AR TARGET SHEET

The following document was too large to scan as one unit, therefore, it has been broken down into sections.

EDMC#:	0027912
SECTION:	3 of 8
DOCUMENT #:	DOE/RL-92-67, DRAFT C
TITLE:	Draft RI/FS Report for 1100-EM-1 OU, Hanford

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DOE/RL-92-67
DRAFT C

Draft Remedial Investigation/ Feasibility Study for the 1100-EM-1 Operable Unit, Hanford

Date Published
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Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management

United States
Department of Energy
P.O. Box 550
Richland, Washington

Approved for Public Release

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APPENDIX A

1100-EM-1 PHASE II RI
MONITORING WELL BORING LOGS AND
HORN RAPIDS LANDFILL TRENCHING LOGS

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Monitoring Well Boring Logs A-1
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1100-EM-1 PHASE II RI
MONITORING WELL BORING LOGS

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Site 1100-EM-1

Boring No. MW-7A Desig. MW-7A Diam. (Casing) 8 inch"

Co-ordinates N 378386.4 E 1944622.6

TEST BORING FIELD LOG

Elevation Top of Boring	388.0	M.S.L	Hammer Wt.		Boring Started MAY 2 91
Total Overburden Drilled	58.3	Feet	Hammer Drop		
Elevation Top of Rock		M.S.L	Casing Left		Boring Completed MAY 6 91
Total Rock Drilled	0.0	Feet	Subsurface Water Data	▽ 40.5	Page
Elev. Bottom of Boring	329.7	M.S.L	Obs. Well		
Total Depth of Boring	58.3	Feet	Drilled By:	R. Jones	
Core Recovered ___ %	Boxes ___	No.	Mfg. Des. Drill:		
Core Recovered ___ Ft: ___	Diam. ___	In.	Inspected By:	K. Singleton (WHC)	
Soil Samples ___ In. Diam.		No.	Classification By:	K. Singleton (WHC)	
Soil Samples ___ In. Diam.		No.	Classification By:	J. McBane (CENPW)	

SCALES ELEV.	DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
						0.0 - 20.0 Portland cement			0 - 2.0 SAND; 10YR5/3 olive; moderately sorted;no reaction to acid; 96% sand (35% VCS, 25% CS, 20% MS); 70% quartz, 30% basalt; subrounded to angular; <3% silt, <2% gravel.
385									2.0 - 3.5 SANDY GRAVEL; 10YR5/3 olive; moist; no to very slight reaction to acid; poorly sorted; gravels have calcium coating having a strong reaction to acid; 65% sand (35% MS, 20% CS, 20% others, 65% quartz, 35% basalt, subrounded to subangular); 35% gravel (15% VCP, 15% others, 95% ba salt, 5% quartz and others); <5% silt.
	5	W50	8.0	5.0 5.5	100				3.5 - 15.0 SANDY GRAVEL; 10YR7/1 light gray; moist; strong reaction to acid; poorly sorted; 60% gravel (30% CP-VCP, 10% small pebbles, 14% others; 85% basalt, 15 % others; subrounded to rounded); 37% sand (30% MS-CS, 70% others; 90% basalt, 10% others; subrounded to subangular); 3% silt. Color @ 7.5 ft 10YR6/2 light grayish brown; basalt content increase to 90-95%.
380									
	10	W51	8.0	10.0 11.3	100				
375									

GENERAL REMARKS:

Depths provided as feet below the existing ground surface; elevations in feet above mean sea level. All sample numbers prefaced by B00-. All samples collected for soil moisture content analysis and archiving.

BORING No. MW-7A

Site 1100-EM-1 Boring No. MW-7A Desig. MW-7A

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
		W52	8.0	15.0 16.5	100				15.0 - 19.0 SANDY GRAVEL; 10YR4/4 dark yellowish brown;moist; poorly sorted;strong reaction to acid; 65% gravel (35% CP-VCP, 10% small pebbles, 20% others; 95% basalt, 5% quartz; rounded); 30% sand (20% CS, 10% others; 95% basalt mostly subrounded, 5% quartz and others mostly angular to subangular); 5% silt.
370									
		W53	8.0	19.0 20.0	100				19.0 - 24.5 SANDY GRAVEL; 10YR4/3 dark brown; moist; poorly sorted; strong reaction to acid; 50% gravel (25% MP, 15% CP, 10% others; 90-95% basalt, rounded to subrounded; 5% quartz); 45% sand (30% CS, 10% VCS, 5% others; 95% basalt, 5% others; subrounded to rounded); <5% silt.
	20					20.05 - 28.4 (8-20)Bentonite crumbles			
365									
	25	W54	8.0	25.0 26.0	100				24.5 - 28.5 SANDY GRAVEL; 10YR4/3 dark brown; moist; reaction to acid slight in soil matrix, strong from particle coatings; poorly sorted; 50-55% sand (15% CS, 15% VCS, 15% FS, 10% VFS; 95% basalt, 5% quartz; subrounded); 40-45% gravel (20% CP, 10% VCP, 10% MP-VFP; rounded; 90% basalt, 10% others); <5% silt.
360									From 27.5 - 27.9 ft silt content increases mostly as a coating around gravels.
						28.4 - 31.8 (1/2 inch)Bentonite pellets			28.5 - 33.2 SANDY GRAVEL; 10YR6/2 light grayish brown; poorly sorted; moderate to slight reaction to acid; moist; 57% sand (20% MS, 20% VFS, 17% others; 60% quartz, 40% basalt; angular); 37% gravel (20% CP & MP, 10% FP, 6% others; 80-85% basalt, 15-20% quartz and others); 6% silt. Reaction to acid strong @ 30.0 ft.
	30	W55	8.0	29.6 30.3	100				
355									Hanford/Ringold fm contact based on gravel mineralogy.
	35					35.0 - 55.0 0.010 slot, continuous wrap stainless steel screen			33.2 - 42.0 SANDY GRAVEL; 10YR5/3 brown; poorly sorted; moist; moderately strong reaction to acid; 50% sand (15% MS, 15% CS, 10% VCS, 10% others; 80% quartz and feldspar, 20% others; angular to subangular); 46% gravel (25% CP, 10% MP, 11% others; 70% quartzite, 30% granites, basalt, and mudstone; rounded); <4% silt; <2% mica. 0.2 ft thick silt-rich (6-7%) layer @ 35.8 ft.
			8.0	35.5 36.0	100				
350									
	40								
			8.0	40.5 41.0	50				

BORING No. MW-7A

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
345									42.0 - 44.0 SILTY SANDY GRAVEL; 50% gravel, 40% sand, 10% silt; moist; poorly sorted; gravels subrounded, sands subangular; 75% quartzite and feldspar, 25% basalt; strong reaction to acid.
	45		8.0	45.0 46.4	100				44.0 - 48.5 SANDY GRAVEL; 55% gravel, 43% sand, 2% silt; 10YR4/3 dark brown; wet; poorly sorted; gravels rounded to subrounded, sands subangular; 75% quartzite, feldspar and others, 25% basalt.
340									
			8.0	48.5 50.1	100				48.5 - 52.0 SILTY SANDY GRAVEL; 50% gravel, 40% sand, 10% silt; 10YR4/3 dark brown; wet; poorly sorted; gravels subrounded, sands subangular to angular; 80% quartzite, feldspar and others, 20% basalt; strong reaction to acid.
	50								
			8.0	52.5 53.5	100				52.0 - 53.5 SLIGHTLY GRAVELLY SAND; 10% gravel, 85% sand, 5% silt; 10YR4/3 dark brown; wet; moderately sorted; gravels subrounded, sands subangular; 90% quartz and feldspar, 10% others; moderate to strong reaction to acid.
335									
			8.0	53.5 55.7	100				53.5 - 58.3 SANDY GRAVEL; 50% gravel, 45% sand, <5% silt; 10YR4/2 dark grayish brown; wet; poorly sorted; gravels rounded to subrounded, sands subangular; 95% quartzite and feldspar, 5% others; slight to moderate reaction to acid.
	55								
						56.0 - 58.3 Borehole caved			
330									Bottom of Boring MW-7A @ 58.3 ft depth.

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Site 1100-EM-1 Page 1 of 3 Pages

Boring No. MW-8A Desig. MW-8A Diam.(Casing 8 inches"

Co-ordinates N 377299.6 E 1947303.7

TEST BORING FIELD LOG

Elevation Top of Boring	386.2 M.S.L	Hammer Wt.		Boring Started	MAY 2 91
Total Overburden Drilled	58.4 Feet	Hammer Drop			
Elevation Top of Rock	M.S.L	Casing Left		Boring Completed	MAY 9 91
Total Rock Drilled	0.0 Feet	Subsurface Water Data	▽ 40.5	Page	
Elev. Bottom of Boring	326.2 M.S.L	Obs. Well			
Total Depth of Boring	60.0 Feet	Drilled By:	D. Rossman		
Core Recovered %	Boxes No.	Mfg. Des. Drill:			
Core Recovered Ft:	Diam. In.	Inspected By:	K. Singleton (WHC)		
Soil Samples In. Diam.	No.	Classification By:	E. Freeman (WHC)		
Soil Samples In. Diam.	No.	Classification By:			

SCALES ELEV.	DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
						0.0 - 3.3 Neat cement			0.0 - 4.0 SILTY SAND; medium brown; moderately well sorted; slightly calcarious (reacts slightly to acid); rounded to subrounded; 60% quartz, 40% basalt; 90% sand (60% VFS, 30% FS, 10% MS), 10% silt; dry.
385									
						3.3 - 18.65 Cement grout			
	5	VQ8	5.0	4.8 6.8	100	4.8 - 6.8 Sample W57			4.0 - 9.0 SANDY GRAVEL; 35% gravel, 60% sand, 5% other; poorly sorted; 2.5Y6/2 light brownish gray; strong reaction to acid; dry; sand subrounded to rounded, 60% MS, 30% FS, 10% VFS; gravel rounded to subrounded, 10%VFP-FP, 70% MP-CP, 20% VCP, 95% basalt.
380									
	10	VQ9	5.0	9.8 12.9	100	9.8 - 12.9 Sample W58			9.0 - 11.0 GRAVELLY SAND; 2.5Y4/2 dark grayish brown; strong reaction with acid; slightly moist; 30% gravel, 70% sand; sand subrounded to subangular, 60% CS, 20% FS, 10% VFS, 70% basalt, 20% quartz, 10% other felsics; gravel 50% VCP, 40% CP, 5% MP, 5% FP, 70% basalt, 30% felsics; poorly sorted.
375									11.0 - 12.0 SILTY CLAY CONGLOMERATE"; not calcareous; held together by fines.
									12.0 - 20.0 GRAVELLY SAND; 10YR5/1 gray, slightly moist; slightly reactive with acid; 85% sand, 15% gravel; sands - 30% VCS, 15% CS, 50% MS, 5% FS, subrounded to subangular, 90% basalt, 10% others; gravels - subrounded, 30% VCP, 40% CP, 20% FP, 20% VFP, 80% basalt, 20% others;

GENERAL REMARKS:

Depths provided in feet beneath the existing ground surface; elevations in feet above mean sea level. All sample numbers prefixed by B00-. V** samples were collected for chemical analysis, W** samples for physical analysis.

BORING No. MW-8A

Site 1100-EM-1 Boring No. MW-8A Desig. MW-8A

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
		VR0	5.0	15.4 17.7	50	15.4 - 17.7 Sample W59			poorly sorted.
370						18.65 - 27.9 Bentonite crumbles			
	20	VR1	8.0	20.2 22.3	60	20.2 - 22.3 Sample W60			20.0 - 49.0 SANDY GRAVEL; 10YR4/1 dark gray; moist; no reaction with acid; 80% gravel (85% basalt, 15% quartzite; subrounded; 5% large cobbles, 5% small cobbles, 50% VCP, 20% CP, 10% MP, 10% FP), 20% sand (95% basalt, 5% others; subrounded to subangular; 35% VCS, 35% CS, 20% MS, 10% FS); poorly sorted.
365									
	25	VR3	5.0	25.0 27.5	60	25.0 - 27.5 Sample W61			Soil reacts strongly with acid @ 25 ft.
360						27.9 - 31.5 (1/4 inch)Bentonite pellets			
	30	VR4	5.0	29.8 32.3	75	29.8 - 32.2 Sample W62			
355						31.5 - 60.0 (20-40)Colorado sand			
	35	VR5	5.0	34.9 37.6	50	34.9 - 37.6 Sample W63 35.3 - 55.6 0.010 inch, continuous wound stainless steel screen			
350									
	40								
345		VR7	5.0	40.8 43.6	70	40.8 - 43.6 Sample W64			

BORING No. MW-8A

Site 1100-EM-1 Boring No. MW-8A Desig. MW-8A

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
	45	VR9	5.0	45.3 48.0	80	45.3 - 48.0 Sample W65			
340									
	50	W66	8.0	49.5 50.8					49.0 - 52.0 SAND; 10YR7/1 light gray; wet; weak reaction to acid; 90% quartz, 5% basalt, 5% granitics; 90% CS, 10% MS; well sorted; subrounded to subangular.
335		W67	8.0	51.5 53.0					
	55								52.0 - 53.5 SANDY GRAVEL; 10YR6/1 light gray; strong reaction with acid; slightly cemented; saturated; 70% gravels (subrounded; 5% small cobbles, 10% VCP, 20% MP, 50% FP, 15% VFP; 95% granitics, 5% basalt), 30% sand (subrounded to subangular; 90% granitics, 10% basalt; 20% VCS, 20% CS, 40% MS, 10% FS, 10% VFS); poorly sorted.
330									53.5 - 57.0 SAND; 10YR7/1 light gray; wet; weak reaction to acid; 90% quartz, 5% basalt, 5% granitics; 90% CS, 10% MS; well sorted; subrounded to subangular.
		VS0	5.0	58.0 60.0	100	58.0 - 60.0 Sample W68			57.0 - 60.0 GRAVELLY SILTY SAND; 5Y5/2 olive gray; no reaction with acid; 20% gravel (40% andesitic, 60% granitic; subrounded; 1% VCP, 20% CP, 50% MP, 20% FP, 9% VFP), 50% sand (10% MS, 40% FS, 50% VFS), 30% silt; poorly sorted.
	60								Bottom of Boring MW-8A @ 60.0 ft.

BORING No. MW-8A

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Site 1100-EM-1

Boring No. MW-18 Desig. MW-18 Diam.(Casing) 8 inch"

Co-ordinates N 367795.9 E 1947500.9

TEST BORING FIELD LOG

Elevation Top of Boring	399.7	M.S.L	Hammer Wt.		Boring Started JAN 17 91
Total Overburden Drilled	69.1	Feet	Hammer Drop		
Elevation Top of Rock		M.S.L	Casing Left		Boring Completed JAN 22 91
Total Rock Drilled	0.0	Feet	Subsurface Water Data	▽ 48.4 ▼	Page
Elev. Bottom of Boring	330.6	M.S.L	Obs. Well		
Total Depth of Boring	69.1	Feet	Drilled By:	G. Thomas	
Core Recovered %		Boxes No.	Mfg. Des. Drill:		
Core Recovered Ft:		Diam. In.	Inspected By:	K. Singleton (WHC)	
Soil Samples In. Diam.		No.	Classification By:	K. Singleton (WHC)	
Soil Samples In. Diam.		No.	Classification By:		

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
		1	10.0	0.0 1.0	100	0.0 - 2.8 Neat cement			0 - 2.0 SAND; 2.5Y3/3 dark olive brown; angular; well sorted; moist; no reaction to acid; 98% sand (80% CS & MS, 20% others; 80% quartz, 15% feldspar; 5% others); 2% silt.
						2.8 - 20.8 Portland cement			2.0 - 7.5 SILTY SANDY GRAVEL; 10YR4/2 dark grayish brown; poorly sorted; well graded; slightly moist to moist; strong reaction to acid; 40% gravel (50% VCP, 15% CP, 15% large cobbles, 10% MP & FP, 10% others; 90% basalt, 10% others; rounded; some calcite coating); 53% sand (70% MS & CS, 20% VCS, 10% others; subangular to subrounded; 90% basalt, 10% others); 7% silt, non-plastic.
395	5	2	10.0	5.0 6.0	100				
390	10	3	10.0	10.5 11.5	100				7.5 - 15.0 SANDY GRAVEL; 10YR4/2 dark grayish brown; poorly sorted; moist to slightly moist; strong reaction to acid; 50% gravel (65% VCP, 20% CP, 15% others; 90% basalt, 10% others; rounded); 47% sand (70% CS & MS, 20% VCS, 10% others; subangular to subrounded; 90% basalt, 10% others); 3% silt.
385									@ 13.1 ft - no reaction to acid

GENERAL REMARKS:

Depths provided as feet below the existing ground surface; elevations in feet above mean sea level. All sample numbers prefixed by MW-18-. All samples collected for soil moisture content determination.

BORING No. MW-18

Site 1100-EM-1 Boring No. MW-18 Desig. MW-18

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
		4	10.0	15.1 16.1	100				15.0 - 16.5 SANDY GRAVEL; 10YR4/1 dark gray; poorly sorted; no reaction to acid; slightly moist to moist; 55% sand (30% CS, 30% VCS, 25% MS, 15% other; 90% basalt, subangular to subrounded, 10% other, angular); 42% gravel (60% VCP, 20% CP, 10% VFP, 10% others; 95% basalt, 5% others); 3% silt.
		5	10.0	17.0 18.0	100				16.5 - 21.5 GRAVELLY SAND; 10YR4/1 dark gray; slightly moist to moist; poorly sorted; no reaction to acid; 73% sand (30% CS, 30% MS, 20% VCS, 20% others; 95% subrounded to subangular basalt, 5% angular to subangular others); 25 % gravel (50% VCP, 20% CP, 10% small cobbles, 20% FP & VFP; 90% basalt, 10% others; rounded to subrounded); 2% silt.
380	20					20.8 - 35.5 Bentonite crumbles			
		6	8.0	22.0 23.0	100				21.5 - 29.8 SANDY GRAVEL; 10YR3/2 very dark grayish brown; poorly sorted; slightly moist to moist; slight to no reaction with acid; 55% sand (60% CS & MS, 25% VCS, 15% others; 90% basalt, 10% others; subrounded to angular); 42% gravel (50% VCP, 20% CP, 20% MP, 10% others; 90% basalt, 10% others); 4% silt. @ 24.5 ft color change to 10YR4/2 dark grayish brown.
375	25								
		7	8.0	28.0 29.0	100				
370	30								29.8 - 30.2 SAND; 10YR2/1 black;slightly moist to moist; well sorted; no reaction to acid; 96% sand (30% CS, 30% MS, 20% VCS, 20% other; 85% basalt, 15% other; subrounded to subangular; <2% gravel; <2% silt. 30.2 - 35.3 SANDY GRAVEL; 10YR4/2 dark grayish brown; slightly moist to moist; slight to no reaction with acid; poorly sorted; 50% sand (60% CS & MS, 25% VCS, 15% others; 90% basalt, 10% others; subangular to subrounded); 46% gravel (70% CP & MP, 30% others; 95% basalt, 5% others; rounded); 4% slit.
365	35								
		8	8.0	35.5 36.5	100	35.5 - 39.3 Bentonite pellets			35.3 - 36.7 SLIGHTLY GRAVELLY SAND; 10YR4/2 dark grayish brown; strong reaction to acid; moist to slightly moist; well sorted; 85% sand (30% MS, 30% CS, 30 % VCS, 10% other; 80% basalt, 20% quartz and feldspar; subrounded to angular); 10% gravel (MP & FP); 5% silt, non-plastic.
360	40					39.3 - 66.3 20-40 Colorado sand			36.7 - 49.5 SANDY GRAVEL; 10YR4/2 dark grayish brown; slightly moist to moist; slight to no reaction with acid; poorly sorted; 51% gravel (70% CP & VCP, 20% MP, 10% others; rounded); 45% sand (60% CS & MS, 25% VCS, 15% others; 90% basalt, 10 % others; subrounded to angular); 4-8% silt, non-plastic.
		9	8.0	41.0 42.0	100				

BORING No. MW-18

Site 1100-EM-1 Boring No. MW-18 Desig. MW-18 Page 3 of 4 Pages

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
						42.0 - 64.0 .010" slot, continuous wound stainless steel screen			
355	45								
		10	8.0	46.0 47.0	100				
350	50								Hanford/Ringold formation contact @ 49.5 ft. 49.5 - 63.5 SILTY SANDY GRAVEL; 10YR5/3 grayish brown to brown; very poorly sorted; no reaction to acid; 60% gravel (30% VCP, 20% CP, 20% small cobbles, 20% MP, 10% others; 55% quartz,. 35% basalt, 10% others; rounded to subrounded); 34% sand (65% MS & CS, 20% VCS, 15% others; 85% quartz, 15% others); 6% silt, non-plastic.
345	55								
340	60	11	8.0	60.0 61.0	100				
335	65					66.3 - 69.1 borehole caved			63.5 - 69.1 SANDY GRAVEL; 10YR7/4 very pale brown; poorly sorted; no to very weak reaction to acid; 60% sand (60% MS, 20% CS, 20% others; 90% quartz, 10% basalt; angular to subangular); 38% gravel (30% VCP, 20% small cobbles, 20% CP, 20% MP, 10% others); <2% silt.

BORING No. MW-18

Site 1100-EM-1 Boring No. MW-18 Desig. MW-18 Page 4 of 4 Pages

SCALES		CORE/SAMPLE			BLOWS PER FT	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
ELEV.	DEPTH	NO. SYMBOL	SIZE	DEPTH RANGE	CORE REC'VY				
									Bottom of Boring MW-18 @ 69.1 ft.

BORING No. MW-18

9312933054 0

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Site 1100-EM-1 Page 1 of 3 Pages

Boring No. MW-19 Desig. MW-19 Diam. (Casing) 8 inch"

Co-ordinates N 373112.6 E 1946073.6

TEST BORING FIELD LOG

Elevation Top of Boring	384.6	M.S.L	Hammer Wt.		Boring Started JUN 8 91
Total Overburden Drilled	54.0	Feet	Hammer Drop		
Elevation Top of Rock		M.S.L	Casing Left		Boring Completed JUN 19 91
Total Rock Drilled	0.0	Feet	Subsurface Water Data	▽ 34.8 ▼	Page
Elev. Bottom of Boring	330.3	M.S.L	Obs. Well		
Total Depth of Boring	54.3	Feet	Drilled By:	Gary Lydin	
Core Recovered %	Boxes	No.	Mfg. Des. Drill:		
Core Recovered Ft:	Diam.	In.	Inspected By:	K. Singleton (WHC)	
Soil Samples In. Diam.		No.	Classification By:	K. Reynolds (WHC)	
Soil Samples In. Diam.		No.	Classification By:	R.S. Edrington (WHC)	

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
									0.0 - 15.0 SLIGHTLY GRAVELLY SAND; 2.5YR7/1 light gray; dry; 5-10% gravel, predominantly subangular to subrounded; 70% medium to coarse sand, subangular to subrounded, moderately sorted, unconsolidated, 70% felsic, 30% mafic; ~10% fine to very fine sand; trace to 10% silt/clay. Interbedded SLIGHTLY GRAVELLY SAND and GRAVELLY SAND to a depth of 15.0 feet.
380									
	5	Z25	8.0	5.0 7.0	100				
375									
	10	Z26	8.0	10.0 12.0	100				
370									

GENERAL REMARKS:

Depths provided in feet below the existing ground surface; elevations in feet above mean sea level. All sample numbers prefixed by B00-. All samples collected for soil moisture content determination.

BORING No. MW-19

Site 1100-EM-1 Boring No. MW-19 Desig. MW-19

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
		Z27	8.0	15.0 17.5	100	15.0 Radiation sample			15.0 - 28.0 SANDY GRAVEL; 45% gravel, 50% sand, 5% silt; 15% VCS, 15% CS, 10% MS, 5% FS, 5% VFS; 5YR6/1 gray; dry; very poorly sorted; larger particle sizes subrounded, smaller sizes subangular; 95% basalt, 5% felsic; smaller particles reactive to HCl, larger sizes slightly reactive.
365									
	20	Z28	8.0	20.0 23.0	100	20.0 Radiation sample			
360									
	25	Z29	8.0	25.0 28.0	100	25.0 Radiation sample			
									28.0 - 40.0 GRAVELLY SAND; 25% gravel, 70% sand, 5% silt; 10% VCS, 10% CS, 40% MS, 5% FS, 5% VFS; 5Y8/3 pale yellow; slightly moist; moderately to poorly sorted; larger particle sizes subrounded, smaller subangular; 80% felsic, 20% basalt, <2% mica; strong reaction to HCl. Hanford/Ringold formation contact @ 28.0 ft depth.
355									
	30	Z30	8.0	30.0 32.0	100	30.0 Radiation sample			
350 ▽									
	35	Z31	8.0	35.0 37.0	100	Static Water Level on 6/11/91, 1600 hrs. 35.0 Radiation sample			GRAVELLY SAND; 35% gravel, 60% sand, 5% silt; slightly higher moisture than above, but otherwise consistant.
345									
	40					40.0 Radiation sample			40.0 - 45.0 SANDY GRAVEL; 50% gravel (<2% cobbles), 45% sand, 5% silt; 10% VCS, 10% CS, 10% MS, 10% FS, 5% VFS; 5Y6/2 light olive gray; wet; very poorly sorted; subrounded to subangular; 80% felsic, 20% mafic, <2% mica; moderate reaction to HCl.

BORING No. MW-19

Site 1100-EM-1 Boring No. MW-19 Desig. MW-19

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
340	45					45.0 Radiation sample			45.0 - 50.0 GRAVELLY SAND; 25% gravel, 70% sand, 5% silt; 5Y6/2 light olive gray; wet; moderately sorted; subrounded; 50% mafic, 50% felsic, <2% mica; slightly reactive to HCl.
335	50					50.0 Radiation sample			50.0 - 52.0 SLIGHTLY GRAVELLY SILTY SAND; 10% gravel,75% sand, 15% silt; 10% VCS, 20% CS, 30% MS, 10% FS, 5% VFS; 5Y6/2 light olive gray; wet; moderately sorted; subangular; 60% felsic, 40% mafic, <2% mica; moderate reaction to HCl in fine grain sizes only.
									52.0 - 54.3 SILT; 5% VFS, 95% silt; 10YR8/3 very pale brown; moist; moderately plastic; very well sorted; >98% felsic, 2% mica, <2% mafic; non-reactive to HCl; some small sand pockets from 52.0 to 53.0 ft.
									Bottom of Boring MW-19 @ 54.0 ft.

BORING No. MW-19

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TEST BORING FIELD LOG

Site 1100-EM-1 | Page 1 of 3 Pages

Boring No. MW-20 | Desig. MW-20 | Diam. (Casing) 8 inch"

Co-ordinates N 375956.3 E 1946115.4

Elevation Top of Boring	383.5 M.S.L	Hammer Wt.		Boring Started	JUN 4 91
Total Overburden Drilled	67.7 Feet	Hammer Drop			
Elevation Top of Rock	M.S.L	Casing Left		Boring Completed	JUN 7 91
Total Rock Drilled	0.0 Feet	Subsurface Water Data	▽ 35.8 ▼	Page	
Elev. Bottom of Boring	315.8 M.S.L	Obs. Well			
Total Depth of Boring	67.7 Feet	Drilled By:	Tim Gifford		
Core Recovered %	Boxes No.	Mfg. Des. Drill:	Walker Neer		
Core Recovered Ft:	Diam. In.	Inspected By:			
Soil Samples In. Diam.	No.	Classification By:	G.B. Gould (WHC)		
Soil Samples In. Diam.	No.	Classification By:			

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
						0.0 - 2.5 Neat cement			0.0 - 5.5 SAND; 10YR5/4; moist; no reaction w/10% HCl; 60% quartz and others, 40% basalt; very fine to medium grained; angular to rounded; no apparent sorting.
						2.5 - 17.4 Cement slurry			
380									
	5								
		Z15	8.0	5.5					5.5 - 6.0 GRAVELLY SILT; 10YR4/4 yellowish brown; moist; lenses of calcareous material in soil; silt 50%, gravel 30%, sand 20%; rounded to well rounded; strong reaction to 10% HCl; quartz and others 50%, basalt 50%; sand very fine to medium, angular to subrounded; non-plastic.
		Z16	8.0	5.8					
				5.8 6.1					
		Z17	8.0	7.0					
				7.3					
375									6.0 - 43.0 SILTY SANDY GRAVEL; 10YR6/3 pale brown; dry; 40% gravel, angular to well rounded, basalt 40%, quartz and others 60%; 50% sand, angular to subrounded, basalt 45%, quartz and others 55%, very fine to very coarse; 10% silt; strong reaction with HCl. Soil in sample B00Z18 @ 9.75 ft was pulverized from the drive barrelling process. Moisture retention may be skewed as a result. Formation is believed to be continuous with above. Basalt boulder at 11.0 ft.
	10	Z18	8.0	9.8					
				10.1					
370									Basalt boulder at 14.0 ft.

GENERAL REMARKS:

Depths provided in feet beneath existing ground surface; elevations in feet above mean sea level. All sample numbers prefixed by B00-. All samples collected for soil moisture content determination.

BORING No. MW-20

Site 1100-EM-1 Boring No. MW-20 Desig. MW-20

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
		Z19	8.0	15.0 – 15.3					
365						17.4 - 20.8 Bentonite crumbles			Color change at 17.0 ft. to 10YR4/2; moist; gravel size decreasing; oxidation stains apparent; basalt 70%, quartz and others 30%.
	20	Z20	8.0	20.0 – 20.3					
						20.8 - 20.9 3/8" Bentonite pellets 20.9 - 64.6 20-40 & 8-12 Colorado Sand			
360									
						24.1 - 45.1 .010 in. slot continuous wound stainless steel screen			
	25	Z21	8.0	25.0 – 25.3					
355									Color change to 10YR5/2; dry; increased amounts of quartz and others; moderate reaction to HCl; poorly sorted; Hanford/Ringold formation contact at 28.0 feet based on gravel mineralogy.
	30	Z22	8.0	30.0 – 30.3					
350									
	35	Z23	8.0	35.0 – 35.3					
						35.8 ft. Static Water Level on 5 JUN 91			
345									
	40								

BORING No. MW-20

Site 1100-EM-1 Boring No. MW-20 Desig. MW-20

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
340	45								43.0 - 44.5 SAND; 5Y5/2 olive gray; fine to coarse; some fine cobbles noted; moderately sorted; wet; angular to rounded; basalt 25%, quartz and others 75%; moderate reaction to 10% HCl.
									44.5 - 53.0 SANDY GRAVEL; 5Y6/2 light olive gray; wet; 55% gravel, subrounded to well rounded, very fine to very coarse pebbles, basalt 45%, quartz and others 55%; 45% sand, angular to subrounded, basalt 40%, quartz and others 60%; soil poorly sorted; no reaction to 10% HCl. Possible lense of sand from 46.5 to 47.0 ft; same lithology as 43.0 to 44.5 ft; very well rounded larger gravels; very micaceous soil.
335	50								
330									53.0 - 55.0 SAND; 5Y5/2 olive gray; saturated; very fine to medium sand; angular to subrounded; basalt 25%, quartz and others 75%; well sorted; weak reaction to 10% HCl.
	55								55.0 - 60.0 SANDY GRAVEL; 50% sand, very fine to very coarse, basalt 40%, quartz and others 60%, angular to subrounded; 50% gravel, very fine to coarse pebbles and small cobbles, basalt 45%, quartz and others 55%, subrounded to well rounded; poorly sorted; saturated; weak reaction to 10% HCl. Sand lense observed at 58.4 ft; very fine to medium grained. Sand lense observed at 59.0 ft; very fine to medium grained.
325									
	60								60.0 - 64.8 GRAVEL; 10YR5/4; saturated; well sorted; very fine to very coarse pebbles; less than 5% sand; some small cobbles noted; larger grains of gravel are very well rounded; basalt 25%, quartz and others 75%. Thin sand lenses noted at ~62.0 ft.
320									Silty lenses observed at 64.7 ft.
	65					Boring caved below 64.6 ft. depth			64.8 - 66.0 SILTY SANDY GRAVEL; 5Y5/2 olive gray; moist; 10YR6/8 discoloration noted as clasts; 50% sand, very fine to medium grained, angular to subrounded, basalt 50%, quartz and others 50%; 35% gravel, very fine to coarse pebbles, subrounded to well rounded, 15% silt, slightly cohesive; poorly sorted; no reaction to 10% HCl.
		Z24	8.0	66.5 67.7					66.0 - 67.7 SILT; 10YR7/1 with lenses of 10YR7/4; moist; low plasticity; no reaction to 10% HCl.
									Bottom of MW-20 @ 67.7 ft.

BORING No. MW-20

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Site 1100-EM-1 Page 1 of 5 Pages

Boring No. MW-21 Desig. MW-21 Diam.(Casing 10 inch"

Co-ordinates N 374482.6 E 1945427.5

TEST BORING FIELD LOG

Elevation Top of Boring	379.5	M.S.L	Hammer Wt.		Boring Started MAY 30 91
Total Overburden Drilled	98.5	Feet	Hammer Drop		
Elevation Top of Rock		M.S.L	Casing Left		Boring Completed JUL 1 91
Total Rock Drilled	0.0	Feet	Subsurface Water Data	▽ 30.5 ▼	Page
Elev. Bottom of Boring	281.0	M.S.L	Obs. Well		
Total Depth of Boring	98.5	Feet	Drilled By:	Dave Rossman	
Core Recovered %	Boxes	No.	Mfg. Des. Drill:	Wellmaster	
Core Recovered Ft:	Diam.	In.	Inspected By:	K. Singleton (WHC)	
Soil Samples In. Diam.		No.	Classification By:	J.A. McBane (CENPW)	
Soil Samples In. Diam.		No.	Classification By:		

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
						0.0 - 2.0 Neat cement 2.0 - 20.0 Portland cement			0.0 - 3.0 SAND; 100% medium sand; 10YR5/2 grayish brown; moist; well sorted; subangular; 75% basalt, 25% quartzite, feldspars, and others; reaction to acid strong.
375									3.0 - 5.0 SANDY GRAVEL; 60% medium sand, 40% gravel; 10YR5/3 brown; poorly sorted; sand subangular, gravels subrounded; 80% basalt, 20% others; reaction to acid strong; moist.
	5	YZ7	8.0	5.0 6.3	100				5.0 - 12.0 GRAVELLY SAND; 75% medium sand, 23% gravel, <2% silt (coating gravels); 10YR5/3 brown; poorly sorted; sand subangular, gravels subrounded to rounded; 80% basalt, 20% others; reaction to acid strong; moist. Sand % increase @ 6.5 ft to 85%, minor calcite coating on gravels.
370									
	10	YZ8	8.0	10.0 11.0	100				
									12.0 - 18.0 SANDY GRAVEL; 80% gravel, 18% fine to coarse sand, <2% silt; 10YR3/1 very dark gray; moist very poorly sorted; gravels subangular to subrounded, sands angular to subangular; 85% basalt, 15% quartzite, feldspar and others; reaction to acid strong. 50% gravel, 50% fine to coarse sand; 10YR4/1 dark gray; moist poorly sorted;
365		YZ9	8.0	14.5	50				

GENERAL REMARKS:

Depths provided in feet beneath the existing ground surface; elevations in feet above mean sea level. All sample numbers prefixed with B00-. All samples were collected for soil moisture content determination.

BORING No. MW-21

9312933549

Site 1100-EM-1 Boring No. MW-21 Desig. MW-21

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
				17.8					angularity as above; 85% basalt, 15% others; strong reaction to acid.
									18.0 - 37.5 SILTY SANDY GRAVEL; 50% gravel, 45% fine to medium sand, 5% silt; 10YR5/3 brown; moist; poorly sorted; grasvels subangular to rounded, sands subangular to angular; 70% basalt, 30% quartzite, feldspar and others; reaction to acid strong. Reaction to acid @ 20.0 ft slight.
360	20	Z00	8.0	18.8 21.1	75	20.0 - 30.5 (8-20)Bentonite crumbles			40% gravel, 35% sand, 25% silt; moderately sorted; non-plastic.
355	25	Z01	8.0	24.0 26.5	75				40% gravel, 55% sand, 5% silt; 10YR5/2 grayish brown; poorly sorted.
350	30	Z02	8.0	29.5 30.2	100				60% gravel, 35% medium sand, 5% silt; 10YR5/2 grayish brown; wet; moderately sorted; 40% basalt, 60% quartzite and others; reaction to acid slight.
						30.5 - 80.5 Pure Gold Bentonite grout			75% quartzite and others, 25% basalt.
									Hanford fm/Ringold fm contact based on mineralogy change in gravels.
345	35								
									37.5 - 54.0 SANDY GRAVEL; 50% gravel, 50% fine to coarse sand; 10YR5/3 brown; wet; poorly sorted; gravels rounded to subangular, sands angular to subangular; 80% quartzite and others, 20% basalt; reaction to acid slight.
340	40								30% gravel, 70% sand; 10YR5/3 brown.

BORING No. MW-21

9413250350

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
335	45								45% gravel, 55% sand.
									55% gravel, 43% sand, <2% silt.
330	50								70% gravel, 28% sand, <2% silt.
325	55								54.0 - 77.1 ASH; 100% minus #200 sieve; 5YR8/1 white; moist; very well sorted; angularity indeterminate; 95% silica assumed; no reaction to acid.
									Isolated stringers of fine sand and very isolated, rounded fine gravels @ 56.0-57.0 ft. Stringers 1/8 inch maximum thickness with no preferred orientation. Minor fine sand and silt stringers to 1/32 inch thickness @ 57.0-58.0 ft, isolated 1/32 inch diameter pebbles within stringers.
320	60								Medium to fine sand and silt stringers to 1/16 inch thickness @ 61.0-61.5 ft.
315	65					Bottom of 10-inch diameter casing. 8-inch casing beyond.			10YR7/2 light gray; color has been very gradually darkening from the top of the ash deposit. 10YR6/2 light brownish gray. Ash appears to be saturated although no free water noted. When squeezed,

Site 1100-EM-1 Boring No. MW-21 Desig. MW-21

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
310	70								color noticably lightens then darkens again when pressure is released.
									Color change in material becoming more dramatic with increasing depth.
305	75								Moisture content appears to be increasing; core consistancy is decreasing. Ash has a jello-like consistancy when it is removed from the core barrel.
									77.1 - 77.5 SILT; 90% silt and ash, 10% fine sand; 2.5Y7/4 pale yellow; wet; well sorted; sands angular; no reaction to acid.
									77.5 - 80.5 SILT; 100% silt; 2.5Y5/3 light olive brown; moist; no reaction to acid; hard consistancy; non-plastic.
300	80								2.5Y7/3 pale yellow; moderately sorted; beginning to see isolated rounded gravels.
						80.5 - 81.2 40-100 Colorado sand 81.2 - 98.5 20-40 Colorado sand			80.5 - 84.5 SILTY GRAVEL; 55% gravel, 10% sand, 35% silt; color - jade green (not on Munsell color chart); moist;very poorly sorted; gravels rounded to subrounded, sands subangular; gravels 95% quartzite feldspars and others, 5% basalt; sands micaceous; no reaction to acid; material has an oily appearance; core has small inclusions of charcoal appearing substance. 60% gravel, 20% sand, 20% silt; very poorly sorted; jade green; wet; gravels rounded to subangular.
295	85								84.5 - 85.5 SILTY SANDY GRAVEL; 60% gravel, 30% sand, 10% silt; jade green; wet; very poorly sorted; gravels rounded to subangular, sands subangular; 95% quartzite and others, 5% basalt; no reaction to acid; color intensity varying irregularly. 85.2 ft silt is occurring in pockets; color remaining jade green; sand color now 5Y4/2 olive gray.
									85.5 - 86.0 SAND; <2% gravel, 98% medium sand; 5Y4/2 olive gray; well sorted; subangular; no reaction to acid.
						88.5 - 98.5 .010" slot, stainless steel continuous wound screen			86.0 - 98.5 SILTY SANDY GRAVEL; 70% gravel, 20% sand, 10% silt; color dark green (not in Munsell charts); wet; poorly sorted; gravels rounded to subangular, sands subangular to angular; no reaction to acid; very similar to 84.5-85.5 except darker in color.
290	90								5Y4/2 olive gray, green tint less intense. Green tint returning.
									55% gravel, 33% sand, 10% silt; dark green with pockets of jade green; wet; poorly sorted;greener color seems concentrated in wetter zones having less sand and more gravel.
									50% gravel, 45% sand, 5% silt.
285	95								5Y4/2 olive gray; estimate green color is from Fe reduction within the confined aquifer.

BORING No. MW-21

Site 1100-EM-1 Boring No. MW-21 Desig. MW-21

SCALES		CORE/SAMPLE				SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
ELEV.	DEPTH	NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT CORE REC'VY				
									Bottom of Boring MW-21 @ 98.5 ft.

BORING No. MW-21

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WALLA WALLA DISTRICT

Site 1100-EM-1

Boring No. MW-22 Desig. MW-22 Diam. (Casing 8 inches"

Co-ordinates N 374531.8 E 1946933.4

TEST BORING FIELD LOG

Elevation Top of Boring	385.1 M.S.L	Hammer Wt.		Boring Started	MAY 31 91
Total Overburden Drilled	63.0 Feet	Hammer Drop			
Elevation Top of Rock	M.S.L	Casing Left		Boring Completed	JUN 6 91
Total Rock Drilled	0.0 Feet	Subsurface Water Data	▽ 37.4 ▼	Page	
Elev. Bottom of Boring	322.1 M.S.L	Obs. Well			
Total Depth of Boring	63.0 Feet	Drilled By:	Gary Lydin		
Core Recovered %	Boxes No.	Mfg. Des. Drill:			
Core Recovered Ft:	Diam. In.	Inspected By:	K. Singleton (WHC)		
Soil Samples In. Diam.	No.	Classification By:	K. Singleton (WHC)		
Soil Samples In. Diam.	No.	Classification By:	R.S. Edrington (WHC)		

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
385						0.0 - 1.0 Neat cement 1.0 - 19.0 Portland cement			0.0 - 2.0 GRAVELLY SAND; 2.5Y4/4 olive brown; 82% sand, 15% gravel, 3% silt; dry at the surface, moist with depth; poorly sorted; sands - 60% MS, 20% CS, 20% others, angular to subangular; gravels - 80% MP, 20% others, rounded; reaction to acid none at surface, weak with increasing depth; 85% quartz, 15% basalt.
		Z04	8.0	4.5 5.0	100				2.0 - 7.0 SANDY GRAVEL; 2.5Y5/2 grayish brown; 54% gravel, 43% sand, <3% silt; poorly sorted; moist; moderate to strong reaction to acid; sands - 80% MS & CS, 20% others, subrounded to subangular; gravels - 70% VCP & CP, 10% MP, 20% others, rounded; 75-85% basalt, 15-25% others; occasional small cobbles; increase in VFS and silt at 7 ft.
380	5								
		Z05	8.0	9.0 10.0	100				7.0 - 13.5 SANDY GRAVEL; 2.5Y5/2 grayish brown; 54% sand, 40% gravel, 6% silt; poorly sorted; slightly moist; moderate to strong reaction to acid; sands - 70% MS & CS, 10% VFS, 20% others, subangular to subrounded; gravels - 60% MP, 20% FP, 20% others, rounded; 85% basalt, 15% others.
375	10								13.5 - 20.0 SANDY GRAVEL; 2.5Y4/2 dark grayish brown; poorly sorted; slightly moist to moist; moderate to strong reaction to acid; 66% sand, 25% gravel, 7% silt; sands - 20% VCS, 15%

GENERAL REMARKS:

All depths are in feet below the existing land surface; elevations are in feet above mean sea level. All sample numbers prefixed with B00-. All samples collected for soil moisture content determination.

BORING No. MW-22

Site 1100-EM-1 Boring No. MW-22 Desig. MW-22

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	SIZE	DEPTH RANGE	BLOWS PER FT CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
370		Z06	8.0	15.0 16.0	100				CS, 15% MS, 10% VFS, subrounded; gravels - 20% CP & VCP, 5% others, rounded; 95% basalt, 5% others; occasional small cobble. 16.5 - 16.9 ft highly cemented layer; strong reaction to acid; lithified; some iron oxide staining.
		Z07	8.0	19.0 20.0	100	19.0 - 24.4 (8-20)Bentonite crumbles			
365	20	Z08	8.0	20.0 21.0	100				20.0 - 21.2 SANDY GRAVEL; 2.5Y3/2 very dark grayish brown; poorly sorted; very moist; strong reaction to acid; 60% gravel, 37% sand; <3% silt; gravels - 20% VFP, 20% FP & MP, 15% CP, 5% others, subrounded to rounded; sands - 20% VCS, 10% CS, 7% others, subrounded; 95% basalt, 5% others. 21.2 - 26.5 SANDY GRAVEL; 2.5Y4/2 dark grayish brown; poorly sorted; moist; moderate reaction to acid; 55% sand, 40% gravel, <5% silt; sands - 20% VCS, 15% CS, 15% MS, 10% VFS, subrounded; gravels - 20% VCP & CP, 10% MP-VFP, 10% others; rounded; 95% basalt, 5% others.
						24.4 - 27.0 (1/2 inch)Bentonite pellets			
360	25	Z09	8.0	25.0 26.0	100				
						27.0 - 60.0 (10-40)Colorado sand			26.6 - 33.0 SANDY GRAVEL; 2.5Y5/2 grayish brown; poorly sorted; moist; moderate to strong reaction to acid; 45% sand, 50% gravel, <5% silt; sands - 15% VCS, 15% CS, 15% others, subrounded to subangular; gravels - 20% CP, 15% others, rounded; 80% basalt, 20% quartz and feldspars.
355	30					30.0 - 50.4 0.010 slot, continuous wound stainless steel screen			
		Z10	8.0	31.0 32.5	100				
									33.0 - 36.5 SILTY SANDY GRAVEL; 2.5Y4/3 olive brown; poorly sorted; moist; 55% sand, 36% gravel, 9% silt; sands - 20%CS, 15% MS-FS, 10% VCS, 10% VFS, subangular to angular; gravels - 20% MP-CP, 11% FP, 5% others, rounded; 9% non-plastic silt; 60-70% basalt, 30-40% quartz and feldspar.
350	35	Z11	8.0	35.0 36.0	100				
									36.5 - 39.0 SILTY SANDY GRAVEL; 2.5Y4/3 olive brown; poorly sorted; moist; strong to moderater reaction to acid; 40% sand, 50% gravel, 10% silt; sands - 20% MS to CS, 10% VCS, 10% others, angular to subrounded; gravels - 30% VCP to CP, 10% MP to VFP, 10% others, rounded; 70% quartz and feldspar, 30% others, 10% non-plastic silt, <2% mica.
345	40								39.0 - 42.5 SANDY GRAVEL; 2.5YR6/2-2.5Y5/3 light brownish gray to light olive brown; wet; poorly sorted; well graded; no reaction to acid; 50% sand, 47% gravel, 3% silt; sands - 30% MS-CS, 10% VCS, 8% others, <2% mica, angular to subangular; gravels - 30% MP, 10% VFP-FP, 7% others, rounded;

BORING No. MW-22

9 5 1 2 5 0 5 3 2 6 2 1 2 6

Site 1100-EM-1 Boring No. MW-22 Desig. MW-22

SCALES ELEV.	SCALES DEPTH	CORE/SAMPLE NO. SYMBOL	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT / CORE REC'VY	SAMPLING & CORING OPERATIONS	WELL	MATL	CLASSIFICATION OF MATERIALS
									90% quartz, 10% others;
340	45								42.5 - 48.0 SILTY SANDY GRAVEL; 50% gravel, 40% sand, 10% silt; sands - 5% VCS, 15% CS, 15% MS, 5% FS-VFS, 15% mafic, 30% felsic; gravels - 30% mafic, 70% felsic, 5% mica; 2.5Y5/2 grayish brown; wet; well rounded to subrounded; moderately sorted; slight reaction to acid.
335	50								48.0 - 51.5 SANDY GRAVEL; 30% gravel, 65% sand, 5% silt; 10% VCS, 25% CS, 15% MS, 10% FS, 5% VFS; 85% felsic, 15% mafic; 2.5Y5/2 grayish brown; wet; well rounded to subrounded; moderately sorted; slight reaction to acid.
330	55								51.5 - 58.0 SANDY GRAVEL; 45% gravel, 50% sand, 5% silt; 5% FP, 40% VFP, 5% VCS, 25% CS, 10% MS, 5% FS, 5% VFS; 2.5Y5/3 light olive brown; wet; 85% felsic, 15% mafic; gravels subrounded, sands subangular; poorly sorted; slight reaction to acid.
325	60					60.0 - 63.0 Hole caved			58.0 - 61.1 SILT; ash-like; 95% silt, 5% VFS to MS; <2% mica; 2.5Y7/3 dark pale yellow; very well sorted; tuffaceous 85%, 15% mafics; no reaction to acid.
		Z12	8.0	62.0 63.0	100				61.1 - 63.0 ASH; 90% silt, <10% VFS; 7.5YR8/1 white; wet; very well sorted; non-reactive with acid.
									Bottom of Boring MW-22 @ 63.0 ft.

BORING No. MW-22

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1100-EM-1 PHASE II RI
HORN RAPIDS LANDFILL TRENCHING LOGS

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9 3 1 2 9 3 3 0 5 6 0

HTW DRILLING LOG

HOLE NO. TRENCH #1

1. COMPANY NAME	CENPW
2. DRILLING SUBCONTRACTOR	WESTINGHOUSE–HANFORD CO.
SHEET	1 OF 2
3. PROJECT	1100–EM–1 OPERABLE UNIT
4. LOCATION	HORN RAPIDS LANDFILL
5. NAME OF DRILLER	C. LARSON / M. FOSS
6. MANUFACTURER'S DESIGNATION OF DRILL	CASE #780 BACKHOE / FMC BACKHOE
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	SAMPLED WITH SPOON FROM BACKHOE BUCKET
8. HOLE LOCATION	N374,282.98, E1,944,459.57
9. SURFACE ELEVATION	N/A
10. DATE STARTED	SEPT 1991
11. DATE COMPLETED	22 OCT 1991
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER/ELAPSED TIME AFTER DRILLING	N/A
14. TOTAL DEPTH OF HOLE	11.0 FEET
17. OTHER WATER LEVEL MEASUREMENTS	N/A

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	0	0	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER	OTHER	OTHER	21. TOTAL CORE RECOVERY
	2	0	SCREENING 4			N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITOR. WELL	OTHER	23. INSPECTOR
	22 OCT 1991			V. M. JOHNSON, WHC / J. A. MCBANE, CENPW

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
		0–11 FEET				
		SANDY GRAVEL: sand 43%, gravel 52%, silt 5%; 10YR 6/2, light brownish gray; poorly sorted; sands subangular, gravels rounded to subrounded; 55% felsic, 45% mafic; no reaction to acid.				
	1	0.5–11 feet: Abundant stainless steel lathe shavings, piping, cable, tires, and coke bottles.				
	2	2 feet: paint can and paint residue.				Paint can and paint residue drummed.
	3		HRL0101			Screening – negative
	4					
					B00T0	Chemical sample
	5					
	6		HRL0102			Screening – negative

FORM MRK JUN 89 55

PROJECT 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NO. TRENCH #1

HTW DRILLING LOG

HOLE NO. TRENCH #1

PROJECT: 1100–EM–1 O.U. – HORN RAPIDS LANDFILL

INSPECTOR: V. M. JOHNSON / J. A. MCBANE

SHEET 2 OF 2

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
	6	SOIL, as above.	HRL0102			Screening – negative
		6–10 feet: Tires, one rusted drum with no visible contents; labelled "certified".				
	7	7 feet: Cloth, rags, coffee can, fiberglas insulation.				
	8					
		8.5 feet: Solidified paint residue, OVM reading of 262ppm, suspect asbestos, scrap metal.				Paint residue drumme
	9		HRL0103			Screening – negative
					B00T1	Chemical sample
	10					
	11		HRL0104			Screening – negative
		Approx. 320 cubic yards excavated.				
		Approx. Landfill Composition:				
		soil – 90%				
		debris – 10%				

FORM MRK JUN 89 55–2

PROJECT: 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NUMBER: TRENCH #1

HTW DRILLING LOG

HOLE NO. TRENCH #3A

1. COMPANY NAME	CENPW
2. DRILLING SUBCONTRACTOR	WESTINGHOUSE–HANFORD CO.
SHEET	1 OF 3
3. PROJECT	1100–EM–1 OPERABLE UNIT
4. LOCATION	HORN RAPIDS LANDFILL
5. NAME OF DRILLER	M. FOSS
6. MANUFACTURER'S DESIGNATION OF DRILL	FMC BACKHOE #HO–17–5669
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	SAMPLED WITH SPOON FROM BACKHOE BUCKET
8. HOLE LOCATION	N374,095.74, E1,944,557.45
9. SURFACE ELEVATION	N/A
10. DATE STARTED	23 OCT 1991
11. DATE COMPLETED	24 OCT 1991
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER/ELAPSED TIME AFTER DRILLING	N/A
14. TOTAL DEPTH OF HOLE	21.0 FEET
17. OTHER WATER LEVEL MEASUREMENTS	N/A

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	0	0	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER SCREENING	OTHER ASBESTOS	OTHER UNKNOWNS	21. TOTAL CORE RECOVERY
	4	0	5	2	2	N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITOR. WELL	OTHER	23. INSPECTOR
	23 OCT 1991			J. A. MCBANE, CENPW

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
		0–13 FEET				
		SANDY GRAVEL: sand 40%, gravel 55%, silt <5%; 10YR 4/2, light gray; dry; poorly sorted; sands subangular to angular, gravels rounded to subangular; 60% basalt, 40% quartzite, feldspars and others; reaction to acid – slight to none.				
	1					
		1.5 feet: layer of stainless steel lathe shavings, slopes downward approx. 5 degrees toward the west.				
	2					
	3	3–5 feet: accumulation of tires, inner tubes, and misc. automotive debris including mufflers and lengths of tail pipe.	HRL3A01			Screening – negative Mufflers/tailpipe possible GPR targets.
	4					
	5		HRL3A02			Screening – negative
		5.5 feet: Empty 5–gallon paint can; 0.0 ppm with OVM screening			B00ZT7	Chemical sample
	6					

FORM MRK JUN 89 55

PROJECT 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NO. TRENCH #3A

HTW DRILLING LOG

HOLE NO. TRENCH #3A

PROJECT: 1100–EM–1 O.U. – HORN RAPIDS LANDFILL

INSPECTOR: J. A. MCBANE

SHEET 2 OF 3

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
	6	6 feet: Encountered white crystaline material partially wrapped in plastic bag, sample obtained.				
	7	7 feet: Flat lying fragment of sheet metal, approx. 1/16 inch thick and 4 feet long by 3 feet wide.				Sheet metal possible GPR target.
	8	8–10 feet: Abundant tires and inner tubes.	HRL3A03 HRL3A04			White crystaline materi Screening – negative
	9					
	10	10 feet: Another bag of white crystaline material. Substance enclosed in a plastic lined paper bag. Pocket of bright purple stained soil. Suspect asbestos.	HRL3A05 HRL3A06		B00ZT8	Purple stained soil Asbestos sample Chemical sample
	11	11–13 feet: very scattered stainless steel lathe shavings.				
	12					
	13	13 – 21 FEET SAND; 100% med to coarse sand; 10YR 7/1 light gray; moist; very well sorted; angular to subangular; 90% quartzite and feldspar, 10% mica; no reaction to acid.	HRL3A07			Screening – negative
	14	No debris below 13 feet depth.				
	15					
	16		HRL3A08			Screening – negativ

FORM MRK JUN 89 55–2

PROJECT: 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NUMBER: TRENCH #3A

9312035564

HTW DRILLING LOG

HOLE NO. TRENCH #3A

PROJECT: 1100-EM-1 O.U. – HORN RAPIDS LANDFILL

INSPECTOR: J. A. MCBANE

SHEET 3 OF 3

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
	16	SOIL, as above – no debris.	HRL3A08			Screening – negative
	17					
	18					
	19		HRL3A09			Asbestos sample
					B00ZT9	Chemical sample
	20					
					B00ZV0	Chemical sample
	21					
		Approx. 108 cubic yards excavated. Approx. Landfill Composition: soil – 97% debris – 3%				

FORM MRK JUN 89 55-2

PROJECT: 1100-EM-1 HORN RAPIDS LANDFILL

HOLE NUMBER: TRENCH #3A

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HTW DRILLING LOG

HOLE NO. TRENCH #3B

1. COMPANY NAME	CENPW
2. DRILLING SUBCONTRACTOR	WESTINGHOUSE–HANFORD CO.
SHEET	1 OF 2
3. PROJECT	1100–EM–1 OPERABLE UNIT
4. LOCATION	HORN RAPIDS LANDFILL
5. NAME OF DRILLER	C. LARSON / M. FOSS
6. MANUFACTURER'S DESIGNATION OF DRILL	CASE 780/FMC BACKHOE #HO–17–5669
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	SAMPLED WITH SPOON FROM BACKHOE BUCKET
8. HOLE LOCATION	N374,095.74, E1,944,546.81
9. SURFACE ELEVATION	N/A
10. DATE STARTED	18 SEPT 1991
11. DATE COMPLETED	23 OCT 1991
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER/ELAPSED TIME AFTER DRILLING	N/A
14. TOTAL DEPTH OF HOLE	8.0 FEET
17. OTHER WATER LEVEL MEASUREMENTS	N/A

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	0	0	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER SCREENING	OTHER ASBESTOS	OTHER	21. TOTAL CORE RECOVERY
	3	0	2	1		N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITOR. WELL	OTHER	23. INSPECTOR
	23 OCT 1991			V. M. JOHNSON, WHC / J. A. MCBANE, CENPW

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
		0–8 FEET				
		SANDY GRAVEL: sand 52%, gravel 44%, silt 4%; 10YR 4/2, light gray; dry; poorly to very poorly sorted; sands subangular, gravels rounded to subrounded; 60% mafic, 40% felsic; no reaction to acid. Scattered boulders 3 feet max. diameter.				
	1					
	2	2–3 feet: Accumulation of tires and inner tubes.				
	3	3–4 feet: Accumulation of stainless steel lathe shavings and building flashing. Sheetrock still attached to flashing in places.	HRL3B01			Screening – negative
	4					
		4.5 feet: Unlabeled, rusted 5 gallon paint can. No contents observed. 0.0 ppm with OVM.				
	5	5–6 feet: Accumulation of tires and inner tubes.				
			HRL3B02			Screening – negative
	6		HRL3B03			Asbestos sample

FORM MRK JUN 89 55

PROJECT 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NO. TRENCH #3B

HTW DRILLING LOG

HOLE NO. TRENCH #3B

PROJECT: 1100-EM-1 O.U. - HORN RAPIDS LANDFILL

INSPECTOR: V. M. JOHNSON / J. A. MCBANE

SHEET 2 OF 2

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
	6	SOIL as above; debris amount and character as above.	HRL3B02 HRL3B03			Screening - negative Asbestos sample
						Appears that GPR ret caused by metal flasl and ss shavings.
	7				B00ZT3 B00ZT4 B00ZT5	Chemical sample Duplicate Split
	8	Approx. 19 cubic yards excavated. Approx. Landfill Composition: soil - 97% debris - 3%				ss - stainless steel

FORM MRK JUN 89 55-2

PROJECT: 1100-EM-1 HORN RAPIDS LANDFILL

HOLE NUMBER: TRENCH #3B

HTW DRILLING LOG

HOLE NO. TRENCH #4/5

1. COMPANY NAME	CENPW
2. DRILLING SUBCONTRACTOR	WESTINGHOUSE–HANFORD CO.
SHEET	1 OF 2
3. PROJECT	1100–EM–1 OPERABLE UNIT
4. LOCATION	HORN RAPIDS LANDFILL
5. NAME OF DRILLER	C. LARSON
6. MANUFACTURER'S DESIGNATION OF DRILL	FMC BACKHOE #HO–17–5669
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	SAMPLED WITH SPOON FROM BACKHOE BUCKET
8. HOLE LOCATION	N374,068.09, E1,944,459.57
9. SURFACE ELEVATION	N/A
10. DATE STARTED	25 OCT 1991
11. DATE COMPLETED	25 OCT 1991
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER/ELAPSED TIME AFTER DRILLING	N/A
14. TOTAL DEPTH OF HOLE	12.0 FEET
17. OTHER WATER LEVEL MEASUREMENTS	N/A

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	0	0	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER	OTHER	OTHER	21. TOTAL CORE RECOVERY
	2	0	SCREENING 2			N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITOR WELL	OTHER	23. INSPECTOR
	25 OCT 1991			J. A. MCBANE, CENPW

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
	1	0–0.5 FEET SILTY SANDY GRAVEL; 60% gravel, 35% sand (fine to med), 5% silt; 10YR 7/3 very pale brown; dry; very poorly sorted; gravels rounded to subrounded, sands angular; 65% basalt, 35% others; no reaction to acid.				
	2	0.5–12 FEET SANDY GRAVEL; 55% gravel, 45% sand (med to coarse), <3% silt; 10YR 6/1 gray; dry; poorly sorted; gravels rounded to subrounded, sands angular to subangular; 70% basalt, 30% others; no reaction to acid; rare cobbles and boulders to 14 inch max. diameter.				
	3		HRL4/501			Screening – negative
	4	No debris observed above 5 feet depth.			B00ZV1	Chemical sample
	5	5 feet: 3–1/2 foot long wooden 4x4 embedded in a concrete mass.				
	6	6 feet: Tires, tail pipe, 12 in. dia. gear wheel.				Possible GPR targets.

FORM MRK JUN 89 55

PROJECT 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NO. TRENCH #4/5

HTW DRILLING LOG

HOLE NO. TRENCH #4/5

PROJECT: 1100–EM–1 O.U. – HORN RAPIDS LANDFILL

INSPECTOR: J. A. MCBANE

SHEET 2 OF 2

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
	6	6 feet: Tires, tail pipe, 12 in. dia. gear wheel.				Possible GPR targets.
		SOIL as above.				
	7		HRL4/502			Screening – negative
	8	8 feet: Tires (5 or 6), long pieces (5–6 feet) of flat lying metal building flashing.				Possible GPR targets.
	9	9 feet: Large piece of sheet metal (4x4 feet) exposed in eastern wall. Approx. 1/32 in. thick. Flat lying relative to ground surface.				Possible GPR target.
	10	10 feet: Rotted timbers in trench sidewalls. Little observed in trench floor.				
	11	11 feet: Rotted timbers, metal flashing strips, fiberglas insulation, street drain grate, copper wire pieces.			B00ZV2	Chemical sample
	12	Approx. 90 cubic yards excavated. Approx. Landfill Composition: soil – 99.5% debris – 0.5%				

FORM MRK JUN 89 55–2

PROJECT: 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NUMBER: TRENCH #4/5

9 3 1 2 9 3 3 0 5 7 0

HTW DRILLING LOG

HOLE NO. TRENCH #6

1. COMPANY NAME	CENPW
2. DRILLING SUBCONTRACTOR	WESTINGHOUSE–HANFORD CO.
SHEET	1 OF 2
3. PROJECT	1100–EM–1 OPERABLE UNIT
4. LOCATION	HORN RAPIDS LANDFILL
5. NAME OF DRILLER	M. FOSS
6. MANUFACTURER'S DESIGNATION OF DRILL	FMC BACKHOE #HO–17–5669
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	SAMPLED WITH SPOON FROM BACKHOE BUCKET
8. HOLE LOCATION	N374,006.38, E1,944,448.94
9. SURFACE ELEVATION	N/A
10. DATE STARTED	28 OCT 1991
11. DATE COMPLETED	30 OCT 1991
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER/ELAPSED TIME AFTER DRILLING	N/A
14. TOTAL DEPTH OF HOLE	6.5 FEET
17. OTHER WATER LEVEL MEASUREMENTS	N/A

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	0	0	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER SCREENING	OTHER	OTHER	21. TOTAL CORE RECOVERY
	0	0	0			N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITOR. WELL	OTHER	23. INSPECTOR
	30 OCT 1991			J. A. MCBANE, CENPW

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYITCAL SAMPLE NUMBER f	REMARKS g
		0–6.5 FEET				
		SANDY GRAVEL; gravel 65%, sand (med to coarse) 35%, silt <2%; 10YR 6/1 gray; dry; poorly sorted; gravels rounded to subrounded, sands angular to subangular; 70% basalt, 30% others; no reaction to acid.				
	1	1.5 feet: Sheet of 1/8 in. rubber approx. 3x4 ft., misc. #8 rebar lengths, fragments of 1/4–1/2 in. dia. steel cable, metal flashing, plasterboard, and wood.				
	2		HRL0601			Screening sample
		2 feet: Flat lying piece of approx. 1/16 in. thick by 2 foot square sheet metal. Flat lying relative to the ground surface.				Possible GPR target.
	3					
	4	4–6.5 feet: Wood debris mixed with rufuse previously described.				
			HRL0602			Screening sample
	5		HRL0603			Asbestos sample
					B00ZB3*	Chemical sample
	6	6 feet: Scattered tires.				

FORM MRK JUN 89 55

PROJECT 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NO. TRENCH #6

HTW DRILLING LOG

HOLE NO. TRENCH #6

PROJECT: 1100–EM–1 O.U. – HORN RAPIDS LANDFILL

INSPECTOR: J. A. MCBANE

SHEET 2 OF 2

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
	6	SOIL as above, debris as above.				
		6.5 feet: Suspect asbestos, medical waste.	HRL0604			Asbestos sample
	7	Trench terminated at 6.5 feet due to unknown hazards associated with medical debris. Approx. 30–40 medical vials containing a milky–white liquid plus one plastic IV bag were uncovered. All samples collected were placed within an ice chest and reburied in the trench.				
		HRL0000 – Sample obtained and subsequently reburied.				
		B00ZB3* – Chemical sample was reburied and sample number was reused for next trench.				
		Approx. 20 cubic yards excavated.				
		Approx. Landfill Composition: soil – 95% debris – 5%				

FORM MRK JUN 89 55–2

PROJECT: 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NUMBER: TRENCH #6

HTW DRILLING LOG

HOLE NO. TRENCH #7

1. COMPANY NAME	CENPW
2. DRILLING SUBCONTRACTOR	WESTINGHOUSE–HANFORD CO.
SHEET	1 OF 1
3. PROJECT	1100–EM–1 OPERABLE UNIT
4. LOCATION	HORN RAPIDS LANDFILL
5. NAME OF DRILLER	C. LARSON / M. FOSS
6. MANUFACTURER'S DESIGNATION OF DRILL	CASE #780 BACKHOE / FMC BACKHOE
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	SAMPLED WITH SPOON FROM BACKHOE BUCKET
8. HOLE LOCATION	N373,863.83, E1,944,461.70
9. SURFACE ELEVATION	N/A
10. DATE STARTED	17 SEPT 1991
11. DATE COMPLETED	17 OCT 1991
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER/ELAPSED TIME AFTER DRILLING	N/A
14. TOTAL DEPTH OF HOLE	6.0 FEET
17. OTHER WATER LEVEL MEASUREMENTS	N/A

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	0	0	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER SCREENING	OTHER	OTHER	21. TOTAL CORE RECOVERY
	1	0	3			N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITOR. WELL	OTHER	23. INSPECTOR
	17 OCT 1991			V. M. JOHNSON, WHC / J. A. MCBANE, CENPW

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
		0–6 FEET				
		SANDY GRAVEL: sand 52%, gravel 43%, silt 5%; 10YR 6/2 light brownish gray; dry; poorly to very poorly sorted; sand subangular, gravel subrounded to rounded; 60% mafics, 40% felsics (gravel); no reaction to acid.				
	1					
		Debris consists of intermixed glass bottles, black tile, metal flashing strips, plasterboard fragments, roofing paper, crushed culverts, rebar, and rotten building timbers.	HRL0701			Screening – negative Crushed culverts and flashing strips likely GPR targets.
	2					
		SOIL and debris uniform throughout excavation.	HRL0702			Screening – negative
	3					
	4				B00ZT2	Chemical sample
			HRL0703			Screening – negative
	5					
		Approx. 50 cubic yards excavated. Approx. Landfill Composition: soil – 85% debris – 15%				
	6					

FORM MRK JUN 89 55

PROJECT 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NO. TRENCH #7

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HTW DRILLING LOG

HOLE NO. TRENCH #8

1. COMPANY NAME	CENPW
2. DRILLING SUBCONTRACTOR	WESTINGHOUSE–HANFORD CO.
SHEET	1 OF 1
3. PROJECT	1100–EM–1 OPERABLE UNIT
4. LOCATION	HORN RAPIDS LANDFILL
5. NAME OF DRILLER	M. FOSS
6. MANUFACTURER'S DESIGNATION OF DRILL	FMC BACKHOE #HO–17–5669
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	SAMPLED WITH SPOON FROM BACKHOE BUCKET
8. HOLE LOCATION	N374,127.66, E1,944,223.40
9. SURFACE ELEVATION	N/A
10. DATE STARTED	30 OCT 1991
11. DATE COMPLETED	30 OCT 1991
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER/ELAPSED TIME AFTER DRILLING	N/A
14. TOTAL DEPTH OF HOLE	5.0 FEET
17. OTHER WATER LEVEL MEASUREMENTS	N/A

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	0	0	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER SCREENING	OTHER ASBESTOS	OTHER	21. TOTAL CORE RECOVERY
	1	0	1	1		N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITOR. WELL	OTHER	23. INSPECTOR
	30 OCT 1991			J. A. MCBANE, CENPW

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
		0–5 FEET				
		SANDY GRAVEL: sand 30%, gravel 65%, silt <5%; 10YR 7/1 light gray; dry; poorly sorted; sand angular to subangular, gravel subrounded to rounded; 60% basalt, 40% others; no reaction to acid.				
	1					
	2	No debris above 3 feet depth.				
	3	3 feet: A single tire and misc. rotten wood debris.	HRL0801 HRL0802			Screening –negative Asbestos sample
	4	4–5 feet: pieces of electrical wire, short lengths of 1/4 in. dia. steel cable.			B00ZV3	Chemical sample
		5 feet: Sheet metal (1/16"x2'x3'), suspect asbestos, sponge fragments, copper rod.				Sheet metal possible GPR target.
	5					
		Approx. 5 cubic yards excavated. Approx. Landfill Composition: soil – 98% debris – 2%				
	6					

FORM MRK JUN 89 55

PROJECT 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NO. TRENCH #8

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9 3 1 2 9 3 3 0 5 7 6

HTW DRILLING LOG

HOLE NO. TRENCH #11

1. COMPANY NAME	CENPW
2. DRILLING SUBCONTRACTOR	WESTINGHOUSE–HANFORD CO.
SHEET	1 OF 1
3. PROJECT	1100–EM–1 OPERABLE UNIT
4. LOCATION	HORN RAPIDS LANDFILL
5. NAME OF DRILLER	C. LARSON
6. MANUFACTURER'S DESIGNATION OF DRILL	CASE 780 BACKHOE #HO–62–5531
7. SIZES AND TYPES OF DRILLING AND SAMPLING EQUIPMENT	SAMPLED WITH SPOON FROM BACKHOE BUCKET
8. HOLE LOCATION	N374,985.11, E1,944,689.36
9. SURFACE ELEVATION	N/A
10. DATE STARTED	20 SEPT 1991
11. DATE COMPLETED	20 SEPT 1991
12. OVERBURDEN THICKNESS	N/A
15. DEPTH GROUNDWATER ENCOUNTERED	N/A
13. DEPTH DRILLED INTO ROCK	N/A
16. DEPTH TO WATER/ELAPSED TIME AFTER DRILLING	N/A
14. TOTAL DEPTH OF HOLE	5.0 FEET
17. OTHER WATER LEVEL MEASUREMENTS	N/A

18. GEOTECHNICAL SAMPLES	DISTURBED	UNDISTURBED	19. TOTAL NUMBER OF CORE BOXES
	0	0	N/A

20. SAMPLES FOR CHEMICAL ANALYSIS	VOC	METALS	OTHER	OTHER	OTHER	21. TOTAL CORE RECOVERY
	1					N/A %

22. DISPOSITION OF HOLE	BACKFILLED	MONITOR. WELL	OTHER	23. INSPECTOR
	20 SEPT '91			V. M. JOHNSON, WHC

ELEV. (ft) a	DEPTH (ft) b	DESCRIPTION OF MATERIALS c	FIELD SCREENING NUMBER d	GEOTECH SAMPLE NUMBER e	ANALYTICAL SAMPLE NUMBER f	REMARKS g
	1	0–5 FEET SANDY GRAVEL: sand 54%, gravel 40%, silt 6%; 10YR 6/2 light brownish gray; dry; moderately to poorly sorted; gravel subrounded to rounded; 70% mafics, 30% felsics; no reaction to acid. 0–2.5 feet: debris consists of coke bottles, large amount of wood, cigarette butts, 3–ft. pocket of light gray to black ash, wire, plastic bags, and minor amounts of metal. 2.5–5 feet: Large amount of metal, wood, rebar, and fragments of asphalt.				
	2					
	3					
	4				B00ZS9	Chemical sample
	5					
	6	Approx. 30 cubic yards excavated.				

FORM MRK JUN 89 55

PROJECT 1100–EM–1 HORN RAPIDS LANDFILL

HOLE NO. TRENCH #11

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9 3 1 2 0 5 3 0 5 7 8

APPENDIX B

GROUNDWATER SURFACE MAPS AND AQUIFER PROPERTIES

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1.0 Groundwater Levels and Potentiometric Surface Contours B-1

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9 3 1 2 6 3 0 5 8 2

1.0 Groundwater Levels and Potentiometric Surface Contours

Figures B-1 through B-19 show the observed groundwater levels, as measured at the wells shown, and the approximate potentiometric surfaces for three time periods in 1990 and for March 1991 through June 1992. The three periods in 1990 were used in the modeling analysis and represent the high, average, and low water table conditions. January 1990 to February 1991 monthly potentiometric surface maps are found in the "Interim Groundwater Data Summary Report"(WHC by Golder Associates, 1991). Well data is found in Table 2-6, the HEIS data base, and in SPC and 300 Area reports.

The potentiometric surface maps were drawn by hand following the conventional methods of contouring. Areas without data points were not contoured except in the area between the North Richland Well Field and the Columbia River. No data points existed in this area, however, the assumption was made that the river surface typically slopes to the south (downriver) and the contour lines were approximately evenly spaced between the river and the known elevations near the well field. Because of the lack of data, however, the contours east and south of the well field are tentative.

Figures B-4 through B-19 are listed chronologically by month. The following list provides the specific days of sampling:

1991:

March 21
April 24
May 28
June 17
July 26
August 16
September 26
October 25
November 25
December 16

1992:

January 13
February 13
March ?
April 27
May 27
June 22

Figure B-20 shows the water table surface near the North Richland well field after extended drawdown. This was the worst historical case of pumping without recharge found for the well field.

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9 3 1 2 3 5 0 3 5 8 4

TABLE B-1: LITERATURE SURVEY COMPILATION (1 of 2)

Vadose Zone

Reference Document	Ave. Annual Precip (cm/yr)	Precipitation Range (cm/yr) max	Precipitation Range (cm/yr) min	Water % Retained by Capilarity max	Water % Retained by Capilarity min	Annual Infiltration (inches/yr) max	Annual Infiltration (inches/yr) min	Annual Evapotranspiration (inches) Pan	Annual Evapotranspiration (inches) Lake	Annual Evapotranspiration (inches) Potential	Annual Evapotranspiration (inches) Actual	Kv (cm/sec) Bulk Sample high	Kv (cm/sec) Bulk Sample low	Kv (cm/sec) <2mm size high	Kv (cm/sec) <2mm size low
1	16	28	8	3	4										
2	16	28	8			3.94	1.97								
3															
4															
5												1.10E-02	3.40E-04	1.40E-02	4.20E-05
6															
7						4	0	55	40	29	7				
8						4.33	0								
9															
10						4.5	0								
11															
12															
Average	16.00	28.00	8.00			4.19	0.49								
Max	16.00	28.00	8.00			4.50	1.97								
Min	16.00	28.00	8.00			3.94	0.00								
Std Dev	0.00	0.00	0.00			0.23	0.85								

1. Soil Moisture Transport in Arid Site Vadose Zones
   ARH-2983
   Oct 1974

2. Arid Site Water Balance: Evapotranspiration Modeling and Measurements
   PNL-5177
   September 1984

3. A Study of Soil-Water Potential and Temperature in Hanford Soils
   BNWL-1712
   1973

4. Natural Groundwater Recharge and Water Balance at the Hanford Site
   PNL-7215
   January 1990

5. Moisture and Textural Variations in Unsaturated Soils/Sediments Near the Hanford Wye Barricade
   PNL-5377
   March 1985

6. RI/FS Work Plan for the 300-FF-5 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 89-14
   June 1990

TABLE B-1: LITERATURE SURVEY COMPILATION (2 of 2)

7. RI/FS Work Plan for the 300-FF-1 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 88-31
   June 1990

8. Phase I RI Report for the Hanford Site 1100-EM-1 Operable Unit
   DOE/RL 90-18
   August 1990

9. Geology and Ground Water Characteristics of the Hanford Reservation of the US Atomic Energy Commission, Washington
   USGS Professional Paper 717
   1972

10. Geology and Hydrology of the Hanford Site: A Standardized Text for use in WHC Documents and Reports
    15 February 1991

11. Groundwater Quality and Flow Characteristics in the Vicinity of Exxon Nuclear Company, Inc. Fuel Fabrication Facility, Richland Washington
    JUB-82-86
    October 1982

12. Geology and Hydrology of the 300 Area and Vicinity, Hanford Site, South-Central Washington
    WHC-EP-0500
    October 1991

Table B-2: LITERATURE SURVEY COMPILATION - SHEET II (1 of 2)

Unconfined Aquifer

Reference Document	Seepage Discharge To Columbia River (cf/sec)	Transmissivity (sq ft/day) Hanford fm. low	Hanford fm. high	Ringold fm. low	Ringold fm. high	(sq ft/d) Average	flow velocity (ft/ max	min	Hanford Effective Porosity	Ringold Effective Porosity	Hydraulic Conductivity (ft/d) Along Flow Path	Perpendicular To Flow Path	Average	Hydraulic Conductivity (ft/d) Hanford fm. low	Hanford fm. high	Ringold fm. low	Ringold fm. high
1																	
2																	
3																	
4																	
5																	
6	3.00	40,000.00	**********	10,000.00	**********									**********		1.900	**********
7		40,000.00	**********	10,000.00	**********					0.11				**********		1.900	**********
8														100.000	1,000.000	0.003	5.000
																10.000	1,000.000
9									0.22	0.11							
10														2,000.000	**********	610.000	3,050.000
11						10,369.92	170	56			632	405	521.4				
12																	
Average		4.00E+04	2.00E+05	1.00E+04	1.00E+06									6.03E+03	2.78E+04	1.25E+02	4.81E+03
Min		4.00E+04	2.00E+05	1.00E+04	1.00E+06									1.00E+02	1.00E+03	3.00E-03	5.00E+00
Max		4.00E+04	2.00E+05	1.00E+04	1.00E+06									1.10E+04	5.00E+04	6.10E+02	1.00E+04
Std Dev		0.00E+00	0.00E+00	0.00E+00	0.00E+00									5.02E+03	2.25E+04	2.43E+02	4.35E+03

	Storage Coefficient Hanford fm. low	high	Slug Test Hydraulic Conductivity (ft/d) Hanford fm. low	Hanford fm. high	Ringold fm. low	Ringold fm. high	Pump Test Hydraulic Conductivity (ft/d) Richland Well Field
1							
2							
3							
4							
5							
6							
7	0.03	0.20					
8			3.00	140.00	0.20	113.00	1500.00
9							
10							
11							
12							
Average							
Min							
Max							
Std Dev							

Table B-2: LITERATURE SURVEY COMPILATION - SHEET II (2 of 2)

1. Soil Moisture Transport in Arid Site Vadose Zones
   ARH-2983
   Oct 1974

2. Arid Site Water Balance: Evapotranspiration Modeling and Measurements
   PNL-5177
   September 1984

3. A Study of Soil-Water Potential and Temperature in Hanford Soils
   BNWL-1712
   1973

4. Natural Groundwater Recharge and Water Balance at the Hanford Site
   PNL-7215
   January 1990

5. Moisture and Textural Variations in Unsaturated Soils/Sediments Near the Hanford Wye Barricade
   PNL-5377
   March 1985

6. RI/FS Work Plan for the 300-FF-5 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 89-14
   June 1990

7. RI/FS Work Plan for the 300-FF-1 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 88-31
   June 1990

8. Phase I RI Report for the Hanford Site 1100-EM-1 Operable Unit
   DOE/RL 90-18
   August 1990

9. Geology and Ground Water Characteristics of the Hanford Reservation of the US Atomic Energy Commission, Washington
   USGS Professional Paper 717
   1972

10. Geology and Hydrology of the Hanford Site: A Standardized Text for use in WHC Documents and Reports
    15 February 1991

11. Groundwater Quality and Flow Characteristics in the Vicinity of Exxon Nuclear Company, Inc. Fuel Fabrication Facility, Richland Washington
    JUB-82-86
    October 1982

12. Geology and Hydrology of the 300 Area and Vicinity, Hanford Site, South-Central Washington
    WHC-EP-0500
    October 1991

Table B-3: LITERATURE SURVEY COMPILATION - SHEET III (1 of 2)

Reference Document	M1 Silt Aquitard Vertical Hydraulic Conductivity (ft/day) high	low
1		
2		
3		
4		
5		
6		
7		
8		
9		
10	1.00E-01	8.00E-04
11		
12		
Average		
Min		
Max		
Std Dev		

1. Soil Moisture Transport in Arid Site Vadose Zones
   ARH-2983
   Oct 1974

2. Arid Site Water Balance: Evapotranspiration Modeling and Measurements
   PNL-5177
   September 1984

3. A Study of Soil-Water Potential and Temperature in Hanford Soils
   BNWL-1712
   1973

4. Natural Groundwater Recharge and Water Balance at the Hanford Site
   PNL-7215
   January 1990

Table B-3: LITERATURE SURVEY COMPILATION - SHEET III (2 of 2)

5. Moisture and Textural Variations in Unsaturated Soils/Sediments Near the Hanford Wye Barricade
   PNL-5377
   March 1985

6. RI/FS Work Planfor the 300-FF-5 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 89-14
   June 1990

7. RI/FS Work Plan for the 300-FF-1 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 88-31
   June 1990

8. Phase I RI Report for the Hanford Site 1100-EM-1 Operable Unit
   DOE/RL 90-18
   August 1990

9. Geology and Ground Water Characteristics of the Hanford Reservation of the US Atomic Energy Commission, Washington
   USGS Professional Paper 717
   1972

10. Geology and Hydrology of the Hanford Site: A Standardized Text for use in WHC Documents and Reports
    15 February 1991

11. Groundwater Quality and Flow Characteristics in the Vicinity of Exxon Nuclear Company, Inc. Fuel Fabrication Facility, Richland Washington
    JUB-82-86
    October 1982

12. Geology and Hydrology of the 300 Area and Vicinity, Hanford Site, South-Central Washington
    WHC-EP-0500
    October 1991

Table B-4: LITERATURE SURVEY COMPILATION - SHEET IV (1 of 2)

Confined Aquifer

Reference Document	Transmissivity Ringold fm. (sq ft/day) low	Transmissivity Ringold fm. (sq ft/day) high	Hydraulic Conductivity (ft/day) low	Hydraulic Conductivity (ft/day) high	Hydraulic Conductivity (ft/day) average	Storage Coefficient low	Storage Coefficient high	Storage Coefficient average
1								
2								
3								
4								
5								
6								8.00E-03
7	8.00E+00	2.00E+02				2.00E-04	5.00E-02	
8					5.00E+00	1.00E+00	1.00E+02	
					3.00E-01	1.00E-01	1.00E+00	
9								3.00E-02
								2.00E-01
								2.00E-04
10			3.00E-03	5.00E+00				
11								
12								
Average					2.65E+00	3.67E-01	3.37E+01	5.96E-02
Min					3.00E-01	2.00E-04	5.00E-02	2.00E-04
Max					5.00E+00	1.00E+00	1.00E+02	2.00E-01
Std Dev					2.35E+00	4.50E-01	4.69E+01	8.18E-02

1. Soil Moisture Transport in Arid Site Vadose Zones
   ARH-2983
   Oct 1974

2. Arid Site Water Balance: Evapotranspiration Modeling and Measurements
   PNL-5177
   September 1984

3. A Study of Soil-Water Potential and Temperature in Hanford Soils
   BNWL-1712
   1973

Table B-4: LITERATURE SURVEY COMPILATION - SHEET IV (2 of 2)

4. Natural Groundwater Recharge and Water Balance at the Hanford Site
   PNL-7215
   January 1990

5. Moisture and Textural Variations in Unsaturated Soils/Sediments Near the Hanford Wye Barricade
   PNL-5377
   March 1985

6. RI/FS Work Plan for the 300-FF-5 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 89-14
   June 1990

7. RI/FS Work Plan for the 300-FF-1 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 88-31
   June 1990

8. Phase I RI Report for the Hanford Site 1100-EM-1 Operable Unit
   DOE/RL 90-18
   August 1990

9. Geology and Ground Water Characteristics of the Hanford Reservation of the US Atomic Energy Commission, Washington
   USGS Professional Paper 717
   1972

10. Geology and Hydrology of the Hanford Site: A Standardized Text for use in WHC Documents and Reports
    15 February 1991

11. Groundwater Quality and Flow Characteristics in the Vicinity of Exxon Nuclear Company, Inc. Fuel Fabrication Facility, Richland Washington
    JUB-82-86
    October 1982

12. Geology and Hydrology of the 300 Area and Vicinity, Hanford Site, South-Central Washington
    WHC-EP-0500
    October 1991

Table B-5: LITERATURE SURVEY COMPILATION - SHEET V (1 of 2)

M3 Silt

Reference Document	Hydraulic Head Difference Basalt vs. Soil Aquifers (feet) low	high	Hydraulic Conductivity (cm/sec)	Specific Yield
1				
2				
3				
4				
5				
6	20.00	35.00		
7				
8			1.00E-06	
9				
10			3.53E-07	
11				
12				2.51E-01
				2.08E-01
				2.45E-01
Average			6.77E-07	2.35E-01
Min			3.53E-07	2.08E-01
Max			1.00E-06	2.51E-01
Std Dev			3.24E-07	1.90E-02

1. Soil Moisture Transport in Arid Site Vadose Zones
   ARH-2983
   Oct 1974

2. Arid Site Water Balance: Evapotranspiration Modeling and Measurements
   PNL-5177
   September 1984

3. A Study of Soil-Water Potential and Temperature in Hanford Soils
   BNWL-1712
   1973

Table B-5: LITERATURE SURVEY COMPILATION - SHEET V (2 of 2)

4. Natural Groundwater Recharge and Water Balance at the Hanford Site
   PNL-7215
   January 1990

5. Moisture and Textural Variations in Unsaturated Soils/Sediments Near the Hanford Wye Barricade
   PNL-5377
   March 1985

6. RI/FS Work Plan for the 300-FF-5 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 89-14
   June 1990

7. RI/FS Work Plan for the 300-FF-1 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 88-31
   June 1990

8. Phase I RI Report for the Hanford Site 1100-EM-1 Operable Unit
   DOE/RL 90-18
   August 1990

9. Geology and Ground Water Characteristics of the Hanford Reservation of the US Atomic Energy Commission, Washington
   USGS Professional Paper 717
   1972

10. Geology and Hydrology of the Hanford Site: A Standardized Text for use in WHC Documents and Reports
    15 February 1991

11. Groundwater Quality and Flow Characteristics in the Vicinity of Exxon Nuclear Company, Inc. Fuel Fabrication Facility, Richland Washington
    JUB-82-86
    October 1982

12. Geology and Hydrology of the 300 Area and Vicinity, Hanford Site, South-Central Washington
    WHC-EP-0500
    October 1991

Table B-6: LITERATURE SURVEY COMPILATION - SHEET VI (1 of 2)

Upper Basalt Aquifer

Reference Document	Transmissivity (sq ft/day) Low	Transmissivity (sq ft/day) High	Hydraulic Conductivities (ft/day) Low	Hydraulic Conductivities (ft/day) High	Specific Storage (ft) Low	Specific Storage (ft) High
1						
2						
3						
4						
5						
6	125.00	1300.00	6.00	260.00	1.00E-06	1.00E-08
	0.01	1000.00			1.60E+00	2.00E+02
7						
8						
9						
10						
11						
12						
Average	62.51	1150.00			8.00E-01	1.00E+02
Min	0.01	1000.00			1.00E-06	1.00E-08
Max	125.00	1300.00			1.60E+00	2.00E+02
Std Dev	62.50	150.00			8.00E-01	1.00E+02

1. Soil Moisture Transport in Arid Site Vadose Zones
   ARH-2983
   Oct 1974

2. Arid Site Water Balance: Evapotranspiration Modeling and Measurements
   PNL-5177
   September 1984

3. A Study of Soil-Water Potential and Temperature in Hanford Soils
   BNWL-1712
   1973

Table B-6: LITERATURE SURVEY COMPILATION - SHEET VI (2 of 2)

4. Natural Groundwater Recharge and Water Balance at the Hanford Site
   PNL-7215
   January 1990

5. Moisture and Textural Variations in Unsaturated Soils/Sediments Near the Hanford Wye Barricade
   PNL-5377
   March 1985

6. RI/FS Work Plan for the 300-FF-5 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 89-14
   June 1990

7. RI/FS Work Plan for the 300-FF-1 Operable Unit, Hanford Site, Richland Washington
   DOE/RL 88-31
   June 1990

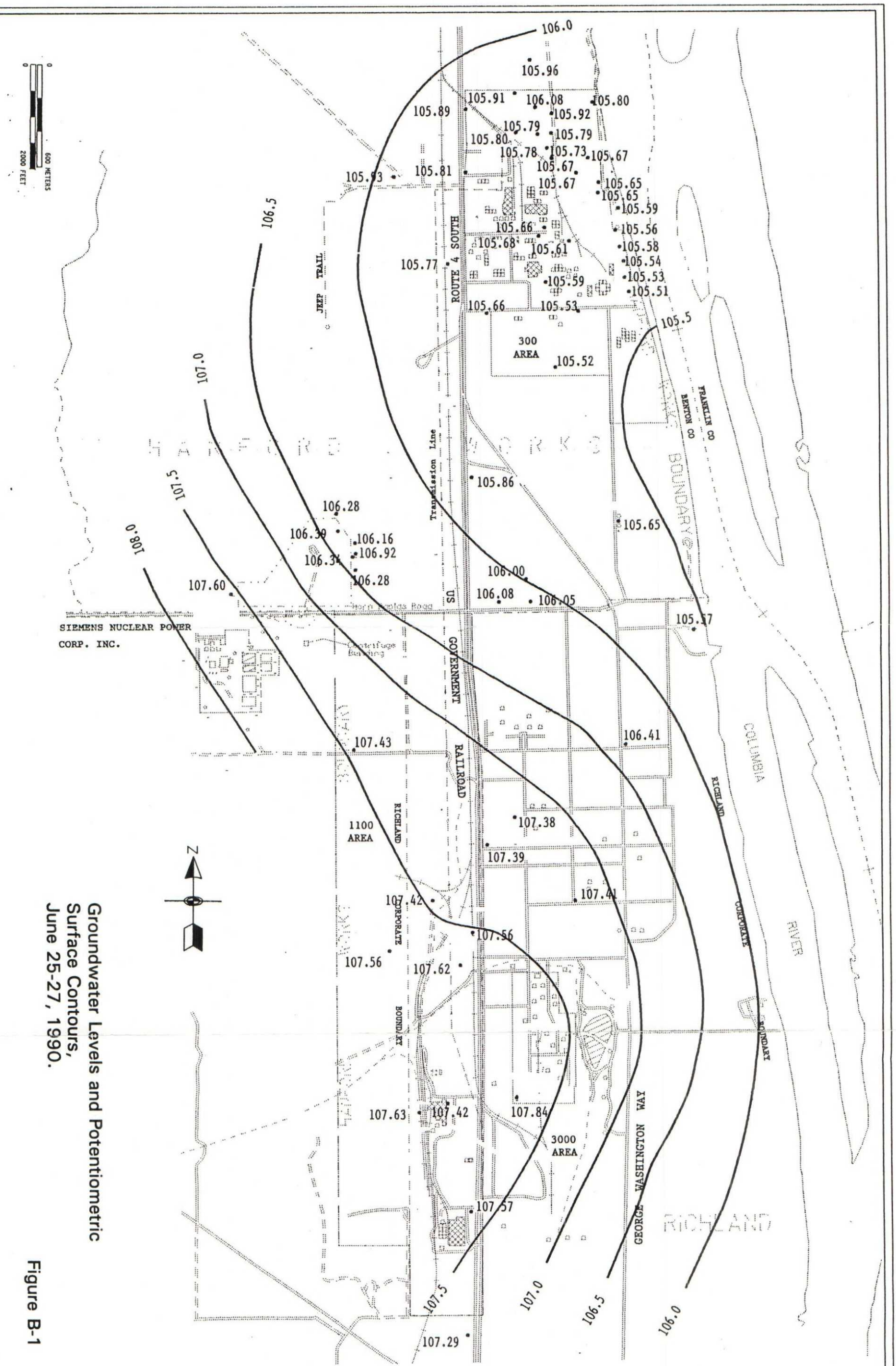
8. Phase I RI Report for the Hanford Site 1100-EM-1 Operable Unit
   DOE/RL 90-18
   August 1990

9. Geology and Ground Water Characteristics of the Hanford Reservation of the US Atomic Energy Commission, Washington
   USGS Professional Paper 717
   1972

10. Geology and Hydrology of the Hanford Site: A Standardized Text for use in WHC Documents and Reports
    15 February 1991

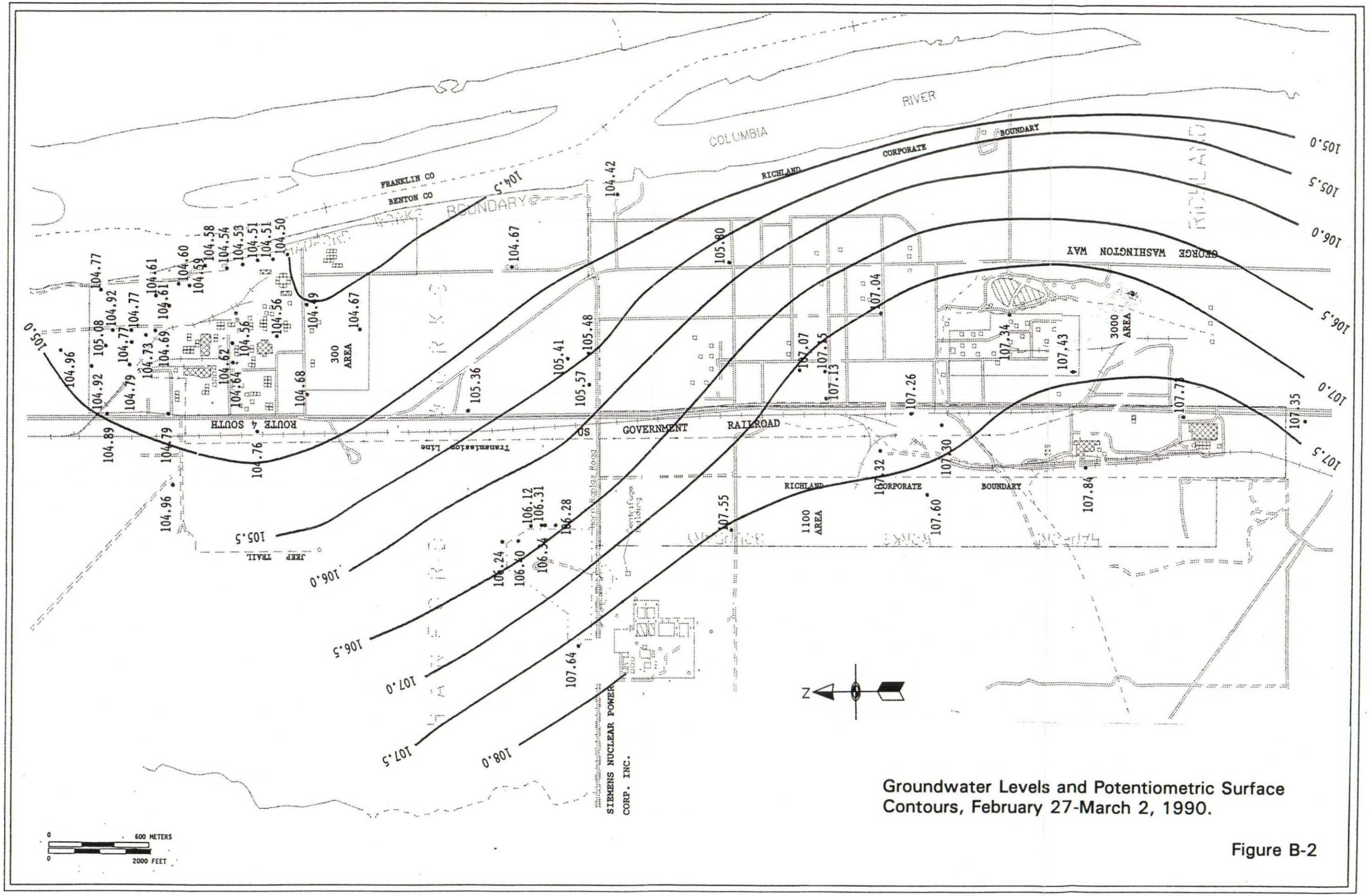
11. Groundwater Quality and Flow Characteristics in the Vicinity of Exxon Nuclear Company, Inc. Fuel Fabrication Facility, Richland Washington
    JUB-82-86
    October 1982

12. Geology and Hydrology of the 300 Area and Vicinity, Hanford Site, South-Central Washington
    WHC-EP-0500
    October 1991



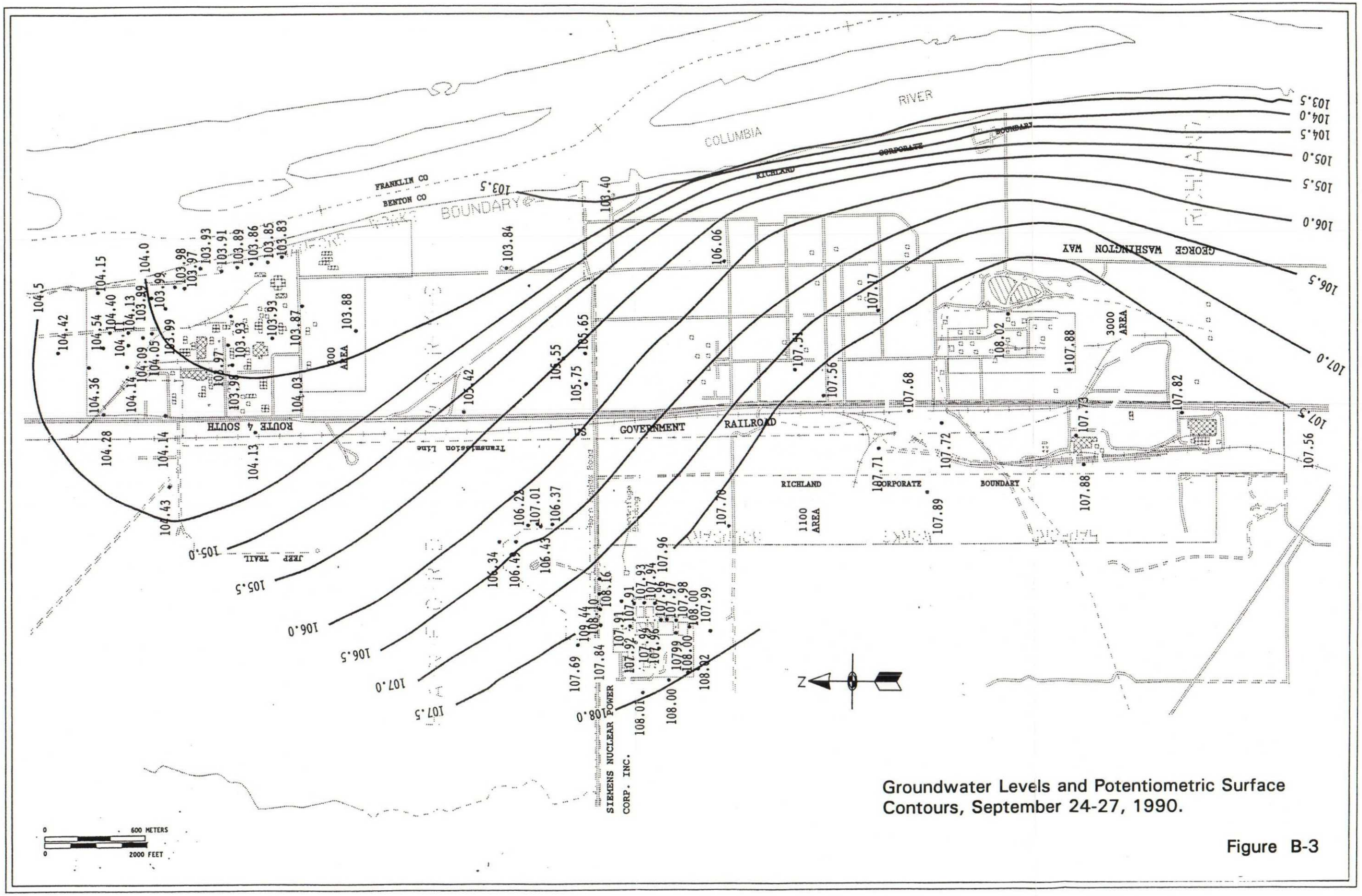
Groundwater Levels and Potentiometric Surface Contours, June 25-27, 1990.

Figure B-1



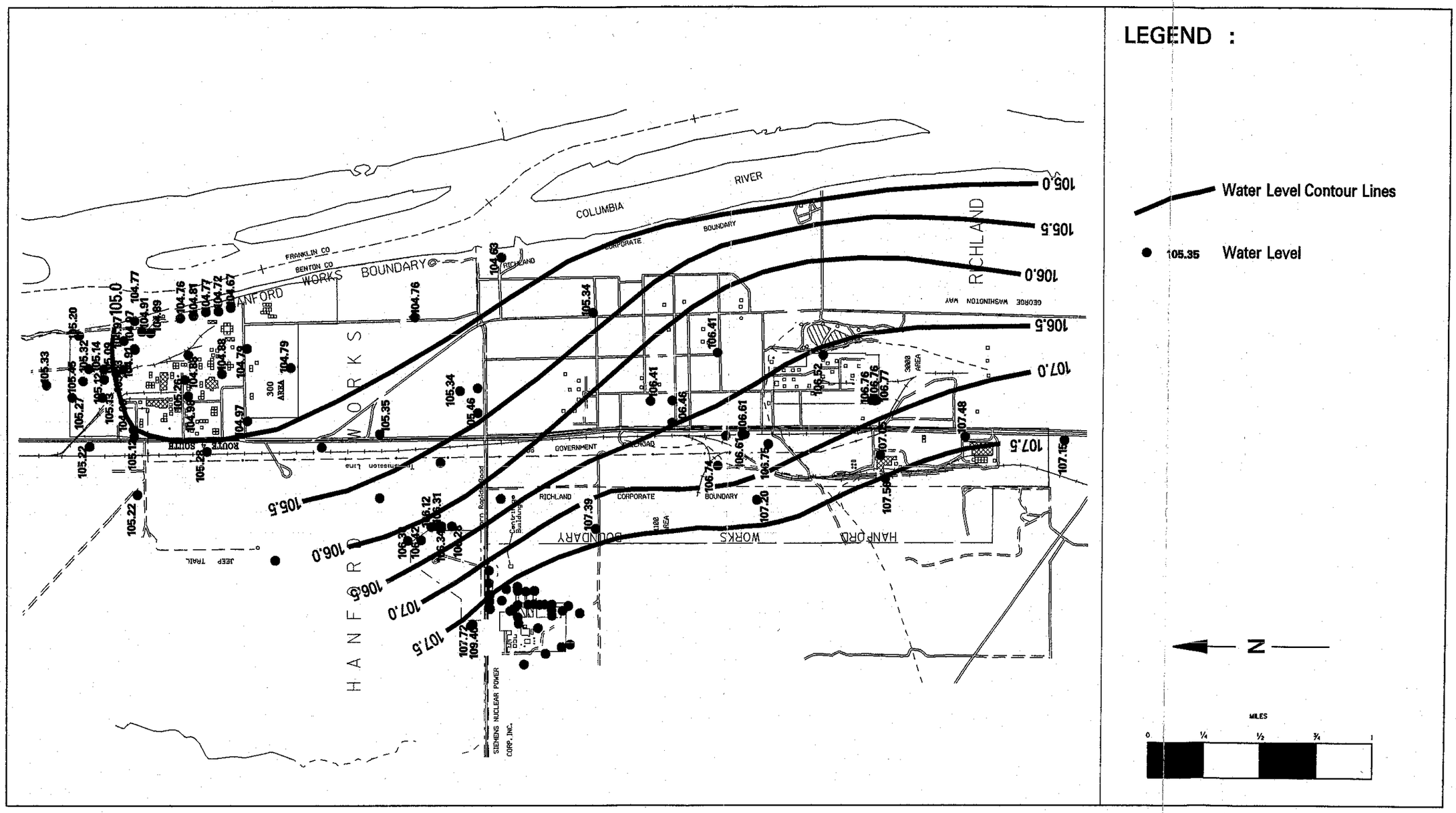
Groundwater Levels and Potentiometric Surface Contours, February 27-March 2, 1990.

Figure B-2



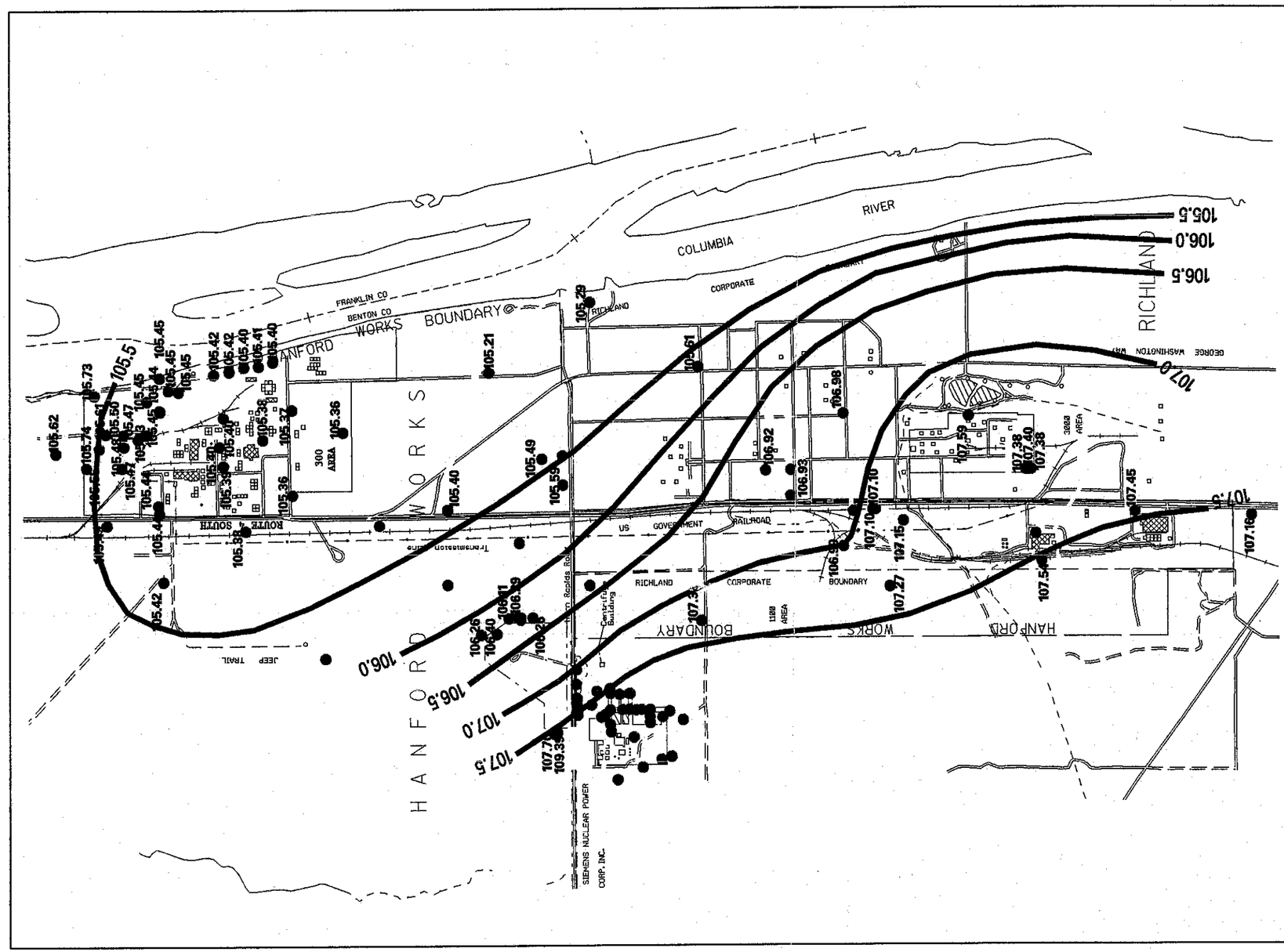
Groundwater Levels and Potentiometric Surface Contours, September 24-27, 1990.

Figure B-3



Groundwater Potentiometric Surface
for the Unconfined Aquifer– March 91

Fig. B-4



LEGEND :

Water Level Contour Lines

● 105.35 Water Level

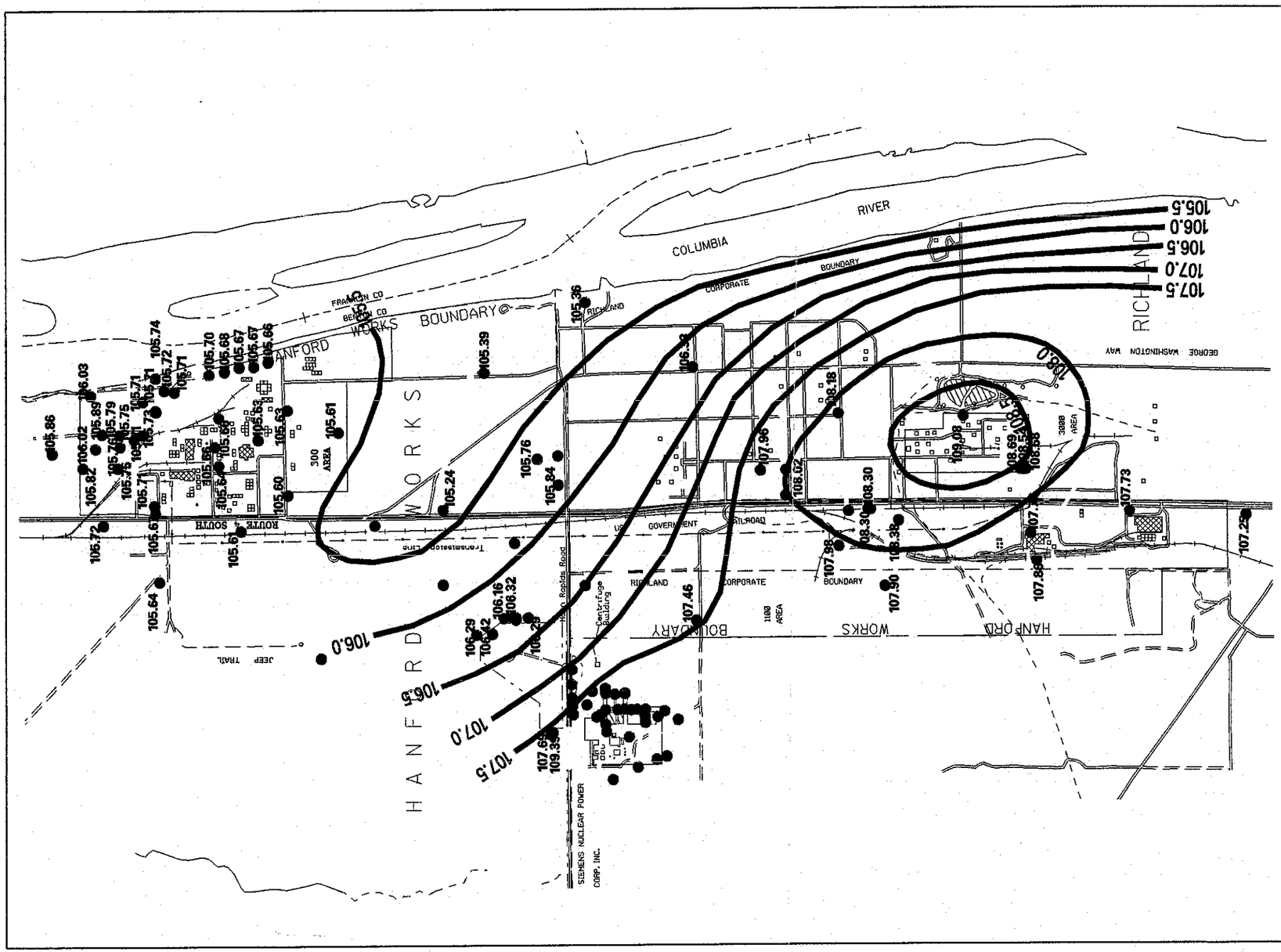
N

MILES

0 ¼ ½ ¾ 1

Groundwater Potentiometric Surface for the Unconfined Aquifer- April 91

Fig. B-5



LEGEND :

Water Level Contour Lines

● 105.35 Water Level

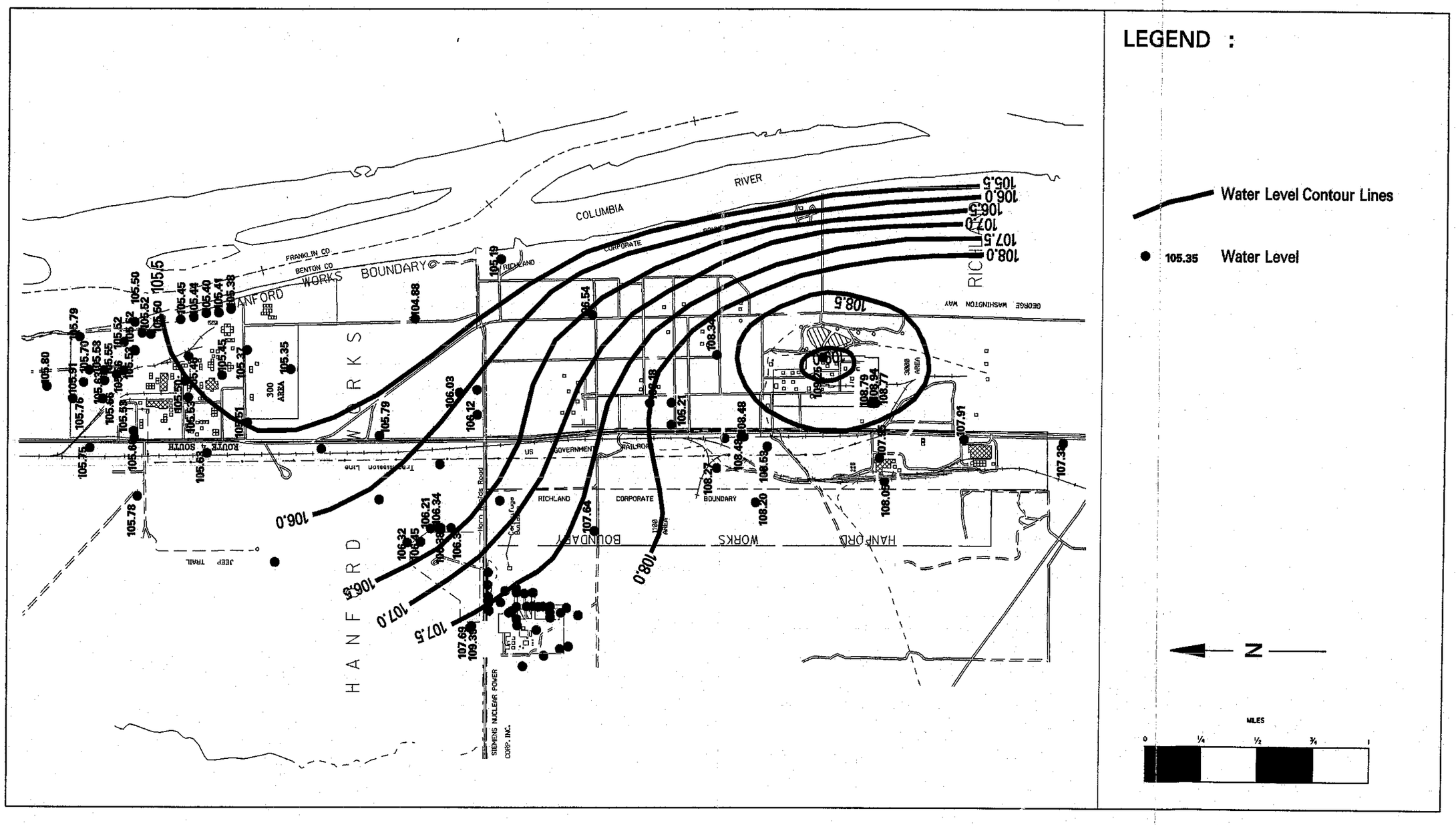
N

MILES

0 ¼ ½ ¾ 1

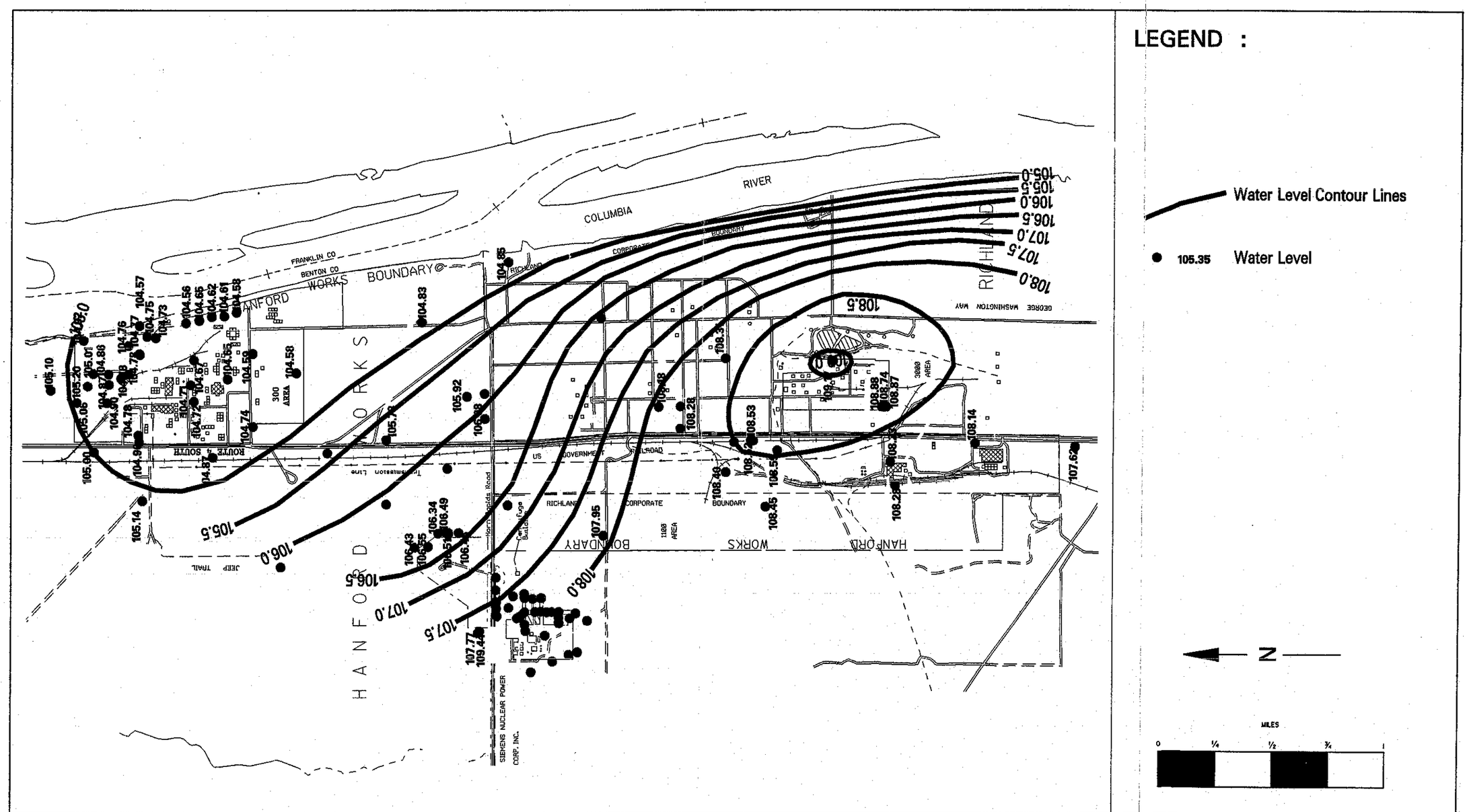
Groundwater Potentiometric Surface for the Unconfined Aquifer- May 91

Fig. B-6



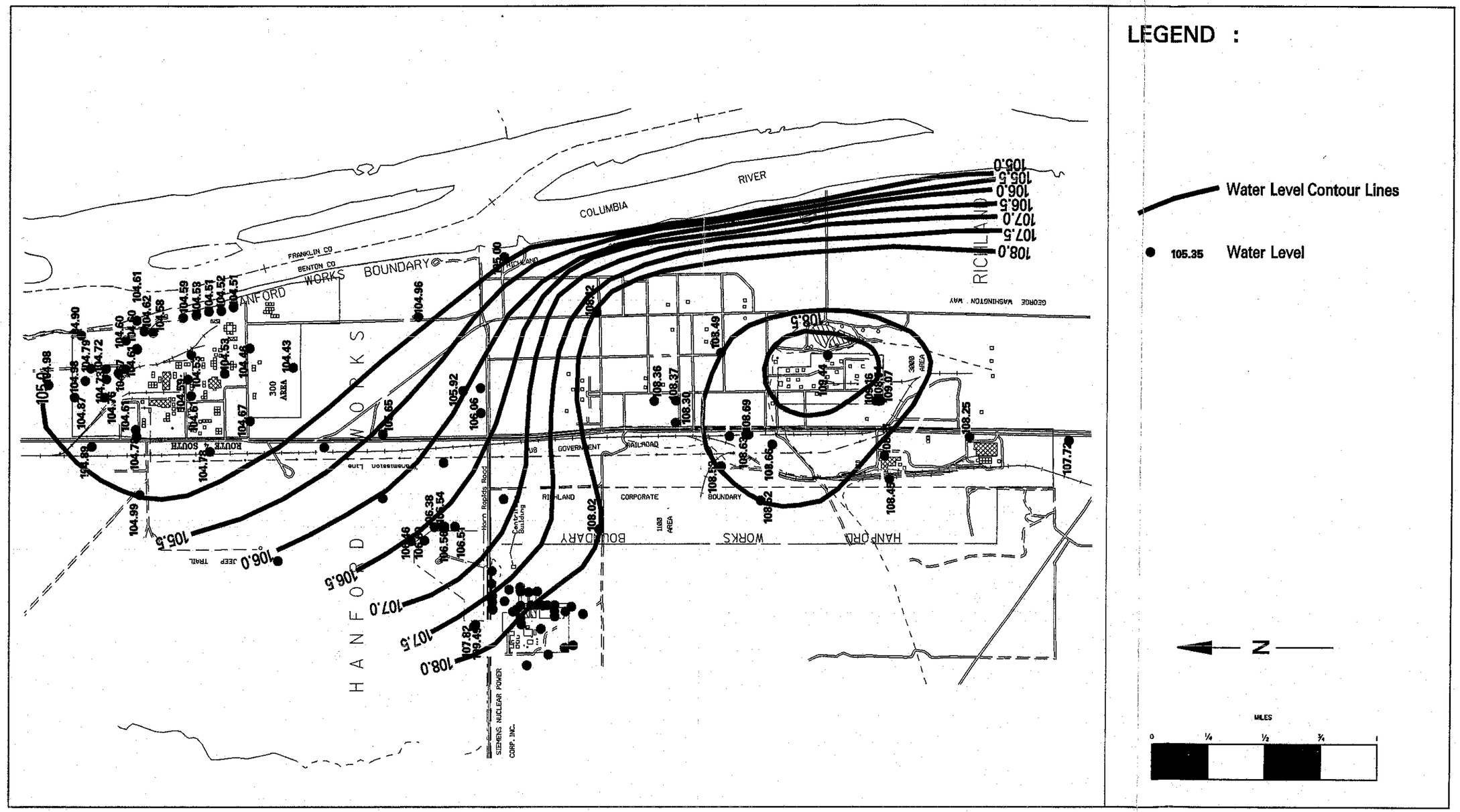
Groundwater Potentiometric Surface
for the Unconfined Aquifer–June 91

Fig. B–7



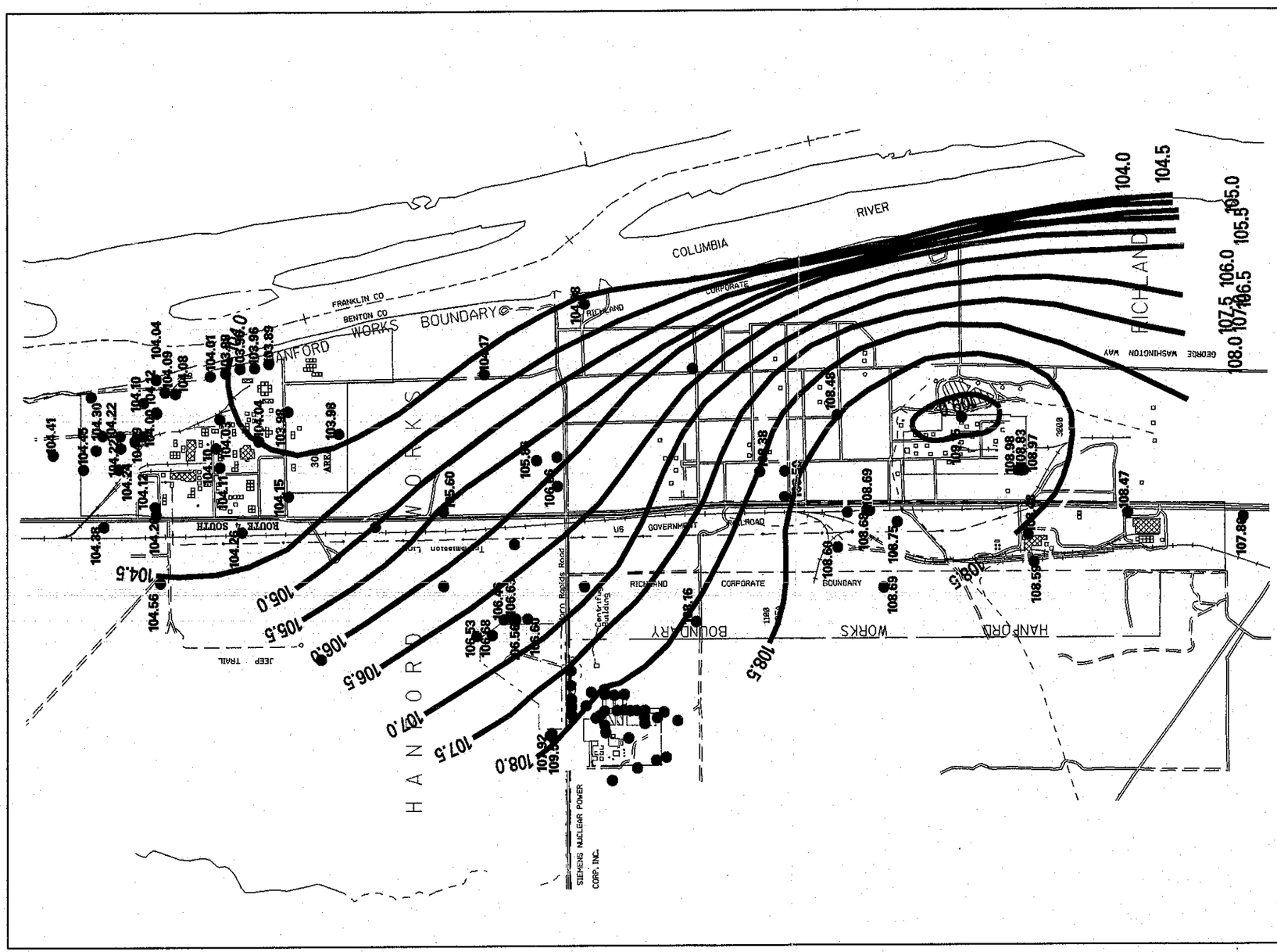
Groundwater Potentiometric Surface for the Unconfined Aquifer–July 91

Fig. B–8



Groundwater Potentiometric Surface
for the Unconfined Aquifer–August 91

Fig. B–9



LEGEND :

Water Level Contour Lines

105.35 Water Level

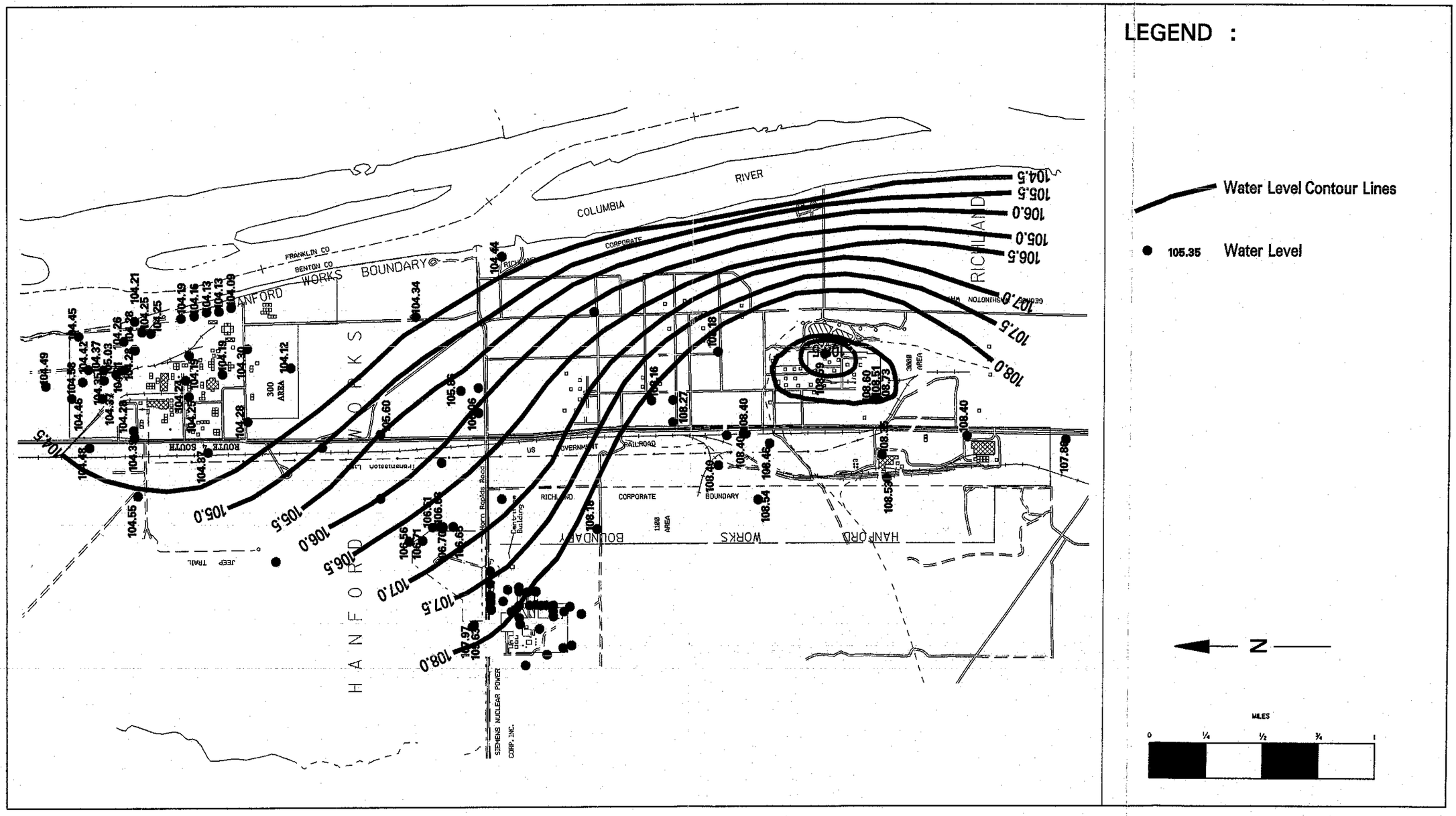
N

MILES

0 ¼ ½ ¾ 1

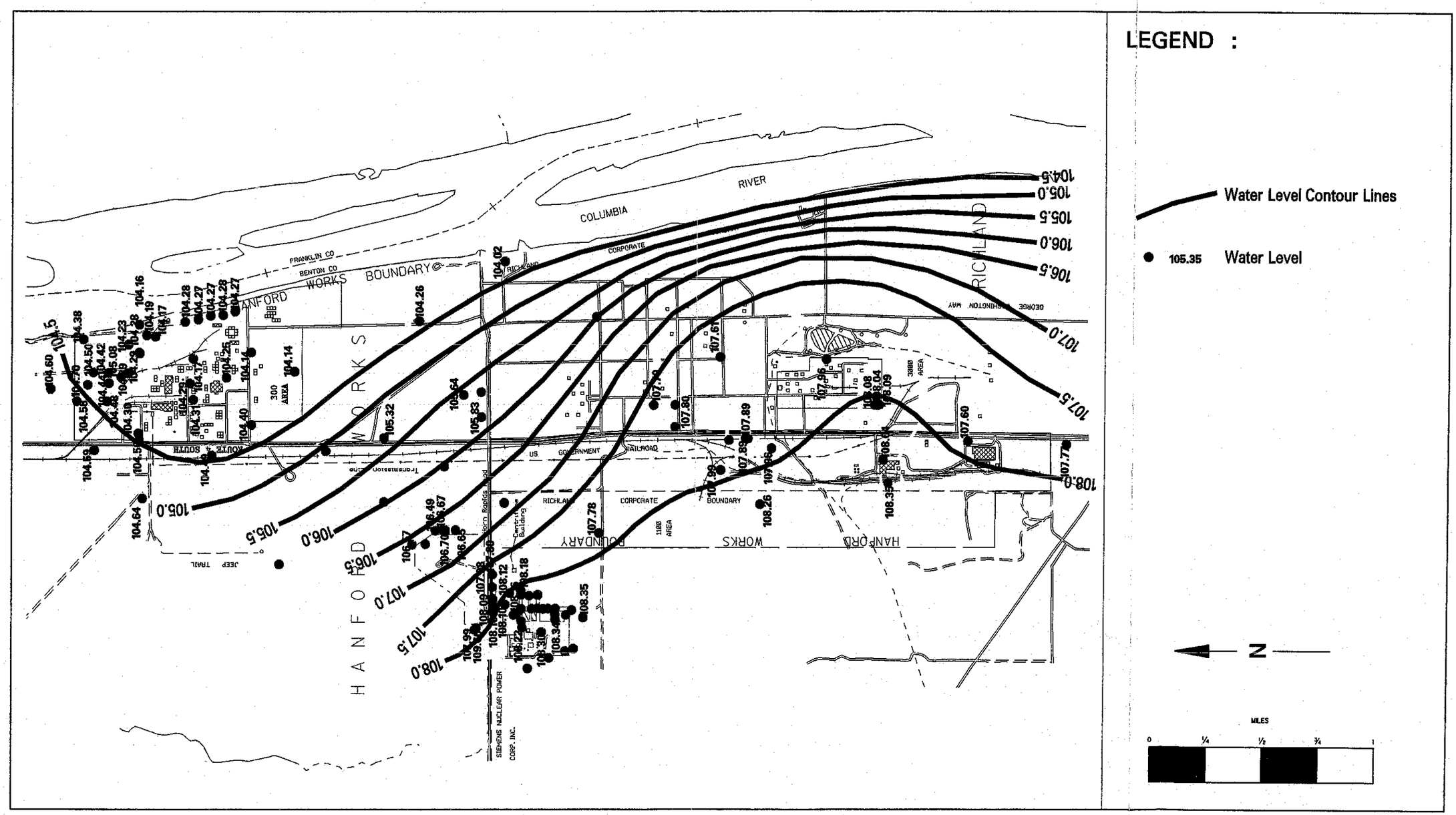
Groundwater Potentiometric Surface
for the Unconfined Aquifer– September 91

Fig. B–10



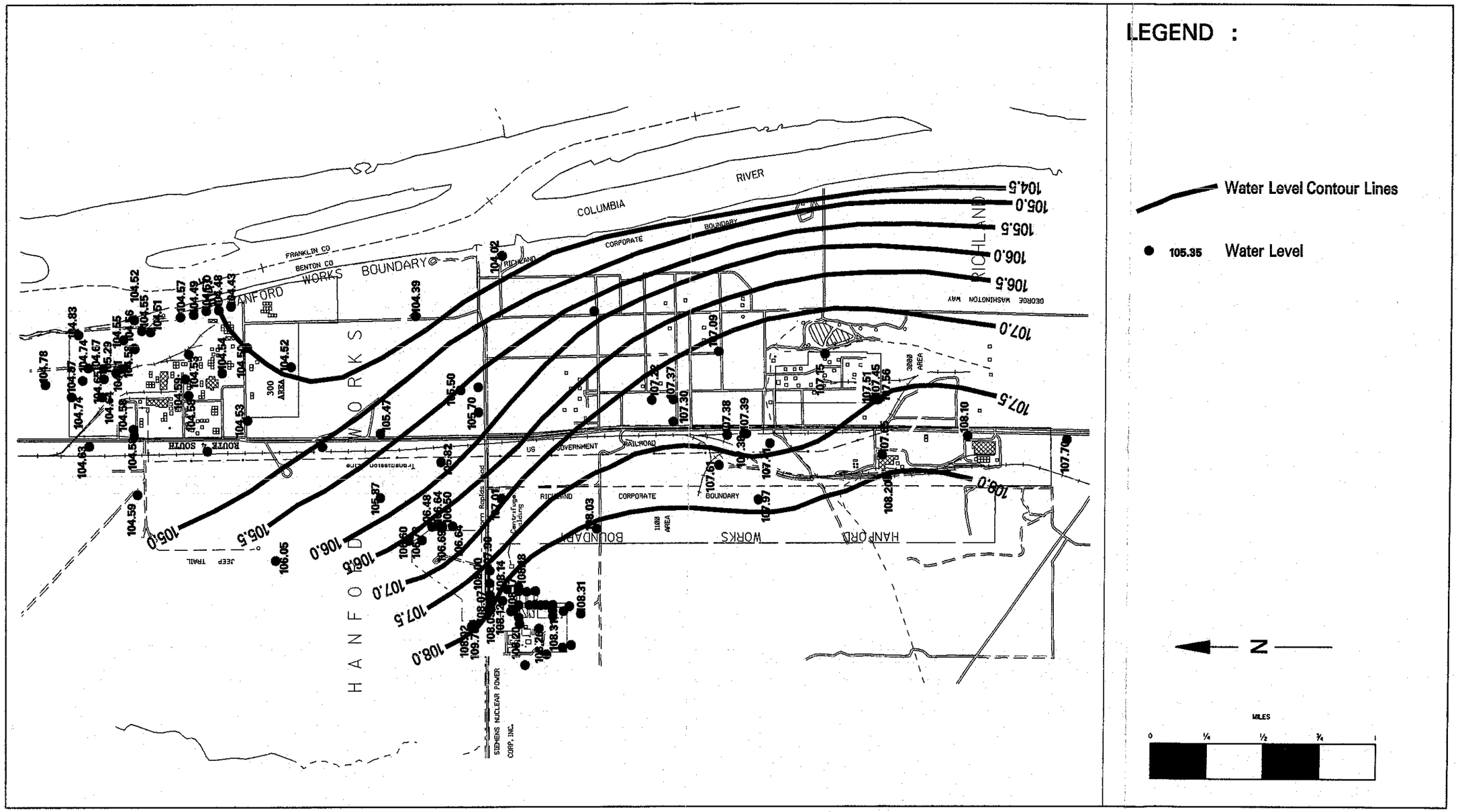
Groundwater Potentiometric Surface
for the Unconfined Aquifer–October 91

Fig. B–11



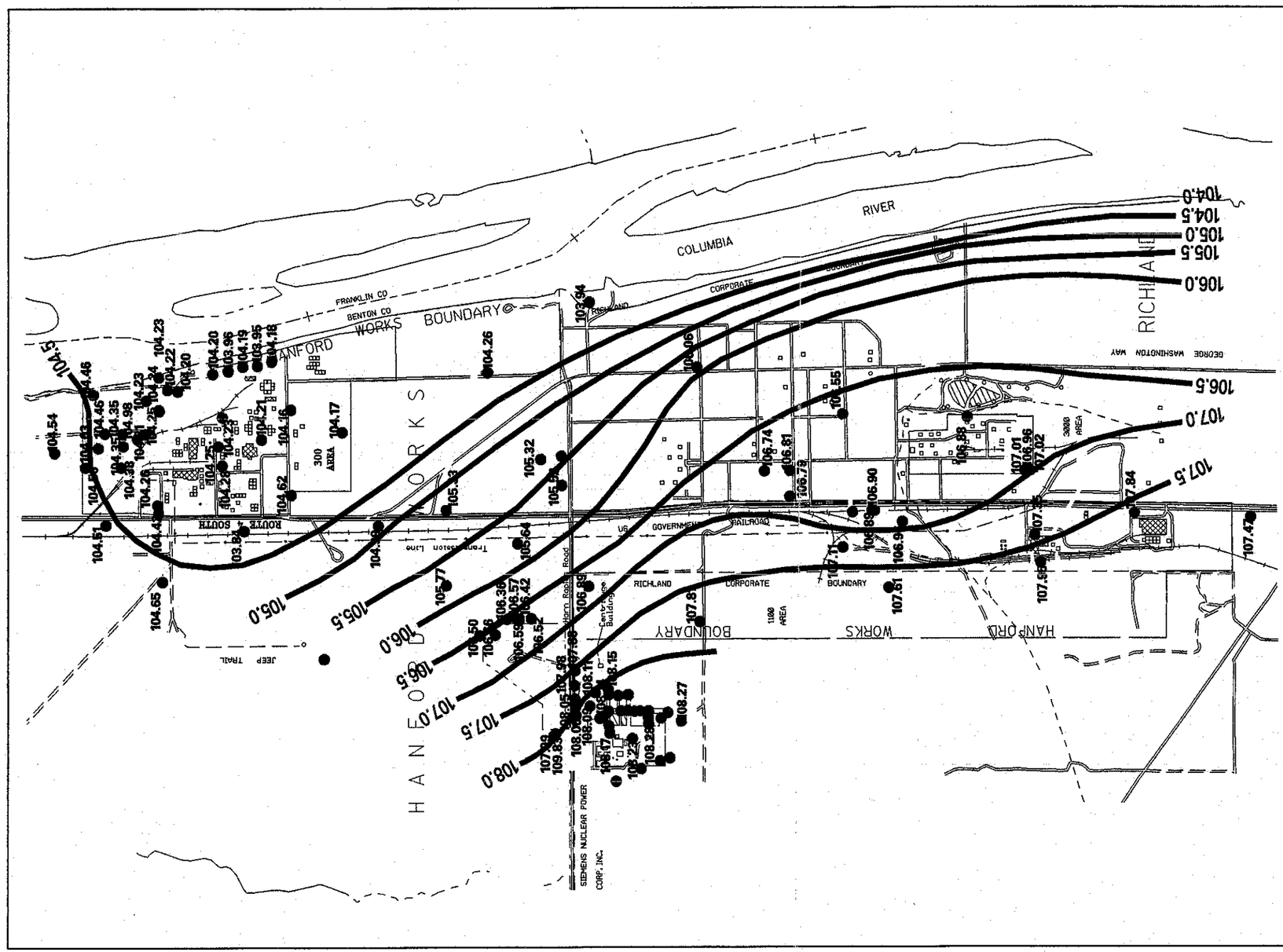
Groundwater Potentiometric Surface
for the Unconfined Aquifer–November 91

Fig. B-12



Groundwater Potentiometric Surface
for the Unconfined Aquifer–December 91

Fig. B-13



LEGEND :

Water Level Contour Lines

● 105.35 Water Level

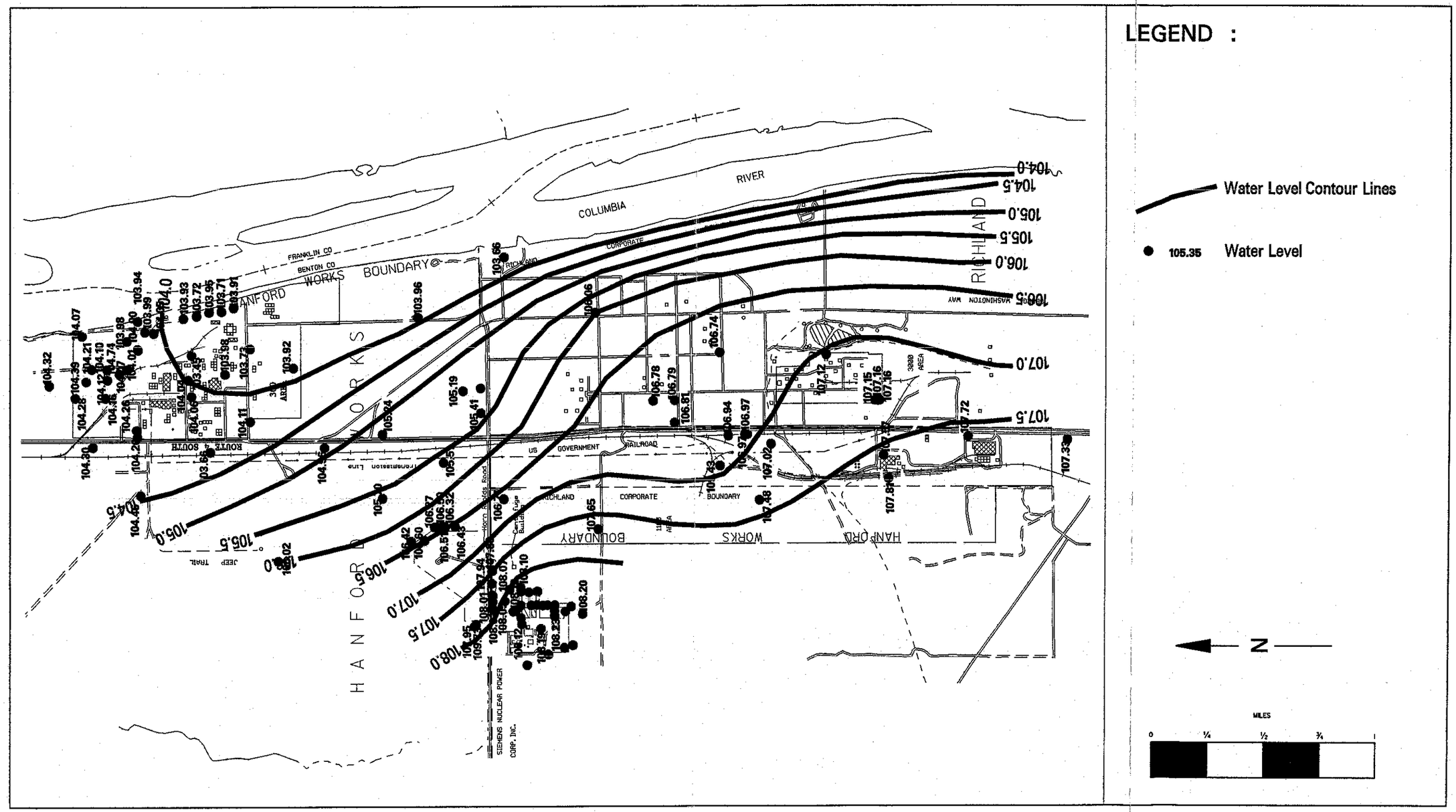
N

MILES

0 ¼ ½ ¾ 1

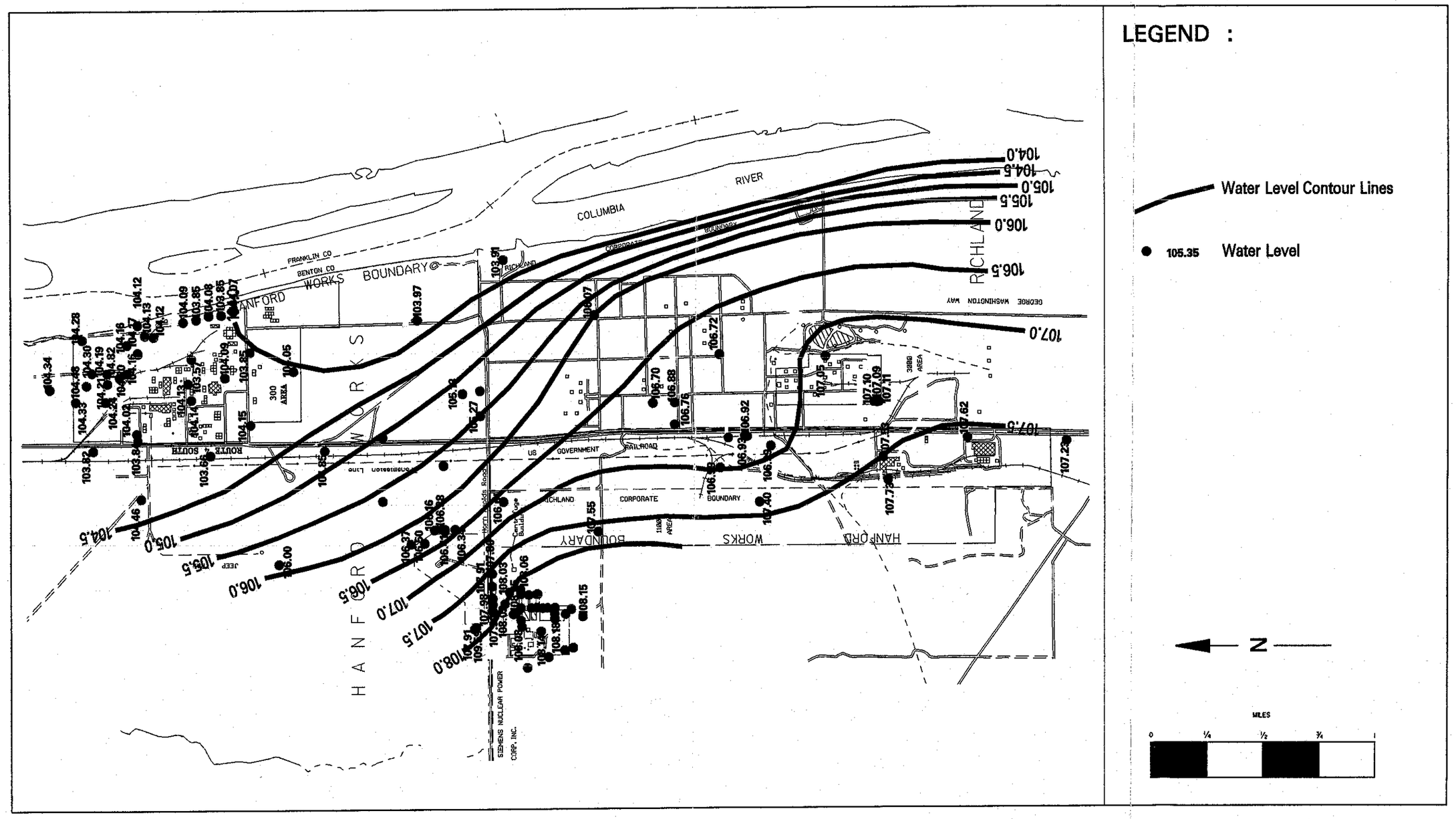
Groundwater Potentiometric Surface
for the Unconfined Aquifer–January 92

Fig. B–14



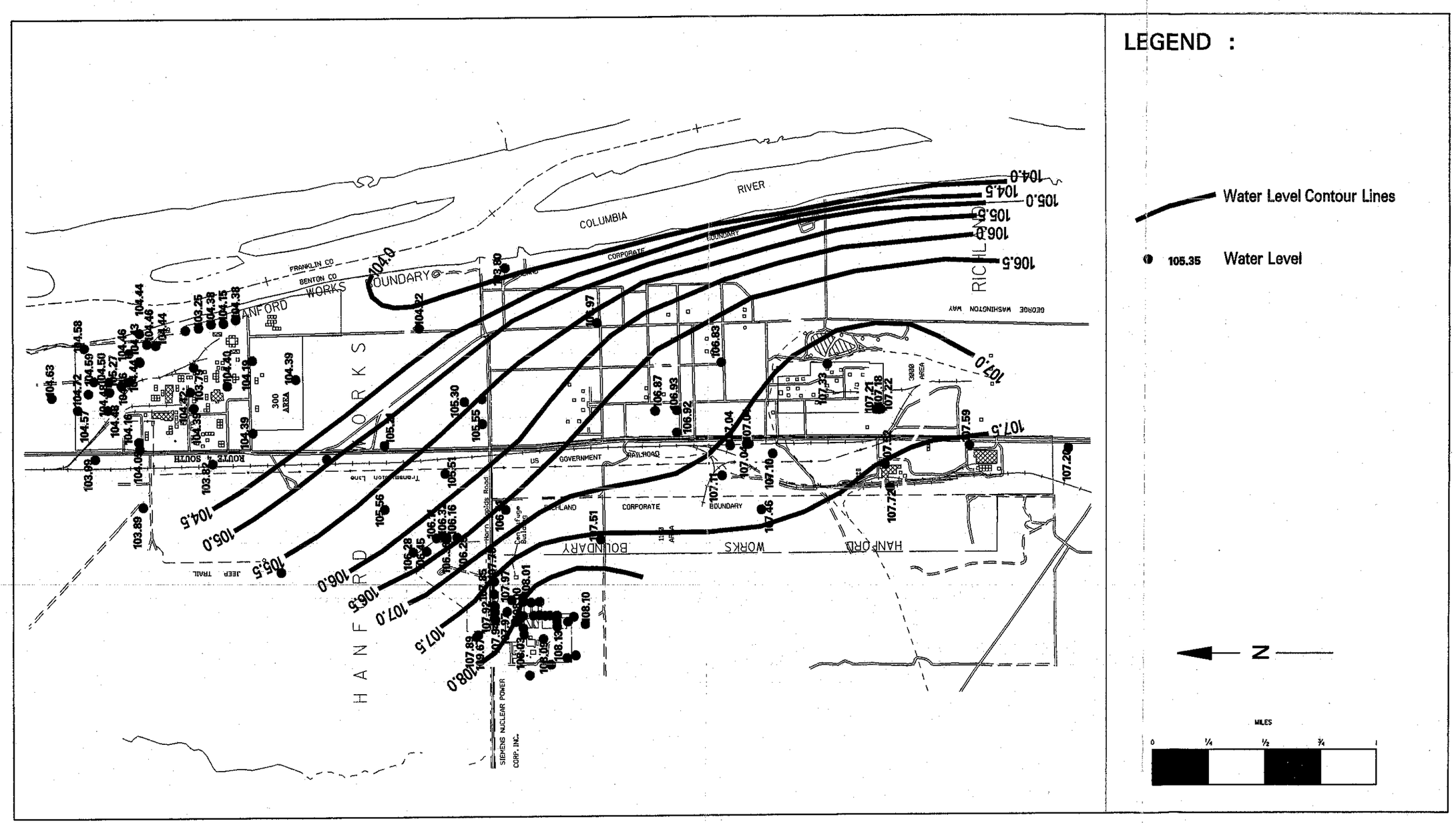
Groundwater Potentiometric Surface
for the Unconfined Aquifer–February 92

Fig. B–15



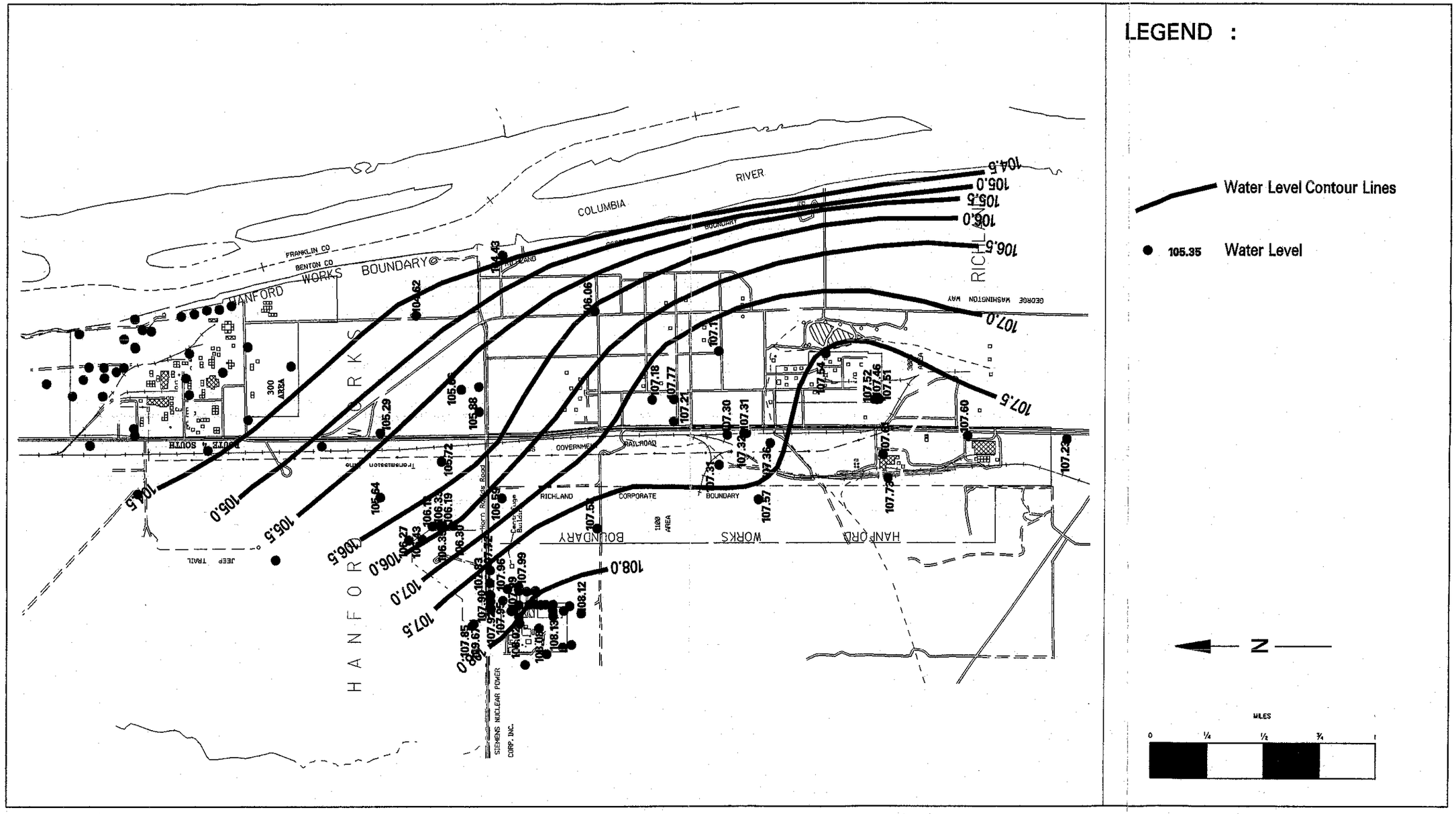
Groundwater Potentiometric Surface
for the Unconfined Aquifer– March 92

Fig B–16



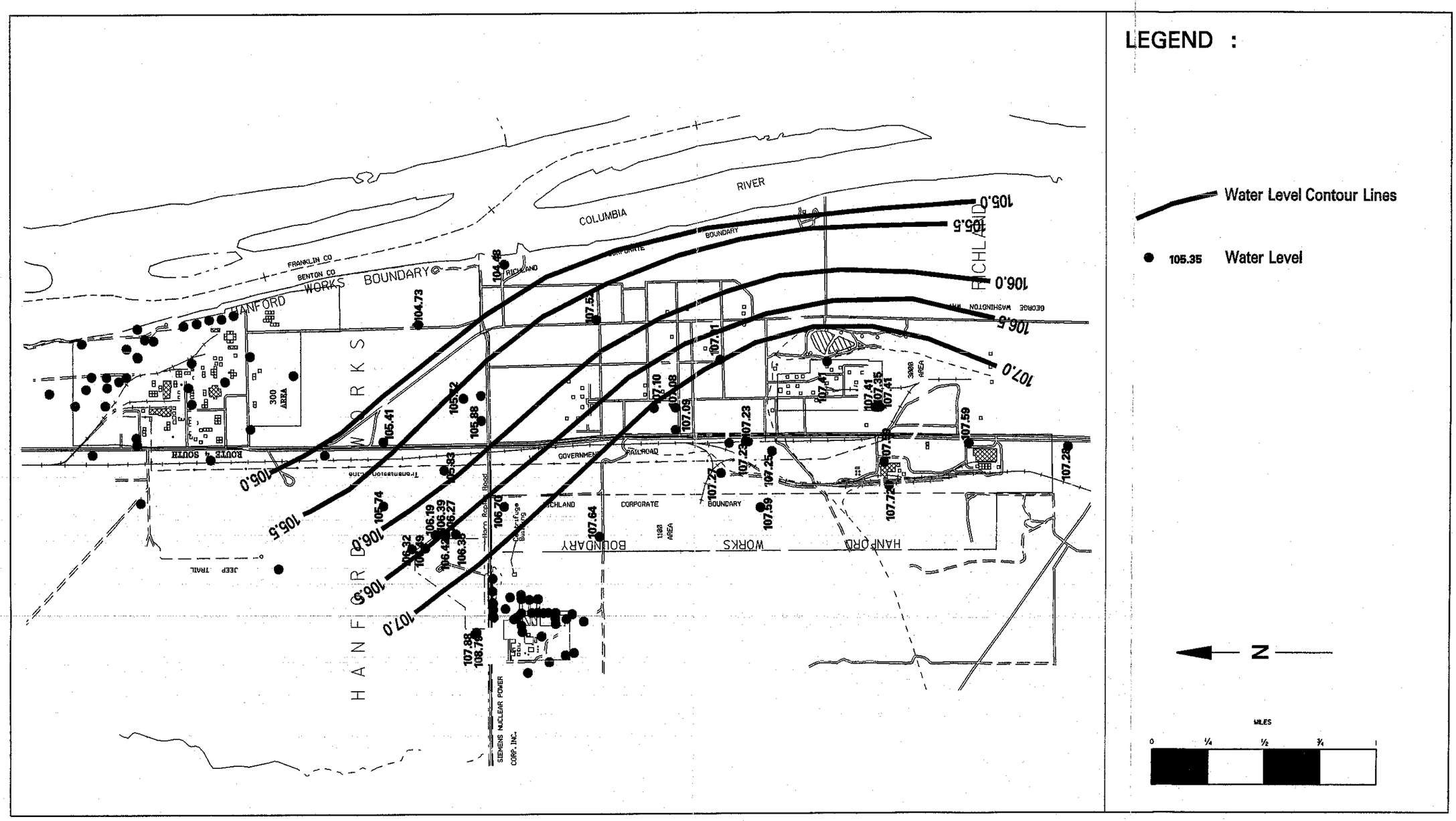
Groundwater Potentiometric Surface for the Unconfined Aquifer–April 92

Fig B–17



Groundwater Potentiometric Surface for the Unconfined Aquifer–May 92

Fig. B–18



Groundwater Potentiometric Surface
for the Unconfined Aquifer–June 92

Fig. B–19

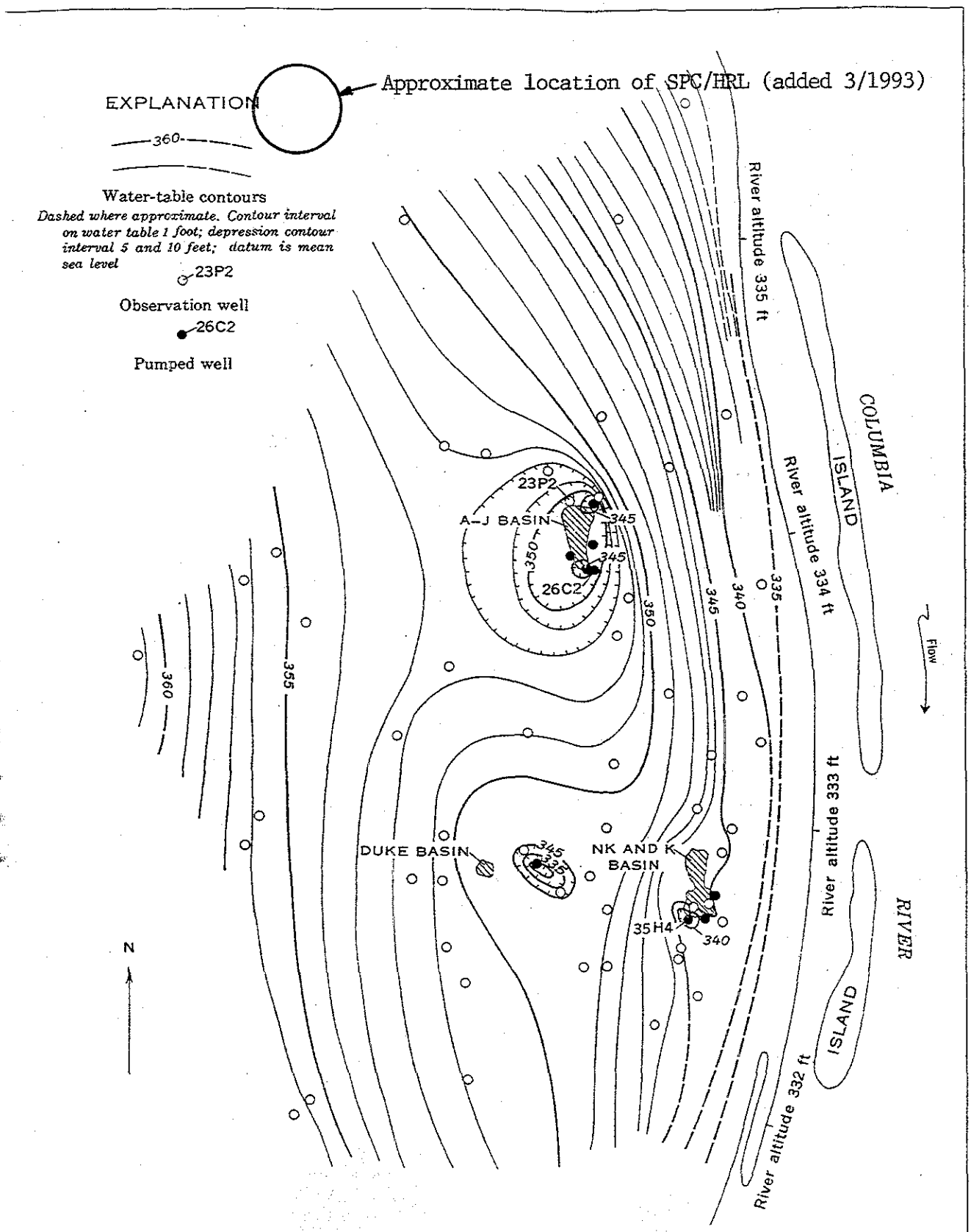


Figure B-20. Richland Well Field, 1952

* From Geological Survey Water-Supply Paper 1594-C, Artificial Recharge in Oregon and Washington, 1962.

APRIL 30, 1952 (BEFORE THE BEGINNING OF A 7-MONTH RECHARGE PERIOD)

se from General Electric Co., Hanford
omic Productions Operations, 1951

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APPENDIX C

STRATIGRAPHIC MAPS FOR USE IN GROUNDWATER MODEL DEVELOPMENT

9 3 1 2 5 2 3 0 6 1 8

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Stratigraphic Maps for Use in Groundwater Model Development

INTRODUCTION

This appendix contains seven maps depicting the subsurface geology beneath the 1100-EM-1 Operable Unit Groundwater Modeling Area. All maps were developed from exploratory borings advanced within the 1100 Area Operable Unit, the 300-FF-5 Operable Unit, on property owned by Siemen's Power Corporation, and miscellaneous water well borings on private property south of the study area. Documents regarding past geologic studies within and adjacent to the 1100 Area were also consulted.

Boring logs were compiled to produce six geologic cross-sections through the 1100-EM-1 Operable Unit. Two of the six extended north-south for the entire length of the operable unit, and four extended roughly east-west to encounter both the eastern and western limits of the area. The cross sections were applied in the interpretation of geologic data which ultimately went into map development. Some borings listed as used in developing the maps are outside the mapping area and are, therefore, not to be found on the completed product. These points outside the map area were used to develop trends for the contour lines as they approached map boundaries or left the map area.

All following geologic maps should be used with the realization that they were compiled from very scattered data points. Approximately 70 percent of the borings (chiefly those located outside the 1100 Area in the residential tracts to the east and south along the Columbia River, and on agricultural lands to the west) were logged by drillers untrained in the geologic classification of soil and rock materials. Many of these classifications were modified during data interpretation to more closely match nearby borings classified by trained geologists. Often, even in borings logged by geologists, depths of significant changes in material were reported to the nearest 5 feet. Geologist logs were modified in some cases to better match formational boundaries identified in adjacent geologist-logged borings. Also, due to the highly complex depositional history of this area, soil horizons were very difficult to reliably project from one boring to the next. Very few laterally continuous soil units were recognizable. Borings are generally clustered throughout the study area into widely separated groups. Between the clusters exist a few isolated borings, at best. Distances separating the boring clusters, and between isolated wells, range from many hundreds to many thousands of feet. The wider the gaps, the greater the uncertainties in the geologic interpretation.

9 3 1 2 9 3 3 0 6 2 2

TABLE C-1. STRATIGRAPHIC DATA COMPILATION FOR 1100 AREA GROUNDWATER MODEL

Well Number	Well Location Northing	Well Location Easting	Top of Well Elevation	Hanford/Ringold fm Contact Depth	Hanford/Ringold fm Contact Elevation	Top of Ash Layer Depth	Top of Ash Layer Elevation	Top of Ringold Upper Silt Layer (M1) Depth	Top of Ringold Upper Silt Layer (M1) Elevation	Bottom of M1 Layer Depth	Bottom of M1 Layer Elevation	M1 Layer Thickness	Top of Ringold Lower Silt Layer (M3) Depth	Top of Ringold Lower Silt Layer (M3) Elevation	M3 Layer Thickness	Depth to Bedrock
MW-1	364,086.15	1,946,554.37	398.00	54.00	344.00	********	********	88.50	309.50	********	********	********	********	********	********	********
MW-2	370,878.50	1,945,364.80	379.36	35.00	344.36	********	********	46.50	332.86	********	********	********	********	********	********	********
MW-3	364,301.11	1,947,081.08	402.63	60.50	342.13	********	********	78.80	323.83	********	********	********	********	********	********	********
MW-4	367,412.22	1,947,590.40	401.10	56.00	345.10	********	********	********	********	********	********	********	********	********	********	********
MW-5	367,389.36	1,947,590.40	401.30	52.00	349.30	********	********	87.00	314.30	********	********	********	********	********	********	********
MW-6	358,019.00	1,946,848.30	396.00	57.50	338.50	********	********	85.00	311.00	********	********	********	********	********	********	********
MW-7	367,097.70	1,946,037.40	395.20	49.40	345.80	********	********	85.50	309.70	********	********	********	********	********	********	********
MW-7A	378,386.40	1,944,622.63	388.00	33.20	354.80	********	********	********	********	********	********	********	********	********	********	********
MW-8	373,797.00	1,943,078.70	371.62	26.00	345.62	********	********	********	********	********	********	********	********	********	********	********
MW-8A	377,299.59	1,947,303.74	386.19	45.00	341.19	********	********	********	********	********	********	********	********	********	********	********
MW-9	373,760.30	1,943,118.40	371.86	28.40	343.46	********	********	35.30	336.56	68.40	303.46	33.10	********	********	********	********
MW-10	375,260.60	1,945,079.30	389.09	35.00	354.09	64.00	325.09	********	********	********	********	********	********	********	********	********
MW-11	374,949.10	1,945,105.10	388.69	43.00	345.69	********	********	********	********	********	********	********	********	********	********	********
MW-12	374,720.60	1,945,415.60	381.14	25.00	356.14	57.00	324.14	********	********	********	********	********	********	********	********	********
MW-13	374,504.60	1,945,399.90	379.85	25.00	354.85	********	********	********	********	********	********	********	********	********	********	********
MW-14	374,522.80	1,945,423.90	380.01	22.00	358.01	53.60	326.41	********	********	********	********	********	********	********	********	********
MW-15	374,230.80	1,945,425.40	377.43	22.00	355.43	51.90	325.53	********	********	********	********	********	********	********	********	********
**********	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
MW-17	364,291.50	1,948,390.79	407.10	54.00	353.10	********	********	90.50	316.60	108.50	298.60	18.00	********	********	********	********
MW-18	367,795.92	1,947,500.90	399.74	49.50	350.24	********	********	********	********	********	********	********	********	********	********	********
MW-19	373,112.58	1,946,073.62	384.56	28.00	356.56	********	********	52.00	332.56	********	********	********	********	********	********	********
MW-20	375,956.34	1,946,115.38	383.45	28.00	355.45	66.00	317.45	********	********	********	********	********	********	********	********	********
MW-21	374,482.62	1,945,427.52	379.45	33.50	345.95	54.00	325.45	77.50	301.95	80.50	298.95	3.00	********	********	********	********
MW-22	374,531.84	1,946,933.36	385.07	36.50	348.57	61.10	323.97	********	********	********	********	********	********	********	********	********
ANF-1	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-2	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-3	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-4	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-5	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-6	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-7	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-8	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-9	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-10	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-11	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-12	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-13	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-14	373,393.80	1,943,512.60	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-15	373,389.70	1,943,652.10	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-16	373,393.20	1,943,816.80	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-17	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-18	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-23	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-24	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
ANF-25	**********	**********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
GM-1	**********	**********	374.04	35.00	339.04	********	********	********	********	********	********	********	********	********	********	********
GM-2	**********	**********	368.49	25.00	343.49	********	********	32.50	335.99	35.00	333.49	2.50	********	********	********	********
GM-3	**********	**********	371.15	33.00	338.15	********	********	********	********	********	********	********	********	********	********	********
GM-4	**********	**********	368.36	24.00	344.36	********	********	********	********	********	********	********	********	********	********	********
GM-5	**********	**********	365.80	20.00	345.80	********	********	********	********	********	********	********	********	********	********	********

TABLE C-1. STRATIGRAPHIC DATA COMPILATION FOR 1100 AREA GROUNDWATER MODEL

Well Number	Well Location Northing	Well Location Easting	Top of Well Elevation	Hanford/Ringold fm Contact Depth	Hanford/Ringold fm Contact Elevation	Top of Ash Layer Depth	Top of Ash Layer Elevation	Top of Ringold Upper Silt Layer (M1) Depth	Top of Ringold Upper Silt Layer (M1) Elevation	Bottom of M1 Layer Depth	Bottom of M1 Layer Elevation	M1 Layer Thickness	Top of Ringold Lower Silt Layer (M3) Depth	Top of Ringold Lower Silt Layer (M3) Elevation	M3 Layer Thickness	Depth to Bedrock
GM-6	********	********	379.47	23.00	356.47	********	********	********	********	********	********	********	********	********	********	********
GM-7	********	********	379.61	30.00	349.61	********	********	********	********	********	********	********	********	********	********	********
GM-8	********	********	370.92	25.00	345.92	********	********	********	********	********	********	********	********	********	********	********
GM-9	********	********	369.34	25.00	344.34	********	********	********	********	********	********	********	********	********	********	********
GM-10	********	********	374.82	30.00	344.82	********	********	********	********	********	********	********	********	********	********	********
GM-11	********	********	380.19	30.00	350.19	********	********	43.00	337.19	********	********	********	********	********	********	********
GM-12	********	********	387.23	30.00	357.23	********	********	********	********	********	********	********	********	********	********	********
6-S27-E14	377,994.34	1,949,190.09	372.00	********	********	********	********	65.00	307.00	75.00	297.00	10.00	92.00	280.00	********	********
								81.00	291.00	92.00	280.00	11.00	125.00	247.00	********	********
6-S29-E12	375,884.02	1,947,588.48	387.97	********	********	********	********	50.00	337.97	75.00	312.97	25.00	********	********	********	********
6-S30-E14	3540 ft. deep		401.00	********	********	********	********	120.00	281.00	130.00	271.00	10.00	160.00	241.00	45.00	205.00
6-S30-E15A	375,027.66	1,950,360.62	398.00	********	********	********	********	********	********	********	********	********	********	********	********	********
6-S30-E15B	No log		********	********	********	********	********	********	********	********	********	********	********	********	********	********
6-S30-E15C	3540 ft. deep		401.74	60.00	341.74	********	********	125.00	276.74	140.00	261.74	15.00	165.00	236.74	35.00	210.00
6-S31-E13			393.00	********	********	********	********	70.00	323.00	82.00	311.00	12.00	********	********	********	********
6-S31-E13A	No drill log is available.		********	********	********	********	********	********	********	********	********	********	********	********	********	********
6-S32-E13A			389.00	********	********	********	********	75.00	314.00	86.00	303.00	11.00	********	********	********	********
6-S32-E13B			394.00	********	********	********	********	68.00	326.00	76.00	318.00	8.00	********	********	********	********
6-S36-E12A	102 ft. deep		402.00	********	********	********	********	80.00	322.00	94.00	308.00	14.00	********	********	********	********
6-S36-E12B	375,027.66	1,950,360.62	398.00	********	********	********	********	82.00	316.00	99.00	299.00	17.00	********	********	********	********
6-S36-E13A	100 ft. deep - Poor drill log		398.00	********	********	********	********	********	********	********	********	********	********	********	********	********
6-S36-E13B	100 ft. deep		398.73	********	********	(tan clay ----->)		75.00	323.73	90.00	308.73	15.00	********	********	********	********
6-S37-E14	368,061.40	2,309,401.00	405.38	49.00	356.38	********	********	********	********	********	********	********	********	********	********	********
6-S41-E13B	364,364.30	2,308,243.70	407.25	65.00	342.25	********	********	********	********	********	********	********	********	********	********	********
6-S43-E12	362,273.00	2,307,422.00	402.83	********	********	********	********	********	********	********	********	********	********	********	********	********
6-S40-E14	365,592.80	2,309,354.00	399.84	52.00	347.84	********	********	********	********	********	********	********	********	********	********	********
11-37-19	********	********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
11-38-16	59 ft. deep		365.40	********	********	(brown silt ---->)		50.00	315.40	********	********	********	********	********	********	********
11-38-16B	********	********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
11-39-10A	100 ft. deep		367.00	********	********	********	********						84.00	283.00	(<-- blue slate)	
11-39-10B	54 ft. deep		362.00	********	********	(yellow clay --->)		44.00	318.00	********	********	********	********	********	********	********
11-39-15	71 ft. deep		392.00	(no silt or clay included in drillers log)				********	********	********	********	********	********	********	********	********
11-39-16A	61.8 ft. deep		367.80	********	********	(clay ------->)		56.80	311.00	********	********	********	********	********	********	********
11-39-16B	110 ft. deep		369.00	********	********	(yellow clay --->)		63.00	306.00	********	********	********	********	********	********	********
11-39-16C	75.3 ft. deep		384.77	(no silt or clay included in drillers log)				********	********	********	********	********	********	********	********	********
11-39-16D	64 ft. deep		371.77	********	********	********	********	60.27	311.50	********	********	********	********	********	********	********
11-39-16E	83 ft. deep		397.10	********	********	********	********	68.00	329.10	********	********	********	********	********	********	********
11-40-15	88 ft. deep		393.00	********	********	********	********	64.93	328.07	78.93	314.07	14.00	********	********	********	********
11-40-16B	87 ft. deep		390.00	********	********	(M1 or M3 ?? --->)		82.00	308.00	********	********	********	********	********	********	********
11-40-16C	56 ft. deep		380.00	(no silt or clay included in drillers log)				********	********	********	********	********	********	********	********	********
11-41-15	76.5 ft. deep		397.00	********	********	********	********	74.00	323.00	********	********	********	********	********	********	********
30-41-14	65 ft. deep		398.00	55.00	343.00	********	********	60.00	338.00	********	********	********	********	********	********	********
30-41-14B	63 ft. deep		403.00	********	********	********	********	none	********	********	********	********	********	********	********	********
30-42-16	134 ft. deep		407.50	********	********	********	********	********	********	********	********	********	128.00	279.50	(blue shale	********
3000-F	373,046.90	1,951,757.53	373.00	No drill log is available		********	********	********	********	********	********	********	********	********	********	********
F-2	371,015.96	1,950,488.19	405.20	No drill log is available		********	********	********	********	********	********	********	********	********	********	********
10/28-10G1	462,157.00	1,191,733.00	389.00	********	********	********	********	69.00	320.00	86.00	303.00	17.00	176.00	213.00	26.00	202.00

TABLE C-1. STRATIGRAPHIC DATA COMPILATION FOR 1100 AREA GROUNDWATER MODEL

Well Number (399-5-2)	Well Location Northing	Well Location Easting	Top of Well Elevation	Hanford/Ringold fm Contact Depth	Hanford/Ringold fm Contact Elevation	Top of Ash Layer Depth	Top of Ash Layer Elevation	Top of Ringold Upper Silt Layer (M1) Depth	Top of Ringold Upper Silt Layer (M1) Elevation	Bottom of M1 Layer Depth	Bottom of M1 Layer Elevation	M1 Layer Thickness	Top of Ringold Lower Silt Layer (M3) Depth	Top of Ringold Lower Silt Layer (M3) Elevation	M3 Layer Thickness	Depth to Bedrock
								122.00	267.00	132.00	257.00	10.00				
Allied Nuclear	********	********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
J. Felton	********	********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
D. Schelke	60 ft. deep		375.00	(no silt or clay included in drillers log)				********	********	********	********	********	********	********	********	********
Wiser Co. Inc.	Well #1 - 85 ft. deep		358.00	********	********	********	********	34.00	324.00	59.00	299.00	25.00	59.00 (59-105', blue clay)	299.00	46.00	********
Wiser Co. Inc.	Well #2 - 43 ft. deep		358.00	********	********	********	********	32.00	326.00	********	********	********	********	********	********	********
H. Pederson	********	********	********	********	********	********	********	********	********	********	********	********	********	********	********	********
GTE	201.8 ft. deep		405.00	********	********	********	********	89.00	316.00	103.00	302.00	14.00	********	********	********	********
1C			375.00	55.00	320.00	********	********	********	********	********	********	********	115.00	260.00	50.00	207.00
399-4-7			372.00	********	********	********	********	********	********	********	********	********	112.00	260.00	********	********
399-4-8			380.00	********	********	********	********	52.00	328.00	********	********	********	********	********	********	********
7C			390.00		390.00			77.00	313.00	102.00	288.00	25.00	175.00	215.00	26.00	189.00
399-6-1			385.48	********	********	********	********	********	********	********	********	********	********	********	********	********
399-8-2			394.87	********	********	********	********	********	********	********	********	********	********	********	********	********
11-41-13C			404.30	********	********	********	********	84.00	320.30	********	********	********	********	********	********	********
11-34-13			389.00	********	********	********	********	75.00	314.00	85.00	304.00	10.00	********	********	********	********
11-41-13A			403.00	No silt or clay to 338 ft. elevation				********	********	********	********	********	********	********	********	********
11-41-13B			402.00	********	********	********	********	63.00	339.00	********	********	********	********	********	********	********
11-34-13			389.00	********	********	********	********	75.00	314.00	********	********	********	********	********	********	********

NOTES: 1. [****] indicates data is not available, could not be located, or could not be discerned from drill logs.
2. Well Location columns may include miscellaneous notes when location coordinates are not available.

Figure C-1. Hanford fm./Ringold fm. Contact Elevations

Contours along the Hanford fm./Ringold fm. contact were based on data from subsurface borings advanced in the 1100-EM-1 Operable Unit, the 300-FF-5 Operable Unit, and during the summer of 1991 on property owned by Siemens Power Corporation. Elevation data is lacking to the west of the 345-foot contour interval due to a complete absence of subsurface explorations. Uncertainties exist in the eastern portion of the map area in the region bounded by Stevens Drive extending to just west of the western bank of the Columbia River because of poor quality drilling logs.

Elevations shown for the Hanford/Ringold contact in table C-1 and in the boring logs for wells MW-11 and MW-21 were adjusted to better match surrounding wells. The contact elevation in MW-11 was adjusted from 345.69 ft to 355.69 ft and in MW-21 from 345.95 ft to 359.95 ft.

Data points used for developing the contour plot were obtained from the following borings:

1100-EM-1	300-FF-5	SIEMENS POWER CORPORATION
MW-2	1C	GM-1
MW-6	7C	GM-2
MW-7	399-4-5	GM-3
MW-7A	399-4-7	GM-4
MW-8	399-4-8	GM-5
MW-8A	399-5-1	GM-6
MW-9	399-5-2	GM-7
MW-10		GM-8
MW-11		GM-9
MW-12		GM-11
MW-13		GM-12
MW-14		
MW-15		
MW-17		
MW-18		
MW-19		
MW-20		
MW-21		
MW-22		
699-S27-E14		
699-S30-15C		

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9 3 1 2 9 3 3 0 6 2 7

Figure C-2. Top of Silt Elevations

Contours along the top of the silt aquitard located beneath the groundwater modeling area were based on data from subsurface borings advanced in the 1100-EM-1 Operable Unit, the 300-FF-5 Operable Unit, and during the summer of 1991 on property owned by Siemens Power Corporation. Elevation data is lacking to the west of the final solid 335-foot contour interval due to a complete absence of subsurface explorations. The final western 335-foot contour line is based on the assumption that the top of silt decreased in elevation from a high in the vicinity of the Siemens Power Corporation complex, to a broad low, and will thereafter continue a gradual rise westward. The eastern portion of the map area, adjacent to the Columbia River, has areas lacking the silt horizon.

The contoured silt horizon is fairly continuous in a north-south orientation throughout the 1100-EM-1 Operable Unit. Discontinuities become conspicuous toward the eastern boundary of the area; adjacent to the Columbia River. This horizon corresponds to the "B" silt as mapped in the 300-FF-5 Operable Unit project. The "A" silt horizon of the 300-FF-5 project is the first silt unit encountered by borings along the Columbia in areas devoid of the "B" unit.

Data points used for developing the contour plot of the top of silt were obtained from the following borings:

1100-EM-1	300-FF-5	SIEMENS POWER CORPORATION
MW-2	7C	GM-2
MW-6	399-4-5	GM-11
MW-7	399-4-7	
MW-9	399-4-8	
MW-19	399-5-2	
MW-21		
699-S27-E14		
699-S29-E12		
699-S30-E15C		
699-S30-E14		
699-S31-E13		
699-S36-E12A		
699-S36-E12B		
699-S36-E13B		

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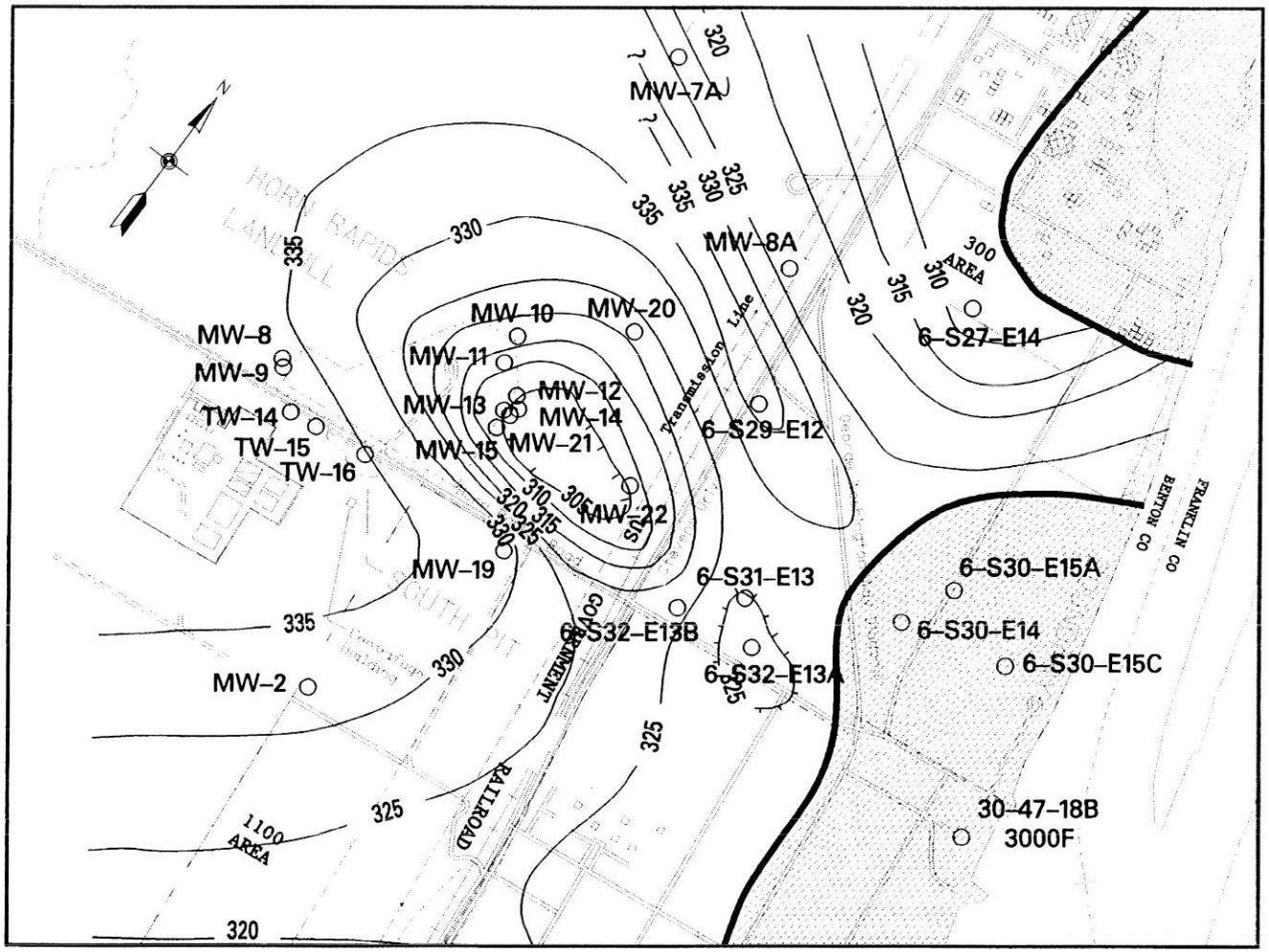
9 3 1 2 9 5 3 0 6 3 1



Silt Aquitard is not present In these areas.

0 300 600 METERS
0 1000 2000 FEET

TOP of SILT ELEVATIONS

Fig. C-2

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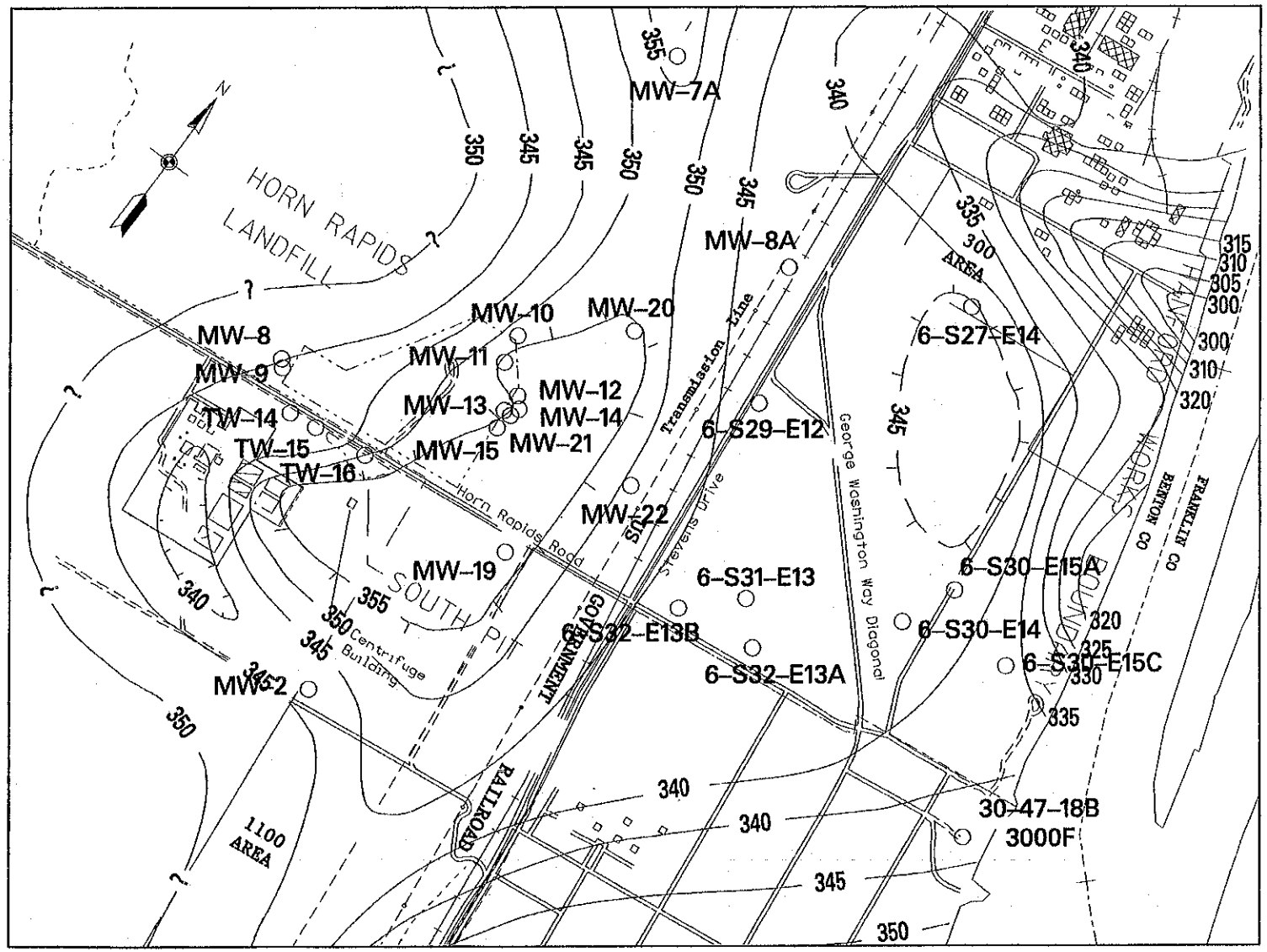
9 3 1 5 9 2 3 0 6 3 3



0 300 600 METERS
0 1000 2000 FEET

HANFORD fm, / RINGOLD fm.
CONTACT ELEVATIONS

Fig. C-1

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9 2 0 5 3 5 9 2 1 3 8

Figure C-3. Contours on Top of Volcanic Ash
Figure C-4. Isopach Map of Volcanic Ash

Contours on the top and mapped thicknesses of the volcanic ash deposit noted in the Horn Rapids Landfill area were based on data from subsurface borings advanced in the 1100-EM-1 Operable Unit. The ash is theorized to be a water lain deposit within an eroded low on the top of the upper silt unit of the middle Ringold Formation (see paragraph 2.2.2.2). Contours on the top of the deposit are fairly certain, based on the number of subsurface borings that intercepted the ash surface. The thickness of the deposit is less certain, based on data from only a single boring that fully penetrated the unit. The outer limits of the ash deposit were estimated. Figures C-3 and C-4 include a zero-line that was arbitrarily placed between wells which intercepted an ash and those which did not.

Data points used for developing the contour plot and isopach map were obtained from the following borings:

<u>1100-EM-1</u>
MW-10
MW-12
MW-14
MW-15
MW-20
MW-21*
MW-22

* Boring fully penetrated the ash deposit.

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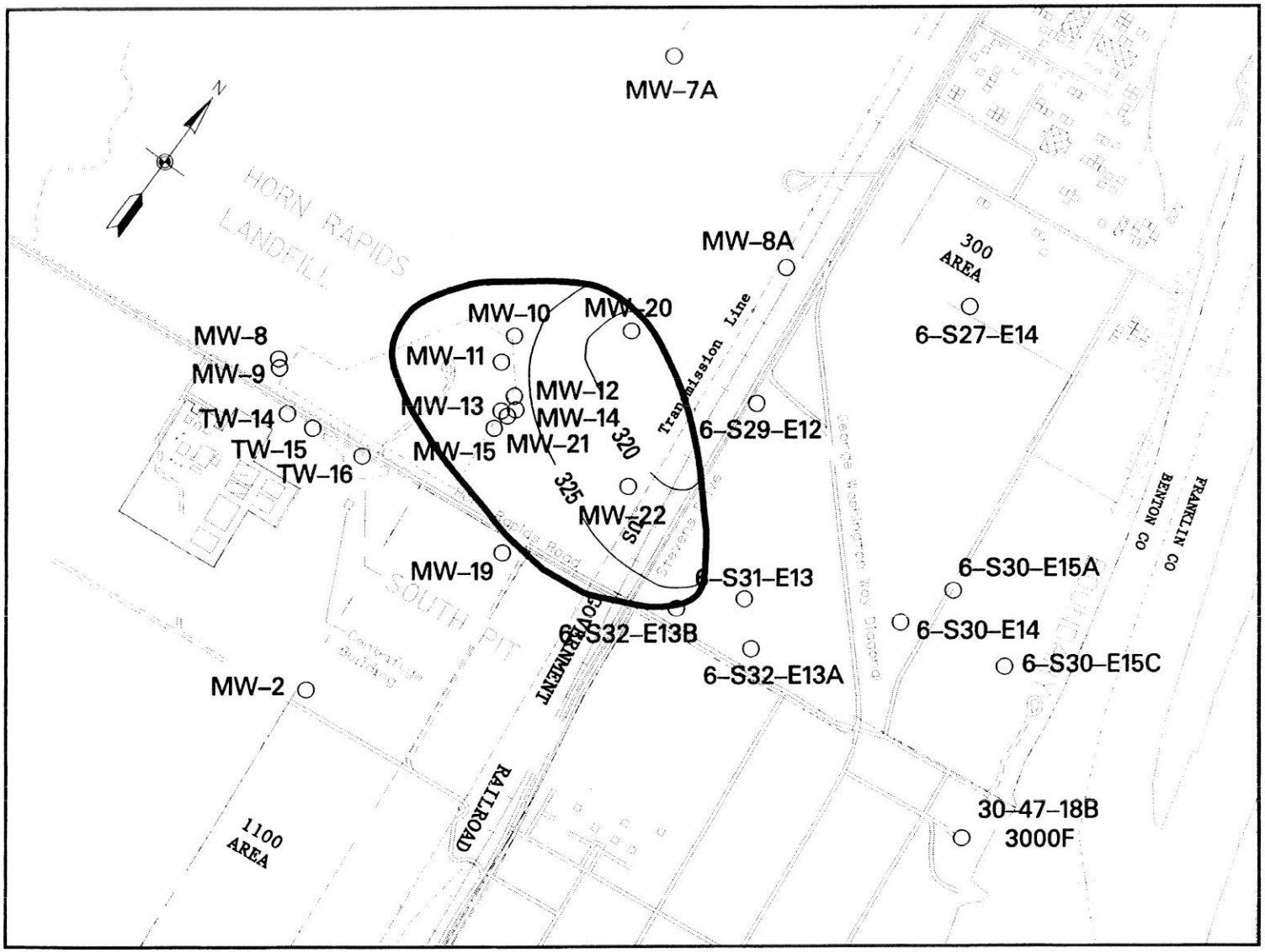
9 3 1 2 9 3 3 0 6 3 5



0 300 600 METERS
0 1000 2000 FEET

CONTOURS on top of VOLCANIC ASH

Fig. C-3

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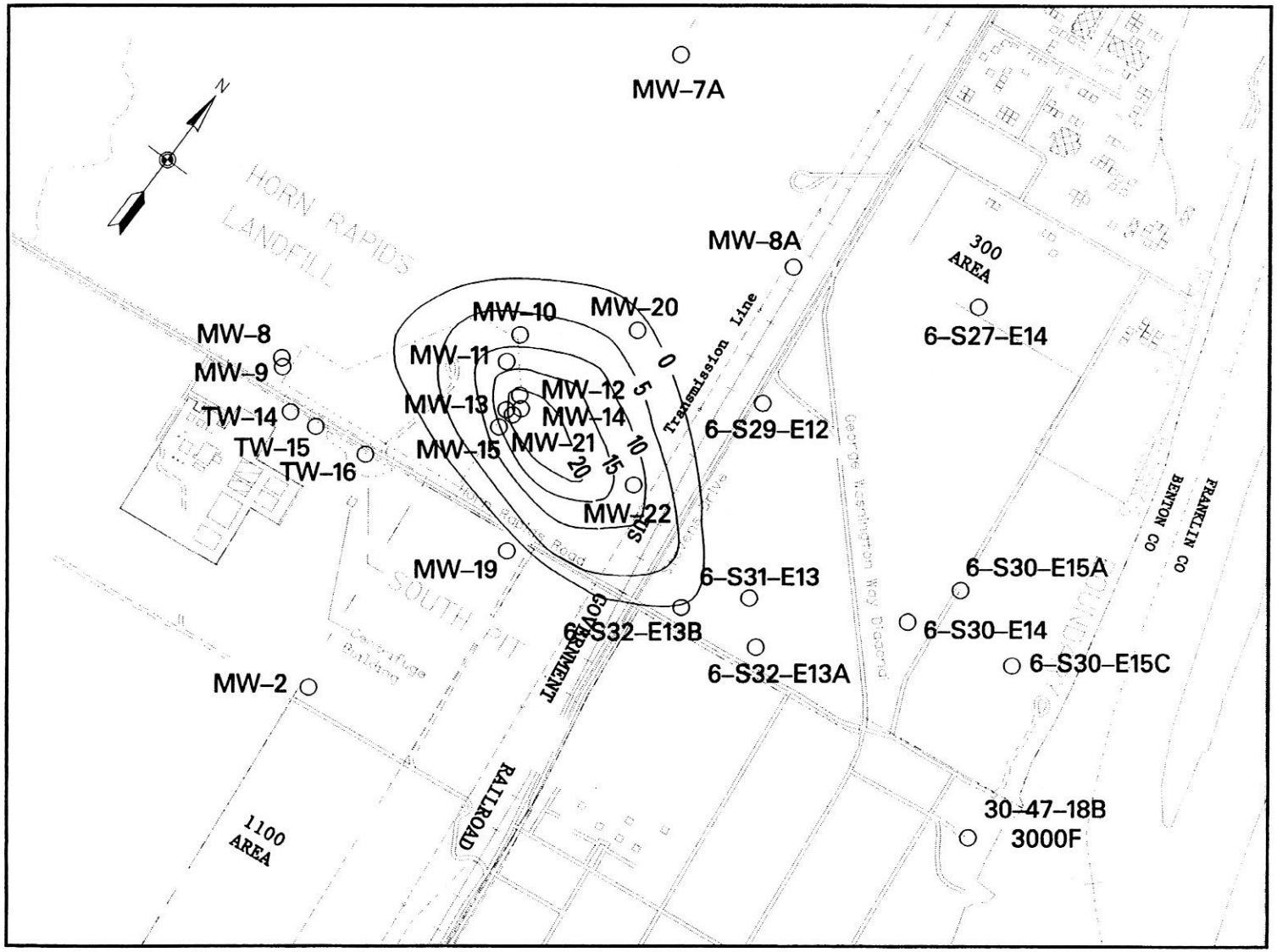

0 300 600 METERS

0 1000 2000 FEET

ISOPACH MAP of VOLCANIC ASH

Fig. C-4

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Figure C-5. Bottom of Silt Elevations

Contours on the bottom of the silt unit were based on data from subsurface borings advanced in the 1100-EM-1 Operable Unit and the 300-FF-5 Operable Unit. Elevation data is lacking to the west of the 300-foot contour due to an absence of subsurface explorations. Uncertainties exist throughout the map area because of sparse data. Few borings penetrated the entire thickness of this silt deposit.

Data points used for developing the contour plot were obtained from the following borings:

1100-EM-1	300-FF-5
MW-9	7C
MW-21	399-4-8
699-S27-E14	399-5-2
699-S29-E12	
699-S31-E13	
699-S32-E13B	
699-S36-E12A	
699-S36-E12B	
699-S36-E13B	

9 3 1 2 9 3 0 6 3 8

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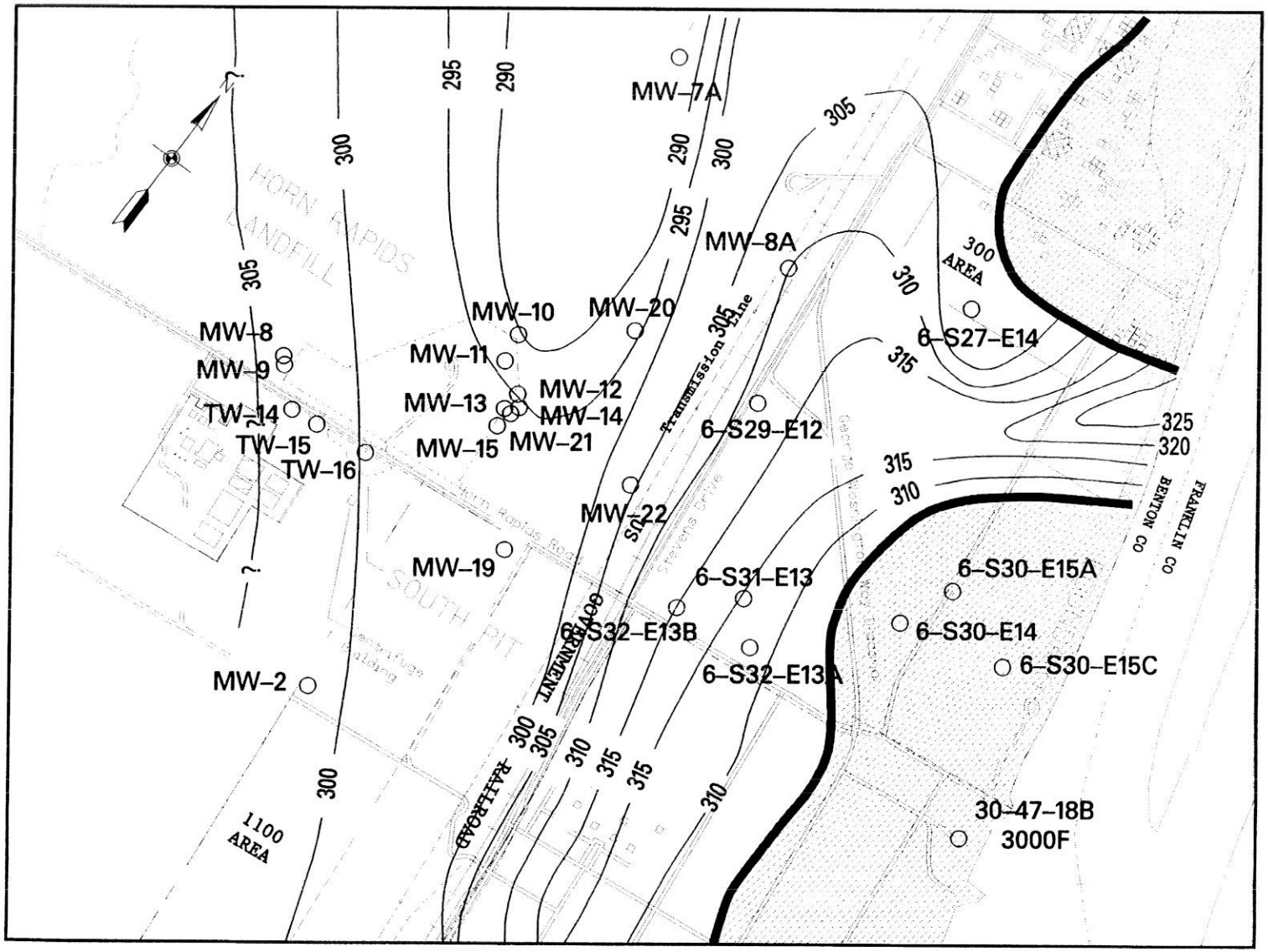
9 3 1 2 9 3 0 6 3 9



Silt Aquitard is not present in these areas.

0 300 600 METERS
0 1000 2000 FEET

BOTTOM of SILT ELEVATIONS

Fig. C-5

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9 3 1 2 9 3 3 0 6 4 1

Figure C-6. Isopach Map of Silt Horizon

The isopach map delineating the thickness of the silt unit was developed directly from the contour maps containing the top and bottom elevations of the silt unit. The zero thickness isopleth along the eastern edge of the map area indicates the silt does not occur east of the line. Silt unit "A," using nomenclature from the 300-FF-5 project, is the first silt layer encountered by subsurface borings advanced east of the zero line. The area south and west of the Siemens Power Corporation complex is lacking reliable subsurface data with which to infer the thickness of the silt unit. Contour lines drawn in this vicinity on both the top of silt and bottom of silt maps are too unreliable, again due to the lack of data, to develop isopleths for the silt.

9 3 1 2 9 3 3 0 6 4 2

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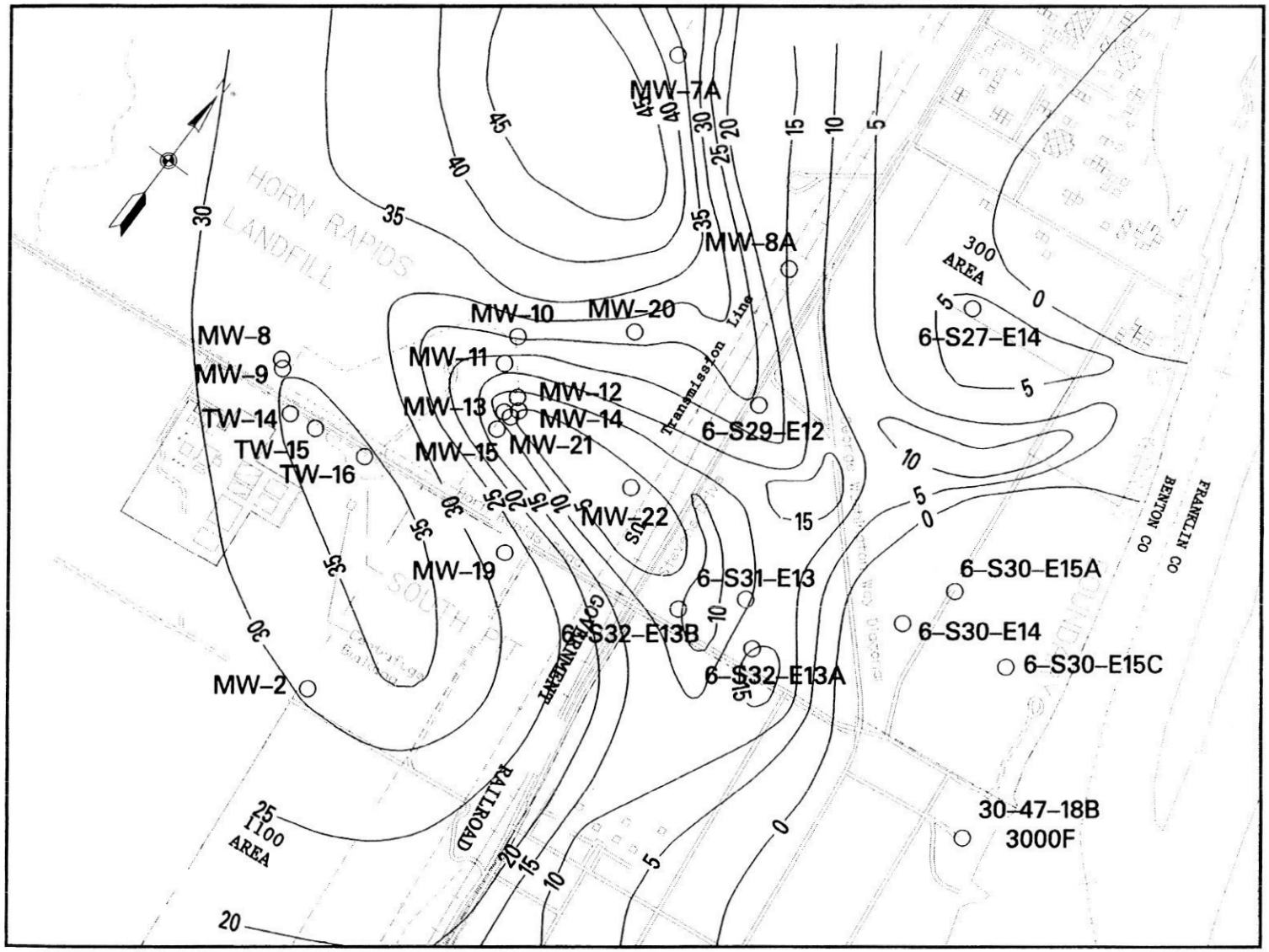
9 3 1 2 9 7 3 0 6 4 3



ISOPACH MAP of SILT HORIZON

Fig. C-6

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9 3 1 2 6 3 3 0 6 4 5

Figure C-7. Top of Basal Ringold Silt

Contours on the top of the basal Ringold silt deposit were derived exclusively from the Westinghouse-Hanford Company document "Geologic Summary of the 300 Area - Hanford Site, South-Central Washington" (K.A. Lindsey and S. Consort, authors). Elevations away from the data points are highly speculative due to the lack of deep, subsurface borings within this area. Deep borings located to the south are too far removed to be reliably projected. No data is available for the western portion of the groundwater modeling area. It is not reasonable to assume that the surface elevation of the lower silt unit continues to drop in this direction. Because of the high probability of some sort of undetermined structure in the silt surface toward the west, no attempt was made to extend the surface contours in this direction.

Data points used for developing the contour plot were obtained from the following borings:

1100-EM-1	300-FF-5
699-S27-E14	399-3-3
699-S30-E14	399-4-5
699-S30-E15C	399-4-7
	399-4-2
	1C
	7C

9 3 1 2 9 3 3 0 6 4 6

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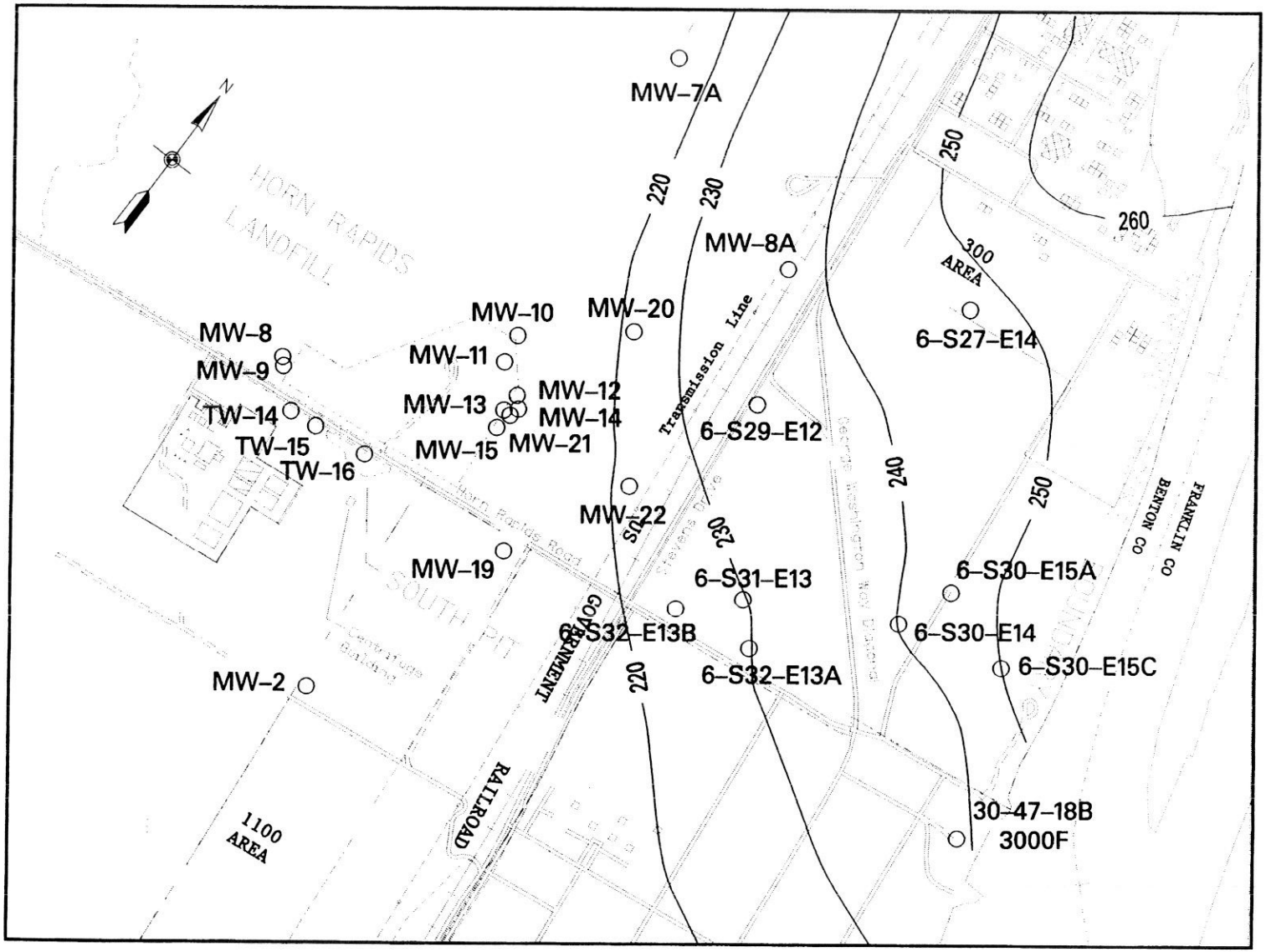
9 3 1 2 9 3 3 0 6 4 7



0 300 600 METERS

0 1000 2000 FEET

TOP of BASAL RINGOLD SILT

Fig. C-7

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9 3 1 2 9 3 3 0 6 4 9

APPENDIX D

SUMMARY OF PHASE II SOIL SAMPLING ANALYTICAL RESULTS

9 3 1 2 9 3 0 3 5 6 5 0

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APPENDIX D CONTENTS

1.0 DISCUSSION OF PHASE II SOIL SAMPLING ANALYTICAL RESULTS . . D-1

2.0 LABORATORY AND VALIDATION QUALIFIER DEFINITIONS (FOR REFERENCE TO TABLE D-1) D-2

3.0 REFERENCES D-3

TABLE

Table D-1 Summary of Phase II Soil Sampling Analytical Results D-4

ATTACHMENT

Attachment D-1 ARDL Report D-29

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1.0 DISCUSSION OF PHASE II SOIL SAMPLING ANALYTICAL RESULTS

Analytical results of the Phase II Remedial Investigation soil sampling performed at Horn Rapids Landfill (HRL) and the Ephemeral Pool are shown in table D-1. Analytical methods from the Environmental Protection Agency (EPA) Contract Laboratory Program (CLP) Statement of Work for Inorganic Analysis EPA ILM02.0 (EPA, 1991a) were used to detect inorganic contaminants from the CLP target analyte list (TAL). Methods from EPA CLP Statement of Work for Organic Analysis EPA OLM01.1 (EPA, 1991b) were used to detect organic, pesticide, and polychlorinated biphenyl (PCB) contaminants from the CLP target compound list (TCL). Inorganic analyses for sample delivery groups (SDG) Westinghouse Hanford Company (WHC) 27 and WHC 28, and all of SDG WHC 29 were validated by the Office of Sample Management using Westinghouse Sample Management Administration Manual WHC-CM-5-3 (WHC, 1990). The remaining analyses were validated by the U.S. Army Corps of Engineers using EPA Functional Guidelines for Evaluating Inorganic and Organic Analyses.

During the trenching activities at HRL, 26 samples (all at depths greater than or equal to 4 feet) were taken from seven locations. Soil samples shown in table D-1, taken from the trenches, are TP-1, TP-3A, TP-3B, TP-4/5, TP-7, TP-8, and TP-11. All samples from the trenches except TP-1 were analyzed for TAL inorganic contaminants, TCL organic contaminants, and TCL pesticides and PCB's. The two samples from TP-1 were analyzed for TCL organics and TCL pesticides and PCB's.

Two samples of material taken from the HRL trenches were sent to U.S. Army Corps of Engineers, North Pacific Division Laboratory in Troutdale, Oregon. The nature of these samples, including field screening methods are presented in paragraph 3.7.4.2.6.

For sample locations B4-1 and B5-1 to B5-3, soil samples that were taken from 0 to 1 foot were analyzed for TAL and TCL contaminants. Samples from these locations that were taken from 1 to 2 feet were analyzed for all TAL and TCL contaminants except pesticides and PCB's. Samples were validated by U.S. Army Corps of Engineers using EPA Functional Guidelines.

Nineteen soil samples were taken at various depths (from 0 to 2 feet) from locations PCB-1 to PCB-4 and PCB-1A to PCB-4A. These samples were analyzed for TCL pesticides and PCB's. Samples were validated by U.S. Army Corps of Engineers using EPA Functional Guidelines.

At the Ephemeral Pool, seven surface samples were taken from the locations E1 to E6. Analysis was performed for TCL pesticides and PCB's at this site.

2.0 LABORATORY AND VALIDATION QUALIFIER DEFINITIONS (FOR REFERENCE TO TABLE D-1)

D - The compound was identified in an analysis at a secondary dilution factor.

J - The analyte was analyzed for and was positively identified, but the associated numerical value may not be consistent with the amount actually present in the environmental sample. The associated numerical value is an estimated quantity.

A subscript may be appended to J indicating which of the following quality control (QC) criteria were not met:

1 - Blank contamination: indicates possible high bias and/or false positives.

2 - Calibration range exceeded: indicates possible low bias.

3 - Holding times not met: indicates low bias for most analytes with the exception of common laboratory contaminants and chlorinated ethenes.

4 - Other QC outside control limits: bias not readily determined.

N - The analysis indicates that an analyte is present and there are strong indications that the identity is correct.

NJ - The analysis indicates that the analyte is tentatively identified and the associated numerical value may not be consistent with the amount actually present in the sample.

A subscript may be appended to NJ indicating which of the following situations apply:

1 - DDT/Endrin breakdown evident.

2 - Interference from other sample components.

3 - Non-TCL compounds.

4 - A confirmation analysis was missing or QC criteria were not met for the confirmation analysis.

R - The data are unusable for all purposes. The analyte was analyzed for, but the presence or absence of the analyte has not been verified.
U - The analyte was analyzed for, and is not present above, the level of the associated sample quantitation limit.

UJ - The analyte was analyzed for, and was not present above, the level of the associated value. The associated numerical value may not accurately or precisely represent the concentration necessary to detect the analyte in this sample.

X - Additional flags defined separately, consult case narrative.

3.0 REFERENCES

EPA, 1991a, *Contract Laboratory Program Statement of Work for Inorganic Analysis*, EPA ILMO2.0.

EPA, 1991b, *Contract Laboratory Program Statement of Work for Organic Analysis*, EPA OLMO1.1.

Westinghouse Hanford Company, 1990, *Westinghouse Sample Management Administration Manual WHC-CM-5-3*.

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	23	28					
Sample No	BOOZ59	BOOZT3	BOOZT4	BOOZT7	BOOZT8	BOOZT9	BOOZV0
Sample Location	TP-11	TP-3B	TP-3B	TP-3A	TP-3A	TP-3A	TP-3A
Sample Depth	4	7-7.5	7-7.5	5	10	19	21-22
INORGANICS							
Aluminum	17800 J	5760 J	4900	5460 J	4770 J	7060 J	3820 J
Antimony	10.5 UN	5.2 R	5.1 R	5.2 R	5.2 R	7.9 R	5.1 R
Arsenic	4.1	0.21 R	0.2 R	0.21 R	0.21 R	0.21 R	1 R
Barium	511 *	72.5	57.9	70.6	65.6	72.1	29.2 R
Beryllium	0.23 U	0.21 R	0.2 R	0.21 R	0.21 R	0.21 R	0.2 R
Cadmium	2.4	0.62 R	0.61 R	0.63 R	0.62 R	0.76 R	0.61 R
Calcium	44800	6270	5770	6170	5960	5340	13900
Chromium	85.7 EN	4.9 J	4.3 J	3.7 J	9.9 J	102 J	8 J
Cobalt	18.9	16.2	16.2	14.8	11.5	13.3	2.9 R
Copper	1280 *	17.1	14.5	16.9	39.4	57.2	6.2
Cyanide	2.8 U	2.6 U	2.5 U	2.6 U	2.6 U	2.7 U	2.5 U
Iron	31900 *	29300 J	29700 J	25500 J	23700 J	23400 J	7390 J
Lead	854 *	2.1	2.2 S	2.2 S	9.8	13	2.4
Magnesium	7640	5050	4700	4100	3760	4040	3130
Manganese	501	414 J	337 J	317 J	262 J	287 J	97.1 J
Mercury	0.11 U	0.1 U	0.1 U	0.1 U	0.1 U	0.11 U	0.1 R
Molybdenum	NA	NR	NR	NR	NR	NR	NR
Nickel	31.6 *	15.4	8.5	7 R	9.2	81.8	8.2
Potassium	3820	706 R	501 R	630 R	659 R	959 R	901 R
Selenium	0.23 UW	0.21 R	0.2 R	0.21 R	0.21 R	0.21 R	0.2 R
Silver	1.1 U	0.62 R	0.61 R	0.63 R	0.62 R	0.64 R	0.61 R
Sodium	2360	494 R	413 R	511 R	402 R	433 R	125 R
Thallium	0.24 B	0.21 R	0.2 R	0.21 R	0.21 R	0.21 R	0.2 R
Titanium	NA	2870 J	3180 J	2860 J	1950 J	1930 J	244 J
Vanadium	49.7	77.1	84.9	69.8	53.2	52.2	9.8 R
Zinc	3160 *	50.1	49.9	50	52.6	115	14.1
Zirconium	NA	28	28.6	27.9	26.1	22	2.2 R

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 3 1 2 9 3 3 0 6 5 8

SDG (WHC)	23	28					
Sample No	BOOZ59	BOOZT3	BOOZT4	BOOZT7	BOOZT8	BOOZT9	BOOZV0
Sample Location	TP-11	TP-3B	TP-3B	TP-3A	TP-3A	TP-3A	TP-3A
Sample Depth	4	7-7.5	7-7.5	5	10	19	21-22
VOLATILE ORGANICS							
Methylene Chloride	6 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	26 B	10 U	10 U	11 U	7 J	11 U	10 U
2-Butanone	11 U	10 U	10 U	11 U	11 U	11 U	10 U
Benzene	6 U	0.3 J	5 U	5 U	5 U	5 U	5 U
Tetrachloroethene	4 J	5 U	5 U	5 U	5 U	5 U	5 U
Toluene	6 U	5 U	5 U	5 U	5 U	5 U	5 U
SEMI VOLATILE ORG							
Benzoic Acid	160 BJ	NA	NA	NA	NA	NA	NA
BEHP	100 BJ	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U
Pyrene	750 U	270 J	1400 U	1400 U	1400 U	220 J	1300 U
1,2,4-Trichlorobenzene	750 U	230 J	1400 U	1400 U	1400 U	1400 U	1300 U
Acenaphthene	750 U	180 J	1400 U	1400 U	1400 U	320 J	1300 U
Phenol	750 U	1400 U	1400 U	1400 U	1400 U	330 J	1300 U
2-Chlorophenol	750 U	1400 U	1400 U	1400 U	1400 U	240 J	1300 U
Di-n-Octylphthlalate	750 U	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U
2-Methylnaphthalene	750 U	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U
Naphthalene	750 U	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U
Pentachlorophenol	3600 U	6700 U	6700 U	6700 U	6800 U	6800 U	6500 U
Di-n-Butyl	750 U	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U
Fluoranthrene	750 U	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U
Phenanthrene	750 U	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U
Anthracene	750 U	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U
Benzo(a)anthracene	750 U	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U
Chrysene	750 U	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U
2,6-Dinitrotoluene	750 U	1400 U	1400 U	1400 U	1400 U	1400 U	1300 U

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	23	28					
Sample No	BOOZ59	BOOZT3	BOOZT4	BOOZT7	BOOZT8	BOOZT9	BOOZV0
Sample Location	TP-11	TP-3B	TP-3B	TP-3A	TP-3A	TP-3A	TP-3A
Sample Depth	4	7-7.5	7-7.5	5	10	19	21-22
PEST/PCB's							
Dieldrin	3.9 JX	17 U	16 U	17 U	17 U	17 U	16 U
Aroclor 1248	90 U	83 U	82 U	84 U	85 U	85 U	85 U
Aroclor 1254	94 J	170 U	160 U	170 U	17 J	48 J	160 U
Aroclor 1260	180 U	170 U	160 U	170 U	170 U	170 U	160 U
Endrin	6.7 JX	17 U	16 U	17 U	17 U	7.2 J	16 U
Aldrin	1 J	8.3 U	8.2 U	8.4 U	8.5 U	0.96 J	8.2 U
4,4'-DDD	18 U	17 U	16 U	17 U	17 U	17 U	16 U
Alpha Chlordane	90 U	83 U	82 U	84 U	1.3 J	85 U	82 U
Beta-BHC	9 U	8.3 U	8.2 U	8.4 U	8.5 U	8.5 U	8.2 U
Gamma Chlordane	90 U	83 U	82 U	84 U	85 U	85 U	82 U
4,4'-DDE	18 U	17 U	16 U	17 U	17 U	17 U	16 U
Endosulfan Sulfate	18 U	17 U	16 U	17 U	17 U	17 U	16 U
Endrin Ketone	18 U	17 U	16 U	17 U	17 U	17 U	16 U
Methoxychlor	90 U	83 U	82 U	84 U	85 U	85 U	82 U
4,4'-DDT	18 U	17 U	16 U	17 U	17 U	17 U	16 U
Endosulfan II	18 U	17 U	16 U	17 U	17 U	17 U	16 U

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 3 1 2 9 3 3 0 6 6 0

SDG (WHC)	28		29	27	23		30
Sample No	BOOZV1	BOOZV2	BOOZV3	BOOZT2	BOOZT0	BOOZT1	BOOZX4
Sample Location	TP-4/5	TP-4/5	TP-8	TP-7	TP-1	TP-1	B5-1
Sample Depth	5	12	5	5	5	9	S
INORGANICS							
Aluminum	4700 J	5750 J	12600	8390	NA	NA	NA
Antimony	5.2 R	5.2 R	7.3 UN	11.3 J	NA	NA	NA
Arsenic	0.21 R	0.21 R	0.74 JN	2.9 J	NA	NA	NA
Barium	68.4	72.2	144	90.7	NA	NA	NA
Beryllium	0.21 R	0.21 R	0.55 N	0.23 U	NA	NA	NA
Cadmium	0.62 R	1 R	0.88 U	0.64 U	NA	NA	NA
Calcium	5540	5610	11600	11000	NA	NA	NA
Chromium	3.2 J	133 J	19.8 J	9.8	NA	NA	NA
Cobalt	12.7	14.2	15.8	4.5 J	NA	NA	NA
Copper	13.5	25.3	523	9.9	NA	NA	NA
Cyanide	2.6 U	2.6 U	3.7 U	2.7 U	NA	NA	NA
Iron	23400 J	22500 J	32700	7950	NA	NA	NA
Lead	2.5	43.4	18.1 J	19.4 J	NA	NA	NA
Magnesium	3790	3120	6390	1730	NA	NA	NA
Manganese	264 J	266 J	485	125	NA	NA	NA
Mercury	0.1 U	0.1 U	1.15 U	0.11 U	NA	NA	NA
Molybdenum	NR	NR	NR	0.42 U	NA	NA	NA
Nickel	5.9 R	71.6	14	57.3	NA	NA	NA
Potassium	613 R	567 R	1970	1270	NA	NA	NA
Selenium	0.21 R	0.21 R	0.29 U	0.21 UJ	NA	NA	NA
Silver	0.62 R	0.63 R	1.3 J	0.64 U	NA	NA	NA
Sodium	386 R	340 R	811 J	1240	NA	NA	NA
Thallium	0.21 R	0.21 R	0.31 J	0.21 U	NA	NA	NA
Titanium	2350 J	2180 J	NA	244 J	NA	NA	NA
Vanadium	63.6	59	85	45.1	NA	NA	NA
Zinc	41.6	239	103	34.4	NA	NA	NA
Zirconium	26.4	20.8	NA	11.7	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	28		29	27	23		30
Sample No	BOOZV1	BOOZV2	BOOZV3	BOOZT2	BOOZT0	BOOZT1	BOOZX4
Sample Location	TP-4/5	TP-4/5	TP-8	TP-7	TP-1	TP-1	B5-1
Sample Depth	5	12	5	5	5	9	S
VOLATILE ORGANICS							
Methylene Chloride	5 U	6 U	5 U	5 U	5 U	5 U	NA
Acetone	11 U	12 U	10 U	11 U	11 B	11 U	NA
2-Butanone	11 U	12 U	10 U	11 U	10 U	11 U	NA
Benzene	5 U	6 U	5 U	5 U	5 U	5 U	NA
Tetrachloroethene	5 U	6 U	5 U	5 U	5 U	5 U	NA
Toluene	5 U	6 U	5 U	5 U	5 U	5 U	NA
SEMI VOLATILE ORG							
Benzoic Acid	NA	NA	6500 U	1800 U	3300 U	NA	NA
BEHP	92 J	76 J	110 J	360 U	670 U	220 J	NA
Pyrene	210 J	1600 U	240 J	130 J	670 U	79 J	NA
1,2,4-Trichlorobenzene	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
Acenaphthene	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
Phenol	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
2-Chlorophenol	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
Di-n-Octylphthlalate	270 BJ	1600 U	1300 U	360 U	670 U	710 U	NA
2-Methylnaphthalene	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
Naphthalene	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
Pentachlorophenol	6900 U	8000 U	6500 U	1800 U	3300 U	3400 U	NA
Di-n-Butyl	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
Fluoranthrene	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
Phenanthrene	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
Anthracene	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
Benzo(a)anthracene	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
Chrysene	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA
2,6-Dinitrotoluene	1400 U	1600 U	1300 U	360 U	670 U	710 U	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 3 1 2 9 3 3 0 6 6 2

SDG (WHC)	28		29	27	23		30
Sample No	BOOZV1	BOOZV2	BOOZV3	BOOZT2	BOOZT0	BOOZT1	BOOZX4
Sample Location	TP-4/5	TP-4/5	TP-8	TP-7	TP-1	TP-1	B5-1
Sample Depth	5	12	5	5	5	9	S
PEST/PCB's							
Dieldrin	8.5 U	1.5 J	21 X	17 U	16 U	90 X	4.3 U
Aroclor 1248	43 U	50 U	82 U	87 U	82 U	86 U	9.6 BJ
Aroclor 1254	85 U	30 J	330	170 U	180 U	2000	43 U
Aroclor 1260	85 U	100 U	160 U	170 U	160 U	170 U	43 U
Endrin	8.5 U	2.4 J	33 X	17 U	16 U	120 X	4.3 U
Aldrin	4.3 U	0.22 J	8.2 U	8.7 U	8.2 U	5.5 J	0.3 JX
4,4'-DDD	8.5 U	0.64 J	16 U	17 U	16 U	6 J	4.3 U
Alpha Chlordane	43 U	50 U	13 JX	87 U	82 U	86 U	21 U
Beta-BHC	4.3 U	5 U	1.2 J	8.7 U	8.2 U	8.6 U	2.1 U
Gamma Chlordane	43 U	50 U	82 U	87 U	82 U	86 U	21 U
4,4'-DDE	8.5 U	10 U	16 U	17 U	16 U	17 U	4.3 U
Endosulfan Sulfate	8.5 U	10 U	16 U	17 U	16 U	17 U	4.3 U
Endrin Ketone	8.5 U	10 U	16 U	17 U	16 U	17 U	4.3 U
Methoxychlor	43 U	50 U	82 U	87 U	82 U	86 U	21 U
4,4'-DDT	8.5 U	6.1 J	16 U	17 U	16 U	17 U	4.3 U
Endosulfan II	8.5 U	10 U	16 U	17 U	16 U	17 U	4.3 U

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	30	31		30		31	6
Sample No	BOOZX5	BOOZX7	BOOZY0	BOOZW6	BOOZW7	BOOZX9	BOOGB0
Sample Location	B5-2	B5-3	B5-3	B4-1	B4-1	B5-3	B5-3
Sample Depth	1	S	1'	S	1	S	0-1
INORGANICS							
Aluminum	NA	NA	NA	NA	NA	NA	5430
Antimony	NA	NA	NA	NA	NA	NA	5.9 NJ
Arsenic	NA	NA	NA	NA	NA	NA	1.2 NJ
Barium	NA	NA	NA	NA	NA	NA	73.6
Beryllium	NA	NA	NA	NA	NA	NA	0.55 J
Cadmium	NA	NA	NA	NA	NA	NA	0.62 UN
Calcium	NA	NA	NA	NA	NA	NA	5200
Chromium	NA	NA	NA	NA	NA	NA	8.7
Cobalt	NA	NA	NA	NA	NA	NA	14.4
Copper	NA	NA	NA	NA	NA	NA	16.7
Cyanide	NA	NA	NA	NA	NA	NA	2.6 U
Iron	NA	NA	NA	NA	NA	NA	25400
Lead	NA	NA	NA	NA	NA	NA	5.7
Magnesium	NA	NA	NA	NA	NA	NA	4290
Manganese	NA	NA	NA	NA	NA	NA	303 JN
Mercury	NA	NA	NA	NA	NA	NA	0.1 U
Molybdenum	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	7.6 J
Potassium	NA	NA	NA	NA	NA	NA	1050
Selenium	NA	NA	NA	NA	NA	NA	0.21 U
Silver	NA	NA	NA	NA	NA	NA	0.83 U
Sodium	NA	NA	NA	NA	NA	NA	241 J
Thallium	NA	NA	NA	NA	NA	NA	NR
Titanium	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	70.3 J
Zinc	NA	NA	NA	NA	NA	NA	49.9
Zirconium	NA	NA	NA	NA	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 3 1 2 9 3 3 0 6 6 4

SDG (WHC)	30	31		30		31	6
Sample No	BOOZX5	BOOZX7	BOOZY0	BOOZW6	BOOZW7	BOOZX9	BOOGB0
Sample Location	B5-2	B5-3	B5-3	B4-1	B4-1	B5-3	B5-3
Sample Depth	1	S	1'	S	1	S	0-1
VOLATILE ORGANICS							
Methylene Chloride	NA	NA	NA	NA	NA	NA	5 U
Acetone	NA	NA	NA	NA	NA	NA	10 U
2-Butanone	NA	NA	NA	NA	NA	NA	10 U
Benzene	NA	NA	NA	NA	NA	NA	5 U
Tetrachloroethene	NA	NA	NA	NA	NA	NA	5 U
Toluene	NA	NA	NA	NA	NA	NA	3 J
SEMI VOLATILE ORG							
Benzoic Acid	NA	NA	NA	NA	NA	NA	3300 U
BEHP	NA	NA	NA	NA	NA	NA	680 U
Pyrene	NA	NA	NA	NA	NA	NA	680 U
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	680 U
Acenaphthene	NA	NA	NA	NA	NA	NA	680 UJ
Phenol	NA	NA	NA	NA	NA	NA	680 U
2-Chlorophenol	NA	NA	NA	NA	NA	NA	680 U
Di-n-Octylphthlalate	NA	NA	NA	NA	NA	NA	680 UJ
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	680 U
Naphthalene	NA	NA	NA	NA	NA	NA	680 U
Pentachlorophenol	NA	NA	NA	NA	NA	NA	3300 U
Di-n-Butyl	NA	NA	NA	NA	NA	NA	680 U
Fluoranthrene	NA	NA	NA	NA	NA	NA	680 U
Phenanthrene	NA	NA	NA	NA	NA	NA	680 U
Anthracene	NA	NA	NA	NA	NA	NA	680 U
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	680 U
Chrysene	NA	NA	NA	NA	NA	NA	680 UJ
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	680 UJ

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	30	31		30		31	6
Sample No	BOOZX5	BOOZX7	BOOZY0	BOOZW6	BOOZW7	BOOZX9	BOOGB0
Sample Location	B5-2	B5-3	B5-3	B4-1	B4-1	B5-3	B5-3
Sample Depth	1	S	1'	S	1	S	0-1
PEST/PCB's							
Dieldrin	4.2 U	4.3 U	4.3 U	5.3 U	72	4.2 U	NA
Aroclor 1248	14 BJ	22 U	21 U	26 U	23 U	21 U	NA
Aroclor 1254	42 U	43 U	42 U	53 U	45 U	42 U	NA
Aroclor 1260	42 U	43 U	42 U	53 U	45 U	42 U	NA
Endrin	4.2 U	4.3 U	4.3 U	5.3 U	4.5 U	4.2 U	NA
Aldrin	2.1 U	2.2 U	2.1 U	8.6	11	2.1 U	NA
4,4'-DDD	4.2 U	4.3 U	4.3 U	5.3 U	4.5 U	4.2 U	NA
Alpha Chlordane	0.75 BJX	22 U	21 U	4.3 BJ	5.8 BJ	21 U	NA
Beta-BHC	2.1 U	2.2 U	2.1 U	2.6 U	2.3 U	2.1 U	NA
Gamma Chlordane	2.5 J	22 U	21 U	13 J	21 J	21 U	NA
4,4'-DDE	4.2 U	4.3 U	4.3 U	75	98	0.32 J	NA
Endosulfan Sulfate	4.2 U	4.3 U	4.3 U	19	4.5 U	4.2 U	NA
Endrin Ketone	4.2 U	4.3 U	4.3 U	13	4.5 U	4.2 U	NA
Methoxychlor	21 U	22 U	21 U	26 U	23 U	21 U	NA
4,4'-DDT	3.8 JX	4.3 U	4.3 U	130	240	1 J	NA
Endosulfan II	4.2 U	4.3 U	4.3 U	5.3 U	4.5 U	4.2 U	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

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SDG (WHC)	6						
Sample No	BOOGB1	BOOGB2	BOOGB3	BOOGB4	BOOGB5	BOOGB7	BOOG92
Sample Location	B5-3	B5-2	B5-2	B4-1	B4-1	B4-1	PCB-1
Sample Depth	1-2	0-1	1-2	0-1	0-1	1-2	0-1
INORGANICS							
Aluminum	5900	5750	4260	14200	15800	8170	NA
Antimony	5 UJN	5 UJN	5 UJN	6.5 UJN	15.6 NJ	6.8 NJ	NA
Arsenic	1.2 NJ	0.86 NJ	0.76 NJ	1.8 NJ	1.8 NJ	1.2 NJ	NA
Barium	65	93.7	68.7	426	427	206	NA
Beryllium	0.48 J	0.42 J	0.42 J	1 J	1.1 J	0.77 J	NA
Cadmium	0.62 UN	0.62 UN	0.62 UN	0.81 UN	0.82 UN	0.65 UN	NA
Calcium	5050	6820	5880	46600	42900	18100	NA
Chromium	5.4 U	7.3	4.2 U	12.5	12.9	6.9	NA
Cobalt	14.8	15.9	15.4	5.9 J	6.7 J	11.3	NA
Copper	16.7	15.4	15.6	31.5	25.3	17.8	NA
Cyanide	2.6 U	2.6 U	2.6 U	3.4 U	3.4 U	2.7 U	NA
Iron	28900	27100	28700	16400	18000	23200	NA
Lead	5.3	9.1	5	41	36.3	10.3	NA
Magnesium	4770	4770	4180	6380	6340	5430	NA
Manganese	343 JN	336 JN	324 JN	131 JN	153 JN	246 JN	NA
Mercury	0.1 U	0.1 U	0.1 U	0.15	0.14 U	0.11 U	NA
Molybdenum	NA	NA	NA	NA	NA	NA	NA
Nickel	6.3 J	10.5	8 B	6.4 J	7.4 J	4.6 J	NA
Potassium	791 J	1380	1140	954 J	1010 J	661 J	NA
Selenium	0.21 U	0.21 U	0.21 U	0.97 J	0.79 J	0.35 J	NA
Silver	0.83 U	0.83 U	0.83 U	1.1 U	1.1 U	0.87 U	NA
Sodium	277 J	378 J	258 J	4240	4450	1790	NA
Thallium	NR	NR	NR	NR	NR	NR	NA
Titanium	NA	NA	NA	NA	NA	NA	NA
Vanadium	75.7 J	76.8 J	79.1 J	27.5 J	30.5 J	59.1 J	NA
Zinc	54.7	63.2	52	47.4	44.2	45.3	NA
Zirconium	NA	NA	NA	NA	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	6						
Sample No	BOOGB1	BOOGB2	BOOGB3	BOOGB4	BOOGB5	BOOGB7	BOOG92
Sample Location	B5-3	B5-2	B5-2	B4-1	B4-1	B4-1	PCB-1
Sample Depth	1-2	0-1	1-2	0-1	0-1	1-2	0-1
VOLATILE ORGANICS							
Methylene Chloride	5 U	5 U	5 U	2 J	7 U	6 U	NA
Acetone	10 U	10 U	10 U	14 U	14 U	12 U	NA
2-Butanone	10 U	10 U	10 U	35	20	18	NA
Benzene	5 U	5 U	5 U	7 U	7 U	6 U	NA
Tetrachloroethene	5 U	5 U	5 U	7 U	7 U	6 U	NA
Toluene	5 U	5 U	1 J	8	5 J	9	NA
SEMI VOLATILE ORG							
Benzoic Acid	3300 U	3300 U	3300 U	4400 U	4400 U	3800 U	NA
BEHP	690 UJ	680 UJ	680 UJ	1100 UJ	1100 UJ	790 UJ	NA
Pyrene	690 U	680 U	680 U	83 J	100 J	88 J	NA
1,2,4-Trichlorobenzene	690 U	680 U	680 U	900 UJ	900 UJ	790 U	NA
Acenaphthene	690 U	680 U	680 U	900 U	900 U	790 U	NA
Phenol	690 UJ	680 UJ	680 UJ	900 UJ	900 UJ	790 UJ	NA
2-Chlorophenol	690 U	680 U	680 U	680 U	900 U	790 UJ	NA
Di-n-Octylphthlalate	690 UJ	680 UJ	680 UJ	900 UJ	900 UJ	790 UJ	NA
2-Methylnaphthalene	690 U	680 U	680 U	400 J	390 J	180 J	NA
Naphthalene	690 U	680 U	680 U	150 J	150 J	790 U	NA
Pentachlorophenol	3300 U	3300 U	3300 U	980 J	620 J	380 U	NA
Di-n-Butyl	690 U	680 U	680 U	65 J	900 UJ	790 UJ	NA
Fluoranthrene	690 U	680 U	680 U	93 J	120 J	62 J	NA
Phenanthrene	690 U	680 U	680 U	900 UJ	250 J	380 J	NA
Anthracene	690 U	680 U	680 U	900 UJ	70 J	790 UJ	NA
Benzo(a)anthracene	690 U	680 U	680 U	900 UJ	93 J	790 UJ	NA
Chrysene	690 UJ	680 UJ	680 UJ	900 UJ	110 J	790 UJ	NA
2,6-Dinitrotoluene	690 UJ	680 UJ	680 UJ	900 UJ	900 UJ	210 J	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 3 1 2 9 3 3 0 6 6 8

SDG (WHC)	6						
Sample No	BOOGB1	BOOGB2	BOOGB3	BOOGB4	BOOGB5	BOOGB7	BOOG92
Sample Location	B5-3	B5-2	B5-2	B4-1	B4-1	B4-1	PCB-1
Sample Depth	1-2	0-1	1-2	0-1	0-1	1-2	0-1
PEST/PCB's							
Dieldrin	NA	NA	NA	NA	NA	NA	33 U
Aroclor 1248	NA	NA	NA	NA	NA	NA	49000 DJ
Aroclor 1254	NA	NA	NA	NA	NA	NA	330 UJ
Aroclor 1260	NA	NA	NA	NA	NA	NA	330 UJ
Endrin	NA	NA	NA	NA	NA	NA	33 U
Aldrin	NA	NA	NA	NA	NA	NA	16 U
4,4'-DDD	NA	NA	NA	NA	NA	NA	33 U
Alpha Chlordane	NA	NA	NA	NA	NA	NA	160 U
Beta-BHC	NA	NA	NA	NA	NA	NA	16 U
Gamma Chlordane	NA	NA	NA	NA	NA	NA	160 U
4,4'-DDE	NA	NA	NA	NA	NA	NA	33 U
Endosulfan Sulfate	NA	NA	NA	NA	NA	NA	33 U
Endrin Ketone	NA	NA	NA	NA	NA	NA	33 U
Methoxychlor	NA	NA	NA	NA	NA	NA	160 U
4,4'-DDT	NA	NA	NA	NA	NA	NA	33 U
Endosulfan II	NA	NA	NA	NA	NA	NA	33 U

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	6						
Sample No	BOOG93	BOOG94	BOOG95	BOOG96	BOOG97	BOOG98	BOOG99
Sample Location	PCB-1	PCB-2	PCB-2	PCB-3	PCB-3	PCB-4	PCB-4
Sample Depth	1-2	0-1	1-2	0-1	1-2	0-1	1-2
INORGANICS							
Aluminum	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA
Titanium	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA
Zirconium	NA	NA	NA	NA	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 3 1 2 9 3 3 0 6 7 0

SDG (WHC)	6						
Sample No	BOOG93	BOOG94	BOOG95	BOOG96	BOOG97	BOOG98	BOOG99
Sample Location	PCB-1	PCB-2	PCB-2	PCB-3	PCB-3	PCB-4	PCB-4
Sample Depth	1-2	0-1	1-2	0-1	1-2	0-1	1-2
VOLATILE ORGANICS							
Methylene Chloride	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA
SEMI VOLATILE ORG							
Benzoic Acid	NA	NA	NA	NA	NA	NA	NA
BEHP	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA
Di-n-Octylphthlalate	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA
Di-n-Butyl	NA	NA	NA	NA	NA	NA	NA
Fluoranthrene	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	6						
Sample No	BOOG93	BOOG94	BOOG95	BOOG96	BOOG97	BOOG98	BOOG99
Sample Location	PCB-1	PCB-2	PCB-2	PCB-3	PCB-3	PCB-4	PCB-4
Sample Depth	1-2	0-1	1-2	0-1	1-2	0-1	1-2
PEST/PCB's							
Dieldrin	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Aroclor 1248	41000 DJ	80000 DJ	100000 DJ	6100 J	15000 DJ	21000 DJ	1500 J
Aroclor 1254	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ
Aroclor 1260	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ	330 UJ
Endrin	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Aldrin	16 UJ	16 UJ	16 UJ	16 UJ	16 UJ	16 UJ	16 UJ
4,4'-DDD	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Alpha Chlordane	160 U	160 U	160 U	160 U	160 U	160 U	160 U
Beta-BHC	16 U	16 U	16 U	16 U	16 U	16 U	16 U
Gamma Chlordane	160 U	160 U	160 U	160 U	160 U	160 U	160 U
4,4'-DDE	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Endosulfan Sulfate	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Endrin Ketone	33 U	33 U	33 U	33 U	33 U	33 U	33 UJ
Methoxychlor	160 U	160 U	160 U	160 U	160 U	160 U	18 J
4,4'-DDT	33 U	33 U	33 U	33 U	33 U	33 U	33 U
Endosulfan II	33 U	33 U	33 U	33 U	33 U	33 U	33 UJ

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 3 1 2 9 3 3 0 6 7 2

SDG (WHC)	30						
Sample No	BOOZV4	BOOZV5	BOOZV6	BOOZV7	BOOZV8	BOOZV9	BOOZX6
Sample Location	PCB-2A	PCB-2A	PCB-3A	PCB-3A	PCB-3A	PCB-4A	PCB-2A
Sample Depth	1	1.5	S	1	20"	S	1.5
INORGANICS							
Aluminum	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA
Titanium	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA
Zirconium	NA	NA	NA	NA	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	30						
Sample No	BOOZV4	BOOZV5	BOOZV6	BOOZV7	BOOZV8	BOOZV9	BOOZX6
Sample Location	PCB-2A	PCB-2A	PCB-3A	PCB-3A	PCB-3A	PCB-4A	PCB-2A
Sample Depth	1	1.5	S	1	20"	S	1.5
VOLATILE ORGANICS							
Methylene Chloride	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA
SEMI VOLATILE ORG							
Benzoic Acid	NA	NA	NA	NA	NA	NA	NA
BEHP	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA
Di-n-Octylphthlalate	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA
Di-n-Butyl	NA	NA	NA	NA	NA	NA	NA
Fluoranthrene	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 3 1 2 9 5 3 0 6 7 4

SDG (WHC)	30						
Sample No	BOOZV4	BOOZV5	BOOZV6	BOOZV7	BOOZV8	BOOZV9	BOOZX6
Sample Location	PCB-2A	PCB-2A	PCB-3A	PCB-3A	PCB-3A	PCB-4A	PCB-2A
Sample Depth	1	1.5	S	1	20"	S	1.5
PEST/PCB's							
Dieldrin	240 X	410 X	100 X	770 X	250 X	4.1 U	4.2 U
Aroclor 1248	8500 BD	12000 BD	3500 BD	23000 BD	9700 BD	16000 BD	2300 B
Aroclor 1254	42 U	42 U	41 U	42 U	42 U	41 U	42 U
Aroclor 1260	42 U	42 U	41 U	42 U	42 U	41 U	42 U
Endrin	61 X	100 X	28 X	200 X	61 X	110 X	39 X
Aldrin	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U	2.1 U
4,4'-DDD	4.2 U	4.2 U	4.1 U	4.2 U	4.2 U	4.1 U	4.2 U
Alpha Chlordane	170 BX	280 BX	74 BX	520 BX	180 BX	290 BX	96 BX
Beta-BHC	13 X	22 X	2.1 U	2.1 U	2.1 U	2.1 U	5.5 X
Gamma Chlordane	21 U	21 U	21 U	21 U	21 U	21 U	21 U
4,4'-DDE	4.2 U	4.2 U	4.1 U	4.2 U	4.2 U	4.1 U	4.2 U
Endosulfan Sulfate	4.2 U	4.2 U	4.1 U	4.2 U	4.2 U	4.1 U	4.2 U
Endrin Ketone	28 X	45 X	4.1 X	93 X	23 X	48 X	14 X
Methoxychlor	28 X	46 X	9.7 JX	95 X	21 U	48 X	15 JX
4,4'-DDT	120 X	200 X	4.1 U	4.2 U	120 X	210 X	4.2 U
Endosulfan II	20 X	36 X	9.6 X	4.2 U	4.2 U	4.1 U	4.2 U

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	30				
Sample No	BOOZW1	BOOZW2	BOOZW3	BOOZW4	BOOZW5
Sample Location	PCB-4A	PCB-4A	PCB-1A	PCB-1A	PCB-1A
Sample Depth	S	1	S	1	1.5
INORGANICS					
Aluminum	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA
Titanium	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA
Zirconium	NA	NA	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 3 1 2 9 3 3 0 6 7 6

SDG (WHC)	30				
Sample No	BOOZW1	BOOZW2	BOOZW3	BOOZW4	BOOZW5
Sample Location	PCB-4A	PCB-4A	PCB-1A	PCB-1A	PCB-1A
Sample Depth	S	1	S	1	1.5
VOLATILE ORGANICS					
Methylene Chloride	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA
SEMI VOLATILE ORG					
Benzoic Acid	NA	NA	NA	NA	NA
BEHP	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA
Di-n-Octylphthlalate	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA
Di-n-Butyl	NA	NA	NA	NA	NA
Fluoranthrene	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	30				
Sample No	BOOZW1	BOOZW2	BOOZW3	BOOZW4	BOOZW5
Sample Location	PCB-4A	PCB-4A	PCB-1A	PCB-1A	PCB-1A
Sample Depth	S	1	S	1	1.5
PEST/PCB's					
Dieldrin	1100 X	1200 X	620 X	820 X	1200 X
Aroclor 1248	36000 BD	39000 BD	20000	29000 BD	43000 BD
Aroclor 1254	42 U	41 U	41	41 U	41 U
Aroclor 1260	42 U	41 U	41	41 U	41 U
Endrin	240 X	270 X	150	180 X	280 X
Aldrin	2.1 U	2.1 U	2 U	2 U	2 U
4,4'-DDD	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U
Alpha Chlordane	680 BX	770 BX	410	540 BX	780 BX
Beta-BHC	2.1 U	75 X	24 BX	50 X	94 X
Gamma Chlordane	21 U	21	20 U	20 U	20 U
4,4'-DDE	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U
Endosulfan Sulfate	4.2 U	4.1 U	4.1 U	4.1 U	4.1 U
Endrin Ketone	120 X	140 X	67 X	81 X	140 X
Methoxychlor	120 X	140 X	66 X	81 X	140 X
4,4'-DDT	520 X	4.1 U	4.1 U	4.1 U	4.1 U
Endosulfan II	98 X	110 X	55 X	66 X	110 X

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 5 1 2 9 3 3 0 6 7 8

SDG (WHC)	BOOG51						
Sample No	BOOG76	BOOG51	BOOG52	BOOG53	BOOG54	BOOG77	BOOG56
Sample Location	E1	E2	E3	E4	E4	E5	E6
Sample Depth	S	S	S	S	S	S	S
INORGANICS							
Aluminum	NA	NA	NA	NA	NA	NA	NA
Antimony	NA	NA	NA	NA	NA	NA	NA
Arsenic	NA	NA	NA	NA	NA	NA	NA
Barium	NA	NA	NA	NA	NA	NA	NA
Beryllium	NA	NA	NA	NA	NA	NA	NA
Cadmium	NA	NA	NA	NA	NA	NA	NA
Calcium	NA	NA	NA	NA	NA	NA	NA
Chromium	NA	NA	NA	NA	NA	NA	NA
Cobalt	NA	NA	NA	NA	NA	NA	NA
Copper	NA	NA	NA	NA	NA	NA	NA
Cyanide	NA	NA	NA	NA	NA	NA	NA
Iron	NA	NA	NA	NA	NA	NA	NA
Lead	NA	NA	NA	NA	NA	NA	NA
Magnesium	NA	NA	NA	NA	NA	NA	NA
Manganese	NA	NA	NA	NA	NA	NA	NA
Mercury	NA	NA	NA	NA	NA	NA	NA
Molybdenum	NA	NA	NA	NA	NA	NA	NA
Nickel	NA	NA	NA	NA	NA	NA	NA
Potassium	NA	NA	NA	NA	NA	NA	NA
Selenium	NA	NA	NA	NA	NA	NA	NA
Silver	NA	NA	NA	NA	NA	NA	NA
Sodium	NA	NA	NA	NA	NA	NA	NA
Thallium	NA	NA	NA	NA	NA	NA	NA
Titanium	NA	NA	NA	NA	NA	NA	NA
Vanadium	NA	NA	NA	NA	NA	NA	NA
Zinc	NA	NA	NA	NA	NA	NA	NA
Zirconium	NA	NA	NA	NA	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

SDG (WHC)	BOOG51						
Sample No	BOOG76	BOOG51	BOOG52	BOOG53	BOOG54	BOOG77	BOOG56
Sample Location	E1	E2	E3	E4	E4	E5	E6
Sample Depth	S	S	S	S	S	S	S
VOLATILE ORGANICS							
Methylene Chloride	NA	NA	NA	NA	NA	NA	NA
Acetone	NA	NA	NA	NA	NA	NA	NA
2-Butanone	NA	NA	NA	NA	NA	NA	NA
Benzene	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	NA	NA	NA	NA	NA	NA	NA
Toluene	NA	NA	NA	NA	NA	NA	NA
SEMI VOLATILE ORG							
Benzoic Acid	NA	NA	NA	NA	NA	NA	NA
BEHP	NA	NA	NA	NA	NA	NA	NA
Pyrene	NA	NA	NA	NA	NA	NA	NA
1,2,4-Trichlorobenzene	NA	NA	NA	NA	NA	NA	NA
Acenaphthene	NA	NA	NA	NA	NA	NA	NA
Phenol	NA	NA	NA	NA	NA	NA	NA
2-Chlorophenol	NA	NA	NA	NA	NA	NA	NA
Di-n-Octylphthlalate	NA	NA	NA	NA	NA	NA	NA
2-Methylnaphthalene	NA	NA	NA	NA	NA	NA	NA
Naphthalene	NA	NA	NA	NA	NA	NA	NA
Pentachlorophenol	NA	NA	NA	NA	NA	NA	NA
Di-n-Butyl	NA	NA	NA	NA	NA	NA	NA
Fluoranthrene	NA	NA	NA	NA	NA	NA	NA
Phenanthrene	NA	NA	NA	NA	NA	NA	NA
Anthracene	NA	NA	NA	NA	NA	NA	NA
Benzo(a)anthracene	NA	NA	NA	NA	NA	NA	NA
Chrysene	NA	NA	NA	NA	NA	NA	NA
2,6-Dinitrotoluene	NA	NA	NA	NA	NA	NA	NA

TABLE D-1 Summary of Phase II Soil Sampling Analytical Results

9 3 1 2 9 3 3 0 6 8 0

SDG (WHC)	BOOG51						
Sample No	BOOG76	BOOG51	BOOG52	BOOG53	BOOG54	BOOG77	BOOG56
Sample Location	E1	E2	E3	E4	E4	E5	E6
Sample Depth	S	S	S	S	S	S	S
PEST/PCB's							
Dieldrin	34 U	34 U	35 U	33 U	34 U	35 U	38 U
Aroclor 1248	170 U	170 U	180 U	170 U	170 U	180 U	190 U
Aroclor 1254	340 U	340 U	350 U	330 U	340 U	350 U	190 U
Aroclor 1260	340 U	42000	11000 XJ	330 U	340 U	350 U	380 U
Endrin	34 U	34 U	35 U	33 U	34 U	35 U	38 U
Aldrin	17 U	17 U	18 U	17 U	17 U	18 U	19 U
4,4'-DDD	34 U	34 U	35 U	33 U	34 U	35 U	38 U
Alpha Chlordane	1100	340	280	210	290	960 XJ	710
Beta-BHC	17 U	17 U	18 U	17 U	17 U	18 U	19 U
Gamma Chlordane	1700	610 XJ	420	330	440	1600 XJ	1000
4,4'-DDE	34 U	34 U	35 U	33 U	34 U	35 U	38 U
Endosulfan Sulfate	34 U	34 U	35 U	33 U	34 U	35 U	38 U
Endrin Ketone	34 U	34 U	35 U	33 U	34 U	35 U	38 U
Methoxychlor	170 U	170 U	180 U	170 U	170 U	180 U	190 U
4,4'-DDT	34 U	34 U	35 U	33 U	34 U	35 U	38 U
Endosulfan II	34 U	34 U	35 U	33 U	34 U	35 U	38 U

Values associated with U qualifier are Sample Quantitation Limit (SQL)
NA indicates analysis not performed
SDG = Sample Delivery Group
WHC = Westinghouse Hanford Company

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9 3 1 2 5 3 6 2 1 0 5 6 8 1

ILIAS/eat

DEPARTMENT OF THE ARMY
NORTH PACIFIC DIVISION MATERIALS LABORATORY
CORPS OF ENGINEERS
1491 N.W. GRAHAM AVENUE
TROUTDALE, OREGON 97060-9503

CENPD-PE-GT-L (1110-1-8100c) 5 Aug 92

MEMORANDUM FOR: Commander, Walla Walla District, ATTN: CENPW-PL-ER (McBane)

SUBJECT: W.O. 92-M-239, Results of Chemical Analyses

Project: HORN RAPIDS LANDFILL
Intended Use: Evaluate site
Source of Material: Reference Chain of Custody Records
Submitted by: CENPW-PL-ER
Date Sampled: 23 Oct 91 Date Received: 9 Jul 92
Methods of Test: Reference Enclosure 1
Reference: DD Form 448 currently being processed

1. Enclosed are results of two solids samples which were submitted to evaluate and confirm their suspected identity. Included are:

a. Enclosure 1, Report number 9158 from ARDL, Inc.

b. Enclosure 2, Chain of Custody and Cooler Receipt forms.

2. If you have any questions or comments regarding this report, please contact Dr. Ajmal Ilias at (503) 665-4166.

3. This completes all work requested to date.

Enclosures

TIMOTHY J. SEEMAN
Director

TJS
seeman

ilias

Copy Furnished: CENPD-PE-GT
W.O. 92-M-239
Review File
Reading File

MFR: Self explanatory. Complete copy in office files.

ARDL REPORT 9158
CORPS OF ENGINEERS - PORTLAND DISTRICT
HORN RAPIDS SITE

DATE SUBMITTED: 7/09/92

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ARDL, Inc.

CHEMISTRY — BIOLOGY — PHYSIOLOGY — ENGINEERING
ENVIRONMENTAL ANALYSIS

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ARDL inc. applied research & development laboratory

CHEMISTRY • BIOLOGY • PHYSIOLOGY
ENGINEERING • ENVIRONMENTAL ANALYSIS

TO: Pam Swan, CENPD

FROM: R. L. Curtin, ARDL

DATE: 7/15/92

SUBJECT: Analytical Results
COE Samples HRL3A03 and HRL3A05
Horn Rapids Site

9312150484

INTRODUCTION

Two solid samples identified as noted above were received from CENPD. This laboratory was requested to evaluate the materials and confirm their suspected identity.

METHODS AND RESULTS

Sample HRL3A03 (ARDL 9158-1)

CENPD suspected that this sample was sodium bisulfate ($NaHSO_4$). Sodium bisulfate is water soluble (28.6 g/100 ml) and its solutions are acidic (pH 1.4 at 0.1 molar).

A quantity of the sample (25.8 g, as is) was dissolved in 100 ml of reagent water. The sample was incompletely soluble and the pH of the preparation was 0.3.

The preparation was filtered and the filtrate evaluated for sodium and sulfate concentration using Methods 7770 and 6010 for sodium and Method 9038 for sulfate. Based on sodium content, the sample contains 32% (w/w) sodium bisulfate. Based on sulfate content, the sample contains 42% sodium bisulfate.

The results observed suggest the following:

1) the sample contains approximately one-third sodium bisulfate; and

2) some free acid (probably sulfuric acid) is present.

P.O. Box 1566 • 1801 W. Forest Street • Mt. Vernon, Illinois 62864 • (618) 244-3235
"Test Everything - Keep The Good" 1 Thes. 5:21

Sample HRL3A05 (ARDL 9158-2)

CENPD suspected that the sample was potassium permanganate.

Potassium permanganate is a strong oxidant which is water soluble (6.4 g/100 ml). Its aqueous solutions are neutral and are characteristically purple in color.

Aqueous solutions of the sample were neutral and were the expected color. The material was incompletely soluble, however, and the depth of color observed suggested that permanganate was not a major constituent of the sample.

The solutions were evaluated for potassium and manganese concentration using Methods 7610 and 6010 for potassium and Methods 7460 and 6010 for manganese. The results obtained indicated that the permanganate concentration in the sample was considerably lower than expected.

Confirmation of these initial values was attempted by standardizing an aqueous solution of the sample against a sodium oxalate standard as described in Method 3500-Ca E (Standard Methods, 17th Edition). The results obtained indicated that, calculated as potassium permanganate, the oxidants present in the sample exceeded sample weight by a factor of approximately 4.

To resolve the contradictory results obtained, a weighed quantity of sample (100 g) was suspended in a known volume of water. After prolonged stirring, the preparation was filtered. The insolubles were recovered quantitatively (98.15%). The insolubles in the sample taken consisted of a considerable quantity of small pebbles and other soil constituents.

The filtrate was scanned over the visible range using a spectrophotometer. The scan obtained was compared with an aqueous solution of ACS grade potassium permanganate after diluting aliquots of the preparations so that their color intensities were approximately equivalent. Photocopies of the spectra obtained are attached. Similarities in the spectra conclusively show that the sample contains potassium permanganate. The spectra also show that another component (not identified) is also present in the sample.

A standard curve was prepared using aqueous solutions of reagent grade potassium permanganate of known concentration. A straight line with a correlation coefficient of 1.000 was obtained. The concentration of potassium permanganate in the sample extract described above was determined using this curve at 544.2 nm where it appeared that interference from other constituents would be minimal.

The results obtained indicate that the water soluble fraction of the sample contains 8.2% potassium permanganate.

S. Army Corps of Engs...

Proj. No.	Project Name: 1100-EM-1 Horn Rapids Landfill Trenching														
Sampler: (Signature) James A McBane															
Date	Time	Preservation	Grab	Comp	Site Code/Sample Number	Number of Containers	Confirm compound Sodium Bisulphate	Confirm Compound Potassium Permanganate							Remarks:
6/23/91	1415		X		HRL3AØ3	1 baggie	X								See notes
6/23/91	1445		X		HRL 3AØ5	1 baggie		X							See notes

① Original chain-of-custody broken months ago.

② Samples kept at room temperature over period of 8 months; no special preservation techniques taken.

③ Should either sample fail the confirmation for the listed compound, please perform whatever testing is required to identify the substance.

④ 7-day turnaround time requested

Sampler Relinquished by: J McBane	Date/Time 6/29/92 1300	Received by: (Sig.) Lisa Snyder	Date/Time 6/30/92 1000	Hazards Associated with Samples: Unknown - cleared for radiation @ Hanford Site.
Relinquished by: (Sig.) Lisa Snyder	Date/Time 6/30/92 1500	Received by: (Sig.)	Date/Time	
Relinquished by: (Sig)	Date/Time	Received for Laboratory by: (Sig.) Donna Cochran	Date/Time 07/01/92 0945	Remarks at time of receipt:
Custody Seal No.		Lab case No.: 9158		

ENG Form 5021-R, Oct 90

Proponent: CEMP-RT

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9 5 1 3 2 5 0 5 8 7

APPENDIX E

SUMMARY OF PHASE II GROUNDWATER ANALYTICAL RESULTS

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9 3 1 2 9 3 3 0 9 8 9

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1.0 INTRODUCTION

This report summarizes six 1100-EM-1 operable unit groundwater monitoring events as follows:

Round 5 - 3/91	Round 7 - 8/91	Round 8 - 11/91
Round 6 - 6/91	Round 7.5 - 9/91	Round 9 - 3/92

The report summarizes all available groundwater chemical analytical results for the 1100-EM-1 area for rounds 5 through 9. The complete chemical analytical results are presented in tables E-1 through E-5 of this appendix following the written summary.

Groundwater samples were analyzed for primary and relevant secondary drinking water, Washington Administrative Code (WAC) 173-304, RCRA groundwater monitoring parameters, general chemistry parameters, Contract Laboratory Program (CLP) Target Compound List (TCL) parameters, CLP Target Analyte List (TAL) parameters, coliform bacteria, and radiochemical parameters. The results have been broken down into the categories of volatile organics, semivolatile organics, pesticides, metals, wet chemistry, radioactive isotopes, and coliform bacteria for ease of comparison. WHC Office of Sample Management provided validated results for Round 5 and partially validated results for sampling Round 6. The remaining analytical data was validated by the U.S. Army Corps of Engineers. Data validation was conducted using the guidelines in Westinghouse Hanford Corporation *Data Validation Procedures for Chemical Analyses* (WHC, 1991-92).

Groundwater samples were obtained according to the Operable Unit Groundwater Sampling Schedule, table 4-1, from the Remedial Investigation (RI) Phase II Supplemental Work Plan for the Hanford Site 1100-EM-1 Operable Unit (DOE/RL-90-37).

2.0 GROUNDWATER CONTAMINATION

Groundwater data is tabulated according to monitoring well number, well identification tag, round number, and sample identifier. Upper tolerance limits (UTL's) are presented for ease of comparison.

2.1 VOLATILE ORGANICS

All data units for volatile organics are given in micrograms per liter(μg/l) unless specified otherwise. Monitoring well numbers 1, 3, 4, 9, 19, and S30-15A show no analyte compounds detected above the sample quantitation limit in Rounds 5 through 9.

Monitoring well numbers 6, 8, 10, 11, 13, 14, 15, 20, 21, S29-E12, and S32-E13A were found to contain the following positively identified and quantified analytes pertinent to quantitative risk assessment. Only values that exceeded site UTL's are noted in this summary, for complete information consult the attached tables. Compounds with the qualifier "D" were identified in an analysis at a secondary dilution factor.

Positively Identified and Quantified Analytes

Monitoring Well	Analytes
6	acetone and chloroform
8	1,1,1-trichloroethane
10(Sample B06196)	1,1,1-trichloroethane
11	acetone, trichloroethene, and 1,1,1-trichloroethane
12	trichloroethene(D)
13	methylene chloride and trichloroethane
14	trichloroethene
15	trichloroethene(D)
20	acetone, trichloroethene, and 1,1,1-trichloroethane
21	acetone
S29-E12	acetone
S32-E13A	acetone

Monitoring well numbers 5, 6, 7, 8/8A, 10, 11, 13, 14, 15, 17, 18, 20, 21, 22, and S30-15A were found to contain the following compounds. It should be noted that these compounds are listed with a "J" qualifier indicating that they are estimated values. They meet identification criteria but their concentration falls below the lowest concentration used in the calibration curve, yet is greater than zero. While their identity is known their concentration should be considered uncertain.

Identified Analytes

Monitoring Well	Analytes
5	1,1,1-trichloroethane
6	tetrachloroethane and acetone
7	acetone and C12 hydrocarbons
8/8A	acetone
10	1,1,1-trichloroethane and trichloroethene
11	trichloroethene
13	1,1,1-trichloroethane and
14	1,1,1-trichloroethane and trichloroethene
15	acetone(J)
17	tetrachloroethane and C12 hydrocarbons
18	acetone(J), chloroform, and tetrachloroethane
20	trichloroethene
21	acetone(J)
22	1,1,1-trichloroethane
S30-15A	chloroform

2.2 SEMIVOLATILE ORGANICS

All data units for semivolatile organics are given in micrograms per liter(μg/l) unless specified otherwise. Monitoring well numbers 1, 2, 3, 4, 6, 7, 8/8A, 9, 10, 11, 12, 14, 15, 17, 18, 19, 20, 21, 22, S30-15A, and S32-E13A show no analyte compounds detected above the sample quantitation limit in Rounds 5 through 9.

Monitoring well numbers 5, 13, and S29-E12 were found to contain the following positively identified and quantified analytes pertinent to quantitative risk assessment.

Positively Identified and Quantified Analytes

Monitoring Well	Analytes
5	diethylphthalate
13	diethylphthalate
S29-E12	diethylphthalate

2.3 PESTICIDE ORGANICS

All data units for pesticide organics are given in micrograms per liter(μg/l) unless specified otherwise. Monitoring well numbers 1, 2, 3, 4, 5, 6, 7, 8/8A, 9, 10, 11, 12, 13, 14, 15, 17, 22, S29-E12, S30-15A, and S32-E13A show no analyte compounds detected above the sample quantitation limit in Rounds 5 through 9.

In monitoring well numbers 18, 19, 20, and 21, the following analytes were identified. It should be noted that these compounds are listed with a "J" qualifier indicating that they are estimated values. They meet the identification criteria but their concentration falls below the lowest concentration used in the calibration curve, yet is greater than zero. While their identity is known their concentration may be uncertain.

Identified Analytes

Monitoring Well	Analytes
18	Aroclor-1260
19	Aroclor-1260
20	Aroclor-1260
21	Aroclor-1260

2.4 METALS AND CYANIDE

All data units for metals/cyanide are given in micrograms per liter(μg/l) unless specified otherwise. Only analytes that were positively identified and quantified that are above site UTL's are listed. In monitoring well numbers 1 through 15, 17 through 22, S29-E12, S30-15A, and S32-E13A, the following analytes were positively identified and quantified.

Positively Identified and Quantified Analytes

Monitoring Well	Compounds
1	Cu, Cr, Ni, K, Ca, Mg
2	Cr
3	Cr, Ni, K, Ca, Cu, Cr, Fe, Mg, Na
4	Cr
5	Ca, K, Zn
6	Cr, Cu
7	Cr, Zn
8	Cr, Cu, Zn
9	Cr, Zn
10	Ba, Ca, Cr, K, Na, Zn
11	Ba, Ca, Cr, Mg, K, Na, Zn
12	Ba, Ca, Mg, K, Na
13	Ca, Cr, Mg, K, Na
14	Ba, Ca, Mg, K, Na
15	Ba, Ca, Cr, K
17	Al, Cr, Ni
18	Al, Cr, Cu, Fe, Zn
19	Cr, Cu, Zn
20	Al, Ba, Ca, Cr, Cu, Fe, K, Na, Zn
21	Cr, Cu, Zn
22	Cr, Cu, K
S29-E12	Zn
S30-15A	Ca, Zn
S32-E13A	Ca, Mg, K, Zn

In monitoring well numbers 1 through 15, 17 through 22, S29-E12, S30-15A, and S32-E13A, the following analytes were identified. The qualifiers for inorganic data are defined differently, thus the definitions for the qualifiers presented below have been included here for ease of interpretation. A "B" qualifier (inorganic compounds only) means that the reported value is less than the contract required detection limit (CRDL) but greater than the instrument detection limit (IDL).

An "*" qualifier means that duplicate analysis was not within control limits. The identity of the analyte is certain but the concentration is uncertain.

A "U" qualifier means that the compound was analyzed for but not detected.

A "W" qualifier means the post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is < 50 percent of spike absorbance. Therefore, the concentration is uncertain.

An "N" qualifier means that the spiked sample recovery was not within control limits making the analytes concentration uncertain.

Identified Analytes

Monitoring Well	Analytes
1	Ba(B), Cu(B), Tl(UW),Zn(B)
2	Sb(B), Be(B), Ni(B),
3	Sb(B), Ba(B), Ca(*), Mg(*), Ni(B), Na(*), Tl(UW), Zn(B), Cu(B)
4	Ba(B), Cr(B)
5	Al(B), Sb(B), Ba(B), Be(B), Cd(B), Cr(B & *), Cu(B), Ni(B), Zn(B)
6	As(BW), Cu(B), Cr(B & B*), Sb(B)
7	Be(B), Zn(B), Cr(B*), Cu(B)
8	Al(B), Ba(B), Be(B), Cr(*), Cu(B)
9	Ba(B), Cd(B), Cu(B)
10	Ba(B), Sb(B), Ni(B)
11	Al(B), Sb(B), Ba(B)
12	Sb(B), Ba(B), Cr(B), Cu(B)
13	Sb(B), Ba(B), Zn(B)
14	Sb(B), Ba(B)
15	Sb(B), Ba(B), Ca(B), Cr(B), Cu(B), Mg(B), Na(B), Zn(B)
17	Cu(B)
18	Al(B), Cr(B), Cu(B), Mg(B), Ni(B), Zn(B)
19	Al(B), Cu(B), Zn(B)
20	Ba(B), Be(B), Cr(B), Cu(B), Ni(B), Zn(B)
21	Be(B), Cd(B), Cu(B), Ni(B), Zn(B)
22	Cu(B), Zn(B)
S29-E12	Sb(B)
S30-15A	Ba(B)
S32-E13A	Sb(B)

2.5 WET CHEMISTRY

Data units vary more for wet chemistry, but is milligrams per liter(mg/l) unless specified otherwise, see tables data for details. In monitoring well numbers 1 through 3, 7 through 15, 17 through 22, S29-E12, S30-E15A, and S32-E13A, the following analytes were positively identified and quantified and found to be above site UTL's, except for nitrates, which have no site UTL.

Positively Identified and Quantified Analytes

Monitoring Well	Analytes
1	nitrates(no UTL) and alkalinity
2	nitrates(no UTL), fluoride, and sulfate
3	alkalinity, chloride, and sulfate
7	fluoride and chloride
8	TDS, sulfate, and fluoride
10	nitrates(no UTL), sulfate, fluoride, TDS, and chloride
11	nitrates(no UTL), fluoride, nitrite, sulfate, and TDS
12	nitrates(no UTL), sulfate, and TDS
13	nitrates(no UTL), sulfates, TDS, and fluoride
14	nitrates(no UTL), fluoride, sulfate, and TDS
15	nitrates(no UTL), fluoride, sulfate, and TDS
17	nitrate, fluoride
18	nitrates(no UTL), sulfate, TDS, and pH
19	fluoride
20	fluoride, sulfate, and TDS
21	fluoride and phosphate
22	fluoride and ammonia
S29-E12	fluoride
S30-E15A	alkalinity
S32-E13A	alkalinity

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2.6 RADIOACTIVE ISOTOPES

All data units are picoCurie per liter(pCi/l). In monitoring well numbers 2, 4 through 9, 17 through 19, 21 through 22, S29-E12, S30-15A, and S3213A, no α or β radiation was detected above the UTL's. The remaining wells, shown below, have α and β levels above the UTL's.

Wells with Radiation Levels Above UTL's

Well Number	Radiation
1	α and β
3	β
10	β
11	α and β
12	β
13	β
14	α and β
15	β
20	β

2.7 COLIFORM BACTERIA

Analytical tests for coliform bacteria were negative.

3.0 DATA QUALIFIER KEY FOR GROUNDWATER LABORATORY DATA[1]

3.1 ORGANICS

U - The analyte was analyzed for and is not detected above the given value.

J - The analyte was analyzed for and was positively identified, but the given numerical value may not be consistent with the amount actually present in the environmental sample.

R - Quality control indicates that the data are unusable. Re-sampling and/or re-analysis is necessary for verification.

N - Presumptive evidence of presence of material(tentative identification).

C - Pesticide results were confirmed by GC/MS.

D - Compound identified in and analysis at a secondary dilution factor.

[1] Source: Risk Assessment Guidance for Superfund, EPA, 540/1-89/0002

A - The TIC is a suspected aldol condensation product.

X - Additional flags defined separately.

3.2 INORGANICS

U - The analyte was analyzed for and is not detected above the given value.

J - The analyte was analyzed for and was positively identified, but the given numerical value may not be consistent with the amount actually present in the environmental sample.

R - Quality control indicates that the data are unusable. Re-sampling and/or re-analysis is necessary for verification.

E - Value is estimated due to matrix interferences.

M - Duplicate infection precision criteria not met.

N - Spiked sample recovery not within control limits.

S - Reported value was determined by the Method of Standard Additions(MSA).

3.3 RADIOACTIVE ISOTOPES

- - = Sample not taken or data not requested
* = Below error limit (for round 5)
LT = Less Than

4.0 REFERENCE

WHC, 1991-92, *Data Validation Procedures for Chemical Analyses*, prepared by Golder Associates, Inc., for Westinghouse Hanford Company, Richland, Washington.

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Table E-1 Volatile, Semivolatile and Pesticide Organic Analysis

MONITORING WELL		1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4
Well ID	SITE UTL'S	S41-E11	S41-E11	S41-E11	S41-E11	S41-E11	S41-E11	S34-E10	S34-E10	S34-E10	S34-E10	S34-E10	S34-E10	S41-E12	S41-E12	S41-E12	S41-E12	S41-E12	S41-E12	S38-E12A	S38-E12A	S38-E12A
ROUND	ug/L	5	6	7	7.5	8	9	5	6	7	7.5	8	9	5	6	7	7.5	8	9	5	6	7
SAMPLE ID#			B00ZC6			B01BT3			B00Z68	B010X3			B06494		B00ZD0			B03BT6			B00Z52	
PARAMETERS (units ug/l)																						
VOLATILE ORGANICS																						
Chloromethane	2	--	10 U	--	--	--	--	--	10 U	10 U	--	--	1 U	--	10 U	--	--	10 U	--	--	10 U	--
Trichlorofluoromethane	NA	--	--	--	--	--	--	--	--	--	--	--	1 U	--	--	--	--	--	--	--	--	--
Bromomethane	2	--	10 U	--	--	--	--	--	10 U	10 U	--	--	1 U	--	10 U	--	--	10 U	--	--	10 U	--
Vinyl Chloride	2	--	10 U	--	--	--	--	--	10 U	10 U	--	--	1 U	--	10 U	--	--	10 U	--	--	10 U	--
Chloroethane	2	--	10 U	--	--	--	--	--	10 U	10 U	--	--	1 U	--	10 U	--	--	10 U	--	--	10 U	--
Methylene Chloride	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	3 U	--	5 U	--	--	5 U	--	--	5 U	--
Acetone	10	--	10 U	--	--	--	--	--	6 J	10 U	--	--	10 U	--	10 U	--	--	10 U	--	--	10 U	--
Carbon Disulfide	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
1,1-Dichloroethene	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
1,1-Dichloroethane	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
cis-1,2-Dichloroethene	1	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--
Trans-1,2-Dichloroethene	NA	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	1	--	5 U	--	--	--	--	--	5 U	--	--	--	--	--	5 U	--	--	5 U	--	--	5 U	--
Chloroform	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
1,2-Dichloroethane	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
2-Butanone	2	--	10 U	--	--	--	--	--	10 U	10 U	--	--	1 U	--	10 U	--	--	10 U	--	--	10 U	--
Tetrahydrofuran	NA	--	--	--	--	--	--	--	--	--	--	--	10 U	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	1.2	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
Carbon Tetrachloride	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
Vinyl Acetate	2	--	10 U	--	--	--	--	--	10 U	--	--	--	0.5 U	--	10 U	--	--	10 U	--	--	10 U	--
Bromodichloromethane	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
1,2-Dichloropropane	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
cis-1,3-Dichloropropene	1	--	5 U	--	--	--	--	--	5 U	--	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
Trans-1,3-Dichloropropene	1	--	5 U	--	--	--	--	--	5 U	--	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
Trichloroethene	1	--	5 U	--	--	--	--	--	5 U	3 J	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
Dibromochloromethane	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
1,1,2-Trichloroethane	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
Benzene	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
Bromoform	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
4-Methyl-2-Pentanone	10	--	10 U	--	--	--	--	--	10 U	2 J	--	--	1 U	--	10 U	--	--	10 U	--	--	10 U	--
2-Hexanone	10	--	10 U	--	--	--	--	--	10 U	6 J	--	--	1 U	--	10 U	--	--	10 U	--	--	10 U	--
Tetrachloroethene	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
1,1,2,2-Tetrachloroethane	1	--	5 U	--	--	--	--	--	5 U	0.9 J	--	--	0.5 U	--	5 U	--	--	10 U	--	--	5 U	--
Toluene	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
Chlorobenzene	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
Ethylbenzene	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
Styrene	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	0.5 U	--	5 U	--	--	5 U	--	--	5 U	--
m,p-xylene	NA	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--
o-xylene	NA	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--
Total Xylenes	1	--	5 U	--	--	--	--	--	5 U	5 U	--	--	--	--	5 U	--	--	5 U	--	--	5 U	--
C12 HYDROCARBON	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--
SEMI-VOLATILE ORGANICS																						
Phenol	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
bis(2-Chloroethyl)Ether	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2-chlorophenol	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
1,3-Dichlorobenzene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
1,4-Dichlorobenzene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Benzyl Alcohol	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
1,2-Dichlorobenzene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2-Methylphenol	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
bis(2-Chloroisopropyl)Ether	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
4-Methylphenol	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
N-Nitroso-Di-n-Propylamine	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Hexachloroethane	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Nitrobenzene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Isophorone	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2-Nitrophenol	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2,4-Dimethylphenol	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Benzoic Acid	50	--	50 U	--	--	--	--	--	50 U	50 U	--	--	--	--	50 U	--	--	200 U	--	--	50 U	--
bis(2-Chloroethoxy)Methane	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2,4-Dichlorophenol	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
1,2,4-Trichlorobenzene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Naphthalene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
4-Chloroaniline	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Hexachlorobutadiene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
4-Chloro-3-Methylphenol	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2-Methylnaphthalene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--

Table E-1 Volatile, Semivolatile and Pesticide Organic Analysis

MONITORING WELL		1	1	1	1	1	1	2	2	2	2	2	2	3	3	3	3	3	3	4	4	4
Well ID	SITE UTL'S	S41-E11	S41-E11	S41-E11	S41-E11	S41-E11	S41-E11	S34-E10	S34-E10	S34-E10	S34-E10	S34-H10	S34-E10	S41-E12	S41-E12	S41-E12	S41-E12	S41-E12	S41-E12	S38-E12A	S38-E12A	S38-E12A
ROUND	ug/L	5	6	7	7.5	8	9	5	6	7	7.5	8	9	5	6	7	7.5	8	9	5	6	7
SAMPLE ID#			B00ZC6			B01BT3			B00Z68	B010X3			B06194		B00ZD0			B01BT6			B007S2	
PARAMETERS (units ug/l)																						
SEMI-VOLATILE ORGANICS (CONT)																						
Hexachlorocyclopentadiene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2,4,6-Trichlorophenol	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2,4,5-Trichlorophenol	50	--	50 U	--	--	--	--	--	50 U	50 U	--	--	--	--	50 U	--	--	200 U	--	--	50 U	--
2-Chloronaphthalene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2-Nitroaniline	50	--	50 U	--	--	--	--	--	50 U	50 U	--	--	--	--	50 U	--	--	200 U	--	--	50 U	--
Dimethyl Phthalate	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Acenaphthylene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2,6-Dinitrotoluene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
3-Nitroaniline	50	--	50 U	--	--	--	--	--	50 U	50 U	--	--	--	--	50 U	--	--	200 U	--	--	50 U	--
Acenaphthene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2,4-Dinitrophenol	50	--	50 U	--	--	--	--	--	50 U	50 U	--	--	--	--	50 U	--	--	200 U	--	--	50 U	--
4-Nitrophenol	50	--	50 U	--	--	--	--	--	50 U	50 U	--	--	--	--	50 U	--	--	40 U	--	--	50 U	--
Dibenzofuran	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
2,4-Dinitrotoluene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Diethylphthalate	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
4-Chlorophenyl-phenylether	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Fluorene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
4-Nitroaniline	50	--	50 U	--	--	--	--	--	50 U	50 U	--	--	--	--	50 U	--	--	200 U	--	--	50 U	--
4,6-Dinitro-2-Methylphenol	50	--	50 U	--	--	--	--	--	50 U	50 U	--	--	--	--	50 U	--	--	200 U	--	--	50 U	--
N-Nitrosodiphenylamine (1)	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
4-Bromophenyl-phenylether	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Hexachlorobenzene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Pentachlorophenol	50	--	50 U	--	--	--	--	--	50 U	50 U	--	--	--	--	50 U	--	--	200 U	--	--	50 U	--
Phenanthrene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Anthracene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Di-n-Butylphthalate	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Fluoranthene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Pyrene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Butylbenzylphthalate	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
3,3'-Dichlorobenzidine	20	--	20 U	--	--	--	--	--	20 U	20 U	--	--	--	--	20 U	--	--	80 U	--	--	20 U	--
Benzo(a)anthracene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Chrysene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
bis(2-Ethylhexyl)Phthalate	23	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Di-n-Octyl Phthalate	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Benzo(b)Fluoranthene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Benzo(k)Fluoranthene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Benzo(a)Pyrene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Indeno(1,2,3-cd)Pyrene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Dibenz(a,h)Anthracene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
Benzo(g,h,i)Perylene	10	--	10 U	--	--	--	--	--	10 U	10 U	--	--	--	--	10 U	--	--	40 U	--	--	10 U	--
PESTICIDE ORGANICS																						
alpha-BHC	0.05	--	0.05 U	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
beta-BHC	0.05	--	0.05 U	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
delta-BHC	0.05	--	0.05 U	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
gamma-BHC	0.05	--	0.05 U	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
Heptachlor	0.05	--	0.05 U	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
Aldrin	0.05	--	0.05 U	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
Heptachlor epoxide	0.05	--	0.05 U	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
Endosulfan I	0.05	--	0.05 U	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
Dieldrin	0.1	--	0.1 U	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
4,4'-DDE	0.1	--	0.1 U	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
Endrin	0.1	--	0.1 U	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
Endosulfan II	0.1	--	0.1 U	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
4,4'-DDD	0.1	--	0.1 U	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
Endosulfan sulfate	0.1	--	0.1 U	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
4,4'-DDT	0.1	--	0.1 U	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
Methoxychlor	0.5	--	0.5 U	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Endrin ketone	0.1	--	0.1 U	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
alpha Chlordane	0.5	--	0.5 U	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
gamma-Chlordane	0.5	--	0.5 U	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Toxaphene	1	--	1 U	--	--	--	--	--	1 U	1 U	--	--	--	--	1 U	--	--	--	--	--	1 U	--
Aroclor-1016	0.5	--	0.5 U	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Aroclor-1221	0.5	--	0.5 U	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Aroclor-1232	0.5	--	0.5 U	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Aroclor-1242	0.5	--	0.5 U	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Aroclor-1248	0.5	--	0.5 U	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Aroclor-1254	1	--	1 U	--	--	--	--	--	1 U	1 U	--	--	--	--	1 U	--	--	--	--	--	1 U	--
Aroclor-1260	1	--	1 U	--	--	--	--	--	1 U	1 U	--	--	--	--	1 U	--	--	--	--	--	1 U	--

Table E-1 Volatile, Semivolitile and Pesticide Organic Analysis

MONITORING WELL		4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6
Well ID	SITE UTL'S	S38-E12A	S38-E12A	S38-E12A	S38-E12B	S38-E12B	S38-E12B	S38-E12B	S38-E12B	S38-E12B	S38-E12B	S37-E11	S37-E11	S37-E11	S37-E11	S37-E11	S37-E11	S37-E11
ROUND	ug/L	7.5	8	9	5	6	6	7	7.5	8	9	5	6	7	7.5	8	8	9
SAMPLE ID#			B01BT9			B00Z56	B00Z60			B01BV0			B00Z64			B01BV2	B01BX7	
PARAMETERS (units ug/l)																		
VOLATILE ORGANICS																		
Chloromethane	2	--	10 U	--	--	10 U	10 U	--	--	10 U	--	--	10 U	--	--	10 U	10 U	--
Trichlorofluoromethane	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	2	--	10 U	--	--	10 U	10 U	--	--	10 U	--	--	10 U	--	--	10 U	10 U	--
Vinyl Chloride	2	--	10 U	--	--	10 U	10 U	--	--	10 U	--	--	10 U	--	--	10 U	10 U	--
Chloroethane	2	--	10 U	--	--	10 U	10 U	--	--	10 U	--	--	10 U	--	--	10 U	10 U	--
Methylene Chloride	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Acetone	10	--	10 U	--	--	10 U	10 U	--	--	10 U	--	--	10 U	--	--	8 J	14	--
Carbon Disulfide	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
1,1-Dichloroethene	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
1,1-Dichloroethane	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
cis-1,2-Dichloroethene	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Trans-1,2-Dichloroethene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Chloroform	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5	--
1,2-Dichloroethane	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
2-Butanone	2	--	10 U	--	--	10 U	10 U	--	--	10 U	--	--	10 U	--	--	10 U	10 U	--
Tetrahydrofuran	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	1.2	--	5 U	--	--	3 J	3 J	--	--	3 J	--	--	5 U	--	--	5 U	5 U	--
Carbon Tetrachloride	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Vinyl Acetate	2	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	--	--
Bromodichloromethane	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
1,2-Dichloropropane	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
cis-1,3-Dichloropropene	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Trans-1,3-Dichloropropene	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Trichloroethene	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Dibromochloromethane	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
1,1,2-Trichloroethane	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Benzene	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Bromoform	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
4-Methyl-2-Pentanone	10	--	10 U	--	--	10 U	10 U	--	--	10 U	--	--	10 U	--	--	10 U	10 U	--
2-Hexanone	10	--	10 U	--	--	10 U	10 U	--	--	10 U	--	--	10 U	--	--	10 U	10 U	--
Tetrachloroethene	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	2 J	--	--	5 U	5 U	--
1,1,2,2-Tetrachloroethane	1	--	10 U	--	--	5 U	5 U	--	--	10 U	--	--	5 U	--	--	10 U	10 U	--
Toluene	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Chlorobenzene	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Ethylbenzene	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
Styrene	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
m,p-xylene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
o-xylene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Total Xylenes	1	--	5 U	--	--	5 U	5 U	--	--	5 U	--	--	5 U	--	--	5 U	5 U	--
C12 HYDROCARBON	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SEMI-VOLATILE ORGANICS																		
Phenol	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
bis(2-Chloroethyl)Ether	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2-chlorophenol	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
1,3-Dichlorobenzene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
1,4-Dichlorobenzene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Benzyl Alcohol	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
1,2-Dichlorobenzene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2-Methylphenol	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
bis(2-Chloroisopropyl)Ether	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
4-Methylphenol	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
N-Nitroso-Di-n-Propylamine	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Hexachloroethane	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Nitrobenzene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Isophorone	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2-Nitrophenol	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2,4-Dimethylphenol	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Benzoic Acid	50	--	--	--	--	50 U	50 U	--	--	--	--	--	50 U	--	--	--	200 U	--
bis(2-Chloroethoxy)Methane	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2,4-Dichlorophenol	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
1,2,4-Trichlorobenzene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Naphthalene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
4-Chloroaniline	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Hexachlorobutadiene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
4-Chloro-3-Methylphenol	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2-Methylnaphthalene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--

Table E-1 Volatile, Semivolitile and Pesticide Organic Analysis

MONITORING WELL		4	4	4	5	5	5	5	5	5	5	6	6	6	6	6	6	6
Well ID	SITE UTL'S	S38-E12A	S38-E12A	S38-E12A	S38-E12B	S38-E12B	S38-E12B	S38-E12B	S38-E12D	S38-E12B	S38-E12B	S37-E11	S37-E11	S37-E11	S37-E11	S37-E11	S37-E11	S37-E11
ROUND	ug/L	7.5	8	9	5	6	6	7	7.5	8	9	5	6	7	7.5	8	8	9
SAMPLE ID#			B01DT9			B00Z56	B00Z60			B01BV0			B00Z64			B01BV2	B01BX7	
PARAMETERS (units ug/l)																		
SEMI-VOLATILE ORGANICS (CONT)																		
Hexachlorocyclopentadiene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2,4,6-Trichlorophenol	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2,4,5-Trichlorophenol	50	--	--	--	--	50 U	50 U	--	--	--	--	--	50 U	--	--	--	200 U	--
2-Chloronaphthalene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2-Nitroaniline	50	--	--	--	--	50 U	50 U	--	--	--	--	--	50 U	--	--	--	200 U	--
Dimethyl Phthalate	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	--	--
Acenaphthylene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2,6-Dinitrotoluene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
3-Nitroaniline	50	--	--	--	--	50 U	50 U	--	--	--	--	--	50 U	--	--	--	200 U	--
Acenaphthene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2,4-Dinitrophenol	50	--	--	--	--	50 U	50 U	--	--	--	--	--	50 U	--	--	--	200 U	--
4-Nitrophenol	50	--	--	--	--	50 U	50 U	--	--	--	--	--	50 U	--	--	--	40 U	--
Dibenzofuran	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
2,4-Dinitrotoluene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Diethylphthalate	10	--	--	--	--	19	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
4-Chlorophenyl-phenylether	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Fluorene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
4-Nitroaniline	50	--	--	--	--	50 U	50 U	--	--	--	--	--	50 U	--	--	--	200 U	--
4,6-Dinitro-2-Methylphenol	50	--	--	--	--	50 U	50 U	--	--	--	--	--	50 U	--	--	--	200 U	--
N-Nitrosodiphenylamine (1)	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
4-Bromophenyl-phenylether	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Hexachlorobenzene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Pentachlorophenol	50	--	--	--	--	50 U	50 U	--	--	--	--	--	50 U	--	--	--	200 U	--
Phenanthrene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Anthracene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Di-n-Butylphthalate	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Fluoranthene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Pyrene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Butylbenzylphthalate	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
3,3'-Dichlorobenzidine	20	--	--	--	--	20 U	20 U	--	--	--	--	--	20 U	--	--	--	80 U	--
Benzo(a)anthracene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Chrysene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
bis(2-Ethylhexyl)Phthalate	23	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Di-n-Octyl Phthalate	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Benzo(b)Fluoranthene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Benzo(k)Fluoranthene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Benzo(a)Pyrene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Indeno(1,2,3-cd)Pyrene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Dibenz(a,h)Anthracene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
Benzo(g,h,i)Perylene	10	--	--	--	--	10 U	10 U	--	--	--	--	--	10 U	--	--	--	40 U	--
PESTICIDE ORGANICS																		
alpha-BHC	0.05	--	--	--	--	0.05 U	--	--	--	--	--	--	0.05 U	--	--	--	0.05 U	--
beta-BHC	0.05	--	--	--	--	0.05 U	--	--	--	--	--	--	0.05 U	--	--	--	0.05 U	--
delta-BHC	0.05	--	--	--	--	0.05 U	--	--	--	--	--	--	0.05 U	--	--	--	0.05 U	--
gamma-BHC	0.05	--	--	--	--	0.05 U	--	--	--	--	--	--	0.05 U	--	--	--	0.05 U	--
Heptachlor	0.05	--	--	--	--	0.05 U	--	--	--	--	--	--	0.05 U	--	--	--	0.05 U	--
Aldrin	0.05	--	--	--	--	0.05 U	--	--	--	--	--	--	0.05 U	--	--	--	0.05 U	--
Heptachlor epoxide	0.05	--	--	--	--	0.05 U	--	--	--	--	--	--	0.05 U	--	--	--	0.05 U	--
Endosulfan I	0.05	--	--	--	--	0.05 U	--	--	--	--	--	--	0.05 U	--	--	--	0.05 U	--
Dieldrin	0.1	--	--	--	--	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	0.1 U	--
4,4'-DDE	0.1	--	--	--	--	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	0.1 U	--
Endrin	0.1	--	--	--	--	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	0.1 U	--
Endosulfan II	0.1	--	--	--	--	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	0.1 U	--
4,4'-DDD	0.1	--	--	--	--	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	0.1 U	--
Endosulfan sulfate	0.1	--	--	--	--	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	0.1 U	--
4,4'-DDT	0.1	--	--	--	--	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	0.1 U	--
Methoxychlor	0.5	--	--	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	0.5 U	--
Endrin ketone	0.1	--	--	--	--	0.1 U	--	--	--	--	--	--	0.1 U	--	--	--	0.1 U	--
alpha-Chlordane	0.5	--	--	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	0.5 U	--
gamma-Chlordane	0.5	--	--	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	0.5 U	--
Toxaphene	1	--	--	--	--	1 U	--	--	--	--	--	--	1 U	--	--	--	1 U	--
Aroclor-1016	0.5	--	--	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	0.5 U	--
Aroclor-1221	0.5	--	--	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	0.5 U	--
Aroclor-1232	0.5	--	--	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	0.5 U	--
Aroclor-1242	0.5	--	--	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	0.5 U	--
Aroclor-1248	0.5	--	--	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	0.5 U	--
Aroclor-1254	1	--	--	--	--	1 U	--	--	--	--	--	--	1 U	--	--	--	1 U	--
Aroclor-1260	1	--	--	--	--	1 U	--	--	--	--	--	--	1 U	--	--	--	1 U	--

Table E-1 Volatile, Semivolitile and Pesticide Organic Analysis

MONITORING WELL		7	7	7A	7A	7A	7	7	8	8A	8	8A	8	8A	8	8	9	9
Well ID	SITE UTL'S	S38-E11	S38-E11	S38-E11	S38-E11	S38-E11	S38-E11	S38-E11	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S32-E08	S32-E08
ROUND	ug/L	5	6	6	7	7.5	8	9	5	6	6	7	7.5	7.5	8	9	5	6
SAMPLE ID#			B00Z76	B00ZG5	B010Z3	B01543				B00ZG9	B00Y36	B010Z7	B01537	B01546		B06195		B00Y40
PARAMETERS (units ug/l)																		
VOLATILE ORGANICS																		
Chloromethane	2	--	10 U	10	10 U	10 U	--	--	--	10 U	10 U	10 U	--	10 U	--	1 U	--	10 U
Trichlorofluoromethane	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1 U	--	--
Bromomethane	2	--	10 U	10	10 U	10 U	--	--	--	10 U	10 U	10 U	--	10 U	--	1 U	--	10 U
Vinyl Chloride	2	--	10 U	10	10 U	10 U	--	--	--	10 U	10 U	10 U	--	10 U	--	1 U	--	10 U
Chloroethane	2	--	10 U	10	10 U	10 U	--	--	--	10 U	10 U	10 U	--	10 U	--	1 U	--	10 U
Methylene Chloride	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	3 U	--	5 U
Acetone	10	--	8 J	10	10 U	10 U	--	--	--	6 BJ	23	10 U	--	10 U	--	10 U	--	10 U
Carbon Disulfide	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
1,1-Dichloroethene	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
1,1-Dichloroethane	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
cis-1,2-Dichloroethene	1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--
Trans-1,2-Dichloroethene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--
1,2-Dichloroethene (total)	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	--	--	5 U	--	--	--	5 U
Chloroform	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
1,2-Dichloroethane	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
2-Butanone	2	--	10 U	10	10 U	10 U	--	--	--	10 U	10 U	10 U	--	10 U	--	1 U	--	10 U
Tetrahydrofuran	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10 U	--	--
1,1,1-Trichloroethane	1.2	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	2	--	5 U
Carbon Tetrachloride	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
Vinyl Acetate	2	--	10 U	10	10 U	10 U	--	--	--	10 U	10 U	--	--	10 U	--	0.5 U	--	10 U
Bromodichloromethane	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
1,2-Dichloropropane	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
cis-1,3-Dichloropropene	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	--	--	5 U	--	0.5 U	--	5 U
Trans-1,3-Dichloropropene	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	--	--	5 U	--	0.5 U	--	5 U
Trichloroethene	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
Dibromochloromethane	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
1,1,2-Trichloroethane	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
Benzene	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
Bromoform	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
4-Methyl-2-Pentanone	10	--	10 U	10	10 U	10 U	--	--	--	10 U	10 U	10 U	--	10 U	--	1 U	--	10 U
2-Hexanone	10	--	10 U	10	10 U	10 U	--	--	--	10 U	10 U	10 U	--	10 U	--	1 U	--	10 U
Tetrachloroethene	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
1,1,2,2-Tetrachloroethane	1	--	5 U	5	5 U	10 U	--	--	--	5 U	5 U	10 U	--	10 U	--	0.5 U	--	5 U
Toluene	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
Chlorobenzene	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
Ethylbenzene	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
Styrene	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	0.5 U	--	5 U
m,p-xylene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--
o-xylene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--
Total Xylenes	1	--	5 U	5	5 U	5 U	--	--	--	5 U	5 U	5 U	--	5 U	--	--	--	5 U
C12 HYDROCARBON	NA	--	63 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--
1,4-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--
1,2-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--
SEMI-VOLATILE ORGANICS																		
Phenol	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
bis(2-Chloroethyl)Ether	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2-chlorophenol	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
1,3-Dichlorobenzene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
1,4-Dichlorobenzene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Benzyl Alcohol	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
1,2-Dichlorobenzene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2-Methylphenol	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
bis(2-Chloroisopropyl)Ether	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
4-Methylphenol	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
N-Nitroso-Di-n-Propylamine	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Hexachloroethane	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Nitrobenzene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Isophorone	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2-Nitrophenol	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2,4-Dimethylphenol	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Benzoic Acid	50	--	50 U	--	50 U	--	--	--	--	50 U	50 U	50 U	--	--	--	--	--	50 U
bis(2-Chloroethoxy)Methane	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2,4-Dichlorophenol	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
1,2,4-Trichlorobenzene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Naphthalene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
4-Chloroaniline	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Hexachlorobutadiene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
4-Chloro-3-Methylphenol	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2-Methylnaphthalene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U

Table E-1 Volatile, Semivolitile and Pesticide Organic Analysis

MONITORING WELL		7	7	7A	7A	7A	7	7	8	8A	8	8A	8	8A	8	8	9	9
Well ID	SITE UTL'S	S38-E11	S38-E11	S38-E11	S38-E11	S38-E11	S38-E11	S38-E11	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S32-E08	S32-E08
ROUND	ug/L	5	6	6	7	7.5	8	9	5	6	6	7	7.5	7.5	8	9	5	6
SAMPLE ID#			B00Z76	B00ZG5	B010Z3	B01543				D00ZG9	D00Y36	B010Z7	B01537	B01546		B06195		B00Y40
PARAMETERS (units ug/l)																		
SEMI-VOLATILE ORGANICS (CONT)																		
Hexachlorocyclopentadiene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2,4,6-Trichlorophenol	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2,4,5-Trichlorophenol	50	--	50 U	--	50 U	--	--	--	--	50 U	50 U	50 U	--	--	--	--	--	50 U
2-Chloronaphthalene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2-Nitroaniline	50	--	50 U	--	50 U	--	--	--	--	50 U	50 U	50 U	--	--	--	--	--	50 U
Dimethyl Phthalate	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Acenaphthylene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2,6-Dinitrotoluene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
3-Nitroaniline	50	--	50 U	--	50 U	--	--	--	--	50 U	50 U	50 U	--	--	--	--	--	50 U
Acenaphthene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2,4-Dinitrophenol	50	--	50 U	--	50 U	--	--	--	--	50 U	50 U	50 U	--	--	--	--	--	50 U
4-Nitrophenol	50	--	50 U	--	50 U	--	--	--	--	50 U	50 U	50 U	--	--	--	--	--	50 U
Dibenzofuran	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
2,4-Dinitrotoluene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Diethylphthalate	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
4-Chlorophenyl-phenylether	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Fluorene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
4-Nitroaniline	50	--	50 U	--	50 U	--	--	--	--	50 U	50 U	50 U	--	--	--	--	--	50 U
4,6-Dinitro-2-Methylphenol	50	--	50 U	--	50 U	--	--	--	--	50 U	50 U	50 U	--	--	--	--	--	50 U
N-Nitrosodiphenylamine (1)	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
4-Bromophenyl-phenylether	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Hexachlorobenzene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Pentachlorophenol	50	--	50 U	--	50 U	--	--	--	--	50 U	50 U	50 U	--	--	--	--	--	50 U
Phenanthrene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Anthracene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Di-n-Butylphthalate	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Fluoranthene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Pyrene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Butylbenzylphthalate	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
3,3'-Dichlorobenzidine	20	--	20 U	--	20 U	--	--	--	--	20 U	20 U	20 U	--	--	--	--	--	20 U
Benzo(a)anthracene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Chrysene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
bis(2-Ethylhexyl)Phthalate	23	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Di-n-Octyl Phthalate	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Benzo(b)Fluoranthene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Benzo(k)Fluoranthene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Benzo(a)Pyrene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Indeno(1,2,3-cd)Pyrene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Dibenz(a,h)Anthracene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
Benzo(g,h,i)Perylene	10	--	10 U	--	10 U	--	--	--	--	10 U	10 U	10 U	--	--	--	--	--	10 U
PESTICIDE ORGANICS																		
alpha-BHC	0.05	--	0.05 U	--	0.05 U	--	--	--	--	0.05 U	0.05 UJ	0.05 U	--	--	--	--	--	0.05 UJ
beta-BHC	0.05	--	0.05 U	--	0.05 U	--	--	--	--	0.05 U	0.05 UJ	0.05 U	--	--	--	--	--	0.05 UJ
delta-BHC	0.05	--	0.05 U	--	0.05 U	--	--	--	--	0.05 U	0.05 UJ	0.05 U	--	--	--	--	--	0.05 UJ
gamma-BHC	0.05	--	0.05 U	--	0.05 U	--	--	--	--	0.05 U	0.05 UJ	0.05 U	--	--	--	--	--	0.05 UJ
Heptachlor	0.05	--	0.05 U	--	0.05 U	--	--	--	--	0.05 U	0.05 UJ	0.05 U	--	--	--	--	--	0.05 UJ
Aldrin	0.05	--	0.05 U	--	0.05 U	--	--	--	--	0.05 U	0.05 UJ	0.05 U	--	--	--	--	--	0.05 UJ
Heptachlor epoxide	0.05	--	0.05 U	--	0.05 U	--	--	--	--	0.05 U	0.05 UJ	0.05 U	--	--	--	--	--	0.05 UJ
Endosulfan I	0.05	--	0.05 U	--	0.05 U	--	--	--	--	0.05 U	0.05 UJ	0.05 U	--	--	--	--	--	0.05 UJ
Dieldrin	0.1	--	0.1 U	--	0.1 U	--	--	--	--	0.1 U	0.1 UJ	0.1 U	--	--	--	--	--	0.1 UJ
4,4'-DDE	0.1	--	0.1 U	--	0.1 U	--	--	--	--	0.1 U	0.1 UJ	0.1 U	--	--	--	--	--	0.1 UJ
Endrin	0.1	--	0.1 U	--	0.1 U	--	--	--	--	0.1 U	0.1 UJ	0.1 U	--	--	--	--	--	0.1 UJ
Endosulfan II	0.1	--	0.1 U	--	0.1 U	--	--	--	--	0.1 U	0.1 UJ	0.1 U	--	--	--	--	--	0.1 UJ
4,4'-DDD	0.1	--	0.1 U	--	0.1 U	--	--	--	--	0.1 U	0.1 UJ	0.1 U	--	--	--	--	--	0.1 UJ
Endosulfan sulfate	0.1	--	0.1 U	--	0.1 U	--	--	--	--	0.1 U	0.1 UJ	0.1 U	--	--	--	--	--	0.1 UJ
4,4'-DDT	0.1	--	0.1 U	--	0.1 U	--	--	--	--	0.1 U	0.1 UJ	0.1 U	--	--	--	--	--	0.1 UJ
Methoxychlor	0.5	--	0.5 U	--	0.5 U	--	--	--	--	0.5 U	0.5 UJ	0.5 U	--	--	--	--	--	0.5 UJ
Endrin ketone	0.1	--	0.1 U	--	0.1 U	--	--	--	--	0.1 U	0.1 UJ	0.1 U	--	--	--	--	--	0.1 UJ
alpha-Chlordane	0.5	--	0.5 U	--	0.5 U	--	--	--	--	0.5 U	0.5 UJ	0.5 U	--	--	--	--	--	0.5 UJ
gamma-Chlordane	0.5	--	0.5 U	--	0.5 U	--	--	--	--	0.5 U	0.5 UJ	0.5 U	--	--	--	--	--	0.5 UJ
Toxaphene	1	--	1 U	--	1 U	--	--	--	--	1 U	1 UJ	1 U	--	--	--	--	--	1 UJ
Aroclor-1016	0.5	--	0.5 U	--	0.5 U	--	--	--	--	0.5 U	0.5 UJ	0.5 U	--	--	--	--	--	0.5 UJ
Aroclor-1221	0.5	--	0.5 U	--	0.5 U	--	--	--	--	0.5 U	0.5 UJ	0.5 U	--	--	--	--	--	0.5 UJ
Aroclor-1232	0.5	--	0.5 U	--	0.5 U	--	--	--	--	0.5 U	0.5 UJ	0.5 U	--	--	--	--	--	0.5 UJ
Aroclor-1242	0.5	--	0.5 U	--	0.5 U	--	--	--	--	0.5 U	0.5 UJ	0.5 U	--	--	--	--	--	0.5 UJ
Aroclor-1248	0.5	--	0.5 U	--	0.5 U	--	--	--	--	0.5 U	0.5 UJ	0.5 U	--	--	--	--	--	0.5 UJ
Aroclor-1254	1	--	1 U	--	1 U	--	--	--	--	1 U	1 UJ	1 U	--	--	--	--	--	1 UJ
Aroclor-1260	1	--	1 U	--	1 U	--	--	--	--	1 U	1 UJ	1 U	--	--	--	--	--	1 UJ

Table E-1 Volatile, Semivolatile and Pesticide Organic Analysis

MONITORING WELL		9	9	9	9	10	10	10	10	10	10	10	11	11	11	11	11	11
Well ID	SITE UTL'S	S32-E08	S32-E08	S32-E08	S32-E08	S30-E10A	S30-E10A	S30-E10A	S30-E10A	S30-E10A	S30-E10A	S30-E10A	S30-E10B	S30-E10B	S30-E10B	S30-E10B	S30-E10D	S30-E10D
ROUND	ug/L	7	7.5	8	9	5	6	6	7	7.5	8	9	5	5	6	6	7	7.5
SAMPLE ID#			B01540	B01546		B00JW2	B00Y44	B00Y48		B01531	B01BV4	B06196	B00HW4	B00HW6	B00Y52	B00Y56	B01DX9	B01534
PARAMETERS (units ug/l)																		
VOLATILE ORGANICS																		
Chloromethane	2	--	10 U	--	--	10 U	10 U	10 U	--	10 U	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U
Trichlorofluoromethane	NA	--	--	--	--	--	--	--	--	--	--	1 U	--	--	--	--	--	--
Bromomethane	2	--	10 U	--	--	10 U	10 U	10 U	--	10 U	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U
Vinyl Chloride	2	--	10 U	--	--	10 U	10 U	10 U	--	10 U	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U
Chloroethane	2	--	10 U	--	--	10 U	10 U	10 U	--	10 U	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U
Methylene Chloride	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	3 U	5 U	5 U	5 U	5 U	5 U	5 U
Acetone	10	--	10 U	--	--	10 U	10 U	10 U	--	10 U	10 U	10 U	10 U	10 U	10 U	10 U	31	10 U
Carbon Disulfide	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethene	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1-Dichloroethane	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,2-Dichloroethene	1	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--
Trans-1,2-Dichloroethene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--
1,2-Dichloroethene (total)	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	--	5 U	5 U	5 U	5 U	--	5 U
Chloroform	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloroethane	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
2-Butanone	2	--	10 U	--	--	10 U	10 U	10 U	--	10 U	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U
Tetrahydrofuran	NA	--	--	--	--	--	--	--	--	--	--	10 U	--	--	--	--	--	--
1,1,1-Trichloroethane	1.2	--	5 U	--	--	5 U	2 J	2 J	--	1 J	5 U	0.8	5 U	5 U	5 U	5 U	1 J	1 J
Carbon Tetrachloride	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
Vinyl Acetate	2	--	10 U	--	--	10 U	10 U	10 U	--	10 U	--	0.5 U	10 U	10 U	10 U	10 U	--	10 U
Bromodichloromethane	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,2-Dichloropropane	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
cis-1,3-Dichloropropene	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	--	5 U
Trans-1,3-Dichloropropene	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	--	5 U
Trichloroethene	1	--	5 U	--	--	5 U	2 J	2 J	--	3 J	3 J	2	5 U	5 U	3 J	4 J	3 J	4 J
Dibromochloromethane	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2-Trichloroethane	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
Benzene	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
Bromoform	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
4-Methyl-2-Pentanone	10	--	10 U	--	--	10 U	10 U	10 U	--	10 U	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U
2-Hexanone	10	--	10 U	--	--	10 U	10 U	10 U	--	10 U	10 U	1 U	10 U	10 U	10 U	10 U	4 J	10 U
Tetrachloroethene	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	1	--	10 U	--	--	5 U	5 U	5 U	--	10 U	10 U	0.5 U	5 U	5 U	5 U	5 U	10 U	10 U
Toluene	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
Chlorobenzene	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
Ethylbenzene	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
Styrene	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U
m,p-xylene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--
o-xylene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--
Total Xylenes	1	--	5 U	--	--	5 U	5 U	5 U	--	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	5 U
C12 HYDROCARBON	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--
1,4-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--
1,2-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--
SEMI-VOLATILE ORGANICS																		
Phenol	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
bis(2-Chloroethyl)Ether	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2-Chlorophenol	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
1,3-Dichlorobenzene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
1,4-Dichlorobenzene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Benzyl Alcohol	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
1,2-Dichlorobenzene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2-Methylphenol	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
bis(2-Chloroisopropyl)Ether	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
4-Methylphenol	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
N-Nitroso-Di-n-Propylamine	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Hexachloroethane	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Nitrobenzene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Isophorone	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2-Nitrophenol	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2,4-Dimethylphenol	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Benzoic Acid	50	--	--	--	--	--	50 U	50 U	--	--	--	--	--	--	50 U	50 U	--	--
bis(2-Chloroethoxy)Methane	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2,4-Dichlorophenol	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
1,2,4-Trichlorobenzene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Naphthalene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
4-Chloroaniline	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Hexachlorobutadiene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
4-Chloro-3-Methylphenol	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2-Methylnaphthalene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--

Table E-1 Volatile, Semivolitile and Pesticide Organic Analysis

MONITORING WELL		9	9	9	9	10	10	10	10	10	10	10	11	11	11	11	11	11
Well ID	SITE UTL'S	S32-E08	S32-E08	S32-E08	S32-E08	S30-E10A	S30-E10A	S30-E10A	S30-E10A	S30-E10A	S30-E10A	S30-E10A	S30-E10B	S30-E10B	S30-E10B	S30-E10B	S30-E10B	S30-E10B
ROUND	ug/L	7	7.5	8	9	5	6	6	7	7.5	8	9	5	5	6	6	7	7.5
SAMPLE ID#			B01540	B01546		B00HW2	B00Y44	B00Y48		B01531	B01HV4	B06196	B00HW4	B00HW6	B00Y52	B00Y56	B010X9	B01534
PARAMETERS (units ug/l)																		
SEMI-VOLATILE ORGANICS (CONT)																		
Hexachlorocyclopentadiene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2,4,6-Trichlorophenol	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2,4,5-Trichlorophenol	50	--	--	--	--	--	50 U	50 U	--	--	--	--	--	--	50 U	50 U	--	--
2-Chloronaphthalene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2-Nitroaniline	50	--	--	--	--	--	50 U	50 U	--	--	--	--	--	--	50 U	50 U	--	--
Dimethyl Phthalate	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Acenaphthylene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2,6-Dinitrotoluene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
3-Nitroaniline	50	--	--	--	--	--	50 U	50 U	--	--	--	--	--	--	50 U	50 U	--	--
Acenaphthene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2,4-Dinitrophenol	50	--	--	--	--	--	50 U	50 U	--	--	--	--	--	--	50 U	50 U	--	--
4-Nitrophenol	50	--	--	--	--	--	50 U	50 U	--	--	--	--	--	--	50 U	50 U	--	--
Dibenzofuran	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
2,4-Dinitrotoluene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Diethylphthalate	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
4-Chlorophenyl-phenylether	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Fluorene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
4-Nitroaniline	50	--	--	--	--	--	50 U	50 U	--	--	--	--	--	--	50 U	50 U	--	--
4,6-Dinitro-2-Methylphenol	50	--	--	--	--	--	50 U	50 U	--	--	--	--	--	--	50 U	50 U	--	--
N-Nitrosodiphenylamine (1)	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
4-Bromophenyl-phenylether	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Hexachlorobenzene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Pentachlorophenol	50	--	--	--	--	--	50 U	50 U	--	--	--	--	--	--	50 U	50 U	--	--
Phenanthrene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Anthracene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Di-n-Butylphthalate	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Fluoranthene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Pyrene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Butylbenzylphthalate	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
3,3'-Dichlorobenzidine	20	--	--	--	--	--	20 U	20 U	--	--	--	--	--	--	20 U	20 U	--	--
Benzo(a)anthracene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Chrysene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
bis(2-Ethylhexyl)Phthalate	23	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Di-n-Octyl Phthalate	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Benzo(b)Fluoranthene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Benzo(k)Fluoranthene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Benzo(a)Pyrene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Indeno(1,2,3-cd)Pyrene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Dibenz(a,h)Anthracene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
Benzo(g,h,i)Perylene	10	--	--	--	--	--	10 U	10 U	--	--	--	--	--	--	10 U	10 U	--	--
PESTICIDE ORGANICS																		
alpha-BHC	0.05	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	--	--	0.05 U	0.05 UJ	--	--
beta-BHC	0.05	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	--	--	0.05 U	0.05 UJ	--	--
delta-BHC	0.05	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	--	--	0.05 U	0.05 UJ	--	--
gamma-BHC	0.05	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	--	--	0.05 U	0.05 UJ	--	--
Heptachlor	0.05	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	--	--	0.05 U	0.05 UJ	--	--
Aldrin	0.05	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	--	--	0.05 U	0.05 UJ	--	--
Heptachlor epoxide	0.05	--	--	--	--	--	0.05 U	0.05 U	--	--	--	--	--	--	0.05 U	0.05 UJ	--	--
Endosulfan I	0.05	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	0.1 UJ	--	--
Dieldrin	0.1	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	0.1 UJ	--	--
4,4'-DDE	0.1	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	0.1 UJ	--	--
Endrin	0.1	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	0.1 UJ	--	--
Endosulfan II	0.1	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	0.1 UJ	--	--
4,4'-DDD	0.1	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	0.1 UJ	--	--
Endosulfan sulfate	0.1	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	0.1 UJ	--	--
4,4'-DDT	0.1	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	--	--	0.5 U	0.5 UJ	--	--
Methoxychlor	0.5	--	--	--	--	--	0.1 U	0.1 U	--	--	--	--	--	--	0.1 U	0.1 UJ	--	--
Endrin ketone	0.1	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	--	--	0.5 U	0.5 UJ	--	--
alpha-Chlordane	0.5	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	--	--	0.5 U	0.5 UJ	--	--
gamma-Chlordane	0.5	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	1 U	1 UJ	--	--
Toxaphene	1	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	--	--	0.5 U	0.5 UJ	--	--
Aroclor-1016	0.5	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	--	--	0.5 U	0.5 UJ	--	--
Aroclor-1221	0.5	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	--	--	0.5 U	0.5 UJ	--	--
Aroclor-1232	0.5	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	--	--	0.5 U	0.5 UJ	--	--
Aroclor-1242	0.5	--	--	--	--	--	0.5 U	0.5 U	--	--	--	--	--	--	0.5 U	0.5 UJ	--	--
Aroclor-1248	0.5	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	1 U	1 UJ	--	--
Aroclor-1254	1	--	--	--	--	--	1 U	1 U	--	--	--	--	--	--	1 U	1 UJ	--	--
Aroclor-1260	1	--	--	--	--	--												

Table E-1 Volatile, Semivolitile and Pesticide Organic Analysis

MONITORING WELL		11	11	12	12	12	12	12	12	13	13	13	13	13	13	14	14	14
Well ID	SITE UTL'S	S30-E10B	S30-E10B	S31-E10A	S31-E10A	S31-E10A	S31-E10A	S31-E10A	S31-E10A	S31-E10B	S31-E10B	S31-E10B	S31-E10B	S31-E10B	S31-E10B	S31-E10C	S31-E10C	S31-E10C
ROUND	ug/L	8	9	5	6	7	7.5	8	9	5	6	7	7.5	8	9	5	6	7
SAMPLE ID #		B01BV7	D06197	B00HX0	B00Y20	B01075	B01478	B01DW0	B06198	B00HX2	B00Y24	B01077	B01501	B01BW3		B00HX4	B00Y28	B01079
PARAMETERS (units ug/l)																		
VOLATILE ORGANICS																		
Chloromethane	2	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U
Trichlorofluoromethane	NA	--	1 U	--	--	--	--	--	10 U	--	--	--	--	--	--	--	--	--
Bromomethane	2	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U
Vinyl Chloride	2	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U
Chloroethane	2	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U
Methylene Chloride	1	5 U	3 U	5 U	5 U	5 U	5 U	5 U	10 U	5 U	5 U	5 U	13	5 U	--	5 U	5 U	5 U
Acetone	10	10 U	10 U	10 U	10 U	10 U	10 U	10 U	100 U	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U
Carbon Disulfide	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
1,1-Dichloroethene	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
1,1-Dichloroethane	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
cis-1,2-Dichloroethene	1	--	0.5 U	--	--	--	--	--	5 U	--	--	--	--	--	--	--	--	--
Trans-1,2-Dichloroethene	NA	--	0.5 U	--	--	--	--	--	5 U	--	--	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	1	5 U	--	5 U	5 U	--	5 U	5 U	--	5 U	5 U	--	5 U	5 U	--	5 U	5 U	--
Chloroform	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
1,2-Dichloroethane	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
2-Butanone	2	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U
Tetrahydrofuran	NA	--	10 U	--	--	--	--	--	100 U	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	1.2	5 U	1	5 U	3 J	2 J	2 J	5 U	5 U	5 U	5 U	5 U	2 J	5 U	--	5 U	5 U	5 U
Carbon Tetrachloride	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
Vinyl Acetate	2	--	0.5 U	10 U	10 U	--	10 U	--	5 U	10 U	10 U	--	10 U	--	--	10 U	10 U	--
Bromodichloromethane	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
1,2-Dichloropropane	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
cis-1,3-Dichloropropene	1	5 U	0.5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	--	5 U	5 U	--
Trans-1,3-Dichloropropene	1	5 U	0.5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	--	5 U	5 U	--
Trichloroethene	1	4 J	6	79	78	69	67	69	58 D	68	70	69	66	63	--	82	75	75
Dibromochloromethane	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
1,1,2-Trichloroethane	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
Benzene	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
Bromoform	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
4-Methyl-2-Pentanone	10	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U
2-Hexanone	10	10 U	1 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	10 U	--	10 U	10 U	10 U
Tetrachloroethene	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
1,1,2,2-Tetrachloroethane	1	10 U	0.5 U	5 U	5 U	10 U	10 U	10 U	5 U	5 U	5 U	10 U	10 U	10 U	--	5 U	5 U	10 U
Toluene	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	2 J	5 U	--	5 U	5 U	5 U
Chlorobenzene	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
Ethylbenzene	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
Styrene	1	5 U	0.5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
m,p-xylene	NA	--	0.5 U	--	--	--	--	--	5 U	--	--	--	--	--	--	--	--	--
o-xylene	NA	--	0.5 U	--	--	--	--	--	5 U	--	--	--	--	--	--	--	--	--
Total Xylenes	1	5 U	--	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U	5 U	5 U	--	5 U	5 U	5 U
C12 HYDROCARBON	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	NA	--	0.5 U	--	--	--	--	--	5 U	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	NA	--	0.5 U	--	--	--	--	--	5 U	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	NA	--	0.5 U	--	--	--	--	--	5 U	--	--	--	--	--	--	--	--	--
SEMI-VOLATILE ORGANICS																		
Phenol	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
bis(2-Chloroethyl)Ether	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2-chlorophenol	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
1,3-Dichlorobenzene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
1,4-Dichlorobenzene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Benzyl Alcohol	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
1,2-Dichlorobenzene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2-Methylphenol	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
bis(2-Chloroisopropyl)Ether	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
4-Methylphenol	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
N-Nitroso-Di-n-Propylamine	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Hexachloroethane	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Nitrobenzene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Isophorone	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2-Nitrophenol	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2,4-Dimethylphenol	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Benzoic Acid	50	--	--	--	50 U	--	--	--	--	--	50 U	--	--	--	--	--	50 U	--
bis(2-Chloroethoxy)Methane	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2,4-Dichlorophenol	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
1,2,4-Trichlorobenzene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Naphthalene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
4-Chloroaniline	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Hexachlorobutadiene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
4-Chloro-3-Methylphenol	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2-Methylnaphthalene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--

Table E-1 Volatile, Semivolitile and Pesticide Organic Analysis

MONITORING WELL		11	11	12	12	12	12	12	12	13	13	13	13	13	13	14	14	14
Well ID	SITE UTL'S	S30-E10B	S30-E10B	S31-E10A	S31-E10A	S31-E10A	S31-E10A	S31-E10A	S31-E10A	S31-E10B	S31-E10B	S31-E10B	S31-E10B	S31-E10B	S31-E10B	S31-E10C	S31-E10C	S31-E10C
ROUND	ug/L	8	9	5	6	7	7.5	8	9	5	6	7	7.5	8	9	5	6	7
SAMPLE ID#		B01DV7	B06197	B00HX0	B00Y20	B010T5	B014Z8	B01BW0	B06198	B00HX2	B00Y24	B010T7	B015O1	B01BW3		B00HX4	B00Y28	B010T9
PARAMETERS (units ug/l)																		
SEMI-VOLATILE ORGANICS (CONT)																		
Hexachlorocyclopentadiene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2,4,6-Trichlorophenol	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2,4,5-Trichlorophenol	50	--	--	--	50 U	--	--	--	--	--	50 U	--	--	--	--	--	50 U	--
2-Chloronaphthalene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2-Nitroaniline	50	--	--	--	50 U	--	--	--	--	--	50 U	--	--	--	--	--	50 U	--
Dimethyl Phthalate	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Acenaphthylene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2,6-Dinitrotoluene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
3-Nitroaniline	50	--	--	--	50 U	--	--	--	--	--	50 U	--	--	--	--	--	50 U	--
Acenaphthene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2,4-Dinitrophenol	50	--	--	--	50 U	--	--	--	--	--	50 U	--	--	--	--	--	50 U	--
4-Nitrophenol	50	--	--	--	50 U	--	--	--	--	--	50 U	--	--	--	--	--	50 U	--
Dibenzofuran	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
2,4-Dinitrotoluene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Diethylphthalate	10	--	--	--	10 U	--	--	--	--	--	10	--	--	--	--	--	10 U	--
4-Chlorophenyl-phenylether	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Fluorene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	30 U	--
4-Nitroaniline	50	--	--	--	50 U	--	--	--	--	--	50 U	--	--	--	--	--	50 U	--
4,6-Dinitro-2-Methylphenol	50	--	--	--	50 U	--	--	--	--	--	50 U	--	--	--	--	--	50 U	--
N-Nitrosodiphenylamine (1)	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
4-Bromophenyl-phenylether	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Hexachlorobenzene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Pentachlorophenol	50	--	--	--	50 U	--	--	--	--	--	50 U	--	--	--	--	--	50 U	--
Phenanthrene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Anthracene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Di-n-Butylphthalate	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Fluoranthene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Pyrene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
ButylBenzylphthalate	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
3,3'-Dichlorobenzidine	20	--	--	--	20 U	--	--	--	--	--	20 U	--	--	--	--	--	20 U	--
Benzo(a)anthracene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Chrysene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
bis(2-Ethylhexyl)Phthalate	23	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Di-n-Octyl Phthalate	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Benzo(b)Fluoranthene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Benzo(k)Fluoranthene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Benzo(a)Pyrene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Indeno(1,2,3-cd)Pyrene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Dibenz(a,h)Anthracene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
Benzo(g,h,i)Perylene	10	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--
PESTICIDE ORGANICS																		
alpha-BHC	0.05	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
beta-BHC	0.05	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
delta-BHC	0.05	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
gamma-BHC	0.05	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
Heptachlor	0.05	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
Aldrin	0.05	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
Heptachlor epoxide	0.05	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--	--	--	--	--	0.05 U	--
Endosulfan I	0.05	--	--	--	0.05 U	--	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
Dieldrin	0.1	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
4,4'-DDE	0.1	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
Endrin	0.1	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
Endosulfan II	0.1	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
4,4'-DDD	0.1	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
Endosulfan sulfate	0.1	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
4,4'-DDT	0.1	--	--	--	0.1 U	--	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Methoxychlor	0.5	--	--	--	0.5 U	--	--	--	--	--	0.1 U	--	--	--	--	--	0.1 U	--
Endrin ketone	0.1	--	--	--	0.1 U	--	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
alpha-Chlordane	0.5	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
gamma-Chlordane	0.5	--	--	--	1 U	--	--	--	--	--	1 U	--	--	--	--	--	1 U	--
Toxaphene	1	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Aroclor-1016	0.5	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Aroclor-1221	0.5	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Aroclor-1232	0.5	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Aroclor-1242	0.5	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--	--	--	--	--	0.5 U	--
Aroclor-1248	0.5	--	--	--	1 U	--	--	--	--	--	1 U	--	--	--	--	--	1 U	--
Aroclor-1254	1	--	--	--	1 U	--	--	--	--	--	1 U	--	--	--	--	--	1 U	--
Aroclor-1260	1	--	--	--														

Table E-1 Volatile, Semivolatile and Pesticide Organic Analysis

MONITORING WELL		14	14	14	15	15	15	15	15	15	15	17	17	17	17	17	17	18
Well ID	SITE UTL'S	S31-E10C	S31-E10C	S31-E10C	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S41-E13C	S41-E13C	S41-E13C	S41-E13C	S41-E13C	S41-E13C	S37-E21
ROUND	ug/L	7.5	8	9	5	6	6	7	7.5	8	9	5	6	7	7.5	8	9	5
SAMPLE ID#		B01504	B01BW6	B06202	B00HX6	B00Y33	B00ZF7	B010V1	B01507	B01BW9	B06206		B00ZC2					B00HV8
PARAMETERS (units ug/l)																		
VOLATILE ORGANICS																		
Chloromethane	2	10 U	10 U	1 U	10 U	--	10 U	10 U	10 U	10 U	1 U	10 UJ	10 U	--	--	--	--	10 UJ
Trichlorofluoromethane	NA	--	--	1 U	--	--	--	--	--	--	1 U	--	--	--	--	--	--	--
Bromomethane	2	10 U	10 U	1 U	10 U	--	10 U	10 U	10 U	10 U	1 U	10 UJ	10 U	--	--	--	--	10 UJ
Vinyl Chloride	2	10 U	10 U	1 U	10 U	--	10 U	10 U	10 U	10 U	1 U	10 UJ	10 U	--	--	--	--	10 UJ
Chloroethane	2	10 U	10 U	1 U	10 U	--	10 U	10 U	10 U	10 U	1 U	10 UJ	10 U	--	--	--	--	10 UJ
Methylene Chloride	1	5 U	5 U	3 U	5 U	--	5 U	5 U	5 U	5 U	3 U	5 UJ	5 U	--	--	--	--	5 UJ
Acetone	10	10 U	4 J	10 U	10 U	--	10 U	10 U	10 U	10 U	10 U	35 U	10 U	--	--	--	--	10 UJ
Carbon Disulfide	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
1,1-Dichloroethene	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
1,1-Dichloroethane	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
cis-1,2-Dichloroethene	1	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--
Trans-1,2-Dichloroethene	NA	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--
1,2-Dichloroethene (total)	1	5 U	5 U	--	5 U	--	5 U	--	5 U	5 U	--	5 UJ	5 U	--	--	--	--	5 UJ
Chloroform	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
1,2-Dichloroethane	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
2-Butanone	2	10 U	10 U	1 U	10 U	--	10 U	10 U	10 U	10 U	1 U	10 UJ	10 U	--	--	--	--	10 UJ
Tetrahydrofuran	NA	--	--	10 U	--	--	--	--	--	--	10 U	--	--	--	--	--	--	--
1,1,1-Trichloroethane	1.2	2 J	5 U	1	5 U	--	5 U	5 U	1 J	5 U	0.7	5 UJ	5 U	--	--	--	--	5 UJ
Carbon Tetrachloride	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
Vinyl Acetate	2	10 U	--	0.5 U	10 U	--	10 U	--	10 U	--	0.5 U	10 UJ	10 U	--	--	--	--	10 UJ
Bromodichloromethane	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
1,2-Dichloropropane	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
cis-1,3-Dichloropropene	1	5 U	5 U	0.5 U	5 U	--	5 U	--	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
Trans-1,3-Dichloropropene	1	5 U	5 U	0.5 U	5 U	--	5 U	--	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
Trichloroethene	1	76	67	58 D	60	--	62	70	66	64	34 D	5 UJ	5 U	--	--	--	--	5 UJ
Dibromochloromethane	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
1,1,2-Trichloroethane	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
Benzene	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
Bromoform	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
4-Methyl-2-Pentanone	10	10 U	10 U	1 U	10 U	--	10 U	10 U	10 U	10 U	1 U	10 UJ	10 U	--	--	--	--	10 UJ
2-Hexanone	10	10 U	10 U	1 U	10 U	--	10 U	10 U	10 U	10 U	1 U	10 UJ	10 U	--	--	--	--	10 UJ
Tetrachloroethene	1	10 U	5 U	0.6	5 U	--	5 U	5 U	5 U	5 U	0.5 U	2 J	5 U	--	--	--	--	2 J
1,1,2,2-Tetrachloroethane	1	10 U	10 U	0.5 U	5 U	--	5 U	10 U	10 U	10 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
Toluene	1	2 J	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
Chlorobenzene	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
Ethylbenzene	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
Styrene	1	5 U	5 U	0.5 U	5 U	--	5 U	5 U	5 U	5 U	0.5 U	5 UJ	5 U	--	--	--	--	5 UJ
m,p-xylene	NA	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--
o-xylene	NA	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--
Total Xylenes	1	5 U	5 U	--	5 U	--	5 U	5 U	5 U	5 U	--	5 UJ	5 U	--	--	--	--	5 UJ
C12 HYDROCARBON	NA	--	--	--	--	--	--	--	--	--	--	--	100 J	--	--	--	--	--
1,3-Dichlorobenzene	NA	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--
1,4-Dichlorobenzene	NA	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--
1,2-Dichlorobenzene	NA	--	--	0.5 U	--	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--
SEMI-VOLATILE ORGANICS																		
Phenol	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
bis(2-Chloroethyl)Ether	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2-chlorophenol	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
1,3-Dichlorobenzene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
1,4-Dichlorobenzene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Benzyl Alcohol	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
1,2-Dichlorobenzene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2-Methylphenol	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
bis(2-Chloroisopropyl)Ether	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
4-Methylphenol	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
N-Nitroso-Di-n-Propylamine	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Hexachloroethane	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Nitrobenzene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Isophorone	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2-Nitrophenol	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2,4-Dimethylphenol	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Benzoic Acid	50	--	--	--	--	--	67 U	--	--	--	--	50 U	50 U	--	--	--	--	50 U
bis(2-Chloroethoxy)Methane	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2,4-Dichlorophenol	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
1,2,4-Trichlorobenzene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Naphthalene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
4-Chloroaniline	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Hexachlorobutadiene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
4-Chloro-3-Methylphenol	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2-Methylnaphthalene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U

Table E-1 Volatile, Semivolatile and Pesticide Organic Analysis

MONITORING WELL		14	14	14	15	15	15	15	15	15	15	17	17	17	17	17	17	18
Well ID	SITE UTL'S	S31-E10C	S31-E10C	S31-E10C	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S41-E13C	S41-E13C	S41-E13C	S41-E13C	S41-E13C	S41-E13C	S37-E21
ROUND	ug/L	7.5	8	9	5	6	6	7	7.5	8	9	5	6	7	7.5	8	9	5
SAMPLE ID#		B01504	B01BW6	B06202	B00HX6	B00Y33	B00ZF7	B010V1	B01507	B01BW9	B06206		B00ZC2					B00HV8
PARAMETERS (units ug/l)																		
SEMI-VOLATILE ORGANICS (CONT)																		
Hexachlorocyclopentadiene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2,4,6-Trichlorophenol	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2,4,5-Trichlorophenol	50	--	--	--	--	--	67 U	--	--	--	--	50 U	50 U	--	--	--	--	50 U
2-Chloronaphthalene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2-Nitroaniline	50	--	--	--	--	--	67 U	--	--	--	--	50 U	50 U	--	--	--	--	50 U
Dimethyl Phthalate	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Acenaphthylene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2,6-Dinitrotoluene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
3-Nitroaniline	50	--	--	--	--	--	67 U	--	--	--	--	50 U	50 U	--	--	--	--	50 U
Acenaphthene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2,4-Dinitrophenol	50	--	--	--	--	--	67 U	--	--	--	--	50 U	50 U	--	--	--	--	50 U
4-Nitrophenol	50	--	--	--	--	--	67 U	--	--	--	--	50 U	50 U	--	--	--	--	50 U
Dibenzofuran	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
2,4-Dinitrotoluene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Diethylphthalate	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
4-Chlorophenyl-phenylether	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Fluorene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
4-Nitroaniline	50	--	--	--	--	--	67 U	--	--	--	--	50 U	50 U	--	--	--	--	50 U
4,6-Dinitro-2-Methylphenol	50	--	--	--	--	--	67 U	--	--	--	--	50 U	50 U	--	--	--	--	50 U
N-Nitrosodiphenylamine (1)	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
4-Bromophenyl-phenylether	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Hexachlorobenzene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Pentachlorophenol	50	--	--	--	--	--	67 U	--	--	--	--	50 U	50 U	--	--	--	--	50 U
Phenanthrene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Anthracene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Di-n-Butylphthalate	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Fluoranthene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Pyrene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Butylbenzylphthalate	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
3,3'-Dichlorobenzidine	20	--	--	--	--	--	27 U	--	--	--	--	20 U	20 U	--	--	--	--	20 U
Benzo(a)anthracene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Chrysene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
bis(2-Ethylhexyl)Phthalate	23	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Di-n-Octyl Phthalate	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Benzo(b)Fluoranthene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Benzo(k)Fluoranthene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Benzo(a)Pyrene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Indeno(1,2,3-cd)Pyrene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Dibenz(a,h)Anthracene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
Benzo(g,h,i)Perylene	10	--	--	--	--	--	13 U	--	--	--	--	10 U	10 U	--	--	--	--	10 U
PESTICIDE ORGANICS																		
alpha-BHC	0.05	--	--	--	--	--	0.05 U	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U
beta-BHC	0.05	--	--	--	--	--	0.05 U	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U
delta-BHC	0.05	--	--	--	--	--	0.05 U	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U
gamma-BHC	0.05	--	--	--	--	--	0.05 U	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U
Heptachlor	0.05	--	--	--	--	--	0.05 U	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U
Aldrin	0.05	--	--	--	--	--	0.05 U	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U
Heptachlor epoxide	0.05	--	--	--	--	--	0.05 U	--	--	--	--	0.05 U	0.05 U	--	--	--	--	0.05 U
Endosulfan I	0.05	--	--	--	--	--	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U
Dieldrin	0.1	--	--	--	--	--	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U
4,4'-DDE	0.1	--	--	--	--	--	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U
Endrin	0.1	--	--	--	--	--	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U
Endosulfan II	0.1	--	--	--	--	--	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U
4,4'-DDD	0.1	--	--	--	--	--	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U
Endosulfan sulfate	0.1	--	--	--	--	--	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U
4,4'-DDT	0.1	--	--	--	--	--	0.5 U	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U
Methoxychlor	0.5	--	--	--	--	--	0.1 U	--	--	--	--	0.1 U	0.1 U	--	--	--	--	0.1 U
Endrin ketone	0.1	--	--	--	--	--	0.5 U	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U
alpha-Chlordane	0.5	--	--	--	--	--	0.5 U	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U
gamma-Chlordane	0.5	--	--	--	--	--	1 U	--	--	--	--	1 U	1 U	--	--	--	--	1 U
Toxaphene	1	--	--	--	--	--	0.5 U	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U
Aroclor-1016	0.5	--	--	--	--	--	0.5 U	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U
Aroclor-1221	0.5	--	--	--	--	--	0.5 U	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U
Aroclor-1232	0.5	--	--	--	--	--	0.5 U	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U
Aroclor-1242	0.5	--	--	--	--	--	0.5 U	--	--	--	--	0.5 U	0.5 U	--	--	--	--	0.5 U
Aroclor-1248	0.5	--	--	--	--	--	1 U	--	--	--	--	1 U	1 U	--	--	--	--	1 U
Aroclor-1254	1	--	--	--	--	--	1 U	--	--	--	--	1 U	1 U	--	--	--	--	1 U
Aroclor-1260	1	--	--	--	--	--												

Table E-1 Volatile, Semivolitile and Pesticide Organic Analysis

MONITORING WELL		18	18	18	18	18	19	19	19	19	19	19
Well ID	SITE UTL'S	S37-E12	S37-E12	S37-E12	S37-E12	S37-E12	S32-E11	S32-E11	S32-E11	S32-E11	S32-E11	S32-E11
ROUND	ug/L	6	7	7.5	8	9	5	6	7	7.5	8	9
SAMPLE ID#		B00ZC1	B010Y9		B01BX2			B00ZH3	D010V3	D01510	B01C07	B06207
PARAMETERS (units ug/l)												
VOLATILE ORGANICS												
Chloromethane	2	10 U	10 U	--	10	--	--	10 U	10 U	10 U	10 U	1 U
Trichlorofluoromethane	NA	--	--	--	--	--	--	--	--	--	--	1 U
Bromomethane	2	10 U	10 U	--	10	--	--	10 U	10 U	10 U	10 U	1 U
Vinyl Chloride	2	10 U	10 U	--	10	--	--	10 U	10 U	10 U	10 U	1 U
Chloroethane	2	10 U	10 U	--	10	--	--	10 U	10 U	10 U	10 U	1 U
Methylene Chloride	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	3 U
Acetone	10	10 U	10 U	--	10	--	--	10 U	10 U	18	10 U	10 U
Carbon Disulfide	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
1,1-Dichloroethene	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
1,1-Dichloroethane	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
cis-1,2-Dichloroethene	1	--	--	--	--	--	--	--	--	--	--	0.5 U
Trans-1,2-Dichloroethene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U
1,2-Dichloroethene (total)	1	5 U	--	--	5	--	--	5 U	--	5 U	5 U	--
Chloroform	1	5 U	1 J	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
1,2-Dichloroethane	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
2-Butanone	2	10 U	10 U	--	10	--	--	10 U	10 U	10 U	10 U	1 U
Tetrahydrofuran	NA	--	--	--	--	--	--	--	--	--	--	10 U
1,1,1-Trichloroethane	1.2	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
Carbon Tetrachloride	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
Vinyl Acetate	2	10 U	--	--	--	--	--	10 U	--	10 U	--	0.5 U
Bromodichloromethane	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
1,2-Dichloropropane	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
cis-1,3-Dichloropropene	1	5 U	--	--	5	--	--	5 U	--	5 U	5 U	0.5 U
Trans-1,3-Dichloropropene	1	5 U	--	--	5	--	--	5 U	--	5 U	5 U	0.5 U
Trichloroethene	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
Dibromochloromethane	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
1,1,2-Trichloroethane	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
Benzene	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
Bromoform	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
4-Methyl-2-Pentanone	10	10 U	10 U	--	10	--	--	10 U	10 U	10 U	10 U	1 U
2-Hexanone	10	10 U	10 U	--	10	--	--	10 U	10 U	10 U	10 U	1 U
Tetrachloroethene	1	5 U	5 U	--	4	--	--	5 U	5 U	5 U	5 U	0.5 U
1,1,2,2-Tetrachloroethane	1	5 U	10 U	--	10	--	--	5 U	10 U	10 U	10 U	0.5 U
Toluene	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
Chlorobenzene	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
Ethylbenzene	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
Styrene	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	0.5 U
m,p-xylene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U
o-xylene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U
Total Xylenes	1	5 U	5 U	--	5	--	--	5 U	5 U	5 U	5 U	--
C12 HYDROCARBON	NA	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U
1,4-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U
1,2-Dichlorobenzene	NA	--	--	--	--	--	--	--	--	--	--	0.5 U
SEMI-VOLATILE ORGANICS												
Phenol	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
bis(2-Chloroethyl)Ether	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2-chlorophenol	10	10 U	10 U	--	6	--	--	--	10 U	--	40 U	--
1,3-Dichlorobenzene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
1,4-Dichlorobenzene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Benzyl Alcohol	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
1,2-Dichlorobenzene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2-Methylphenol	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
bis(2-Chloroisopropyl)Ether	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
4-Methylphenol	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
N-Nitroso-Di-n-Propylamine	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Hexachloroethane	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Nitrobenzene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Isophorone	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2-Nitrophenol	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2,4-Dimethylphenol	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Benzoic Acid	50	50 U	50 U	--	200	--	--	--	50 U	--	200 U	--
bis(2-Chloroethoxy)Methane	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2,4-Dichlorophenol	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
1,2,4-Trichlorobenzene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Naphthalene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
4-Chloroaniline	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Hexachlorobutadiene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
4-Chloro-3-Methylphenol	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2-Methylnaphthalene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--

Table E-1 Volatile, Semivolitile and Pesticide Organic Analysis

MONITORING WELL		18	18	18	18	18	19	19	19	19	19	19
Well ID	SITE UTL'S	S37-E12	S37-E12	S37-E12	S37-E12	S37-E12	S32-E11	S32-E11	S32-E11	S32-E11	S32-E11	S32-E11
ROUND	ug/L	6	7	7.5	8	9	5	6	7	7.5	8	9
SAMPLE ID#		B00ZG1	B010V9		B01BX2			B00ZH3	B010V5	B01510	B01C07	B06207
PARAMETERS (units ug/l)												
SEMI-VOLATILE ORGANICS (CONT)												
Hexachlorocyclopentadiene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2,4,6-Trichlorophenol	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2,4,5-Trichlorophenol	50	50 U	50 U	--	200	--	--	--	50 U	--	200 U	--
2-Chloronaphthalene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2-Nitroaniline	50	50 U	50 U	--	200	--	--	--	50 U	--	200 U	--
Dimethyl Phthalate	10	10 U	10 U	--	--	--	--	--	10 U	--	--	--
Acenaphthylene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2,6-Dinitrotoluene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
3-Nitroaniline	50	50 U	50 U	--	200	--	--	--	50 U	--	200 U	--
Acenaphthene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2,4-Dinitrophenol	50	50 U	50 U	--	200	--	--	--	50 U	--	200 U	--
4-Nitrophenol	50	50 U	50 U	--	200	--	--	--	50 U	--	40 U	--
Dibenzofuran	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
2,4-Dinitrotoluene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Diethylphthalate	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
4-Chlorophenyl-phenylether	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Fluorene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
4-Nitroaniline	50	50 U	50 U	--	200	--	--	--	50 U	--	200 U	--
4,6-Dinitro-2-Methylphenol	50	50 U	50 U	--	200	--	--	--	50 U	--	200 U	--
N-Nitrosodiphenylamine (1)	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
4-Bromophenyl-phenylether	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Hexachlorobenzene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Pentachlorophenol	50	50 U	50 U	--	200	--	--	--	50 U	--	200 U	--
Phenanthrene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Anthracene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Di-n-Butylphthalate	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Fluoranthene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Pyrene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Butylbenzylphthalate	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
3,3'-Dichlorobenzidine	20	20 U	20 U	--	80	--	--	--	20 U	--	80 U	--
Benzo(a)anthracene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Chrysene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
bis(2-Ethylhexyl)Phthalate	23	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Di-n-Octyl Phthalate	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Benzo(b)Fluoranthene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Benzo(k)Fluoranthene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Benzo(a)Pyrene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Indeno(1,2,3-cd)Pyrene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Dibenz(a,h)Anthracene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
Benzo(g,h,i)Perylene	10	10 U	10 U	--	40	--	--	--	10 U	--	40 U	--
PESTICIDE ORGANICS												
alpha-BHC	0.05	0.05 U	0.05 U	--	0.05	--	--	--	0.05 U	--	0.05 U	--
beta-BHC	0.05	0.05 U	0.05 U	--	0.05	--	--	--	0.05 U	--	0.05 U	--
delta-BHC	0.05	0.05 U	0.05 U	--	0.05	--	--	--	0.05 U	--	0.05 U	--
gamma-BHC	0.05	0.05 U	0.05 U	--	0.05	--	--	--	0.05 U	--	0.05 U	--
Heptachlor	0.05	0.05 U	0.05 U	--	0.05	--	--	--	0.05 U	--	0.05 U	--
Aldrin	0.05	0.05 U	0.05 U	--	0.05	--	--	--	0.05 U	--	0.05 U	--
Heptachlor epoxide	0.05	0.05 U	0.05 U	--	0.05	--	--	--	0.05 U	--	0.05 U	--
Endosulfan I	0.05	0.05 U	0.05 U	--	0.05	--	--	--	0.05 U	--	0.05 U	--
Dieldrin	0.1	0.1 U	0.1 U	--	0.1	--	--	--	0.1 U	--	0.018 JX	--
4,4'-DDE	0.1	0.1 U	0.1 U	--	0.1	--	--	--	0.1 U	--	0.1 U	--
Endrin	0.1	0.1 U	0.1 U	--	0.1	--	--	--	0.1 U	--	0.1 U	--
Endosulfan II	0.1	0.1 U	0.1 U	--	0.1	--	--	--	0.1 U	--	0.1 U	--
4,4'-DDD	0.1	0.1 U	0.1 U	--	0.1	--	--	--	0.1 U	--	0.1 U	--
Endosulfan sulfate	0.1	0.1 U	0.1 U	--	0.1	--	--	--	0.1 U	--	0.1 U	--
4,4'-DDT	0.1	0.1 U	0.1 U	--	0.1	--	--	--	0.1 U	--	0.1 U	--
Methoxychlor	0.5	0.5 U	0.5 U	--	0.5	--	--	--	0.5 U	--	0.5 U	--
Endrin ketone	0.1	0.1 U	0.1 U	--	0.1	--	--	--	0.1 U	--	0.1 U	--
alpha-Chlordane	0.5	0.5 U	0.5 U	--	0.5	--	--	--	0.5 U	--	0.5 U	--
gamma-Chlordane	0.5	0.5 U	0.5 U	--	0.5	--	--	--	0.5 U	--	0.5 U	--
Toxaphene	1	1 U	1 U	--	1	--	--	--	1 U	--	1 U	--
Aroclor-1016	0.5	0.5 U	0.5 U	--	0.5	--	--	--	0.5 U	--	0.5 U	--
Aroclor-1221	0.5	0.5 U	0.5 U	--	0.5	--	--	--	0.5 U	--	0.5 U	--
Aroclor-1232	0.5	0.5 U	0.5 U	--	0.5	--	--	--	0.5 U	--	0.5 U	--
Aroclor-1242	0.5	0.5 U	0.5 U	--	0.5	--	--	--	0.5 U	--	0.5 U	--
Aroclor-1248	0.5	0.5 U	0.5 U	--	0.5	--	--	--	0.5 U	--	0.5 U	--
Aroclor-1254	1	1 U	1 U	--	1	--	--	--	1 U	--	1 U	--
Aroclor-1260	1	1 U	0.047 J	--	1	--	--	--	1 U	--	0.86 J	--

Table E-1 Volatile, Semivolitile and Posticide Organic Analysis

ilk		20	20	20	20	20	20	21	21	21	21	21	21	22	22	22	22	22	22
Well ID	SITE UTL'S	S29-E11	S29-E11	S29-E11	S29-E11	S29-E11	S29-E11	S31-E10E	S31-E10E	S31-E10E	S31-E10E	S31-E10E	S31-E10E	S31-E11	S31-E11	S31-E11	S31-E11	S31-E11	S31-E11
ROUND	ug/L	5	6	7	7.5	8	9	5	6	7	7.5	8	9	5	6	7	7.5	8	9
SAMPLE ID#			B00ZJ14	B010V7	B01513	B01C12	B06208		B00ZH5	B010W1	B01516	B01C17			B00ZH6	B010W5	B01519	B01C22	B06209
PARAMETERS																			
VOLATILE ORGANICS																			
Chloromethane	2	--	10 U	10 U	10 U	10 U	1 U	--	10 U	10 U	10 U	10 U	--	--	10 U	10 U	10 U	10 U	1 U
Trichlorofluoro	NA	--	--	--	--	--	1 U	--	--	--	--	--	--	--	--	--	--	--	1 U
Bromomethane	2	--	10 U	10 U	10 U	10 U	1 U	--	10 U	10 U	10 U	10 U	--	--	10 U	10 U	10 U	10 U	1 U
Vinyl Chloride	2	--	10 U	10 U	10 U	10 U	1 U	--	10 U	10 U	10 U	10 U	--	--	10 U	10 U	10 U	10 U	1 U
Chloroethane	2	--	10 U	10 U	10 U	10 U	1 U	--	10 U	10 U	10 U	10 U	--	--	10 U	10 U	10 U	10 U	1 U
Methylene Chlor	1	--	5 U	5 U	5 U	5 U	3 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	6	3 U
Acetone	10	--	10 U	10 U	21	10 U	10 U	--	10 B	10 U	12	10 U	--	--	10 U	10 U	10 U	10 U	10 U
Carbon Disulfid	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
1,1-Dichloroethe	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
1,1-Dichloroetha	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
cis-1,2-Dichloro	1	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	--	0.5 U
Trans-1,2-Dichl	NA	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	--	0.5 U
1,2-Dichloroethe	1	--	5 U	--	5 U	5 U	--	--	--	--	5 U	5 U	--	--	5 U	--	5 U	5 U	--
Chloroform	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
1,2-Dichloroetha	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
2-Butanone	2	--	10 U	10 U	10 U	10 U	1 U	--	10 U	10 U	10 U	10 U	--	--	10 U	10 U	10 U	10 U	1 U
Tetrahydrofuran	NA	--	--	--	--	--	10 U	--	--	--	--	--	--	--	--	--	--	--	10 U
1,1,1-Trichloroe	1.2	--	5 U	5 U	5 U	5 U	0.5	--	5 u	5 U	5 U	5 U	--	--	5 U	1 J	5 U	5 U	0.5 U
Carbon Tetrachl	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
Vinyl Acetate	2	--	10 U	--	10 U	10 U	0.5 U	--	--	--	10 U	10 U	--	--	10 U	--	10 U	--	0.5 U
Bromodichlorom	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
1,2-Dichloropro	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
cis-1,3-Dichloro	1	--	5 U	--	5 U	5 U	0.5 U	--	--	--	5 U	5 U	--	--	5 U	--	5 U	5 U	0.5 U
Trans-1,3-Dichl	1	--	5 U	--	5 U	5 U	0.5 U	--	--	--	5 U	5 U	--	--	5 U	--	5 U	5 U	0.5 U
Trichloroethene	1	--	3 J	2 J	3 J	4 J	4	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
Dibromochloro	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
1,1,2-Trichloroe	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
Benzene	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
Bromoform	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
4-Methyl-2-Pent	10	--	10 U	10 U	10 U	10 U	1 U	--	10 U	10 U	10 U	10 U	--	--	10 U	10 U	10 U	10 U	1 U
2-Hexanone	10	--	10 U	10 U	10 U	10 U	1 U	--	10 U	10 U	10 U	10 U	--	--	10 U	10 U	10 U	10 U	1 U
Tetrachloroethen	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
1,1,2,2-Tetrachl	1	--	5 U	10 U	10 U	10 U	0.5 U	--	10 U	10 U	10 U	10 U	--	--	5 U	10 U	10 U	10 U	0.5 U
Toluene	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
Chlorobenzene	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
Ethylbenzene	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
Styrene	1	--	5 U	5 U	5 U	5 U	0.5 U	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	0.5 U
m,p-xylene	NA	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	--	0.5 U
o-xylene	NA	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	--	0.5 U
Total Xylenes	1	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	--	--	5 U	5 U	5 U	5 U	--
C12 HYDROC	NA	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichloroben	NA	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	--	0.5 U
1,4-Dichloroben	NA	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	--	0.5 U
1,2-Dichloroben	NA	--	--	--	--	--	0.5 U	--	--	--	--	--	--	--	--	--	--	--	0.5 U
SEMI-VOLATILE ORGANICS																			
Phenol	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
bis(2-Chloroethy	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2-chlorophenol	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
1,3-Dichloroben	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
1,4-Dichloroben	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Benzyl Alcohol	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
1,2-Dichloroben	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2-Methylphenol	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
bis(2-Chloroisop	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
4-Methylphenol	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
N-Nitroso-Di-n-	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Hexachloroethan	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Nitrobenzene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Isophorone	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2-Nitrophenol	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2,4-Dimethylpho	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Benzoic Acid	50	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--
bis(2-Chloroetho	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2,4-Dichlorophe	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
1,2,4-Trichlorob	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Naphthalene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
4-Chloroaniline	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Hexachlorobuta	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
4-Chloro-3-Meth	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2-Methylnaphtha	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--

Table E-1 Volatile, Semivolitile and Pesticide Organic Analysis

Sit		20	20	20	20	20	20	21	21	21	21	21	21	22	22	22	22	22	22
Well ID	SITE UTL'S	S29-E11	S29-E11	S29-E11	S29-E11	S29-E11	S29-E11	S31-E10E	S31-E10E	S31-E10E	S31-E10E	S31-E10E	S31-E10E	S31-E11	S31-E11	S31-E11	S31-E11	S31-E11	S31-E11
ROUND	ug/L	5	6	7	7.5	8	9	5	6	7	7.5	8	9	5	6	7	7.5	8	9
SAMPLE ID#			B00ZH4	B010V7	B01513	B01C12	B06208		B00ZH5	B010W1	B01516	B01C17			B00ZH6	B010W5	B01519	B01C22	B06209
PARAMETERS																			
SEMI-VOLATILE ORGANICS (ONT)																			
Hexachlorocyclo	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2,4,6-Trichlorop	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2,4,5-Tricholoro	50	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--
2-Chloronaphtha	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2-Nitroaniline	50	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--
Dimethyl Phthal	10	--	--	10 U	--	--	--	--	--	10 U	--	--	--	--	--	10 U	--	--	--
Acenaphthylene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2,6-Dinitrotolue	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
3-Nitroaniline	50	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--
Acenaphthene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2,4-Dinitrophen	50	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--
4-Nitrophenol	50	--	--	50 U	--	40 U	--	--	--	50 U	--	40 U	--	--	--	50 U	--	200 U	--
Dibenzofuran	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
2,4-Dinitrotolue	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Diethylphthalate	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
4-Chlorophenyl-	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Fluorene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
4-Nitroaniline	50	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--
4,6-Dinitro-2-M	50	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--
N-Nitrosodiphen	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
4-Bromophenyl-	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Hexachlorobenz	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Pentachlorophen	50	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--	--	--	50 U	--	200 U	--
Phenanthrene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Anthracene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Di-n-Butylphthal	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Fluoranthene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Pyrene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Butylbenzylphth	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
3,3'-Dichlorobe	20	--	--	20 U	--	80 U	--	--	--	20 U	--	80 U	--	--	--	20 U	--	80 U	--
Benzo(a)anthrac	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Chrysene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
bis(2-Ehhylhexyl	23	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Di-n-Octyl Phtha	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Benzo(b)Fluoran	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Benzo(k)Fluoran	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Benzo(a)Pyrene	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Indeno(1,2,3-cd)	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Dibenz(a,h)Anth	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
Benzo(g,h,i)Per	10	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--	--	--	10 U	--	40 U	--
PESTICIDE OR																			
alpha-BHC	0.05	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--
beta-BHC	0.05	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--
delta-BHC	0.05	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--
gamma-BHC	0.05	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--
Heptachlor	0.05	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--
Aldrin	0.05	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--
Heptachlor epox	0.05	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--	--	--	0.05 U	--	0.05 U	--
Endosulfan I	0.05	--	--	0.05 U	--	0.05 U	--	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--
Dieldrin	0.1	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--
4,4'-DDE	0.1	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--
Endrin	0.1	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--
Endosulfan II	0.1	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--
4,4'-DDD	0.1	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--
Endosulfan sulfa	0.1	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--
4,4'-DDT	0.1	--	--	0.1 U	--	0.1 U	--	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--
Methoxychlor	0.5	--	--	0.5 U	--	0.5 U	--	--	--	0.1 U	--	0.1 U	--	--	--	0.1 U	--	0.1 U	--
Endrin ketone	0.1	--	--	0.1 U	--	0.1 U	--	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--
alpha-Chlordane	0.5	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--
gamma-Chlorda	0.5	--	--	0.5 U	--	0.5 U	--	--	--	1 U	--	1 U	--	--	--	1 U	--	1 U	--
Toxaphene	1	--	--	1 U	--	1 U	--	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--
Aroclor-1016	0.5	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--
Aroclor-1221	0.5	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--
Aroclor-1232	0.5	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--
Aroclor-1242	0.5	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--	--	--	0.5 U	--	0.5 U	--
Aroclor-1248	0.5	--	--	0.5 U	--	0.5 U	--	--	--	1 U	--	1 U	--	--	--	1 U	--	1 U	--
Aroclor-1254	1	--	--	1 U	--	1 U	--	--	--	1 U	--	1 U	--	--	--	1 U	--	1 U	--
Aroclor-1260	1	--	--	1 U	--	1 U	--	--	--										

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL		1	1	1	1	1	1	1	1
	SITE UTL'S	S41-E11	S41-E11	S41-E11	S41-E11	S41-E11	S41-E11	S41-E11	S41-E11
ROUND	ug/L	5	6	6	7	7.5	8	8	9
SAMPLE ID#			B00ZC6	B00ZC7			B01BT3	B01BT4	
PARAMETERS									
METALS									
			unfiltered	filtered					
Aluminum	152	--	58 U	58 U	--	--	75 J	129 J	--
Antimony	21	--	24 U	24 U	--	--	44 U	44 U	--
Arsenic	10.9	--	3.6 J	4 J	--	--	4 J	3.5 J	--
Barium	60.5	--	38.9 J	35.2 J	--	--	65 J	64.4 J	--
Beryllium	1	--	1 U	1 U	--	--	1 U	1 U	--
Cadmium	3	--	3 U	3 U	--	--	4 U	4 U	--
Calcium	74600	--	56600 *	54400 *	--	--	87900	88700	--
Chromium	7.8	--	48.4	6.7 J	--	--	13.4	7 U	--
Colbalt	3	--	5 U	5 U	--	--	4 U	4 U	--
Copper	5.22	--	6.3 J	7.4 J	--	--	15.2 J	28.8	--
Iron	820	--	402	28.5 J	--	--	272	80.3 J	--
Lead	13.7	--	1 U	1.5 J	--	--	2.4 J	1 U	--
Magnesium	20200	--	11300 *	10800 *	--	--	18500	18600	--
Manganese	390	--	8.3 J	1.3 J	--	--	11.7 J	12.5 J	--
Mercury	0.2	--	0.2 U	0.2 U	--	--	0.2 U	0.2 U	--
Nickel	15	--	79.9	66.8	--	--	134	96.9	--
Potassium	7140	--	6870	6600	--	--	8150	8180	--
Selenium	5.29	--	1.1 J	1 U	--	--	2 U	20 U	--
Silver	4.0	--	4 U	4 U	--	--	4 U	4 U	--
Sodium	29500	--	21800 *	20800 *	--	--	28900	28900	--
Thallium	4	--	1 U	1 U	--	--	4 U	1 U	--
Vanadium	18.1	--	10.5 J	9.6 J	--	--	16.7 J	16.8 J	--
Zinc	8.3	--	4.4 J	13.1 J	--	--	8.3 J	12.7 J	--
Cyanide	10	--	10 U	-- NR	--	--	10 U	-- NR	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	SITE UTL'S	2 S34-E10	2 S34-E10	2 S34-E10	2 S34-E10	2 S34-E10	2 S34-E10	2 S34-E10
ROUND	ug/L	5	6	6	7	7.5	8	9
SAMPLE ID#			B00Z68	B00Z69	B010X3			B06194
PARAMETERS								
METALS			unfiltered	filtered				
Aluminum	152	--	61.6 J	58 U	--	--	--	--
Antimony	21	--	24 U	24.4 J	--	--	--	--
Arsenic	10.9	--	4.7 J	3.8 J	--	--	--	--
Barium	60.5	--	56 J	57 J	--	--	--	51.1
Beryllium	1	--	1.4 J	1.4 J	--	--	--	--
Cadmium	3	--	3 U	3 U	--	--	--	--
Calcium	74600	--	53300	54800	--	--	--	50800
Chromium	7.8	--	40.1	6 U	--	--	--	--
Colbalt	3	--	5 U	5 U	--	--	--	--
Copper	5.22	--	5 U	5 U	--	--	--	--
Iron	820	--	234	29.8 J	--	--	--	120
Lead	13.7	--	1.5 J	1 U	--	--	--	--
Magnesium	20200	--	10900	11100	--	--	--	10600
Manganese	390	--	9.1 J	5 J	--	--	--	15 U
Mercury	0.2	--	0.2 U	0.2 U	--	--	--	--
Nickel	15	--	31.1 J	12 U	--	--	--	--
Potassium	7140	--	6420	6330	--	--	--	5790
Selenium	5.29	--	1.6 J	1 U	--	--	--	--
Silver	4.0	--	4 U	4 U	--	--	--	--
Sodium	29500	--	21100	21500	--	--	--	20600
Thallium	4	--	1 UN	1 UN	--	--	--	--
Vanadium	18.1	--	9.8 J	4.5 J	--	--	--	--
Zinc	8.3	--	4 U	4 U	--	--	--	--
Cyanide	10	--	10 U	-- NR	--	--	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL		3	3	3	3	3	3	3	3
	SITE UTL'S	S41-E12	S41-E12	S41-E12	S41-E12	S41-E12	S41-E12	S41-E12	S41-E12
ROUND	ug/L	5	6	6	7	7.5	8	8	9
SAMPLE ID#			B00ZD0	B00ZD1			B01BT6	B01BT7	
PARAMETERS									
METALS									
			unfiltered	filtered					
Aluminum	152	--	133 J	58 U	--	--	139 J	80.4 J	--
Antimony	21	--	43.4 J	25.6 J	--	--	49.8 J	47.8 J	--
Arsenic	10.9	--	1.7 J	1.8 J	--	--	3.2 J	1.3 J	--
Barium	60.5	--	174 J	101 J	--	--	146 J	138 J	--
Beryllium	1	--	1 U	1 U	--	--	1 U	1 U	--
Cadmium	3	--	3 U	3 U	--	--	4 U	4 U	--
Calcium	74600	--	197000 J	118000 J	--	--	146000	142000	--
Chromium	7.8	--	38.7	6 U	--	--	170	7 U	--
Colbalt	3	--	5 U	5 U	--	--	4 U	4 U	--
Copper	5.22	--	5 U	5 U	--	--	30.4	13.6 J	--
Iron	820	--	719	44.7 J	--	--	2050	49.1 J	--
Lead	13.7	--	1.7 J	1.1 J	--	--	2.6 J	1.5 J	--
Magnesium	20200	--	42100 J	24900 J	--	--	32200	31400	--
Manganese	390	--	62.3	30.5	--	--	25.6	9.3 J	--
Mercury	0.2	--	0.2 U	0.2 U	--	--	0.2 U	0.2 U	--
Nickel	15	--	51.6	21.7 J	--	--	140	106	--
Potassium	7140	--	13900	8950	--	--	10500	10900	--
Selenium	5.29	--	1 U	1 U	--	--	10 UN	1 UN	--
Silver	4.0	--	4 U	4 U	--	--	4 U	4 U	--
Sodium	29500	--	56900 J	35900 J	--	--	49800	48400	--
Thallium	4	--	1 U	1 U	--	--	10 UN	10 UN	--
Vanadium	18.1	--	11.5 J	4.8 J	--	--	12.4 J	12.7 J	--
Zinc	8.3	--	5.7 J	8.2 J	--	--	10.6 J	5 U	--
Cyanide	10	--	10 U	--	--	--	10 U	-- NR	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL		4	4	4	4	4	4	4
	SITE UTL'S	S38-E12A	S38-E12A	S38-E12A	S38-E12A	S38-E12A	S38-E12A	S38-E12A
ROUND	ug/L	5	6	6	7	7.5	8	9
SAMPLE ID#			B00Z52	B00Z53			B01BT9	
PARAMETERS								
METALS								
			unfiltered	filtered				
Aluminum	152	--	58 U	58 U	--	--	--	--
Antimony	21	--	24 U	24 U	--	--	--	--
Arsenic	10.9	--	4.2 J	4.2 J	--	--	--	--
Barium	60.5	--	41.5 J	61 J	--	--	--	--
Beryllium	1	--	1 U	1 U	--	--	--	--
Cadmium	3	--	3 U	3 U	--	--	--	--
Calcium	74600	--	4200	62200	--	--	--	--
Chromium	7.8	--	10.4	8 J	--	--	--	--
Colbalt	3	--	5 U	5 U	--	--	--	--
Copper	5.22	--	5 U	5 U	--	--	--	--
Iron	820	--	58.9 J	31.1 J	--	--	--	--
Lead	13.7	--	4	2.1 J	--	--	--	--
Magnesium	20200	--	8700	12900	--	--	--	--
Manganese	390	--	1 U	1.4 J	--	--	--	--
Mercury	0.2	--	0.2 U	0.2 U	--	--	--	--
Nickel	15	--	12 U	12 U	--	--	--	--
Potassium	7140	--	4540 J	6180	--	--	--	--
Selenium	5.29	--	1 UN	1 UN	--	--	--	--
Silver	4.0	--	4 U	4 U	--	--	--	--
Sodium	29500	--	13500	18900	--	--	--	--
Thallium	4	--	1 UN	1 UN	--	--	--	--
Vanadium	18.1	--	5.9 J	14.7 J	--	--	--	--
Zinc	8.3	--	4 U	34	--	--	--	--
Cyanide	10	--	10 U	-- NR	--	--	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	SITE UTL'S	5 S38-E12B	5 S38-E12B	5 S38-E12B	5 S38-E12B	5 S38-E12B	5 S38-E12B	5 S38-E12B	5 S38-E12B	5 S38-E12B	5 S38-E12B
ROUND	ug/L	5	6	6	6	6	7	7.5	8	8	9
SAMPLE ID#			B00Z56	B00Z57	B00Z60	B00Z61			B01BV0	B01BV1	
PARAMETERS											
METALS											
			unfiltered	filtered	unfiltered	filtered					
Aluminum	152	--	58 U	58 U	58 U	58 U	--	--	110 J	152 J	--
Antimony	21	--	24 U	24 U	24 U	37.3 J	--	--	25 U	25 U	--
Arsenic	10.9	--	4.9 J	5.5 J	4.9 J	2.3 J	--	--	6.2 J	6.3 J	--
Barium	60.5	--	64.7 J	68.4 J	68.4 J	97.7 J	--	--	47.4 J	51.3 J	--
Beryllium	1	--	1 U	1 U	1 U	1 U	--	--	1 U	2.1 J	--
Cadmium	3	--	3 U	6 U	3 U	3 U	--	--	3 U	4.7 J	--
Calcium	74600	--	42600	49200	45900	103000	--	--	37100	36500	--
Chromium	7.8	--	21.5	9.2 J	20.2	6 U	--	--	19.7 J	8 U	--
Colbalt	3	--	5 U	5 U	5 U	5 U	--	--	6 U	6 U	--
Copper	5.22	--	5 U	5 U	5 U	5.5 J	--	--	21.6 J	21.2 J	--
Iron	820	--	132	42.8 J	125	62.3 J	--	--	78.4 J	40.5 J	--
Lead	13.7	--	1 J	1 U	1.2 J	2.3 J	--	--	1.6 J	1.1 J	--
Magnesium	20200	--	8440	9710	9140	19000	--	--	7210	7360	--
Manganese	390	--	15.8	1.6 J	16.3	1 U	--	--	2.7 J	4.6 J	--
Mercury	0.2	--	0.2 U	0.2 U	0.2 U	0.2 U	--	--	0.2 U	0.2 U	--
Nickel	15	--	20.7 J	16.6 J	12 U	12 U	--	--	31.5 J	21.4 J	--
Potassium	7140	--	5600	5710	5920	8070	--	--	4470 J	4580 J	--
Selenium	5.29	--	1 UN	1 UN	1 UN	1 UN	--	--	1.4 J	1 U	--
Silver	4.0	--	4 U	4 U	4 U	4 U	--	--	3 U	3 U	--
Sodium	29500	--	20700	24800	22200	17200	--	--	18500	18500	--
Thallium	4	--	1 UN	1 UN	1 UN	1 UN	--	--	1 J	1 U	--
Vanadium	18.1	--	11.7 J	8.8 J	8.8 J	9.8 J	--	--	9.3 J	12.5 J	--
Zinc	8.3	--	4 U	4 U	4 U	14.9 J	--	--	22.6	18.5 J	--
Cyanide	10	--	10 U	-- NR	10 U	-- NR	--	--	20 U	-- NR	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	SITE UTL'S	6 S37-E11	6 S37-E11	6 S37-E11	6 S37-E11	6 S37-E11	6 S37-E11	6 S37-E11	6 S37-E11	6 S37-E11	6 S37-E11
ROUND	ug/L	5	6	6	7	7.5	8	8	8	8	9
SAMPLE ID#			B00Z64	B00Z65			B01BV2	B01BV3	B01BX7	B01BX8	
PARAMETERS											
METALS			unfiltered	filtered							
Aluminum	152	--	58 U	58 U	--	--	97.5 J	131 J	123 J	117 J	--
Antimony	21	--	24 U	33.2 J	--	--	44 U	44 U	25 U	25 U	--
Arsenic	10.9	--	5.2 J	4.9 J	--	--	5.4 J	5.7 J	1 U	15 J	--
Barium	60.5	--	42.1 J	40.3 J	--	--	36.3 J	38 J	11.7 J	10.9 J	--
Beryllium	1	--	1 U	1 U	--	--	1 U	1 U	1 U	1.3 J	--
Cadmium	3	--	3 U	3 U	--	--	4 U	4 U	3 U	3.1 J	--
Calcium	74600	--	43000	41900	--	--	41000	42500	25300	24100	--
Chromium	7.8	--	11.6	6 U	--	--	9.4 J	7 U	9 J	9.1 J	--
Colbalt	3	--	5 U	5 U	--	--	4 U	4 U	6 U	6 U	--
Copper	5.22	--	5 U	5 U	--	--	26.6	44.6	20.3 J	15.2 J	--
Iron	820	--	119	19 U	--	--	58.1 J	8.7 J	69.6 J	78.1 J	--
Lead	13.7	--	1 U	1 U	--	--	3.4	2.5 J	2 J	1.3 J	--
Magnesium	20200	--	8960	8780	--	--	8600	8840	4300 J	4240 J	--
Manganese	390	--	3.2 J	1 U	--	--	2.3 J	1 U	3.2 J	2.5 J	--
Mercury	0.2	--	0.2 U	0.2 U	--	--	0.2 U	0.2 U	NR	0.2 U	--
Nickel	15	--	12 U	12 U	--	--	17 U	17 U	16 U	21.4 J	--
Potassium	7140	--	5740	5120	--	--	4970 J	5620	2160 J	1640 J	--
Selenium	5.29	--	1 UJ	1 UN	--	--	2 U	2 U	1 U	1 U	--
Silver	4.0	--	4 U	4 U	--	--	4 U	4 U	3 U	3 U	--
Sodium	29500	--	20300	20000	--	--	18800	19400	3180 J	3000 J	--
Thallium	4	--	1 UN	1 UN	--	--	1 U	1 U	1.3 J	1 U	--
Vanadium	18.1	--	12.7 J	5.9 J	--	--	14 J	14 J	7.5 J	5 J	--
Zinc	8.3	--	4 U	4 U	--	--	10.6 J	8.8 J	18.6 J	21	--
Cyanide	10	--	10 U	-- NR	--	--	10 U	-- NR	20 U	-- NR	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL		7	7	7	7A	7A	7	7
	SITE UTL'S	S38-E11	S38-E11	S38-E11	S38-E11	S38-E11	S38-E11	S38-E11
ROUND	ug/L	5	6	6	7	7.5	8	9
SAMPLE ID#			B00Z72	B00Z73	B010Z3	B01543		
PARAMETERS								
METALS								
			unfiltered	filtered				
Aluminum	152	--	125 J	58 U	--	76.4 J	--	--
Antimony	21	--	24 U	24 U	--	46 U	--	--
Arsenic	10.9	--	7.4 J	7.2 J	--	5.7 J	--	--
Barium	60.5	--	36.6 J	32.8 J	--	54.4 J	--	--
Beryllium	1	--	1.8 J	1.8 J	--	2.3 J	--	--
Cadmium	3	--	3 U	3 U	--	3 U	--	--
Calcium	74600	--	55200	53400	--	52700	--	--
Chromium	7.8	--	24	6 U	--	9 J	--	--
Colbalt	3	--	5 U	5 U	--	6 U	--	--
Copper	5.22	--	5 U	5 U	--	6.4 J	--	--
Iron	820	--	236	28.5 J	--	15 U	--	--
Lead	13.7	--	1 U	1.4 J	--	2.1 J	--	--
Magnesium	20200	--	9870	9480	--	11300	--	--
Manganese	390	--	11.5 J	2.2 N	--	4 U	--	--
Mercury	0.2	--	0.2 U	0.2 U	--	0.2 U	--	--
Nickel	15	--	13.8 J	12 U	--	18 U	--	--
Potassium	7140	--	6740	6020	--	6250	--	--
Selenium	5.29	--	1 U	1 U	--	1.9 J	--	--
Silver	4.0	--	4 U	4 U	--	5 U	--	--
Sodium	29500	--	23600	22500	--	23200	--	--
Thallium	4	--	1 UN	1 UN	--	1 UN	--	--
Vanadium	18.1	--	13.4 J	12.5 J	--	7 U	--	--
Zinc	8.3	--	10.4 J	4 U	--	21.2	--	--
Cyanide	10	--	10 U	-- NR	--	-- NR	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	SITE UTL'S	8	8A	8A	8	8	8A	8A	8	8A	8	8
		S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08	S31-E08
ROUND	ug/L	5	6	6	6	6	7	7	7.5	7.5	8	9
SAMPLE ID#			B00ZG9	B00ZH0	B00Y36	B00Y37	B010Z7	B010Z8	B01537	B01546		B06195
PARAMETERS												
METALS			unfiltered	filtered	unfiltered	filtered	unfiltered	filtered				
Aluminum	152	--	158 J	58 U	58 U	58 U	40 U	40 U	86.2 J	99.6 J	--	--
Antimony	21	--	24 U	24 U	24 U	24 U	46 U	46 U	46 U	46 U	--	--
Arsenic	10.9	--	3.4 J	3.4 J	7.2 J	7.4 J	5 J	4.5 J	7.9 J	4 J	--	--
Barium	60.5	--	64.4 J	21.9 J	48.5 J	48.5 J	69.4 J	61.9 J	49.1 J	65.8 J	--	50.3
Beryllium	1	--	1 U	1 U	1 U	1 U	1.1 J	1 U	2.3 J	2.3 J	--	--
Cadmium	3	--	3 U	3 U	3 U	3 U	3 U	3 U	3 U	3 U	--	--
Calcium	74600	--	71100 J	24100 J	55300	54900	74100	67000	54700	68200	--	54700
Chromium	7.8	--	19.4	6 U	13.1	10.6	13	7 U	18 *	7 U	--	--
Colbalt	3	--	5 U	5 U	5 U	5 U	6 U	6 U	6 U	6 U	--	--
Copper	5.22	--	5 U	5 U	5 U	5 U	5 U	5 U	16.6 J	7.7 J	--	--
Iron	820	--	254	19 U	39.7 J	34.2 J	76.6 J	51 J	53.2 J	24 J	--	100 U
Lead	13.7	--	2.1 J	2.1 J	1 J	21	3.1 W*	2.9 J	2.1 J	1 U	--	--
Magnesium	20200	--	13800	4680 J	12900	12700	14400	13700	13200	14300	--	13100
Manganese	390	--	9.7 J	1.9 J	1.3 U	1.6 U	4 U	4 U	4 U	4 U	--	15 U
Mercury	0.2	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--	--
Nickel	15	--	13.5 J	12 U	12 U	12 U	18 U	18 U	18 U	18 U	--	--
Potassium	7140	--	7800	3160 J	5190	5060	6890	6300	5460	7080	--	5160
Selenium	5.29	--	1.2 J	1.2 J	1 U	1 U	1.8 J	1 U	1.2 J	1 J	--	--
Silver	4.0	--	4 U	4 U	430 U	4 U	5 U	5 U	5 U	5 U	--	--
Sodium	29500	--	24100 J	9650 *	18900	18900	26100	24500	19600	26300	--	21700
Thallium	4	--	1 U	1 U	1 U	1 U	1 U	1 U	1 UN	1 UN	--	--
Vanadium	18.1	--	8.6 J	4 U	13.9 U	14.9 U	8.2 J	7 U	11.3 J	7 U	--	--
Zinc	8.3	--	22.3	4 U	4 U	4 U	8.1 J	4.6 J	21.1	21.1	--	--
Cyanide	10	--	10 U	-- NR	10 U	-- NR	10 U	-- NR	-- NR	-- NR	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	SITE UTL'S	9	9	9	9	9	9	9
			S32-E08	S32-E08	S32-E08	S32-E08	S32-E08	S32-E08
ROUND	ug/L	5	6	6	7	7.5	8	9
SAMPLE ID#			B00Y40	B00Y41		B01540		
PARAMETERS								
METALS			unfiltered	filtered				
Aluminum	152	--	73.9 J	58 U	--	86.4 J	--	--
Antimony	21	--	24 U	24 U	--	46 U	--	--
Arsenic	10.9	--	1.8 J	1.7 J	--	2.8 J	--	--
Barium	60.5	--	64.6 J	64 J	--	69.6 J	--	--
Beryllium	1	--	1 U	1 U	--	1 U	--	--
Cadmium	3	--	3 U	3 U	--	3.3 J	--	--
Calcium	74600	--	20200	20200	--	20000	--	--
Chromium	7.8	--	22.5	4.5 J	--	7 U	--	--
Colbalt	3	--	5 U	5 U	--	6 U	--	--
Copper	5.22	--	5 U	5 U	--	6.4 J	--	--
Iron	820	--	81.3 J	35.2 J	--	24 J	--	--
Lead	13.7	--	1 U	1.2 J	--	2.6 J	--	--
Magnesium	20200	--	4750 J	4690 J	--	4960 J	--	--
Manganese	390	--	87 J	84.1 J	--	96.2	--	--
Mercury	0.2	--	0.2 U	0.2 U	--	0.2 U	--	--
Nickel	15	--	12 U	12 U	--	18 U	--	--
Potassium	7140	--	5010	4450 J	--	4530 J	--	--
Selenium	5.29	--	1 U	1 U	--	1 U	--	--
Silver	4.0	--	4 U	4 U	--	5 U	--	--
Sodium	29500	--	14300	15000	--	15000	--	--
Thallium	4	--	1 U	1 U	--	1 UN	--	--
Vanadium	18.1	--	6 U	5 U	--	7 U	--	--
Zinc	8.3	--	4 U	4 U	--	21.4	--	--
Cyanide	10	--	10 U	-- NR		-- NR	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	SITE UTL'S	10 S30-E10A	10 S30-E10A	10 S30-E10A	10 S30-E10A	10 S30-E10A	10 S30-E10A	10 S30-E10A	10 S30-E10A	10 S30-E10A
ROUND	ug/L	5	6	6	6	6	7	7.5	8	9
SAMPLE ID#			B00Y44	B00Y45	B00Y48	B00Y49	B010X3	B01531	B01BV4	B06196
PARAMETERS										
METALS										
			unfiltered	filtered	unfiltered	filtered				
Aluminum	152	--	103 J	58 U	106 J	58 U	--	40 U	--	--
Antimony	21	--	24 U	24 U	33.3 J	31 J	--	46 U	--	--
Arsenic	10.9	--	2.8 J	3.3 J	3.1 J	3 J	--	2.4 J	--	--
Barium	60.5	--	88.8 J	87 J	87.6 J	88.8 J	--	84.6 J	--	90.3
Beryllium	1	--	1 U	1 U	1 U	1 U	--	1 U	--	--
Cadmium	3	--	3 U	3 U	3 U	3 U	--	3 U	--	--
Calcium	74600	--	97300	97500	97000	98300	--	97700	--	95800
Chromium	7.8	--	24.4	6 U	27.5	6.9 J	--	7 U	--	--
Colbalt	3	--	5 U	5 U	5 U	530 U	--	6 U	--	--
Copper	5.22	--	5 U	5 U	5 U	5 U	--	5 U	--	--
Iron	820	--	159	20.3 J	181	19 U	--	18.7 U	--	100 U
Lead	13.7	--	1 U	1 U	1 U	1 U	--	5.3	--	--
Magnesium	20200	--	19900	19800	19700	19900	--	19900	--	19800
Manganese	390	--	5.2 U	1 U	6 U	1 U	--	4 U	--	15 U
Mercury	0.2	--	0.2 U	0.2 U	0.2 U	0.2 U	--	0.2 U	--	--
Nickel	15	--	12 U	12 U	16.9 J	12 U	--	18 U	--	--
Potassium	7140	--	8460	8390	8040	8710	--	8560	--	7530
Selenium	5.29	--	1 U	1 U	1 U	1 U	--	1 U	--	--
Silver	4.0	--	4 U	4 U	4 U	4 U	--	5 U	--	--
Sodium	29500	--	29500	29800	29200	29900	--	29700	--	30500
Thallium	4	--	1 U	1 U	1 U	1 U	--	1 UJ	--	--
Vanadium	18.1	--	8.9 U	6 U	5.9 U	5 U	--	7 J	--	--
Zinc	8.3	--	10.3 J	4 U	25.3	4.3 J	--	4.9 J	--	--
Cyanide	10	--	10 U	-- NR	10 U	-- NR	--	-- NR	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	SITE UTL'S	11 S30-E10B	11 S30-E10B	11 S30-E10B	11 S30-E10B	11 S30-E10B	11 S30-E10B	11 S30-E10B	11 S30-E10B	11 S30-E10B
ROUND	ug/L	5	6	6	6	6	7	7.5	8	9
SAMPLE ID#			B00Y52	B00Y53	B00Y56	B00Y57	B010X9	B01534	B01BV7	B06197
PARAMETERS										
METALS			unfiltered	filtered	unfiltered	filtered				
Aluminum	152	--	83 J	58 U	165 J	58 U	--	40 U	--	--
Antimony	21	--	27.4 J	49.2 J	24 U	31.4 J	--	46 U	--	--
Arsenic	10.9	--	2.1 J	2.1 JW	2.2 JW	1.9 J	--	1.5 J	--	--
Barium	60.5	--	88.2 J	88.8 J	87 J	87 J	--	87.4 J	--	84.1
Beryllium	1	--	1 U	1 U	1 U	1 U	--	1 U	--	--
Cadmium	3	--	3 U	3 U	3 U	3 U	--	3 U	--	--
Calcium	74600	--	105000	107000	10500	10500	--	111000	--	105000
Chromium	7.8	--	20	6 U	17.5	6 U	--	7 U	--	--
Colbalt	3	--	5 U	5 U	5 U	5 U	--	6 U	--	--
Copper	5.22	--	5 U	5 U	5 U	5 U	--	5 U	--	--
Iron	820	--	159	27.3 J	202	25.8 J	--	15 U	--	100 U
Lead	13.7	--	1 U	1 U	1.4 JW	1 U	--	1 U	--	--
Magnesium	20200	--	22000	22200	21900	21900	--	23000	--	22600
Manganese	390	--	64.3 E	57.9 E	57.9 E	57.9 E	--	10.7 U	--	20.1
Mercury	0.2	--	0.2 U	0.2 U	0.2 U	0.2 U	--	0.2 U	--	--
Nickel	15	--	12 U	12 U	12 U	12 U	--	18 U	--	--
Potassium	7140	--	9230	9350	9130	9480	--	9830	--	8330
Selenium	5.29	--	1 U	1 U	1 U	1 U	--	1 U	--	--
Silver	4.0	--	4 U	4 U	4 U	4 U	--	5 U	--	--
Sodium	29500	--	31900	32500	31800	31900	--	32700	--	35600
Thallium	4	--	1 U	1 U	1 U	1 U	--	1 UJ	--	--
Vanadium	18.1	--	4.9 U	5 U	5.9 U	7 U	--	7 U	--	--
Zinc	8.3	--	43.1	4.3 J	6.5 J	6.1 J	--	4 U	--	--
Cyanide	10	--	10 U	-- NR	10 U	-- NR	--	-- NR	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL		12	12	12	12	12	12	12
	SITE UTL'S	S31-E10A	S31-E10A	S31-E10A	S31-E10A	S31-E10A	S31-E10A	S31-E10A
ROUND	ug/L	5	6	6	7	7.5	8	9
SAMPLE ID#			B00Y20	B00Y21	B010T5	B014Z8	B01BW0	B06I98
PARAMETERS								
METALS								
			unfiltered	filtered				
Aluminum	152	--	71.5 J	58 U	--	40 U	--	--
Antimony	21	--	39.5 J	24 U	--	46 U	--	--
Arsenic	10.9	--	3.8 J	3.5 J	--	6.6 U	--	--
Barium	60.5	--	111 J	112 J	--	112 J	--	103
Beryllium	1	--	1 U	1 U	--	1 U	--	--
Cadmium	3	--	3 U	3 U	--	3 U	--	--
Calcium	74600	--	111000	112000	--	115000	--	102000
Chromium	7.8	--	9.4 J	8.1 J	--	7 U	--	--
Colbalt	3	--	5 U	5 U	--	6 U	--	--
Copper	5.22	--	6.2 J	5.1 J	--	5 U	--	--
Iron	820	--	56.5 J	28.3 J	--	41.4 U	--	100 U
Lead	13.7	--	1 U	1 U	--	1.2 J	--	--
Magnesium	20200	--	22400	22600	--	23300	--	20800
Manganese	390	--	2.7 U	2.7 U	--	4 U	--	15 U
Mercury	0.2	--	0.2 U	0.2 U	--	0.2 U	--	--
Nickel	15	--	12 U	12 U	--	18 U	--	--
Potassium	7140	--	9190	8810	--	9170	--	7790
Selenium	5.29	--	1.5 JW	1 U	--	1 U	--	--
Silver	4.0	--	4 U	4 U	--	5 U	--	--
Sodium	29500	--	31000	31300	--	31600	--	30900
Thallium	4	--	1 U	1 U	--	1 UJ	--	--
Vanadium	18.1	--	10.9 U	9 U	--	7 J	--	--
Zinc	8.3	--	3 J	4.2 J	--	4 U	--	--
Cyanide	10	--	10 U	-- NR	--	-- --	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	SITE UTL'S	13 S31-E10B	13 S31-E10B	13 S31-E10B	13 S31-E10B	13 S31-E10B	13 S31-E10B	13 S31-E10B
ROUND	ug/L	5	6	6	7	7.5	8	9
SAMPLE ID#			B00Y24	B00Y25	B010T7	B01501	B01BW3	
PARAMETERS								
METALS			unfiltered	filtered				
Aluminum	152	--	139 J	58.7 J	--	40 U	--	--
Antimony	21	--	24 U	40.8 J	--	46 U	--	--
Arsenic	10.9	--	3.5 J	3.6 J	--	2.6	--	--
Barium	60.5	--	96.3 J	96.3 J	--	89.2 J	--	--
Beryllium	1	--	1 U	1 U	--	1 U	--	--
Cadmium	3	--	3 U	3 U	--	3 U	--	--
Calcium	74600	--	105000	104000	--	102000	--	--
Chromium	7.8	--	18.7	6 U	--	7 U	--	--
Colbalt	3	--	5 U	5 U	--	6 U	--	--
Copper	5.22	--	5 U	5 U	--	10.9 J	--	--
Iron	820	--	216	46.1 J	--	22.4 U	--	--
Lead	13.7	--	1 J	1 U	--	1.5 J	--	--
Magnesium	20200	--	21300	21200	--	20800	--	--
Manganese	390	--	10 U	2.8 U	--	4 U	--	--
Mercury	0.2	--	0.2 U	0.2 U	--	0.2 U	--	--
Nickel	15	--	12 U	12 U	--	18 U	--	--
Potassium	7140	--	8460	8560	--	8280	--	--
Selenium	5.29	--	1 U	1 U	--	1 U	--	--
Silver	4.0	--	4 U	4 U	--	5 U	--	--
Sodium	29500	--	29500	29700	--	29200	--	--
Thallium	4	--	1 U	1 U	--	1 UJ	--	--
Vanadium	18.1	--	9.9 U	8 U	--	7.7 J	--	--
Zinc	8.3	--	4 U	9.8 J	--	5.2 J	--	--
Cyanide	10	--	10 U	-- NR	--	-- NR	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	14	14	14	14	14	14	14
WELL ID	S31-E10C	S31-E10C	S31-E10C	S31-E10C	S31-E10C	S31-E10C	S31-E10C
ROUND	5	6	6	7	7.5	8	9
SAMPLE ID#		B00Y28	B00Y29	B010T9	B01504	B01BW6	B06202
PARAMETERS							
METALS							
		unfiltered	filtered				
Aluminum	--	62.5 J	58 U	--	58.5 J	--	--
Antimony	--	24 U	28.9 J	--	46 U	--	--
Arsenic	--	1.8 J	1.7 J	--	2.2 J	--	--
Barium	--	84.5 J	86.4 J	--	81.4 J	--	83.2
Beryllium	--	1 U	1 U	--	1 U	--	--
Cadmium	--	3 U	3 U	--	3 U	--	--
Calcium	--	107000	108000	--	109000	--	102000
Chromium	--	15	6.2 J	--	7 U	--	--
Colbalt	--	5 U	5 U	--	6 U	--	--
Copper	--	5 U	5 U	--	5 U	--	--
Iron	--	70.4 J	26.3 J	--	15 U	--	100 U
Lead	--	1 U	1 U	--	1.2 J	--	--
Magnesium	--	221000	22400	--	22100	--	21200
Manganese	--	7 U	5.1 U	--	4.5 J	--	15 U
Mercury	--	0.2 U	0.2 U	--	0.2 U	--	--
Nickel	--	12 U	12 U	--	18 U	--	--
Potassium	--	9010	8930	--	8960	--	7820
Selenium	--	1 U	1 U	--	1 U	--	--
Silver	--	4 U	4 U	--	5 U	--	--
Sodium	--	30600	31100	--	30400	--	30600
Thallium	--	1 U	1 U	--	1 UJ	--	--
Vanadium	--	7 U	4 U	--	7 U	--	--
Zinc	--	4.7 J	4 U	--	5.1 J	--	--
Cyanide	--	10 U	-- NR	--	-- NR	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	15	15	15	15	15	15	15	15
WELL ID	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D
ROUND	5	6	6	6	7	7.5	8	9
SAMPLE ID#		B00ZF7	B00ZF8	B00Y33	B010V1	B01507	B01BW9	B06206
PARAMETERS								
METALS								
		unfiltered	filtered					
Aluminum	--	58 U	114 J	58 U	--	40 U	--	--
Antimony	--	24 U	29.8 J	24 U	--	46 U	--	--
Arsenic	--	3.6 JW	3.9 JW	4.8 J	--	3.5 J	--	--
Barium	--	71.7 J	129 J	78.3 J	--	82.3 J	--	65.3
Beryllium	--	1 U	1 U	1 U	--	1 U	--	--
Cadmium	--	3 U	3 U	3 U	--	3 U	--	--
Calcium	--	87000 *	158000 *	86400	--	93300	--	70300
Chromium	--	10.9	6 U	8.7 J	--	7 U	--	--
Colbalt	--	5 U	5 U	5 U	--	6 U	--	--
Copper	--	5 U	16.9 J	5 U	--	5 U	--	--
Iron	--	49.9 J	20.9 J	24.3 J	--	23.9 U	--	100 U
Lead	--	2.9 J	1 U	1.1 J	--	1 U	--	--
Magnesium	--	17100 *	31000 *	17600	--	19000	--	14600
Manganese	--	1 U	1 U	1.4 U	--	4 U	--	15 U
Mercury	--	0.2 U	0.2 U	0.2 U	--	0.2 U	--	--
Nickel	--	12 U	12 U	12 U	--	18 U	--	--
Potassium	--	7700	12000	7910	--	8420	--	6190
Selenium	--	1 U	1 U	1 U	--	1 U	--	--
Silver	--	4 U	4 U	4 U	--	5 U	--	--
Sodium	--	24400 *	40800 *	26200	--	27400	--	25400
Thallium	--	1 U	1 U	1 U	--	1 UJ	--	--
Vanadium	--	7.7 J	17.3 J	9 U	--	9.8 J	--	--
Zinc	--	4 U	14.8 J	4.4 J	--	4 U	--	--
Cyanide	--	10 U	-- NR	-- NR	--	-- NR	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	17	17	17	17	17	17	17	17
WELL ID	S31-E13C	S31-E13C	S31-E13C	S31-E13C	S31-E13C	S31-E13C	S31-E13C	S31-E13C
ROUND	5	5	6	6	7	7.5	8	9
SAMPLE ID#	B00HS9	B00HT0	B00ZC2	B00ZC3				
PARAMETERS								
METALS								
	unfiltered	filtered	unfiltered	filtered				
Aluminum	39.4 J	25 U	487	58 U	--	--	--	--
Antimony	37 U	37 U	24 U	24 U	--	--	--	--
Arsenic	4.6 J	3.9 J	4.4 J	4.9 J	--	--	--	--
Barium	39.6 J	39.6 J	26.7 J	19.4 J	--	--	--	--
Beryllium	2 U	2 U	1 U	1 U	--	--	--	--
Cadmium	4 U	4 U	3 U	3 U	--	--	--	--
Calcium	50300	51500	25900	26800	--	--	--	--
Chromium	4.7 J	4 U	57.5	6 U	--	--	--	--
Colbalt	2 U	5 U	5 U	5 U	--	--	--	--
Copper	4 U	4 U	7.4 J	5 U	--	--	--	--
Iron	59.3 J	38.3 J	729	26.2 J	--	--	--	--
Lead	3 U	3 U	4.9	1.1 J	--	--	--	--
Magnesium	10300	10500	5430	5460	--	--	--	--
Manganese	2 U	2 U	114	92.8	--	--	--	--
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	--	--	--	--
Nickel	20 U	20 U	60.3	13.9 J	--	--	--	--
Potassium	5020	4670 J	4020 J	3800 J	--	--	--	--
Selenium	4 UJ	4 UJ	1 U	1 U	--	--	--	--
Silver	5 U	5 U	4 U	4 U	--	--	--	--
Sodium	8080	8360	16200	16700	--	--	--	--
Thallium	6 U	6 U	1 UN	1 UN	--	--	--	--
Vanadium	8.3 J	7.5 J	4 U	4 U	--	--	--	--
Zinc	4 U	4 U	4 U	5.2 J	--	--	--	--
Cyanide	10 U	-- NR	10 U	-- NR	--	--	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	18	18	18	18	18	18	18	18	18	18
WELL ID	S37-E12	S37-E12	S37-E12	S37-E12	S37-E12	S37-E12	S37-E12	S37-E12	S37-E12	S37-E12
ROUND	5	5	6	6	7	7	7.5	8	8	9
SAMPLE ID#	B00HV8	B00HV9	B00ZG1	B00ZG2	B010Y9	B010Z0		B01BX2	B01BX3	
PARAMETERS										
METALS										
	unfiltered	filtered	unfiltered	filtered	unfiltered	filtered				
Aluminum	629	229	211	72.9 J	141 J	40 U	--	184 J	78.5 J	--
Antimony	37 U	37 U	24 U	24 U	46 U	46 U	--	44 U	44 U	--
Arsenic	5.3 J	4.9 J	4.3 JW	4.2 JW	5.6 J	4.9 J	--	4.8 JW	4.5 J	--
Barium	52.3 J	45.2 J	29.8 J	29.2 J	32.6 J	26.1 J	--	35.7 J	35.7 J	--
Beryllium	2 U	2 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--
Cadmium	4 U	4 U	3 U	3 U	3 U	3 U	--	4 U	4 U	--
Calcium	47900	47800	39800 *	40400 *	38900	35800	--	48100	47800	--
Chromium	7.5 J	7.5 J	43.6	6 U	29.1	7 U	--	41.8	9.4 J	--
Colbalt	5 U	5 U	5 U	5 U	6 U	6 U	--	4 U	4 U	--
Copper	4 U	4 U	5.3 J	22.1 J	6.5 J	5 U	--	42.8	27.7	--
Iron	901	390	459	19 U	444	78.1 J	--	383	41.1 J	--
Lead	3 U	3 U	1.8 J	3.7	6.5 *	3 W*	--	2.6 JW	2.3 J	--
Magnesium	10100	10000	79100 *	7910 *	7570	7240	--	9560	9440	--
Manganese	80.3	72.1	13.6 J	4.6 J	14.1 J	4 U	--	11.4 J	1 U	--
Mercury	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--	0.2 U	0.2 U	--
Nickel	20 U	20 U	19.5 J	12 U	20.8 J	18 U	--	17 U	17 U	--
Potassium	4920 J	4500 J	4610 J	4400 J	3680 J	3650 J	--	4600 J	5030	--
Selenium	4 JN	4 UJ	1 U	1 U	1 U	1 U	--	2 U	2 U	--
Silver	5 U	5 U	4 U	4 U	5 U	5 U	--	4 U	4 U	--
Sodium	15500	15400	11100 *	11100 *	11300	10800	--	13600	13500	--
Thallium	6 U	6 U	1 U	1 U	1 U	1 U	--	1 U	1 U	--
Vanadium	10.7 J	9.1 J	8.6 J	6.7 J	7 U	7 U	--	13 J	14.5 J	--
Zinc	4 U	79.6	27.5	18.4 J	19.8 J	7.5 J	--	17.7 J	10.6 J	--
Cyanide	10 U	--	10 U	-- NR	10 U	-- NR	--	10 U	-- NR	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	19	19	19	19	19	19	19	19
WELL ID	S32-E11	S32-E11	S32-E11	S32-E11	S32-E11	S32-E11	S32-E11	S32-E11
ROUND	5	6	7	7	7.5	8	8	9
SAMPLE ID#		B00ZH3	B010V3	B010V4	B01510	B01C07	B01C08	B06207
PARAMETERS								
METALS								
			unfiltered	filtered				
Aluminum	--	--	67.1 J	40 U	40 U	131 J	172 J	--
Antimony	--	--	46 U	46 U	46 U	25 U	25 U	--
Arsenic	--	--	2.6 J	2.2 J	4.2 J	4.4 JW	4.8 JW	--
Barium	--	--	50.2 J	48.5 J	45.5 J	41.9 J	42.5 J	50 U
Beryllium	--	--	1 U	1 U	1 U	1 U	1 U	--
Cadmium	--	--	3 U	3 U	3 U	3 U	3.6 J	--
Calcium	--	--	47700	47300	47300	47700	46500	44100
Chromium	--	--	10.3	7 U	7 U	8 U*	8 U*	--
Colbalt	--	--	6 U	6 U	6 U	6 U	6 U	--
Copper	--	--	9.2 J	5 U	5 U	13 J	32.4	--
Iron	--	--	70.8 J	20.7 J	16.4 U	97.5 J	18.4 J	100 U
Lead	--	--	1 U	1 U	1 J	2.5 J	1.6 J	--
Magnesium	--	--	9500	9370	9470	9150	9290	8740
Manganese	--	--	53.6	52.1	28.5	16.7	12.1 J	15 U
Mercury	--	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--
Nickel	--	--	18 U	18 U	18 U	16 U	16 U	--
Potassium	--	--	6340 UN	5620	6000 U	5550	5590	5730
Selenium	--	--	1 U	1 UN	1 U	1 JW	1 U	--
Silver	--	--	5 U	5 U	5 U	3 U	3 U	--
Sodium	--	--	20900	20600	20600	20500	21000	19800
Thallium	--	--	1 U	1 U	1 UJ	1 U	1 U	--
Vanadium	--	--	7 U	7 U	11.2 J	6.1 J	7.5 J	--
Zinc	--	--	13.2 J	10.3 J	4 U	11.4 J	31.5	--
Cyanide	--	--	10 U	-- NR	-- NR	20 U	-- NR	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	20	20	20	20	20	20	20	20
WELL ID	S29-E11	S29-E11	S29-E11	S29-E11	S29-E11	S29-E11	S29-E11	S29-E11
ROUND	5	6	7	7	7.5	8	8	9
SAMPLE ID#		B00ZH4	B010V7	B010V8	B01513	B01C12	B01C13	B06208
PARAMETERS								
METALS								
			unfiltered	filtered				
Aluminum	--	--	222	40 U	40 U	746	38 J	--
Antimony	--	--	46 U	46 U	46 U	44 U	44 U	--
Arsenic	--	--	1 U	1 U	2.1 J	3.7 J	3.6 JW	--
Barium	--	--	99.7 J	98.5 J	93.7 J	99.5 J	89.9 J	93.1
Beryllium	--	--	1 U	1 U	1 U	1.1 J	1 U	--
Cadmium	--	--	3 U	3 U	3 U	4 U	4 U	--
Calcium	--	--	95500	95900	92900	94500	92400	91000
Chromium	--	--	11.4	8.5 J	7 U	53.3	7 U	--
Colbalt	--	--	6 U	6 U	6 U	4 U	4 U	--
Copper	--	--	12.8 J	5 U	5 U	31.9	11 J	--
Iron	--	--	186	46.7 J	25 U	1010	38.1 J	172
Lead	--	--	1 U	1 U	4.6	1.6 JN	2.3 JN	--
Magnesium	--	--	18400	18300	18300	18800	18300	18200
Manganese	--	--	104	99.1	80.6	67.5	40.1	28
Mercury	--	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--
Nickel	--	--	18 U	18 U	18 U	24.6 J	17 U	--
Potassium	--	--	9410	8900	8900	8550	8630	7700
Selenium	--	--	1 UN	1 UN	1 U	1 UN	1 UN	--
Silver	--	--	5 U	5 U	5 U	4 U	4 U	--
Sodium	--	--	30200	30300	30100	30700	30100	30600
Thallium	--	--	1 U	1.1 J	1 UJ	1 UN	1 UN	--
Vanadium	--	--	7 U	7 U	7 U	14.4 J	10.9 J	--
Zinc	--	--	21.6	10 J	4 U	9 J	5 U	--
Cyanide	--	--	11.6 U	-- NR	-- NR	10 U	-- NR	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	21	21	21	21	21	21	21	21
WELL ID	S31-E10E	S31-E10E	S31-E10E	S31-E10E	S31-E10E	S31-E10E	S31-E10E	S31-E10E
ROUND	5	6	7	7	7.5	8	8	9
SAMPLE ID#		B00ZH5	B010W1	B010W2	B01516	B01C17	B01C18	
PARAMETERS								
METALS								
			unfiltered	filtered				
Aluminum	--	--	73.3 J	84.5 J	40 U	621	147 J	--
Antimony	--	--	46 U	46 U	46 U	44 U	44 U	--
Arsenic	--	--	1 U	1 U	1 U	1 U	1 U	--
Barium	--	--	37.2 J	33.3 J	38.2 J	39.1 J	36 J	--
Beryllium	--	--	3.4 J	1 U	1 U	1.1 J	1 U	--
Cadmium	--	--	3.6 J	3 U	3 U	4 U	4 U	--
Calcium	--	--	22000	22800	23300	23300	23400	--
Chromium	--	--	30.7	7 U	7 U	55.7	7 U	--
Colbalt	--	--	6 U	6 U	6 U	4 U	4 U	--
Copper	--	--	9 J	8.1 J	5 U	92.6	81.7	--
Iron	--	--	377	178	283 J	588	54.6 J	--
Lead	--	--	1 U	1 U	1 U	1.9 JN	2.2 JN	--
Magnesium	--	--	5690	5880	6000	5970	5990	--
Manganese	--	--	163	157	155	182	151	--
Mercury	--	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--
Nickel	--	--	33.6 J	18 U	18 U	34.6 J	17 U	--
Potassium	--	--	5500	5100	5500	5000	5160	--
Selenium	--	--	1 UN	1 UN	1 U	1 UN	1 UN	--
Silver	--	--	5 U	5 U	5 U	4 U	4 U	--
Sodium	--	--	27800	24600	22700	22700	22300	--
Thallium	--	--	1 U	1 U	1 UJ	1 UN	1 UN	--
Vanadium	--	--	7 U	7 U	7 U	5 U	7.1 J	--
Zinc	--	--	26.2	17.9 J	4 U	28.1	5.8 J	--
Cyanide	--	--	10 U	-- NR	-- NR	10 U	-- NR	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	22	22	22	22	22	22	22	22
WELL ID	S31-E11	S31-E11	S31-E11	S31-E11	S31-E11	S31-E11	S31-E11	S31-E11
ROUND	5	6	7	7	7.5	8	8	9
SAMPLE ID#		B00ZH6	B010W5	B010W6	B01519	B01C22	B01C23	B06209
PARAMETERS								
METALS								
			unfiltered	filtered				
Aluminum	--	--	80.5 J	40 U	40 U	117 J	127 J	--
Antimony	--	--	46 U	46 U	46 U	44 U	44 U	--
Arsenic	--	--	2.2 JW	2.8 JW	1.9 J	3.2 J	3.2 J	--
Barium	--	--	59.4 N	58.2 J	57.3 J	51.7 J	52.3 J	50 U
Beryllium	--	--	1 U	1 U	4 U	1 U	1 U	--
Cadmium	--	--	3 U	3 U	3 U	4 U	4 U	--
Calcium	--	--	42400	42700	45400	46800	46900	44600
Chromium	--	--	10.8	7 U	7 U	19.8	10.4	--
Colbalt	--	--	6 U	6 U	6 U	4 U	4 U	--
Copper	--	--	10.9 N	5 U	5 U	19.6 J	54.4	--
Iron	--	--	88.7 N	27.8 J	27.6 U	110	38.6 J	100 U
Lead	--	--	1.1 N	1 U	1 U	2 J	2.6 J	--
Magnesium	--	--	9010	91100	9560	9610	9580	9000
Manganese	--	--	113	101	95.6	44.4	41.3	15 U
Mercury	--	--	0.2 U	0.2 U	0.2 U	0.2 U	0.2 U	--
Nickel	--	--	18 U	18 U	18 U	17 U	17 U	--
Potassium	--	--	7420	7770	6750	6600	6630	5460
Selenium	--	--	1.4 JN	2.2 JN	1.3 J	2 U	2 U	--
Silver	--	--	5 U	5 U	5 U	4 U	4 U	--
Sodium	--	--	21000	21100	20900	21200	21400	20300
Thallium	--	--	1 U	1 U	1 UJ	41 U	1 U	--
Vanadium	--	--	7 U	7 U	7 U	11.6 J	7.2 J	--
Zinc	--	--	12.2 J	12.2 J	4.1 J	8.8 J	17.7 J	--
Cyanide	--	--	10 U	--	-- NR	10 U	-- NR	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	S29-E12	S29-E12	S29-E12	S29-E12	S29-E12	S29-E12
WELL ID	S29-E12	S29-E12	S29-E12	S29-E12	S29-E12	S29-E12
ROUND	5	6	7	7.5	8	9
SAMPLE ID#		B00Y72		B01C29		B06210
PARAMETERS						
METALS						
Aluminum	--	58 U	--	--	--	--
Antimony	--	32 J	--	--	--	--
Arsenic	--	4.4 JW	--	--	--	--
Barium	--	48.2 J	--	--	--	50 U
Beryllium	--	1 U	--	--	--	--
Cadmium	--	3 U	--	--	--	--
Calcium	--	50300	--	--	--	47500
Chromium	--	6 U	--	--	--	--
Colbalt	--	5 U	--	--	--	--
Copper	--	5 U	--	--	--	--
Iron	--	83.2 J	--	--	--	100 U
Lead	--	1 U	--	--	--	--
Magnesium	--	9830	--	--	--	9410
Manganese	--	1 U	--	--	--	15 U
Mercury	--	0.2 U	--	--	--	--
Nickel	--	12 U	--	--	--	--
Potassium	--	6220	--	--	--	5970
Selenium	--	1 UN	--	--	--	--
Silver	--	4 U	--	--	--	--
Sodium	--	22900	--	--	--	20900
Thallium	--	1 UN	--	--	--	--
Vanadium	--	9.8 J	--	--	--	--
Zinc	--	91.4	--	--	--	--
Cyanide	--	10 U	--	--	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	S30-15A	S30-15A	S30-E15A	S30-15A	S30-15A	S30-15A
WELL ID	S30-15A	S30-E15A	S30-E15A	S30-15A	S30-15A	S30-15A
ROUND	5	6	7	7.5	8	9
SAMPLE ID#		B00Y68				
PARAMETERS						
METALS						
Aluminum	--	58 U	--	--	--	--
Antimony	--	24 U	--	--	--	--
Arsenic	--	1.8 J	--	--	--	--
Barium	--	70.2 J	--	--	--	--
Beryllium	--	1 U	--	--	--	--
Cadmium	--	3 U	--	--	--	--
Calcium	--	80800	--	--	--	--
Chromium	--	6 U	--	--	--	--
Colbalt	--	5 U	--	--	--	--
Copper	--	5 U	--	--	--	--
Iron	--	251	--	--	--	--
Lead	--	6.2	--	--	--	--
Magnesium	--	14500	--	--	--	--
Manganese	--	1.3 J	--	--	--	--
Mercury	--	0.2 U	--	--	--	--
Nickel	--	12 U	--	--	--	--
Potassium	--	6950	--	--	--	--
Selenium	--	1 UN	--	--	--	--
Silver	--	4 U	--	--	--	--
Sodium	--	14600	--	--	--	--
Thallium	--	1 UN	--	--	--	--
Vanadium	--	5.8 J	--	--	--	--
Zinc	--	56.2	--	--	--	--
Cyanide	--	10 U	--	--	--	--

TABLE E-2 Metals and Cyanide Analytical Data

MONITORING WELL	S32-E13A	S32-E13A	S32-E13A	S32-E13A	S32-E13A	S32-E13A
WELL ID	S32-E13A	S32-E13A	S32-E13A	S32-E13A	S32-E13A	S32-E13A
ROUND	5	6	7	7.5	8	9
SAMPLE ID#		B00Y60				
PARAMETERS						
METALS						
Aluminum	--	58 U	--	--	--	--
Antimony	--	48.7 J	--	--	--	--
Arsenic	--	2.5 J	--	--	--	--
Barium	--	117 J	--	--	--	--
Beryllium	--	1 U	--	--	--	--
Cadmium	--	3 U	--	--	--	--
Calcium	--	123000	--	--	--	--
Chromium	--	6 U	--	--	--	--
Colbalt	--	5 U	--	--	--	--
Copper	--	5 U	--	--	--	--
Iron	--	375	--	--	--	--
Lead	--	2.6 J	--	--	--	--
Magnesium	--	23100	--	--	--	--
Manganese	--	3.6 J	--	--	--	--
Mercury	--	0.2 U	--	--	--	--
Nickel	--	12 U	--	--	--	--
Potassium	--	9130	--	--	--	--
Selenium	--	1.5 JN	--	--	--	--
Silver	--	4 U	--	--	--	--
Sodium	--	19800	--	--	--	--
Thallium	--	1 UN	--	--	--	--
Vanadium	--	11.7 J	--	--	--	--
Zinc	--	22.8	--	--	--	--
Cyanide	--	10 U	--	--	--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		1	1		1	1	1	1
WELL I.D.	UNIT UTL'S	S41-E11	S41-E11		S41-E11	S34-E10	S41-E11	S41-E11
ROUND		5	6		7	7.5	8	9
SAMPLE ID#			B00ZC6				B01BT3	
PARAMETERS								
WET CHEMISTRY (units = mg/L)								
TOX (ug/L)	220	--	--		--	--	--	--
TOC	3.9	--	--		--	--	--	--
Ammonia	0.15	--	0.02		--	--	--	--
Nitrates	NA	--	4.4		--	--	--	--
COD	15	--	10	ND	--	--	--	--
Turbidity (units = NTU)	NA	--	0.3		--	--	--	--
Alkalinity (CaCO3)	199	--	170		--	--	240	--
Fluoride (F)	0.5	--	0.5		--	--	--	--
Chloride (Cl)	22.1	--	14		--	--	--	--
Bromide (Br)	1	--	0.2	ND	--	--	--	--
Phosphate (PO4-P)	1.0	--	0.2	ND	--	--	--	--
Nitrate (NO3-N)	12.3	--	18		--	--	--	--
Nitrite (NO2-N)	1	--	0.07	ND	--	--	--	--
Sulfate (SO4)	42.5	--	31		--	--	--	--
TDS	433	--	310		--	--	--	--
pH	7.5-8.7	--	7.8		--	--	--	--
Conductivity (units = umhos/cm)	NA	--	480		--	--	720	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		2	2		2	2	2
WELL I.D.	UNIT UTL'S	S34-E10	S34-E10		S34-E10	S34-E10	S34-E10
ROUND		5	6		7	7.5	8
SAMPLE ID#			B00Z68				
PARAMETERS							
WET CHEMISTRY (units = mg/L)							
TOX (ug/L)	220	--	--		--	--	--
TOC	3.9	--	--		--	--	--
Ammonia	0.15	--	0.06		--	--	--
Nitrates	NA	--	6.5		--	--	--
COD	15	--	10	ND	--	--	--
Turbidity (units = NTU)	NA	--	0.6		--	--	--
Alkalinity (CaCO3)	199	--	140		--	--	--
Fluoride (F)	0.5	--	0.7		--	--	--
Chloride (Cl)	22.1	--	13		--	--	--
Bromide (Br)	1	--	0.2	ND	--	--	--
Phosphate (PO4-P)	1.0	--	0.1	ND	--	--	--
Nitrate (NO3-N)	12.3	--	6		--	--	--
Nitrite (NO2-N)	1	--	0.06	ND	--	--	--
Sulfate (SO4)	42.5	--	41		--	--	--
TDS	433	--	300		--	--	--
pH	7.5-8.7	--	7.7		--	--	--
Conductivity (units = umhos/cm)	NA	--	470		--	--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		2	3	3		3	3	3
WELL I.D.	UNIT UTL'S	S34-E10	S41-E12	S41-E12		S41-E12	S41-E12	S41-E12
ROUND		9	5	6		7	7.5	8
SAMPLE ID#		B06194		B00ZD0				B01BT6
PARAMETERS								
WET CHEMISTRY (units = mg/L)								
TOX (ug/L)	220	--	--	--		--	--	--
TOC	3.9	--	--	--		--	--	--
Ammonia	0.15	0.05 U	--	0.1		--	--	--
Nitrates	NA	--	--	2.2		--	--	--
COD	15	--	--	10	ND	--	--	--
Turbidity (units = NTU)	NA	--	--	0.9		--	--	--
Alkalinity (CaCO3)	199	154	--	310		--	--	--
Fluoride (F)	0.5	0.3	--	0.8		--	--	--
Chloride (Cl)	22.1	13.8	--	110		--	--	--
Bromide (Br)	1	--	--	0.2		--	--	--
Phosphate (PO4-P)	1.0	0.03 J	--	0.2	ND	--	--	--
Nitrate (NO3-N)	12.3	5.01	--	10.6		--	--	--
Nitrite (NO2-N)	1	0.1 U	--	0.07	ND	--	--	--
Sulfate (SO4)	42.5	45.5	--	23		--	--	--
TDS	433	--	--	590		--	--	--
pH	7.5-8.7	7.88	--	7.5		--	--	--
Conductivity (units = umhos/cm)	NA	--	--	940		--	--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		3	4	4		4	4	4
WELL I.D.	UNIT UTL'S	S41-E12	S38-E12A	S38-E12A		S38-E12A	S38-E12A	S38-E12A
ROUND		9	5	6		7	7.5	8
SAMPLE ID#				B00Z52				B01BT9
PARAMETERS								
WET CHEMISTRY (units = mg/L)								
TOX (ug/L)	220	--	--	--		--	--	--
TOC	3.9	--	--	--		--	--	--
Ammonia	0.15	--	--	0.02	ND	--	--	--
Nitrates	NA	--	--	2		--	--	--
COD	15	--	--	10	ND	--	--	--
Turbidity (units = NTU)	NA	--	--	0.2		--	--	--
Alkalinity (CaCO3)	199	--	--	130		--	--	--
Fluoride (F)	0.5	--	--	0.6		--	--	--
Chloride (Cl)	22.1	--	--	8.5		--	--	--
Bromide (Br)	1	--	--	0.2	ND	--	--	--
Phosphate (PO4-P)	1.0	--	--	0.1	ND	--	--	--
Nitrate (NO3-N)	12.3	--	--	1.8		--	--	--
Nitrite (NO2-N)	1	--	--	0.06	ND	--	--	--
Sulfate (SO4)	42.5	--	--	17		--	--	--
TDS	433	--	--	220		--	--	--
pH	7.5-8.7	--	--	7.8		--	--	--
Conductivity (units = umhos/cm)	NA	--	--	350		--	--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL	UNIT UTL'S	4	5	5		5		5	5
WELL I.D.		S38-E12A	S38-E12B	S38-E12B		S38-E12B/DUPL.		S38-E12B	S38-E12B
ROUND		9	5	6		6		7	7.5
SAMPLE ID#				B00Z56		B00Z60			
PARAMETERS									
WET CHEMISTRY (units = mg/L)									
TOX (ug/L)	220	--	--	--		--		--	--
TOC	3.9	--	--	--		--		--	--
Ammonia	0.15	--	--	0.02	ND	0.02		--	--
Nitrates	NA	--	--	1.7		1.7		--	--
COD	15	--	--	10	ND	10	ND	--	--
Turbidity (units = NTU)	NA	--	--	0.4		0.4		--	--
Alkalinity (CaCO3)	199	--	--	120		120		--	--
Fluoride (F)	0.5	--	--	0.6		0.6		--	--
Chloride (Cl)	22.1	--	--	6.5		6.5		--	--
Bromide (Br)	1	--	--	0.2	ND	0.2	ND	--	--
Phosphate (PO4-P)	1.0	--	--	0.1	ND	0.1	ND	--	--
Nitrate (NO3-N)	12.3	--	--	1.5		1.8		--	--
Nitrite (NO2-N)	1	--	--	0.06	ND	0.06	ND	--	--
Sulfate (SO4)	42.5	--	--	17		17		--	--
TDS	433	--	--	210		220		--	--
pH	7.5-8.7	--	--	7.9		7.9		--	--
Conductivity (units = umhos/cm)	NA	--	--	330		330		--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		5	5	6	6		6	6
WELL I.D.	UNIT UTL'S	S38-E12B	S38-E12	S37-E11	S37-E11		S37-E11	S37-E11
ROUND		8	9	5	6		7	7.5
SAMPLE ID#		B01BV0			B00Z64			
PARAMETERS								
WET CHEMISTRY (units = mg/L)								
TOX (ug/L)	220	--	--	--	--		--	--
TOC	3.9	--	--	--	--		--	--
Ammonia	0.15	--	--	--	0.02	ND	--	--
Nitrates	NA	--	--	--	2.4		--	--
COD	15	--	--	--	10	ND	--	--
Turbidity (units = NTU)	NA	--	--	--	0.4		--	--
Alkalinity (CaCO3)	199	--	--	--	140		--	--
Fluoride (F)	0.5	--	--	--	0.6		--	--
Chloride (Cl)	22.1	--	--	--	9.2		--	--
Bromide (Br)	1	--	--	--	0.2	ND	--	--
Phosphate (PO4-P)	1.0	--	--	--	0.1	ND	--	--
Nitrate (NO3-N)	12.3	--	--	--	2.4		--	--
Nitrite (NO2-N)	1	--	--	--	0.06	ND	--	--
Sulfate (SO4)	42.5	--	--	--	23		--	--
TDS	433	--	--	--	250		--	--
pH	7.5-8.7	--	--	--	7.9		--	--
Conductivity (units = umhos/cm)	NA	--	--	--	360		--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL	UNIT UTL'S	6	6	7	7	7	7A
WELL I.D.		S37-E11	S37-E11	S38-E11	S38-E11	S38-E11/SPLIT	S38-E11
ROUND		8	9	5	6	6	6
SAMPLE ID#		B01BV2			B00Z72	B00Z76	B00XY0
PARAMETERS							
WET CHEMISTRY (units = mg/L)							
TOX (ug/L)	220	--	--	--	--	--	--
TOC	3.9	--	--	--	--	--	--
Ammonia	0.15	--	--	--	0.04	0.02 ND	120
Nitrates	NA	--	--	--	3.8	3.6	7.5
COD	15	--	--	--	10 ND	10 ND	10
Turbidity (units = NTU)	NA	--	--	--	0.7	0.6	0.7
Alkalinity (CaCO3)	199	--	--	--	160	150	110
Fluoride (F)	0.5	--	--	--	0.7	0.6	0.9
Chloride (Cl)	22.1	--	--	--	13	13	24
Bromide (Br)	1	--	--	--	0.2 ND	0.2 ND	0.2
Phosphate (PO4-P)	1.0	--	--	--	0.1 ND	0.1 ND	0.2
Nitrate (NO3-N)	12.3	--	--	--	3.5	3.6	8
Nitrite (NO2-N)	1	--	--	--	0.06 ND	0.06 ND	0.06
Sulfate (SO4)	42.5	--	--	--	38	39	49
TDS	433	--	--	--	280	280	340
pH	7.5-8.7	--	--	--	7.7	7.8	7.7
Conductivity (units = umhos/cm)	NA	--	--	--	470	460	520

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL			7A		7A		7	7
WELL I.D.	UNIT UTL'S		S38-E11		S38-E11		S38-E11	S38-E11
ROUND			7		7.5		8	9
SAMPLE ID#			B010Z3		B01543			
PARAMETERS								
WET CHEMISTRY (units = mg/L)								
TOX (ug/L)	220		--		--		--	--
TOC	3.9		--		--		--	--
Ammonia	0.15		0.02	ND	0.03		--	--
Nitrates	NA		6.9		7.8		--	--
COD	15	ND	10	ND	10	ND	--	--
Turbidity (units = NTU)	NA		1.7		--		--	--
Alkalinity (CaCO3)	199		130		--		--	--
Fluoride (F)	0.5		0.6		0.5		--	--
Chloride (Cl)	22.1		23		25		--	--
Bromide (Br)	1		0.2		0.3		--	--
Phosphate (PO4-P)	1.0	ND	0.2	ND	0.2	ND	--	--
Nitrate (NO3-N)	12.3		7.6		7.6		--	--
Nitrite (NO2-N)	1	ND	0.07	ND	0.07	ND	--	--
Sulfate (SO4)	42.5		47		47		--	--
TDS	433		350		--		--	--
pH	7.5-8.7		7.7		7.9		--	--
Conductivity (units = umhos/cm)	NA		440		510		--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		8	8A		8A		8A		8	
WELL I.D.	UNIT UTL'S	S31-E8	S31-E8		S31-E8		S38-E11		S31-E8	
ROUND		5	6		6		7		7.5	
SAMPLE ID#			B00ZG9		B00Y36		B010Z7		B01537	
PARAMETERS										
WET CHEMISTRY (units = mg/L)										
TOX (ug/L)	220	--	--		--		--		--	
TOC	3.9	--	--		--		--		--	
Ammonia	0.15	--	0.05		0.54		0.05	ND	0.05	
Nitrates	NA	--	17		7.3		17		7.1	
COD	15	--	10	ND	10	ND	10	ND	10	ND
Turbidity (units = NTU)	NA	--	2.3		0.2	ND	0.4		--	
Alkalinity (CaCO3)	199	--	140		160		150		--	
Fluoride (F)	0.5	--	0.8		0.4		0.8		0.5	
Chloride (Cl)	22.1	--	12		15		13		17	
Bromide (Br)	1	--	0.2	ND	0.2	ND	0.2	ND	0.2	ND
Phosphate (PO4-P)	1.0	--	0.2	ND	0.7	ND	0.2	ND	0.2	ND
Nitrate (NO3-N)	12.3	--	18		6.7		17		6.8	
Nitrite (NO2-N)	1	--	0.07	ND	0.06	ND	0.07		0.07	ND
Sulfate (SO4)	42.5	--	68		31		61		30	
TDS	433	--	400		330		500		--	
pH	7.5-8.7	--	7.8		7.8		7.8		7.8	
Conductivity (units = umhos/cm)	NA	--	670		460		590		490	

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		8A		8	8		9	9	
WELL I.D.	UNIT UTL'S	S31-E8		S31-E08	S31-E08		S32-E8	S32-E8	
ROUND		7.5		8	9		5	6	
SAMPLE ID#		B01546			B06195			B00Y40	
PARAMETERS									
WET CHEMISTRY (units = mg/L)									
TOX (ug/L)	220	--		--	--		--	--	
TOC	3.9	--		--	--		--	--	
Ammonia	0.15	0.29		--	0.05 U		--	0.17	
Nitrates	NA	17		--	--		--	0.17	
COD	15	10	ND	--	--		--	10	ND
Turbidity (units = NTU)	NA	--		--	--		--	0.2	ND
Alkalinity (CaCO3)	199	--		--	161		--	90	
Fluoride (F)	0.5	0.6		--	0.3		--	0.4	
Chloride (Cl)	22.1	14		--	16.2		--	2	
Bromide (Br)	1	0.2	ND	--	--		--	0.2	ND
Phosphate (PO4-P)	1.0	0.2	ND	--	0.04 J		--	0.7	ND
Nitrate (NO3-N)	12.3	17		--	6.5		--	0.05	ND
Nitrite (NO2-N)	1	0.07	ND	--	0.1 U		--	0.06	ND
Sulfate (SO4)	42.5	61		--	29.8		--	11	
TDS	433	--		--	--		--	160	
pH	7.5-8.7	7.8		--	7.8		--	7.8	
Conductivity (units = umhos/cm)	NA	610		--	--		--	220	

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		9	9		9	9	10
WELL I.D.	UNIT UTL'S	S32-E08	S32-E8		S32-E08	S32-E08	S30-E10A
ROUND		7	7.5		8	9	5
SAMPLE ID#			B01540				B00HW2
PARAMETERS							
WET CHEMISTRY (units = mg/L)							
TOX (ug/L)	220	--	--		--	--	--
TOC	3.9	--	--		--	--	--
Ammonia	0.15	--	0.03		--	--	0.03 U
Nitrates	NA	--	10	ND	--	--	36
COD	15	--	10	ND	--	--	10 U
Turbidity (units = NTU)	NA	--	--		--	--	0.4
Alkalinity (CaCO3)	199	--	--		--	--	150
Fluoride (F)	0.5	--	0.4		--	--	1 U
Chloride (Cl)	22.1	--	2.1		--	--	23
Bromide (Br)	1	--	0.2	ND	--	--	0.2 U
Phosphate (PO4-P)	1.0	--	0.2	ND	--	--	0.7 U
Nitrate (NO3-N)	12.3	--	0.05	ND	--	--	39
Nitrite (NO2-N)	1	--	0.07	ND	--	--	0.06 U
Sulfate (SO4)	42.5	--	11		--	--	75
TDS	433	--	--		--	--	540
pH	7.5-8.7	--	8		--	--	7.8
Conductivity (units = umhos/cm)	NA	--	220		--	--	940

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		10		10		10		10		10
WELL I.D.	UNIT UTL'S	S30-E10A		S30-E10A /DUPL.		S30-E10A		S30-E10A		S30-E10A
ROUND		6		6		7		7.5		8
SAMPLE ID#		B00Y44		B00Y48		B010X3		B01531		B01BV4
PARAMETERS										
WET CHEMISTRY (units = mg/L)										
TOX (ug/L)	220	--		--		--		--		--
TOC	3.9	--		--		--		--		--
Ammonia	0.15	0.11		0.06		0.08		0.03		--
Nitrates	NA	41		43		46		41		--
COD	15	10		10	ND	10	ND	10	ND	--
Turbidity (units = NTU)	NA	0.3		0.6		0.6		--		--
Alkalinity (CaCO3)	199	150		150		150		--		--
Fluoride (F)	0.5	0.8		0.8		0.9		0.9		--
Chloride (Cl)	22.1	22		22		22		23		--
Bromide (Br)	1	0.2	ND	0.2	ND	0.2	ND	0.2	ND	--
Phosphate (PO4-P)	1.0	0.7	ND	0.7	ND	0.2	ND	0.4	ND	--
Nitrate (NO3-N)	12.3	38		38		47		38		--
Nitrite (NO2-N)	1	0.06	ND	0.06	ND	0.07	ND	0.07	ND	--
Sulfate (SO4)	42.5	69		69		75		63		--
TDS	433	590		590		780		--		--
pH	7.5-8.7	7.7		7.8		7.8		7.8		--
Conductivity (units = umhos/cm)	NA	820		800		930		850		--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		10	11	11	11	11
WELL I.D.	UNIT UTL'S	S30E10A	S30-E10B	S30-E10B	S30-E10B	S30-E10B
ROUND		9	5	5	6	6
SAMPLE ID#		B06196	B00HW4	B00HW6	B00Y52	B00Y56
PARAMETERS						
WET CHEMISTRY (units = mg/L)						
TOX (ug/L)	220	--	--	--	--	--
TOC	3.9	--	--	--	--	--
Ammonia	0.15	0.05 U	0.2 U	0.2 U	0.16	0.21
Nitrates	NA	--	42	42	49	51
COD	15	--	10 U	10 U	10 ND	10
Turbidity (units = NTU)	NA	--	0.5	0.5	0.7	0.4
Alkalinity (CaCO3)	199	159	150	150	150	150
Fluoride (F)	0.5	0.3	1 U	1 U	0.8	0.8
Chloride (Cl)	22.1	26	22	22	23	23
Bromide (Br)	1	--	0.2 U	0.2 U	0.2 ND	0.2
Phosphate (PO4-P)	1.0	0.03 U	0.7 U	0.7 U	0.7 ND	0.7
Nitrate (NO3-N)	12.3	43	40	42	46	46
Nitrite (NO2-N)	1	0.1 U	1.8	1.5	0.71	0.75
Sulfate (SO4)	42.5	68.7	79	81	76	75
TDS	433	--	580	580	640	650
pH	7.5-8.7	7.67	7.8	7.8	7.6	7.8
Conductivity (units = umhos/cm)	NA	--	820	940	910	920

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		11		11		11		11	
WELL I.D.	UNIT UTL'S	S30-E10B/DUPL.		S30-E10B/SPLIT		S30-E10B		S30-E10B	
ROUND		7		7		7		7.5	
SAMPLE ID#		B010X5		B010X7		B010X9		B01534	
PARAMETERS									
WET CHEMISTRY (units = mg/L)									
TOX (ug/L)	220	--		--		--		--	
TOC	3.9	--		--		--		--	
Ammonia	0.15	0.05		0.05		0.05	ND	0.12	
Nitrates	NA	45		45		38		53	
COD	15	ND	10	ND	10	ND	10	ND	10	ND
Turbidity (units = NTU)	NA	2.7		0.9		1		--	
Alkalinity (CaCO3)	199	150		150		160		--	
Fluoride (F)	0.5	1.5		0.9		0.9		0.9	
Chloride (Cl)	22.1	23		23		21		24	
Bromide (Br)	1	ND	0.2	ND	0.2	ND	0.2	ND	0.2	ND
Phosphate (PO4-P)	1.0	ND	0.2	ND	0.2	ND	0.2	ND	0.4	ND
Nitrate (NO3-N)	12.3	46		47		39		48	
Nitrite (NO2-N)	1	0.07	ND	0.07	ND	0.07	ND	0.07	ND
Sulfate (SO4)	42.5	74		75		65		70	
TDS	433	690		700		650		--	
pH	7.5-8.7	7.7		7.8		7.8		7.8	
Conductivity (units = umhos/cm)	NA	950		930		850		920	

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL	UNIT UTL'S	11	11	12	12	12
WELL I.D.		S30-E10B	S30-E10B	S31-E10A	S31-E10A	S31-E10A
ROUND		8	9	5	6	7
SAMPLE ID#		B01BV7	B06197	B00HX0	B00Y20	B010T5
PARAMETERS						
WET CHEMISTRY (units = mg/L)						
TOX (ug/L)	220	--	--	--	--	--
TOC	3.9	--	--	--	--	--
Ammonia	0.15	--	0.05 U	0.2 U	0.04	0.87
Nitrates	NA	--	--	49	55	49
COD	15	--	--	10 U	10 ND	10 ND
Turbidity (units = NTU)	NA	--	--	0.2	0.2 ND	0.2 ND
Alkalinity (CaCO3)	199	--	161	160	170	170
Fluoride (F)	0.5	--	0.3	1.1 U	0.8	0.9
Chloride (Cl)	22.1	--	26.2	21	17	18
Bromide (Br)	1	--	--	0.2 U	0.2 ND	0.2 ND
Phosphate (PO4-P)	1.0	--	0.03 U	0.7 U	0.7 ND	0.2 ND
Nitrate (NO3-N)	12.3	--	48.8	50	49	51
Nitrite (NO2-N)	1	--	0.1 U	0.06 U	0.06 ND	0.07 ND
Sulfate (SO4)	42.5	--	75.4	78	71	71
TDS	433	--	--	610	700	720
pH	7.5-8.7	--	7.65	7.8	7.7	7.6
Conductivity (units = umhos/cm)	NA	--	--	940	940	880

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		12		12	12	13	13	
WELL I.D.	UNIT UTL'S	S31-E10A		S31-E10A	S31-E10A	S31-E10B	S31-E10B	
ROUND		7.5		8	9	5	6	
SAMPLE ID#		B014Z8		B01BW0	B06198	B00HX2	B00Y24	
PARAMETERS								
WET CHEMISTRY (units = mg/L)								
TOX (ug/L)	220	--		--	--	--	--	
TOC	3.9	--		--	--	--	--	
Ammonia	0.15	0.03		--	0.05 U	0.2 U	0.32	
Nitrates	NA	58		--	--	45	53	
COD	15	10	ND	--	--	10 U	10	ND
Turbidity (units = NTU)	NA	--		--	--	0.2 U	0.6	
Alkalinity (CaCO3)	199	--		--	171	160	160	
Fluoride (F)	0.5	1		--	0.4	1.3 U	1	
Chloride (Cl)	22.1	18		--	17.7	20	16	
Bromide (Br)	1	0.2	ND	--	--	0.2 U	0.2	ND
Phosphate (PO4-P)	1.0	0.4	ND	--	0.03 J	0.7 U	0.7	
Nitrate (NO3-N)	12.3	52		--	51.6	45	46	
Nitrite (NO2-N)	1	0.07	ND	--	0.1 U	0.06 U	0.6	ND
Sulfate (SO4)	42.5	67		--	70.7	68	65	
TDS	433	--		--	--	600	650	
pH	7.5-8.7	7.7		--	7.57	7.8	7.6	
Conductivity (units = umhos/cm)	NA	970		--	--	820	820	

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		13		13		13	13	14
WELL I.D.	UNIT UTL'S	S31-E10B		S31-E10B		S31-E10B	S31-E10B	S31-E10C
ROUND		7		7.5		8	9	5
SAMPLE ID#		B010T7		B01501		B01BW3		B00HX4
PARAMETERS								
WET CHEMISTRY (units = mg/L)								
TOX (ug/L)	220	--		--		--	--	--
TOC	3.9	--		--		--	--	--
Ammonia	0.15	0.1		0.04		--	--	0.2 U
Nitrates	NA	44		52		--	--	49
COD	15	10	ND	10	ND	--	--	10 U
Turbidity (units = NTU)	NA	0.2	ND	--		--	--	0.2 U
Alkalinity (CaCO3)	199	170		--		--	--	170
Fluoride (F)	0.5	1.1		1		--	--	1.1 U
Chloride (Cl)	22.1	15		17		--	--	21
Bromide (Br)	1	0.2	ND	0.2	ND	--	--	0.2 U
Phosphate (PO4-P)	1.0	0.2	ND	0.4	ND	--	--	0.7 U
Nitrate (NO3-N)	12.3	45		43		--	--	47
Nitrite (NO2-N)	1	0.07	ND	0.07	ND	--	--	0.06 U
Sulfate (SO4)	42.5	63		59		--	--	76
TDS	433	640		--		--	--	640
pH	7.5-8.7	7.8		7.7		--	--	7.8
Conductivity (units = umhos/cm)	NA	800		870		--	--	940

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		14		14		14		14	14
WELL I.D.	UNIT UTL'S	S31-E10C		S31-E10C		S31-E10C		S31-E10C	S31-E10C
ROUND		6		7		7.5		8	9
SAMPLE ID#		B00Y28		B010T9		B01504		B01BW6	B06202
PARAMETERS									
WET CHEMISTRY (units = mg/L)									
TOX (ug/L)	220	--		--		--		--	--
TOC	3.9	--		--		--		--	--
Ammonia	0.15	1		0.07		0.05		--	0.05 U
Nitrates	NA	52		46		54		--	--
COD	15	10	ND	10	ND	10	ND	--	--
Turbidity (units = NTU)	NA	0.2		0.2	ND	--		--	--
Alkalinity (CaCO3)	199	170		170		--		--	172
Fluoride (F)	0.5	0.9		1		0.9		--	0.4
Chloride (Cl)	22.1	17		16		16		--	17.4
Bromide (Br)	1	0.2	ND	0.2	ND	0.2	ND	--	--
Phosphate (PO4-P)	1.0	0.7	ND	0.2	ND	0.4	ND	--	0.03 J
Nitrate (NO3-N)	12.3	47		47		48		--	50.7
Nitrite (NO2-N)	1	0.06	ND	0.07	ND	0.07	ND	--	0.1 U
Sulfate (SO4)	42.5	72		69		65		--	70.3
TDS	433	630		660		--		--	--
pH	7.5-8.7	7.6		7.8		7.8		--	7.64
Conductivity (units = umhos/cm)	NA	940		820		920		--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		15	15	15	15	15
WELL I.D.	UNIT UTL'S	S31-E10D	S31-E10D	S31-E10D	S31-E10D	S31-E10D
ROUND		5	6	7	7.5	8
SAMPLE ID#		B00HX6	B00ZF7	B010V1	B01507	B01BW9
PARAMETERS						
WET CHEMISTRY (units = mg/L)						
TOX (ug/L)	220	--	--	--	--	--
TOC	3.9	--	--	--	--	--
Ammonia	0.15	0.2 U	0.22	0.05	0.02 ND	--
Nitrates	NA	30	33	36	40	--
COD	15	10 U	10 ND	10 ND	10 ND	--
Turbidity (units = NTU)	NA	0.2 U	0.3	0.2 ND	--	--
Alkalinity (CaCO3)	199	150	160	170	--	--
Fluoride (F)	0.5	1.1 U	1	1	1	--
Chloride (Cl)	22.1	19	14	14	15	--
Bromide (Br)	1	0.2 U	0.2 ND	0.2 ND	0.2 ND	--
Phosphate (PO4-P)	1.0	0.7 U	0.2 ND	0.2 ND	0.4 ND	--
Nitrate (NO3-N)	12.3	30	33	30	36	--
Nitrite (NO2-N)	1	0.06 U	0.07 ND	0.07 ND	0.07 ND	--
Sulfate (SO4)	42.5	55	57	58	55	--
TDS	433	450	500	570	--	--
pH	7.5-8.7	7.9	7.7	7.9	7.8	--
Conductivity (units = umhos/cm)	NA	690	770	730	780	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		15	17	17	17	17
WELL I.D.	UNIT UTL'S	S31-E10A	S41-E13A	S41-E13C	S41-E13C	S41-E13C
ROUND		9	5	6	7	7
SAMPLE ID#		B06206	B00HS9	B00ZC2		
PARAMETERS						
WET CHEMISTRY (units = mg/L)						
TOX (ug/L)	220	--	10 U	--	--	--
TOC	3.9	--	0.5	--	--	--
Ammonia	0.15	0.05 U	0.2 U	0.02 ND	--	--
Nitrates	NA	--	0.73	0.05	--	--
COD	15	--	10 U	10 ND	--	--
Turbidity (units = NTU)	NA	--	0.6	2.9	--	--
Alkalinity (CaCO3)	199	159	160	110	--	--
Fluoride (F)	0.5	0.6	0.8 U	0.4	--	--
Chloride (Cl)	22.1	14.3	4.8	2.7	--	--
Bromide (Br)	1	--	0.2 U	0.2 ND	--	--
Phosphate (PO4-P)	1.0	0.04 J	0.07 U	0.2 ND	--	--
Nitrate (NO3-N)	12.3	23.6	0.96	0.05 ND	--	--
Nitrite (NO2-N)	1	0.1 U	0.06 U	0.07 ND	--	--
Sulfate (SO4)	42.5	46.3	9.9	14	--	--
TDS	433	--	220	160	--	--
pH	7.5-8.7	7.73	8	8	--	--
Conductivity (units = umhos/cm)	NA	--	350	260	--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL	UNIT UTL'S	17	17	18	18	18
WELL I.D.		S31-E13A	S41-E13A	S37-E12	S37-E12	S37-E12
ROUND		8	9	5	6	7
SAMPLE ID#				B00HV8	B00ZG1	B010Y9
PARAMETERS						
WET CHEMISTRY (units = mg/L)						
TOX (ug/L)	220	--	--	10 U	--	--
TOC	3.9	--	--	0.5	--	--
Ammonia	0.15	--	--	0.3	0.1	0.05 ND
Nitrates	NA	--	--	2.3	1.9	1.6
COD	15	--	--	10 U	10 ND	10 ND
Turbidity (units = NTU)	NA	--	--	1.2	2	2
Alkalinity (CaCO3)	199	--	--	10 U	120	120
Fluoride (F)	0.5	--	--	0.9 U	0.3	0.7
Chloride (Cl)	22.1	--	--	7.1	11	7
Bromide (Br)	1	--	--	0.2 U	0.2 ND	0.2 ND
Phosphate (PO4-P)	1.0	--	--	0.07 U	0.2 ND	0.2 ND
Nitrate (NO3-N)	12.3	--	--	2.2	1.9	1.6
Nitrite (NO2-N)	1	--	--	0.06 U	0.07 ND	0.07 ND
Sulfate (SO4)	42.5	--	--	3300	16	14
TDS	433	--	--	570	190	280
pH	7.5-8.7	--	--	1.6	7.8	7.7
Conductivity (units = umhos/cm)	NA	--	--	--	360	310

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		18	18	18	19	19	19	
WELL I.D.	UNIT UTL'S	S37-E12	S37-E12	S37-E12	S32-E11	S32-E11	S32-E11	
ROUND		7	8	9	5	6	7	
SAMPLE ID#			B01BX2			B00ZH3	B010V3	
PARAMETERS								
WET CHEMISTRY (units = mg/L)								
TOX (ug/L)	220	--	--	--	--	--	--	
TOC	3.9	--	--	--	--	--	--	
Ammonia	0.15	--	--	--	--	--	0.05	ND
Nitrates	NA	--	--	--	--	--	3.2	
COD	15	--	--	--	--	--	10	ND
Turbidity (units = NTU)	NA	--	--	--	--	--	0.5	
Alkalinity (CaCO3)	199	--	--	--	--	--	140	
Fluoride (F)	0.5	--	--	--	--	--	0.8	
Chloride (Cl)	22.1	--	--	--	--	--	11	
Bromide (Br)	1	--	--	--	--	--	0.2	ND
Phosphate (PO4-P)	1.0	--	--	--	--	--	0.2	ND
Nitrate (NO3-N)	12.3	--	--	--	--	--	3.4	
Nitrite (NO2-N)	1	--	--	--	--	--	0.07	ND
Sulfate (SO4)	42.5	--	--	--	--	--	35	
TDS	433	--	--	--	--	--	350	
pH	7.5-8.7	--	--	--	--	--	7.8	
Conductivity (units = umhos/cm)	NA	--	--	--	--	--	420	

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		19		19	19	20	20	20
WELL I.D.	UNIT UTL'S	S32-E11		S32-E11	S32-E11	S29-E11	S29-E11	S29-E11
ROUND		7		8	9	5	6	7
SAMPLE ID#		B01510		B01C07	B06207		B00ZH4	B010V7
PARAMETERS								
WET CHEMISTRY (units = mg/L)								
TOX (ug/L)	220	--		--	--	--	--	--
TOC	3.9	--		--	--	--	--	--
Ammonia	0.15	0.02	ND	--	0.05 U	--	--	0.23
Nitrates	NA	3.8		--	--	--	--	31
COD	15	10	ND	--	--	--	--	10
Turbidity (units = NTU)	NA	--		--	--	--	--	2.2
Alkalinity (CaCO3)	199	--		--	142	--	--	160
Fluoride (F)	0.5	0.8		--	0.3	--	--	1
Chloride (Cl)	22.1	12		--	12.1	--	--	13
Bromide (Br)	1	0.2	ND	--	--	--	--	0.2
Phosphate (PO4-P)	1.0	0.4	ND	--	0.04 J	--	--	0.2
Nitrate (NO3-N)	12.3	3.4		--	3.6	--	--	31
Nitrite (NO2-N)	1	0.07	ND	--	0.1 U	--	--	0.07
Sulfate (SO4)	42.5	34		--	35.3	--	--	85
TDS	433	--		--	--	--	--	600
pH	7.5-8.7	8		--	7.87	--	--	7.8
Conductivity (units = umhos/cm)	NA	440		--	--	--	--	770

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		20		20		20	21	21
WELL I.D.	UNIT UTL'S	S29-E11		S29-E11		S29-E11	S31-E10E	S31-E10E
ROUND		7.5		8		9	5	6
SAMPLE ID#		B01513		B01C12		B06208		B00ZH5
PARAMETERS								
WET CHEMISTRY (units = mg/L)								
TOX (ug/L)	220	--		--		--	--	--
TOC	3.9	--		--		--	--	--
Ammonia	0.15	0.2		0.07		0.05 U	--	--
Nitrates	NA	32		31		--	--	--
COD	15	10	ND	10	ND	--	--	--
Turbidity (units = NTU)	NA	--		9.9		--	--	--
Alkalinity (CaCO3)	199	--		160		162	--	--
Fluoride (F)	0.5	0.9		0.8		0.3	--	--
Chloride (Cl)	22.1	13		14		14.5	--	--
Bromide (Br)	1	0.2	ND	0.2	ND	--	--	--
Phosphate (PO4-P)	1.0	0.4	ND		ND	0.03 J	--	--
Nitrate (NO3-N)	12.3	31		28		35	--	--
Nitrite (NO2-N)	1	0.07	ND	0.07	ND	0.1 U	--	--
Sulfate (SO4)	42.5	80		73		89.6	--	--
TDS	433	--		510		--	--	--
pH	7.5-8.7	7.8		8		7.86	--	--
Conductivity (units = umhos/cm)	NA	730		730		--	--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		21		21		21		21	22
WELL I.D.	UNIT UTL'S	S31-E10E		S31-E10E		S31-E10E		S31-E10E	S31-E11
ROUND		7		7.5		8		9	5
SAMPLE ID#		B010W1		B01516		B01C17			
PARAMETERS									
WET CHEMISTRY (units = mg/L)									
TOX (ug/L)	220	--		--		--		--	--
TOC	3.9	--		--		--		--	--
Ammonia	0.15	0.07		0.14		0.07		--	--
Nitrates	NA	10	ND	0.1		0.01	ND	--	--
COD	15	10	ND	10	ND	10	ND	--	--
Turbidity (units = NTU)	NA	0.9		--		1.2		--	--
Alkalinity (CaCO3)	199	120		--		120		--	--
Fluoride (F)	0.5	0.9		1.1		1		--	--
Chloride (Cl)	22.1	2.9		2.9		3		--	--
Bromide (Br)	1	0.2	ND	0.2	ND	0.2	ND	--	--
Phosphate (PO4-P)	1.0	1.9		1		1.1		--	--
Nitrate (NO3-N)	12.3	0.05	ND	0.05	ND	0.05	ND	--	--
Nitrite (NO2-N)	1	0.07	ND	0.07	ND	0.07	ND	--	--
Sulfate (SO4)	42.5	12		13		12		--	--
TDS	433	250		--		180		--	--
pH	7.5-8.7	8		8		8		--	--
Conductivity (units = umhos/cm)	NA	280		280		270		--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		22	22		22		22		22	
WELL I.D.	UNIT UTL'S	S31-E11	S31-E11		S31-E11		S31-E11/DUP.		S31-E11/SPLIT	
ROUND		6	7		7.5		7.5		7.5	
SAMPLE ID#		B00ZH6	B010W5		B01519		B01522		B01525	
PARAMETERS										
WET CHEMISTRY (units = mg/L)										
TOX (ug/L)	220	--	--		--		--		--	
TOC	3.9	--	--		--		--		--	
Ammonia	0.15	--	0.05		0.16		0.09		0.1	
Nitrates	NA	--	3.2		4		0.03		0.18	
COD	15	--	80		10	ND	10	ND	10	ND
Turbidity (units = NTU)	NA	--	0.5		--		--		--	
Alkalinity (CaCO3)	199	--	140		--		--		--	
Fluoride (F)	0.5	--	0.8		0.8		1		1.1	
Chloride (Cl)	22.1	--	12		11		2.9		2.9	
Bromide (Br)	1	--	0.2	ND	0.2	ND	0.2	ND	0.2	ND
Phosphate (PO4-P)	1.0	--	0.05		0.4	ND	1		1.1	
Nitrate (NO3-N)	12.3	--	3.3	ND	3.7		0.05	ND	0.05	ND
Nitrite (NO2-N)	1	--	0.07		0.07	ND	0.07	ND	0.07	ND
Sulfate (SO4)	42.5	--	31		32		13		13	
TDS	433	--	320		--		--		--	
pH	7.5-8.7	--	8		7.9		8		8	
Conductivity (units = umhos/cm)	NA	--	400		410		270		280	

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		22	22	S29-E12	S29-E12	S29-E12	S29-E12
WELL I.D.	UNIT UTL'S	S31-E11	S31-E11	S29-E12	S29-E12	S29-E12	S29-E12
ROUND		8	9	5	6	7	7.5
SAMPLE ID#		B01C22	B06209		B00Y72		B01C29
PARAMETERS							
WET CHEMISTRY (units = mg/L)							
TOX (ug/L)	220	--	--	--	--	--	--
TOC	3.9	--	--	--	--	--	--
Ammonia	0.15	--	0.05 U	--	--	--	--
Nitrates	NA	--	--	--	5	--	--
COD	15	--	--	--	--	--	--
Turbidity (units = NTU)	NA	--	--	--	--	--	--
Alkalinity (CaCO3)	199	--	142	--	140	--	--
Fluoride (F)	0.5	--	0.3	--	0.7	--	--
Chloride (Cl)	22.1	--	13.2	--	13	--	--
Bromide (Br)	1	--	--	--	--	--	--
Phosphate (PO4-P)	1.0	--	0.04 J	--	--	--	--
Nitrate (NO3-N)	12.3	--	4.2	--	4.5	--	--
Nitrite (NO2-N)	1	--	0.1 U	--	--	--	--
Sulfate (SO4)	42.5	--	35.1	--	33	--	--
TDS	433	--	--	--	300	--	--
pH	7.5-8.7	--	7.9	--	7.6	--	--
Conductivity (units = umhos/cm)	NA	--	--	--	530	--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		S29-E12	S29-E12	S30-15A	S30-15A	S30-E15A	S30-15A
WELL I.D.	UNIT UTL'S	S29-E12	S29-E12	S30-15A	S30-E15A	S30-E15A	S30-15A
ROUND		8	9	5	6	7	7.5
SAMPLE ID#			B06210		B00Y68		
PARAMETERS							
WET CHEMISTRY (units = mg/L)							
TOX (ug/L)	220	--	--	--	10	--	--
TOC	3.9	--	--	--	--	--	--
Ammonia	0.15	--	0.05 U	--	0.35	--	--
Nitrates	NA	--	--	--	2.7	--	--
COD	15	--	--	--	--	--	--
Turbidity (units = NTU)	NA	--	--	--	0.4	--	--
Alkalinity (CaCO3)	199	--	144	--	220	--	--
Fluoride (F)	0.5	--	0.3	--	0.5	--	--
Chloride (Cl)	22.1	--	13.2	--	7.3	--	--
Bromide (Br)	1	--	--	--	--	--	--
Phosphate (PO4-P)	1.0	--	0.03 J	--	--	--	--
Nitrate (NO3-N)	12.3	--	6.2	--	2.8	--	--
Nitrite (NO2-N)	1	--	0.1 U	--	--	--	--
Sulfate (SO4)	42.5	--	37.2	--	18	--	--
TDS	433	--	--	--	330	--	--
pH	7.5-8.7	--	7.67	--	7.6	--	--
Conductivity (units = umhos/cm)	NA	--	--	--	510	--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL		S30-15A	S30-15A
WELL I.D.	UNIT UTL'S	S30-15A	S30-15A
ROUND		8	9
SAMPLE ID#			
PARAMETERS			
WET CHEMISTRY (units = mg/L)			
TOX (ug/L)	220	--	--
TOC	3.9	--	--
Ammonia	0.15	--	--
Nitrates	NA	--	--
COD	15	--	--
Turbidity (units = NTU)	NA	--	--
Alkalinity (CaCO3)	199	--	--
Fluoride (F)	0.5	--	--
Chloride (Cl)	22.1	--	--
Bromide (Br)	1	--	--
Phosphate (PO4-P)	1.0	--	--
Nitrate (NO3-N)	12.3	--	--
Nitrite (NO2-N)	1	--	--
Sulfate (SO4)	42.5	--	--
TDS	433	--	--
pH	7.5-8.7	--	--
Conductivity (units = umhos/cm)	NA	--	--

TABLE E-3 Wet Chemistry Analytical Data

MONITORING WELL WELL I.D. ROUND	UNIT UTL'S	S32-E13A S32-E13A 5	S32-E13A S32-E13A 6	S32-E13A S32-E13A 7	S32-E13A S32-E13A 7.5	S32-E13A S32-E13A 8	S32-E13A S32-E13A 9
SAMPLE ID#			B00Y60				
PARAMETERS							
WET CHEMISTRY (units = mg/L)							
TOX (ug/L)	220	--	--	--	--	--	--
TOC	3.9	--	1.1	--	--	--	--
Ammonia	0.15	--	--	--	--	--	--
Nitrates	NA	--	3.7	--	--	--	--
COD	15	--	--	--	--	--	--
Turbidity (units = NTU)	NA	--	0.4	--	--	--	--
Alkalinity (CaCO3)	199	--	250	--	--	--	--
Fluoride (F)	0.5	--	0.6	--	--	--	--
Chloride (Cl)	22.1	--	8.5	--	--	--	--
Bromide (Br)	1	--	--	--	--	--	--
Phosphate (PO4-P)	1.0	--	--	--	--	--	--
Nitrate (NO3-N)	12.3	--	3.4	--	--	--	--
Nitrite (NO2-N)	1	--	--	--	--	--	--
Sulfate (SO4)	42.5	--	19	--	--	--	--
TDS	433	--	350	--	--	--	--
pH	7.5-8.7	--	7.4	--	--	--	--
Conductivity (units = umhos/cm)	NA	--	540	--	--	--	--

Table E-4. Gross Alpha Analytical Data

UTL: 8.2 pCi/L	Gross Alpha, pCi/L				
Round:	5th	6th	7th	7-1/2	8th
Date:	3/91	6/91	8/91	9/91	11/91
Well Number					
MW-1	--	LT 3	--	--	11±5
MW-2	--	LT 4	--	--	--
MW-3	--	LT 4	--	--	LT 2
MW-4	--	LT 3	--	--	--
MW-5	--	LT 3	--	--	--
MW-6	--	LT 3	--	--	LT 1
MW-7	--	LT 3	--	LT 2	--
MW-8	--	LT 2	--	LT 1	--
MW-9	--	LT 2	--	2.9±2.	--
MW-10	*	LT 3	LT 2	0	LT 2
MW-11	*	LT 3	LT 1	LT 2	9.6±7.1
MW-12	*	5.5±4.1	LT 3	3.6±2.	LT 2
MW-13	6.4	LT 5	LT 2	5	2.9±2.4
MW-14	*	8.4±4.4	2.2±1.9	3.5±2.	5.3±2.9
MW-15	*	LT 4	2.1±2.0	4	3.5±1.9
MW-17	--	LT 3	--	LT 2	--
MW-18	6.6	LT 3	LT 1	2.2±1.	LT 2
MW-19	--	--	LT 2	9	2.2±1.7
MW-20	--	--	LT 2	--	6.3±3.2
MW-21	--	--	LT 2	--	LT 1
MW-22	--	--	LT 2	LT 1	*
S29-E12	--	LT 3	--	LT 2	LT 2
S30-E15A	--	LT 4	--	LT 1	--
S32-E13A	--	LT 3	--	LT 1	--

-- = Sample not taken or data not requested
* = Below error limit (for round 5)
LT = Less Than

Radionuclide Maximum Contaminant Levels (MCL),
40 CFR 141, EPA 1986a:
Gross Alpha . . . . 15 pCi/l

The error associated with the confidence interval is defined as the counts collected at two standard deviations from the peak.

Table E-5. Gross Beta Analytical Data

UTL: 18 pCi/L	Gross Beta, pCi/L				
Round:	5th	6th	7th	7-1/2	8
Date:	3/91	6/91	8/91	9/91	11/91
Well Number					
MW-1	--	8.6±2.9	--	--	24±2.0
MW-2	--	13±3	--	--	--
MW-3	--	11±3.0	--	--	18±2.0
MW-4	--	6.9±2.7	--	--	--
MW-5	--	7.4±2.7	--	--	--
MW-6	--	8.1±2.9	--	--	2.9±1.0
MW-7	--	9.5±3.0	--	--	--
MW-8	--	--	--	7.6±1.4	--
MW-9	--	5±2.6	--	6.9±1.2	--
MW-10	63.0	62±6	18±2.0	43±3.0	48±3.0
MW-11	60.0	61±6	20±2.0	49±3.0	60±3.0
MW-12	61.0	66±6	20±3.0	53±3.0	58±3.0
MW-13	61.0	60±5	23±2.0	48±3.0	51±3.0
MW-14	70.0	61±5	38±3.0	46±3.0	56±3.0
MW-15	46.0	50±5	21±2.0	41±3.0	43±4.0
MW-17	--	6.2±2.7	--	--	--
MW-18	13.0	9.7±2.9	5.5±1.2	--	6.3±1.3
MW-19	--	--	9.2±1.5	9.5±1.5	9.6±1.5
MW-20	--	--	71±4.0	53±3.0	87±6.0
MW-21	--	--	7.3±1.3	8.6±1.4	6.3±1.3
MW-22	--	--	10±2.0	9.3±1.5	5.1
S29-E12	--	12±3	--	--	8.0±1.4
S30-E15A	--	9.8±3.1	--	--	--
S32-E13A	--	5.3±2.9	--	--	--

-- Sample not taken or data not requested
LT = Less Than

Radionuclide Maximum Contaminant Levels (MCL),
40 CFR 141, EPA 1986a:
Gross Beta . . . . 50 pCi/l

The error associated with the confidence interval is defined as the counts collected at two standard deviations from the peak.

9 3 1 3 9 3 0 7 7 3

APPENDIX F

SIEMENS POWER CORPORATION
ANALYTICAL RESULTS

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9 3 1 2 0 3 3 0 7 7 5

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9 2 1 2 9 3 6 3 5 0 7 7 0

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some uncertainty in reported concentrations due to well construction techniques and sampling techniques for samples collected prior to November 1991. All TW wells, except TW-17 and TW-18, are constructed of carbon steel which, due to corrosion and the presence of iron oxides, may impact water quality results. Wells TW-17 and TW-18 raised some issues questioning the absolute accuracy of this data. Wells constructed in November 1991 as part of the SPC RI and sample collection protocol for those wells (labeled GM versus earlier-constructed wells designated TW) are constructed of PVC and are smaller (3-inch diameter) than the other wells (6-inch diameter). These factors and others, including uncertainty regarding well depths, screened intervals, and other construction information, suggest that the data should not be assumed to be accurate.

It seems unlikely, however, that the well material would interfere with the analytes of concern (TCE and nitrates) as there are no known interferences from carbon steel for these compounds. The following tables provide the data available from SPC to date.

Well construction and sample collection methods for sampling activities in November 1991 and later are consistent with current EPA guidelines for CLP data. The GM wells show no significant data quality concerns, data quality is comparable to 1100-EM-1 results.

4.0 REFERENCES

EPA, 1988a, *Laboratory Data Validation Functional Guidelines for Organic Analysis*, February 1988.

EPA, 1988b, *Laboratory Data Validation Functional Guidelines for Inorganic Analysis*, July 1988.

Exxon Nuclear Company, Inc., October 1982, *Groundwater Quality and Flow Characteristics in the Vicinity of the Exxon Nuclear Company, Inc. fuel Fabrication Facility, Richland, Washington*, Report number XN-JUB-82-86.

Geraghty & Miller, Inc.; September 19, 1991; *Work Plan, Phase I Groundwater Study*; prepared for Siemens Nuclear Power Corporation; Richland, Washington.

1.0 INTRODUCTION

The Siemens Power Corporation (SPC) is the current corporate entity that owns the fuels fabrication facility in Richland, Washington. Several chemical waste storage lagoons are maintained onsite. The lagoons received wastes from the fabrication process that contained dissolved ammonia, sulfate, fluoride, and nitrate. Trichloroethene (TCE), nitrate, ammonia, fluoride, and radionuclides (gross-alpha and gross-beta radiation) were found to be present in the groundwater at the SPC facility. All of these analytes can be attributed to the lagoons except TCE, which was not used in process applications. Subsequent groundwater sampling and analyses have shown TCE and nitrates to be the major contaminants of concern.

2.0 SPC DATA COLLECTION ACTIVITIES

SPC monitored as many as 25 wells between 1973 and 1991 to determine contaminant impact from leaking lagoons on groundwater quality. Selected wells were analyzed for nitrate, ammonium, fluoride, and gross-alpha and gross-beta radiation on a quarterly basis since 1973 to fulfill requirements for the State Waste Discharge Permit and NRC license Number SNM-1227. After a spill of waste containing ammonium hydroxide in July 1989, samples have been collected on a weekly basis starting March 1990 at wells TW-9 and TW-26 and analyzed for ammonium to determine the degree of groundwater contamination. Additionally, four rounds of samples were collected from selected SPC wells between February 1990 and June 1991 in conjunction with quarterly sampling by the U.S. Department of Energy at the Horn Rapids Landfill site and analyzed for TCE, nitrate, and gross-alpha and gross-beta radiation.

In August 1991, samples were collected from 25 existing wells and analyzed for TCE, dichloroethene, and vinyl chloride (breakdown products of TCE), nitrate, ammonia, fluoride, and gross-alpha and -beta radiation.

Since November 1991, sample collection activities and associated investigations are consistent with the remedial investigation (RI) requirements of an independent action under the State of Washington Model-Toxics Control Act (MTCA). The data collected supports the RI and feasibility study (FS) by providing further characterization of the distribution of contaminants and further delineation of the groundwater flow system (also, see section 6.0) in the unconfined aquifer. Water level values are presented in appendix B. Detailed descriptions of the water level measurement and groundwater sampling and analysis procedures are provided in appendix A of the *Work Plan, Phase I Groundwater Study* (Geraghty & Miller, 1991). Data validation was conducted using Environmental Protection Agency (EPA) guidelines (EPA, 1988a, b).

3.0 SPC DATA QUALITY

Data for wells was obtained from SPC by personal communication and previous reports (Exxon, 1982, and Geraghty & Miller, 1991). Initially, there were concerns for

Table F-1 TCE Concentrations, Siemens Nuclear Power Corporation

Units: ug/L

Date	9/87	12/87	4/90	4/90 *	6/90	9/90	10/90	8/91	11/91	3/92
Well #										
TW-1	8.9	230	40	40	--	--	--	11	--	--
TW-2	--	--	59	56	--	--	--	27	--	--
TW-3	--	--	--	--	--	32	--	12	--	--
TW-4	--	--	--	--	--	26	--	11	--	--
TW-5	--	--	--	--	--	23	--	9.6	--	--
TW-6	--	--	--	--	--	12	--	5.5	--	--
TW-7	--	--	--	--	--	ND	--	5.5	--	--
TW-8	--	ND	--	--	--	--	--	ND	--	--
TW-9	--	420	51	22	--	--	--	11	--	--
TW-11	--	--	--	--	--	--	20	10	--	--
TW-12	--	--	--	--	--	--	24	16	--	--
TW-13	--	--	ND	ND	--	--	ND	ND	--	--
TW-14	--	--	39	33	22	14	--	12	--	10
TW-15	--	--	76	72	58	44	--	25	--	--
TW-16	--	--	73	30	53	33	--	12	--	--
TW-17	--	--	--	--	--	--	--	36	--	--
TW-18	--	--	--	--	--	--	--	36	--	--
TW-19	--	--	--	--	--	--	11	7.9	--	--
TW-20	--	--	--	--	--	--	5	4.1	--	--
TW-21	--	--	--	--	--	--	2 J	1.6	--	--
TW-22	--	--	--	--	--	--	ND	ND	--	--
TW-23	--	--	--	--	--	--	ND	ND	--	--
TW-24	--	--	--	--	--	--	ND	ND	--	--
TW-25	--	--	--	--	--	--	--	ND	--	--
TW-26	--	--	--	--	--	--	--	12	--	--
TW-27(1)	--	--	--	--	--	--	--	13	--	--
TW-30(2)	--	--	--	--	--	--	--	ND	--	--
GM-1	--	--	--	--	--	--	--	--	ND	ND
GM-2	--	--	--	--	--	--	--	--	ND	ND
GM-3	--	--	--	--	--	--	--	--	22 J	15
GM-4	--	--	--	--	--	--	--	--	2 J	ND
GM-5	--	--	--	--	--	--	--	--	22 J	14
GM-6	--	--	--	--	--	--	--	--	12 J	18
GM-7	--	--	--	--	--	--	--	--	13 J	15
GM-8	--	--	--	--	--	--	--	--	13 J	22
GM-9	--	--	--	--	--	--	--	--	10 J	9
GM-10	--	--	--	--	--	--	--	--	21 J	18
GM-11	--	--	--	--	--	--	--	--	23 J	17
GM-12	--	--	--	--	--	--	--	--	35 J	29

* = Indicates duplicate samples
ND = Not detected
- - = Data not available
J = The associated numerical value is an estimated quanitiy

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TABLE F–2 Nitrate (as Nitrogen) for Siemens Power Corp.

	(YEAR/QUARTER)															
	81/1	81/2	81/3	81/4	82/1	82/2	82/3	82/4	83/1	83/2	83/3	83/4	84/1	84/2	84/3	84/4
UNITS: mg/L																
Well #																
TW–1	68	79	38	27	72	63	49	81	99	81	60	52	52	--	53	--
TW–2	34	65	42	18	34	37	33	39	65	57	18	6	44	--	43	--
TW–9	75	75	40	37	47	64	53	56	58	67	48	11	21	--	86	--
TW–13	2.6	3.2	2.1	1.4	2.5	3.1	1.4	0.8	3.5	4.4	1.6	1.3	2.8	--	2.7	--
TW–14	53	77	34	21	40	37	51	65	68	68	52	41	75	--	64	--
TW–15	80	65	39	22	46	61	41	31	54	51	11	39	64	--	53	--
TW–16	--	--	--	--	--	--	24	13	41	0.9	1.2	1.5	1.4	--	1.4	--
TW–23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TW–24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

-- = Data Not Availble * Indicates Duplicate Samples

TABLE F–2 Nitrate (as Nitrogen) for Siemens Power Corp.

	(YEAR/QUARTER)															
	85/1	85/2	85/3	85/4	86/1	86/2	86/3	86/4	87/1	87/2	87/3	87/4	88/1	88/2	88/3	88/4
UNITS: mg/L																
Well #																
TW–1	71	--	64	--	46	--	42	--	--	51.3	25.6	39.6	52	--	54.4	--
TW–2	57	--	69	--	38	--	34	--	--	44.7	37.7	--	25.8	--	57.5	--
TW–9	94	--	75	--	59	--	86	--	--	--	77.9	--	41.8	--	61.8	--
TW–13	10.2	--	5.6	--	5.6	--	3.4	--	--	--	--	--	--	--	--	--
TW–14	46	--	49	--	52	--	49	--	--	--	64.2	--	42	--	46.9	--
TW–15	85	--	49	--	56	--	33.9	--	--	--	59.4	--	58.9	--	38.4	--
TW–16	1.8	--	--	--	1.4	--	1.4	--	--	--	2.3	--	1.1	--	1.8	--
TW–23	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TW–24	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–1	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–9	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–11	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GM–12	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

--=Data Not Availble * Indicates Duplicate Samples

TABLE F–2 Nitrate (as Nitrogen) for Siemens Power Corp.

	(YEAR/QUARTER)													
	89/1	89/2	89/3	89/4	2/90	5/90	8/90	11/90	3/91	6/91	8/91	9/91	11/91	3/92
UNITS: mg/L														
Well #														
TW–1	46.6	--	38.9	--	--	--	--	--	--	--	--	--	--	--
TW–2	62.5	--	60.8	--	--	--	--	--	--	--	--	--	--	--
TW–9	20.3	--	83.1	--	--	--	--	--	--	--	--	35	--	--
TW–13	--	--	--	--	--	--	--	--	--	--	--	--	--	--
TW–14	56.5	--	63.9	--	--	79.5	--	--	--	--	--	44	--	--
TW–15	64.2	--	63.9	--	--	61.4	--	--	--	--	--	36	--	--
TW–16	5.7	--	2.5	--	--	42.7	--	--	--	--	--	22	--	--
TW–23	--	--	--	--	--	--	--	--	--	--	--	4.4	--	--
TW–24	--	--	--	--	--	--	--	--	--	--	--	4.7	--	--
GM–1	--	--	--	--	--	--	--	--	--	--	--	--	4.26	4.45
GM–2	--	--	--	--	--	--	--	--	--	--	--	--	3.87	6.52
GM–3	--	--	--	--	--	--	--	--	--	--	--	--	11.4	8.71
GM–4	--	--	--	--	--	--	--	--	--	--	--	--	19	22.1
GM–5	--	--	--	--	--	--	--	--	--	--	--	--	26 *	37.1 *
GM–6	--	--	--	--	--	--	--	--	--	--	--	--	6.43	6.46
GM–7	--	--	--	--	--	--	--	--	--	--	--	--	5.46	8.66
GM–8	--	--	--	--	--	--	--	--	--	--	--	--	15.5	19.9
GM–9	--	--	--	--	--	--	--	--	--	--	--	--	45.7	5.07
GM–10	--	--	--	--	--	--	--	--	--	--	--	--	21.4	24.4
GM–11	--	--	--	--	--	--	--	--	--	--	--	--	9.56	10.2
GM–12	--	--	--	--	--	--	--	--	--	--	--	--	8.22	24.1

--=Data Not Availble * Indicates Duplicate Samples

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APPENDIX G

INSTITUTIONAL CONTROLS ASSESSMENT

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1.0 INTRODUCTION

Controlling public access to and preventing development of hazardous waste sites are important institutional control issues. The types of controls that are appropriate for hazardous waste sites are commonly practiced at Hanford. Security at Hanford provides for the protection of Government property in accordance with Department of Energy (DOE) DOE Order 5632.6. Additionally, each site is closely investigated and reviewed prior to selection for development. In the event that DOE should release this property, Federal regulations require removal/cleanup of any remaining wastes or restrictions on the use of the land to avoid any Government liability associated with the wastes (41 CFR, 101-47-401-4, Federal Property Management Regulation).

In addition to the institutional controls at Hanford, the City of Richland has an ordinance (promulgated in 1985) that requires a permit for all wells. The City of Richland will not issue a permit for wells providing water for human consumption. The intent of this ordinance is to ensure that all human consumption of water within the city would be from the city's water supply system. This ordinance works to prevent human exposure to contaminated groundwater by requiring residents to utilize the city water system. There are no known contaminated groundwater plumes emanating from waste sites in the 1100-EM-1 Operable Unit which threaten residential areas. In the event that changes to the ownership and use of land in the 1100 Area occurred at some point in the future, city ordinances would play a part in institutional controls.

2.0 SECURITY AT HANFORD

Protection of DOE property in accordance with DOE Order 5632.6, requires a site security plan and includes provisions for access control, physical barriers, and intrusion detection. This order is not specific to hazardous waste sites, but many of the provisions can be adapted to the institutional controls needed for these sites. Fencing, posting of trespassing signs, and including the gate lock (and associated keys) in the security accountability system are performed in accordance with the security procedures at Hanford. Additionally, any unauthorized intrusion into DOE property protected by a fence exposes the trespasser to prosecution of a misdemeanor and may be subject to fines or imprisonment under Title 42, United States Code section 2278 (a) and Title 18, United States Code section 3571.

3.0 CONTROL OF SITE DEVELOPMENT

3.1 GENERAL

There are three control measures currently in place at Hanford that would preclude the inappropriate development of a hazardous waste site within the Hanford Reservation. These measures include the investigation and evaluation of a potential development site and the development of a Site Evaluation Report; a review of that report by the Site Selection Team; and the review of controlled maps showing the location of hazardous areas. These control measures are described in more detail in the following sections.

3.2 SITE EVALUATION REPORT

The DOE-RL Order 4320.2C, Site Selection Process for Hanford Facilities, requires that all land developments, disturbances, or improvements be evaluated. The existing process that implements this order is shown on figure O-1 and requires an investigation and report for each site. In the case of simple sites, an evaluation letter may be issued that would eliminate the full scale report requirement. The site evaluation format has been established and requires evaluation of safety concerns and utility provisions. This investigation and reporting process should preclude development of a site contaminated with hazardous wastes.

3.3 SITE SELECTION TEAM

Each site evaluation report or letter is reviewed by a multidisciplinary review board having a wide range of knowledge and expertise. This board reviews the adequacy of the investigation and the process of evaluating the site. The team members represent a cross section of organizations (see list of current board members in table O-1). The wide range of disciplines and backgrounds represented by the review board helps ensure that an adequate investigation of the site is conducted.

3.4 CONTROLLED MAPS OF HAZARDOUS AREAS

Maps of hazardous areas are maintained and held on record at the Westinghouse Hanford Company Design Engineering Services office. Records and maps are maintained in groups such as burial grounds, tank farms, grout facilities, buildings, *etc*. The burial ground maps are maintained as part of the Resource Conservation and Recovery Act (RCRA), Part A and Part B permits for the site, and any changes to or deletion of information on the maps is accomplished through a formal system of review and approval process controlled by the Waste Management office. Changes to these burial ground drawings require coordination with Ecology. It is possible that information on hazardous waste sites could be included on these drawings and any changes controlled through this existing system. If the hazardous waste sites are not included with the RCRA drawings, then the current system for controlling other drawings consists of restrictions on persons having authority to change drawings and an automatic system of recording and tracking any changes made to a drawing. Either of these systems would provide an easily accessible record showing the location of hazardous waste sites, thereby reducing the opportunity for constructing a facility in a hazardous waste area. Selected members of the Site Selection Team have access to the drawings and may receive automatic, weekly updates.

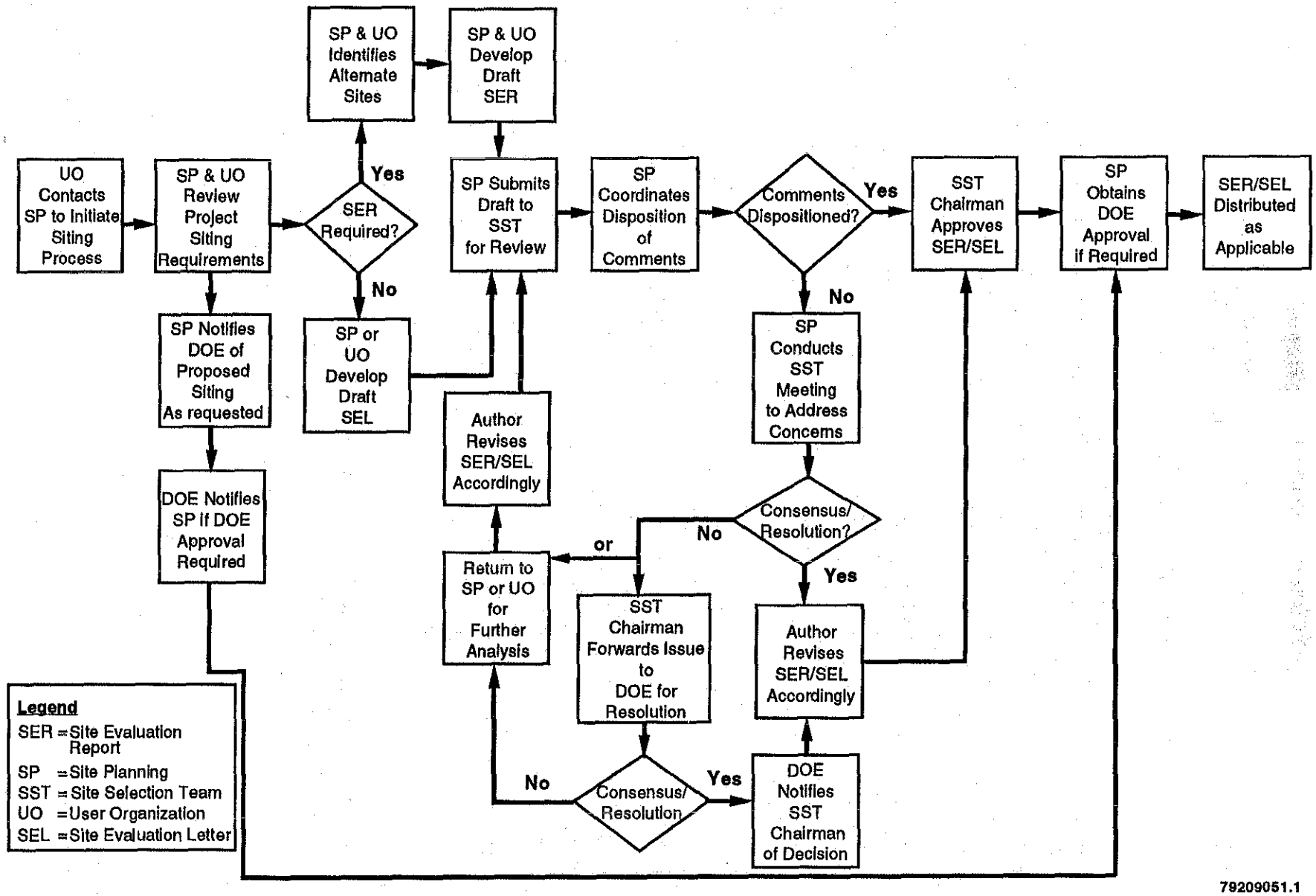

Figure G-1. Site Development Review and Selection System

Table G-1. Hanford Facilities Site Selection Board Members List as of October 1992

NAME	ORGANIZATION
Organizational Representatives	
G. F. Brazil	Kaiser Engineers Hanford
T. W. Campbell	Operations Support Services (OSS) (Safeguards and Security)
G. L. Crawford	Tank Waste Remediation
J. J. Dorian	Environment, Safety, Health & QA (Environmental - Assurance, Waste Tank, System & Audit Integration)
T. E. Gates	Engineered Applications
J. C. Hail	Battelle
W. F. Heine	Restoration and Remediation
C. M. Kronvall	Facility Operations
R. D. Lichfield	Environment, Safety, Health & QA (Fire Protection Program)
R. C. Roos	Restoration & Remediation
H. H. Yoshikawa	Resource Planning & Program Integration
Infrastructure Representatives	
F. R. Buck	Boeing Computer Services Richland/Information Resource Management - Telecommunications
J. M. Hache	WHC/OSS - Electrical Utilities
F. D. Howald	WHC/OSS - Fire Department
D. A. Rohl	WHC/OSS - Water Utilities
J. S. Stair	WHC/OSS - Sanitary Sewer Systems
G. L. Wiggins	WHC/OSS - Roads and Transportation

Note: Positions on the Team frequently change. The list above serves as an example of the type of persons and positions on the Team.

4.0 CITY OF RICHLAND WATER WELL CONTROL

4.1 GENERAL

The City of Richland's institutional control of the water supply system has limited applicability in the evaluation of the 1100-EM-1 Operable Unit because no 1100-EM-1 waste sites are located upgradient of residential areas. Only if DOE surplused portions of the 1100-EM-1 Operable Unit containing wastes, and if residences were then constructed (in an industrial-zoned area) downgradient of the wastes, would the city's control of the water supply system become important.

4.2 EFFECTIVENESS OF CITY CONTROLS

The intent of the city of Richland's water well permit system is to require all residents to connect to the city water supply system for human consumption of water. During the Phase II Remedial Investigation, a survey was conducted (WHC, 1991) to determine the number of private wells and how the water from these wells was utilized. Of a potential 42 residential wells that are suspected to exist in the North Richland area, 16 wells were not permitted [2 of the wells were abandoned or unused and 14 were installed prior to 1985 (promulgation of city ordinance)]. Of these wells, no more than four may be used for domestic purposes. This indicates that, currently, there is little exposure to the natural groundwater and that the city's well permit system provides an additional safeguard against exposure to groundwater contamination.

5.0 EFFECTIVENESS OF INSTITUTIONAL CONTROLS

The current controls in place at Hanford should effectively prevent human exposure in the event that contaminants remain in place at hazardous waste sites. Access control to the waste sites can be accomplished in accordance with the available security procedures at Hanford. As an added safety factor, the City of Richland ordinance requires wells to be permitted. The city's control of the groundwater is an additional safety measure that can be considered if property ownership and land use changes radically in the future.

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APPENDIX H

SATURATED ZONE FLOW AND CONTAMINANT TRANSPORT MODELING

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APPENDIX H CONTENTS

SATURATED ZONE FLOW AND CONTAMINANT TRANSPORT MODELING . . H-1

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SATURATED ZONE FLOW AND CONTAMINANT TRANSPORT MODELING

Hydrofacies zone designation for model layers 1 through 15 are shown in figures H-1 through H-15. A hydrofacies zone is an area with distinct hydrogeological characteristics. The properties of the zones were listed in table 4-6. Most of the zone boundaries followed the stratigraphic map boundaries presented in appendix C. The exceptions were the boundaries between the three hydrofacies in the Hanford Formation that were determined by changes in the groundwater surface gradient.

Figures H-16 through H-18 show simulation results with input values exceeding the ranges found during model calibration. The simulations with high retardation and porosity values show that the model was not extremely sensitive to these parameters. The simulation with no dispersivity showed the model results did not match well with observed results for this case, which is expected since contaminant dispersion is a significant element in the transport process.

Model input information and results for the nitrate simulation are shown in figures H-19 and H-20. The same calibrated hydraulic and contaminant transport parameters used for the trichloroethene (TCE) analysis were used to estimate the baseline fate of the nitrate plume. The only change was that the retardation value for nitrate was set at 1.0 (no retardation, conservative transport). For the nitrate source, the total nitrogen data from well TW-2 was used as a guide, with the amount of nitrate assumed to be 80 percent of the observed total nitrogen values shown in figure H-19. The observed nitrate values for 1990 and 1992 are shown in figure 4-26. A simulation was run that resulted in predicted values roughly matching these two data sets. This simulation, shown in figure H-20, predicts that nitrate values will attenuate to below the maximum contaminant level (MCL) of 10 ppm before the year 2005. This simulation assumed that the nitrate sources above 10 ppm do not exist beyond 1993. Although these results were not refined through further analysis, they are consistent with the contaminant transport theory that indicates a conservative solute, such as nitrate, attenuates faster than a nonconservative substance, such as TCE. These results also support the modeling analysis approach for this site of focusing on the TCE, and assuming the nitrate attenuates to its MCL sooner than the TCE.

Model input and output files for the conservative simulation are provided. Input and output files for other simulations were basically the same with the appropriate input changes as described in the main report.

Time-series contaminant concentrations at MW-13, MW-14, MW-15, TW-9, TW-16, and TW-1 are provided. Beginning time is April 1976. This output is for the primary (unconservative calibration discussed in section 6, paragraph 6.4.5.

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ZONE DESIGNATION, LAYER 1

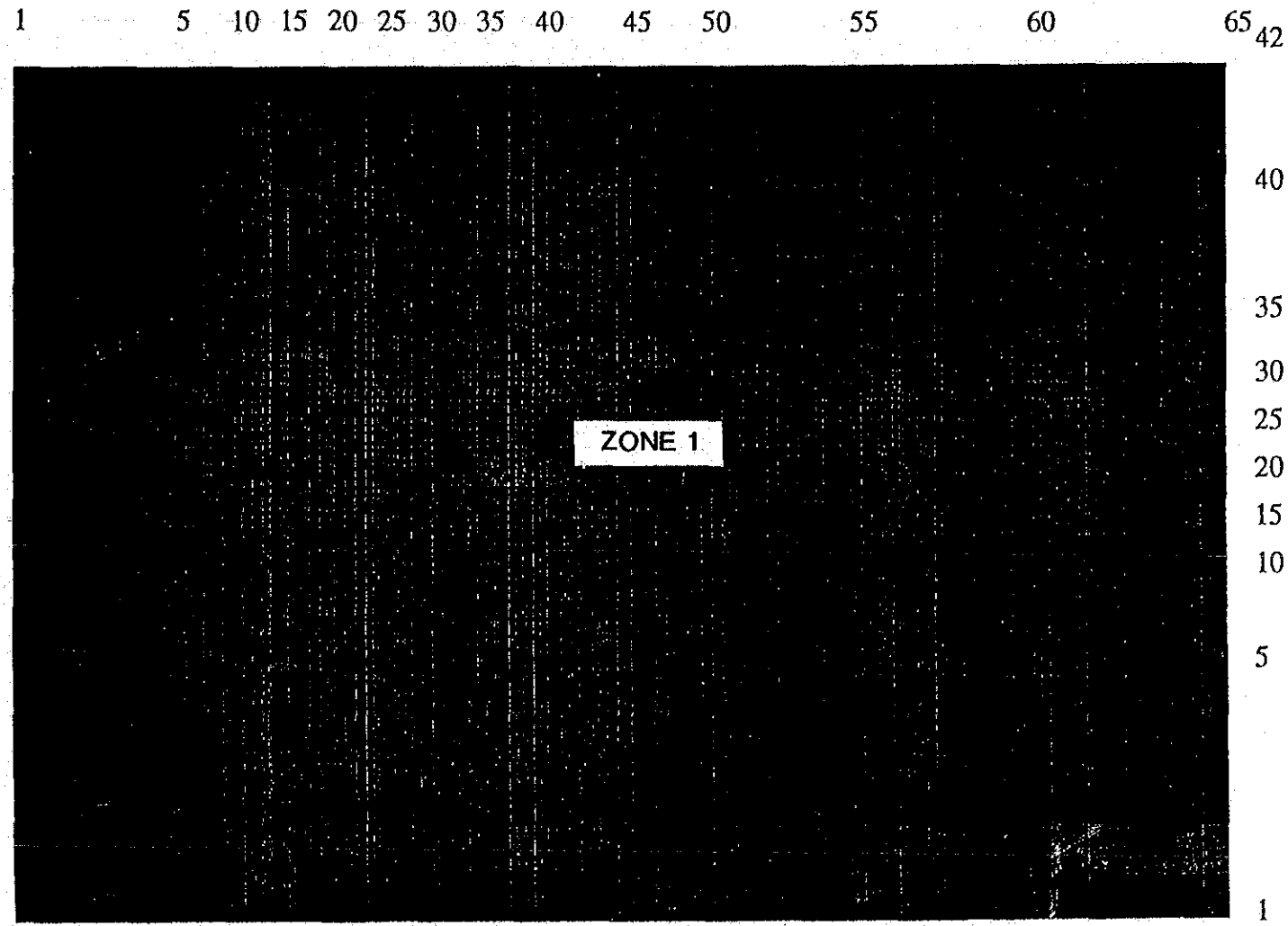

Figure H-1 Groundwater Model Hydrofacies Zone Designation, Layer 1.

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ZONE DESIGNATION, LAYER 2

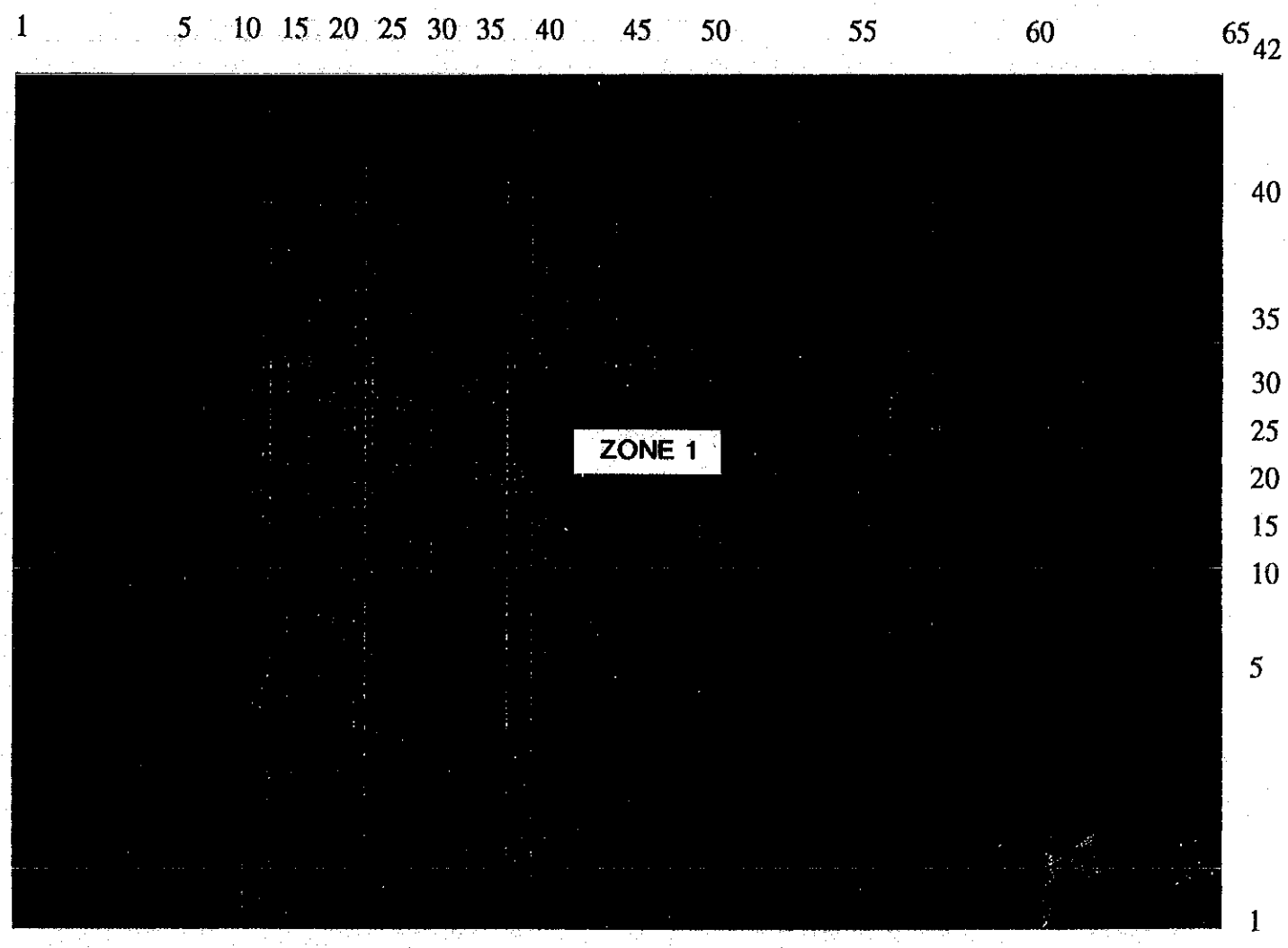

Figure H-2 Groundwater Model Hydrofacies Zone Designation, Layer 2.

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ZONE DESIGNATION, LAYER 3

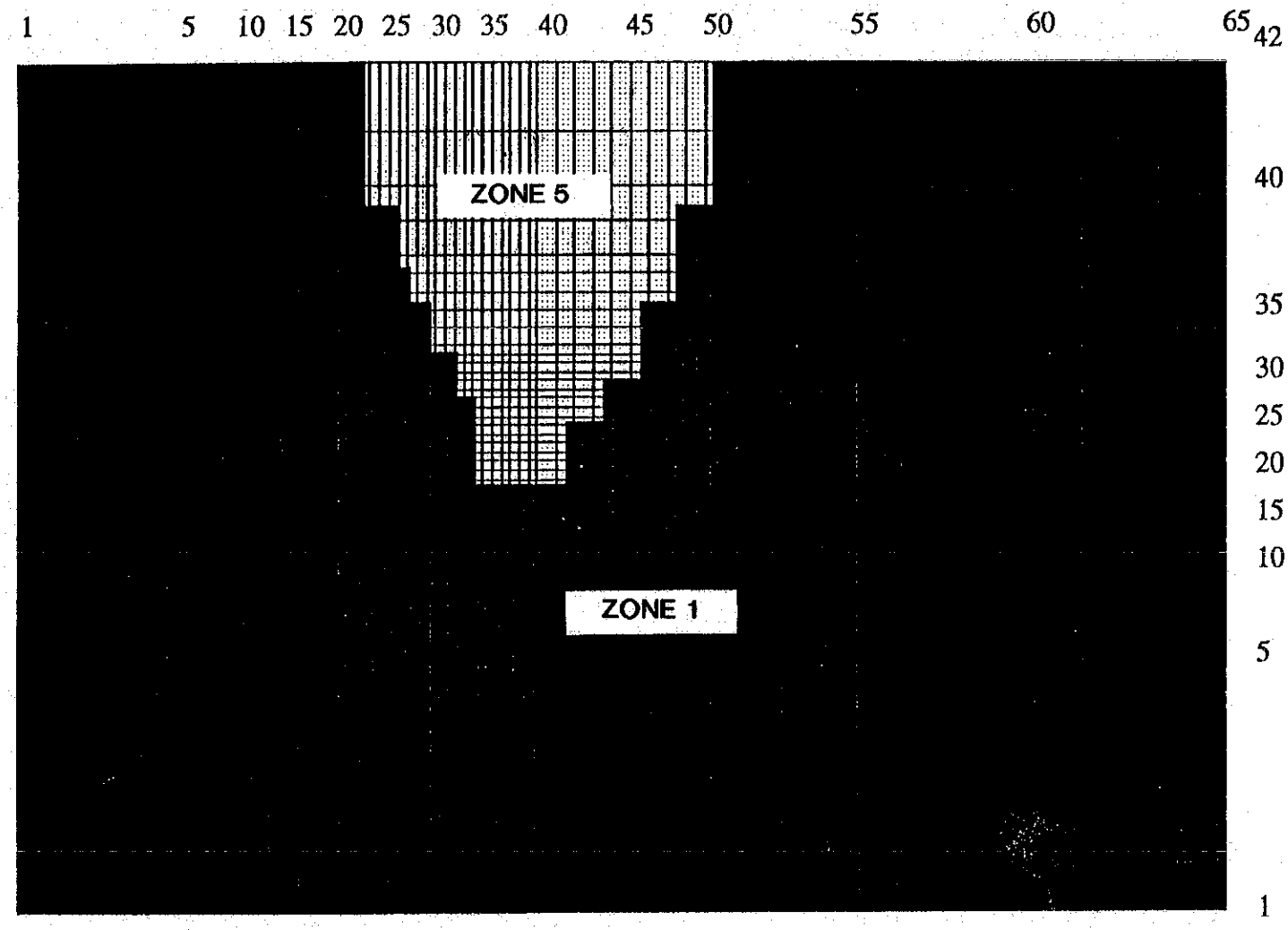

Figure H-3 Groundwater Model Hydrofacies Zone Designation, Layer 3.

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ZONE DESIGNATION, LAYER 4

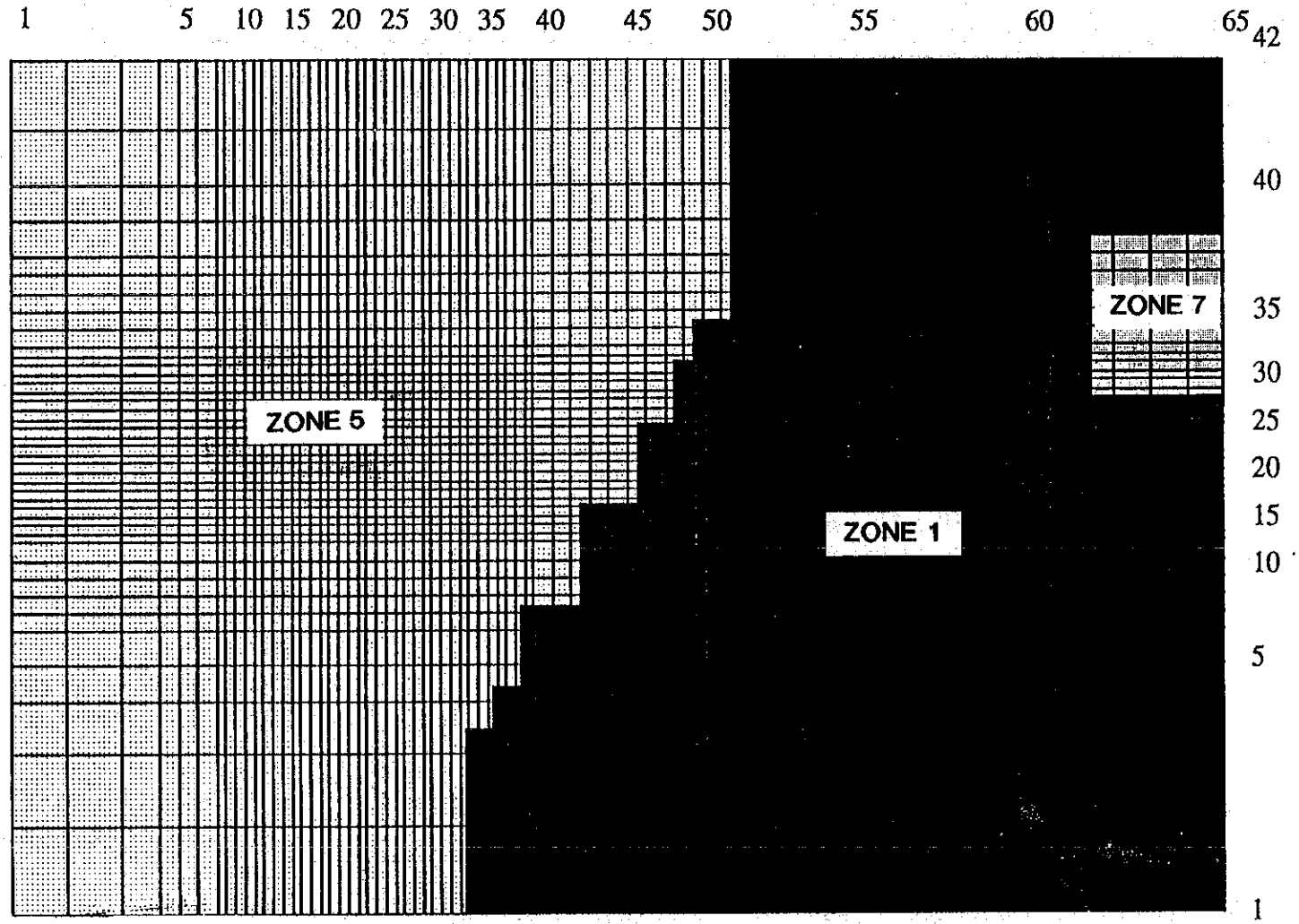

Figure H-4 Groundwater Model Hydrofacies Zone Designation, Layer 4.

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ZONE DESIGNATION, LAYER 5

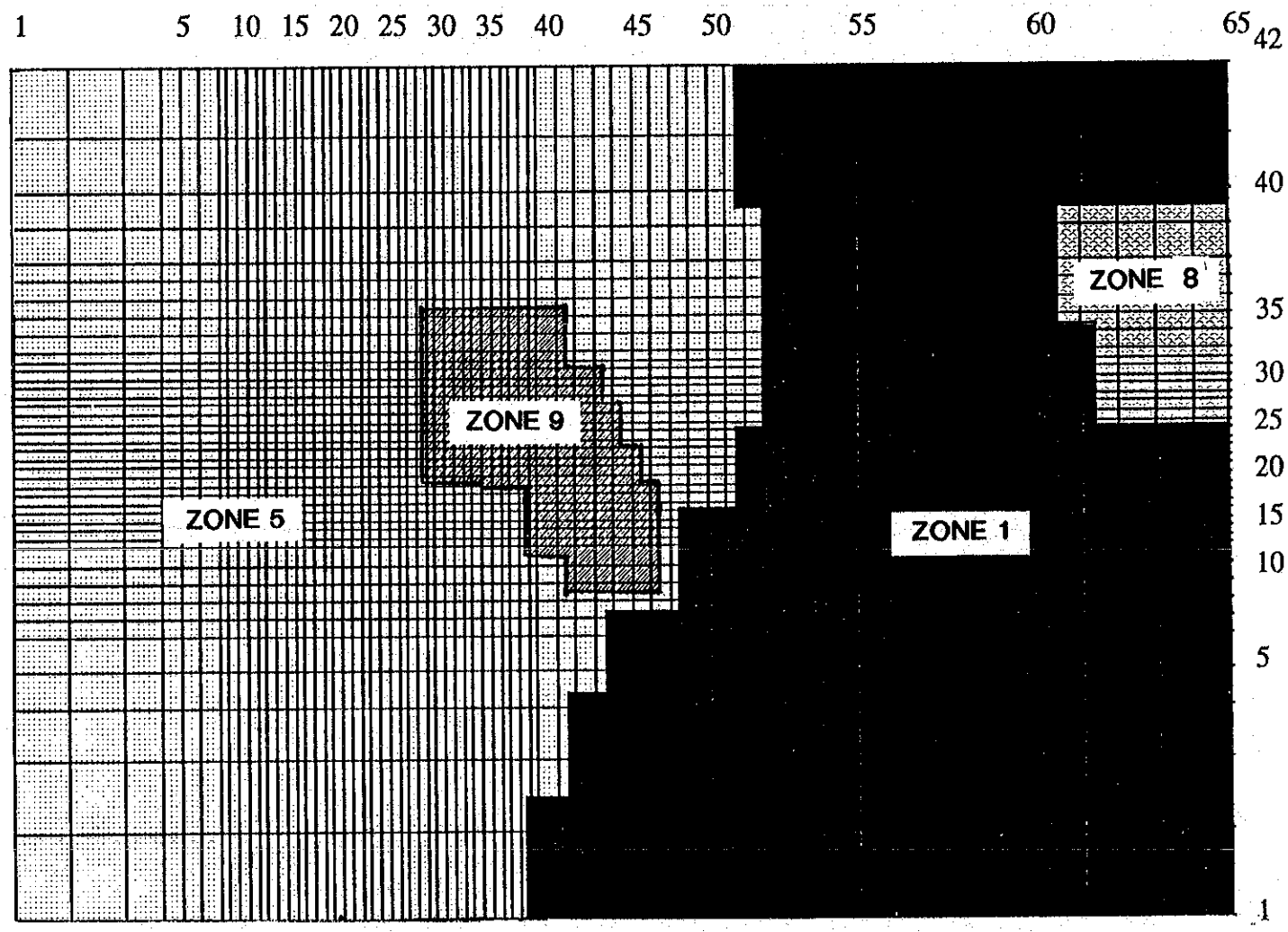

Figure H-5 Groundwater Model Hydrofacies Zone Designation, Layer 5.

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ZONE DESIGNATION, LAYER 6

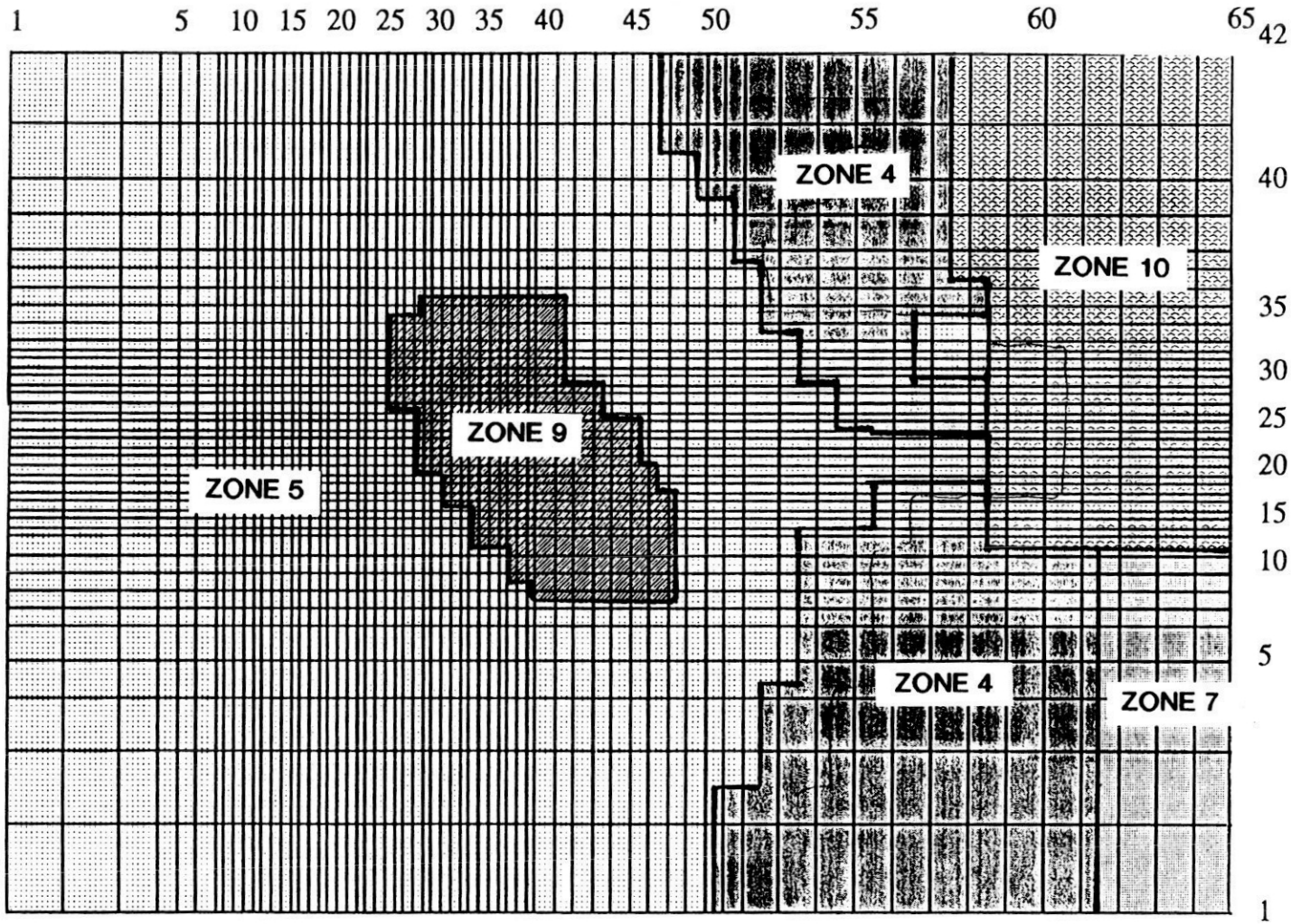

Figure H-6 Groundwater Model Hydrofacies Zone Designation, Layer 6.

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ZONE DESIGNATION, LAYER 7

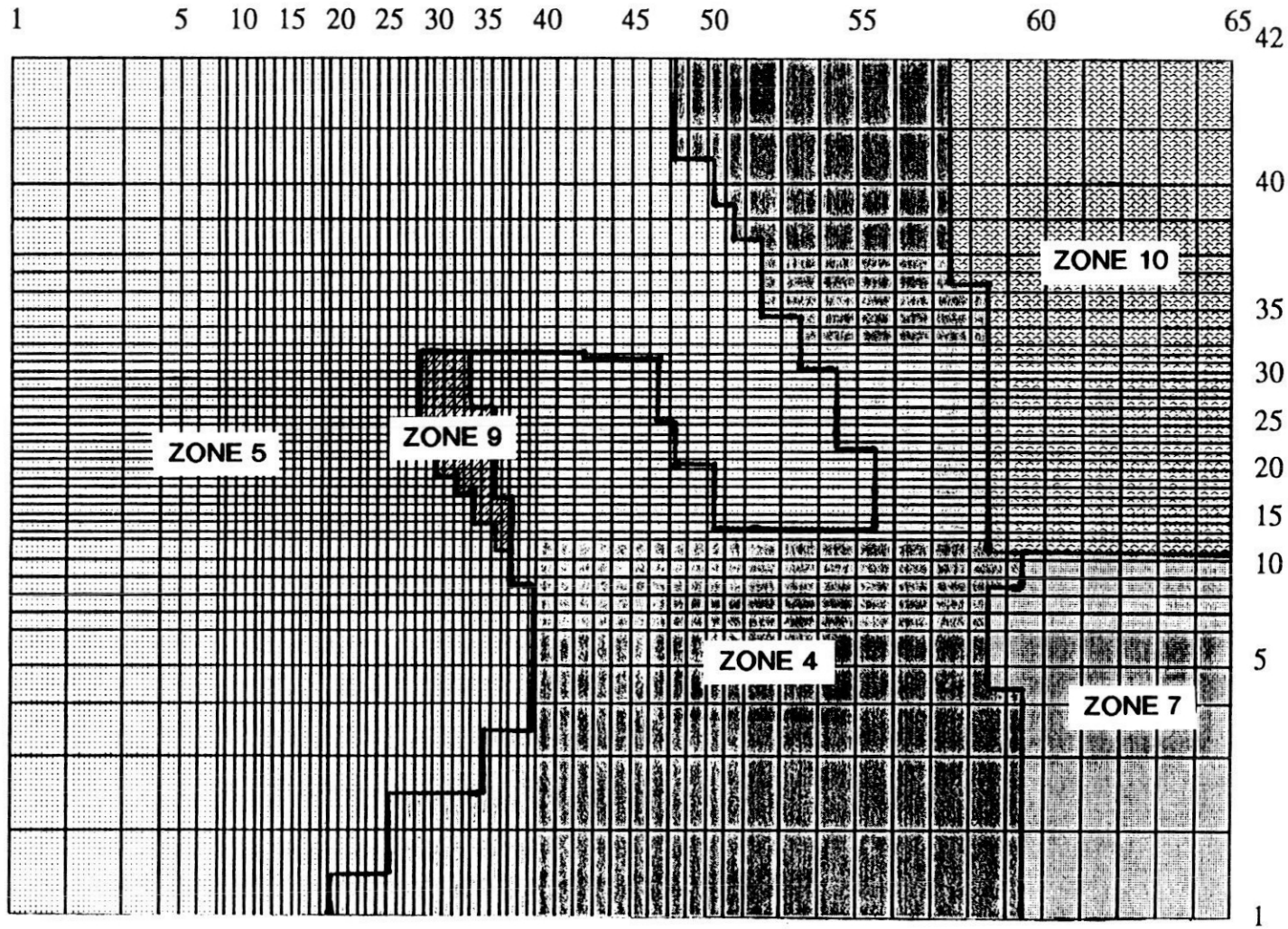

Figure H-7 Groundwater Model Hydrofacies Zone Designation, Layer 7.

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ZONE DESIGNATION, LAYER 8

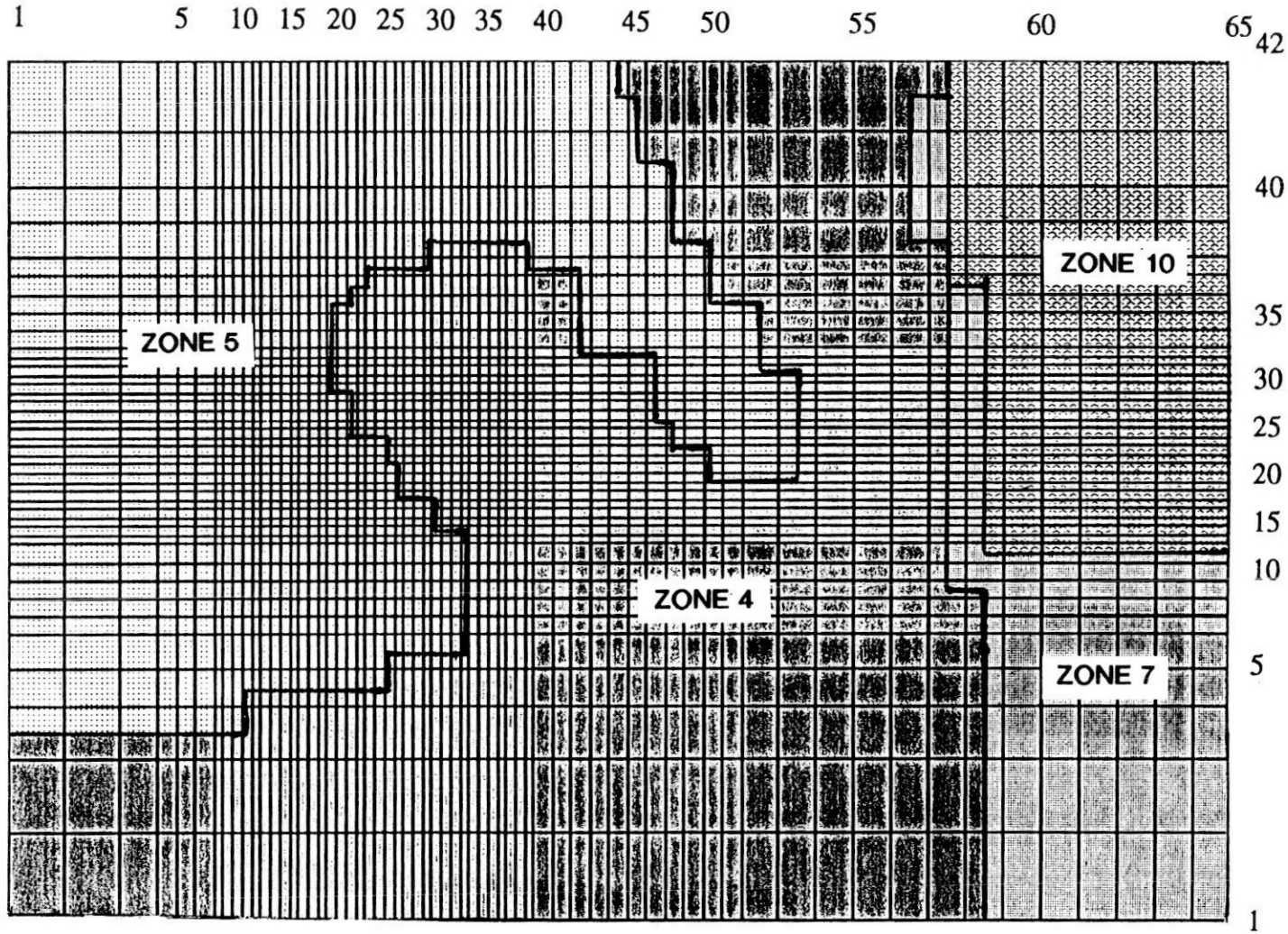

Figure H-8 Groundwater Model Hydrofacies Zone Designation, Layer 8.

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ZONE DESIGNATION, LAYER 9

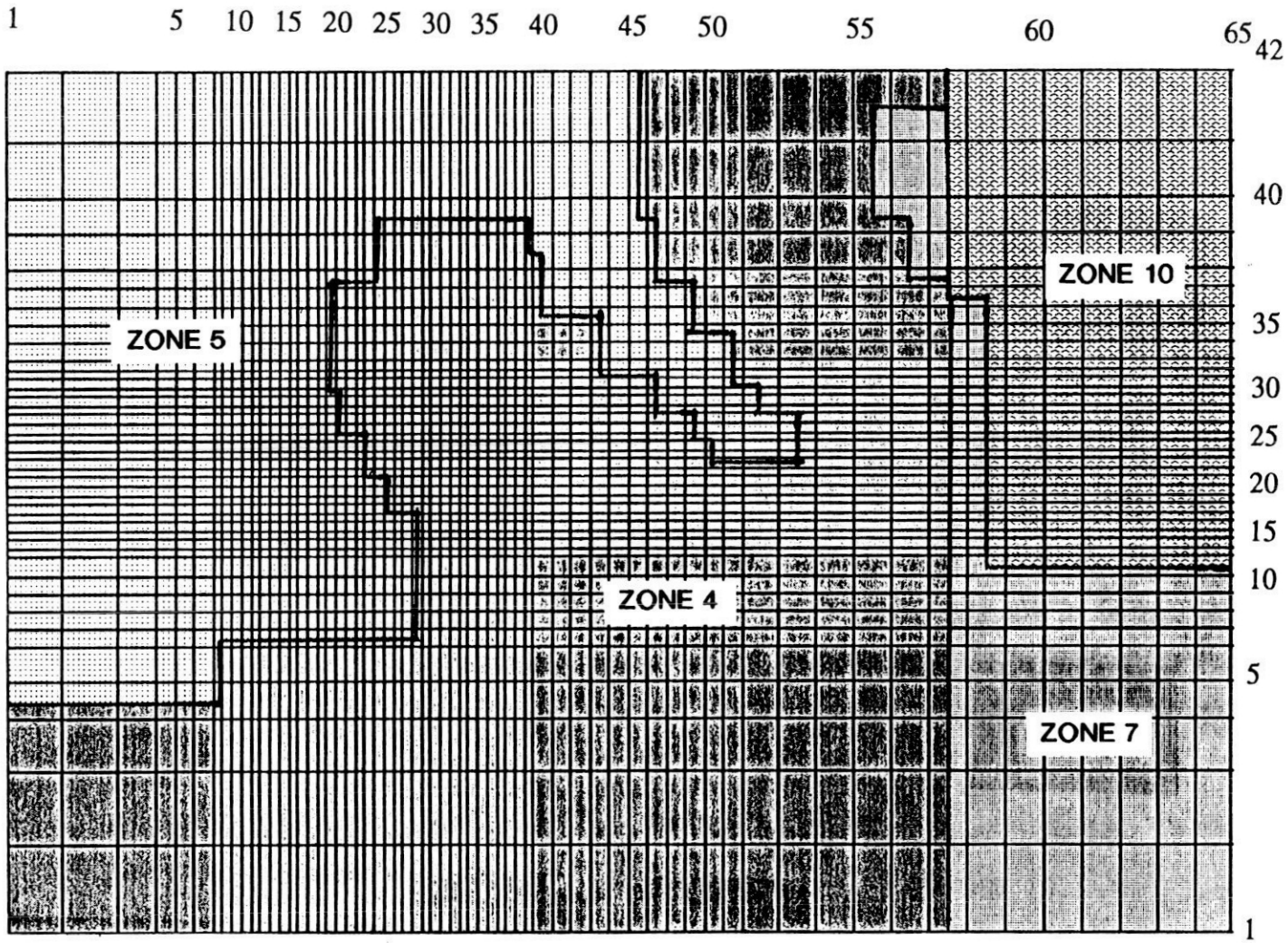

Figure H-9 Groundwater Model Hydrofacies Zone Designation, Layer 9.

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9 3 1 2 9 2 3 0 3 8 1 9

ZONE DESIGNATION, LAYER 10

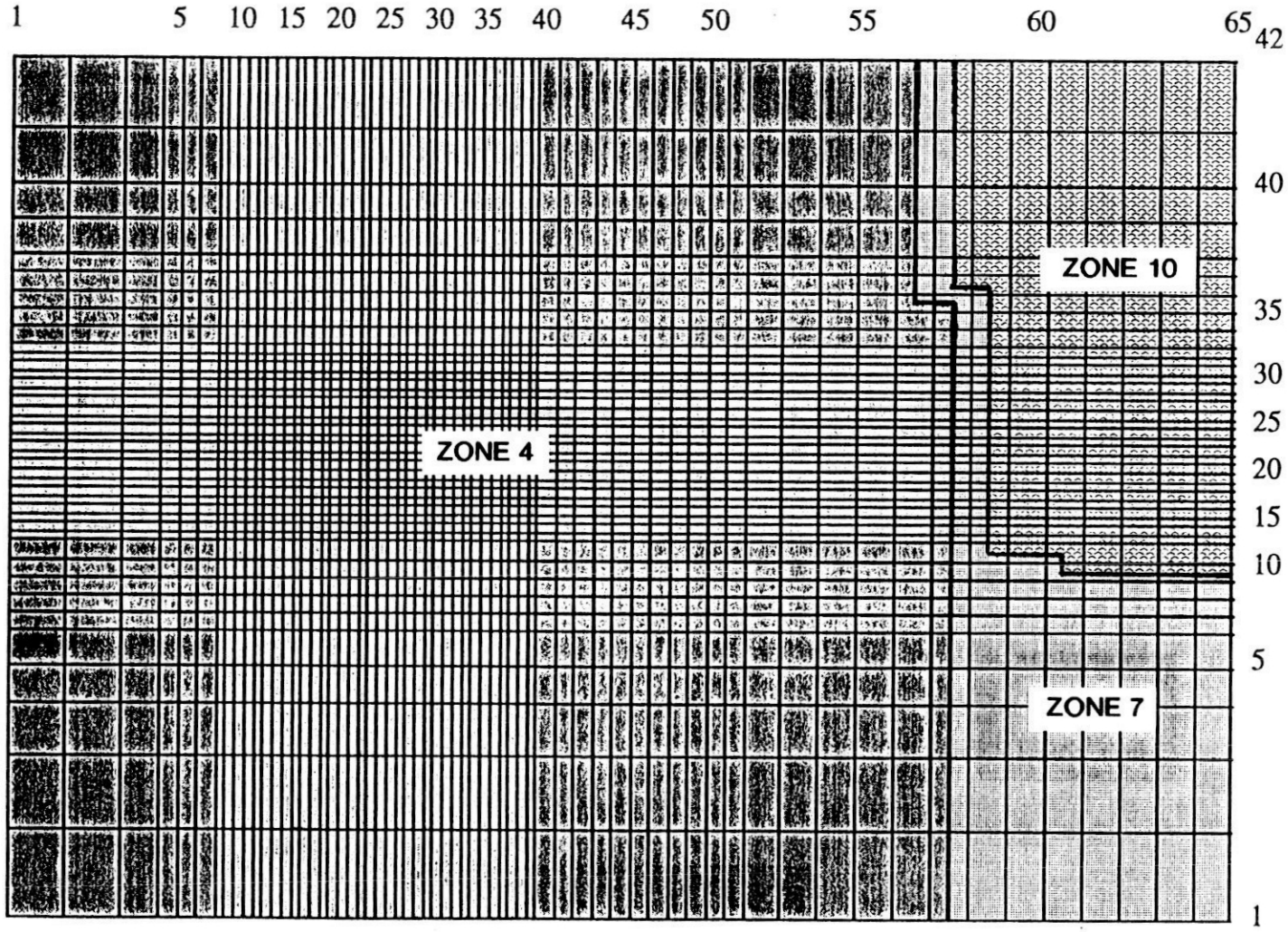

Figure H-10 Groundwater Model Hydrofacies Zone Designation, Layer 10.

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ZONE DESIGNATION, LAYER 11

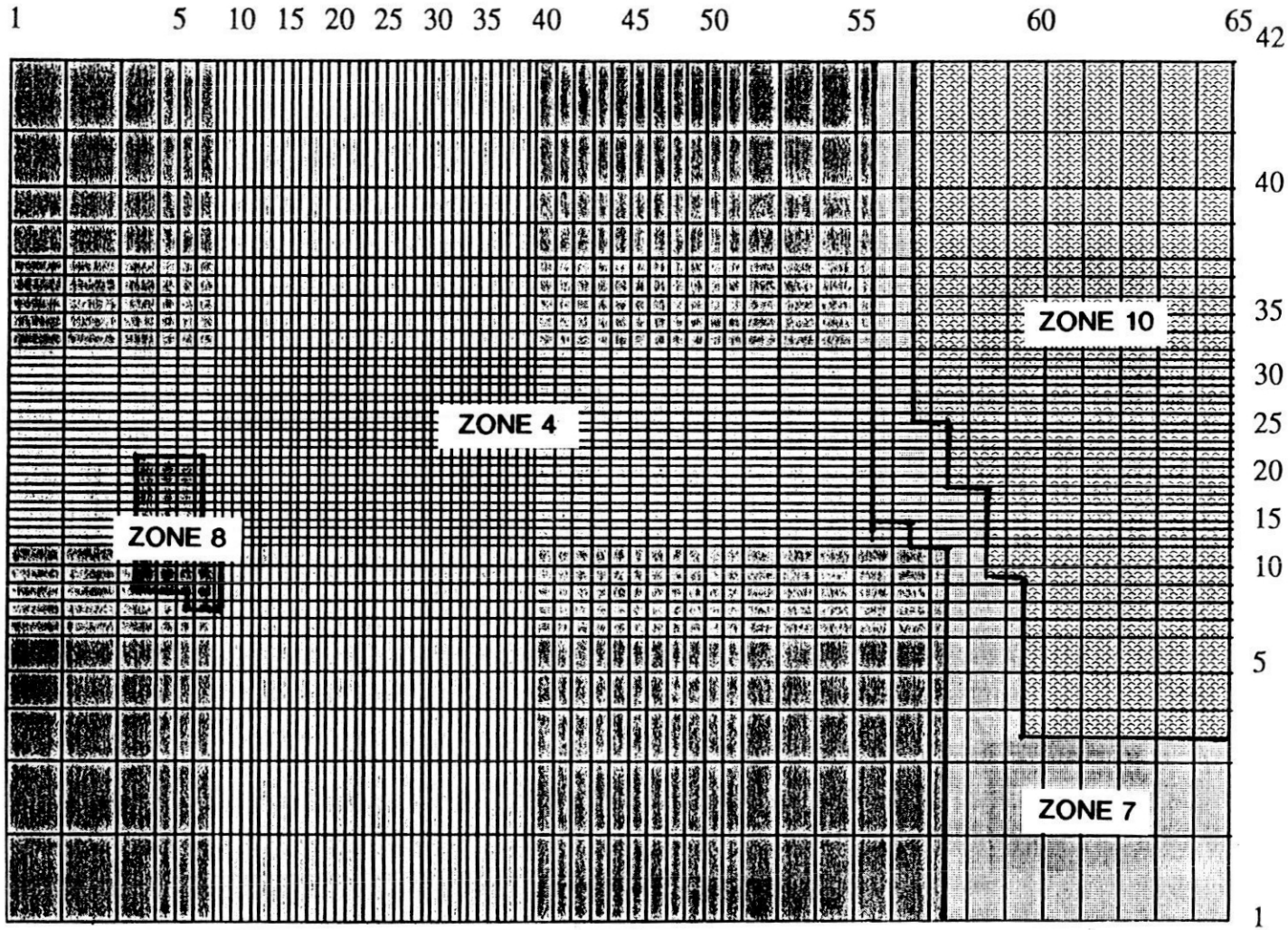

Figure H-11 Groundwater Model Hydrofacies Zone Designation, Layer 11.

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ZONE DESIGNATION, LAYER 12

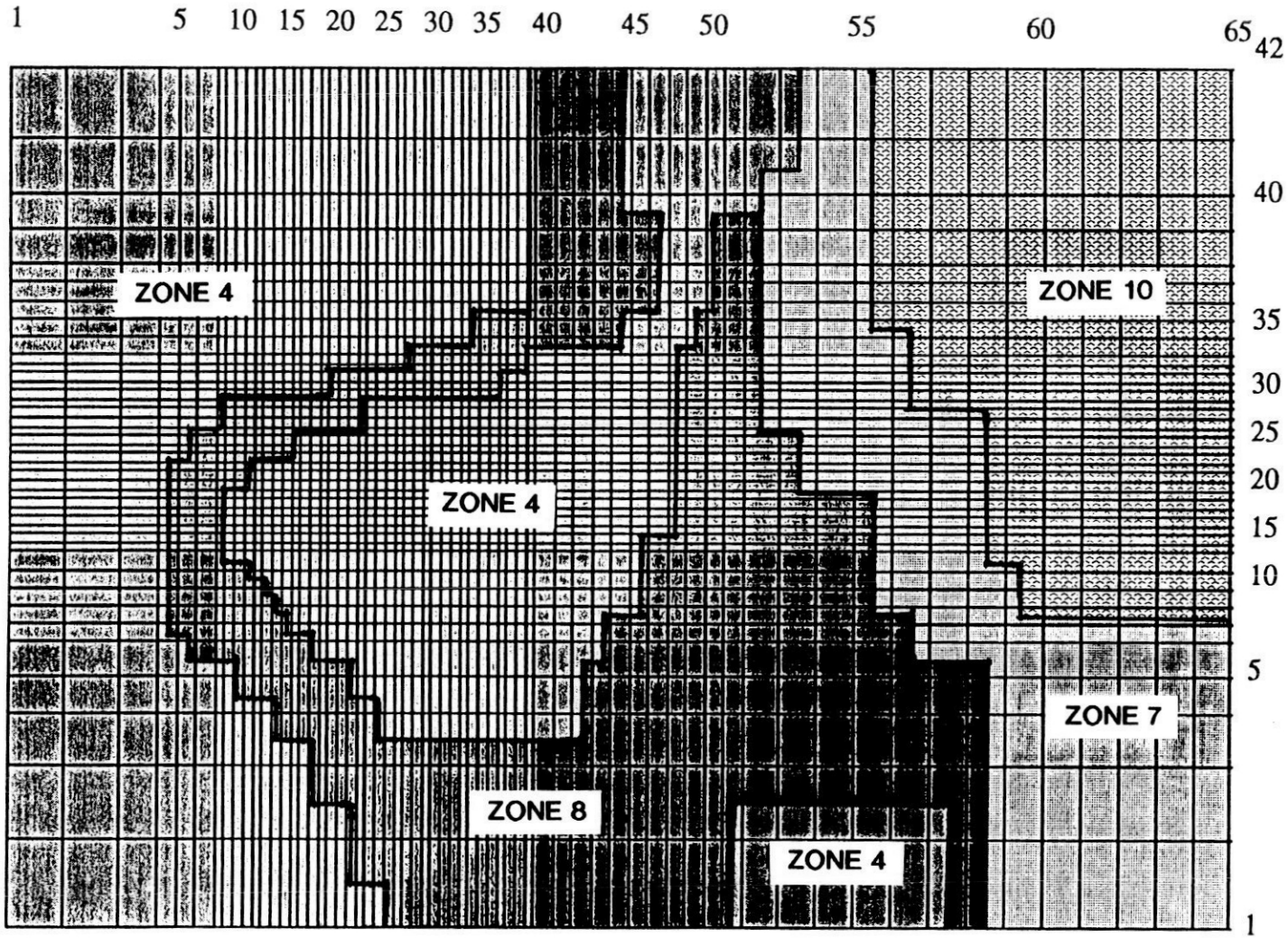

Figure H-12 Groundwater Model Hydrofacies Zone Designation, Layer 12.

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ZONE DESIGNATION, LAYER 13

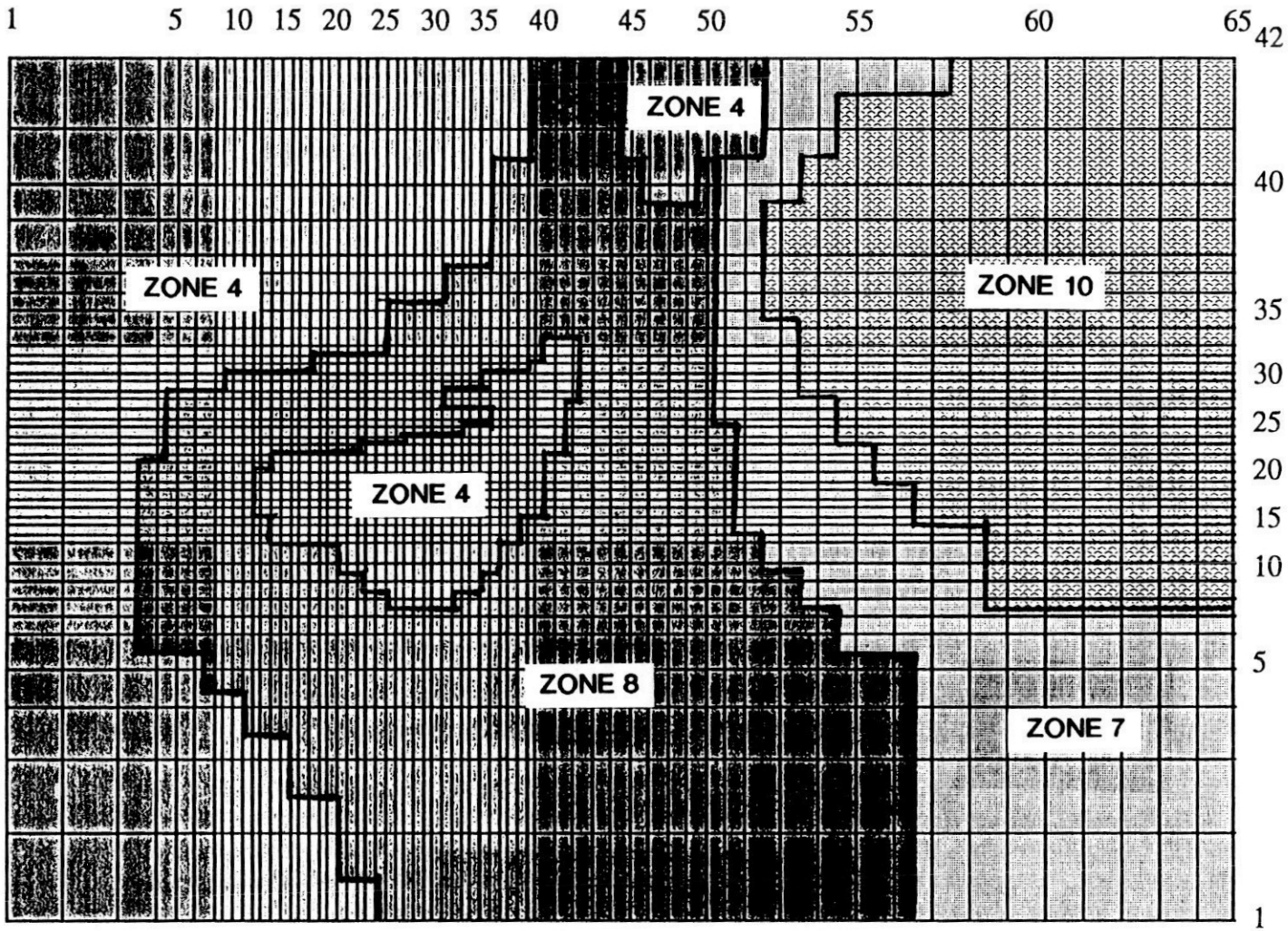

Figure H-13 Groundwater Model Hydrofacies Zone Designation, Layer 13.

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ZONE DESIGNATION, LAYER 14

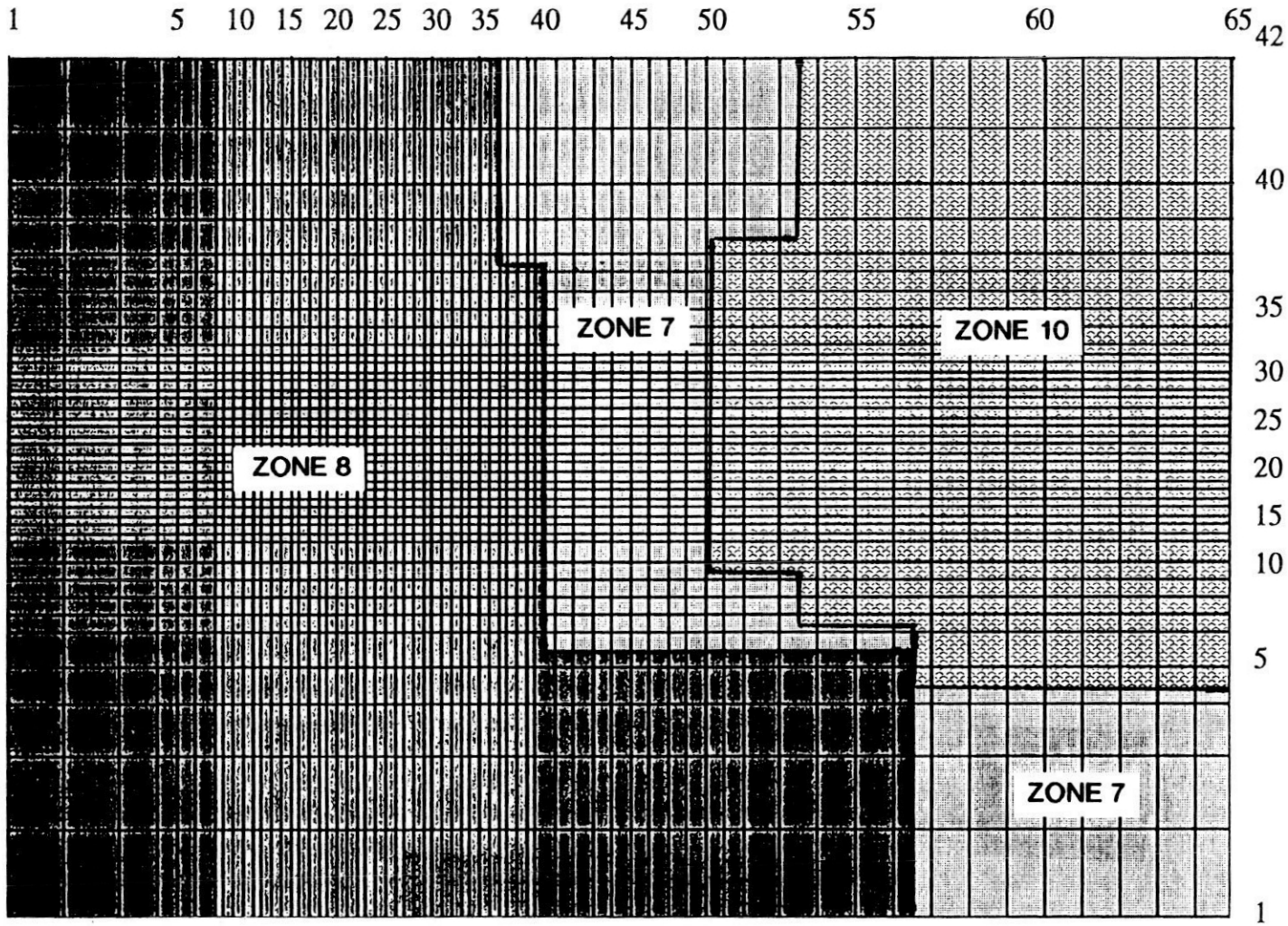

Figure H-14 Groundwater Model Hydrofacies Zone Designation, Layer 14.

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ZONE DESIGNATION, LAYER 15

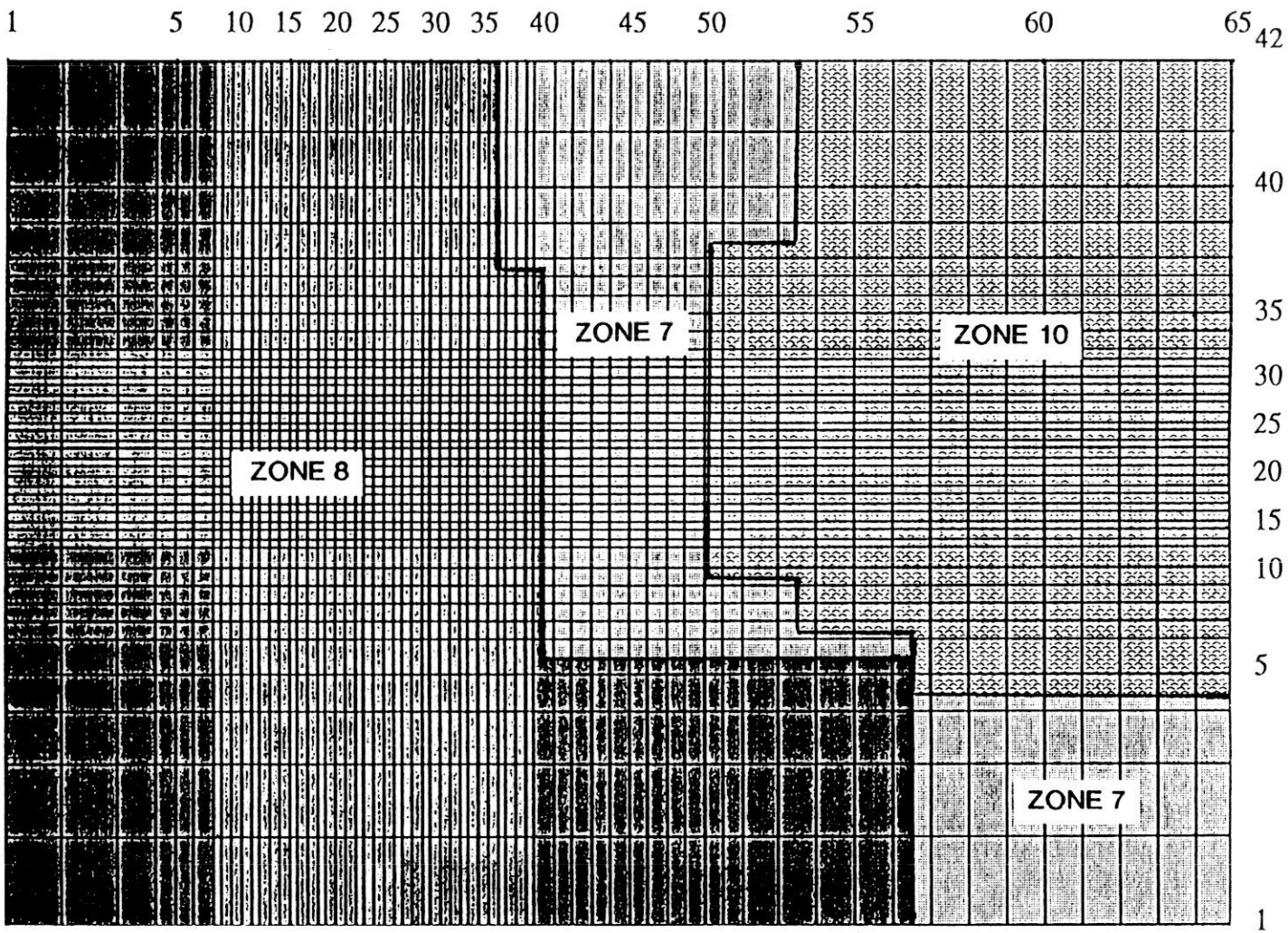

Figure H-15 Groundwater Model Hydrofacies Zone Designation, Layer 15.

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