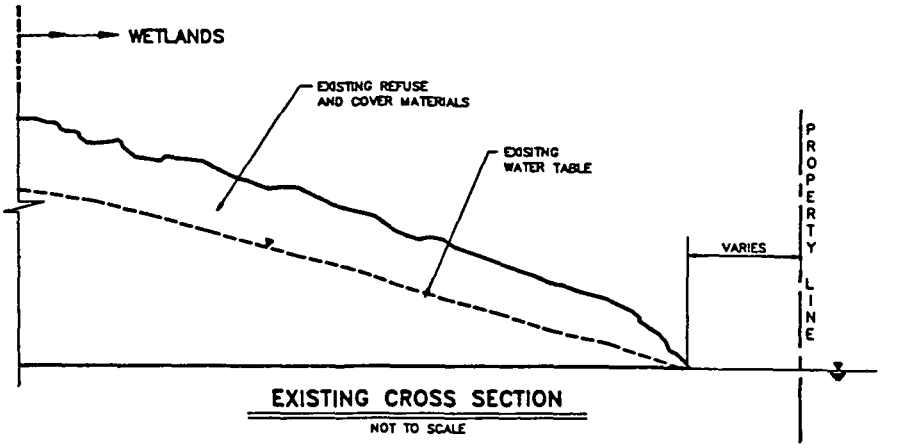

\6885\OURS\ST03 6/19/91
DANE COUNTY
POND
EARTHEN WALKWAY
NORTH LINE OF THE SOUTHWEST 1/4
YAHARA RIVER
WEST LINE OF THE SOUTHWEST 1/4
CITY OF STOUGHTON
FEMA FLOOD PLAIN Elevation = 843.0 ft. (USGS Datum)
SHELTER HOUSE
VENNEVOLL, INC.
SKAALEN SUNSET HOME, INC.
GARAGE
AMUNDSON PARKWAY
BASE DRAWING SUPPLIED BY: ERM NORTH CENTRAL, INC.
LEGEND:
PROPERTY LINE
GRAVEL ROAD
DRAINAGE DITCH
APPROXIMATE EXTENT OF COVER
INTERCEPTOR TRENCH/SLURRY WALL
APPROXIMATE AREA OF SATURATED REFUSE
APPROXIMATE LANDFILL BOUNDARY (BASED ON RESULTS OF DRILLING AND GEOPHYSICAL SURVEY)
APPROXIMATE SCALE (ft)
0 100 200
NOTES:
1. ALL LAND IN SECTION 4, T.5 N., R.11 E.
2. SURVEY PERFORMED BY ROYAL OAK ENGINEERING, INC.- MADISON, WISCONSIN.
ENSR™
ENSR CONSULTING AND ENGINEERING
LOCATION OF SLURRY WALL & INTERCEPTOR TRENCH (REFUSE LEFT IN PLACE)
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN
DRAWN EDH
APPVD ARN
DATE 6/19/91
REVISED X
PROJECT NUMBER 6885-002
REV 0

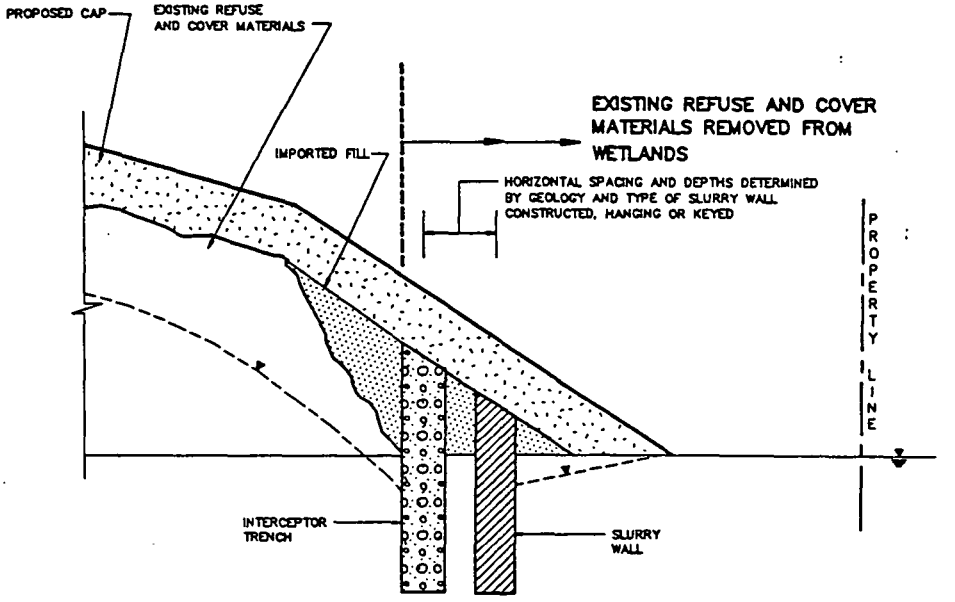
FIGURE 4-4

6885\OURS\ST01 6/19/91



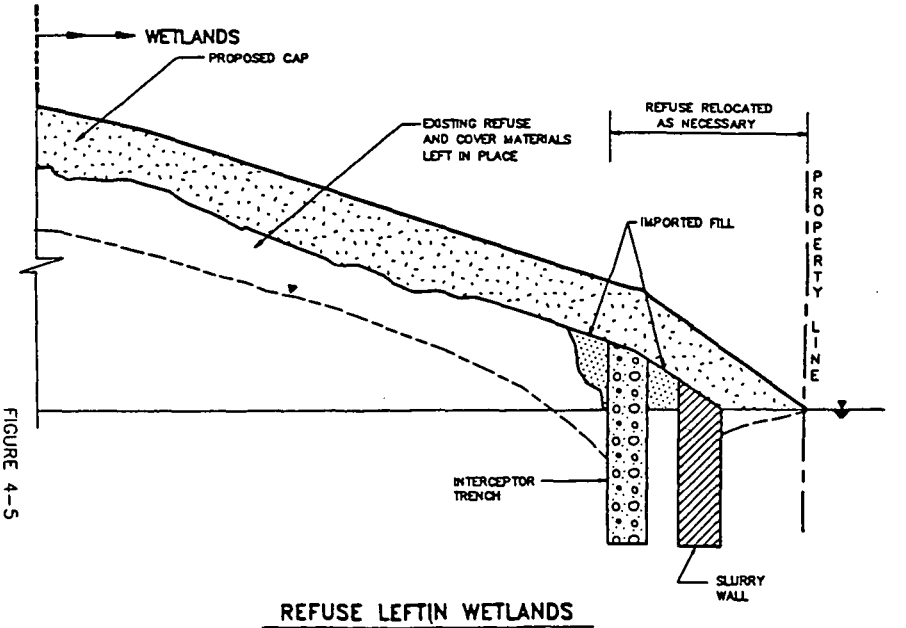
EXISTING CROSS SECTION

NOT TO SCALE



REFUSE REMOVED FROM WETLANDS

NOT TO SCALE



REFUSE LEFTIN WETLANDS

NOT TO SCALE

FIGURE 4-5

ENSR™
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TYPICAL SLURRY WALL & INTERCEPTOR TRENCH CROSS-SECTIONS
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN

DRAWN:	EDH	DATE:	6/19/91	PROJECT NUMBER:	REV.
APPVD:	AM	REVISED:		6885-002	0

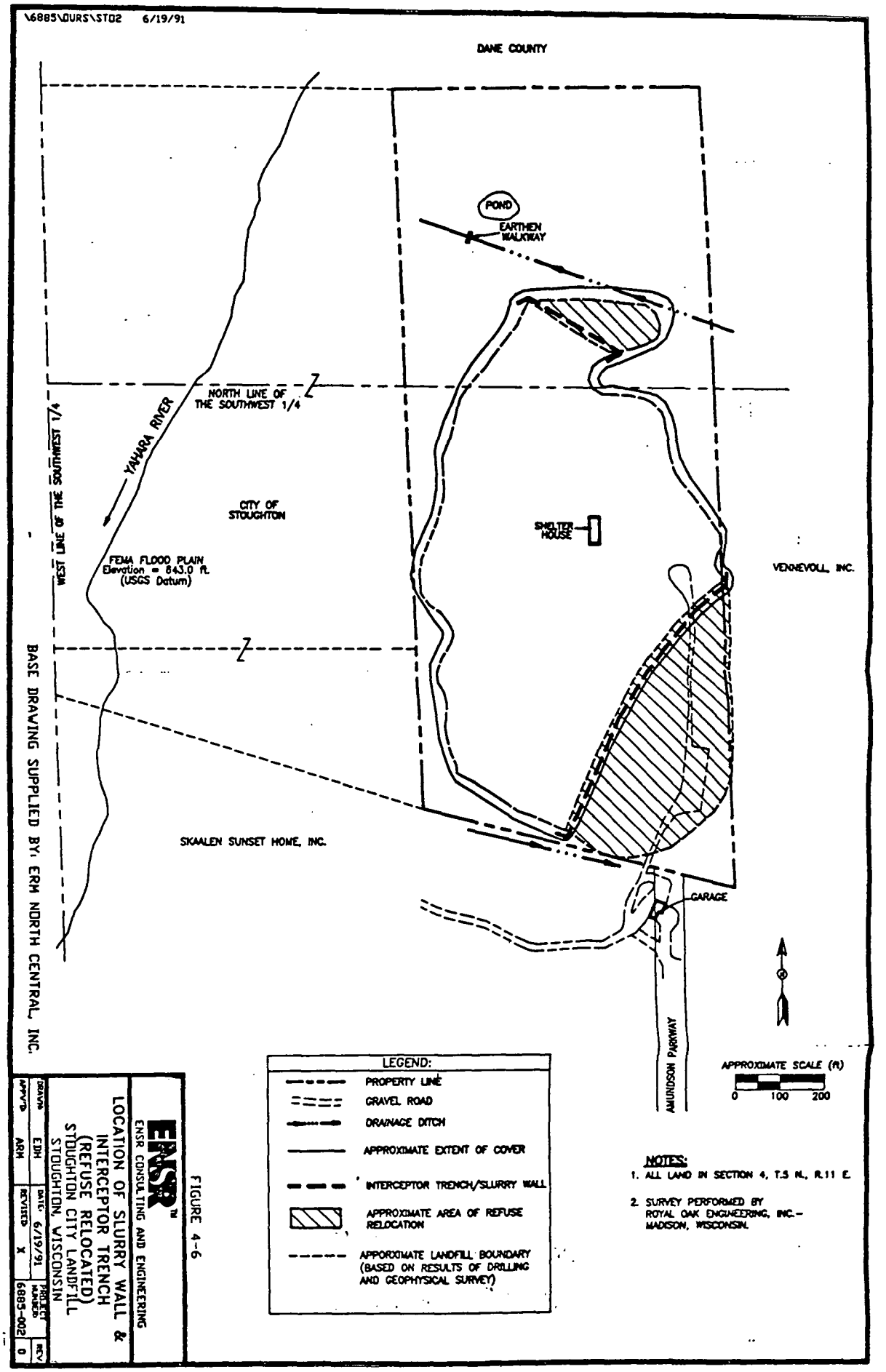
\6885\OURS\ST02 6/19/91
DANE COUNTY
POND
EARTHEN WALKWAY
NORTH LINE OF THE SOUTHWEST 1/4
YAHARA RIVER
WEST LINE OF THE SOUTHWEST 1/4
CITY OF STOUGHTON
SHELTER HOUSE
FEMA FLOOD PLAIN Elevation = 843.0 ft. (USGS Datum)
VENNEVOLL, INC.
SKAALEN SUNSET HOME, INC.
GARAGE
AMUNDSON PARKWAY
BASE DRAWING SUPPLIED BY: ERM NORTH CENTRAL, INC.
LEGEND:
PROPERTY LINE
GRAVEL ROAD
DRAINAGE DITCH
APPROXIMATE EXTENT OF COVER
INTERCEPTOR TRENCH/SLURRY WALL
APPROXIMATE AREA OF REFUSE RELOCATION
APPROXIMATE LANDFILL BOUNDARY (BASED ON RESULTS OF DRILLING AND GEOPHYSICAL SURVEY)
APPROXIMATE SCALE (ft)
0 100 200
NOTES:
1. ALL LAND IN SECTION 4, T.5 N., R.11 E.
2. SURVEY PERFORMED BY ROYAL OAK ENGINEERING, INC.- MADISON, WISCONSIN.
ENSR CONSULTING AND ENGINEERING
LOCATION OF SLURRY WALL & INTERCEPTOR TRENCH (REFUSE RELOCATED)
STOUGHTON CITY LANDFILL
STOUGHTON, WISCONSIN
DRAWN EDH
APP'VD ARH
DATE 6/19/91
REVISED X
PROJECT NUMBER 6885-002
REV. 0

FIGURE 4-6

would consist of temporary impermeable basins into which the excavated refuse would be placed. The refuse would be allowed to drain, and the water collected for treatment in the same leachate treatment system constructed to treat leachate from the interceptor trenches. The dewatered refuse would then be relocated to the top of the landfill, and eventually capped along with the rest of the landfill. The total area of the landfill requiring a cap would be reduced by excluding areas from which waste was removed. After completion of the solid waste dewatering, the temporary basins would be removed.

Installation of trenches and slurry walls would be completed after excavation of saturated wastes, with these structures being located at the edge of the excavation farthest from the wetland. Fill would be imported to the Site to backfill the excavated area on the north of the landfill and to fill and slope the excavation face in the southeast part of the landfill. The fill along the southeastern excavation face would be graded such that the maximum slope would be 25 percent.

This alternative would cost $8.4 million for initial capital costs and $351,600 annually for O&M costs. Therefore, over 30 years, this alternative would cost $13.8 million (NPV) to implement.

6. Alternative 5: Solid Waste Cap with Groundwater Pump and Treat

The details of cap construction and related issues would be the same as those discussed for Alternative 3. Gas control would be as described for Alternative 3.

A groundwater collection and treatment system would be a component of this alternative. The exact number of wells, their locations, depths, and their pumping rates would be determined based on treatability studies. However, for cost estimation purposes, it was assumed that two groundwater recovery wells would be installed downgradient (west) of MW-3D. The wells would collectively pump groundwater to collection piping at a rate of approximately 75 gpm, which would carry the water to the on-Site treatment facility. Well construction and pump installation standards, as outlined in WAC NR 112, would be complied with. An effluent discharge permit would have to be obtained, under the Wisconsin Pollutant Discharge Elimination System (WPDES), if treated groundwater is discharged off-Site. Substantive State effluent discharge standards would have to be complied with, if the treatment groundwater is discharged on-Site.

For cost estimate purposes, it was assumed that surface biological treatment would be used to remove tetrahydrofuran from the groundwater. The most effective process for this Site will be determined based on treatability studies. However, for cost

estimation purposes, a fixed-film, plug flow reactor configuration has been selected.

Treatability studies will be conducted during remedial design in order to determine the optimum treatment process for removing THF and other contaminants of concern from the groundwater beneath the Site. For cost estimation purposes, the FS assumed that the THF plume would be managed via above ground biological treatment.

This alternative would cost $3.7 million for initial capital costs, $210,800 annually for the O&M costs first five years, and $146,600 annually thereafter. Therefore, over 30 years, this alternative would cost $6.2 million (NPV) to implement.

7. Alternative 6A: Solid Waste Cap with Physical Barrier and Groundwater Pump and Treat

The cap would be as described in Alternative 3. The details of construction and related issues would be the same as those discussed for Alternative 3. Gas control would be as described for Alternative 3. The details of installation and operation of the groundwater interceptor/barrier trenches, and optional relocation of saturated solid waste is as described for Alternative 4. The details of groundwater collection and treatment would be as described for Alternative 5.

This alternative would cost $7.7 million for initial capital costs, $393,800 annually for the O&M costs first five years, and $146,600 annually thereafter. Therefore, over 30 years, this alternative would cost $13.4 million (NPV) to implement.

8. Alternative 6B: Solid Waste Cap with Consolidation of Waste, Physical Barrier, and Groundwater Pump and Treat

This alternative is similar to Alternative 6A but includes the waste excavation and consolidation option along with the construction of a physical barrier.

This alternative would cost $9.1 million for initial capital costs, $393,800 annually for the first five years, and $146,600 annually thereafter. Therefore, over 30 years, this alternative would cost $14.8 million (NPV) to implement.

9. Alternative 7: Solid Waste Cap with Consolidation of Waste and Groundwater Pump and Treat

This is the alternative identified in the Proposed Plan as the Agency's preferred alternative.

The cap would meet requirements of WAC NR 504 for final cover systems for solid waste disposal facilities. The details of

construction and related issues would be the same as those discussed for Alternative 3. Gas control would be as described for Alternative 3.

This alternative would also consist of excavating wastes in contact with groundwater along the landfill's northeastern and southeastern boundaries, and consolidation along the Site's western boundary. This would remove the direct contact of wastes and groundwater and will result in less impact to the wetlands adjacent to the Site's eastern border.

The contaminated groundwater plume to the west of the Site would be extracted via a system of extraction wells and treated above ground to comply with numeric WPDES and Best Available Treatment (BAT) requirements. The method of treatment will be determined during remedial design, depending on the results of treatability studies during design. For FS cost estimate purposes, it was assumed that surface biological treatment would be employed. Treated groundwater will be discharged to the Yahara River.

This alternative would cost $5.2 million for initial capital costs, $393,800 annually for O&M costs for the first five years, and $146,600 annually thereafter. Therefore, over 30 years, this alternative would cost $8.5 million (NPV) to implement.

10. Alternative 7A: Solid Waste Cap with Consolidation of Waste and Contingency Groundwater Pump and Treat

This alternative is a modification to Alternative 7, the preferred alternative identified in the Proposed Plan, and this alternative comprises the solid waste cap and waste consolidation components of Alternative 7. As described in Section IX, the groundwater component of this remedy is subject to contingencies.

A groundwater extraction and treatment system would be required unless the results of additional investigation of the sand and gravel aquifer and the bedrock aquifer indicate that NR 140 groundwater quality standards will be met without groundwater extraction and treatment. This determination will be made as described in Section IX.

The exact number of extraction wells, their locations, depths, and their pumping rates will be determined by U.S. EPA, in consultation with WDNR, based on pump tests. However, for cost estimation proposes, it was assumed that two groundwater extraction wells would be installed downgradient (west) of MW-3D. The wells would collectively pump groundwater to collection piping at a rate of approximately 75 gpm, which would carry the water to the on-Site treatment facility. Well construction and pump installation standards, as outlined in WAC NR 112, would be complied with. An effluent discharge permit would have to be obtained, under the Wisconsin Pollutant Discharge Elimination

System (WPDES), if treated groundwater is discharged off-site. Substantive State effluent discharge standards would have to be complied with, if the treatment groundwater is discharged on-site.

If groundwater pump and treat is required, the cost of this alternative, in terms of capital cost, annual operating costs and net present worth are identical to that of Alternative 7. In the event that groundwater pump and treat is determined not to be required, the capital cost of this alternative would be approximately $4.5 million; annual operating costs would be approximately $329,600 for the first five years and $146,600 thereafter; and over 30 years, the NPV would amount to $7.5 million.

XI. SUMMARY OF THE COMPARATIVE ANALYSIS OF ALTERNATIVES

A. The Nine Evaluation Criteria

The FS examined eight alternatives, including the No Action alternative, and evaluated them according to technical feasibility, environmental protection, public health protection and institutional issues. In addition to these eight, the Proposed Plan presented a ninth alternative which was a "hybrid" of Alternatives 4B and 5, excluding the physical barrier. The U.S. EPA carried forth each of these alternatives for evaluation in its Proposed Plan. In response to public concerns over limited groundwater contamination data, U.S. EPA, in consultation with WDNR, has proposed a tenth alternative which comprises the components of Alternative 7, but allows for groundwater extraction and treatment on a contingency basis, as identified in Section IX above. The alternatives were evaluated according to the following nine criteria which are used by the U.S. EPA to provide the rationale for the selection of the final remedial action at a Site:

THRESHOLD CRITERIA

1) **Overall Protection of Human Health and the Environment** addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced or controlled through treatment, engineering controls, or institutional controls.

2) **Compliance with State and Federal Regulations (ARAR's)** addresses whether or not a remedy will meet all the applicable or relevant and appropriate requirements of Federal and State environmental statutes and/or provides grounds for invoking a waiver.

PRIMARY BALANCING CRITERIA

3) **Reduction of Toxicity, Mobility, or Volume Through Treatment** is the anticipated performance of the treatment technologies a remedy may employ.

4) **Short-Term Effectiveness** addresses the period of time needed to achieve protection, and any adverse impacts on human health and the environment that may be posed during the construction and implementation period until clean-up goals are achieved.

5) **Long-Term Effectiveness and Permanence** refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once clean-up goals have been met.

6) **Implementability** is the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular option.

7) **Cost** includes estimated capital and operation and maintenance costs, and net present worth costs.

MODIFYING CRITERIA

8) **State Acceptance** indicates whether, based on its review of the RI/FS and the Proposed Plan, the State concurs, opposes, or has no comment on the preferred alternative at the present time.

9) **Community Acceptance** are assessed in the Record of Decision following a review of the public comments received on the RI/FS report and the Proposed Plan.

B. Comparative Analyses of Alternatives

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.

Each alternative was evaluated using the nine criteria. The regulatory basis for these criteria comes from the National Contingency Plan and Section 121 of CERCLA (Clean-up Standards). Section 121(b)(1) states that, "Remedial actions in which treatment which permanently and significantly reduces the volume, toxicity or mobility of the hazardous substances, pollutants, and contaminants is a principal element, are to be preferred over remedial actions not involving such treatment. The off-Site transport and disposal of hazardous substances or contaminant materials without such treatment should be the least favored alternative remedial action where practicable treatment

technologies are available." Section 121 of CERCLA also requires that the selected remedy be protective of human health and the environment, cost effective, and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

Each alternative is compared to the nine criteria in the following section:

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 Stoughton Site are the potential ingestion of contaminated groundwater, exposure to or ingestion of contaminated surface water and/or sediments in the Yahara River and the wetlands adjacent to the Site, and inhalation of airborne volatile organic contaminants. Based upon these pathways of concern, the remedial action alternatives were evaluated on their ability to: 1. reduce precipitation infiltration through the landfill, which reduces the levels of contaminants leaching into the groundwater; 2. meet clean-up standards, and; 3. reduce the levels of hazardous substances discharging into the wetlands.

Alternatives 1 and 2 are not protective of human health and the environment. Alternatives 3, 4A and 4B will prevent direct contact with waste, and Alternatives 4A and 4B will prevent or minimize further contact between groundwater and contaminants along the eastern Site boundary. However, none of these alternatives address the ground-water contamination to the west of the Site. Alternatives 6A, 6B, 7 and 7A will prevent direct contact with the waste, prevent or minimize further contact between groundwater and contaminants along the eastern Site boundary, and will remove contaminants from groundwater to the west of the Site, unless additional monitoring indicates that groundwater extraction is not required. Alternative 5 will prevent direct contact with the waste, will remove contaminants from the groundwater west of the Site, unless additional monitoring indicates that groundwater extraction is not required, but will not prevent or minimize further contact with groundwater and contamination along the eastern boundary.

Only Alternatives 6A, 6B, 7 and 7A will achieve the three objectives stated in the above paragraph, and therefore only Alternatives 6A, 6B, 7 and 7A are considered protective of human health and the environment. Alternatives 1 through 5 are therefore not protective of human health and the environment for reasons stated in this paragraph.

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 contaminants found at the Site (chemical specific), siting requirements itself (location specific) or proposed actions at the Site (action specific). The Statutory Determinations Section, Section XIII, discusses all the potential ARARs for the Site. This section only notes those ARARs with which a particular alternative does not comply.

Alternatives 1 and 2 fail to meet any of the chemical-specific ARARs described in section XII, nor do they meet the NR 504.07, WAC landfill requirements for landfill closure, which are relevant and appropriate for this Site.

Alternative 3 would not meet NR 140 requirements pertaining to the PAL for THF because it would not prevent the continued release of contaminants already present in the groundwater detected at the waste boundary above Wisconsin groundwater quality standards. It also fails to meet State Water Quality Criteria for wetlands, NR 103, and the State wetlands antidegradation regulations, NR 105, because it does not address the continuing leaching of metals from the saturated waste and their discharge into the wetlands.

Alternative 4 would comply with the State Water Quality Standards ARAR but not the NR 140 groundwater standards.

Alternative 4B would not comply with NR 140 groundwater standards.

Alternative 5 would not comply with the State Water Quality Standards.

Alternatives 6A, 6B, 7 and 7A would comply with all applicable or relevant and appropriate requirements.

Because they are not protective of human health and the environment and do not meet all ARARs, and therefore do meet the threshold criteria, Alternatives 1 through 5 will not be considered for further evaluation.

3) Reduction of Toxicity, Mobility, or Volume (TMV) Through Treatment.

None of the alternatives considered will reduce the toxicity, mobility or volume of solid waste through treatment. Alternatives 6A, 6B, 7 and 7A will offer some reduction in the amount of contaminants currently found in the groundwater through

treatment. Due to the low risks posed from contact with or ingestion of the Site waste, and because of the large volume of wastes in place, the benefit of treating the source of the contamination at the Site would be marginal and extremely expensive.

4) Short-Term Effectiveness.

Because wastes will be excavated and relocated, Alternatives 6A 7 and 7A would present the potential for workers to inhale or ingest Site contaminants. The additional amount of protection will have to be evaluated taking into account the disadvantages of additional waste handling, potential increased exposure to waste, and increased handling of leachate from dewatering excavated wastes. Site workers would be trained and required to wear personal protection equipment during excavation activities. Because of the proximity of houses to the Site, there is a potential for Site contaminants to become airborne and wind blown, and inhaled by nearby residents. However, air monitoring stations would be set up around the entire Site to determine the levels of contaminants in the air and to ensure that these levels are safe. Placement of the cap can be completed in less than one year. For Alternatives 6A and 6B, the installation of a physical barrier along the southeastern and northeastern sections would require additional time to complete. For Alternatives 6A, 6B, 7 and 7A, ground-water restoration measures west of the Site will take many years to complete.

5) Long-Term Effectiveness and Permanence.

Alternatives 6A, 6B, 7 and 7A would provide long-term protection from direct contact with wastes and reduce the infiltration of water into the landfill area. The effectiveness of these alternatives is dependent on proper maintenance of the cap.

Alternatives 6B, 7 and 7A involve the excavation and relocation of disposed waste followed by consolidation onto the western portion of the landfill. Because wastes currently in contact with groundwater along the eastern portion of the Site will be removed, these alternatives would offer a more secure long-term solution to this problem than Alternative 6A. The long-term effectiveness of Alternative 6A would be dependent on the proper maintenance of the physical barrier to be installed.

Alternatives 6A, 6B, 7 and 7A would offer a permanent solution to ground-water contamination by pumping contaminated groundwater west of the Site and treating it prior to discharge to the Yahara River.

6) Implementability.

Construction equipment necessary for installation of the multilayer cap is readily available and cap construction does not present difficult technical or engineering challenges. Alternatives 6B, 7 and 7A would require the excavation, relocation and consolidation of wastes. This would present some technical difficulty but is still technically feasible. Alternative 6A may cause impacts on the wetlands adjacent to the Site and east of the landfill as a result of construction of the physical barrier. This physical barrier would be designed in such a way as to minimize adverse impacts on the wetlands. Surface water levels in the wetlands may be affected as a result of the physical barrier. This situation would be evaluated and a system would be designed to maintain proper surface-water levels. Alternatives 6A, 6B, 7 and 7A would require a ground-water pumping system designed in such a way as to not result in lowering of the wetlands water levels.

7) Cost.

The cost of the selected alternative, if groundwater extraction and treatment is required, is estimated to be $8.5 million, net present worth, over a 30 year life. If groundwater extraction and treatment is not required, the 30 year NPV is $7.5 million. When compared to Alternatives 6A and 6B, the selected alternative meets the threshold criteria at significantly lower costs. For a comparison of costs of alternatives at varying discount factors, refer to Table "Cost Est."

8) State Acceptance.

The State of Wisconsin concurs with the selected remedy. The WDNR is a signatory to the RI/FS Consent Order with the City of Stoughton and Uniroyal, and has been an active and supporting participant in the remedial process for this Site.

9) Community Acceptance.

The specific comments received and U.S. EPA's responses are outlined in the Attached Responsiveness Summary.

XII. THE SELECTED REMEDY

U.S. EPA and WDNR believe that Alternative 7A is the most appropriate solution for the SCL Site because of its performance against the nine evaluation criteria previously discussed. The major components of the selected alternative include the following: NR 504 cap; groundwater extraction and treatment for removal of the THF plume west of the landfill, unless additional monitoring indicates that extraction is not required to achieve compliance with State groundwater quality standards; and

STOUGHTON CITY LANDFILL
COMPARATIVE COSTS OF REMEDIAL ALTERNATIVES

TABLE COST EST.

REMEDIAL ALTERNATIVE	CAPITAL COSTS	ANNUAL O&M COSTS		NET PRESENT VALUE OVER 30-YR PROJECT LIFE (at 10% discount rate)	NET PRESENT VALUE OVER 30-YR PROJECT LIFE* (at 5% discount rate)	NET PRESENT VALUE OVER 30-YR PROJECT LIFE (at 3% discount rate)
ALTERNATIVE 1: No Action	$5,000	Yrs. 1-30:	$134,600	$1,274,000 -39%	$2,074,000 0%	$2,643,000 27%
ALTERNATIVE 2: Cap Repair & Upgrade	$2,155,300	Yrs. 1-30:	$146,600	$3,537,000 -20%	$4,409,000 0%	$5,029,000 14%
ALTERNATIVE 3: Solid Waste Cap	$2,983,442	Yrs. 1-30:	$146,600	$4,365,000 -17%	$5,237,000 0%	$5,857,000 12%
ALTERNATIVE 4A: Solid Waste Cap with Physical Barrier	$6,944,000	Yrs. 1-30:	$351,600	$10,259,000 -17%	$12,349,000 0%	$13,836,000 12%
ALTERNATIVE 4B: Solid Waste Cap with Consolidation of Waste and Physical Barrier	$8,408,000	Yrs. 1-30:	$351,600	$11,723,000 -15%	$13,813,000 0%	$15,300,000 11%
ALTERNATIVE 5: Solid Waste Cap with 5-yr. Groundwater Pump & Treat	$3,696,000	Yrs. 1- 5: Yrs. 6-30:	$210,800 $146,600	$5,321,000 -15%	$6,228,000 0%	$6,863,000 10%
ALTERNATIVE 6A: Solid Waste Cap with Physical Barrier and GW Pump & Treat (costed for 5 yrs.)	$7,707,000	Yrs. 1- 5: Yrs. 6-30:	$393,800 $146,600	$10,026,000 -9%	$11,031,000 0%	$11,713,000 6%
ALTERNATIVE 6B: Solid Waste Cap with Consolidation of Waste, Physical Barrier and GW Pump & Treat (costed for 5 yrs.)	$9,121,000	Yrs. 1- 5: Yrs. 6-30:	$393,800 $146,600	$11,440,000 -8%	$12,445,000 0%	$13,127,000 5%
ALTERNATIVE 7: Solid Waste Cap with Consolidation of Waste and GW Pump & Treat (costed for 5 yrs.)	$5,200,000	Yrs. 1- 5: Yrs. 6-30:	$393,800 $146,600	$7,519,000 -12%	$8,524,000 0%	$9,206,000 8%
ALTERNATIVE 7A *: Solid Waste Cap with Consolidation of Waste and GW Pump & Treat Contingency (not costed)	$4,500,000	Yrs. 1- 5: Yrs. 6-30:	$329,600 $146,600	$6,576,000 -13%	$7,546,000 0%	$8,212,000 9%

NOTE: * Superfund program RI/FS guidance recommends that a discount rate of 5% before taxes and after inflation be assumed, as shown in the shaded column and as used by the PRPs in the FS Report. Net Present Values shown are rounded to the nearest $1,000. Percentages shown in Net Present Value (NPV) columns compare NPV against NPV in shaded column. Alternative 7A was not presented in the Proposed Plan. This table is revised from FS Report Table 7-1.

excavation and consolidation of saturated wastes. Alternative 7A also includes the installation of a fence around the Site; the placement of institutional controls such as deed restrictions to control future land use; and the use of long-term ground-water monitoring to determine the effectiveness of the cap and ground-water extraction system, if required.

The selected remedy is the final remedial alternative to be implemented at the Stoughton Site, encompassing all areas of concern at the landfill. The areas of concern are considered to be the groundwater contaminant plume located to the west of the landfill boundary and leachate generation along the eastern boundary of the Site which is impacting the adjacent wetlands area. 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 groundwater contamination.

The alternative recommended by U.S. EPA, after consultation with WDNR, for the Stoughton City Landfill Site, Alternative 7A, provides the best balance with respect to the nine criteria. Based on information available at this time, U.S. EPA believes that the recommended remedy is protective of human health and the environment, complies with ARAR's and is cost effective.

The evaluation of the other alternatives found that:

* Alternatives 1, 2, 3, 4A, 4B and 5 are not protective of human health and the environment and/or do not comply with ARARs.

* Alternative 6A will address the potential for further ground-water contamination east of the Site by placing a physical barrier along the southeast and northeast sections of the landfill, thereby limiting the movement of contaminants away from the Site. This alternative would also effectively limit contaminant movement through the waste and treat ground-water contamination west of the Site. However, the barrier would pose maintenance problems and would not offer the long-term reliability that Alternatives 7 and 7A would offer.

* Alternative 6B would address ground-water contamination problems and would also effectively limit contamination movement through the waste. However, this Alternative is more costly than the recommended Alternative.

XIII. STATUTORY DETERMINATIONS SUMMARY

1. Protection of Human Health and the Environment

The selected remedy will prevent direct contact with wastes and reduce contaminant levels in the aquifer to the State's NR 140

standards. In addition, the selected remedy will provide for protection of the eastern wetlands by preventing or mitigating further effects from leachate generation from wastes situated in the water table in the southeastern and northeastern sections of the Site.

2. Attainment of ARARs

The selected remedy will attain all Federal and State applicable or relevant and appropriate requirements as presented in the FS and in this Record of Decision. In addition, the selected remedy will attain all Federal and State "To Be Considered" requirements as described in the FS and in this Record of Decision.

1. Chemical specific ARARs

Chemical specific ARARs regulate the release to the environment of specific substances having certain chemical characteristics. These requirements generally set health or risk-based concentration limits or discharge limitations after treatment in various environmental media for specific hazardous substances. The selected remedy would achieve compliance with the following chemical specific ARARs related to groundwater, surface water discharges and ambient air quality at the site.

A. Federal

1. Maximum Containment Levels (MCLs) and Maximum Containment Level Goals (MCLGs), 40 CFR Part 141. These are enforcable drinking water standards established by U.S. EPA under the Safe Drinking Water Act (SDWA), 40 U.S.C. § 300 et. seq. MCLs are applicable when the water will be provided directly to 25 or more people or will be supplied to 15 or more service connections and are to be measured at the tap. Because the groundwater at the SCL Site is not currently a source of drinking water, MCLs are not applicable. At the Stoughton site, MCLs and MCLGs are relevant and appropriate, since the sand and gravel aquifer is a Class IIa aquifer (a potential drinking water source) which could potentially be impacted by the contaminant plume. MCLGs are relevant and appropriate when the standard is set at a level greater than zero (for non-carcinogens). The point of compliance for MCLs and MCLGs is at the boundary of the landfilled-wastes. At the SCL Site no MCLs or above-zero MCLGs are currently exceeded.

2. Ambient Water Quality Criteria, 40 CFR Part 131, developed under the Clean Water Act (CWA), 33 U.S.C. § 1251 et. seq. for protection of human health and aquatic life. 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 the SCL Site, the

treated groundwater will be discharged to the Yahara River. 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 groundwater or surface water, the environmental media affected, and upon the latest information available. At a Superfund site, the Federal AWQC would not be applicable since they are non-enforceable guidelines, but they are relevant and appropriate for pretreatment requirements for discharge of treated water to a Publicly Operated Treatment Works (POTW). Since treated water will be discharged to the Yahara 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 Yahara River. AWQC adopted for drinking water and AWQC for protection of freshwater aquatic organisms are relevant and appropriate to the discharge of the treated groundwater into the Yahara River.

3. National Ambient Air Quality Standards, 40 CFR Part 50. May be applicable to air stripping, fugitive dust raised from excavation, grading and other construction activities. Every available precaution will be taken during construction to minimize fugitve dust emissions. In the event air stripping is used to treat groundwater prior to discharge to the Yahara River, any emissions for which there are standards will be monitored. However, it is not anticipated that air stripping of THF will release any listed contaminents.

B. State

1. The State of Wisconsin is authorized to administer the implementation of the Federal SDWA. The State has also promulgated groundwater 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 groundwater 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. Groundwater quality standards established pursuant to Ch. NR 140, WAC, include preventive action limits (PALs), enforcement standards (ESs), and/or (Wisconsin) alternative concentration limits (WACLs). Because State PALs are more stringent than federal MCLs, and because there are no MCLs for certain of the contaminents of concern, notably THF, State PALs are applicable to the Stoughton site as groundwater clean-up standards.

Consistent with the exemption criteria of section NR 140.28, WAC, a Wisconsin alternative concentration limit (WACL) may be established to replace the preventive action limit (PAL), as the groundwater clean-up standard if it is determined that it is not

technically and economically[1] feasible to achieve the PAL for a specific substance. Except where the background concentration of a compound exceeds the enforcement standard (ES) 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 implementation of the selected remedy at the Stoughton site will be in compliance with Ch. NR 140, WAC, in that preventive action limits (PALs) will be met at and beyond the edge of the waste management area unless WACLs are established pursuant to the criteria in section NR 140.28, WAC, in which case the WACLs will be met.

2. 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 promulgated Wisconsin Water Quality Criteria (WWQC) under Ch. NR 105, WAC, based on the Federal AWQC developed by U.S. EPA. The Yahara 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 groundwater from the site.

3. 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 Yahara 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.

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[1] A determination of technical or economic infeasibility may be made, no earlier than five years after operation of the ground water extraction system begins, 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 monitoring wells.

2. Action specific ARARs

Action specific ARARs are technology or activity based requirements or limitations on actions taken with respect to hazardous waste. They indicate how a selected remedy must be achieved.

A. Federal

1. Clean Water Act section 404 prohibits the deposit of dredged or fill material in wetlands without a permit. The substantive prohibition will be observed during site activities pertaining to remedy implementation.

2. Executive Order 11990 - Protection of Wetlands, is an applicable requirement to protect against the loss or degradation of wetlands. The selected remedy will comply with this Order in the design of the groundwater extraction system, when excavating the saturated waste, when constructing the cap and when designing or implementing any other component of the remedy.

3. RCRA Subtitle C. RCRA is not applicable at the Site because the jurisdictional requirement that the facility have treated, stored or disposed of RCRA hazardous waste after July 26, 1982 is not met. Disposal ceased at the SCL in 1972 and the landfill was closed in 1980. However, certain of the RCRA requirements pertaining to the cap and future monitoring of the facility are relevant and appropriate.

4. RCRA Subtitle D. The cap proposed for the Stoughton 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 D and also section NR 504.07, WAC, which is the relevant and appropriate requirement for this site. (See discussion of State action specific ARARs below).

5. If air stripping is chosen as the method for treating extracted groundwater prior to discharge, that activity, as well as the handling of contaminated soil during excavation, consolidation of waste and cap construction could cause air emissions in exceedances of Clean Air Act standards. The design of the selected remedy will either reduce such emissions to acceptable levels or treat them to comply with standards.

B. State

1. 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 Yahara River in that discharges must meet water quality standards.

2. Ch. NR 103, WAC, establishes water quality standards for wetlands. Ch. NR 103, WAC, would be applicable to actions that affect wetlands. The implementation of the selected remedy will reduce contaminated groundwater discharge to the wetlands and thus comply with the anti-degradation provisions of Ch. NR 103, WAC, and assure that significant adverse impacts to the wetlands will not occur in the future.

3. Chapter NR 504, WAC is not applicable to this site because it regulates 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 the Stoughton site, in that a cap of sufficient integrity to minimize liquid infiltration into the waste is necessary to retard further leaching of contaminents into the groundwater, Ch. NR 504, WAC requirements are relevant for the Stoughton site. Chapter NR 504, WAC requirements are well-suited for the Stoughton 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. These requirements will be met by the cap component of the selected remedy.

4. 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 Yahara 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.

5. Chapter 147, Wisconsin Statutes, is also applicable to treated water to be discharged to the Yahara 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).

6. Chapter NR 445, WAC regulates air emissions from treatment technologies and is applicable to point source emissions from industrial facilities. Air stripping may be used to treat

groundwater prior to discharge. 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.

7. 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." To date, no threatened or endangered species have been found at the Site.

3. Location specific ARARs

Location specific ARARs are restrictions placed on the concentration of hazardous substances or the conduct of activities solely because they are in specific locations.

A. Federal

1. Executive Order 11988 - Protection of Flood Plains, are applicable to the Site due to its location within the mapped 100-year flood plain (843 feet above mean sea level) of the Yahara River. This Order would be met by designing the groundwater treatment system to be located above this elevation and be protected from erosional damage.

B. State

1. 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.

3. Cost-Effectiveness

Cost-effectiveness compares the effectiveness of an alternative in proportion to its cost of providing its environmental benefits. The selected remedy's long-term effectiveness and its ability to reduce the amount of THF in the surficial aquifer 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.

With respect to VOC emissions during treatment of the groundwater and movement of saturated wastes, 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 groundwater to the Yahara 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.

The selected remedy will achieve the threshold criteria by attaining all Federal and State ARAR's and providing protection to human health and the environment, and at lower costs than Alternatives 6A and 6B.

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

The selected alternative will provide for a permanent solution to the THF contaminant plume west of the Site by extracting contaminated groundwater and treating it above ground. Wastes in contact with groundwater will be excavated and placed away from the eastern wetlands, thereby providing a long-term solution to the environmental impacts to the wetlands.

5. Preference for Treatment as a Principal Element

There are no identifiable hot spots in the waste for which treatment is viable or practical. Although no test pits were conducted during the RI, analyses of borings obtained during monitoring well installation do not show elevated contaminant concentrations indicative of hot-spot disposal areas. Due to the heterogeneity of the waste, it is not feasible to excavate and treat a specific portion of the landfill.

Extraction of groundwater to the west of the Site will reduce concentrations of contaminants to levels which will meet State groundwater quality standards, if this component of the selected remedy is required as described in Section IX above.

RESPONSIVENESS SUMMARY
FOR THE RECORD OF DECISION
FOR THE STOUGHTON CITY LANDFILL

The United States Environmental Protection Agency (USEPA) recently held a public comment period from July 12 through August 12, 1991, for interested parties to comment on the Proposed Plan for remediating contamination problems at the Stoughton City Landfill Site (SCL Site) in Stoughton, Wisconsin. Comments were also taken on any documents in the administrative record, including the Remedial Investigation/Feasibility Study (RI/FS). The required public hearing on July 24, 1991, focused on the results of the FS and the USEPA recommended alternative as presented in the Proposed Plan fact sheet. The public comment period was held in accordance with Section 117 of the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) as amended.

The purpose of this Responsiveness Summary is to document USEPA's and WDNR's responses to comments received during the public comment period. These comments were considered prior to selection of the final remedy for the Stoughton City Landfill Superfund Site, which is detailed in the Record of Decision (ROD).

BACKGROUND ON COMMUNITY INVOLVEMENT

USEPA is responsible for conducting the community relations program for this Site. A Community Relations Plan (CRP) was established by USEPA for the Site in December 1988. It established a process to develop two-way flow of project information between local officials, concerned citizens, the media, WDNR and USEPA. Three information repositories were established in the community -- Stoughton City Hall, the Stoughton City Library, and the Stoughton Public Utilities office. Several different press releases and fact sheets were issued to announce field activities and findings of the RI and FS activities. A public meeting was held in Stoughton on November 21,1988, at the start of the RI/FS to explain the investigation that was about to begin. A special afternoon availability session was also held for the residents of Vennevoll Subdivision at their clubhouse that same day . Another public meeting on the findings of the RI/FS and the Proposed Plan was held in Stoughton on July 24, 1991. Both public meetings were carried by the local public access cable television channel. Community relations activities are summarized in the ROD, if additional information is desired.

PUBLIC HEARING

The required public hearing on the Proposed Plan for the Stoughton City Landfill Site was held from 7:00 p.m. to 10:30 p.m.

on July 24, 1991, at the Stoughton Public Safety Building Council Chambers in Stoughton , Wisconsin. Approximately 110 persons attended, including several local, county or federal officials or their representatives, representatives of the PRPs, and members of the press (television, radio and newspapers). Representatives of USEPA and the WDNR presented information concerning the RI, FS, and Proposed Plan and responded to questions from individuals attending the meeting. An oral public comment period was held. A transcript of that public meeting, including the oral public comment period, was prepared by a court reporter in attendance. Copies of the transcript are available at the three Site information repositories.

The following presents a compilation of comments received from the general public and the Potentially Responsible Parties (PRPs) during the public comment period, and USEPA and WDNR's responses to those comments. The comments are presented in the two following categories: comments from citizens, and comments from the PRPs. Since the City of Stoughton is a PRP, comments received from representatives of the City of Stoughton are presented under the PRP category. Comments within the citizen comments category are organized as follows: those in favor of the No Action alternative; those in favor of delaying the decision while gathering more information; those in favor of mixed-funding or the City's proposed alternative; and those in favor of the USEPA and WDNR's Recommended Alternative as presented in the Proposed Plan fact sheet.

It is important to note that the following are direct quotes excerpted from either the transcript of the public meeting's formal public comment period, or from correspondence submitted during the public comment period. The commentor is identified, as well as whether the comment was submitted orally or in writing. The material enclosed in square brackets -- i.e., [ ] -- has been added in order to clarify the comment or to provide references as appropriate.

Where a comment is lengthy or makes several points not reiterated in other comments within the organizational subsection, the comment is responded to separately. In most cases, the issues raised by the group of comments are identified and responded to at the end of the organizational subsection.

CITIZEN COMMENTS

IN FAVOR OF NO ACTION:

NORDEEN E. OFFERDAHL
WRITTEN COMMENT:

"Considering the fact that ... no contamination of any wells within the city or immediate vicinity, I believe that the expenditure of several million dollars in 'clean up' is not warranted. I would hope and trust that the [US]EPA reconsider their proposed remedy."

MR. JOE RALPH & MS. MARGIE SELBO
WRITTEN COMMENT:

"THF [tetrahydrofuran] levels in the Stoughton City Landfill exceed that which is presently permitted in the State of Wisconsin.

There is no evidence that any living thing has been (or will be) adversely affected on, in or around said landfill in the thirty years that THF has been present ... [or] so long as present restrictions remain in place.

It is not known if levels have increased, decreased or have remained the same over the thirty year period.

It is not known if measures recommended by [US]EPA will prove effective.

It is not known if disturbing the landfill area will create hazards to living things on, in or around said landfill.

Continued monitoring of the area will forewarn the community of potential hazards.

... The recommendations [the Recommended Alternative as stated in the Proposed Plan fact sheet] seem to have been rushed as if to beat some deadline, possibly budget interests of the coming year."

RESPONSE:

The Superfund program, as directed by Congress, must assess not only present risks to human health and the environment, but also potential risks. The selected remedy for the Site must also comply with State and Federal applicable or relevant and appropriate requirements at a Site.

The USEPA and WDNR acknowledge that there is no data available from years prior to 1983 to evaluate the trend of contaminant levels in the environment over time near the Site, and are seeking over the next year to gather information which will allow a partial assessment of any such trend over the limited time of the further study. By gathering data over the next nine months to one year, we would, in effect, have a nine year timeframe by which to look at THF trends on or near the Stoughton City Landfill Site. Data collected in 1983 by the Wisconsin State Laboratory of Hygiene did indicate tetrahydrofuran (THF) at monitoring well SB-3 at a concentration of 1000 µg/L. This represents a concentration 20

times greater than the State of Wisconsin's NR 140 enforcement standard (ES) of 50 µg/L, and 100 times greater than the State's preventive action limit (PAL) of 10 µg/L. Monitoring well SB-3 is located approximately 700 feet north of monitoring well MW-3D. In 1984, groundwater samples from SB-3 which were analyzed by Swanson Laboratories showed THF concentration at less than 550 µg/L.

The Agencies note that the levels of tetrahydrofuran in the groundwater at the Site have been found to consistently exceed State groundwater quality standards, and as such need to be addressed in the selected remedy for this Site. THF was found at MW-3D in all three groundwater sampling events during 1989 and 1990, ranging in concentrations from 360 µg/L (this was a replicate sample taken during round one, in which the original sample had a THF concentration of 390 µg/L, which indicates good data reproducibility) to 660 µg/L. THF was also detected in MW-4D and MW-5S during the third round of groundwater sampling, at concentrations of 27 µg/L 19 µg/L, respectively. In addition, the potential ingestion of the groundwater, at the current levels of contaminants, poses an unacceptable risk.

USEPA is confident that the groundwater extraction and treatment component of the selected remedy, if implemented, would have a high probability of success in terms of effectively withdrawing and removing THF from contaminated groundwater. THF is completely miscible in water and is able to travel throughout the aquifer with negligible retardation effects (note: the Feasibility Study calculated a THF retardation factor of 1.09). For these reasons, extraction of the THF plume in the surficial aquifer is expected to be technically feasible. The extent of the contamination would dictate the location of the extraction wells and the requisite pumping rates to effect plume containment and extraction.

During remedial design phase tasks, treatability studies would be conducted to determine the optimum treatment scheme for removing THF from the groundwater. Possible methods of THF removal are carbon adsorption, bioremediation and air stripping. Recent carbon adsorption treatability tests conducted on THF-impacted groundwater at the Hagen Farm Superfund Site indicated a high removal efficiency (≥ 99.7%), although the adsorptive capacity of THF is relatively low (4.5 mg/g). Bioremediation treatability tests are currently being conducted at the Hagen Farm Site, and the results of these should be available prior to initiating remedial design for the Stoughton Site.

The present restrictions in place at the landfill do not meet the threshold criteria of protecting human health and the environment. The present restrictions in place at the landfill are also insufficient as a permanent remedy, one of the Superfund program expectations. Furthermore, the present restrictions are

not formalized in any mechanisms which would assure their continued implementation.

Continued monitoring of the groundwater will be an integral component of the remedy selected at this Site as part of implementation of the remedy. For any remedy for a Site where there are contaminated wastes left in place, there is a five-year review required, and that review will further the understanding of contaminant trends over a longer time period. However, since THF and many of the other contaminants were not adequately historically monitored, long-term trends of their levels in the environment near the Site can not be evaluated at this time.

To summarize, the No Action alternative, under which continued monitoring of the area would be performed, is not an acceptable final alternative as it is not protective of human health or the environment, does not comply with applicable or relevant and appropriate requirements (including Wisconsin Administrative Code NR 140), does not treat hazardous substances to the maximum extent practicable, does not restore groundwater to its beneficial uses, and is not a permanent remedy for the Site.

MR. DOUG BRADLEY
ORAL COMMENT:

"... [I]f I thought there was a problem, I would not for a second hesitate to spend money to fix it. But there is far more evidence here ... that there is not a great risk here. You people [USEPA and WDNR] haven't given us anything in facts. These people [the City's staff and consultants] have given us facts and data that shows there really isn't that high potential danger. What you [USEPA and WDNR] have given us is what-ifs. If I'm going to spend a ton of money, I would rather spend that money on facts than what-ifs, because what-ifs don't mean anything.

The other thing that upsets me is you talk about community acceptance. ... [You, USEPA and WDNR] make it sound like community acceptance is important and then stand there and say 'Well, we really don't have more time to do any further studies, because we made up our minds before we ever had this meeting we are going to go ahead and spend the $12 million. We thought it would be nice to stand up here and let you people talk, but the hell with you, we have already made the decision. We are going back. We are going to have this done. We are not going to take any more time. I'm sorry, thank you for coming, but we have already made the decision.' And that's exactly what I think the [US]EPA and WDNR did."

<u>RESPONSE</u>:

The No Action alternative is not acceptable, as identified in the Proposed Plan and reiterated in this responsiveness summary.

Although the municipal wells (#3 and #6) recently tested by the City of Stoughton had no THF concentrations above the method detection limit (10 µg/L), indicating that the public drinking water supply is not currently impacted by Site contaminants, this, in and of itself, is no assurance that future impacts to these wells will not occur. The RI Report indicates two principal aquifers in Dane County: the upper aquifer consisting of glacial outwash (sand, gravel, silty clay) and the lower Cambrian sandstone bedrock. While there may exist localized clay lenses of low impermeability, it is accepted that these two aquifers are hydraulically connected throughout the County. In addition, although municipal well #3 is located to the west of the Yahara River, because contamination was found at Site monitoring well MW-3D, which is screened at 61 feet to 71 feet below ground surface, the Yahara River, which has a maximum depth of 20 - 30 feet, would not act as a discontinuity to groundwater flow. While the River serves as a regional groundwater discharge, groundwater flow patterns would still go beneath the River.

Also, the zone of influence resulting from municipal well #3 extends to within close proximity of the Site. Geology and Groundwater Resources of Dane County, Cline, D. (1965). This is also a concern to the Agencies because Site contaminants which are leaving the Site in a westerly direction (direction of groundwater flow in surficial aquifer along the Site's western border) could be intercepted by the City's well. While Well #3 extends to a depth of about 940 feet into the sandstone bedrock, it is an uncased borehole starting from about 210 feet below ground surface. This would allow for a wide vertical area for contaminant plume interception, and would allow for Site contaminants to vertically travel a distance of about 140 feet, not 800 or so feet (as the City would leave one to believe) before they reach the well. USEPA acknowledges the fact that there are no vertical groundwater flow gradients as determined by slug tests during the RI. This would tend to support the presumption that contaminants (specifically those which have densities less than that of water) would not travel downward toward the bedrock aquifer. However, because of the cone of depression of the City's wells, groundwater flow would be induced downward, even in the absence of naturally occurring vertical flow components in the aquifer.

At the Hagen Farm Site, THF concentrations as high as 1200 µg/L were detected in monitoring wells more than 1000 feet down-gradient from the Site. The Hagen Farm Site, which is also situated in Dane County, had greater THF concentrations detected on-Site than at the Stoughton City Landfill Site. However, when considering aquifer characteristics such as hydraulic conductivity and horizontal hydraulic gradients, there are order of magnitude similarities at the two Sites. This might be somewhat predicted based on the fact that both Sites are located within similar surficial aquifers. When considering the hydrogeologic conditions to the west of the Stoughton landfill, one can appreciate the

Agencies' concerns that the City wells may be impacted at some future time.

In light of public comments, and in recognition of the need to better define the extent of groundwater contamination, the USEPA, in consultation with WDNR, is requiring that the PRPs conduct additional work to better define the extent of the groundwater contamination, both vertically and horizontally. The Agencies have also identified contingencies in the Record of Decision that will take into account the results of the additional monitoring of groundwater. Because the Agencies believe that a decision on a remedy for this Site is warranted at this time, based on the data collected during the Remedial Investigation, we believe it is important to move forward towards remediation at this Site rather than delaying.

Our inclusion of this contingency language is indicative of our consideration of community acceptance.

IN FAVOR OF DELAYING DECISION AND GATHERING MORE INFORMATION:

DAWN ZWEEP
WRITTEN COMMENT:

"... [I]n a court of law a case has to be won by a proponderence (sic) of evidence to state their case. I did not feel that the [US]EPA or the [W]DNR even came close. There were many questions left unanswered.

I am neither supporting nor denying that a clean up is needed, quite frankly I don't think it has been proven one way or another..."

MR. NITZSCHE
WRITTEN COMMENT:

"I feel that the data and information the involved agencies have at this time is not conclusive enough to make a decision of

this magnitude. ... [M]ore conclusive data should be gathered prior to making the final recommendation or decision."

MR. LANE
WRITTEN COMMENT:

"I have no confidence in any of the proposals offered by the parties involved [City, USEPA, or WDNR]. Recommendations appear to be based on incomplete data, unknown cause-effect, marginal

knowledge of the extent of the problem, and far too much [conjecture]. To propose solutions when the extent of the problem is not known (e.g., no deep wells drilled and sampled) smacks of the existence of other pressures (political and/or otherwise) ... At this time the issue is not one of doing something or not or one of money, but rather one of having all the best available information and data before proceeding. Get the facts first, then make the decisions."

MR. BRADLEY
ORAL COMMENT:

"... I have not been convinced by any of these studies. ... I think the majority in this room have the same opinion that I do, that we haven't been convinced that your cleanup [the Recommended Alternative as stated in the Proposed Plan fact sheet] is the answer. ... I don't agree with these people that say we have got to fix something. We don't know what to fix. I have no problem if I was convinced, but I have not been convinced."

DEBRA A. BRADLEY
WRITTEN COMMENT:

"... [W]e, as a community, have a problem that must be resolved. A safe environment for human beings as well as wild life is an extremely important issue for me.

I don't understand how the USEPA can recommend a cleanup alternative when it lacks complete information. Sound business decisions are not based on bits and pieces of information but rather all [emphasis added by commentor] the facts.

I would like to see the USEPA and the WDNR continue frequent [emphasis added by commentor] ground water monitoring and restrict Site access until the testing is adequate and all of the (current) facts are in; at which time a recommendation should be made.

This cleanup is going to cost the taxpayers of Stoughton dearly. I would feel better knowing the "investment" we are making is based on complete [emphasis added by commentor] and current information and that the 'cure fits the illness'."

MS. HANSON
ORAL COMMENT:

"If it takes six months, if it takes a year, if it takes five years, all you have to do is come up with the data to convince these people that it is going to fall apart. Nobody can afford to fix it after it is broken. ... You've got to stop it before it breaks."

DONALD L. HEILIGER
WRITTEN COMMENT:

"I hope that the [US]EPA will take every opportunity to further study this important issue. It appears that there are more ways than the one proposed by [US]EPA to solve the issue, certainly at a more reasonable cost and just as safe."

THE STOUGHTON COURIER
WRITTEN COMMENT:

"We who live here , more than anyone else, would like to see the Site cleaned up and the matter put to rest. But the specialists representing the [US]EPA and [Wisconsin] Department of Natural Resources have not made a compelling case for their recommended cleanup [the Recommended Alternative as stated in the Proposed Plan fact sheet].

They [USEPA and WDNR] left the distinct impression that they are indeed under some kind of pressure to complete a record of decision by the end of the [US]EPA's fiscal year.

Moreover, they [USEPA and WDNR] were unable to answer several key questions regarding the health and environmental dangers posed by the former dump. Without those answers, it becomes impossible ... to judge the merits of their recommendations. In this regard they failed the very citizens their agencies exist to serve.

... [I]s it not unreasonable [sic], then, to expect to know just what we are paying for and why?

The reasonable thing to do, therefore, is to delay a record of decision until the agencies can tell us what we want and need to know. We realize not every question can be answered, but if we are to be encumbered with expenses exceeding our yearly budget, we need more answers than we have.

... It is reasonable, therefore, to expect federal and state money available under the Superfund law to be brought into play.

... We want the dump cleaned up and we're willing to pay a fair share to do it. But we're not comfortable the [US]EPA knows enough to justify its recommendation [the Recommended Alternative as stated in the Proposed Plan fact sheet], nor are we capable of paying for it alone."

U.S. SENATOR ROBERT KASTEN
WRITTEN COMMENT:

USEPA should "... consider deferring the groundwater portion of the Proposed Plan until more information is available. The City

of Stoughton should be asked to address the water contamination concern, however, the taxpayer should not be placed in the position of spending funds on the cleanup which currently are not supported by data."

STATE SENATOR CHARLES J. CHVALA
WRITTEN COMMENT:

"... [I am] greatly concerned with the many unanswered questions about the Site, and [am] reluctant to move forward with any plan until these questions are answered. Perhaps foremost among [these questions] is the actual magnitude of the health risk from the landfill, especially contamination to the groundwater. [T]ests have not discovered any contamination of city or private wells, and although this does not preclude the possibility of contamination in the future, it does raise questions as to the extent of the contamination.

...I urge the [US]EPA to consider pursuing a 'mixed funding' approach, utilizing both state and federal money to finance the cost of this clean up."

STATE REPRESENTATIVE RUDY SILBAUGH
WRITTEN COMMENT:

"... (T)here is now the legitimate question whether any actual, proven problems remain at the Site to warrant the extensive, costly cleanup procedures that are currently being proposed by the [US]EPA.

At this juncture in time, I would like to convey my personal support for a request that the [US]EPA defer the Record of Decision until such time that more data becomes available and until more test monitoring results are completed to the groundwater analysis. The [US]EPA may additionally want to reconsider its recommended alternative (#7) regarding waste relocation and consolidation.

...I would like to go on record in support of mixed funding, pursuant to your authority under CERCLA.

...I would like to reiterate my support for the City of Stoughton's position on this project and would request the [US]EPA's favorable consideration."

RESPONSE:

In light of the public comments, and in recognition of the need to better define the extent of groundwater contamination, and to prevent further delays that have occurred throughout this

process, the USEPA and WDNR have required additional monitoring of the Site at this time. The remedy implemented pursuant to the Record of Decision will reflect the findings of that additional monitoring. The Agencies believe that further delaying the decisions at this Site would only increase the overall costs of remedy implementation. The Agencies believe that the collection of further data is not essential to select a remedy at this time. The reasons for our position are as follows:

First and foremost, Congress tasked USEPA to respond to releases of hazardous contaminants in order to protect human health and the environment. At Stoughton, although we do not at this time know the full extent of contamination at the Site, we do know that there has been a release of contaminants from the landfill into the groundwater at levels that are unacceptable from a human health perspective. Although at the public meeting, the USEPA did not have certain specific information to support this fact, during the public comment period, USEPA discovered that in fact the PRPs had been using unfounded and incorrect health data (specifically, the ingestion reference dose [rfD] for THF used by the PRPs was incorrect) in calculating the severity of the groundwater problems. The Stoughton Risk Assessment has been revised to reflect the new information received by the project manager from U.S. EPA's Environmental Criteria and Assessment Office (ECAO) in Cincinnati, Ohio. Based on this information, U.S. EPA has determined that ingestion of THF would pose an unacceptable toxic effect, if ingested at the levels found 100 feet downgradient of the Stoughton Landfill. Once it is determined that groundwater poses an unacceptable risk, USEPA policy requires that the groundwater be returned to its beneficial use, which is for drinking purposes. While USEPA and WDNR believe we have adequate information to proceed with a groundwater remedy at this Site at this time, we recognize that additional data is needed to better define the extent of groundwater contamination. This information will be gathered over the next several months and during the remedial design.

Secondly, once it is determined that a Site poses an unacceptable risk to human health or the environment, Congress has required that USEPA meet the requirements of all Federal or more stringent State environmental regulations, which we refer to as Applicable or Relevant and Appropriate Requirements (ARARs).

WDNR has promulgated ARARs that specifically address groundwater quality, Wisconsin Administrative Code (WAC) NR 140. The concentration of THF in the groundwater downgradient of the Stoughton Site significantly exceeds groundwater quality standards. This further supports the decision to proceed with a groundwater remedy. As discussed earlier, USEPA has added language to the Record of Decision such that if, based on the additional groundwater monitoring that the PRPs have been required to do, the contaminants in the groundwater no longer exceed NR 140 Enforcement

Standards, implementation of a groundwater extraction and treatment system will be postponed until more groundwater monitoring results can be obtained. However, it is not anticipated this will be the case, since THF does not degrade quickly, the concentrations of THF in 1989 and 1990 were found to be between seven and 13 times the ES, and the groundwater is not moving rapidly enough to effect significant dilution. If groundwater extraction is not immediately required, monitoring will be required for up to thirty years after waste consolidation and cap construction to determine whether or not State groundwater quality standards will be achieved without groundwater extraction and treatment.

The requirement to meet ARARs also applies to the landfill cap and the adjacent wetlands. Since the cap does not presently meet the current closure standards, WAC NR 504, a new cap is required to meet this ARAR. Since there are State Ambient Water Quality Standards (NR 105) exeedences in the wetlands adjacent to the Site, USEPA believes it to be appropriate to stop the release of contaminants from the wetlands by consolidating the waste that is in contact with the groundwater on the dry area of the landfill.

In summary, USEPA believes it to be practical and appropriate to proceed with the remedy as stated in our earlier Proposed Plan, with contingencies, should we discover unanticipated results from the sampling conducted over the next months.

IN FAVOR OF MIXED FUNDING/CITY'S PROPOSED ALTERNATIVE:

U.S. REPRESENTATIVE SCOTT KLUG
WRITTEN COMMENT:

"I strongly encourage the Environmental Protection Agency to review this project ... [and] to pursue a ... mixed funding settlement ..."

BARBARA A. LYNCH
WRITTEN COMMENT:

"I agree with the remediation proposed by the Common Council. ... Regardless of what remedy is ultimately required by the [US]EPA,...I...ask that the [US]EPA and the State of Wisconsin agree to pay for a substantial share of the cleanup and other response costs for the Site, through the 'mixed funding' of Superfund."

MS. NANCY HAGEN
ORAL & WRITTEN COMMENT:

"I feel comforted with the results, which show me that there are no dangers. I think that the [US]EPA and WDNR are not proving

the problem [and are] suggesting an overkill with their alternative. I have trust and confidence in the city's alternative. It shows acknowledgement of the problem and a reasonable solution."

DR. SCHAMMED
WRITTEN COMMENT:

"... [M]y chief interest is in the health of my community. However, the information available on toxic wastes at the Stoughton [City Landfill] Site are mainly matters of conjecture, 'potential,' possibility, and basically unproven. ... I feel that the enormous monies being considered in this case to deal with unproven risks is poor judgement. ... I believe the City of Stoughton has a much more plausible plan."

MR. CARRAO
ORAL COMMENT:

"I am in favor of a clean environment. ... However, this matter [the Recommended Alternative as presented in the Proposed Plan fact sheet] is slightly a little over-kill remedy to a problem that is closely being monitored and should be monitored for many years to come. ... Certain provisions should be taken to possibly re-cap the area, if there is a need, but to completely upset the area and perform a full scale reconstruction is not necessary at this time. Continue to monitor and evaluate."

MS. KINNING
WRITTEN COMMENT:

"[I] agree with the remediation proposed by the City Council. ... Regardless of which remedy is ultimately required by [US]EPA ... [I] ask that [US]EPA and the State of Wisconsin agree to pay for a substantial share of the cleanup and other response costs for the Site, through the 'mixed funding' of Superfund."

MR. RALPH & MS. DOROTHY BRADLEY
WRITTEN COMMENT:

"We agree with the remediation proposed by the City Council. ... Regardless of which remedy is ultimately required by [US]EPA ... We ask that [US]EPA and the State of Wisconsin agree to pay for a substantial share of the cleanup and other response costs for the Site, through the 'mixed funding' of Superfund."

MS. KATHLEEN HANSON
WRITTEN COMMENT:

" I agree with the remediation proposed by the City Council. ... Regardless of which remedy is ultimately required by [US]EPA

... [I] ask that [US]EPA and the State of Wisconsin agree to pay for a substantial share of the cleanup and other response costs for the Site, through the 'mixed funding' of Superfund."

FIRST NATIONAL BANK OF STOUGHTON
WRITTEN COMMENT:

"... [W]e would recommend the adoption of the remediation as proposed by the City Council. ... [And we] would urge that funds be made available by [US]EPA and also the State to pay for a fair share of the cleanup costs of the Site through the 'mixed funding' of Superfund."

MARK BENSON
WRITTEN COMMENT:

"Skaalen Sunset Home, Inc. and a related corporation, Vennevoll, Inc., own real estate south and west of the Stoughton City Landfill.... I [Executive Director] am writing on behalf of the corporations as a comment regarding remediation for the landfill recommended by USEPA and the Wisconsin DNR.

I agree with the remediation alternative supported by the Common Council.... ...[W]hatever cleanup alternative is chosen, ... [w]e ask that the [US]EPA and Wisconsin DNR agree to pay for the substantial share of the cleanup and other response costs for the Site, through the 'mixed funding' provisions of Superfund."

MR. ERIC CARLSON & MS. JANE CARLSON
WRITTEN COMMENT:

"We are unhappy with the WDNR's and [US]EPA's recommended alternative [the Recommended Alternative as stated in the Proposed Plan fact sheet] and are asking you to consider the alternative [recommended] by the City of Stoughton instead.

We feel that the WDNR/[US]EPA proposed alternative is excessive and inappropriate for the following reasons.

The Wisconsin Department of Health and Social Services has stated that there are no threats to public health from the Site as long as contact with the material is controlled and the contaminated groundwater is not consumed. It is a fairly simple matter to control access to the Site, to monitor wells at the Site, and to keep people from installing drinking water wells within the plume of contamination.

... The [City's] public drinking water wells have not been impacted by the landfill and are located far enough away from the Site that it is very unlikely any contaminants will ... reach the wells. This situation can be easily monitored through the sampling of these wells. Furthermore, the wells can be taken off line or

the water cost-effectively treated prior to distribution if the contaminants do reach the wells.

No federal ... drinking water standards have been exceeded at the Site. ... [T]he [State groundwater standard for tetrahydrofuran, or THF] was exceeded on the City of Stoughton property and there is no documented evidence that THF is migrating off-Site where it may be a health concern.

... It is not clearly documented that the metals in the wetlands originated from the Site.

... [E]xcavation and movement of the wastes which are in the groundwater appears to be unnecessary. ... It seems that capping the materials would serve the same purpose (i.e., minimize leaching to the wetlands, would be safer to workers, and would be more cost-effective).

... [W]e feel that pumping and treating the groundwater at the Site is unnecessary. Should contamination reach city wells, it would likely be more cost-effective to implement wellhead treatment or take the well out of service than to pump and treat groundwater at the Site.

The WDNR/[US]EPA proposed alternative seems to have been selected without consideration to cost. It will cost the average household over $300 per year for the next 20 years to implement this alternative. This cost may be justifiable if there was a real threat to the public health or the environment, or if the alternative was clearly more effective than the one recommended by the City of Stoughton.

We feel we have a safe, healthy environment in which to live and start a family and that this environment is not adversely impacted by the [Stoughton City Landfill].

We ask that you [USEPA] please reconsider the alternative that you have proposed [the Recommended Alternative as stated in the Proposed Plan fact sheet]. If you really feel unable to select the alternative recommended by the city at this time, then at least consider additional monitoring before implementing such a costly and apparently unnecessary action."

RESPONSE:

Relative to the City's recommended alternative, please see the lengthy discussion presented later in the PRP COMMENTS section of this Responsiveness Summary.

To claim USEPA selected its proposed alternative without giving consideration to costs is inaccurate. Prior to evaluating alternatives of varying costs, the determination must be made as to

whether those alternatives meet the threshold criteria of ensuring protection of human health and the environment and of meeting Federal and State applicable or relevant and appropriate requirements, or providing justification for an ARAR waiver. If an alternative does not meet the critical threshold criteria, it cannot be further considered for Site remediation, and therefore, cannot be further evaluated with respect to less costly or more costly alternatives which do achieve the threshold criteria. With that in mind, USEPA and WDNR, did evaluate those alternatives which meet the threshold criteria, i.e., Alternatives 6A, 6B and 7 in the Proposed Plan. The costs of these alternatives, based on net present value (NPV) over 30 years, is estimated to be $13.4 million, $14.8 million and $8.5 million, respectively. In the interest of selecting a cost-effective yet adequate remedy, USEPA, in consultation with WDNR, selected Alternative 7 in the Proposed Plan.

The issue of mixed funding is relevant only to who pays how much for the remedy selected in the ROD. The USEPA will undertake an initial evaluation of the Site for mixed funding prospects after issuance of the ROD and prior to issuance of the special notice letters.

The NCP requires that a Class II aquifer be cleaned up to its beneficial use as a drinking water source. Therefore, treating contamination at the currently existing municipal wells would not comply with the NCP. Further, waiting until the contaminant plume spreads to the point at which it does contaminant Stoughton's drinking water would needlessly endanger the health of its citizens and increase the cost of groundwater treatment.

IN FAVOR OF PROPOSED PLAN:

MS. AMUNDSON
ORAL COMMENT:

I cannot support the city's choice of alternative. ... [It is] an option that merely brings the Site up to nine-year old state standards and one which the [US]EPA says is not protective of human health and the environment. ... By choosing the cheapest alternative I think we postpone the problem ... are you satisfied to treat the symptoms when there is a cure? ... Lack of money is not a reason or a justification for choosing the least expensive alternative. ... An investment in proper cleanup would also be important to the children and future of this community."

MS. PAT FOSDAHL
ORAL COMMENT:

"I also would like to speak in support of the [US]EPA and WDNR proposal [the Recommended Alternative as stated in the Proposed

Plan fact sheet] and against the city's proposal. ... The problem will not go away. It will move, and we know it is moving, and it will become very difficult and very expensive to clean it up later ... In addition, Uniroyal ... may not be around forever to help pay for it, but we [the City] will be and if we wait and clean it up later, then we [the City] may have to pay more of the burden of it.

I would rather not tell the children [who are born with birth defects] ... that the City of Stoughton has decided to wait and see if there were any other babies that are born with defects like they were. I don't want to face those children and say that."

LAWRENCE R. "LARRY" MORK & MARY A. MORK
ORAL (LARRY) & WRITTEN (JOINT) COMMENT:

"I would like to see the proposal that the [US]EPA and WDNR have proposed [the Recommended Alternative as stated in the Proposed Plan fact sheet] go into effect. I know that if it ain't broke, don't fix it. But also an ounce of prevention is worth a pound of cure. And I would like to see this cured."

"... [W]e are in favor of Alternative 7 as proposed by the [US]EPA and the Wisconsin DNR.

We do have our concerns:

...[W]e are concerned with any chemicals becoming airborne during the cleanup. We would want assurances that the cleanup process will not cause any toxins to become airborne.

...[C]leanup is not expected to begin until Spring of 1993. There must be immediate and constant monitoring of the test wells and municipal wells, especially for THF as this is currently tested for regularly."

MR. BURROUGHS
WRITTEN COMMENT:

"... the City of Stoughton and Uniroyal should follow the cleanup procedures recommended by the [US]EPA and the WDNR [the Recommended Alternative as stated in the Proposed Plan fact sheet].

... [I am] perfectly satisfied that it has been proven beyond any doubt that there is contamination of the groundwater ... Nobody knows exactly how bad the problem is, how long it will take to fix or how much it will cost. There is a very real possibility that adequate answers to these questions will never be found.

[I] strongly urge the [US]EPA and WDNR to pursue the cleanup methods that will do the best job of removing these chemicals from the ground. [I] am more than willing to pay [my] share as required and think it is time people in this country were made to pay for

the devastation that the lifestyles they demand have caused. [I] look forward to seeing a speedy resolution of this matter and hope that the right course is chosen."

MS. FRICKE
WRITTEN COMMENT:

"I am in favor of following the clean-up plan recommended by the [US]EPA [the Recommended Alternative as stated in the Proposed Plan fact sheet] as opposed to the plan proposed by the City Council. I believe the [US]EPA plan to be the safest and most practical in the long run."

... I would like to strongly urge your [USEPA's] consideration of mixed funding for the City of Stoughton."

MR. ROBERT L." BOB" PAULSON
ORAL & WRITTEN COMMENT:

"I'd like to address the issue that people think it's not broke. ... The fact here is standards are being exceeded, Preventative Action Limits are being exceeded at the point of standards application. ... So the standards are being exceeded and, therefore, the people of the State of Wisconsin are concerned. It is broke, and it needs to be remediated.

... The other problem that has come up ... is that we don't know a lot. There are gaps in the data. ... Lack of data is no excuse as far as I'm concerned.

... I am in favor of doing the right thing ...

I feel that the PRP's should do what is right. Doing nothing but replace the cap at 1982 standards is not right. ...[T]reatment of the ground water because it exceeds standards is enough justification. ...My advice is to do it right the first time.

I personally cannot accept entering into an agreement to do groundwater pump and treat when the current data are so vague, of questionable quality and inconclusive as to extent of contamination. ...I feel it is a mistake to issue the ROD without the extent of groundwater contamination better defined. ... [B]asing a decision on incomplete data of questionable quality is a large mistake and I will not support the ROD without more and better quality data.

I am in support of the refuse relocation to prevent further impacts to the wetlands and possibly surface waters. I support the installation of a new cap to current standards but have reservations about future advances in knowledge and technology requiring additional work. I recognize and understand the need for

the groundwater pump and treat but I do not support [emphasis added by commentor] issuance of a ROD before additional groundwater monitoring better defines the extent of contamination."

RESPONSE:

The Agencies are in agreement with the need to implement a remedy at this Site at this time, especially given the levels of contaminants found in the surface water and groundwater at the Site. Therefore, in order to protect the environment and human health, and respond to both Agency concerns as well as concerns of others in Stoughton, we are selecting a remedy as well as requiring additional monitoring of Site conditions to ensure the decision made is the best decision for this Site. The selected remedy can be implemented without significantly more time elapsing than in the remedy in the Proposed Plan.

Relative to the issue of mixed funding raised by some of these comments, please see the above response.

PRPS' COMMENTS

FIRE CHIEF OSCAR FORTON
(SUBMITTED ON CITY STATIONARY)
WRITTEN COMMENT:

"I cannot understand why the [US]EPA is insistent on cleaning up this landfill when there is only a small trace appearing in a water sample, which [sic] there is no data that there has been a hazard to the health of our citizen's, there is no confirmed, or even unconfirmed, cases of health problems, birth defects, deaths, etc. Your [USEPA's and WDNR's] reason for the clean-up is because this rating of the sample is above the recommended standard. I can't prove to you that conditions at this Site have improved since it was closed, but you can't prove to me that they have not improved. Nature might do a lot for us if we just let it be.

Why would you [USEPA and WDNR] even consider disturbing the land when the area is fenced in with no anticipated usage of Amundson Park! We [the City] are willing to monitor our wells for any future contaminants coming from this Site.

I feel you [USEPA and WDNR] are going overboard with this clean-up ... I think if we just let it set as is, and constantly monitor the Site, everything will work out for all of us."

RESPONSE:

USEPA and WDNR must consider not only whether people are presently at risk from contamination from a Site, but also the potential risk in the future. Although nobody is presently being

exposed to contaminated groundwater, there is potential for exposure in the future. The contamination found in the groundwater far exceeded trace levels, and is present at levels that U.S. EPA considers to be unacceptable, in addition to being significantly above State Groundwater Quality Enforcement Standards. The landfill is not truly "fenced" as stated by the commentor, in that only a gate exists at the entrance to the Site (Amundson Drive), although it should be noted that there is a space in this gate which would allow for trespassers to enter the Site, and there is also snow fencing along the Site's southern and eastern borders. Snow fencing does not provide an effective barrier to trespassers or animals. Chain link fencing around the Site perimeter was suggested by USEPA during the RI field work, but objections raised by the PRP Steering Committee due to the costs of perimeter fencing, resulted in a concession by USEPA at that time. The groundwater will be monitored in the future; however, USEPA and WDNR do not believe these actions alone would be protective of human health or the environment for the following reasons.

The goal of the Superfund program is detailed in the National Contingency Plan (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 USEPA's groundwater protection goal has been set forth in the NCP, in which the Agency has determined that it

> "expects to return usable groundwaters to their beneficial uses wherever practicable, within a time frame that is reasonable given the particular circumstances of the Site. Whenever restoration of groundwaters is not practicable, [US] EPA expects to prevent further migration of the plume, prevent exposure to the contaminated groundwater, 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:

> "[US] 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)).

Finally, State groundwater quality standards, under NR 140, WAC, require that actions be taken to prevent the continued 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 discussed earlier, the Hazard Index risk posed by groundwater use at the Site is 9.5. The NCP states that a Hazard Index greater than 1 would not be adequately protective of human health.

2. As detailed above, the USEPA 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 <u>in conjunction with</u> active response measures where practicable. We believe there is a practicable method to extract and treat contaminated groundwater.

MICHAEL DORAN
STRAND ASSOCIATES (FOR THE CITY)
ORAL COMMENT:

First, of the "... substances [zinc, lead, copper and iron, as cited by USEPA] that potentially exceed federal water quality standards, ... the only element that would be of issue ... would be iron. [According to] the 1986 water quality criteria published by the federal government, ... in a marsh type environment or a swampy type environment, ... iron can become quite concentrated and it is of very little concern to aquatic life.

Second, regarding the risk assessment, "... seven air samples were taken and one air sample had those values. At the same time that sample was taken a duplicate sample from the same location at the same time was clean. That sample had no detects. So that is the kind of risks that really what are looking at when we are evaluating this Site.

Third, after a brief look at [US]EPA's cost estimates, it appears "... that there are some significant items that haven't been included in the capital cost, and those may include such items as air monitoring. ... The method of estimating that [US]EPA utilized appears to exclude those costs."

<u>RESPONSE</u>:

There have been documented exceedances of State Chronic Water Quality Criteria at this Site for copper, lead, arsenic and zinc in

the surface water adjacent to where wastes are in direct contact with groundwater.

The methods used to calculate risks at the Site have been reviewed and approved by the USEPA. The risks calculated by the PRPs associated with the ingestion of groundwater have been found to be in error, as the reference dose (Rfd) for tetrahydrofuran (THF) used in the risk tables presented in the Feasibility Study and summarized in the Proposed Plan fact sheet was incorrect. It appears the PRP consultant, ENSR, calculated an oral ingestion reference dose for THF from an inhalation THF RfD, which was to have been provided them by U.S. EPA Research Triangle Park, according to ENSR. This RfD derived by ENSR was incorrect, either as a result of using data from different animal studies or there was an error in the computation utilized in going from inhalation exposure to ingestion. In any event, the RfD used by ENSR was 0.068 mg/kg/day which is significantly higher than the interim THF Rfd recommended by U.S. EPA's Environmental Criteria Assessment Office (ECAO). ECAO suggests an interim oral reference dose of 0.002 mg/kg/day. Since the hazard index is inversely proportional to the RfD, the resultant potential human health risks from ingestion of Site groundwater increased by a factor of 34 (i.e., the ratio of 0.068 to 0.002) when U.S. EPA revised the risk tables in August 1991. Upon further review by USEPA in response to this comment, the risks associated with ingestion of groundwater were recalculated and found to result in a Hazard Index of 9.5; this level is one order of magnitude higher than the USEPA's acceptable level of 1, and hence the risks are unacceptable to USEPA.

The cost estimates presented by USEPA were derived from those developed by the consultants for the PRPs. These estimates do appear to have included the cost of air monitoring during construction. The Cost Estimates in Appendix B of the June 1991 Feasibility Study include one-time (i.e., "lump sum") costs for air monitoring for those alternatives involving waste excavation. This figure is estimated at $300,000, and is included in the capital cost of Alternative 7. The major capital costs of the three components of Alternative 7 (solid waste cap; waste excavation and consolidation; groundwater extraction & treatment) were all taken directly from the FS Report prepared by ENSR on behalf of the PRP Steering Committee. Prior to submittal of this document to U.S. EPA, the PRP Steering Committee presumably reviewed and approved the document. If some lower budget items were not included in the U.S. EPA cost estimate, it is because they were excluded from the FS cost estimates. Cost of dewatering appears to have been left out of U.S. EPA's cost estimate for Alternative 7 in the Proposed Plan. The FS calculates a total treatment volume of 2.2 million gallons of water. U.S. EPA believes this is an over-estimate of the actual volume of water which will need to be treated. Consequently, the costs associated with dewatering (i.e., $440,000 in the FS) should markedly decrease as a result of engineering practices which can be implemented in order to reduce the volume of

water entering the excavation area during refuse removal. The FS fails to address treatment of this water in a publicly owned treatment works (POTW). Also, pre-fabricated treatment systems can be utilized which will significantly lower the costs of treatment of water. Therefore, the estimates for Alternative 7 are expected to fall within the range of accuracy of +50/-30 percent.

MR. JOHN NEAL
CITY FINANCE DIRECTOR
ORAL COMMENT:

First, " ... the $8.5 million figure that the [USEPA and WDNR] are proposing, in my estimation, is very inaccurate. They [USEPA and WDNR] have left out the cost of borrowing the money to do this in the first place. They [USEPA and WDNR] make what's called a net present value calculation, which assumes we have money available up-front. We [the City] do not have the money, so we would have to borrow up-front capital of $2 million over a period of 20 years at seven percent, which would cost the city $5 million in interest.

Secondly, they [USEPA and WDNR] are projecting what they call operation and maintenance [O&M] costs for a 30-year period. If you look at their schedule, you will see that they [USEPA and WDNR] have the same figure for 25 years. ... They [USEPA and WDNR] applied no inflation factor to these O&M costs. I asked them [presumably either the city finance department or the City's outside auditor] to run this through their computer. They came up with a figure of not $3.7 million as the [US]EPA has on this handout [the Proposed Plan fact sheet] on page 9, but comes out to $6.9 million and as long as we are rounding up to the nearest million, we [the City] will call that $7 million, an extra $5 million in extra costs. Very quickly, in about half an hour, I got up to $17 million or double the figure they [USEPA and WDNR] have been discussing."

RESPONSE:

The cost estimates presented by USEPA were derived from those developed by the consultant for the PRPs and presented to the USEPA by the PRPs in the Feasibility Study [FS] Report for the Site. The City, one of the two identified PRPs, had ample opportunity to review the cost estimates prepared on their behalf and to direct their consultant to revise the estimates to account for the effects of inflation during the projected 30-year O&M period of the project.

The cost estimates prepared by the PRPs' consultants follow the net present value (NPV) analysis method acceptable to the USEPA. The NPV method utilizes an USEPA-directed 10 percent "discount factor," which is intended to account for the time value

of money needed to be invested at present to cover the full estimated lifetime cost of the project.

The USEPA acknowledges that the cost estimates presented in the Proposed Plan fact sheet, which were taken from the PRPs' FS Report, do not account for the cost of borrowing the money. The cost of borrowing money is not routinely factored into the USEPA's analysis of costs. The PRPs, however, could have directed their consultant to include the cost of borrowing the money, and evaluated that impact on the standardized cost estimates, in order to present the PRPs' best estimate of the cost of implementing the alternatives being evaluated. Such an approach, known as a sensitivity analysis, is acceptable to USEPA as long as the standardized cost estimates are also presented. U.S. EPA, however, uses standardized cost estimates when evaluating the cost and cost-effectiveness of various alternatives, and not the results of a sensitivity analysis.

Evaluating the impacts of inflation and interest rates are very sensitive to underlying assumptions. A proper evaluation of the impacts of these factors would involve assuming different values for yearly inflation rates and interest rates, calculating a revised NPV total cost estimate, and comparing those to the original NPV total cost estimate. This approach, known as a sensitivity analysis, is common in financial analysis and has been used at other Superfund Sites. The PRPs apparently elected not to utilize it for the Stoughton City Landfill Site.

MAYOR HELEN JOHNSON
ORAL COMMENT:

"... [A]t present the Site is fenced to deny access, and it is covered by a soil cap that was deemed sufficient by the WDNR at the time the Site was closed.

The city has regularly sampled the city well to the west of the Yahara River as well as other city wells. The city wells have been found to comply with all drinking water standards.

The State of Wisconsin has sampled private wells in the vicinity of the Site, and we have been advised by the State that the private wells are safe. If test results in the future indicate a problem, the City will advise the residents of Stoughton immediately.

As to the city well, our [City] water utilities would stop use of the well immediately if there were any reported values that indicated the pollution of that water source.

... [N]one of the [insurance companies providing liability and property coverage to the City] has agreed to contribute toward the defense costs of the [US]EPA enforcement action or toward

investigation and cleanup of the Stoughton Site.

... [W]e [the City] intend to assert that a substantial share of the cost of the cleanup is the responsibility of Uniroyal. However, we [the City] are concerned about our ability to collect monies from Uniroyal to meet there fair share of responsibility. Therefore, we are also taking a hard look at our [the City's] fiscal situation in order to determine how the City could fund some portion of the cleanup cost and what the increase in tax levy would be if that comes to pass. We [the City] intend to vigorously press the [US]EPA to have a portion of the cost paid for by the United States government, but at present have no assurance that the United States government will bear any part of those costs."

RESPONSE:

As discussed above, although the Site is temporarily fenced (snow fence) on two sides, and capped with a soil cover, USEPA and WDNR do not consider the Site in its present condition to be protective of human health and the environment, or to meet Applicable or Relevant and Appropriate Requirements (ARARs). Congress passed CERCLA, and gave USEPA the authority and charge to implement the statute. The statute requires that USEPA select remedies that

- Are protective of human health and the environment;
- Comply with ARARs (or justify an ARAR waiver);
- Are cost-effective;
- Utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and
- Satisfy the preference for treatment that reduces toxicity, mobility, or volume as a principal element, OR provide an explanation as to why this preference is not satisfied.

As discussed above, although private and public drinking water wells are not presently contaminated, USEPA must also consider and base its decisions on potential risks to future users. It should be noted that the City does not routinely test its well #3 for THF, and does not have historical data to evaluate. USEPA does acknowledge that the City has tested its wells in the past for volatile organic compounds, but since THF requires special analytical services, it is not a compound checked for in routine volatile organic scans. Although the commentor states that the City would immediately stop use of the municipal well should it become contaminated, USEPA does not believe this to be prudent, as

it puts people at real risk to exposure, and would cost significantly more money to remedy once the plume has migrated to the wells.

MAYOR HELEN JOHNSON
WRITTEN COMMENT:

"... [A] word of explanation and comment on the financial material provided [a financial report prepared jointly by City staff and the City's auditing firm, Virchow, Krause and Company). The Common Council feels that the recommended alternative [the Recommended Alternative presented in the Proposed Plan fact sheet] could be devastating to the City's financial condition. We have been advised by Uniroyal that it is not in good financial condition. The City is deeply concerned that in the event that Uniroyal is not able or willing to pay a substantial share of the cost of the chosen remedy, and the City ultimately must pay a share of the cost whatever remedy is chosen, it could mean more than doubling the City's debt load. This would greatly restrict the City's ability to provide services, engage in capital projects for the benefit of its citizens, or respond to emergency needs for capital.

... The City therefore believes that it is imperative that the USEPA immediately begin consideration of the possibility of utilizing the authority the agency has under Section 122(b) [of the Superfund law as amended] to enter into a mixed funding solution to this Site. We understand that consideration of mixed funding is not going to be a part of the Record of Decision, but nonetheless, consideration of this issue at the earliest possible time is critical."

RESOLUTION R-17-91 OF THE
COMMON COUNCIL OF THE CITY OF STOUGHTON
WRITTEN COMMENT:

"RESOLVED, that the City's consulting engineering firm (Strand Associates), the City Attorney, and outside legal counsel (Boardman, Suhr, Curry & Field), with the assistance of Robert Kardasz, Utility Manager, are hereby authorized to submit comments on behalf of the City with respect to the USEPA's recommended cleanup plan [the Recommended Alternative presented in the Proposed Plan fact sheet] for the Stoughton [City Landfill] Superfund Site ...

... The Council therefore expressly hereby demands that the USEPA and the State of Wisconsin undertake to pay for a substantial share of the cleanup and other response costs for this Site through the explicit authority that Superfund resources be used at a Site (so called 'mixed funding') provided in Section 122(b) of the

Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), as amended. The specific terms of such mixed funding approach would be addressed in subsequent discussions among the Potentially Responsible Parties, USEPA and the State of Wisconsin.

RESOLVED FURTHER, that a copy of these resolutions shall be filed with the USEPA and the State of Wisconsin as part of the comments from the City on the recommended cleanup plan."

RESPONSE:

Relative to the issue of mixed funding, the USEPA will undertake an initial evaluation of the Site for mixed funding prospects after issuance of the ROD and prior to issuance of special notice letters.

STRAND ASSOCIATES, INC.
ON BEHALF OF THE CITY
WRITTEN COMMENT:

"The substance of this memorandum has been reviewed with the City and this memorandum is filed at the direction and with the authority of the Mayor and Common Council of the City.

...[With regard to risks to public health], [US]EPA believes that there is an unacceptable risk to the public from inhaling air at the Site, based [solely] on the volatile organic compound (VOC) 1,2-dichloroethene measured in one air sample at the Site, but:

- the concentration was '... slightly above the method detection limit'(page 4-32 of RI);

- a duplicate sample (same location at same time) detected no VOCs and 'did not confirm' (page 4-32 of RI) the positive result and 'The single positive result may also be from improper field handling of the sample media' (page 4-32 of RI);

- no VOCs were detected at six other locations during RI sampling;

- WDNR/State Lab of Hygiene detected no VOCs during two sample rounds conducted prior to the RI; and

- the State Department of Health and Social Services has determined (see their 7/24/91 Fact Sheet) that 'Air tests above the Site did not show contamination at levels of health concern.'

Consequently, the City does not believe that the presence of an unacceptable health risk has been demonstrated for the Site.

... [With regard to environmental risks and environmental compliance] ... [US]EPA believes tetrahydrofuran (THF) in groundwater in the western portion of the Site is a potential threat to City well #3, and to be present at levels above groundwater standards, but:

- City well #3 (and #6) has been measured for THF, and there are no detects; ...

- water level measurements in monitoring wells at the Site do not suggest any recharge of deeper groundwaters is occurring at the Site;

- THF has not been measured at the point of standards application for the State Enforcement Standard (ES) as defined in NR 140.22, and there is no federal drinking water standard for THF;

- modelling work conducted as part of the Feasibility Study (FS) concluded that any violations of the ES at the point of [standards] application is unlikely; ...

- [US]EPA agrees that any groundwater problems due to THF are poorly defined and that additional investigative work is necessary.

Therefore, the City does not believe that adequate justification is yet available for a ROD [Record of Decision] requiring a groundwater remedy at the Site.

[US]EPA [and the WDNR] believe that the presence of saturated refuse (refuse located in the water table) at the north and southeast margins of the Site are causing degradation of groundwater quality [and adversely impacting the wetlands], but:

- there are no groundwater quality data from monitoring well clusters 2 and 6 (located near or in this saturated waste) which exceed [US]EPA groundwater standards or which approach State health-based ESs, and

- the only groundwater quality data from these locations which exceed state ESs are for iron and manganese, which are regulated for aesthetic purposes only (plumbing fixture staining), and for which we understand ESs are not consistently enforced by WDNR.

Therefore, the City does not agree that there is sufficient evidence in the data to conclude that the saturated wastes are contributing to a degradation of groundwater quality, for those parameters consistently regulated by WDNR.

[US]EPA believes that contaminated groundwater discharges from

the area of the saturated wastes is causing problems with zinc, lead, copper and iron in the surface water east of the Site, but:

- zinc, lead, and copper are not detectable in any of the groundwater monitoring wells at the Site (including MW-2S which is located within the saturated refuse area);

- [US]EPA's "Quality Criteria for Water, 1986", states "swamp waters may contain iron concentrations of several mg/L in the presence or absence of dissolved oxygen, but this iron form has little effect on aquatic life"; and

- state surface water quality criteria (NR 105) does not regulate iron.

Consequently, the City does not believe that non-compliance with ambient water quality ARARs has been demonstrated by the data, or that it can be concluded from the data that present conditions at the Site are causing any increased levels of zinc, lead or copper (the ARARs of concern as expressed by [US]EPA and regulated by NR 105).

[US]EPA believes that contaminated groundwater discharges from the area of the saturated wastes is causing accumulations of cadmium and chromium in the sediments of the wetland east of the Site (above biological tolerance levels for aquatic life), but:

- cadmium was not detected in any of the Site groundwater monitoring wells;

- chromium was not detected in any of the shallow monitoring wells and was detected in only one of the six deeper wells, but this was at a very low concentration and from a well on the west of the Site; and

- the most elevated levels of cadmium and chromium were found at the sample point furthest from the Site and '... surface water runoff from this road (highway "N") may be the source of metals contamination ...'

Consequently, the City does not believe that present Site conditions are contributing to elevated levels of cadmium or chromium in the wetland sediments east of the Site.

[US]EPA [and WDNR] believe that the present cap, if upgraded as proposed in the FS, would not meet current state requirements for a frost protection layer, but:

- [US]EPA's comments on the FS indicate that the present cap (if upgraded as proposed by the FS) would meet the remedial action objective '... to reduce the further movement of contaminants to groundwater ...', and

- the FS proposes to upgrade the cap to provide a tightness specification equal to WDNR's current specification, and to provide ongoing inspections and maintenance of the upgraded cap.

Based on existing data, the City does not agree that the Site poses a significant threat to public health or the environment. The City believes that a decision on any significant remedial action at the Site should be delayed until the results of additional investigative work to be performed at the Site. Should the additional work conclude that the Site does not pose a significant health or environmental risk, the Site should be removed from the NPL.

If the Site cannot be removed from the NPL, the City believes that upgrading of the present cap, together with Site and use restrictions (FS Alternative 2) meets the remedy objectives of:

- minimizing direct contact with the wastes, and

- reducing further movement of contaminants to groundwater in order to prevent contamination of the groundwater due to infiltration of precipitation through the wastes.

The City believes that the need for saturated waste excavation is not supportable on the basis of the data, and that such action is unwarranted.

The City recommends that any ROD issued for the Site should at a maximum require that the characteristics of the present cap be investigated, and that the cap be upgraded to meet the criteria as described in FS Alternative 2. With this approach, to City recognizes that it may be desirable to provide an NR 504 (Subtitle D) cap should investigations of the present cap conclude that the cost for cap upgrading (FS Alternative 2) would approach the cost of an NR 504 cap (FS Alternative 3).

The City believes that it is not warranted at this time to proceed with a groundwater remedy, that a final groundwater remedy (if one is required) should be determined following additional groundwater investigations which have been requested by [US]EPA, and notes that this is the approach to groundwater that [US]EPA and WDNR were directing the PRPs to take prior to the issuance of their final comments on the FS.

RESPONSE:

Although the City does not believe an unacceptable risk has been demonstrated at the Site, USEPA and WDNR disagree. As discussed earlier, the Hazard Index for THF, based on the concentration in the groundwater at the Site, is greater than the acceptable level of 1, and State groundwater quality standards have

been significantly exceeded. Although the air data shows slightly elevated risks if people were to be exposed, based on results from one sample location, USEPA acknowledges that additional air monitoring should be conducted during the construction to ensure that levels are below levels of health concern. USEPA recalculated the non-carcinogenic health risks via inhalation as a result of concerns raised at the public meeting. Following approved risk assessment guidance documents, USEPA averaged the concentrations of the four volatile organics detected during the ambient air monitoring program (1,2-Dichloroethane, ethyl benzene, xylene and toluene) with one-half of their respective method detection limits, and re-computed the risk tables. This resulted in an inhalation hazard index of 0.99, which is very close to the "cut-off" of 1.

Although the city believes there is not adequate justification to select a groundwater remedy, USEPA and WDNR disagree. USEPA acknowledges that the City has stated that data shows no detects of THF in their public water supply Wells #3 and 6. However, we are required to respond to contamination released into the groundwater above health-based levels and standards even if persons are not presently being exposed. (See earlier response regarding the program expectations to return aquifers to their beneficial use).

As stated above, USEPA agrees that there is no vertical (downward or upward) groundwater flow gradients at the Site's western monitoring wells. However, the surficial aquifer and sandstone bedrock are hydraulically connected and the City well #3's cone of depression comes within close proximity to the Site. For these reasons, the potential exists for contaminants to be drawn from the upper aquifer into the lower aquifer. The fact that the upper aquifer is of moderate permeability would also serve to support USEPA's and WDNR's concerns that THF can be drawn into well #3 as a result of its pumping effects on the lower and upper aquifers.

Although there is no federal drinking water standard for THF, Congress explicitly required in CERCLA that where a more stringent State ARAR exists, that level must be met at completion of remedial action, unless a waiver is justified. State groundwater quality standards in NR 140 are applicable.

The City is confusing State groundwater quality standard exceedances which trigger an evaluation of possible responses and State groundwater quality standard exceedances which indicate that a cleanup standard has not been met. The City is incorrect when it argues that USEPA should only be looking for ES exceedances at the Design Management Zone (DMZ) or beyond. The City is ignoring NR 140.27 which provides that "if, the concentration of a substance in groundwater attains or exceeds an enforcement standard at a location other than a point of standards application for an enforcement standard, NR 140.24 shall apply", i.e., an evaluation of possible responses is triggered to determine how compliance with

State groundwater quality standards will be achieved.

USEPA and WDNR do not agree with the results of the modelling work done by the PRPs that suggests that violations of the ES will not occur further down gradient of the present area of contamination. In fact, USEPA and WDNR anticipate requiring that monitoring wells be placed on the west side of the Yahara River.

As discussed earlier, USEPA and WDNR believe that there is adequate information gathered on this Site to issue a Record of Decision. However, USEPA and WDNR agree that additional data is required to better define the extent of groundwater contamination. The ROD has been written to anticipate the possibility that the concentration and extent of contamination has been overstated and that the levels at MW-3 have decreased to below the ES since the time that well was sampled.

Although the City does not agree, U.S. EPA and WDNR believe that there is sufficient data to conclude that saturated wastes are contributing to degradation of groundwater quality. The following contaminants exceeded their respective surface water or groundwater standards in the wetlands or in Well Cluster 2:

Contaminant	Location	Concentration (µg/L)	PAL (µg/L)
Arsenic	MW-2S	5.2	5
Barium	MW-2S	391	200

Contaminant	Location	Concentration (mg/kg)	Background Soil (mg/kg)
Copper	SLMW2SD1S	25.9	17.8
Lead	"	460	6.3
Zinc	"	163	23.7

Contaminant	Location	Concentration (µg/L)	AWQC, Chronic (µg/L)
Copper	SL-2	33.9	29.9
Iron	SL-1	31,900	1000
Iron	SL-2	46,600	1000
Iron	SL-8	19,200	1000
Lead	SL-1	28.9	12.6
Lead	SL-2	68.6	12.6
Lead	SL-8	15.2	12.6
Zinc	SL-2	327	270

Although the City is correct in stating that the only ESs that were exceeded in the area of saturated waste were iron and manganese, which are aesthetic-based ARARs, the State of Wisconsin established Chapter 160, Wisconsin Statutes, and Chapter NR 140, Wisconsin Administrative Code, to protect not only drinking water quality in the State of Wisconsin, but more importantly to protect the State's overall groundwater quality. In doing so, it developed a set of actions that the WDNR could take to mitigate present and future releases, regardless of whether the contamination is from public health or public welfare contaminants.

Based on the release of these contaminants above State groundwater ARARS, USEPA and WDNR maintain that the saturated waste is contributing to contamination in the wetlands and to the groundwater.

Although the City believes that the data does not demonstrate non-compliance with ambient water quality criteria (AWQC), or that it can be concluded that the present conditions at the Site are causing increased levels of zinc, lead or copper, USEPA and WDNR disagree. The following contaminants exceeded their respective State chronic water quality criteria for surface water (NR 105) in the wetlands:

Contaminants	Location	Concentration (µg/l)	Standard (µg/l)
Copper	SL2	33.9	33
Lead	"	68.6	41
Zinc	"	327	13

Elevated levels of zinc, copper and lead were found in waste samples taken adjacent to the wetlands at the SCL Site. Analyses of surface water quality samples from adjacent wetlands found the levels of those compounds exceeded chronic toxicity criteria established for this Site. That criteria was established using hardness values from the wetlands identified as background for this Site.

USEPA acknowledges that cadmium was not found in any of the monitoring wells as stated by the commentor. USEPA also acknowledges that chromium was only found in MW-4D at a concentration of 8 µg/L. While it is true that the levels of cadmium and chromium in sediments at SL-8 (23.3 mg/kg and 34.6 mg/kg, respectively) were higher than sediments at SL-2 (8.5 mg/kg and 17.8 mg/kg, respectively), it should be also noted that concentrations of lead were higher in sediments at SL-2 (172 mg/kg) than in sediments at SL-8 (37.4 mg/kg). It should also be noted that levels of chromium in surface water were higher near the Site than at SL-8 (6.8 µg/L) vs. 16.5 µg/L (at SL-1) and 15.8 µg/L (at SL-2). In addition, concentrations of arsenic in surface water at SL-1 (7.3 µg/L) and SL-2 (6.2 µg/L) were higher than in surface water at SL-8 (4.2 µg/L). Also, concentrations of zinc were higher in surface water at SL-2 (327 µg/L) than at SL-8 (173 µg/L). And as the above table shows, lead concentrations in surface water were greatest near the Site. From this data, while USEPA acknowledges the potential contributions of surface water runoff from Highway N, the conclusion that Site wastes are also contributing to elevated metals concentrations in the adjacent wetlands cannot be ignored.

Although the City does not believe that present Site conditions are contributing to elevated levels of cadmium or chromium in the wetland sediments east of the Site, USEPA points to the fact that mixed refuse/soil from the MW-2 cluster indicated elevated concentrations, with respect to background samples taken 300 to 400 feet west and southwest of MW-3 cluster, of the following metals: cadmium (27 mg/kg) vs. 1.3 mg/kg (background); chromium (40 mg/kg) vs. 15.4 (background); copper (25.1 mg/kg) vs. 17.8 mg/kg (background); lead (460 mg/kg) vs. 11.7 mg/kg (background); and zinc (163 mg/kg) vs. 36.3 mg/kg (background).

Furthermore, as the above table shows, the highest concentrations of inorganics were found to be closest to the Site, not closest to Highway N (SL-1 and SL-2 are located within 50 feet of the disposal area, while SL-8 is approximately 650 feet from the disposal area). When comparing surface water inorganic results versus background, it can be seen that for chromium and lead, background levels were below the limits of detection of 10 µg/L and 5 µg/L, respectively, while they were found at elevated concentrations at SL-1, SL-2 and SL-8. The highest background iron concentration was 435 µg/L vs. 46,600 µg/L found at SL-2.

As stated in the City's comments, USEPA and WDNR do not

believe the cap upgrade alternative would be effective over the long-term and therefore not be protective, nor would it meet the landfill closure requirements of NR 504. However, some parts of the existing cap may be used as the initial grading layer of the cap. Although USEPA indicated that the cap upgrade would reduce the further movement of contaminants to groundwater, the NR 504 cap would be more effective over the long-term and meet ARARs, whereas the cap upgrade does not meet ARARs.

Although the City does not believe the Site poses a significant threat to public health or the environment, as discussed earlier, USEPA and WDNR do not agree. The USEPA believes adequate data is available to proceed with remedy selection in this ROD, as discussed earlier.

The NCP directs that the Superfund program shall achieve an adequate level of protection 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}) or a Hazard Index less than 1. The potential risk associated with the ingestion of contaminated water from the contaminant plume is estimated to pose a Hazard Index of 9.5, which is an unacceptable risk. In addition, the USEPA must protect the environment. The Agencies are concerned with the long-term effects of contaminants on plant and animal species in the wetlands.

Although Alternative 2 would decrease the direct contact risk with the wastes and would decrease further movement of contaminants into groundwater due to infiltration, USEPA can not select this remedy at this Site. First of all, the cap upgrade would not meet ARARs for closure. Freeze/thaw and animal burrowing effects would be minimized by a frost protection layer provided for in a NR 504 cap, whereas the cap upgrade does not provide this additional effectiveness.

Although a Site fence will be designed in the final design of the remedy and Site land use restrictions will be obtained, these will not protect the groundwater from the contaminants that are leaching out of the landfill nor will these protect the wetlands or surface water where contaminated groundwater is discharging. The groundwater protection goals stated in the NCP and in State law require action to alleviate the potential problems presented by the Site.

USEPA and WDNR will work closely with the City to investigate the existing cap to determine what portions of the cap can be used to meet the NR 504 cap standards. USEPA acknowledges the City's desire to keep the cost of this remedy to a minimum. However, USEPA can only consider cost as a major criteria in comparing remedies that are protective, meet ARARs (or meet the requirement of an ARAR waiver), and are comparable on the other modifying criteria.

USEPA and WDNR, as discussed earlier, believe that waste consolidation is a cost-effective method to prevent further degradation of the wetlands, since it is significantly less costly than other containment alternatives (slurry wall) and provides a greater level of long-term effectiveness since the contaminated waste will be removed from the saturated zone and contained on Site.

In summary, the USEPA and the WDNR selected Alternative 7 in the Proposed Plan for the Stoughton City Landfill Site since this alternative was found to be a cost-effective method of protecting human health and the environment, meeting ARARs, and providing permanent treatment to the maximum extent practicable. The selected remedy, Alternative 7A, provides the best balance with respect to the nine criteria.

The following responses address those comments pertaining to the Preliminary Ecological Assessment and Agency findings and conclusions with respect to environmental impacts in the wetlands. Ambient Water Quality Criteria (AWQC) are ARARs if after considering the designated or potential use of the surface or groundwater, the environmental media affected, the purposes for which such criteria were developed, and the latest information available, the criteria are determined to be relevant and appropriate. CERCLA §121(d)(2)(B)(i). The Preliminary Ecological Assessment's findings support the relevance and appropriateness of AWQC at the Site.

AWQC are well-documented and widely accepted numeric criteria with which impacts to aquatic biota from surface water contaminants can be judged. The use of AWQC to judge the seriousness of surface water contamination has been well established by the U.S. EPA. Since Superfund Remedial Actions are required by statute to be protective of the environment, exceedances of AWQC such as those at this Site warrant that U.S. EPA consider remediation to address these elevated contaminant levels.

Despite the fact that zinc, lead, and copper were not detected at existing Site monitoring well locations, existing data indicate that the landfill is contributing these metals to the wetlands. The RI Report concluded that shallow groundwater flow from the southeast portion of the landfill, where waste is in contact with the groundwater, is toward the wetlands where these metals are elevated. None of the monitoring wells, including MW-2, were placed in the groundwater plume between the waste in contact with groundwater and the wetlands. Furthermore, contamination by copper, lead, zinc, and other compounds is commonplace at landfills that accept municipal and light industrial refuse, such as Stoughton City landfill. In fact, significantly elevated lead levels were detected in a random subsurface soil sample taken at monitoring well location MW-2 (est. 460 ppm vs. 11.7 ppm and 6.3 ppm in background). This evidence suggests that these contaminants

are present in the waste that is in contact with groundwater. The presence of heavy iron floc along the landfill edge of these wetlands strongly indicates that contaminated leachate discharge from the landfill is entering the wetlands. Therefore, this information leads us to the conclusion the elevated levels of zinc, copper, and lead, as well as other contaminants in the wetland, are coming from the landfill.

The heavy iron floc in the wetland along the landfill edge, noted near samples SL-1 and SL-2 in the preliminary Ecological Assessment, strongly indicates that high iron levels are not natural but are caused by landfill leachate. Also, if the high iron levels were natural, then locations SL-3 and SL-4, which are approximately 300 feet and 800 feet , respectively, from SL-2, would have similarly high iron levels. Iron was detected at 5,530 ug/L at location SL-3 and 653 ug/L at SL-4, compared to est. 46,400 ug/L at SL-2. Exceedance of federal AWQC for iron in itself indicates iron levels are unacceptable.

Contamination of wetland sediments could have been caused by surface runoff from the landfill. (See above comments).

Cadmium levels at sampling locations SL-2 and SL-6, far from the roadway and in areas receiving groundwater discharge and past surface runoff from the landfill, are also elevated. Also, cadmium was detected in subsurface soils at MW-2, near the southeastern wetlands.

The lack of observations during the RI of actual effects to plant or animal communities does not mean that such effects are not occurring. Community level effects from contaminants are generally difficult to observe, and, more importantly, no RI field activities were conducted to look for such effects. The Preliminary Ecological Assessment included only large-scale examination (presence or absence of plants and animals), and did not include any community analyses.

The ecological assessment conducted for the Site was based on available data and a Site visit by ecologists. Region V has defined such an assessment as a Preliminary Ecological Assessment, which is why the report is titled as such. The conclusion of such a report necessarily contains uncertainty. To ensure proper protection of the environment, this uncertainty must be dealt with conservatively. Such a conservative approach toward available data leads to the conclusions contained in the Preliminary Ecological Assessment. Additional quantitative evaluations of surface water toxicity or impacts to the biotic communities, had they been conducted as part of the RI, would indeed have helped to eliminate some of this uncertainty.

There is no basis to conclude that general watershed contamination, not the landfill, is the source of surface water and

sediment contamination in wetlands. (See comments above).

Precipitation and adsorption would reduce the contaminant concentration in the surface water. Antagonistic effects between contaminants are known to occur in some circumstances, but the assessment dealt with the uncertainty associated with a multiple contaminant mixture conservatively. (See above comment).

One of the reasons hardness effects the toxicity of divalent metals is that alkalinity commonly increases with hardness, and that in high alkalinity (and high pH) waters, complexes such as carbonates can be formed which reduce the bioavailability of the metals. Mg and Ca, which are used to calculate hardness, were significantly elevated above background at Sites SL-1 and SL-2. Consultation with a U.S. EPA water chemistry expert lead to the assumption that alkalinity may not be increasing with hardness in this landfill leachate situation. In light of this uncertainty, hardness was calculated using Ca and Mg levels from a location where these ions are more typical of ambient background conditions. This calculated value (296 ppm as CaCO3) agrees with the hardness value given in the RI for regional groundwater (326 ppm as CaCO3).

It is true that many of the factors listed would reduce water toxicity to biota. The high regional water hardness and alkalinity are taken into account by AWQC. Other factors, such as pH and organic ligands, are difficult to take into consideration without actual measurements, and thus were treated conservatively in the assessment.

Total recoverable concentrations may indeed be lower than total concentrations, but in the absence of specific data on total recoverable concentrations, we can only use total concentrations.

BOARDMAN, SUHR, CURRY & FIELD
(ON BEHALF OF THE CITY OF STOUGHTON)
WRITTEN COMMENT:

"We have been retained as outside counsel by the City of Stoughton (City) with respect to the above Site. The City Council has asked me to submit comments on certain legal issues that have arisen in connection with the recommendation of USEPA for a remedy for the above Site contained in its [Proposed Plan] Fact Sheet dated July 1991 (Fact Sheet). ... [T]he substance of this memorandum has been reviewed with the City [and] is filed at the direction and with the authority of the Mayor and Common Council of the City.

... The City specifically believes that, dependent in part upon the results of the additional work to be done at the Site, the City may assert that this Site should be de-listed on the grounds that the Site poses no significant threat to public health or the

environment, and, therefore, taking of remedial measures is not appropriate.

The issue of whether the PAL [Preventative Action Limit] or ES [Enforcement Standard] is in fact the standard for cleanup affects not only the concentration to be achieved (and thus conceivably the length of time a particular remedy might need to be pursued), but also affects where the standard must be met. PALs must be met at any point at which groundwater is monitored (NR 140.22(2)), while ESs must be met at particular locations, and not necessarily every point groundwater is monitored.

In the present case, the highest data point for THF is 660 ug/L which was measured, for practical purposes, at the waste boundary.

As a matter of law, PALs are not absolute standards in the remedial context. A '...PAL is not intended to be an absolute standard at which remedial action is always required.' Section 160.001(8), Stats. While PALs are standard in the sense that they are numbers that authorize the State to take a range of response actions, such responses may well use the PAL exceedance as a trigger to warn of a problem, and cause measures to be taken as a trigger to warn of a problem, and cause measures to be taken in the relevant facility, practice or activity that ensure that the ES is not exceeded. While serving as a warning of concern, and authorizing a range of response activities, PALs are not absolute standards in the remedial context. If they were in fact absolute standards, ESs would serve little if any function in the statutory scheme, since one would always be required to meet the PAL.

The fact that a PAL, by statute, is not 'an absolute standard, at which remedial action is always required,' raises several questions as to the use of the PAL as an ARAR.

In the NCP, 40 CFR 300.400(g)(4) states that only standards which are of general applicability [emphasis added by the commentor] meet the definition of a state ARAR:

(4) Only those state standards that are promulgated are identified by the state in a timely manner, and are more stringent than federal requirements may be applicable or relevant and appropriate. For purposes of identification and notification of promulgated state standards, the term 'promulgated' means that the standards of general applicability and are legally enforceable.

It is difficult for the State of Wisconsin to represent to the lead agency on this Site, USEPA, that the PALs are standards of general applicability when the authorizing statutory language expressly states to the contrary. This is not merely a question of what WDNR staff would like to apply, or what they have applied on

other Sites, but what must be applied in all cases, as a matter of law. Aside from whether particular PRPs on certain Sites choose to challenge this issue, or whether staff would like to apply the PALs in all cases, the fact is that as a matter of law in Wisconsin, PALs are not absolute standards that can be enforced per se in all remedial situations.

The PAL is not an absolute standard because it will not be imposed to the extent that it is not technically or economically feasible to attain. Section 160.23(1), Stats., provides that when a PAL is exceeded, the WDNR may implement responses to:

(a) Minimize the concentration of the substance in the groundwater at the point of standards application where technically and economically feasible;

(b) Regain and maintain compliance with the preventive action limit, unless, in the determination of the regulatory agency, the preventive action limit is either not technically or economically feasible, in which case, it shall achieve compliance with the lowest possible concentration which is technically and economically feasible; and

(c) Ensure that the enforcement standard is not attained or exceeded at the point of standards application.

This language, unlike that applicable to exceedances of ESs in Section 160.25, Stats., allows compliance with 'the lowest possible concentration which is technically and economically feasible.' This provision, contained in both subs. (1)(a) and (b), has two implications in this case.

First, it reinforces the conclusions that a PAL cannot be an ARAR since again, by law, it is not an absolute standard. If at one Site, a PAL is either not technically or economically achievable, and therefore it is not applied, then the State cannot assert at other Sites that the PAL is generally applicable (i.e., applied to all cases and not on a Site-specific basis). In fact, the number may be adjusted on a Site-specific basis depending upon the technical and economic conditions at the Site.

There is also the question of 'technical feasibility,' which involves both questions of the efficacy of the pumping of groundwater to reduce concentrations of THF to acceptable levels in the groundwater, and perhaps also the issue of the treatability of the water extracted from the ground before it is discharged elsewhere. The City has concerns about the level to which THF can be effectively reduced in the groundwater given widespread (including within USEPA) and growing reservations about the effectiveness of pump and treat remedies. In addition, if a standard is set for THF removal prior to discharge to the Yahara

River, there is very little information that addresses the treatability of THF. In light of the significant treatability issue that remains with respect to the particular substance of concern here, the 'technical feasibility' of meeting the PAL cannot be addressed at this time, and thus the relevance of the PAL to the actual long term cleanup objective is very much in doubt. Again, under such circumstances, one simply cannot assert that the PAL is an ARAR. Such issues, while certainly representing important unknowns at many Sites, do not affect the need to comply with ESs, but as a matter of law, do affect the need to comply with PALs. Because the ultimate impact of PALs is subject to these considerations of technical and economic feasibility, PALs are not absolute standards that can serve as ARARs.

In summary, from a legal perspective, the PAL for THF may be a 'goal' that DNR desires to reach, but it may be revised upward depending upon the technical and economic circumstances at particular Sites, and may well be revised upward to the lowest achievable concentration in this Site. Even if the Department thought that the PAL was technically and economically achievable at a particular Site, it would still not qualify as an ARAR, since that would have to be a Site-specific determination at every Site, depending upon the substances present and other circumstances, and thus the PAL could not be considered of general application and enforceable per se, in all cases.

The importance of consistency of application to the ARAR concept is also evident from the section of the NCP that indicates that an alternative may be selected in the remedy selection process that does not meet a State ARAR if:

> ... the state has not consistently applied, or demonstrated the intention to consistently apply, the promulgated requirement in similar circumstances at other remedial actions within the state. 40 CFR 300.430(f)(1)(ii)(C)(5)

This language focuses on the State's actual regulatory practice and intention in future regulatory action. The focus on actual application here reinforces the meaning of enforceability as a matter of law in the previously cited section, 40 CFR 300.400(g)(4). Further, since the State cannot state that it will consistently apply the requirement in the future, due to the contingent nature of the PAL (dependent upon technical and economic conditions of the particular Site), this section of the NCP suggests that a remedial alternative need not meet this standard. With respect to the consistency issue, see also 55 FR 8749 et seq.

The legislative history supports the flexibility of enforcing the PAL, thus disqualifying it as an ARAR. Although the plain meaning of the statute (Section 160.001(8), Stats.) obviates the need to look to the legislative history, to the extent it is suggested that there is ambiguity as to the nature of the PALs as

standards, one can resort to documents indicating legislative history and background to the statute (Ch. 160, Stats.). Without intending the following as a comprehensive review of legislative history, several legislative documents issued in recent years which review the operation of the groundwater law summarize the relationship of PALs and ESs under the groundwater law. These sources consistently support the foregoing interpretation of PALs as not being absolute standards.

For example, a November 7, 1989 Information Memorandum 89-11 from the Wisconsin Legislative Council Staff, entitled "Background and Current Status of Groundwater Protection Provisions under Current 160, Stats." states, on page 4:

3. Effects of Standards

The enforcement standard [ES] defines when a violation has occurred. When a substance is detected in groundwater, in concentrations equal to or greater than its enforcement standard,

the facility, activity or practice which is the source of the substance is subject to immediate enforcement action.

The preventive action limit [PAL] for a substance functions as a "warning" to assess the need for regulatory responses when a substance is detected in groundwater. When a preventive action limit is attained or exceeded, some regulatory response may be necessary. The regulatory agency having jurisdiction over the facility, activity or practice causing the substance to enter groundwater is required to evaluate the situation and take action necessary to maintain the concentration of the substance at the preventive action limit or at the lowest concentration feasible. Preventive action limits are intended to provide regulatory agencies with time to take preventive measures to ensure that enforcement standards are not violated. [The commentor notes that the emphasis is in the original.]

A report entitled "An Evaluation of Groundwater Protection Program," dated September 1990, from the Legislative Audit Bureau, states, at page 8, in describing the two tiered system:

- preventive action limits [PALs], which signal that pollution is occurring at a level which, while not health-threatening, may still require agency action; and

- enforcement standards [ESs], which indicate that pollution is at a level requiring a response from the state agency regulating the activity causing the pollution.

The upshot of the foregoing is that the PALs were not intended as, nor are they as a matter of law, an absolute standard, but rather a desirable goal where reasonably achievable.

(2) Point of Standards Application. The ES for THF is an ARAR, however, the City does not believe that the ES has been exceeded in this case, since the groundwater standards in Chapter NR 140 consist of both a numerical standard and a point of standards application. The numerical standards do not have independent significance when considered at points other than those adopted in the rules as appropriate points of application.

The City believes that the appropriate point of standards application [PSA] for purposes of determining whether this Site has exceeded the groundwater enforcement standards is the Site's design management zone. This position is based upon 160.21 Stats. Where the point of standards application is located depends upon the type of facility involved. Section 160.21 sets forth three different types of facilities:

1. A facility where monitoring is required under existing rules for a facility, activity or practice (Section 160.21(2)(a));

2. A facility where monitoring is not required under existing rules for a facility, activity or practice (Section 160.21(2)(b)); and

3. A facility subject to regulations under subch. IV of ch. 144 [solid & hazardous waste provisions] or ch. 147 (WPDES facilities). [Emphasis added by commentor]

Subchapter IV of Chapter 144 sets forth statutory requirements for both active and closed landfills. We [the City] believe that the Stoughton landfill, which is not a closed landfill, would be a facility subject to regulation under those provisions. We are advised that the landfill was properly licensed under these statutes during its period of active operation. We are also advised that the WDNR requires the Stoughton landfill, pursuant to Chapter 144, to submit quarterly monitoring reports on the closed landfill.

For a facility governed by subch. IV of Chapter 144, the statutes (at Section 160.21(2)(c)3) explicitly provide that the points of standards application for enforcement standards are at:

1. any point of present groundwater use;
2. the property boundaries; and
3. any point beyond a 3-dimensional design management zone within property boundaries established under general criteria specified by rule and applied to individual facilities.

Based upon this language, the proper point of standards application for the Stoughton landfill Site is the closer of the design management zone or the property boundaries. The property boundaries are defined in Section 160.01 (6m), States., as the boundaries of the total contiguous parcel of land owned by a common

owner. Since the City owns the parcel of property immediately to the west of the landfill property, that property would be included as under common ownership with the parcel where the landfill is actually located, for purposes of applying the property boundaries rule. Where the design management zone is closer to the waste than the property boundary, then the DMZ would be the applicable limit. Elsewhere, the property boundary would be the applicable point of standards application for the enforcement standards.

In discussion with WDNR staff counsel, we have been advised that, notwithstanding the above reading of state law (with which we understand the Department does not disagree as a general matter), the Department views the appropriate point of standards application for a Superfund Site to be at the waste boundary. Apparently the basis for this view is due to the requirement in the NCP for the appropriate point of compliance for groundwater cleanup standards.

The applicable NCP provision is 40 CFR 300.430(f)-(5)(iii)(A), which provides that "Performance shall be measured at appropriate locations in the groundwater...." While this language standing alone is not at all clear, the discussion of the interpretation of this by [US]EPA in the Preamble to the rule promulgation (55 Fed. Reg. 9753-8754) indicates that:

> [US]EPA believes that remediation levels should generally be attained throughout the contaminated plume, or at and beyond the edge of the waste management area, when the waste is left in place.

This position is arrived at based upon the federal MCLs and MCLGs which are promulgated under the Safe Drinking Water Act. The discussion in the Preamble is about whether the commentors' desire to have these drinking water standards applied at the tap is appropriate. Naturally, [US]EPA rejects this position, because it would lead to no groundwater remediation in-situ, and would have PRPs arguing for treatment only at points of use in all cases. However, there are two very important points that distinguish this MCL discussion, and [US]EPA's position based upon it, from the question before us, which is where do you apply a State ARAR.

First, the MCLs and MCLGs are not groundwater standards at all, and thus [US]EPA was faced with figuring out some way to apply drinking water standards to a groundwater situation. That is, standing alone, the MCLs and MCLGs do not have a point of standards application concept built-in in a groundwater context. There is no federal groundwater law. On the other hand, NR 140 is a groundwater law, with standards designed with PSAs in the ground in mind when the standards were developed. Thus [US]EPA had no choice but to make a policy decision in this vacuum. No such vacuum exists in the State groundwater law in Wisconsin. The issue of PSAs was debated, and choices were made. The acknowledgement of a Design Management Zone in the NR 140 regulatory scheme was a policy decision that concentrations of substances higher than the ES

numerical value would be accepted in an anticipated, restricted impact zone surrounding facilities serving the public function of operating as landfills.

Second, NR 140 only applies here by virtue of the State ARAR language in the NCP, and thus is not a set of standards subject in the first instance to federal interpretation, but rather is a body of law and standards that are incorporated into the federal cleanup program. The USEPA cannot make up a "hybrid" ARAR by taking a numerical standard from the State program, a point of standards application from the federal program, and then justify its application to a Site on the ground that it is a State ARAR. The hybrid standard that USEPA staff would seek to employ here does not meet the definitional requirements of a State ARAR under 40 CFR 300.400(G)(4) quoted above. The waste boundary element of the hybrid ARAR is not "promulgated" since it is not generally applicable nor is it legally enforceable under state law.

This position is supported by the NCP's recognition that where a State ARAR includes exemption or variance language, a variance or exemption granted under the state program becomes the State ARAR for CERCLA purposes. See 40 CFR 300.400(g)(2)(v) and Preamble discussion at 55 FR 8744. Chapter NR 140 developed standards with particular PSAs in mind, and one cannot take the standards in the abstract and apply them in a different way than provided for in the state law of which they are a part.

In plain terms, when USEPA as the lead agency, incorporates State ARARs into the Superfund program, it cannot pick and choose those parts of state regulations it likes and combine them with parts of federal regulations it likes, to make a new standard that does not exist in either state or federal law.

C. Available Institutional Controls.

One of the issues that have been discussed in USEPA's comments is the contribution that institutional controls might make to preventing the movement of contaminants through pathways to reach the public or the environment. One pathway that was examined in particular was the matter of access to groundwater. In all remedies proposed in the FS, deed restrictions and available forms of land use controls were included.

We wish to comment on what those may mean in practical terms under Wisconsin law, so that the relative sufficiency of that component of any remedy ultimately selected can be better appreciated, and so the need for additional remedial steps to address the same pathway can be evaluated in light of the protectiveness of the institutional controls.

(1) Comments on the State code. One way to restrict access to the groundwater is to ensure that wells will not be driven into

the area that may be contaminated. Section NR 112.08 provides restrictions on well location, and states:

Any potable or nonpotable well or reservoir shall be located:...

(g) Twelve hundred feet between a well or reservoir and: 1. The nearest edge of an existing, proposed or abandoned landfill, to the nearest fill area of abandoned landfills, if known, otherwise to the nearest property line; ...." [Emphasis added by commentor]

In USEPA's letter dated July 9, 1991 commenting on the final revisions to the Feasibility Study for the Stoughton City Landfill Site and referring to the code section above-quoted, it is stated at page 5:

Because the State has the ability to grant variances from water supply well restrictions, future prohibition of the use of the groundwater for drinking water purposes by the State cannot be guaranteed.

Construction of private wells for drinking water purposes is regulated under Chapter 162 of the Wisconsin Statutes and through administrative regulations promulgated by the Wisconsin DNR under Chapter NR 112, Wis. Adm. Code. The [W]DNR has primary regulatory, but under Section 162.07, Wis. Stats., the [W]DNR may authorize counties to adopt well ordinances under Section 59.07, Stats., if counties adopt ordinances and develop enforcement programs acceptable to the [W]DNR. In the event that a county assumes regulatory authority, the [W]DNR maintains responsibility to oversee the country program and has the power to concurrently enforce the provisions of Chapter 162, Stats., and Chapter NR 112 in certain cases, such as where there are special circumstances requiring concurrent enforcement. In Dane County, the County administers NR 112 through County ordinance, but [W]DNR retains the right to deal with all variance requests.

Section NR 112.08 of the Administrative Code contains standards and rules for the location of private wells in order to reduce the possibility of contamination. As quoted above, section NR 112.08(4)(g)1. requires wells or reservoirs to be located a minimum of 1,200 feet from the edge of the landfills. Variances may be granted to requirements of this Chapter, under Section NR 112.43. The [W]DNR may condition the issuance of a variance by requiring additional construction or installation features to safeguard the groundwater and water supplied by the well from contamination. It is this variance provision that apparently is of some concern to the USEPA.

The possibility of persons obtaining a variance to construct

a well within the limits imposed by NR 112 should be readily controllable given [W]DNR's knowledge of the circumstances. It is within [W]DNR's control to grant the variance, and it seems extraordinary to state that a code provision is not effective when its application is in the hands of the "supporting agency" specifically working on this Site. [W]DNR is not an ideal observer to this Superfund process, and surely can find some means to pass relevant information among staff to ensure that the public health considerations to be served by NR 112 are met.

In addition, there are possible mechanisms that could be used to further guarantee that no wells will be constructed within 1,200 feet or other distance deemed necessary.

For the land within the jurisdiction of Stoughton, the city could adopt an overlay zoning district or other ordinance provision that would prohibit private well construction and require the subject properties to be connected to the city's public water supply as needed. For land that is within 1,200 feet of the landfill, but currently in the unincorporated area of the county, the city could agree to amend its Master Plan Urban Service Area and annex those properties in order to ensure that no development occurs without public water supply.

Another possible means to guarantee that no variances will be granted allowing wells closer than 1,200 feet (or another distance deemed safe) may be for the [W]DNR, the county and the City to enter into an intergovernmental agreement pursuant to Section 66.30, Wis. Stats., that would prohibit such variances. Section 66.30 authorizes municipalities and the state or any department or agency thereof to contract for the joint exercise of any power or duty required or authorized by law. The contract could provide that due to the potential of contamination of groundwater in the distance of the landfill will be approved unless a water treatment system was installed or other measures taken to ensure against contamination of the water. Such an intergovernmental agreement could also ensure that regardless of which regulatory authority -- the county or the WDNR -- administers the permitting system in the future, variances would be prohibited. The basis for the agreement would be the shared concern for barring access to groundwater under the circumstances. The City would agree to initiate and keep in place certain restrictions that would be within its power, such as measures relating to unsewered development, access to the public water supply, deed restrictions, and the like.

(2) Comments on deed restrictions

Attached is a preliminary draft of a proposed deed restriction for the parcel on which the Site is located, and the adjacent parcel to the west, which is also owned by the City. The groundwater sample with the highest level of concern was on the west side of the Site, close to the property boundary with the

parcel owned by the City to the west of the Site.

The purpose of the deed restriction is to assure that water cannot be withdrawn from the real estate except under specified conditions designed to assure that the use of the water would not be a hazard to human health and safety. By executing a deed restriction, the City of Stoughton can impose these conditions upon future owners of the land.

The deed restriction is set up to expire on January 1, 2022, but they may be extended for additional ten year periods by the Secretary of the Department of Natural Resources. The reason for this limitation is because of the provisions of sec. 706.09, Wis. Stats., which provide that a purchaser for value without notice takes free of any adverse claims dependent upon any interest of which no affirmative and express notice appears of record within 30 years. Therefore, in order to assure continuing validity, any

restrictions will need to be re-recorded or otherwise appear in the records of the Register of Deeds at least every 30 years.

The proposed restriction also is drafted to meet the problems presented by sec. 236.293, Wis. Stats. That section states that restrictions for public benefit can be released or waived in writing by the public body having the right of enforcement. Therefore, it is important that the right to enforce this restriction be given to parties other than the City of Stoughton.

3. Comments on the role of institutional controls

The City is cognizant of the language in the NCP that indicates the limitation on relying solely on institutional controls. 40 CFR 300.430(a)(1)(iii)(D). In the particular case of groundwater, the City has, in the comments submitted by Strand Associates, Inc., indicated its reservations about reaching a decision on a final groundwater remedy at this time, given the limited information that is available at this point to the agencies and the PRPs as to the extent of Tetrahydrofuran contamination. One of the factors that must ultimately be considered in determining the relative role for institutional controls or active response measures in limiting access to the groundwater is the question of treatability of the contamination, about which little is known at this time. 40 CFR 300.430(a)(1)(iii)(F) of the NCP states:

> [US]EPA expects to return usable ground waters to their beneficial uses wherever practicable, within a timeframe that is reasonable given the particular circumstances of the Site. When reservation of ground water to beneficial uses is not practicable, [US]EPA expects to prevent further migration of the plume, prevent exposure to the contaminated ground water, and evaluate further risk reduction.

The City contends that USEPA is not in a position to draw a conclusion at this time as to the practicability of treatment of the groundwater for Tetrahydrofuran, or what would be involved in preventing further migration of the plume, if one exists, or the risks that might be posed after institutional controls are instituted. This quoted section lends support to the point that a final groundwater remedy should not be selected at this time.

D. Mixed Funding

At this time, the City requests that whatever preliminary considerations the agency [USEPA] conducts be commenced immediately, and that the agency [USEPA] be prepared to schedule a meeting with the City, prior to issuance of a special notice letter, shortly after the issuance of the Record of Decision.

RESPONSE:

(1) General Applicability of NR 140 PALs

Chapter NR 140, WAC, as a whole, is a consistently-applied standard applicable to the Stoughton Site. It specifically addresses the contaminant of concern (THF) and the location at which the PAL for THF is to be met. NR 140 meets the NCP requirement that a regulation be "promulgated" before it can be considered an ARAR. The NCP defines "promulgated" to mean "standards that are of general applicability and legally enforceable." To be "of general applicability", the requirement must be applicable to all circumstances covered by the requirement, not only Superfund sites. "CERCLA Compliance with Other Laws Manual: Part II", OSWER Directive 9234.1-02, page 7-3. NR 140 on its face applies "To all facilities, practices and activities which may effect groundwater quality" and which are regulated under listed State statutes including Ch 144 WSA. NR 140.03, WAC. Both the numerical groundwater quality standards and the circumstances under which exceptions to such standards might be allowed (the setting of ACLs), which are contained in NR 140, are generally applicable and legally enforceable.

Under NR 140, PALs function as a trigger when exceedances are measured at any point at which groundwater is monitored. Thereafter, they are the clean-up standard which must be attained at either the property boundary or the edge of the Design Management Zone, unless it is not technically or economically feasible to attain them. If they are not attainable, clean-up to a level no greater the enforcement standard is required. The fact that the regulation allows a possibility that PAL clean-up levels will not be required if particular conditions are found to exist does not mean that the PALs are not generally applicable. There is no requirement in the NCP that there must be an "absolute standard"

in order for there to be an ARAR. Most regulations provide for exemptions or waivers of some type.

(2) Points of Standards Application

To determine whether clean-up standards have been met, the point of standards application set forth in NR 140.22(1) applies. U.S. EPA and WDNR agree with the City's comment that the point of standards application, for the purposes of determining whether groundwater clean-up standards have been met as defined in NR 140 is the closer of the design management zone or the property boundary. However, U.S. EPA is not "picking and choosing" parts of the State regulation it likes. The basis for requiring the PALs be met at the waste boundary in addition to requiring they be met at the ARAR point of standards application is to insure that the remedy is protective. The U.S. EPA, through the NCP, established the waste management boundary as the point where protectiveness (i.e., remediation) levels generally shall be achieved at Superfund Sites. Once standards are met at the waste management boundary, the U.S. EPA believes protectiveness has been achieved for the pathway of concern.

The surficial aquifer and sandstone bedrock are hydraulically connected and the City well #3's cone of depression comes within close proximity to the Site. Therefore, the potential exists for contaminants to be drawn from the upper aquifer into the lower aquifer. The fact that the upper aquifer is of moderate permeability would also serve to support USEPA's and WDNR's concerns that THF can be drawn into well #3 as a result of its pumping effects on the lower and upper aquifers. For these reasons, at the SCL Site, U.S. EPA, in consultation with WDNR, has determined that protectiveness is most clearly assured by requiring the groundwater not attain or exceed the PAL for THF at the waste boundary.

(3) Available Institutional Controls

The comments pertaining to institutional controls are noted and will be taken into consideration when planning and implementing the selected remedy. It should be noted, however, that zoning cannot guarantee that no wells will be allowed in the area in the future since zoning requirements can be amended, and WDNR could not sign the suggested intergovernmental agreement without first amending the administrative rule which authorizes variances, NR 112.43, to limit its applicability. WDNR cannot change the policies and procedures set forth in administrative rules without going through the rule promulgation process.

The draft deed restriction provided in the comments may be used as a basis for any final deed restrictions which are to be implemented for the Site.

With regard to the treatability of contaminants, the Agencies note that the levels of tetrahydrofuran in the groundwater at the Site have been found to consistently exceed State groundwater quality standards, and as such need to be addressed in the selected remedy for this Site. THF was found at MW-3D in all three groundwater sampling events during 1989 and 1990, ranging in concentrations from 360 µg/L (this was a replicate sample taken during round one, in which the original sample had a THF concentration of 390 µg/L, which indicates good data reproducibility) to 660 µg/L. THF was also detected in MW-4D and MW-5S during the third round of groundwater sampling, at concentrations of 27 µg/L and 19 µg/L, respectively. In addition, the potential ingestion of the groundwater, at the current levels of contaminants, poses an unacceptable risk.

USEPA is confident that the groundwater extraction and treatment component of the selected remedy, if implemented, would have a high probability of success in terms of effectively withdrawing and removing THF from contaminated groundwater. THF is completely miscible in water and is able to travel throughout the aquifer with negligible retardation effects (note: the Feasibility Study calculated a THF retardation factor of 1.09). For these reasons, extraction of the THF plume in the surficial aquifer is expected to be technically feasible. The extent of the contamination would dictate the location of the extraction wells and the requisite pumping rates to effect plume containment and extraction.

U.S. EPA disagrees with the statement that little is known about contamination at the Site. The concentration of THF in the groundwater downgradient of the Stoughton Site significantly exceeds groundwater quality standards. This further supports the decision to proceed with a groundwater remedy. As discussed earlier, USEPA has added language to the Record of Decision such that if, based on the additional groundwater monitoring that the PRPs have been required to do, the contaminants in the groundwater no longer exceed NR 140 Enforcement Standards, implementation of a groundwater extraction and treatment system will be postponed until more groundwater monitoring results can be obtained. However, it is not anticipated this will be the case, since THF does not degrade quickly, the concentrations of THF in 1989 and 1990 were found to be between seven and 13 times the ES, and the groundwater is not moving rapidly enough to effect significant dilution. If groundwater extraction is not immediately required, monitoring will be required for up to thirty years after waste consolidation and cap construction to determine whether or not State groundwater quality standards will be achieved without groundwater extraction and treatment.

(4) Mixed Funding

See above comments relating to the issue of mixed funding.

ENSR
(ON BEHALF OF THE STOUGHTON CITY LANDFILL Site PRP COMMITTEE)
WRITTEN COMMENT:

"This letter presents the Stoughton City Landfill Superfund Site PRP Committee's comments regarding the remedial alternative recommendation (Proposed Plan) presented by USEPA and the Wisconsin Department of Natural Resources (WDNR) for the subject Site. ENSR Consulting and Engineering has prepared these comments on behalf of the PRP Committee. These comments are intended to be supplementary to those prepared and submitted on August 9, 1991 by the City of Stoughton. By way of a preliminary comment, the Committee most strongly agrees with and supports the comments submitted separately by the City of Stoughton.

[First, with regard to USEPA's presentation of Site risks in the Proposed Plan fact sheet] ... [i]t is important to provide perspective on the summary of potential risks provided by the USEPA in the Fact Sheet developed for the Site. It is especially important to understand the potential for risk and the assumptions and calculations that are used to develop these risk numbers.

USEPA goes to great lengths to describe that a value above 1 for noncarcinogenic risks (hazard index) represents an unacceptable risk at the Site in the USEPA's view. The "development of an unacceptable level" is based upon air emission samples from the landfill. The USEPA does not properly state, however, that WDNR performed a survey at the Site and detected no VOC emissions during that survey. It also does not state that the actual data from which the risk estimate was developed was a questionable sample. The air emissions monitoring performed at the Site by the PRP Committee indicated that no VOCs were found in 6 of the 7 samples analyzed. The only data that supports USEPA's assertion is suspect since a duplicate sample taken from the same location was found to contain no VOCs. However, based on the conservative requirements for risk assessment, the PRPs were required to use the value from the single detection. It was further required that the PRPs assume that an individual would breath the contaminated air for eight hours per day, 365 days per year, over a 30-year residency. Again a conservative estimate of risk has been achieved. A similar argument can be made for direct contact with sediments. The result of these analyses is an extremely conservative estimate of the hypothetical potential risk that may result from the Site. Thus, although USEPA provides the estimated number of additional cases, they are misleading the public by not specifically describing the conservative assumptions used to generate these risk values, and by presenting the risk in the fashion that they have. USEPA has correctly presented the cancer risk further in their description when they discuss the fact that all risks calculated for the Site are acceptable to USEPA requirements.

[Second, with regard to USEPA judgements concerning

Alternative 2.] ... Throughout the Fact Sheet provided by the USEPA for the Stoughton City Landfill Superfund Site, the USEPA improperly states that the alternative recommended by the PRP Committee, Alternative 2, is not protective, or does not meet the ARARs. We believe that this is an incorrect statement and is not supported by data collected during the RI and by the information presented in the FS.

The summary of Site risks presented by the USEPA indicates, as described above, that chemical concentrations found during the RI are within a risk range for cancer that is considered acceptable by USEPA standards. The noncarcinogenic risk presented by USEPA in the summary of Site risks is based on questionable data. It is the PRPs assertion that the data collected for the Site indicates that little or no evidence is presented that suggests that either human health or the environment need to be protected from the currently existing conditions in the landfill. However, Alternative 2, as recommended by the PRP Committee, provides for an upgrade to the existing cap, access and use restrictions, and monitoring that will provide the significantly increased level of protectiveness over the current conditions.

The USEPA also incorrectly states that groundwater cleanup is required because state standards have been exceeded. The state of Wisconsin enforcement standards were exceeded for tetrahydrofuran (THF) in one well at the landfill Site (MW-3D). This well is within the design management zone for this landfill. It is not known whether these standards are exceeded outside of this zone. The PRPs have performed an extensive groundwater investigation during which only one well was determined to have enforcement standard exceedances at the Site. In addition, extensive evaluation of risks indicate that the maximum concentration of THF (660 ppb) is well below the concentration that would pose a noncarcinogenic threat to human health. The PRPs additionally evaluated technologies available for groundwater treatment and determined that natural degradation of THF within the aquifer was sufficient to remove this compound over time. Testing of public water wells by the City of Stoughton was additionally performed and indicates that no impact due to THF was found. We believe that the PRPs have properly responded to the requirements of the PALs through the actions described above and will continue to monitor groundwater for exceedances of the enforcement standards. Therefore, as it is presented in the Feasibility Study, the recommended alternative (Alternative 2) is both protective of human health and the environment and in compliance with all ARARs for the Site.

In summary, the committee recommends that the USEPA reconsider their proposed cleanup plan and revise it to recommend Alternative 2. The committee believes that Alternative 2 meets or exceeds the standards of the nine criteria for selection of a remedial alternative for the Site. The committee also believes that based

on all available information that the Site represents no appreciable risk to human health and the environment and as such Alternative 2 provides a level of protectiveness that exceeds what is necessary at the Site.

RESPONSE:

USEPA acknowledges that the assumptions used in our risk assessment are conservative. However, it is USEPA policy to select exposure assumptions that result in an overall exposure estimate that is conservative, but in a realistic range of exposure.

The Superfund program has always designed its remedies to be protective of all individuals and environmental receptors that may be exposed at a Site; consequently, EPA believes it is important to include all reasonably expected exposures in its risk assessments. However, USEPA recommends against the use of unrealistic exposure scenarios and assumptions. The reasonable maximum exposure scenario is "reasonable" because it is a product of factors, such as concentration and exposure frequency and duration, that are an appropriate mix of values.

USEPA believes that the likelihood of the exposure actually occurring should be considered when deciding the appropriate level of remediation, to the degree that this likelihood can be determined. The risk assessment guidance referenced above is designed to focus the assessment on more realistic exposures. USEPA has adopted these positions as policy and has not revised the regulation.

USEPA believes the assumptions used to calculate risks are reasonable and necessary to adequately protect human health and the environment. It must be stated that the PRPs calculated the risk from the single air detection on their own initiative. In addition, USEPA, recognizing commentor's concerns, recalculated the air risk using two samples and averaged the results. These new risk tables are in the administrative record, and the recalculated Hazard Index risk due to exposure to air at the Site is 0.99 as compared to the PRP's calculation of Hazard Index risk of 1.6.

The commentor correctly states that the carcinogenic risk is within the range that USEPA generally regards as acceptable. However, as is stated in the memorandum, Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions, April 22, 1991, USEPA also considers Hazard Index exceedances of 1, other chemical specific ARARs, or other Site specific reasons. At Stoughton, in addition to air pathway concerns, there are exceedances of State groundwater standards and a Hazard Index of 9.5 based on groundwater ingestion. Therefore, there is unacceptable risk, which merits action to protect human health and the environment.

Although, the commentor is correct in stating that we do not know

whether standards are exceeded outside the "design management zone" as defined in NR 140, the NR 140 point of standards application for PAL exceedances, to determine whether or not an evaluation of possible responses is triggered, is at any location where groundwater is monitored. USEPA believes that remediation levels should generally be attained throughout the contaminated plume, or at and beyond the edge of the waste management area when the waste is left in place.

Although the commentor states that the PRPs determined that degradation of THF within the aquifer is sufficient to remove this compound over time, USEPA disagrees. First of all, USEPA has not been provided with data to support this finding. In fact, assuming the release of THF into the environment occurred during operation of this landfill, it appears that either there was a significantly higher concentration released at that time, or minimal natural degradation has occurred.

Appendix C of the Feasibility Study considers percolation of water through the landfill cover and evaluates THF transport in the surficial aquifer west of the Site in the vicinity of MW-3. The analysis is based on the Hydrologic Evaluation of Landfill Performance (HELP) model. The discussion of the modeling effort on the part of ENSR indicates that default soil characteristics contained within the program were used. While it is possible that the existing soil cover materials and those that could be obtained from local borrow sources would have characteristics similar to the default values, the data provided did not substantiate this. As a result, the findings of the modeling are considered generic rather than Site specific and should only be used to make general comparisons between flux through a designed cover system versus a rudimental soil cover such as currently exists. A review of Appendix C indicates that the model used to estimate geochemical effects on the groundwater transport of THF is simplistic and the input data used seem to be literature values. In summary, a high degree of confidence in the results of the modeling effort is not possible at this time.

As discussed earlier, 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. If it could be demonstrated that the aquifer will cleanse itself within a reasonable period of time, USEPA could possible consider that as a viable option. However, natural cleansing is not expected to occur within a reasonable period of time at this Site.

The Site contaminants present a significant potential risk to groundwater consumers at this time. As set forth in CERCLA and the NCP, the intent of the Superfund program is to actively clean up

Sites where actual or potential risks exist, not to merely monitor until a bad situation becomes worse. USEPA believes that suitable technology exists to address the Site problems. In addition, State groundwater laws require that action be taken to prevent the continued release of contaminants above standards at the point of standards application. Thus, groundwater cleanup action is necessary and warranted at the Site, and it is technically practicable.

In summary, although USEPA could delay making a decision at this time, we do not believe this would be a prudent or responsible decision. USEPA believes that we have enough data to decide that groundwater extraction is necessary, and that the additional data will supplement our knowledge of the extent of the plume. Seldom is the contamination problem less than what we find during the RI/FS. In fact, in most cases, based on Agency experience, the contamination problems are more complex and severe. For the Agency to wait to make a decision on the groundwater, may also cost more in transaction costs in the long run.

In addition, the cost of waiting until the plume has reached the wellfield would not be a financially prudent decision even if it were legally allowed since it costs significantly more to clean up an aquifer once the contamination has spread versus taking care of a more limited problem.

USEPA understands the dilemma that the liability scheme of joint and several liability in CERCLA has created for municipalities.

Congress (CERCLA, Section 107(a)) has determined that those entities who owned and/or operated a Superfund Site, as in the case of the City, are potentially liable for repayment of Site response costs the USEPA has incurred or will incur in the future. The City and other PRPs at this Site will be given the opportunity to voluntarily conduct the remedial action(s) selected.

In light of this and relevant guidance on settlement with municipalities, the City may potentially be held responsible for the cleanup costs. 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 Stoughton Site, if there is no agreement with the PRPs to perform the remedy, the USEPA 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 (a)) to the PRPs to conduct the cleanup. The Agencies would then have the option of recovering the costs through litigation in the future.

The USEPA and WDNR are aware of the potential burden the cost of cleanup may pose on the City residents and the other PRP. The Agencies will be evaluating the fiscal viability of the City and

the other PRP in relation to potential response costs, and the USEPA will take the evaluation into account during discussions with the PRPs regarding remedy implementation. If the City and other PRP are unable to immediately fund the remedial action at this Site, USEPA municipal settlement policy provides for a consideration of repayment of Federal costs over time.

The Agencies intend to work with the City and other PRP to work out an expeditious solution to this problem focussing on minimizing

transactional costs and with interests of cleaning up the Site as expeditiously as possible.

WDNR WRITTEN COMMENTS

Additional Data Request

"Discussions with officials of the City of Stoughton and members of the public during and after the public meeting on the proposed plan for the Stoughton City Landfill have indicated that the community is not comfortable with the remedy selection process given the limited data obtained during the remedial investigation. Further discussions with City officials indicate that the City recognizes the need for additional data and is supportive of the agencies' request for obtaining additional data. This confirms the WDNR's belief that additional data collection is necessary at the site prior to implementation of the remedy, and prompts us to submit this letter to you as comment.

The agencies' decision to allow the collection of limited data by the PRPs during the Remedial Investigation to conserve finances has proven to be short-sighted. Staff at the WDNR have been working with staff at EPA prior to the public meeting to identify data needs and to ensure those needs are met through an April request to the PRPs to collect additional data. Upon receipt of the PRP response proposing additional work, the WDNR submitted comments to EPA stating that the PRP proposal was inadequate and reiterating WDNR's support for EPA's original request for additional work.

Additional data is needed to further define the extent of the groundwater contamination plume migrating from the landfill site, as well as to provide the agencies with a better assessment of the extent of the contamination in the adjacent wetlands and surface water. We believe this information is essential for the design and implementation of appropriate remediation for this site."

Waste Consolidation

"The WDNR supports the concept of waste consolidation at this

site, based on the surface water quality sampling and waste analyses conducted at the site. The WDNR, however, believes that a more detailed cost estimate is needed for this alternative."

Contingency Record of Decision

"Based on the information obtained by the PRPs during the remedial investigation, to date, we believe that the extraction of groundwater and subsequent treatment of the water prior to discharge will be necessary to comply with state groundwater quality standards. However, we recognize that additional data as requested by the agencies will provide us with subsequent information to better define the extent of the contamination (both horizontal and vertical) and to determine whether the contaminants are migrating towards the City wells.

The WDNR recognizes that this new information may lead to a reevaluation of the response needed to achieve compliance with State groundwater quality standards. Even so, we believe from an administrative perspective, proceeding with a Record of decision, at this time that is contingent on the results of the new information is the best approach for this site.

Lastly, for your information, The WDNR will be corresponding with EPA in the future regarding the issue of mixed funding at this site."

RESPONSE:

USEPA acknowledges the need for gathering additional Site data and will continue to work closely with WDNR and the PRPs to gather this data over the next nine months to one year. USEPA acknowledges the State's comments relating to waste consolidation and a contingency approach to groundwater contamination at the Site.