WORKSHEET 1
SUMMARY SCORE SHEET

Site Name: Kellogg's Korner (Arthur Leyendekker)

Site Location: (City, County, or Section/Township/Range)

SE¼SE¼ Section 35 T10N R22E W.M.
NE Corner of the intersection of Midvale Road and Emerald Road
Sunnyside, Washington (Yakima County)

Site Description: (Include management areas, compounds of concern, and quantities)

In April 1990, seepage of gasoline from the bank of a drainage canal into the canal water was reported to, and observed by, the Department of Ecology. Two 500-gallon leaded gasoline underground storage tanks were removed by the owner (Arthur Leyendekker). Ecology issued an order and $3,000 penalty in August, 1990, citing continuing gasoline seepage into the canal. The owner subsequently installed a trench to stop petroleum migration, excavated petroleum-contaminated soil, extended a steel culvert to prevent gasoline from entering the canal and demolished the business of the site, Kellogg's Korner convenience store. Compounds of concern are benzene, toluene, ethylbenzene and xylene which have been detected in soil and groundwater at the site.

Special Considerations: (Include limitations in site file data, data which cannot be accomodated in the model, but which are important in evaluating the risk associated with the site)

ROUTE SCORES:

Ground Water/Human:	50.7	Overall Rank:	_____
Surface Water/Human:	7.0		
Air/Human:	18.4		
Air/Environmental:	0.0		
Surface Water/Environmental:	6.3		

WORKSHEET 2
ROUTE DOCUMENTATION

SURFACE WATER ROUTE

List substances to be considered for scoring. Source: 7, 8

1. BENZENE
2. TOLUENE
3. ETHYLBENZENE
4. XYLENE
5. LEAD

Explain basis for choice of substances to be used in scoring.

THE FIRST FOUR COMPOUNDS HAVE BEEN DETECTED IN SOIL AND GROUNDWATER AT THE SITE. LEAD WAS CONSIDERED FOR SCORING BECAUSE A LEADED GASOLINE TANK FAILED A PRESSURE TEST, BUT LEAD WAS NOT USED BECAUSE IT WAS NOT DETECTED AT ELEVATED LEVELS AT THE SITE.

List management units to be considered in scoring: Source: 1, 6

1. SPILL OR DISCHARGE
2. WASTE PILE

Explain basis for choice of unit used in scoring.

DISCHARGE FROM LEAKING UNDERGROUND STORAGE TANK HAS BEEN DOCUMENTED AT SITE. WHERE CONTAMINATED MATERIALS HAVE BEEN EXCAVATED OR DISTURBED AND ARE STORED ABOVE GRADE, THE CONTAMINATED MATERIAL IS TO BE SCORED AS A WASTE PILE. MATERIAL HAS BEEN DISTURBED, BUT IS NOT STORED ABOVE GRADE. UNIT USED FOR SCORING WAS DISCHARGE.

AIR ROUTE

List substances to be considered for scoring. Source: 7, 8

1. BENZENE
2. TOLUENE
3. ETHYLBENZENE
4. XYLENE
5. LEAD

Explain basis for choice of substances to be used in scoring.

THE FIRST FOUR COMPOUNDS HAVE BEEN DETECTED IN SOIL AND GROUNDWATER AT THE SITE AND WERE USED FOR SCORING. LEAD WAS CONSIDERED FOR SCORING BECAUSE A LEADED GASOLINE TANK FAILED A PRESSURE TEST, BUT LEAD WAS NOT USED IN SCORING BECAUSE IT WAS NOT DETECTED AT ELEVATED LEVELS AT THE SITE.

List management units to be considered in scoring: Source: 1, 6

1. SPILL OR DISCHARGE
2. WASTE PILE

Explain basis for choice of unit used in scoring.

DISCHARGE FROM UNDERGROUND STORAGE TANK HAS BEEN DOCUMENTED AT SITE. WHERE CONTAMINATED MATERIALS HAVE BEEN EXCAVATED OR DISTURBED AND ARE STORED ABOVE GRADE, THE CONTAMINATED MATERIAL IS TO BE SCORED AS A WASTE PILE. MATERIAL HAS BEEN DISTURBED, BUT IS NOT STORED ABOVE GRADE. UNIT USED FOR SCORING WAS DISCHARGE.

WORKSHEET 2 (CONTINUED)
ROUTE DOCUMENTATION

GROUND WATER ROUTE

List substances to be considered for scoring. Source: 7, 8

1. BENZENE
2. TOLUENE
3. ETHYLBENZENE
4. XYLENE
5. LEAD

Explain basis for choice of substances to be used in scoring.

THE FIRST FOUR COMPOUNDS WERE CHOSEN FOR SCORING BECAUSE THEY HAVE BEEN DETECTED IN SOIL AND GROUNDWATER AT THE SITE. LEAD WAS CONSIDERED FOR SCORING BECAUSE A LEADED GASOLINE TANK FAILED A PRESSURE TEST, BUT LEAD WAS NOT USED FOR SCORING BECAUSE IT WAS NOT DETECTED AT ELEVATED LEVELS AT THE SITE.

List management units to be considered in scoring: Source: 1, 6

1. SPILL OR DISCHARGE
2. WASTE PILE

Explain basis for choice of unit used in scoring.

DISCHARGE FROM UNDERGROUND STORAGE TANK HAS BEEN DOCUMENTED AT SITE, WHERE CONTAMINATED MATERIALS HAVE BEEN EXCAVATED OR DISTURBED AND ARE STORED ABOVE GRADE, THE CONTAMINATED MATERIAL IS TO BE SCORED AS A WASTE PILE, MATERIAL HAS BEEN DISTURBED, BUT IS NOT STORED ABOVE GRADE, UNIT USED FOR SCORING WAS DISCHARGE.

WORKSHEET 3
SUBSTANCE CHARACTERISTIC WORKSHEET
FOR MULTIPLE UNIT/SUBSTANCE SITES

	Combination 1	Combination 2	Combination 3
Unit: Substance: AIR ROUTE Human Toxicity/Mobility Value: Environmental Toxicity/ Mobility Value: Containment Value:			
Air Human Subscore: Air Environmental Score:			
SURFACE WATER ROUTE Human Toxicity Value: Environmental Toxicity Value: Containment Value:			
Surface Water Human Subscore: Surface Water Environmental Subscore:			
GROUND WATER ROUTE Human Toxicity/Mobility Value: Containment Value:			
Ground Water Subscore:			

WORKSHEET 4
SURFACE WATER ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Std. (µg/l)	Value	Chronic Toxicity mg/kg/day	Value	Acute Toxicity mg/kg-bw	Value	Carcinogencity WOE	Potency Factor	Value
1. BENZENE	1. 500 (MCL)	8	X	—	1. 3306 LD_{50} ORAL RAT	3	A	.029	5
2. TOLUENE	2. 2000 (PMCL)	2	.3 RFDORAL	1	2. 5000 LD_{50} ORAL RAT	3	D	X	—
3. ETHYLBENZENE	3. 700 (PMCL)	4	.1 RFDORAL	1	3. 3500 LD_{50} ORAL RAT	3	D	X	—
4. XYLENE	4. X	—	X	—	4. 4300 LD_{50} ORAL RAT	3	X	X	—
5.									
6.									

Source: 3, 4
Highest Value: 8
+2 Bonus Points?: 0
Value: 8

1.2 Environmental Toxicity

Source: 3,4,5 Value: 2

Substance	Acute Criteria (µg/L)	Non-human mammalian acute toxicity (mg/kg)	Value
1. BENZENE	5300 LOEL	3306 LD_{50} ORAL RAT	2
2. TOLUENE	17,500 LOEL	5000 LD_{50} ORAL RAT	2
3. ETHYLBENZENE	32,000 LOEL	3500 LD_{50} ORAL RAT	2
4. XYLENE	X	4300 LD_{50} ORAL RAT	2
5.			
6.			

1.3 Substance Quantity

Source: 13 Value: 7

Explain basis: (50 FT)(130 FEET) = 6500 FT^2

2.0 MIGRATION POTENTIAL

2.1 Containment

Source: 14 Value: 4

Explain basis: SPILL, DISCHARGE AT SURFACE WITH UNMAINTAINED RUNON/RUNOFF CONTROL

2.2 Surface Soil Permeability: HIGH. SILTY SANDY LOAM — PAGE 11 Source: 1 Value: 1

2.3 Total Annual Precipitation: 7.5 INCHES — PAGE 11 Source: 1 Value: 1

2.4 Maximum 2-Year 24-Hr Precipitation: 0.75 INCHES — PAGE 11 Source: 1 Value: 1

2.5 Flood Plain: NOT IN FLOOD PLAIN — Source: 2 Value: 0

2.6 Terrain Slope: 2 % — PAGE 11 Source: 1 Value: 1

3.0 TARGETS

3.1 Distance to Surface Water: 60 FEET. DRAINAGE DITCH — Source: 1 Value: 10

3.2 Population Served within 2 miles: 0 — Source: 16,17 Value: 0

3.3 Area Irrigated by Sources within 2 miles: 0 — Source: 16 Value: 0

3.4 Distance to Fishery Resource: 5.4 MILES. YAKIMA RIVER — Source: 15 Value: 0

3.5 Distance to Sensitive Environment: 23,200 FEET — Source: 15 Value: 0

List: SUNNYSIDE WILDLIFE REC AREA 4.4 MILES SOUTH OF SITE

4.0 RELEASE

Explain basis: YES. VISIBLE OBSERVATION OF PETROLEUM ENTERING DRAINAGE CANAL — Source: 6 Value: 5

WORKSHEET 5
AIR ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Introduction - please review before scoring

1.2 Human Toxicity

Substance	Air Std. µg/m³	Value	Chronic Toxicity mg/kg/day	Value	Acute Toxicity mg/kg-bw	Value	Carcinogencity WOE	Potency Factor	Value
1. BENZENE	.12	10	X	—	LC_{50} 10,000 PPM	5	A	.029	5
2. TOLUENE	1248.6	1	2 (RFD)	1	X	—	D	X	—
3. ETHYL BENZENE	1448.6	1	136 NOAEL	1	X	—	D	X	—
4. XYLENE	X	—	X	—	X	—	X	—	—
5.									
6.									

Source: 3
Highest Value: 10
+2 Bonus Points?: 0
Toxicity Value: 10

1.3 Mobility

1.3.1 Gaseous Mobility mm Hg AT 25°C
Vapor Pressure: 1.91 2.28 3.10 4.7 Source: 4, 9
Value: 1. 4 2. 4 3. 4 4. 3

1.3.2 Particulate Mobility
Soil Type: N. A. Source: ___
Erodibility: ___
Climatic Factor: ___
Particulate Mobility Potential Value: ___

1.4 Final Human Health Toxicity/Mobility Matrix: TOXICITY = 10, MOBILITY = 4 Value: 20

1.5 Environmental Toxicity/Mobility

Substance	Non-human mammalian Acute Toxicity	Value	Mobility	Value
1. BENZENE	10,000 PPM LC_{50}	5	4	10
2. TOLUENE				
3. ETHYL BENZENE				
4. XYLENE	2,212 PPM LC_{50}	5	4	10
5.				
6.				

Environmental Toxicity Mobility Matrix: Source: 10 Value: 10

1.6 Substance Quantity: (50 FEET)(130 FEET) = 6500 FT^2

Source: 13 Value: 5

2.0 MIGRATION POTENTIAL

2.1 Containment: SPILL, VAPORS, UNDERGROUND TANK WITH RELEASE THAT HAS REACHED THE SURFACE — **Source:** 1 **Value:** 10

3.0 TARGETS

3.1 Nearest Population: APPROXIMATELY 200 FEET — PAGE 13 **Source:** 1 **Value:** 10

3.2 Nearest Sensitive Environment: 6900 FEET — **Source:** 12 **Value:** 0

List: CITY PARK 1.3 MILE N.E. OF SITE

3.3 Population within 1/2 mile: (44 BUILDINGS) × (3 PERSONS / BUILDING) = 132 — **Source:** 12 **Value:** 11

4.0 RELEASE: NONE DOCUMENTED — **Source:** ___ **Value:** 0

WORKSHEET 6
GROUND WATER ROUTE

1.0 SUBSTANCE CHARACTERISTICS

1.1 Human Toxicity

Substance	Drinking Water Std. (ug/l)	Value	Chronic Toxicity mg/kg/day	Value	Acute Toxicity mg/kg-bw	Value	Carcinogenicity WOE	Potency Factor	Value
1. BENZENE	1. 5 MCL	8	X	—	1. 3306 LD_{50} ORAL RAT	3	A	.029	5
2. TOLUENE	2. 2000 PMCL	2	.3 RfD ORAL	1	2. 5000 LD_{50} ORAL RAT	3	D	X	—
3. ETHYLBENZENE	3. 700 PMCL	4	.1 RfD ORAL	1	3. 3500 LD_{50} ORAL RAT	3	D	X	—
4. XYLENE	4. X	—	X	—	4. 4300 LD_{50} ORAL RAT	3	X	X	—
5.									
6.									

Source: 3, 4
Highest Value: 8
+2 Bonus Points?: 0
Value: 8

1.2 Mobility

Substance: SOLUBILITY (mg/l): 1. 1780 2. 515 3. 152 4. ~200 Source: 3, 4 Value: 3
VALUES 1. 3 2. 2 3. 2 4. 2

1.3 Substance Quantity

Source: 13 Value: 4

Explain basis: (50 FEET)(130 FEET)(11 FEET) (ASSUMED DEPTH) $\left(\frac{1\ YD^3}{27\ FT^3}\right)$ = 2648 YD^3

2.0 MIGRATION POTENTIAL

2.1 Containment

Source: 1 Value: 10

Explain basis: E, SPILL

2.2 Net Precipitation: 1.4 INCHES

Source: 11 Value: 1

2.3 Subsurface Hydraulic Conductivity: STRATIFIED UNDERLYING AREA - PERMEABILITY - LOAMY FINE SAND - RAPID MODERATELY SLOW. 10^{-5} TO 10^{-3} CM/SEC.

Source: 14, 18, 19 Value: 3

2.4 Vertical Depth to Ground Water: 0. CONTAMINATION IN CONTACT WITH GROUND WATER.

Source: 1 Value: 8

3.0 TARGETS

3.1 Ground Water Usage: PRIVATE. NO ALTERNATE.

PAGE 13 Source: 1 Value: 5

3.2 Distance to Nearest Drinking Water Well: APPROXMATELY 200 FT

PAGE 13 Source: 1 Value: 5

3.3 Population Served with 2 miles: √9984 PUBLIC + 39 DOMESTIC MAX. 100

Source: 16, 17 Value: 100

3.4 Area Irrigated by Wells within 2 miles: .75 √301

Source: 16 Value: 13

4.0 RELEASE

Explain basis: YES. BENZENE, TOLUENE, ETHYLBENZENE, XYLENE DETECTED IN GROUNDWATER ON SITE.

Source: 8 Value: 5

WORKSHEET 7
SOURCES USED IN SCORING

1. SITE HAZARD ASSESSMENT DATA COLLECTION SUMMARY SHEETS FOR WASHINGTON RANKING METHOD, BRAD CARD, PLSA, 1991
2. FLOOD BOUNDARY AND FLOODWAY MAP, COMMUNITY-PANEL NO. 530217 1850, FEMA.
3. WASHINGTON DEPT. OF HEALTH GUIDE TO PHYSICO-CHEMICAL, TOXICOLOGICAL AND REGULATORY VALUES FOR PRIORITY POLLUTANTS, NONA KIMBELL ET AL, DRAFT, JULY, 1990.
4. REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES, U.S. DEPT. OF HUMAN AND HEALTH SERVICES, DORIS V. SWEET, EDITOR, APRIL, 1987.
5. QUALITY CRITERIA FOR WATER 1986, U.S. EPA.
6. NOTICE OF PENALTY, DOCKET NO. DE 90-C195, DEPARTMENT OF ECOLOGY, 8/22/90.
7. ANALYTICAL RESULTS, NORTH CREEK ANALYTICAL, 7/3/90.
8. ENGINEERING REPORT ON LEAKING UNDERGROUND STORAGE TANK CLEANUP EXCAVATION DEWATERING PROPOSAL, KELLOGG'S CORNER, PLSA, NOVEMBER 1990.
9. SOIL VAPOR SURVEY BOOT CAMP, COURSE NOTES, GARY ROBBINS, UNIVERSITY OF CONNECTICUT, 1990.
10. CONSOLIDATED FREIGHTWAYS SHA WORKSHEET, SAIC, 1990.
11. WASHINGTON CLIMATE, COOPERATIVE EXTENSION SERVICE, WSU.
12. SUNNYSIDE QUADRANGLE MAP, USGS 7.5 MINUTE SERIES TOPOGRAPHIC.
13. ESTIMATED AREA OF SOIL CONTAMINATION, BOB SWACKHAMER, DEPARTMENT OF ECOLOGY, 1991.
14. SITE INSPECTION, BOB SWACKHAMER, DEPT. OF ECOLOGY, 1991.
15. TOPPENISH, WASHINGTON MAP, 30 X 60 MINUTE SERIES (TOPOGRAPHIC), DEPT. OF INTERIOR BUREAU OF LAND MANAGEMENT.
16. RECORDED WATER RIGHTS OF THE DEPARTMENT OF ECOLOGY REGION 4, 8/16/90.
17. PUBLIC WATER SUPPLY SYSTEM LISTING, WASHINGTON DEPARTMENT OF HEALTH, 11/8/89.
18. SOIL SURVEY OF YAKIMA COUNTY, USDA SOIL CONSERVATION SERVICE.
19. PRELIMINARY HYDROGEOLOGIC ASSESSMENT 636 EAST EDISON AVENUE SUNNYSIDE, DELTA ENVIRONMENTAL CONSULTANTS.