APPENDIX B

SSURGO Soil Data Reports

Engineering Properties

Bergen County, New Jersey

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash.

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
BohC:												
Boonton, moderately well drained	0-6	Gravelly loam	CL-ML, ML, SC, SC-SM, SM	A-2, A-4	0-5	0-10	75-90	50-70	40-65	25-55	15-25	3-7
	6-23	Gravelly fine sandy loam, Gravelly loam, Silt loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0-10	85-100	50-95	40-90	25-75	20-30	4-10
	23-41	Gravelly fine sandy loam, Gravelly sandy loam, Loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0-10	80-95	50-95	35-85	25-60	20-30	4-10
	41-44	Gravelly fine sandy loam, Gravelly loam, Loamy fine sand	CL-ML, ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7
	44-66	Gravelly fine sandy loam, Gravelly loam, Gravelly loamy fine sand, Loamy fine sand	CL-ML, ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
BohD:												
Boonton, moderately well drained	0-5	Gravelly loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0-5	0-10	75-90	50-70	40-65	25-55	15-25	3-7
	5-22	Gravelly fine sandy loam, Gravelly loam, Silt loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0-10	85-100	50-95	40-90	25-75	20-30	4-10
	22-40	Gravelly fine sandy loam, Gravelly sandy loam, Loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0-10	80-95	50-95	35-85	25-60	20-30	4-10
	40-44	Gravelly fine sandy loam, Gravelly loam, Loamy fine sand	CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7
	44-66	Gravelly fine sandy loam, Gravelly loam, Gravelly loamy fine sand, Loamy fine sand	CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
BohE:												
Boonton, moderately well drained	0-4	Gravelly loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0-5	0-10	75-90	50-70	40-65	25-55	15-25	3-7
	4-20	Gravelly fine sandy loam, Gravelly loam, Silt loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0-10	85-100	50-95	40-90	25-75	20-30	4-10
	20-40	Gravelly fine sandy loam, Gravelly sandy loam, Loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0-10	80-95	50-95	35-85	25-60	20-30	4-10
	40-44	Gravelly fine sandy loam, Gravelly loam, Loamy fine sand	CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7
	44-66	Gravelly fine sandy loam, Gravelly loam, Gravelly loamy fine sand, Loamy fine sand	CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
BorC:												
Boonton, moderately well drained, very stony	0-6	Gravelly loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	5-10	85-95	60-85	45-80	30-65	15-25	3-7
	6-23	Gravelly fine sandy loam, Gravelly loam, Gravelly silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0-10	80-90	50-85	40-80	25-70	20-30	4-10
	23-40	Gravelly fine sandy loam, Gravelly loam, Gravelly sandy loam	SC, SC-SM	A-1-b, A-2, A-4	0	0-10	80-95	50-80	35-70	20-50	20-30	4-10
	40-44	Gravelly fine sandy loam, Gravelly loam, Loamy fine sand	CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7
	44-66	Gravelly fine sandy loam, Gravelly loam, Gravelly loamy fine sand, Loamy fine sand	CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7
Rock outcrop	0-157	Unweathered bedrock	---	---	---	---	---	---	---	---	0-14	---

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
BorD:												
Boonton, moderately well drained, very stony	0-4	Gravelly loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	5-10	85-95	60-85	45-80	30-65	15-25	3-7
	4-22	Gravelly fine sandy loam, Gravelly loam, Gravelly silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0-10	80-90	50-85	40-80	25-70	20-30	4-10
	22-40	Gravelly fine sandy loam, Gravelly loam, Gravelly sandy loam	SC, SC-SM	A-1-b, A-2, A-4	0	0-10	80-95	50-80	35-70	20-50	20-30	4-10
	40-44	Gravelly fine sandy loam, Gravelly loam, Loamy fine sand	CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7
	44-66	Gravelly fine sandy loam, Gravelly loam, Gravelly loamy fine sand, Loamy fine sand	CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7
Rock outcrop	0-157	Unweathered bedrock	---	---	---	---	---	---	---	---	0-14	---

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
BorE:												
Boonton, moderately well drained, very stony	0-3	Gravelly loam	CL-ML, ML, SC-SM, SM	A-2, A-4	0	5-10	85-95	60-85	45-80	30-65	15-25	3-7
	3-20	Gravelly fine sandy loam, Gravelly loam, Gravelly silt loam	CL, CL-ML, SC, SC-SM	A-2-4, A-4	0	0-10	80-90	50-85	40-80	25-70	20-30	4-10
	20-40	Gravelly fine sandy loam, Gravelly loam, Gravelly sandy loam	SC, SC-SM	A-1-b, A-2, A-4	0	0-10	80-95	50-80	35-70	20-50	20-30	4-10
	40-44	Gravelly fine sandy loam, Gravelly loam, Loamy fine sand	CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7
	44-66	Gravelly fine sandy loam, Gravelly loam, Gravelly loamy fine sand, Loamy fine sand	CL-ML, ML, SC-SM, SM	A-1, A-2, A-4	0	0-20	85-100	45-95	35-85	15-60	15-25	2-7
Rock outcrop	0-157	Unweathered bedrock	---	---	---	---	---	---	---	---	0-14	---

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
BouB:												
Boonton	0-5	Loam	CL-ML, ML, SC-SM	A-4	0	0	100	100	91-97	60-66	22-31	3-8
	5-8	Silt loam	CL-ML, ML	A-4	0	0	70-73	70-73	63-71	47-54	22-32	3-8
	8-17	Silt loam	CL-ML, ML	A-4	0	0	92-96	92-96	83-92	60-68	19-25	3-8
	17-30	Gravelly fine sandy loam, Gravelly silt loam, Silt loam	CL, CL-ML, SC-SM	A-4	0	0	95-98	95-98	85-95	67-76	20-27	5-10
	30-40	Gravelly fine sandy loam	SC, SC-SM	A-2, A-4	0	0	76-79	76-79	64-72	35-42	20-27	4-9
	40-47	Fine sandy loam, Fine sandy loam, Gravelly sandy loam	SC, SC-SM	A-4	0	1-4	82-86	82-86	72-81	37-45	20-27	4-9
	47-58	Loamy sand	SM	A-2-4	0	0	85-88	85-88	72-79	22-27	0-21	NP-4
	58-72	Loamy sand	SM	A-2-4	0	3-5	83-86	83-86	69-76	22-27	0-21	NP-4
Urban land, Boonton substratum	0-12	Material	---	---	---	---	---	---	---	---	---	---
	12-47	Gravelly fine sandy loam, Gravelly silt loam, Silt loam	CL, CL-ML, SC-SM	A-4	0	0	95-98	95-98	85-95	67-76	20-27	5-10
	47-58	Loamy sand	SM	A-2-4	0	0	85-88	85-88	72-79	22-27	0-21	NP-4
	58-72	Loamy sand	SM	A-2-4	0	3-5	83-86	83-86	69-76	22-27	0-21	NP-4

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
BouC:												
Boonton	0-5	Loam	CL-ML, ML, SC-SM	A-4	0	0	100	100	91-97	60-66	22-31	3-8
	5-8	Silt loam	CL-ML, ML	A-4	0	0	70-73	70-73	63-71	47-54	22-32	3-8
	8-17	Silt loam	CL-ML, ML	A-4	0	0	92-96	92-96	83-92	60-68	19-25	3-8
	17-30	Gravelly fine sandy loam, Gravelly silt loam, Silt loam	CL, CL-ML, SC-SM	A-4	0	0	95-98	95-98	85-95	67-76	20-27	5-10
	30-40	Gravelly fine sandy loam	SC, SC-SM	A-2, A-4	0	0	76-79	76-79	64-72	35-42	20-27	4-9
	40-47	Fine sandy loam, Fine sandy loam, Gravelly sandy loam	SC, SC-SM	A-4	0	1-4	82-86	82-86	72-81	37-45	20-27	4-9
	47-58	Loamy sand	SM	A-2-4	0	0	85-88	85-88	72-79	22-27	0-21	NP-4
	58-72	Loamy sand	SM	A-2-4	0	3-5	83-86	83-86	69-76	22-27	0-21	NP-4
Urban land, Boonton substratum	0-12	Material	---	---	---	---	---	---	---	---	---	---
	12-47	Gravelly fine sandy loam, Gravelly silt loam, Silt loam	CL, CL-ML, SC-SM	A-4	0	0	95-98	95-98	85-95	67-76	20-27	5-10
	47-58	Loamy sand	SM	A-2-4	0	0	85-88	85-88	72-79	22-27	0-21	NP-4
	58-72	Loamy sand	SM	A-2-4	0	3-5	83-86	83-86	69-76	22-27	0-21	NP-4

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
BouD:												
Boonton	0-5	Loam	CL-ML, ML, SC-SM	A-4	0	0	100	100	91-97	60-66	22-31	3-8
	5-8	Silt loam	CL-ML, ML	A-4	0	0	70-73	70-73	63-71	47-54	22-32	3-8
	8-17	Silt loam	CL-ML, ML	A-4	0	0	92-96	92-96	83-92	60-68	19-25	3-8
	17-30	Gravelly fine sandy loam, Gravelly silt loam, Silt loam	CL, CL-ML, SC-SM	A-4	0	0	95-98	95-98	85-95	67-76	20-27	5-10
	30-40	Gravelly fine sandy loam	SC, SC-SM	A-2, A-4	0	0	76-79	76-79	64-72	35-42	20-27	4-9
	40-47	Fine sandy loam, Fine sandy loam, Gravelly sandy loam	SC, SC-SM	A-4	0	1-4	82-86	82-86	72-81	37-45	20-27	4-9
	47-58	Loamy sand	SM	A-2-4	0	0	85-88	85-88	72-79	22-27	0-21	NP-4
	58-72	Loamy sand	SM	A-2-4	0	3-5	83-86	83-86	69-76	22-27	0-21	NP-4
Urban land, Boonton substratum	0-12	Material	---	---	---	---	---	---	---	---	---	---
	12-47	Gravelly fine sandy loam, Gravelly silt loam, Silt loam	CL, CL-ML, SC-SM	A-4	0	0	95-98	95-98	85-95	67-76	20-27	5-10
	47-58	Loamy sand	SM	A-2-4	0	0	85-88	85-88	72-79	22-27	0-21	NP-4
	58-72	Loamy sand	SM	A-2-4	0	3-5	83-86	83-86	69-76	22-27	0-21	NP-4

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
BouE:												
Boonton	0-5	Loam	CL-ML, ML, SC-SM	A-4	0	0	80-100	80-100	75-100	50-90	22-31	3-8
	5-8	Gravelly loam	CL-ML, ML, SC-SM	A-4	0	0	80-100	80-100	75-100	50-90	22-31	3-8
	8-17	Silt loam	ML	A-4	0	0	80-100	80-100	75-100	50-90	19-25	3-8
	17-30	Gravelly fine sandy loam, Gravelly silt loam, Silt loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0	80-100	80-100	75-100	30-70	20-27	5-10
	30-40	Gravelly fine sandy loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0	80-100	80-100	75-100	30-70	20-27	4-9
	40-47	Fine sandy loam, Fine sandy loam, Gravelly sandy loam	CL, CL-ML, SC, SC-SM	A-2, A-4	0	0-2	80-100	80-100	75-100	30-70	20-27	4-9
	47-58	Loamy sand	---	A-2-4	0	0	80-100	80-100	75-100	10-50	0-21	NP-4
	58-72	Loamy sand	---	A-2-4	0	0-3	80-100	80-100	75-100	10-50	0-21	NP-4
Urban land, Boonton red sandstone lowland substratum	0-12	Material	---	---	0	0	0	0	0	0	0	NP
	12-47	Gravelly fine sandy loam, Gravelly silt loam, Silt loam	CL, CL-ML, SC-SM	A-4	0	0	95-98	95-98	85-95	67-76	20-27	5-10
	47-58	Loamy sand	---	A-2-4	0	0	80-100	80-100	75-100	10-50	0-21	NP-4
	58-72	Loamy sand	---	A-2-4	0	0-3	80-100	80-100	75-100	10-50	0-21	NP-4

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
DuoB:												
Dunellen	0-5	Loam	CL, ML, SC, SM	A-2, A-4	0	0-2	95-100	75-100	60-80	30-70	20-30	3-10
	5-15	Gravelly sandy loam, Loam, Sandy loam	ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-2	95-100	60-95	40-80	20-75	20-30	3-10
	15-26	Gravelly sandy loam, Loam, Sandy loam	ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-2	95-100	60-95	40-80	20-75	20-30	3-10
	26-66	Stratified gravelly sand to sand to loamy sand	SM, SP-SM	A-1, A-2	0	0-10	70-80	40-65	30-55	10-25	15-20	NP
DuoC:												
Dunellen	0-3	Loam	CL, ML, SC, SM	A-2, A-4	0	0-2	95-100	75-100	60-80	30-70	20-30	3-10
	3-15	Gravelly sandy loam, Loam, Sandy loam	ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-2	95-100	60-95	40-80	20-75	20-30	3-10
	15-26	Gravelly sandy loam, Loam, Sandy loam	ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-2	95-100	60-95	40-80	20-75	20-30	3-10
	26-66	Stratified gravelly sand to sand to loamy sand	SM, SP-SM	A-1, A-2	0	0-10	70-80	40-65	30-55	10-25	15-20	NP

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
DuoD:												
Dunellen	0-2	Loam	CL, ML, SC, SM	A-2, A-4	0	0-2	95-100	75-100	60-80	30-70	20-30	3-10
	2-15	Gravelly sandy loam, Loam, Sandy loam	ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-2	95-100	60-95	40-80	20-75	20-30	3-10
	15-34	Gravelly sandy loam, Loam, Sandy loam	ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-2	95-100	60-95	40-80	20-75	20-30	3-10
	26-66	Stratified gravelly sand to sand to loamy sand	SM, SP-SM	A-1, A-2	0	0-10	70-80	40-65	30-55	10-25	15-20	NP
DuuA:												
Dunellen	0-6	Loam	CL, ML, SC, SM	A-2, A-4	0	0-2	95-100	75-100	60-80	30-70	20-30	3-10
	6-15	Gravelly sandy loam, Loam, Sandy loam	ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-2	95-100	60-95	40-80	20-75	20-30	3-10
	15-35	Gravelly sandy loam, Loam, Sandy loam	ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-2	95-100	60-95	40-80	20-75	20-30	3-10
	26-66	Stratified gravelly sand to sand to loamy sand	SM, SP-SM	A-1, A-2	0	0-10	70-80	40-65	30-55	10-25	15-20	NP
Urban land	0-60	Variable	---	---	---	---	---	---	---	---	0-14	---

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
DuuB:												
Dunellen	0-8	Sandy loam	SC, SM	A-2, A-2-4, A-4	0	0-1	94-100	69-100	47-82	21-44	20-39	2-13
	8-14	Sandy loam	SC, SM	A-2, A-2-4, A-4	0	0-1	94-100	69-100	47-82	21-44	20-39	2-13
	14-20	Gravelly sandy loam, Loam, Sandy loam	SC, SC-SM, SM	A-1, A-2, A-2-4, A-4	0	0-1	95-100	58-100	42-85	20-48	17-31	2-12
	20-31	Gravelly sandy loam, Loam, Sandy loam	SC, SC-SM, SM	A-1, A-2, A-2-4, A-4	0	0-1	95-100	58-100	42-85	20-48	17-31	2-12
	31-42	Gravelly sandy loam, Loam, Sandy loam	SC, SC-SM, SM	A-1, A-2, A-2-4, A-4	0	0-1	95-100	58-100	42-85	20-48	17-31	2-12
	42-70	Stratified gravelly sand to sand to loamy sand	SM, SP-SM	A-1, A-2	0	0-10	70-80	40-65	30-55	10-25	15-20	NP
Urban land, Dunellen substratum	0-12	Material	---	---	---	---	---	---	---	---	---	---
	12-31	Gravelly sandy loam, Loam, Sandy loam	SC, SC-SM, SM	A-1, A-2, A-2-4, A-4	0	0-1	95-100	58-100	42-85	20-48	17-31	2-12
	31-42	Gravelly sandy loam, Loam, Sandy loam	SC, SC-SM, SM	A-1, A-2, A-2-4, A-4	0	0-1	95-100	58-100	42-85	20-48	17-31	2-12
	42-70	Loamy sand	SC, SC-SM, SM	A-2, A-2-4	0	0-8	75-91	42-89	31-75	7-24	17-28	2-10

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
DuuC:												
Dunellen	0-8	Sandy loam	SC, SM	A-2, A-2-4, A-4	0	0-1	94-100	69-100	47-82	21-44	20-39	2-13
	8-14	Sandy loam	SC, SM	A-2, A-2-4, A-4	0	0-1	94-100	69-100	47-82	21-44	20-39	2-13
	14-20	Gravelly sandy loam, Loam, Sandy loam	SC, SC-SM, SM	A-1, A-2, A-2-4, A-4	0	0-1	95-100	58-100	42-85	20-48	17-31	2-12
	20-31	Gravelly sandy loam, Loam, Sandy loam	SC, SC-SM, SM	A-1, A-2, A-2-4, A-4	0	0-1	95-100	58-100	42-85	20-48	17-31	2-12
	31-42	Gravelly sandy loam, Loam, Sandy loam	SC, SC-SM, SM	A-1, A-2, A-2-4, A-4	0	0-1	95-100	58-100	42-85	20-48	17-31	2-12
	42-70	Stratified gravelly sand to sand to loamy sand	SM, SP-SM	A-1, A-2	0	0-10	70-80	40-65	30-55	10-25	15-20	NP
Urban land, Dunellen substratum	0-12	Material	---	---	---	---	---	---	---	---	---	---
	12-31	Gravelly sandy loam, Loam, Sandy loam	SC, SC-SM, SM	A-1, A-2, A-2-4, A-4	0	0-1	95-100	58-100	42-85	20-48	17-31	2-12
	31-42	Gravelly sandy loam, Loam, Sandy loam	SC, SC-SM, SM	A-1, A-2, A-2-4, A-4	0	0-1	95-100	58-100	42-85	20-48	17-31	2-12
	42-70	Loamy sand	SC, SC-SM, SM	A-2, A-2-4	0	0-8	75-91	42-89	31-75	7-24	17-28	2-10

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
DuuD:												
Dunellen	0-2	Loam	CL, ML, SC, SM	A-2, A-4	0	0-2	95-100	75-100	60-80	30-70	20-30	3-10
	2-15	Gravelly sandy loam, Loam, Sandy loam	ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-2	95-100	60-95	40-80	20-75	20-30	3-10
	15-33	Gravelly sandy loam, Loam, Sandy loam	ML, SC, SC-SM, SM	A-1, A-2, A-4	0	0-2	95-100	60-95	40-80	20-75	20-30	3-10
	33-66	Stratified gravelly sand to sand to loamy sand	SM, SP-SM	A-1, A-2	0	0-10	70-80	40-65	30-55	10-25	15-20	NP
Urban land	0-60	Variable	---	---	---	---	---	---	---	---	0-14	---
FmhAt:												
Fluvaquents, loamy, frequently flooded	0-5	Loam, Silt loam	CL, ML, SM	A-4, A-7-6	0	0-5	95-100	74-100	60-100	43-78	22-45	3-18
	5-12	Silty clay loam, Silt loam	CL, CL-ML	A-4, A-6	0	0-5	95-100	76-100	68-100	55-87	22-38	7-19
	12-18	Sandy clay loam	CL, SC	A-2-6, A-6, A-7-6	0	0-11	90-100	57-100	44-92	26-60	29-44	13-25
	18-24	Sandy clay loam	CL, SC	A-2-6, A-6, A-7-6	0	0-11	90-100	57-100	44-92	26-60	29-44	13-25
	24-60	Sandy loam	CL, SC-SM, SM	A-1-b, A-4	0-1	0-10	90-100	59-100	42-81	24-51	16-27	2-10

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
HamBb:												
Haledon, very stony	0-8	Gravelly loam	CL, CL-ML, ML	A-4	0	5-15	80-95	75-85	65-75	50-70	20-30	3-10
	8-15	Cobbly fine sandy loam, Cobbly loam, Gravelly loam, Silt loam	CL-ML, ML, SC-SM	A-2, A-4	0	0-20	85-100	65-90	45-90	25-80	20-30	3-10
	15-23	Cobbly fine sandy loam, Cobbly loam, Gravelly loam, Silt loam	CL-ML, ML, SC-SM	A-2, A-4	0	0-20	85-100	65-90	45-90	25-80	20-30	3-10
	23-33	Cobbly fine sandy loam, Cobbly loam, Gravelly sandy loam, Silt loam	CL-ML, ML, SC-SM	A-2, A-4	0	0-20	85-100	65-90	45-90	25-80	20-30	3-10
	33-41	Cobbly sandy loam, Fine sandy loam, Gravelly fine sandy loam, Gravelly loam	CL-ML, ML, SC-SM	A-1, A-2, A-4	0	0-20	80-100	65-90	40-85	20-70	20-30	3-10
	41-66	Gravelly sandy loam, Loam, Sandy loam	GC-GM, SC-SM	A-1, A-2	0	0-5	60-85	55-75	30-55	10-30	10-20	NP-8

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
HasB:												
Haledon	0-2	Moderately decomposed plant material	PT	A-8	0	0	100	100	100	100	0	NP
	2-8	Silt loam	CL, CL-ML, ML	A-4	0	0-10	84-90	72-90	66-88	53-72	26-37	7-12
	8-15	Silt loam	CL, CL-ML, SC-SM	A-4	0	0-16	86-100	61-100	54-95	44-78	23-31	7-12
	15-22	Silt loam	CL, CL-ML, SC, SC-SM	A-4	0	0-14	87-100	65-100	58-95	48-80	23-31	7-12
	22-27	Loam	CL, SC, SC-SM	A-2, A-6	0	0-14	83-100	61-100	48-89	33-65	19-31	3-12
	27-30	Loam	CL, SC, SC-SM	A-2, A-2-4, A-4	0	0-14	83-100	61-100	48-90	33-65	19-31	3-12
	30-60	Gravelly fine sandy loam, Loam, Sandy loam	SC-SM, SM	A-2, A-2-4, A-4	0	0-10	80-89	59-89	52-84	27-45	17-24	2-6
Urban land, Haledon substratum	0-12	Material	---	---	---	---	---	---	---	---	---	---
	12-30	Silt loam	CL, CL-ML, SC, SC-SM	A-4	0	0-14	87-100	65-100	58-95	48-80	23-31	7-12
	30-60	Gravelly fine sandy loam, Loam, Sandy loam	SC-SM, SM	A-2-4, A-4	0	0-10	80-89	59-89	52-84	27-45	17-24	2-6

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
PbuA:												
Pascack	0-5	Silt loam	CL-ML, SC, SM	A-4	0	0	85-100	85-100	65-85	35-60	20-30	3-10
	5-12	Fine sandy loam, Gravelly sandy loam, Sandy loam	SC, SC-SM, SM	A-2, A-4	0	0	80-100	80-100	45-75	30-50	20-30	3-10
	12-26	Fine sandy loam, Gravelly sandy loam, Sandy loam	SC, SC-SM, SM	A-2, A-4	0	0	80-100	80-100	45-75	30-50	20-30	3-10
	26-32	Gravelly sandy loam, Sandy loam	SC, SC-SM, SM	A-1-b, A-2, A-4	0	0	75-100	65-100	40-70	20-40	20-30	3-10
	32-52	Loamy sand, Stratified sand to gravelly loamy sand	SM, SP	A-1-b, A-2-4	0	0	60-100	45-100	30-75	5-20	15-25	NP-5
	52-72	Loamy sand, Stratified sand to gravelly loamy sand	SM, SP	A-1-b, A-2-4	0	0	60-100	45-100	30-75	5-20	15-25	NP-5
UdkttB:												
Udorthents, loamy fill substratum	0-12	Loam	CL-ML	A-4	0	0	100	90-97	75-97	52-76	22-43	3-18
	12-60	Silty clay	CH	A-7-6	0	0	96-100	87-100	78-100	75-100	46-66	28-43
UdouB:												
Udorthents, organic substratum	---	---	---	---	---	---	---	---	---	---	---	---
Urban land	0-60	Variable	---	---	0	0	0	---	---	---	0-14	---
UdrB:												
Udorthents, refuse substratum	0-60	Silt loam	CL-ML, ML	A-4, A-7-6	0	0	100	100	93-100	85-100	28-47	7-18

Engineering Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				*Pct*	*Pct*					*Pct*	
UdwB:												
Udorthents, wet substratum	---	---	---	---	---	---	---	---	---	---	---	---
UdwuB:												
Udorthents, wet substratum	---	---	---	---	---	---	---	---	---	---	---	---
Urban land	0-60	Variable	---	---	---	---	---	---	---	---	0-14	---
UR:												
Urban land	---	---	---	---	---	---	---	---	---	---	---	---

Soil Features

Bergen County, New Jersey

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
BohC:									
Boonton, moderately well drained	Fragipan	---	---	Noncemented	0	---	Moderate	Moderate	High
BohD:									
Boonton, moderately well drained	Fragipan	---	---	Noncemented	0	---	Moderate	Moderate	High
BohE:									
Boonton, moderately well drained	Fragipan	---	---	Noncemented	0	---	Moderate	Moderate	High
BorC:									
Boonton, moderately well drained, very stony	Fragipan	---	---	Noncemented	0	---	Moderate	Moderate	High
Rock outcrop	Lithic bedrock	0	---	Very strongly cemented	0	---	None	---	---
BorD:									
Boonton, moderately well drained, very stony	Fragipan	---	---	Noncemented	0	---	Moderate	Moderate	High
Rock outcrop	Lithic bedrock	0	---	Very strongly cemented	0	---	None	---	---
BorE:									
Boonton, moderately well drained, very stony	Fragipan	---	---	Noncemented	0	---	Moderate	Moderate	High
Rock outcrop	Lithic bedrock	0	---	Very strongly cemented	0	---	None	---	---

Soil Features

Bergen County, New Jersey

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
BouB:									
Boonton	Fragipan	20-36	10-46	Noncemented	0	0	Moderate	Moderate	High
Urban land, Boonton substratum	---	---	---	---	0	0	Moderate	Moderate	High
BouC:									
Boonton	Fragipan	20-36	10-46	Noncemented	0	0	Moderate	Moderate	High
Urban land, Boonton substratum	---	---	---	---	0	0	Moderate	Moderate	High
BouD:									
Boonton	Fragipan	20-36	10-46	Noncemented	0	0	Moderate	Moderate	High
Urban land, Boonton substratum	---	---	---	---	0	0	Moderate	Moderate	High
BouE:									
Boonton	Fragipan	20-36	10-46	Noncemented	0	0	Moderate	Moderate	High
Urban land, Boonton red sandstone lowland substratum	---	---	---	---	0	0	Moderate	Low	Moderate
DuoB:									
Dunellen	---	---	---	---	0	---	Moderate	Low	Moderate
DuoC:									
Dunellen	---	---	---	---	0	---	Moderate	Low	Moderate

Soil Features

Bergen County, New Jersey

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
DuoD:									
Dunellen	---	---	---	---	0	---	Moderate	Low	Moderate
DuuA:									
Dunellen	---	---	---	---	0	---	Moderate	Low	Moderate
Urban land	---	---	---	---	---	---	---	---	---
DuuB:									
Dunellen	---	---	---	---	0	0	Moderate	Low	Moderate
Urban land, Dunellen substratum	---	---	---	---	0	0	Moderate	Low	Moderate
DuuC:									
Dunellen	---	---	---	---	0	0	Moderate	Low	Moderate
Urban land, Dunellen substratum	---	---	---	---	0	0	Moderate	Low	Moderate
DuuD:									
Dunellen	---	---	---	---	0	---	Moderate	Low	Moderate
Urban land	---	---	---	---	---	---	---	---	---
FmhAt:									
Fluvaquents, loamy, frequently flooded	---	---	---	---	0	0	High	High	Moderate
HamBb:									
Haledon, very stony	Fragipan	24-35	---	Noncemented	0	---	High	Moderate	Moderate

Soil Features

Bergen County, New Jersey

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
HasB:									
Haledon	Fragipan	24-36	6-40	Noncemented	0	0	High	Moderate	Moderate
Urban land, Haledon substratum	---	---	---	---	0	0	High	Moderate	Moderate
PbuA:									
Pascack	---	---	---	---	0	---	High	Moderate	High
UdkttB:									
Udorthents, loamy fill substratum	---	---	---	---	0	0	High	High	Moderate
UdouB:									
Udorthents, organic substratum	---	---	---	---	0	0	---	---	---
Urban land	---	---	---	---	---	---	---	---	---
UdrB:									
Udorthents, refuse substratum	---	---	---	---	0	0	---	---	---
UdwB:									
Udorthents, wet substratum	---	---	---	---	---	---	---	---	---
UdwuB:									
Udorthents, wet substratum	---	---	---	---	---	---	---	---	---
Urban land	---	---	---	---	---	---	---	---	---

Soil Features

Bergen County, New Jersey

Map symbol and soil name	Restrictive layer				Subsidence		Potential for frost action	Risk of corrosion	
	Kind	Depth to top	Thickness	Hardness	Initial	Total		Uncoated steel	Concrete
		In	In		In	In			
UR:									
Urban land	---	---	---	---	---	---	---	---	---

Hydric Soils

Bergen County, New Jersey

Map symbol and map unit name	Component	Percent of map unit	Landform	Hydric rating	Hydric criteria
FmhAt:					
Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded	Fluvaquents, loamy, frequently flooded	10	Flood plains	Yes	2B3
HamBb:					
Haledon gravelly loam, 0 to 8 percent slopes, very stony	Hasbrouck, very stony	5	Depressions	Yes	2B3
PbuA:					
Pascack silt loam, 0 to 3 percent slopes	Preakness, frequently flooded	5	Drainageways	Yes	2B3, 3
UdkttB:					
Udorthents, loamy, 0 to 8 percent slopes, frequently flooded	Parsippany	5	Outwash plains	Yes	2B3, 3
UdwB:					
Udorthents, wet substratum, 0 to 8 percent slopes	Pawcatuck, very frequently flooded	1	Tidal marshes	Yes	---
	Transquaking, very frequently flooded	1	Tidal marshes	Yes	1
UdwuB:					
Udorthents, wet substratum-Urban land complex (SSURGO1)	Pawcatuck, very frequently flooded	1	Tidal marshes	Yes	---
	Transquaking, very frequently flooded	1	Tidal marshes	Yes	1

Explanation of hydric criteria codes:

1. All Histels except for Folistels, and Histosols except for Folists.
2. Soils in Aquic suborders, great groups, or subgroups, Albolls suborder, Historthels great group, Histoturbels great group, Pachic subgroups, or Cumulic subgroups that:
   A. are somewhat poorly drained and have a water table at the surface (0.0 feet) during the growing season, or
   B. are poorly drained or very poorly drained and have either:
      1.) a water table at the surface (0.0 feet) during the growing season if textures are coarse sand, sand, or fine sand in all layers within a depth of 20 inches, or
      2.) a water table at a depth of 0.5 foot or less during the growing season if permeability is equal to or greater than 6.0 in/hr in all layers within a depth of 20 inches, or
      3.) a water table at a depth of 1.0 foot or less during the growing season if permeability is less than 6.0 in/hr in any layer within a depth of 20 inches.
3. Soils that are frequently ponded for long or very long duration during the growing season.
4. Soils that are frequently flooded for long or very long duration during the growing season.

RUSLE2 Related Attributes

Bergen County, New Jersey

Map symbol and soil name	Pct. of map unit	Hydrologic group	Kf	T factor	Representative value		
					% Sand	% Silt	% Clay
BohC:							
Boonton, moderately well drained	85	C	.43	3	45.6	43.4	11.0
BohD:							
Boonton, moderately well drained	85	C	.43	3	45.6	43.4	11.0
BohE:							
Boonton, moderately well drained	85	C	.43	3	45.6	43.4	11.0
BorC:							
Boonton, moderately well drained, very stony	55	C	.43	3	45.6	43.4	11.0
Rock outcrop	25	D	---	1	---	---	---
BorD:							
Boonton, moderately well drained, very stony	55	C	.43	3	45.6	43.4	11.0
Rock outcrop	30	D	---	1	---	---	---
BorE:							
Boonton, moderately well drained, very stony	55	C	.43	3	45.6	43.4	11.0
Rock outcrop	30	D	---	1	---	---	---
BouB:							
Boonton	50	C	.43	3	46.1	43.8	10.1
Urban land, Boonton substratum	40	---	---	---	---	---	---
BouC:							
Boonton	50	C	.43	3	46.1	43.8	10.1
Urban land, Boonton substratum	40	---	---	---	---	---	---
BouD:							
Boonton	60	C	.43	3	46.1	43.8	10.1
Urban land, Boonton substratum	30	---	---	---	---	---	---

RUSLE2 Related Attributes

Bergen County, New Jersey

Map symbol and soil name	Pct. of map unit	Hydrologic group	Kf	T factor	Representative value		
					% Sand	% Silt	% Clay
BouE:							
Boonton	50	C	.43	3	46.1	43.8	10.1
Urban land, Boonton red sandstone lowland substratum	40	---	---	---	---	---	---
DuoB:							
Dunellen	85	A	.32	4	45.7	41.8	12.5
DuoC:							
Dunellen	85	A	.32	4	45.7	41.8	12.5
DuoD:							
Dunellen	85	A	.32	4	45.7	41.8	12.5
DuuA:							
Dunellen	55	A	.32	4	45.7	41.8	12.5
Urban land	30	---	---	---	---	---	---
DuuB:							
Dunellen	60	A	.28	4	67.9	19.6	12.5
Urban land, Dunellen substratum	30	---	---	---	---	---	---
DuuC:							
Dunellen	60	A	.28	4	67.9	19.6	12.5
Urban land, Dunellen substratum	30	---	---	---	---	---	---
DuuD:							
Dunellen	55	A	.32	4	45.7	41.8	12.5
Urban land	25	---	---	---	---	---	---
FmhAt:							
Fluvaquents, loamy, frequently flooded	80	B/D	.32	5	40.0	45.0	15.0
HamBb:							
Haledon, very stony	85	C	.32	4	43.0	39.5	17.5
HasB:							
Haledon	60	C	---	3	30.8	56.4	12.8

RUSLE2 Related Attributes

Bergen County, New Jersey

Map symbol and soil name	Pct. of map unit	Hydrologic group	Kf	T factor	Representative value		
					% Sand	% Silt	% Clay
HasB:							
Urban land, Haledon substratum	30	---	---	---	---	---	---
PbuA:							
Pascack	85	C	.37	4	30.7	56.3	13.0
UdkttB:							
Udorthents, loamy fill substratum	85	D	.43	2	46.0	44.0	10.0
UdouB:							
Udorthents, organic substratum	55	D	---	---	---	---	---
Urban land	30	---	---	---	---	---	---
UdrB:							
Udorthents, refuse substratum	100	D	.37	5	13.9	70.6	15.5
UdwB:							
Udorthents, wet substratum	85	D	---	5	---	---	---
UdwuB:							
Udorthents, wet substratum	55	D	---	5	---	---	---
Urban land	30	---	---	---	---	---	---
UR:							
Urban land	95	---	---	---	---	---	---

Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment

Bergen County, New Jersey

[Onsite investigation may be needed to validate the interpretations in this table and to confirm the identity of the soil on a given site. The numbers in the value columns range from 0.01 to 1.00. The larger the value, the greater the potential limitation. The table shows only the top five limitations for any given soil. The soil may have additional limitations]

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BohC:					
Boonton, moderately well drained	85	Very limited		Very limited	
		Slope	1.00	Too steep for surface application	1.00
		Slow water movement	1.00	Too steep for sprinkler irrigation	1.00
		Depth to saturated zone	0.99	Too acid	0.99
				Depth to saturated zone	0.99
				Slow water movement	0.96
BohD:					
Boonton, moderately well drained	85	Very limited		Very limited	
		Slope	1.00	Too steep for surface application	1.00
		Slow water movement	1.00	Too steep for sprinkler irrigation	1.00
		Depth to saturated zone	0.99	Too acid	0.99
				Depth to saturated zone	0.99
				Slow water movement	0.96
BohE:					
Boonton, moderately well drained	85	Very limited		Very limited	
		Slope	1.00	Too steep for surface application	1.00
		Slow water movement	1.00	Too steep for sprinkler irrigation	1.00
		Depth to saturated zone	0.99	Too acid	0.99
				Depth to saturated zone	0.99
				Slow water movement	0.96

Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment

Bergen County, New Jersey

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BorC:					
Boonton, moderately well drained, very stony	55	Very limited		Very limited	
		Slope	1.00	Too steep for surface application	1.00
		Slow water movement	1.00	Too steep for sprinkler irrigation	1.00
		Depth to saturated zone	0.99	Too acid	0.99
				Depth to saturated zone	0.99
				Slow water movement	0.99
Rock outcrop	25	Not rated		Not rated	
BorD:					
Boonton, moderately well drained, very stony	55	Very limited		Very limited	
		Slope	1.00	Too steep for surface application	1.00
		Slow water movement	1.00	Too steep for sprinkler irrigation	1.00
		Depth to saturated zone	0.99	Too acid	0.99
				Depth to saturated zone	0.99
				Slow water movement	0.99
Rock outcrop	30	Not rated		Not rated	
BorE:					
Boonton, moderately well drained, very stony	55	Very limited		Very limited	
		Slope	1.00	Too steep for surface application	1.00
		Slow water movement	1.00	Too steep for sprinkler irrigation	1.00
		Depth to saturated zone	0.99	Too acid	0.99
				Depth to saturated zone	0.99
				Slow water movement	0.99
Rock outcrop	30	Not rated		Not rated	

Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment

Bergen County, New Jersey

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BouB:					
Boonton	50	Very limited		Very limited	
		Slow water movement	1.00	Too acid	1.00
		Slope	0.50	Slow water movement	0.96
		Too acid	0.31	Too steep for surface application	0.68
Urban land, Boonton substratum	40	Very limited		Not rated	
		Slow water movement	1.00		
		Too acid	0.21		
BouC:					
Boonton	50	Very limited		Very limited	
		Slope	1.00	Too acid	1.00
		Slow water movement	1.00	Too steep for surface application	1.00
		Too acid	0.31	Too steep for sprinkler irrigation	1.00
				Slow water movement	0.96
Urban land, Boonton substratum	40	Very limited		Not rated	
		Slow water movement	1.00		
		Too acid	0.21		
BouD:					
Boonton	60	Very limited		Very limited	
		Slope	1.00	Too acid	1.00
		Slow water movement	1.00	Too steep for surface application	1.00
		Too acid	0.31	Too steep for sprinkler irrigation	1.00
				Slow water movement	0.96
Urban land, Boonton substratum	30	Very limited		Not rated	
		Slow water movement	1.00		
		Too acid	0.21		

Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment

Bergen County, New Jersey

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
BouE:					
Boonton	50	Very limited		Very limited	
		Slope	1.00	Too acid	1.00
		Slow water movement	1.00	Too steep for surface application	1.00
		Too acid	0.31	Too steep for sprinkler irrigation	1.00
				Slow water movement	0.96
Urban land, Boonton red sandstone lowland substratum	40	Very limited		Not rated	
		Slow water movement	1.00		
		Too acid	0.21		
DuoB:					
Dunellen	85	Somewhat limited		Very limited	
		Slow water movement	0.61	Filtering capacity	1.00
				Too acid	0.99
				Too steep for surface application	0.08
DuoC:					
Dunellen	85	Very limited		Very limited	
		Slope	1.00	Filtering capacity	1.00
		Slow water movement	0.61	Too steep for surface application	1.00
				Too acid	0.99
				Too steep for sprinkler irrigation	0.50
DuoD:					
Dunellen	85	Very limited		Very limited	
		Slope	1.00	Filtering capacity	1.00
		Slow water movement	0.61	Too steep for surface application	1.00
				Too steep for sprinkler irrigation	1.00
				Too acid	0.99
DuuA:					
Dunellen	55	Somewhat limited		Very limited	
		Slow water movement	0.61	Filtering capacity	1.00
				Too acid	0.99
Urban land	30	Not rated		Not rated	

Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment

Bergen County, New Jersey

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
DuuB:					
Dunellen	60	Somewhat limited		Very limited	
		Slow water movement	0.32	Filtering capacity	1.00
				Too acid	0.99
				Too steep for surface application	0.08
Urban land, Dunellen substratum	30	Somewhat limited		Not rated	
		Slow water movement	0.32		
DuuC:					
Dunellen	60	Very limited		Very limited	
		Slope	1.00	Filtering capacity	1.00
		Slow water movement	0.32	Too steep for surface application	1.00
				Too steep for sprinkler irrigation	1.00
				Too acid	0.99
Urban land, Dunellen substratum	30	Somewhat limited		Not rated	
		Slow water movement	0.32		
DuuD:					
Dunellen	55	Very limited		Very limited	
		Slope	1.00	Filtering capacity	1.00
		Slow water movement	0.61	Too steep for surface application	1.00
				Too steep for sprinkler irrigation	1.00
				Too acid	0.99
Urban land	25	Not rated		Not rated	
FmhAt:					
Fluvaquents, loamy, frequently flooded	80	Very limited		Very limited	
		Ponding	1.00	Ponding	1.00
		Flooding	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Flooding	1.00
		Slow water movement	1.00	Too acid	0.42
				Filtering capacity	0.01

Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment

Bergen County, New Jersey

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
HamBb:					
Haledon, very stony	85	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too steep for surface application	0.68
		Slope	0.50	Slow water movement	0.43
				Too acid	0.42
HasB:					
Haledon	60	Very limited		Very limited	
		Slow water movement	1.00	Depth to saturated zone	1.00
		Depth to saturated zone	1.00	Too acid	1.00
		Too acid	0.96	Slow water movement	0.96
				Too steep for surface application	0.08
Urban land, Haledon substratum	30	Very limited		Not rated	
		Slow water movement	1.00		
		Depth to saturated zone	1.00		
PbuA:					
Pascack	85	Very limited		Very limited	
		Depth to saturated zone	1.00	Filtering capacity	1.00
		Slow water movement	0.31	Depth to saturated zone	1.00
				Too acid	0.91
UdkttB:					
Udorthents, loamy fill substratum	85	Very limited		Somewhat limited	
		Slow water movement	1.00	Slow water movement	0.96
		Too acid	0.14	Too acid	0.77
UdouB:					
Udorthents, organic substratum	55	Not rated		Not rated	
Urban land	30	Not rated		Not rated	

Agricultural Disposal of Wastewater by Rapid Infiltration and Slow Rate Treatment

Bergen County, New Jersey

Map symbol and soil name	Pct. of map unit	Rapid infiltration of wastewater		Slow rate treatment of wastewater	
		Rating class and limiting features	Value	Rating class and limiting features	Value
UdrB:					
Udorthents, refuse substratum	100	Very limited		Somewhat limited	
		Slow water movement	1.00	Too steep for surface application	0.08
UdwB:					
Udorthents, wet substratum	85	Not rated		Not rated	
UdwuB:					
Udorthents, wet substratum	55	Not rated		Not rated	
Urban land	30	Not rated		Not rated	
UR:					
Urban land	95	Not rated		Not rated	

Physical Soil Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
BohC:														
Boonton, moderately well drained	0-6	---	---	7-15	1.30-1.45	4.23-14.11	0.11-0.16	0.0-2.9	2.0-4.0	.37	.43	3	5	56
	6-23	---	---	10-18	1.55-1.65	4.23-14.11	0.08-0.19	0.0-2.9	0.5-1.0	.37	.43			
	23-41	---	---	7-15	1.65-1.80	0.42-1.41	0.02-0.06	0.0-2.9	0.5-1.0	.24	.28			
	41-44	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
	44-66	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
BohD:														
Boonton, moderately well drained	0-5	---	---	7-15	1.30-1.45	4.23-14.11	0.11-0.16	0.0-2.9	2.0-4.0	.37	.43	3	5	56
	5-22	---	---	10-18	1.55-1.65	4.23-14.11	0.08-0.19	0.0-2.9	0.5-1.0	.37	.43			
	22-40	---	---	7-15	1.65-1.80	0.42-1.41	0.02-0.06	0.0-2.9	0.5-1.0	.24	.28			
	40-44	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
	44-66	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
BohE:														
Boonton, moderately well drained	0-4	---	---	7-15	1.30-1.45	4.23-14.11	0.11-0.16	0.0-2.9	2.0-4.0	.37	.43	3	5	56
	4-20	---	---	10-18	1.55-1.65	4.23-14.11	0.08-0.19	0.0-2.9	0.5-1.0	.37	.43			
	20-40	---	---	7-15	1.65-1.80	0.42-1.41	0.02-0.06	0.0-2.9	0.5-1.0	.24	.28			
	40-44	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
	44-66	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
BorC:														
Boonton, moderately well drained, very stony	0-6	---	---	7-15	1.45-1.60	4.23-14.11	0.11-0.19	0.0-2.9	2.0-4.0	.32	.43	3	8	0
	6-23	---	---	10-18	1.55-1.65	4.23-14.11	0.08-0.19	0.0-2.9	0.5-1.0	.37	.43			
	23-40	---	---	7-15	1.65-1.75	0.00-1.41	0.02-0.06	0.0-2.9	0.5-1.0	.24	.28			
	40-44	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
	44-66	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			

Physical Soil Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
BorC:														
Rock outcrop	0-157	---	---	---	---	---	0.00	---	---	---	---	1	---	0
BorD:														
Boonton, moderately well drained, very stony	0-4	---	---	7-15	1.45-1.60	4.23-14.11	0.11-0.19	0.0-2.9	2.0-4.0	.32	.43	3	8	0
	4-22	---	---	10-18	1.55-1.65	4.23-14.11	0.08-0.19	0.0-2.9	0.5-1.0	.37	.43			
	22-40	---	---	7-15	1.65-1.75	0.00-1.41	0.02-0.06	0.0-2.9	0.5-1.0	.24	.28			
	40-44	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
	44-66	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
Rock outcrop	0-157	---	---	---	---	---	0.00	---	---	---	---	1	---	0
BorE:														
Boonton, moderately well drained, very stony	0-3	---	---	7-15	1.45-1.60	4.23-14.11	0.11-0.19	0.0-2.9	2.0-4.0	.32	.43	3	8	0
	3-20	---	---	10-18	1.55-1.65	4.23-14.11	0.08-0.19	0.0-2.9	0.5-1.0	.37	.43			
	20-40	---	---	7-15	1.65-1.75	0.00-1.41	0.02-0.06	0.0-2.9	0.5-1.0	.24	.28			
	40-44	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
	44-66	---	---	5-15	1.55-1.65	0.42-14.11	0.02-0.06	0.0-2.9	0.5-1.0	.32	.37			
Rock outcrop	0-157	---	---	---	---	---	0.00	---	---	---	---	1	---	0

Physical Soil Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
BouB:														
Boonton	0-5	30-50	43-57	7-13	0.50-1.50	4.00-14.00	0.14-0.20	0.1-1.5	2.0-4.0	.43	.43	3	5	56
	5-8	30-50	43-57	7-13	0.50-1.50	4.00-14.00	0.14-0.20	0.1-1.5	2.0-4.0	.43	.43			
	8-17	30-50	43-57	7-13	1.00-1.30	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	17-30	30-50	41-54	9-16	1.55-1.65	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	30-40	40-60	25-45	8-15	1.55-1.65	0.42-1.40	0.02-0.06	0.1-1.5	0.5-1.0	.28	.32			
	40-47	40-70	22-45	8-15	1.55-1.65	0.42-1.40	0.02-0.06	0.1-1.5	0.5-1.0	.28	.32			
	47-58	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
	58-72	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
Urban land, Boonton substratum	0-12	---	---	---	---	---	---	---	---	---	---	---	8	0
	12-47	30-50	41-54	9-16	1.55-1.65	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	47-58	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
	58-72	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
BouC:														
Boonton	0-5	30-50	43-57	7-13	0.50-1.50	4.00-14.00	0.14-0.20	0.1-1.5	2.0-4.0	.43	.43	3	5	56
	5-8	30-50	43-57	7-13	0.50-1.50	4.00-14.00	0.14-0.20	0.1-1.5	2.0-4.0	.43	.43			
	8-17	30-50	43-57	7-13	1.00-1.30	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	17-30	30-50	41-54	9-16	1.55-1.65	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	30-40	40-60	25-45	8-15	1.55-1.65	0.42-1.40	0.02-0.06	0.1-1.5	0.5-1.0	.28	.32			
	40-47	40-70	22-45	8-15	1.55-1.65	0.42-1.40	0.02-0.06	0.1-1.5	0.5-1.0	.28	.32			
	47-58	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
	58-72	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			

Physical Soil Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
BouC:														
Urban land, Boonton substratum	0-12	---	---	---	---	---	---	---	---	---	---	---	8	0
	12-47	30-50	41-54	9-16	1.55-1.65	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	47-58	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
	58-72	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
BouD:														
Boonton	0-5	30-50	43-57	7-13	0.50-1.50	4.00-14.00	0.14-0.20	0.1-1.5	2.0-4.0	.43	.43	3	5	56
	5-8	30-50	43-57	7-13	0.50-1.50	4.00-14.00	0.14-0.20	0.1-1.5	2.0-4.0	.43	.43			
	8-17	30-50	43-57	7-13	1.00-1.30	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	17-30	30-50	41-54	9-16	1.55-1.65	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	30-40	40-60	25-45	8-15	1.55-1.65	0.42-1.40	0.02-0.06	0.1-1.5	0.5-1.0	.28	.32			
	40-47	40-70	22-45	8-15	1.55-1.65	0.42-1.40	0.02-0.06	0.1-1.5	0.5-1.0	.28	.32			
	47-58	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
	58-72	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
Urban land, Boonton substratum	0-12	---	---	---	---	---	---	---	---	---	---	---	8	0
	12-47	30-50	41-54	9-16	1.55-1.65	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	47-58	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
	58-72	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			

Physical Soil Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
BouE:														
Boonton	0-5	30-50	43-57	7-13	0.50-1.50	4.00-14.00	0.14-0.20	0.1-1.5	2.0-4.0	.43	.43	3	5	56
	5-8	30-50	43-57	7-13	0.50-1.50	4.00-14.00	0.14-0.20	0.1-1.5	2.0-4.0	.43	.43			
	8-17	30-50	43-57	7-13	1.00-1.30	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	17-30	30-50	41-54	9-16	1.55-1.65	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	30-40	40-60	25-45	8-15	1.55-1.65	0.42-1.40	0.02-0.06	0.1-1.5	0.5-1.0	.28	.32			
	40-47	40-70	22-45	8-15	1.55-1.65	0.42-1.40	0.02-0.06	0.1-1.5	0.5-1.0	.28	.32			
	47-58	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
	58-72	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
Urban land, Boonton red sandstone lowland substratum	0-12	---	---	---	---	---	0.00	0.0	0.0	---	---	---	8	0
	12-47	30-50	41-54	9-16	1.55-1.65	4.00-14.00	0.08-0.19	0.1-1.5	0.5-1.0	.37	.43			
	47-58	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
	58-72	75-90	7-17	3-8	1.55-1.65	14.00-42.00	0.08-0.19	0.1-1.5	0.5-1.0	.28	.32			
DuoB:														
Dunellen	0-5	---	---	5-20	1.10-1.30	14.11-42.34	0.13-0.16	0.0-2.9	2.0-4.0	.32	.32	4	5	56
	5-15	---	---	5-18	1.20-1.40	4.23-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	15-26	---	---	5-18	1.20-1.40	4.23-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	26-66	---	---	5-15	1.30-1.50	42.34-141.14	0.05-0.10	0.0-2.9	0.5-1.0	.15	.17			
DuoC:														
Dunellen	0-3	---	---	5-20	1.10-1.30	14.11-42.34	0.13-0.16	0.0-2.9	2.0-4.0	.32	.32	4	5	56
	3-15	---	---	5-18	1.20-1.40	4.23-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	15-26	---	---	5-18	1.20-1.40	4.23-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	26-66	---	---	5-15	1.30-1.50	42.34-141.14	0.05-0.10	0.0-2.9	0.5-1.0	.15	.17			

Physical Soil Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
DuoD:														
Dunellen	0-2	---	---	5-20	1.10-1.30	14.11-42.34	0.13-0.16	0.0-2.9	2.0-4.0	.32	.32	4	5	56
	2-15	---	---	5-18	1.20-1.40	4.23-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	15-34	---	---	5-18	1.20-1.40	4.23-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	26-66	---	---	5-15	1.30-1.50	42.34-141.14	0.05-0.10	0.0-2.9	0.5-1.0	.15	.17			
DuuA:														
Dunellen	0-6	---	---	5-20	1.10-1.30	14.11-42.34	0.13-0.16	0.0-2.9	2.0-4.0	.32	.32	4	5	56
	6-15	---	---	5-18	1.20-1.40	4.23-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	15-35	---	---	5-18	1.20-1.40	4.23-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	26-66	---	---	5-15	1.30-1.50	42.34-141.14	0.05-0.10	0.0-2.9	0.5-1.0	.15	.17			
Urban land	0-60	---	---	---	---	---	0.00	---	0.0	---	---	---	---	---
DuuB:														
Dunellen	0-8	43-85	5-45	5-18	1.10-1.30	14.11-42.34	0.13-0.16	0.0-2.9	2.0-4.0	.28	.28	4	3	86
	8-14	43-85	5-45	5-18	1.10-1.30	14.11-42.34	0.13-0.16	0.0-2.9	2.0-4.0	.28	.28			
	14-20	43-85	5-45	5-18	1.20-1.40	14.00-42.00	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	20-31	43-85	5-45	5-18	1.20-1.40	14.00-42.00	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	31-42	43-85	5-45	5-18	1.20-1.40	14.00-42.00	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	42-70	---	---	5-15	1.30-1.50	42.34-141.14	0.05-0.10	0.0-2.9	0.5-1.0	.15	.17			
Urban land, Dunellen substratum	0-12	---	---	---	---	---	---	---	---	---	---	---	8	0
	12-31	43-85	5-45	5-18	1.20-1.40	14.00-42.00	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	31-42	43-85	5-45	5-18	1.20-1.40	14.00-42.00	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	42-70	70-90	2-25	5-15	1.30-1.50	42.00-141.00	0.05-0.10	0.0-2.9	0.5-1.0	.17	.20			

Physical Soil Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
DuuC:														
Dunellen	0-8	43-85	5-45	5-18	1.10-1.30	14.11-42.34	0.13-0.16	0.0-2.9	2.0-4.0	.28	.28	4	3	86
	8-14	43-85	5-45	5-18	1.10-1.30	14.11-42.34	0.13-0.16	0.0-2.9	2.0-4.0	.28	.28			
	14-20	43-85	5-45	5-18	1.20-1.40	14.00-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	20-31	43-85	5-45	5-18	1.20-1.40	14.00-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	31-42	43-85	5-45	5-18	1.20-1.40	14.00-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	42-70	---	---	5-15	1.30-1.50	42.34-141.14	0.05-0.10	0.0-2.9	0.5-1.0	.15	.17			
Urban land, Dunellen substratum	0-12	---	---	---	---	---	---	---	---	---	---	---	8	0
	12-31	43-85	5-45	5-18	1.20-1.40	14.00-42.00	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	31-42	43-85	5-45	5-18	1.20-1.40	14.00-42.00	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	42-70	70-90	2-25	5-15	1.30-1.50	42.00-141.00	0.05-0.10	0.0-2.9	0.5-1.0	.17	.20			
DuuD:														
Dunellen	0-2	---	---	5-20	1.10-1.30	14.11-42.34	0.13-0.16	0.0-2.9	2.0-4.0	.32	.32	4	5	56
	2-15	---	---	5-18	1.20-1.40	4.23-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	15-33	---	---	5-18	1.20-1.40	4.23-42.34	0.10-0.20	0.0-2.9	0.5-1.0	.32	.37			
	33-66	---	---	5-15	1.30-1.50	42.34-141.14	0.05-0.10	0.0-2.9	0.5-1.0	.15	.17			
Urban land	0-60	---	---	---	---	---	0.00	---	0.0	---	---	---	---	---
FmhAt:														
Fluvaquents, loamy, frequently flooded	0-5	23-52	28-50	7-27	1.20-1.40	4.23-14.11	0.16-0.20	0.0-2.9	2.0-4.0	.32	.32	5	5	56
	5-12	20-50	50-80	12-27	1.30-1.50	4.00-14.00	0.16-0.20	0.0-2.9	0.0-0.5	.43	.43			
	12-18	45-80	5-25	20-35	1.20-1.50	4.00-14.00	0.12-0.18	3.0-5.9	0.0-0.5	.32	.37			
	18-24	45-80	5-25	20-35	1.20-1.50	4.00-14.00	0.12-0.18	3.0-5.9	0.0-0.5	.32	.37			
	24-60	43-85	10-45	5-15	1.20-1.70	14.11-42.34	0.04-0.08	0.0-2.9	0.0-0.5	.10	.17			

Physical Soil Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
HamBb:														
Haledon, very stony	0-8	---	---	10-25	1.20-1.40	4.23-14.11	0.16-0.20	0.0-2.9	2.0-4.0	.24	.32	4	8	0
	8-15	---	---	10-20	1.30-1.50	4.23-14.11	0.14-0.19	0.0-2.9	0.4-0.6	.37	.43			
	15-23	---	---	10-20	1.30-1.50	4.23-14.11	0.14-0.19	0.0-2.9	0.1-0.3	.37	.43			
	23-33	---	---	10-20	1.30-1.50	4.23-14.11	0.14-0.19	0.0-2.9	0.1-0.3	.37	.43			
	33-41	---	---	10-20	1.60-1.80	0.42-4.23	0.06-0.10	0.0-2.9	0.1-0.3	.24	.28			
	41-66	---	---	10-20	1.30-1.50	0.42-4.23	0.06-0.10	0.0-2.9	0.1-0.3	.28	.32			
HasB:														
Haledon	0-2	0-50	0-80	0-18	0.30-0.50	14.00-42.00	0.55-0.65	0.0	60-85	---	---	3	5	56
	2-8	20-50	50-80	12-18	1.10-1.45	4.23-14.11	0.18-0.22	0.0-2.9	2.0-4.0	.32	.32			
	8-15	20-50	50-80	12-18	1.30-1.45	4.23-14.11	0.14-0.19	0.0-2.9	0.5-1.0	.37	.43			
	15-22	20-50	50-80	12-18	1.55-1.65	4.23-14.11	0.14-0.19	0.0-2.9	0.5-1.0	.37	.43			
	22-27	23-52	28-50	7-18	1.55-1.65	4.00-14.00	0.06-0.10	0.0-2.9	0.5-1.0	.24	.28			
	27-30	23-52	28-50	7-18	1.55-1.65	4.00-14.00	0.06-0.10	0.0-2.9	0.5-1.0	.24	.28			
	30-60	45-85	5-45	5-10	1.55-1.80	0.42-1.41	0.06-0.10	0.0-2.9	0.5-1.0	.32	.37			
Urban land, Haledon substratum	0-12	---	---	---	---	---	---	---	---	---	---	---	8	0
	12-30	20-50	50-80	12-18	1.55-1.65	4.23-14.11	0.14-0.19	0.0-2.9	0.5-1.0	.37	.43			
	30-60	45-85	5-45	5-10	1.55-1.65	0.42-1.41	0.06-0.10	0.0-2.9	0.5-1.0	.32	.37			
PbuA:														
Pascack	0-5	---	---	8-18	1.25-1.45	14.11-42.34	0.14-0.20	0.0-2.9	2.0-4.0	.37	.37	4	5	56
	5-12	---	---	10-18	1.25-1.50	14.11-42.34	0.10-0.16	0.0-2.9	0.4-0.6	.32	.37			
	12-26	---	---	10-18	1.25-1.50	14.11-42.34	0.10-0.16	0.0-2.9	0.1-0.3	.32	.37			
	26-32	---	---	10-18	1.25-1.50	14.11-42.34	0.07-0.13	0.0-2.9	0.1-0.3	.28	.32			
	32-52	---	---	2-10	1.45-1.70	42.34-141.14	0.05-0.08	0.0-2.9	0.1-0.3	.17	.20			
	52-72	---	---	2-10	1.45-1.70	42.34-141.14	0.05-0.08	0.0-2.9	0.1-0.3	.17	.20			

Physical Soil Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensibility	Organic matter	Erosion factors			Wind erodibility group	Wind erodibility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
UdkttB:														
Udorthents, loamy fill substratum	0-12	23-52	28-50	7-27	1.30-1.50	14.00-42.00	0.14-0.20	0.0-2.9	2.0-4.0	.43	.43	2	5	56
	12-60	5-18	40-60	40-60	1.65-1.85	0.42-1.41	0.08-0.18	0.0-2.9	0.0-0.5	.28	.28			
UdoB:														
Udorthents, organic substratum	0-36	---	---	1-3	1.30-1.70	42.34-141.14	---	0.0-2.9	0.5-3.0	.28	.28	---	---	---
	36-60	---	---	1-3	0.10-0.50	4.00-14.00	---	---	30-60	---	---			
UdrB:														
Udorthents, refuse substratum	0-60	10-50	50-80	12-27	1.20-1.50	4.23-14.11	0.16-0.24	0.0-2.9	3.0-5.0	.37	.37	5	5	56
UdwB:														
Udorthents, wet substratum	---	---	---	---	---	---	---	---	---	---	---	5	8	0
UdwuB:														
Udorthents, wet substratum	---	---	---	---	---	---	---	---	---	---	---	5	8	0
Urban land	0-60	---	---	---	---	---	0.00	---	0.0	---	---	---	---	---
UR:														
Urban land	---	---	---	---	---	---	---	---	---	---	---	---	8	0

Prime and other Important Farmlands

Bergen County, New Jersey

Map symbol	Map unit name	Farmland classification
DuoB	Dunellen loam, 3 to 8 percent slopes	All areas are prime farmland
PbuA	Pascack silt loam, 0 to 3 percent slopes	All areas are prime farmland
BohC	Boonton moderately well drained gravelly loam, 8 to 15 percent slopes	Farmland of statewide importance
DuoC	Dunellen loam, 8 to 15 percent slopes	Farmland of statewide importance

Map Unit Text

Bergen County, New Jersey

Map unit: BorC - Boonton moderately well drained-Rock outcrop complex, 8 to 15 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Rock outcrop consists of exposures of bare, hard bedrock other than lava flows and rock-lined pits. They consist mainly of unweathered volcanic and metamorphic rock, but includes some sedimentary rock such as consolidated limestone and conglomerate. Slopes range from 0 to 100 percent.

Map unit: BorD - Boonton moderately well drained-Rock outcrop complex, 15 to 25 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Rock outcrop consists of exposures of bare, hard bedrock other than lava flows and rock-lined pits. They consist mainly of unweathered volcanic and metamorphic rock, but includes some sedimentary rock such as consolidated limestone and conglomerate. Slopes range from 0 to 100 percent.

Map unit: BorE - Boonton moderately well drained-Rock outcrop complex, 25 to 45 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Rock outcrop consists of exposures of bare, hard bedrock other than lava flows and rock-lined pits. They consist mainly of unweathered volcanic and metamorphic rock, but includes some sedimentary rock such as consolidated limestone and conglomerate. Slopes range from 0 to 100 percent.

Map unit: BouB - Boonton-Urban land complex, 0 to 8 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent.

Map unit: BouC - Boonton-Urban land complex, 8 to 15 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent.

Map unit: BouD - Boonton-Urban land complex, 15 to 25 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent.

Map unit: BouE - Boonton-Urban land complex, 25 to 45 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent.

Map unit: DuoB - Dunellen loam, 3 to 8 percent slopes

Text kind/Category: Nontechnical description/SOI-5

The Dunellen series consists of deep, well drained soils on outwash plains and terraces. They formed in water-deposited material. Typically, these soils have a dark brown sandy loam surface layer, 8 inches thick. A subsurface layer from 8 to 14 inches is brown sandy loam. The subsoil layers from 14 to 32 inches are reddish-brown and dark reddish-brown sandy loam. The dark reddish-brown substratum from 32 to 42 inches is sandy loam and from 42 to 70 inches is loamy sand. Slopes range from 0 to 35 percent.

Map unit: DuoC - Dunellen loam, 8 to 15 percent slopes

Text kind/Category: Nontechnical description/SOI-5

The Dunellen series consists of deep, well drained soils on outwash plains and terraces. They formed in water-deposited material. Typically, these soils have a dark brown sandy loam surface layer, 8 inches thick. A subsurface layer from 8 to 14 inches is brown sandy loam. The subsoil layers from 14 to 32 inches are reddish-brown and dark reddish-brown sandy loam. The dark reddish-brown substratum from 32 to 42 inches is sandy loam and from 42 to 70 inches is loamy sand. Slopes range from 0 to 35 percent.

Map unit: DuoD - Dunellen loam, 15 to 25 percent slopes

Text kind/Category: Nontechnical description/SOI-5

The Dunellen series consists of deep, well drained soils on outwash plains and terraces. They formed in water-deposited material. Typically, these soils have a dark brown sandy loam surface layer, 8 inches thick. A subsurface layer from 8 to 14 inches is brown sandy loam. The subsoil layers from 14 to 32 inches are reddish-brown and dark reddish-brown sandy loam. The dark reddish-brown substratum from 32 to 42 inches is sandy loam and from 42 to 70 inches is loamy sand. Slopes range from 0 to 35 percent.

Map unit: DuuA - Dunellen-Urban land complex, 0 to 3 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent.

Text kind/Category: Nontechnical description/SOI-5

The Dunellen series consists of deep, well drained soils on outwash plains and terraces. They formed in water-deposited material. Typically, these soils have a dark brown sandy loam surface layer, 8 inches thick. A subsurface layer from 8 to 14 inches is brown sandy loam. The subsoil layers from 14 to 32 inches are reddish-brown and dark reddish-brown sandy loam. The dark reddish-brown substratum from 32 to 42 inches is sandy loam and from 42 to 70 inches is loamy sand. Slopes range from 0 to 35 percent.

Map unit: DuuB - Dunellen-Urban land complex, 3 to 8 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent.

Text kind/Category: Nontechnical description/SOI-5

The Dunellen series consists of deep, well drained soils on outwash plains and terraces. They formed in water-deposited material. Typically, these soils have a dark brown sandy loam surface layer, 8 inches thick. A subsurface layer from 8 to 14 inches is brown sandy loam. The subsoil layers from 14 to 32 inches are reddish-brown and dark reddish-brown sandy loam. The dark reddish-brown substratum from 32 to 42 inches is sandy loam and from 42 to 70 inches is loamy sand. Slopes range from 0 to 35 percent.

Map unit: DuuC - Dunellen-Urban land complex, 8 to 15 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent.

Text kind/Category: Nontechnical description/SOI-5

The Dunellen series consists of deep, well drained soils on outwash plains and terraces. They formed in water-deposited material. Typically, these soils have a dark brown sandy loam surface layer, 8 inches thick. A subsurface layer from 8 to 14 inches is brown sandy loam. The subsoil layers from 14 to 32 inches are reddish-brown and dark reddish-brown sandy loam. The dark reddish-brown substratum from 32 to 42 inches is sandy loam and from 42 to 70 inches is loamy sand. Slopes range from 0 to 35 percent.

Map unit: DuuD - Dunellen-Urban land complex, 15 to 25 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent.

Text kind/Category: Nontechnical description/SOI-5

The Dunellen series consists of deep, well drained soils on outwash plains and terraces. They formed in water-deposited material. Typically, these soils have a dark brown sandy loam surface layer, 8 inches thick. A subsurface layer from 8 to 14 inches is brown sandy loam. The subsoil layers from 14 to 32 inches are reddish-brown and dark reddish-brown sandy loam. The dark reddish-brown substratum from 32 to 42 inches is sandy loam and from 42 to 70 inches is loamy sand. Slopes range from 0 to 35 percent.

Map unit: FmhAt - Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded

Text kind/Category: Nontechnical description/SOI-5

Fluvaquents, loamy consist of very deep, poorly and somewhat poorly drained soils on flood plains. They formed in alluvium. Typically these soils have a reddish brown silt loam surface layer 7 inches thick. The mottled silt loam subsoil is reddish brown from 7 to 16 inches and pinkish gray from 16 to 35 inches. The substratum from 35 to 52 inches is pinkish gray sandy loam and below 52 inches is varigated pinkish gray stratified sand and gravel. Slopes range from 0 to 8 percent.

Map unit: HamBb - Haledon gravelly loam, 0 to 8 percent slopes, very stony

Text kind/Category: Nontechnical description/SOI-5

The Haledon series consists of deep, somewhat poorly drained soils on uplands. They formed in glacial till. Typically, these soils have a very dark grayish-brown, very stony or extremely stony loam surface layer, 8 inches thick. The mottled subsoil from 8 to 30 inches is yellowish-brown cobbly loam. A very firm and brittle mottled fragipan from 30 to 45 inches is dark brown gravelly sandy loam. The substratum from 45 to 72 inches is dark brown very firm gravelly sandy loam. Slopes range from 0 to 15 percent.

Map unit: HasB - Haledon-Urban land complex, 3 to 8 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent.

Map Unit Text

Bergen County, New Jersey

Map unit: UdrB - Udorthents, refuse substratum, 0 to 8 percent slopes

Text kind/Category: Nontechnical description/SOI-5

Udrothents, refuse substratum, consist of areas either presently or formerly used to landfill trash. After closure of the inactive landfills, most were covered with earthen materials. The most recent closures usually have a dense fine textured cap of earth or fabric topped with a layer of soil suitable for growing plants to stablize the slopes. Slopes are 0 to 50 percent.

Map unit: UR - Urban land

Text kind/Category: Nontechnical description/SOI-5

Urban land is land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Slopes range from 0 to 45 percent.

Map Unit Description

Bergen County, New Jersey

BohC Boonton moderately well drained gravelly loam, 8 to 15 percent slopes

Setting

Landscape: Till plains
Elevation: 50 to 500 feet
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 130 to 150 days

Composition

Boonton, moderately well drained, and similar soils: 85 percent

Description of Boonton, moderately well drained

Setting

Landform: Ground moraines
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy basal till derived from basalt

Properties and Qualities

Slope: 8 to 15 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 3.2 inches)

Interpretive Groups

Land capability (non irrigated): 3e

Typical Profile

0 to 6 inches: gravelly loam
6 to 23 inches: gravelly loam
23 to 41 inches: gravelly fine sandy loam
41 to 44 inches: gravelly fine sandy loam
44 to 66 inches: gravelly loamy fine sand

BohD Boonton moderately well drained gravelly loam, 15 to 25 percent slopes

Setting

Landscape: Till plains
Elevation: 50 to 500 feet
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 130 to 150 days

Composition

Boonton, moderately well drained, and similar soils: 85 percent

Description of Boonton, moderately well drained

Setting

Landform: Ground moraines
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy basal till derived from basalt

Properties and Qualities

Slope: 15 to 25 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 3.1 inches)

Interpretive Groups

Land capability (non irrigated): 4e

Typical Profile

0 to 5 inches: gravelly loam
5 to 22 inches: gravelly loam
22 to 40 inches: gravelly fine sandy loam
40 to 44 inches: gravelly fine sandy loam
44 to 66 inches: gravelly loamy fine sand

BohE Boonton moderately well drained gravelly loam, 25 to 45 percent slopes

Setting

Landscape: Till plains
Elevation: 50 to 500 feet
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 130 to 150 days

Composition

Boonton, moderately well drained, and similar soils: 85 percent

Description of Boonton, moderately well drained

Setting

Landform: Ground moraines
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy basal till derived from basalt

Properties and Qualities

Slope: 25 to 45 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Very low (about 2.8 inches)

Interpretive Groups

Land capability (non irrigated): 6e

Typical Profile

0 to 4 inches: gravelly loam
4 to 20 inches: gravelly loam
20 to 40 inches: gravelly fine sandy loam
40 to 44 inches: gravelly fine sandy loam
44 to 66 inches: gravelly loamy fine sand

BorC Boonton moderately well drained-Rock outcrop complex, 8 to 15 percent slopes

Setting

Landscape: Till plains
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 130 to 150 days

Composition

Boonton, moderately well drained, very stony, and similar soils: 55 percent
Rock outcrop: 25 percent

Description of Boonton, moderately well drained, very stony

Setting

Landform: Ground moraines
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy till derived from basalt

Properties and Qualities

Slope: 8 to 15 percent
Surface area covered with stones and boulders: 1.6 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low or moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 3.3 inches)

Interpretive Groups

Land capability (non irrigated): 6s

Typical Profile

0 to 6 inches: gravelly loam
6 to 23 inches: gravelly loam
23 to 40 inches: gravelly fine sandy loam
40 to 44 inches: gravelly fine sandy loam
44 to 66 inches: gravelly loamy fine sand

Description of Rock outcrop

Setting

Landform: Ridges
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear

Properties and Qualities

Depth to restrictive feature: 0 to 0 inches to Lithic bedrock
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups

Land capability (non irrigated): 8w

Typical Profile

0 to 157 inches: unweathered bedrock

BorD Boonton moderately well drained-Rock outcrop complex, 15 to 25 percent slopes

Setting

Landscape: Till plains
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 130 to 150 days

Composition

Boonton, moderately well drained, very stony, and similar soils: 55 percent
Rock outcrop: 30 percent

Description of Boonton, moderately well drained, very stony

Setting

Landform: Ground moraines
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy till derived from basalt

Properties and Qualities

Slope: 15 to 25 percent
Surface area covered with stones and boulders: 1.6 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low or moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 3.1 inches)

Interpretive Groups

Land capability (non irrigated): 6s

Typical Profile

0 to 4 inches: gravelly loam
4 to 22 inches: gravelly loam
22 to 40 inches: gravelly fine sandy loam
40 to 44 inches: gravelly fine sandy loam
44 to 66 inches: gravelly loamy fine sand

Description of Rock outcrop

Setting

Landform: Ridges
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear

Properties and Qualities

Depth to restrictive feature: 0 to 0 inches to Lithic bedrock
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups

Land capability (non irrigated): 8w

Typical Profile

0 to 157 inches: unweathered bedrock

BorE Boonton moderately well drained-Rock outcrop complex, 25 to 45 percent slopes

Setting

Landscape: Till plains
Mean annual precipitation: 40 to 45 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 130 to 150 days

Composition

Boonton, moderately well drained, very stony, and similar soils: 55 percent
Rock outcrop: 30 percent

Description of Boonton, moderately well drained, very stony

Setting

Landform: Ground moraines
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy till derived from basalt

Properties and Qualities

Slope: 25 to 35 percent
Surface area covered with stones and boulders: 1.6 percent
Depth to restrictive feature: None within 60 inches
Drainage class: Moderately well drained
Capacity of the most limiting layer to transmit water (Ksat): Very low or moderately high (0.00 to 0.20 in/hr)
Depth to water table: About 18 to 36 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Very low (about 2.8 inches)

Interpretive Groups

Land capability (non irrigated): 7s

Typical Profile

0 to 3 inches: gravelly loam
3 to 20 inches: gravelly loam
20 to 40 inches: gravelly fine sandy loam
40 to 44 inches: gravelly fine sandy loam
44 to 66 inches: gravelly loamy fine sand

Description of Rock outcrop

Setting

Landform: Ridges
Landform position (two-dimensional): Summit
Down-slope shape: Convex
Across-slope shape: Linear

Properties and Qualities

Depth to restrictive feature: 0 to 0 inches to Lithic bedrock
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups

Land capability (non irrigated): 8w

Typical Profile

0 to 157 inches: unweathered bedrock

BouB Boonton-Urban land complex, 0 to 8 percent slopes

Setting

Landscape: Till plains
Elevation: 50 to 500 feet
Mean annual precipitation: 0 to 45 inches
Mean annual air temperature: 32 to 57 degrees F
Frost-free period: 0 to 150 days

Composition

Boonton and similar soils: 50 percent
Urban land, boonton substratum: 40 percent
Minor components: 10 percent

Description of Boonton

Setting

Landform: Ground moraines
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy basal till derived from basalt

Properties and Qualities

Slope: 0 to 8 percent
Depth to restrictive feature: 20 to 36 inches to Fragipan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.20 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 4.4 inches)

Interpretive Groups

Land capability (non irrigated): 2e

Typical Profile

0 to 5 inches: loam
5 to 8 inches: silt loam
8 to 17 inches: silt loam
17 to 30 inches: silt loam
30 to 40 inches: gravelly fine sandy loam
40 to 47 inches: fine sandy loam
47 to 58 inches: loamy sand
58 to 72 inches: loamy sand

Description of Urban land, boonton substratum

Setting

Landform: Ground moraines
Anthropogenic features: Urban land
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.57 to 1.98 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 6.7 inches)

Interpretive Groups

Land capability (non irrigated): 8s

Typical Profile

0 to 12 inches: material
12 to 47 inches: silt loam
47 to 58 inches: loamy sand
58 to 72 inches: loamy sand

Minor Components

Udorthents, boonton substratum soils

Percent of map unit: 10 percent
Landform: Ground moraines
Anthropogenic features: Artificial levees
Down-slope shape: Convex
Across-slope shape: Linear

BouC Boonton-Urban land complex, 8 to 15 percent slopes

Setting

Landscape: Till plains
Elevation: 50 to 500 feet
Mean annual precipitation: 0 to 55 inches
Mean annual air temperature: 32 to 73 degrees F
Frost-free period: 0 to 184 days

Composition

Boonton and similar soils: 50 percent
Urban land, boonton substratum: 40 percent
Minor components: 10 percent

Description of Boonton

Setting

Landform: Ground moraines
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy basal till derived from basalt

Properties and Qualities

Slope: 8 to 15 percent
Depth to restrictive feature: 20 to 36 inches to Fragipan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.20 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 4.4 inches)

Interpretive Groups

Land capability (non irrigated): 3e

Typical Profile

0 to 5 inches: loam
5 to 8 inches: silt loam
8 to 17 inches: silt loam
17 to 30 inches: silt loam
30 to 40 inches: gravelly fine sandy loam
40 to 47 inches: fine sandy loam
47 to 58 inches: loamy sand
58 to 72 inches: loamy sand

Description of Urban land, boonton substratum

Setting

Landform: Ground moraines
Anthropogenic features: Urban land
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.57 to 1.98 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 6.7 inches)

Interpretive Groups

Land capability (non irrigated): 8s

Typical Profile

0 to 12 inches: material
12 to 47 inches: silt loam
47 to 58 inches: loamy sand
58 to 72 inches: loamy sand

Minor Components

Udorthents, boonton substratum soils

Percent of map unit: 10 percent
Landform: Ground moraines
Anthropogenic features: Artificial levees
Down-slope shape: Convex
Across-slope shape: Linear

BouD Boonton-Urban land complex, 15 to 25 percent slopes

Setting

Landscape: Till plains
Elevation: 50 to 500 feet
Mean annual precipitation: 0 to 55 inches
Mean annual air temperature: 32 to 73 degrees F
Frost-free period: 0 to 184 days

Composition

Boonton and similar soils: 60 percent
Urban land, boonton substratum: 30 percent
Minor components: 10 percent

Description of Boonton

Setting

Landform: Ground moraines
Landform position (two-dimensional): Shoulder, summit
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy basal till derived from basalt

Properties and Qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 36 inches to Fragipan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.20 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 4.4 inches)

Interpretive Groups

Land capability (non irrigated): 7s

Typical Profile

0 to 5 inches: loam
5 to 8 inches: silt loam
8 to 17 inches: silt loam
17 to 30 inches: silt loam
30 to 40 inches: gravelly fine sandy loam
40 to 47 inches: fine sandy loam
47 to 58 inches: loamy sand
58 to 72 inches: loamy sand

Description of Urban land, boonton substratum

Setting

Landform: Ground moraines
Landform position (two-dimensional): Shoulder, summit
Anthropogenic features: Urban land
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.57 to 1.98 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 6.7 inches)

Interpretive Groups

Land capability (non irrigated): 8s

Typical Profile

0 to 12 inches: material
12 to 47 inches: silt loam
47 to 58 inches: loamy sand
58 to 72 inches: loamy sand

Minor Components

Udorthents, boonton substratum soils

Percent of map unit: 10 percent
Landform: Ground moraines
Landform position (two-dimensional): Shoulder, summit
Anthropogenic features: Artificial levees
Down-slope shape: Convex
Across-slope shape: Linear

BouE Boonton-Urban land complex, 25 to 45 percent slopes

Setting

Landscape: Till plains
Elevation: 50 to 500 feet
Mean annual precipitation: 42 to 55 inches
Mean annual air temperature: 38 to 73 degrees F
Frost-free period: 156 to 184 days

Composition

Boonton and similar soils: 50 percent
Urban land, boonton red sandstone lowland substratum: 40 percent
Minor components: 10 percent

Description of Boonton

Setting

Landform: Ground moraines
Landform position (two-dimensional): Shoulder, summit
Down-slope shape: Convex
Across-slope shape: Linear
Parent material: Coarse-loamy basal till derived from basalt

Properties and Qualities

Slope: 15 to 25 percent
Depth to restrictive feature: 20 to 36 inches to Fragipan
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.20 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 4.4 inches)

Interpretive Groups

Land capability (non irrigated): 7s

Typical Profile

0 to 5 inches: loam
5 to 8 inches: gravelly loam
8 to 17 inches: silt loam
17 to 30 inches: silt loam
30 to 40 inches: gravelly fine sandy loam
40 to 47 inches: fine sandy loam
47 to 58 inches: loamy sand
58 to 72 inches: loamy sand

Description of Urban land, boonton red sandstone lowland substratum

Setting

Anthropogenic features: Urban land
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.57 to 1.98 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 6.7 inches)

Interpretive Groups

Land capability (non irrigated): 8s

Typical Profile

0 to 12 inches: material

12 to 47 inches: silt loam
47 to 58 inches: loamy sand
58 to 72 inches: loamy sand

Minor Components

Udorthents, boonton red sandstone lowland substratum soils

Percent of map unit: 10 percent
Anthropogenic features: Artificial levees
Down-slope shape: Linear
Across-slope shape: Linear

DuoB Dunellen loam, 3 to 8 percent slopes

Setting

Landscape: Outwash plains
Elevation: 50 to 150 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 190 days

Composition

Dunellen and similar soils: 85 percent

Description of Dunellen

Setting

Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy outwash derived from sandstone

Properties and Qualities

Slope: 3 to 8 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.60 to 6.00 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 6.6 inches)

Interpretive Groups

Land capability (non irrigated): 2e

Typical Profile

0 to 5 inches: loam
5 to 15 inches: loam
15 to 26 inches: loam
26 to 66 inches: stratified gravelly sand to sand to loamy sand

DuoC Dunellen loam, 8 to 15 percent slopes

Setting

Landscape: Outwash plains
Elevation: 50 to 150 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 190 days

Composition

Dunellen and similar soils: 85 percent

Description of Dunellen

Setting

Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy outwash derived from sandstone

Properties and Qualities

Slope: 8 to 15 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.60 to 6.00 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 6.6 inches)

Interpretive Groups

Land capability (non irrigated): 3e

Typical Profile

0 to 3 inches: loam
3 to 15 inches: loam
15 to 26 inches: loam
26 to 66 inches: stratified gravelly sand to sand to loamy sand

DuoD Dunellen loam, 15 to 25 percent slopes

Setting

Landscape: Outwash plains
Elevation: 50 to 150 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 190 days

Composition

Dunellen and similar soils: 85 percent

Description of Dunellen

Setting

Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy outwash derived from sandstone

Properties and Qualities

Slope: 15 to 25 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.60 to 6.00 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 7.8 inches)

Interpretive Groups

Land capability (non irrigated): 4e

Typical Profile

0 to 2 inches: loam
2 to 15 inches: loam
15 to 34 inches: loam
26 to 66 inches: stratified gravelly sand to sand to loamy sand

DuuA Dunellen-Urban land complex, 0 to 3 percent slopes

Setting

Landscape: Outwash plains
Elevation: 50 to 150 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 160 to 190 days

Composition

Dunellen and similar soils: 55 percent
Urban land: 30 percent

Description of Dunellen

Setting

Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy outwash derived from sandstone

Properties and Qualities

Slope: 0 to 3 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.60 to 6.00 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 8.0 inches)

Interpretive Groups

Land capability (non irrigated): 1

Typical Profile

0 to 6 inches: loam
6 to 15 inches: loam
15 to 35 inches: loam
26 to 66 inches: stratified gravelly sand to sand to loamy sand

Description of Urban land

Setting

Landform: Outwash plains
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups

Land capability (non irrigated): 8s

Typical Profile

0 to 60 inches: variable

DuuB Dunellen-Urban land complex, 3 to 8 percent slopes

Setting

Landscape: Outwash plains
Elevation: 50 to 150 feet
Mean annual precipitation: 0 to 55 inches
Mean annual air temperature: 32 to 73 degrees F
Frost-free period: 0 to 190 days

Composition

Dunellen and similar soils: 60 percent
Urban land, dunellen substratum: 30 percent
Minor components: 10 percent

Description of Dunellen

Setting

Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy outwash derived from sandstone

Properties and Qualities

Slope: 3 to 8 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 7.7 inches)

Interpretive Groups

Land capability (non irrigated): 3e

Typical Profile

0 to 8 inches: sandy loam
8 to 14 inches: sandy loam
14 to 20 inches: sandy loam
20 to 31 inches: sandy loam
31 to 42 inches: sandy loam
42 to 70 inches: stratified gravelly sand to sand to loamy sand

Description of Urban land, dunellen substratum

Setting

Landform: Outwash plains
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 6.0 inches)

Interpretive Groups

Land capability (non irrigated): 8s

Typical Profile

0 to 12 inches: material
12 to 31 inches: sandy loam

31 to 42 inches: sandy loam
42 to 70 inches: loamy sand

Minor Components

Udorthents, dunellen substratum soils

Percent of map unit: 10 percent
Landform: Outwash plains
Anthropogenic features: Artificial levees
Down-slope shape: Linear
Across-slope shape: Linear

DuuC Dunellen-Urban land complex, 8 to 15 percent slopes

Setting

Landscape: Outwash plains
Elevation: 50 to 150 feet
Mean annual precipitation: 0 to 55 inches
Mean annual air temperature: 32 to 73 degrees F
Frost-free period: 0 to 190 days

Composition

Dunellen and similar soils: 60 percent
Urban land, dunellen substratum: 30 percent
Minor components: 10 percent

Description of Dunellen

Setting

Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy outwash derived from sandstone

Properties and Qualities

Slope: 8 to 15 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 6.00 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 7.7 inches)

Interpretive Groups

Land capability (non irrigated): 3e

Typical Profile

0 to 8 inches: sandy loam
8 to 14 inches: sandy loam
14 to 20 inches: sandy loam
20 to 31 inches: sandy loam
31 to 42 inches: sandy loam
42 to 70 inches: stratified gravelly sand to sand to loamy sand

Description of Urban land, dunellen substratum

Setting

Landform: Outwash plains
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 6.0 inches)

Interpretive Groups

Land capability (non irrigated): 8s

Typical Profile

0 to 12 inches: material
12 to 31 inches: sandy loam

31 to 42 inches: sandy loam
42 to 70 inches: loamy sand

Minor Components

Udorthents, dunellen substratum soils

Percent of map unit: 10 percent
Landform: Outwash plains
Anthropogenic features: Artificial levees
Down-slope shape: Linear
Across-slope shape: Linear

DuuD Dunellen-Urban land complex, 15 to 25 percent slopes

Setting

Landscape: Outwash plains
Elevation: 50 to 150 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 55 degrees F
Frost-free period: 160 to 190 days

Composition

Dunellen and similar soils: 55 percent
Urban land: 25 percent

Description of Dunellen

Setting

Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Coarse-loamy outwash derived from sandstone

Properties and Qualities

Slope: 15 to 25 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.60 to 6.00 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 7.1 inches)

Interpretive Groups

Land capability (non irrigated): 4e

Typical Profile

0 to 2 inches: loam
2 to 15 inches: loam
15 to 33 inches: loam
33 to 66 inches: stratified gravelly sand to sand to loamy sand

Description of Urban land

Setting

Landform: Outwash plains
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups

Land capability (non irrigated): 8s

Typical Profile

0 to 60 inches: variable

FmhAt Fluvaquents, loamy, 0 to 3 percent slopes, frequently flooded

Setting

Landscape: River valleys
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 45 to 55 degrees F

Composition

Fluvaquents, loamy, frequently flooded, and similar soils: 80 percent
Minor components: 20 percent

Description of Fluvaquents, loamy, frequently flooded

Setting

Landform: Flood plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Recent alluvium

Properties and Qualities

Slope: 0 to 3 percent
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.57 to 1.98 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: Frequent
Frequency of ponding: Frequent
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 6.1 inches)

Interpretive Groups

Land capability (non irrigated): 5w

Typical Profile

0 to 5 inches: loam
5 to 12 inches: silt loam
12 to 18 inches: sandy clay loam
18 to 24 inches: sandy clay loam
24 to 60 inches: sandy loam

Minor Components

Udifluvents, frequently flooded soils

Percent of map unit: 10 percent
Landform: Flood plains
Down-slope shape: Linear
Across-slope shape: Linear

Fluvaquents, loamy, frequently flooded soils

Percent of map unit: 10 percent
Landform: Flood plains
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Linear

HamBb Haledon gravelly loam, 0 to 8 percent slopes, very stony

Setting

Landscape: Till plains
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 180 to 200 days

Composition

Haledon, very stony, and similar soils: 85 percent
Minor components: 5 percent

Description of Haledon, very stony

Setting

Landform: Ground moraines
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy basal till derived from basalt

Properties and Qualities

Slope: 3 to 8 percent
Surface area covered with stones and boulders: 1.6 percent
Depth to restrictive feature: 24 to 35 inches to Fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.60 in/hr)
Depth to water table: About 6 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Available water capacity: Low (about 5.4 inches)

Interpretive Groups

Land capability (non irrigated): 6w

Typical Profile

0 to 8 inches: gravelly loam
8 to 15 inches: gravelly loam
15 to 23 inches: gravelly loam
23 to 33 inches: gravelly sandy loam
33 to 41 inches: gravelly fine sandy loam
41 to 66 inches: gravelly sandy loam

Minor Components

Hasbrouck, very stony soils

Percent of map unit: 5 percent
Landform: Depressions
Landform position (two-dimensional): Toeslope
Down-slope shape: Concave
Across-slope shape: Concave

HasB Haledon-Urban land complex, 3 to 8 percent slopes

Setting

Landscape: Till plains
Elevation: 50 to 500 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 45 to 55 degrees F
Frost-free period: 140 to 200 days

Composition

Haledon and similar soils: 60 percent
Urban land, haledon substratum: 30 percent
Minor components: 10 percent

Description of Haledon

Setting

Landform: Ground moraines
Down-slope shape: Linear
Across-slope shape: Convex
Parent material: Coarse-loamy basal till derived from basalt

Properties and Qualities

Slope: 3 to 8 percent
Depth to restrictive feature: 24 to 36 inches to Fragipan
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 7 to 18 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 5.2 inches)

Interpretive Groups

Land capability (non irrigated): 3e

Typical Profile

0 to 2 inches: moderately decomposed plant material
2 to 8 inches: silt loam
8 to 15 inches: silt loam
15 to 22 inches: silt loam
22 to 27 inches: loam
27 to 30 inches: loam
30 to 60 inches: gravelly fine sandy loam

Description of Urban land, haledon substratum

Setting

Landform: Ground moraines
Anthropogenic features: Urban land
Down-slope shape: Convex, linear
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 7 to 48 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Low (about 5.4 inches)

Interpretive Groups

Land capability (non irrigated): 8s

Typical Profile

0 to 12 inches: material
12 to 30 inches: silt loam
30 to 60 inches: gravelly fine sandy loam

Minor Components

Udorthents, haledon substratum soils

Percent of map unit: 10 percent
Landform: Ground moraines
Anthropogenic features: Artificial levees
Down-slope shape: Linear
Across-slope shape: Convex

PbuA Pascack silt loam, 0 to 3 percent slopes

Setting

Landscape: Outwash plains
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 180 to 200 days

Composition

Pascack and similar soils: 85 percent
Minor components: 5 percent

Description of Pascack

Setting

Landform: Drainageways
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Coarse-loamy outwash

Properties and Qualities

Slope: 0 to 3 percent
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Available water capacity: Moderate (about 6.1 inches)

Interpretive Groups

Land capability (non irrigated): 3w

Typical Profile

0 to 5 inches: silt loam
5 to 12 inches: fine sandy loam
12 to 26 inches: fine sandy loam
26 to 32 inches: sandy loam
32 to 52 inches: loamy sand
52 to 72 inches: stratified sand to gravelly loamy sand

Minor Components

Preakness, frequently flooded soils

Percent of map unit: 5 percent
Landform: Drainageways
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Concave

UdkttB Udorthents, loamy, 0 to 8 percent slopes, frequently flooded

Setting

Landscape: Outwash plains, uplands
Elevation: 10 to 220 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 45 to 57 degrees F
Frost-free period: 140 to 210 days

Composition

Udorthents, loamy fill substratum, and similar soils: 85 percent
Minor components: 15 percent

Description of Udorthents, loamy fill substratum

Setting

Landform: Low hills
Anthropogenic features: Cuts (road, railroad, etc.), fills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy material transported by human activity

Properties and Qualities

Slope: 0 to 8 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately low or moderately high (0.06 to 0.20 in/hr)
Depth to water table: About 48 to 122 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: Moderate (about 8.4 inches)

Interpretive Groups

Land capability (non irrigated): 2e

Typical Profile

0 to 12 inches: loam
12 to 60 inches: silty clay

Minor Components

Loamy fill

Percent of map unit: 10 percent
Landform: Flats
Anthropogenic features: Artificial levees
Down-slope shape: Linear
Across-slope shape: Linear

Parsippany soils

Percent of map unit: 5 percent
Landform: Outwash plains
Down-slope shape: Linear
Across-slope shape: Linear

UdoB Udorthents, organic substratum, 0 to 8 percent slopes

Setting

Landscape: Uplands
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 180 to 200 days

Composition

Udorthents, organic substratum, and similar soils: 90 percent

Description of Udorthents, organic substratum

Setting

Landform: Flats
Anthropogenic features: Fills, leveled land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy lateral spread deposits over organic material

Properties and Qualities

Slope: 0 to 8 percent
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.57 to 1.98 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent

Typical Profile

0 to 36 inches: sand
36 to 60 inches: muck

UdrB Udorthents, refuse substratum, 0 to 8 percent slopes

Setting

Landscape: Uplands
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 180 to 200 days

Composition

Udorthents, refuse substratum, and similar soils: 100 percent

Description of Udorthents, refuse substratum

Setting

Landform: Low hills
Anthropogenic features: Fills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy lateral spread deposits over organic material

Properties and Qualities

Slope: 0 to 8 percent
Drainage class: Well drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.60 to 2.00 in/hr)
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Gypsum maximum: 0 percent
Available water capacity: High (about 12.0 inches)

Interpretive Groups

Land capability (non irrigated): 7s

Typical Profile

0 to 60 inches: silt loam

UdwB Udorthents, wet substratum, 0 to 8 percent slopes

Setting

Landscape: Coastal plains, uplands
Elevation: 20 to 30 feet
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 180 to 200 days

Composition

Udorthents, wet substratum, and similar soils: 85 percent
Minor components: 2 percent

Description of Udorthents, wet substratum

Setting

Landform: Flats
Anthropogenic features: Fills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy lateral spread deposits

Properties and Qualities

Slope: 0 to 8 percent
Drainage class: Moderately well drained
Frequency of flooding: None
Frequency of ponding: None

Minor Components

Pawcatuck, very frequently flooded soils

Percent of map unit: 1 percent
Landform: Tidal marshes
Down-slope shape: Linear
Across-slope shape: Linear

Transquaking, very frequently flooded soils

Percent of map unit: 1 percent
Landform: Tidal marshes
Down-slope shape: Linear
Across-slope shape: Linear

UdwuB Udorthents, wet substratum-Urban land complex (SSURGO1)

Setting

Landscape: Coastal plains, uplands
Elevation: 20 to 30 feet
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 180 to 200 days

Composition

Udorthents, wet substratum, and similar soils: 55 percent
Urban land: 30 percent
Minor components: 2 percent

Description of Udorthents, wet substratum

Setting

Landform: Flats
Anthropogenic features: Fills
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Loamy lateral spread deposits

Properties and Qualities

Slope: 0 to 8 percent
Drainage class: Moderately well drained
Frequency of flooding: None
Frequency of ponding: None

Description of Urban land

Setting

Landform: Tidal marshes
Anthropogenic features: Urban land
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Available water capacity: Very low (about 0.0 inches)

Interpretive Groups

Land capability (non irrigated): 8s

Typical Profile

0 to 60 inches: variable

Minor Components

Transquaking, very frequently flooded soils

Percent of map unit: 1 percent
Landform: Tidal marshes
Down-slope shape: Linear
Across-slope shape: Linear

Pawcatuck, very frequently flooded soils

Percent of map unit: 1 percent
Landform: Tidal marshes
Down-slope shape: Linear
Across-slope shape: Linear

UR Urban land

Setting

Landscape: Coastal plains, uplands
Elevation: 0 to 170 feet
Mean annual precipitation: 40 to 48 inches
Mean annual air temperature: 50 to 57 degrees F
Frost-free period: 180 to 210 days

Composition

Urban land: 95 percent
Minor components: 5 percent

Description of Urban land

Setting

Anthropogenic features: Urban land
Parent material: Surface covered by pavement, concrete, buildings, and other structures underlain by disturbed and natural soil material

Properties and Qualities

Slope: 0 to 3 percent
Frequency of flooding: None
Frequency of ponding: None

Interpretive Groups

Land capability (non irrigated): 8s

Minor Components

Udorthents soils

Percent of map unit: 5 percent
Landform: Low hills
Anthropogenic features: Artificial levees
Down-slope shape: Linear
Across-slope shape: Linear

Map Unit Description

Detailed Soil Map Units

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. The contrasting components are mentioned in the map unit descriptions. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description indicates the composition of the map unit and selected properties of the components of the unit.

Soils that have profiles that are almost alike make up a "soil series." Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into "soil phases." Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A "complex" consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An "association" is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An "undifferentiated group" is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include "miscellaneous areas." Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Map Unit Description

Bergen County, New Jersey

PbuA Pascack silt loam, 0 to 3 percent slopes

Setting

Landscape: Outwash plains
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 180 to 200 days

Composition

Pascack and similar soils: 85 percent
Minor components: 5 percent

Description of Pascack

Setting

Landform: Drainageways
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Coarse-loamy outwash

Properties and Qualities

Slope: 0 to 3 percent
Drainage class: Somewhat poorly drained
Capacity of the most limiting layer to transmit water (Ksat): High (2.00 to 6.00 in/hr)
Depth to water table: About 12 to 24 inches
Frequency of flooding: None
Frequency of ponding: None
Calcium carbonate maximum: 0 percent
Available water capacity: Moderate (about 6.1 inches)

Interpretive Groups

Land capability (non irrigated): 3w

Typical Profile

0 to 5 inches: silt loam
5 to 12 inches: fine sandy loam
12 to 26 inches: fine sandy loam
26 to 32 inches: sandy loam
32 to 52 inches: loamy sand
52 to 72 inches: stratified sand to gravelly loamy sand

Minor Components

Preakness, frequently flooded soils

Percent of map unit: 5 percent
Landform: Drainageways
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Concave

Engineering Properties

Bergen County, New Jersey

Absence of an entry indicates that the data were not estimated. The asterisk '*' denotes the representative texture; other possible textures follow the dash.

Map symbol and soil name	Depth	USDA texture	Classification		Fragments		Percent passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO	>10 Inches	3-10 Inches	4	10	40	200		
	In				Pct	Pct					Pct	
PbuA:												
Pascack	0-5	Silt loam	CL-ML, SC, SM	A-4	0	0	85-100	85-100	65-85	35-60	20-30	3-10
	5-12	Fine sandy loam, Gravelly sandy loam, Sandy loam	SC, SC-SM, SM	A-2, A-4	0	0	80-100	80-100	45-75	30-50	20-30	3-10
	12-26	Fine sandy loam, Gravelly sandy loam, Sandy loam	SC, SC-SM, SM	A-2, A-4	0	0	80-100	80-100	45-75	30-50	20-30	3-10
	26-32	Gravelly sandy loam, Sandy loam	SC, SC-SM, SM	A-1-b, A-2, A-4	0	0	75-100	65-100	40-70	20-40	20-30	3-10
	32-52	Loamy sand, Stratified sand to gravelly loamy sand	SM, SP	A-1-b, A-2-4	0	0	60-100	45-100	30-75	5-20	15-25	NP-5
	52-72	Loamy sand, Stratified sand to gravelly loamy sand	SM, SP	A-1-b, A-2-4	0	0	60-100	45-100	30-75	5-20	15-25	NP-5

RUSLE2 Related Attributes

Bergen County, New Jersey

Map symbol and soil name	Pct. of map unit	Hydrologic group	Kf	T factor	Representative value		
					% Sand	% Silt	% Clay
PbuA:							
Pascack	85	C	.37	4	30.7	56.3	13.0

Physical Soil Properties

Bergen County, New Jersey

Map symbol and soil name	Depth	Sand	Silt	Clay	Moist bulk density	Saturated hydraulic conductivity	Available water capacity	Linear extensi-bility	Organic matter	Erosion factors			Wind erodi-bility group	Wind erodi-bility index
										Kw	Kf	T		
	In	Pct	Pct	Pct	g/cc	micro m/sec	In/In	Pct	Pct					
PbuA:														
Pascack	0-5	---	---	8-18	1.25-1.45	14.11-42.34	0.14-0.20	0.0-2.9	2.0-4.0	.37	.37	4	5	56
	5-12	---	---	10-18	1.25-1.50	14.11-42.34	0.10-0.16	0.0-2.9	0.4-0.6	.32	.37			
	12-26	---	---	10-18	1.25-1.50	14.11-42.34	0.10-0.16	0.0-2.9	0.1-0.3	.32	.37			
	26-32	---	---	10-18	1.25-1.50	14.11-42.34	0.07-0.13	0.0-2.9	0.1-0.3	.28	.32			
	32-52	---	---	2-10	1.45-1.70	42.34-141.14	0.05-0.08	0.0-2.9	0.1-0.3	.17	.20			
	52-72	---	---	2-10	1.45-1.70	42.34-141.14	0.05-0.08	0.0-2.9	0.1-0.3	.17	.20			

Map Unit Description

Bergen County, New Jersey

PrnAt Preakness silt loam, 0 to 3 percent slopes, frequently flooded

Setting

Landscape: Outwash plains
Mean annual precipitation: 42 to 48 inches
Mean annual air temperature: 48 to 55 degrees F
Frost-free period: 18 to 200 days

Composition

Preakness, frequently flooded, and similar soils: 85 percent

Description of Preakness, frequently flooded

Setting

Landform: Drainageways
Landform position (two-dimensional): Toeslope
Down-slope shape: Linear
Across-slope shape: Concave
Parent material: Coarse-loamy outwash derived from gneiss, sandstone, conglomerate and basalt

Properties and Qualities

Slope: 0 to 3 percent
Drainage class: Very poorly drained
Capacity of the most limiting layer to transmit water (Ksat): Moderately high or high (0.60 to 6.00 in/hr)
Depth to water table: About 0 to 0 inches
Frequency of flooding: Frequent
Frequency of ponding: Occasional
Calcium carbonate maximum: 0 percent
Available water capacity: Moderate (about 7.1 inches)

Interpretive Groups

Land capability (non irrigated): 6w

Typical Profile

0 to 10 inches: silt loam
10 to 26 inches: fine sandy loam
26 to 35 inches: fine sandy loam
35 to 48 inches: stratified sand to gravelly sandy loam
48 to 66 inches: gravelly sand

APPENDIX C

NJDEP Water Quality Standards

Ground Water Quality Standards - Class IIA by Constituent

Constituents name	casrn	Ground Water Quality *μ g/l or ppb*	Practical Quantitation Level (PQL) *μ g/l or ppb*	Higher of (PQL) and Ground Water *μ g/l or ppb*	InterimType
Acenaphthene	83-32-9	400	10	400	Specific
Acenaphthyene	208-96-8	100	10	100	Interim Specific
Acetone	67-64-1	6000	10	6000	Specific
Acetonitrile	75-05-8	100	9	100	Interim Generic
Acetophenone	98-86-2	700	10	700	Specific
Acrolein	107-02-8	4	5	5	Specific
Acrylamide	79-06-1	0.008	0.2	0.2	Specific
Acrylonitrile	107-13-1	0.06	2	2	Specific
Adipates (Di(ethylhexyl)adipate) (DEHA)	103-23-1	30	3	30	Specific
Alachlor	15972-60-8	0.4	0.1	0.4	Specific
Aldicarb sulfone	1646-88-4	7	0.3	7	Specific
Aldrin	309-00-2	0.002	0.04	0.04	Specific
Aluminum	7429-90-5	200	30	200	Specific
Ammonia	7664-41-7	3000	200	3000	Specific
Aniline	62-53-3	6	2	6	Specific
Anthracene	120-12-7	2000	10	2000	Specific
Antimony (Total)	7440-36-0	6	3	6	Specific
Arsenic (Total)	7440-38-2	0.02	3	3	Specific
Asbestos	1332-21-4	$7X10^6$f/L>10	10^6f/L>10uma	$7X10^6$f/L>10	Specific
Atrazine	1912-24-9	3	0.1	3	Specific
Barium	7440-39-3	6000	200	6000	Specific
Benzo(a)anthracene	56-55-3	0.05	0.1	0.1	Specific
Benzene	71-43-2	0.2	1	1	Specific
Benzidine	92-87-5	0.0002	20	20	Specific
Benzo(a)pyrene(BaP)	50-32-8	0.005	0.1	0.1	Specific
Benzo(b)fluoranthene (3,4-Benzofluoranthene)	205-99-2	0.05	0.2	0.2	Specific
Benzo(ghi)perylene	191-24-2	100	0.3	100	Interim Specific
Benzo(k)fluoranthene	207-08-9	0.5	0.3	0.5	Specific
Benzoic Acid	65-85-0	30000	50	30000	Specific
Benzyl Alcohol	100-51-6	2000	20	2000	Specific
Beryllium	7440-41-7	1	1	1	Specific

Constituents name	casrn	Ground Water Quality μ g/l or ppb	Practical Quantitation Level (PQL) μ g/l or ppb	Higher of (PQL) and Ground Water μ g/l or ppb	InterimType
alpha-BHC (alpha-HCH) (benzenehydrochloride)	319-84-6	0.006	0.02	0.02	Specific
beta-BHC (beta-HCH)	319-85-7	0.02	0.04	0.04	Specific
gamma-BHC (gamma-HCH/Lindane)	58-89-9	0.03	0.02	0.03	Specific
Biphenyl (Diphenyl) (1,1-biphenyl)	92-52-4	400	10	400	Specific
Bis(2-chloroethyl) ether (Dichloroethyl ether)	111-44-4	0.03	7	7	Specific
Bis(2-chloroisopropyl)ether	108-60-1	300	10	300	
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	2	3	3	Specific
Bromodichloromethane(Dichlorobromomethane)	75-27-4	0.6	1	1	Specific
Bromoform	75-25-2	4	0.8	4	Specific
Bromomethane (Methyl bromide)	74-83-9	10	1	10	Specific
2-Butanone (MEK)	78-93-3	300	2	300	Specific
Butylbenzyl phthalate	85-68-7	100	1	100	Specific
Cadmium	7440-43-9	4	0.5	4	Specific
Camphor	76-22-2	1000	0.5	1000	Specific
Caprolactam	105-60-2	3500	5000	3500	Interim Specific
Carbofuran	1563-66-2	40	0.5	40	Specific
Carbon Disulfide	75-15-0	700	1	700	Specific
Carbon Tetrachloride	56-23-5	0.4	1	1	Specific
Chlordane	57-74-9	0.01	0.5	0.5	Specific
Chloride	16887-00-6	250000	2000	250000	Specific
4-Chloro-3-methylphenol (3-Methyl-4-chlorophenol)	59-50-7	100	20	100	Interim Specific
Chlorobenzene	108-90-7	50	1	50	Specific
Chloroethane	75-00-3	5	0.5	5	Interim Generic
Chloroform	67-66-3	70	1	70	Specific
2-Chloronaphthalene	91-58-7	600	10	600	
2-Chlorophenol	95-57-8	40	20	40	Specific
Chlorpyrifos	2921-88-2	20	0.1	20	Specific
Chromium (Total)	7440-47-3	70	1	70	Specific
Chrysene	218-01-9	5	0.2	5	Specific
Cobalt	7440-48-4	100	0.5	100	Interim Specific
Color (measure by "Color Unit")	color	10 CU	5 CU	10 CU	Specific
Copper	7440-50-8	1300	4	1300	Specific
Cumene (isopropyl benzene)	98-82-8	700	1	700	Specific

Constituents name	casrn	Ground Water Quality μ g/l or ppb	Practical Quantitation Level (PQL) μ g/l or ppb	Higher of (PQL) and Ground Water μ g/l or ppb	InterimType
Cyanide (free cyanide)	57-12-5	100	6	100	Specific
Dalapon (2,2-Dichloropropionic acid)	75-99-0	200	0.1	200	Specific
4,4'-DDD (p,p'-TDE)	72-54-8	0.1	0.02	0.1	Specific
4,4'-DDE	72-55-9	0.1	0.01	0.1	Specific
4,4'-DDT	50-29-3	0.1	0.1	0.1	Specific
Demeton	8065-48-3	0.3	1	1	Specific
Dibenz(a,h)anthracene	53-70-3	0.005	0.3	0.3	Specific
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	0.02	0.02	0.02	Specific
Dibromochloromethane (Chlorodibromomethane)	124-48-1	0.4	1	1	Specific
Dichlormid	37764-25-3	600	50	600	Interim Specific
1,3-Dichlorobenzene (meta)	541-73-1	600	5	600	Specific
1,2-Dichlorobenzene (ortho)	95-50-1	600	5	600	Specific
1,4-Dichlorobenzene (para)	106-46-7	75	5	75	Specific
3,3'-Dichlorobenzidine	91-94-1	0.08	30	30	Specific
1,2-Dichloroethane	107-06-2	0.3	2	2	Specific
1,1-Dichloroethane (1,1-DCA)	75-34-3	50	1	50	Specific
1,1-Dichloroethylene (1,1-DCE)	75-35-4	1	1	1	Specific
cis-1,2-Dichloroethylene	156-59-2	70	1	70	Specific
trans-1,2-Dichloroethylene	156-60-5	100	1	100	Specific
2,4-Dichlorophenol	120-83-2	20	10	20	Specific
2,4-Dichlorophenoxyacetic acid (2,4-D)	94-75-7	70	2	70	Specific
1,2-Dichloropropane	78-87-5	0.5	1	1	Interim Generic
1,3-Dichloropropene(cis and trans)	542-75-6	0.4	1	1	Specific
Dieldrin	60-57-1	0.002	0.03	0.03	Specific
Diethyl phthalate	84-66-2	6000	1	6000	Specific
Diisodecyl phthalate (DIDP)	26761-40-0	100	3	100	Specific
Diisopropyl ether (DIPE)	108-20-3	20000	5	20000	Specific
2,4-Dimethyl phenol	105-67-9	100	20	100	Specific
Dimethyl phthalate	131-11-3	100	10	100	Interim Specific
Di-n-butyl phthalate	84-74-2	700	1	700	Specific
4,6-Dinitro-O-Cresol (2 -Methyl-4 .6-Dinitrophenol)	534-52-1	7	1	7	Interim Specific
2,4-Dinitrophenol	51-28-5	10	40	40	Specific
2,4-Dinitrotoluene/2,6-Dinitrotoluene Mix	25321-14-6	0.05	10	10	Specific

Constituents name	casrn	Ground Water Quality μ g/l or ppb	Practical Quantitation Level (PQL) μ g/l or ppb	Higher of (PQL) and Ground Water μ g/l or ppb	InterimType
Di-n-octyl phthalate	117-84-0	100	10	100	
Dinoseb	88-85-7	7	2	7	Specific
1,4-Dioxane	123-91-1	3	10	3	Interim Specific
Diphenyl oxide (ether)	101-84-8	100	10	100	Interim Specific
Diphenylamine	122-39-4	200	20	200	Specific
1,2-Diphenylhydrazine	122-66-7	0.04	20	20	Specific
Diquat	85-00-7	20	2	20	Specific
Endosulfan (alpha and beta)	115-29-7	40	0.1	40	Specific
Beta-Endosulfan (Endosulfan II)	33213-65-9	40	0.04	40	Specific
Alpha-Endosulfan (Endosulfan I)	959-98-8	40	0.02	40	Specific
Endosulfan Sulfate	1031-07-8	40	0.02	40	Specific
Endothall	145-73-3	100	60	100	Specific
Endrin	72-20-8	2	0.03	2	Specific
Epichlorohydrin	106-89-8	4	5	5	Specific
Ethion	563-12-2	4	0.5	4	Specific
Ethyl acetate	141-78-6	6000	10	6000	Specific
Ethyl ether	60-29-7	1000	50	1000	Specific
2-Ethyl-1-hexanol hexanol	104-76-7	200	0.5	200	Interim Specific
Ethylbenzene	100-41-4	700	2	700	Specific
Ethylene dibromide (EDB) (1,2-dibromomethane)	106-93-4	0.0004	0.03	0.03	Specific
Ethylene glycol	107-21-1	300	200	300	Specific
Ethylene glycol monomethyl ether	109-86-4	7	20000	20000	Specific
Fluoranthene	206-44-0	300	10	300	Specific
Fluorene	86-73-7	300	1	300	Specific
Fluoride	7782-41-4	2000	500	2000	
Foaming Agents (ABS/LAS)	foaming	500	0.5	500	Specific
Formaldehyde	50-00-0	100	30	100	Specific
Freon 11 (Trichlorofluoromethane)	75-69-4	2000	1	2000	Specific
Freon 12 (Dichlorodifluoromethane)	75-71-8	1000	2	1000	Specific
Glyphosate	1071-83-6	700	30	700	Specific
Hardness (as CaCO3)	hardness	250000	10000	250000	Specific
Heptachlor	76-44-8	0.008	0.05	0.05	Specific
Heptachlor epoxide	1024-57-3	0.004	0.2	0.2	Specific

Constituents name	casrn	Ground Water Quality μ g/l or ppb	Practical Quantitation Level (PQL) μ g/l or ppb	Higher of (PQL) and Ground Water μ g/l or ppb	InterimType
Heptane (n-Heptane)	142-82-5	100	0.5	100	Interim Generic
Hexachlorobenzene	118-74-1	0.02	0.02	0.02	Specific
Hexachlorobutadiene	87-68-3	0.4	1	1	Specific
Hexachlorocyclopentadiene	77-47-4	40	0.5	40	Specific
Hexachloroethane	67-72-1	2	7	7	Specific
Hexahydro-1,3,5-Trinitro-1,3,5-Triazine (RDX)	121-82-4	0.3	0.5	0.3	Interim Specific
Hexane (n-Hexane)	110-54-3	30	5	30	Specific
2-Hexanone	591-78-6	300	1	300	Interim Specific
Indeno (1,2,3-cd)pyrene	193-39-5	0.05	0.2	0.2	Specific
Iron	7439-89-6	300	20	300	Specific
Isophorone	78-59-1	40	10	40	Specific
Lead (Total)	7439-92-1	5	5	5	Specific
Malathion	121-75-5	100	0.6	100	Specific
Manganese	7439-96-5	50	0.4	50	Specific
Mercury (Total)	7439-97-6	2	0.05	2	Specific
Methanol	67-56-1	4000	70	4000	Specific
Methoxychlor	72-43-5	40	0.1	40	Specific
Methyl acetate	79-20-9	7000	0.5	7000	Specific
Methyl Salicylate	119-36-8	4000	50	4000	Specific
Methyl tert butyl ether (MTBE)	1634-04-4	70	1	70	Specific
2-(2-Methyl-4-chlorophenoxy) propionic acid (MCPP)	93-65-2	7	0.5	7	Interim Specific
Methylene chloride	75-09-2	3	1	3	Specific
2-Methylnaphthalene	91-57-6	30	10	30	Interim Specific
Metolachlor	51218-45-2	100	0.5	100	Interim Specific
Mirex	2385-85-5	0.1	0.08	0.1	Specific
Molybdenum	7439-98-7	40	2	40	Specific
Naphthalene	91-20-3	300	2	300	Specific
n-Butanol (n-butyl alcohol)	71-36-3	700	20	700	Specific
Nickel (Soluble salts)	7440-02-0	100	4	100	Specific
Nitrate	14797-55-8	10000	100	10000	Specific
Nitrate and Nitrite	n&n	10000	10	10000	Specific
Nitrite	14797-65-0	1000	10	1000	Specific
Nitrobenzene	98-95-3	4	6	6	Specific

Constituents name	casrn	Ground Water Quality μ g/l or ppb	Practical Quantitation Level (PQL) μ g/l or ppb	Higher of (PQL) and Ground Water μ g/l or ppb	InterimType
N-Nitrosodimethylamine	62-75-9	0.0007	0.8	0.8	Specific
N-Nitrosodi-n-propylamine (Di-n-propylnitrosamine)	621-64-7	0.005	10	10	Specific
N-Nitrosodiphenylamine	86-30-6	7	10	10	Specific
n-Propanol	71-23-8	100	40	100	Interim Generic
Odor (measure by Threshold Odor Number)	odor	3b	NA	3b	Specific
Oxamyl	23135-22-0	200	1	200	Specific
Parathion	56-38-2	4	0.08	4	Specific
PBBs (Polybrominated biphenyls)	67774-32-7	0.004	0.001	0.004	Specific
PCBs (Polychlorinated biphenyls)	1336-36-3	0.02	0.5	0.5	Specific
Pentachlorophenol	87-86-5	0.3	0.1	0.3	Specific
pH	pH	6.5-8.5	NA	6.5-8.5	Specific
Phenanthrene	85-01-8	100	10	100	Interim Specific
Phenol	108-95-2	2000	10	2000	Specific
Pyrene	129-00-0	200	0.1	200	Specific
Salicylic acid	69-72-7	80	30	80	
Salicylic acid	69-72-7	100	100	100	Interim Specific
Selenium (Total)	7782-49-2	40	4	40	Specific
Silver	7440-22-4	40	1	40	Specific
Simazine	122-34-9	0.3	0.8	0.8	Specific
Sodium	7440-23-5	50000	400	50000	Specific
Styrene	100-42-5	100	2	100	Specific
Sulfate	14808-79-8	250000	5000	250000	Specific
Taste	taste	None Objecti	NA	None Objecti	Specific
t-Butyl alcohol (TBA)	75-65-0	100	2	100	Specific
TDS (Total Dissolved Solids)	TDS	500000	10000	500000	Specific
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6	2e-007	1e-005	1e-005	Specific
1,1,2,2-Tetrachloroethane	79-34-5	1	1	1	Specific
1,1,1,2-Tetrachloroethane	630-20-6	1	1	1	Specific
Tetrachloroethylene (PCE)	127-18-4	0.4	1	1	Specific
2,3,4,6-Tetrachlorophenol	58-90-2	200	3	200	Specific
Tetrahydrofuran	109-99-9	10	10	10	Specific
Thallium	7440-28-0	0.5	2	2	Specific
Toluene	108-88-3	600	1	600	Specific

Constituents name	casrn	Ground Water Quality μ g/l or ppb	Practical Quantitation Level (PQL) μ g/l or ppb	Higher of (PQL) and Ground Water μ g/l or ppb	InterimType
Toxaphene	8001-35-2	0.03	2	2	Specific
1,2,4-Trichlorobenzene	120-82-1	9	1	9	Specific
1,1,2-Trichloroethane	79-00-5	3	2	3	Specific
1,1,1-Trichloroethane (TCA)	71-55-6	30	1	30	Specific
Trichloroethene (TCE) (..ethylene)	79-01-6	1	1	1	Specific
2,4,5-Trichlorophenol	95-95-4	700	10	700	Specific
2,4,6-Trichlorophenol	88-06-2	1	20	20	Specific
2-(2,4,5-trichlorophenoxy)propionic acid (Silvex) (2,4,5-TP)	93-72-1	60	0.6	60	Specific
1,2,3-Trichloropropane	96-18-4	0.005	0.03	0.03	Specific
2,4,6-Trinitrotoluene (TNT)	118-96-7	1	0.3	1	Interim Specific
Vanadium Pentoxide	1314-62-1	60	1	60	Specific
Vinyl Acetate	108-05-4	7000	5	7000	Specific
Vinyl Chloride	75-01-4	0.08	1	1	Specific
Xylenes (Total)	1330-20-7	1000	2	1000	Specific
Zinc	7440-66-6	2000	10	2000	Specific

Ground Water Explaination of Terms

***** = Ground Water Quality Criteria and PQLs are expressed as ug/L unless otherwise noted. Table 1 criteria are all maximum values unless clearly indicated as a range for which the minimum value is to the left and the maximum value is to the right.**
****** = revised via administrative change (see 39 N.J.R. 3538(a)).**
PQL = Practical Quantitation Level as defined in N.J.A.C. 7:9C-1.4
CASRN = Chemical Abstracts System Registration Number
NA = not available for this constituent.
a = Asbestos criterion is measured in terms of fibers/L longer than 10 micrometers (f/L > 10 um)
ug = micrograms, L = liter, f = fibers, CU= Standard Cobalt Units
b = Odor Threshold Number, mg = milligrams, H = Hardness
(Total) = means the concentration of metal in an unfiltered sample following treatment with hot dilute mineral acid (as defined in "Methods for Chemical Analysis of Water_Wastes", EPA-600/4-79-020, March 1979) or other digestion defined by the analytical method. However samples that contain less than 1 nephlometric turbidity unit (NTU) and are properly preserved, may be directly analyzed without digestion.
m = Pursuant to prevailing Safe Drinking Water Act Regulations any positive result for fecal coliform is in violation of the MCL and is therefore an exceedance of the ground water quality standards.

Drinking Water Standards by Constituent

constituents name	casrn	standard μ g/l or ppb (unless otherwise specified)	type	comment
Adipates (Di(ethylhexyl)adipate) (DEHA)	103-23-1	400	Primary	FEDERAL MCL
Alachlor	15972-60-8	2	Primary	FEDERAL MCL - No monitoring required
Aldicarb	116-06-3	3	Primary	FEDERAL MCL - No monitoring required
Aldicarb sulfone	1646-88-4	2	Primary	FEDERAL MCL - No monitoring required
Aldicarb sulfoxide	1646-87-3	4	Primary	FEDERAL MCL
Aluminum	7429-90-5	200	Secondary	STATE RUL - Recommended upper limit
Antimony (Total)	7440-36-0	6	Primary	FEDERAL MCL
Arsenic (Total)	7440-38-2	5	Primary	STATE MCL
Asbestos	1332-21-4	$7x10^{6}$ fibers/l >10 um	Primary	FEDERAL MCL
Atrazine	1912-24-9	3	Primary	FEDERAL MCL
Barium	7440-39-3	2000	Primary	FEDERAL MCL
Benzene	71-43-2	1	Primary	STATE MCL
Beta particle /Photon radioactivity	Beta/Photon	4 mrem/yr.	Primary	FEDERAL MCL
Benzo(a)pyrene(BaP)	50-32-8	0.2	Primary	FEDERAL MCL
Beryllium	7440-41-7	4	Primary	FEDERAL MCL
BHC (gamma-HCH/Lindane)	58-89-9	0.2	Primary	FEDERAL MCL
Bis(2-ethylhexyl) phthalate (DEHP)	117-81-7	6	Primary	FEDERAL MCL
Bromate	15541-45-4	10	Primary	FEDERAL MCL
Bromoacetic Acid	79-08-3	See Haloacetic Acids	Primary	FEDERAL MCL
Bromodichloromethane(Dichlorobromo methane)	75-27-4	See Trihalomethanes	Primary	FEDERAL MCL
Bromoform	75-25-2	See Trihalomethanes	Primary	FEDERAL MCL
Cadmium	7440-43-9	5	Primary	FEDERAL MCL
Carbofuran	1563-66-2	40	Primary	FEDERAL MCL
Carbon Tetrachloride	56-23-5	2	Primary	STATE MCL
Chloramines	10599-90-3	4000 (as Cl_2)	Primary	FEDERAL -Maximum residential disinfectant level (MRDL)
Chlordane	57-74-9	0.5	Primary	STATE MCL
Chloride	16887-00-6	250,000	Secondary	STATE -RUL - Recommended upper limit
Chlorine dioxide	10049-04-4	800 (as ClO_2)	Primary	FEDERAL -Maximum residential disinfectant level (MRDL)
Chlorine	7782-50-5	4000 (as Cl_2)	Primary	FEDERAL -Maximum residential disinfectant level (MRDL)
Chlorite	7758-19-2	1,000	Primary	FEDERAL MCL
Chlorobenzene	108-90-7	50	Primary	STATE MCL

constituents name	casrn	standard μ g/l or ppb (unless otherwise specified)	type	comment
Chloroform	67-66-3	See Trihalomethanes	Primary	FEDERAL MCL
Chromium (Total)	7440-47-3	100	Primary	FEDERAL MCL
Coliform bacteria	Coliform bacteria	Presence or absence	Primary	FEDERAL MCL
Color (measure by "Color Unit")	color	10 color units	Secondary	STATE RUL
Copper	7440-50-8	1300	Primary	FEDERAL Action Level
Cyanide (free cyanide)	57-12-5	200	Primary	FEDERAL MCL
Dalapon (2,2-Dichloropropionic acid)	75-99-0	200	Primary	FEDERAL MCL
Dibromoacetic Acid	631-64-1	See Haloacetic Acids	Primary	FEDERAL MCL
Dibromochloromethane (Chlorodibromomethane)	124-48-1	See Trihalomethanes	Primary	FEDERAL MCL
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	0.2	Primary	FEDERAL MCL
Dichloroacetic acid	79-43-6	See Haloacetic Acids	Primary	FEDERAL MCL
1,2-Dichlorobenzene (ortho)	95-50-1	600	Primary	FEDERAL MCL
1,3-Dichlorobenzene (meta)	541-73-1	600	Primary	STATE MCL
1,4-Dichlorobenzene (para)	106-46-7	75	Primary	FEDERAL MCL
1,1-Dichloroethane (1,1-DCA)	75-34-3	50	Primary	STATE MCL
1,2-Dichloroethane	107-06-2	2	Primary	STATE MCL
cis-1,2-Dichloroethylene	156-59-2	70	Primary	FEDERAL MCL
trans-1,2-Dichloroethylene	156-60-5	100	Primary	FEDERAL MCL
1,1-Dichloroethylene (1,1-DCE)	75-35-4	2	Primary	STATE MCL
2,4-Dichlorophenoxyacetic acid (2,4-D)	94-75-7	70	Primary	FEDERAL MCL
1,2-Dichloropropane	78-87-5	5	Primary	FEDERAL MCL
Dinoseb	88-85-7	7	Primary	FEDERAL MCL
Diquat	85-00-7	20	Primary	FEDERAL MCL
E. Coli	ecoli	0	Primary	FEDERAL MCL
Endothall	145-73-3	100	Primary	FEDERAL MCL
Endrin	72-20-8	2	Primary	FEDERAL MCL
Ethylbenzene	100-41-4	700	Primary	FEDERAL MCL
Ethylene dibromide (EDB) (1,2-Dibromoethane)	106-93-4	0.05	Primary	FEDERAL MCL
Fecal Coliform	fecal	0	Primary	FEDERAL MCL
Fluoride	16984-48-8	4,000	Primary	FEDERAL MCL
Fluoride	16984-48-8	2,000	Secondary	STATE RUL - Recommended upper limit
Foaming Agents (ABS/LAS)	foaming	500	Secondary	STATE RUL - Recommended upper limit
Glyphosate	1071-83-6	700	Primary	FEDERAL MCL
Gross Alpha	grossalpha	15 (pCi/l)	Primary	FEDERAL MCL
Haloacetic Acids	haloacids	60 (Total of 5 individual HAAs)	Primary	FEDERAL MCL

constituents name	casrn	standard μ g/l or ppb (unless otherwise specified)	type	comment
Hardness (as CaCO3)	hardness	250,000	Secondary	STATE RUL - Recommended upper limit
Heptachlor	76-44-8	0.4	Primary	FEDERAL MCL
Heptachlor epoxide	1024-57-3	0.2	Primary	FEDERAL MCL
Hexachlorobenzene	118-74-1	1	Primary	FEDERAL MCL
Hexachlorocyclopentadiene	77-47-4	50	Primary	FEDERAL MCL
Iron	7439-89-6	300	Secondary	STATE RUL - Recommended upper limit
Lead (Total)	7439-92-1	15	Primary	FEDERAL Action Level
Manganese	7439-96-5	50	Secondary	STATE RUL - Recommended upper limit
Mercury (Inorganic)	7439-97-6	2	Primary	FEDERAL MCL
Methoxychlor	72-43-5	40	Primary	FEDERAL MCL
Methyl tert butyl ether (MTBE)	1634-04-4	70	Primary	STATE MCL
Methylene chloride	75-09-2	3	Primary	STATE MCL
Monochloroacetic acid	79-11-8	See Haloacetic Acids	Primary	FEDERAL MCL
Naphthalene	91-20-3	300	Primary	STATE MCL
Nickel (Soluble salts)	7440-02-0		Primary	FEDERAL - No MCL - Monitoring Required
Nitrate	84145-82-4	10,000	Primary	FEDERAL MCL
Nitrite	14797-65-0	1,000	Primary	FEDERAL MCL
Odor (measure by Threshold Odor Number)	odor	3	Secondary	STATE RUL - Recommended upper limit
Oxamyl	23135-22-0	200	Primary	FEDERAL MCL
Pentachlorophenol	87-86-5	1	Primary	FEDERAL MCL
pH	pH	6.5-8.5	Secondary	STATE - Optimum range
Picloram	1918-02-1	500	Primary	FEDERAL MCL
PCBs (Polychlorinated biphenyls)	1336-36-3	0.5	Primary	FEDERAL MCL
Radium-226 & Radium-228 combined	r&r	5 (pCi/l)	Primary	FEDERAL MCL
Selenium (Total)	7782-49-2	50	Primary	FEDERAL MCL
Silver	7440-22-4	100	Secondary	STATE RUL - Recommended upper limit
Simazine	122-34-9	4	Primary	FEDERAL MCL
Sodium	7440-23-5	50,000	Secondary	STATE RUL - Recommended upper limit
Styrene	100-42-5	100	Primary	FEDERAL MCL
Sulfate	14808-79-8	250,000	Secondary	STATE RUL - Recommended upper limit
Taste	taste	No objectionable taste	Secondary	STATE RUL Recommended upper limit
TDS (Total Dissolved Solids)	TDS	500,000	Secondary	STATE RUL Recommended upper limit
2,3,7,8-Tetrachlorodibenzo-p-dioxin (TCDD)	1746-01-6	3 x 10-5	Primary	FEDERAL MCL

constituents name	casrn	standard μ g/l or ppb (unless otherwise specified)	type	comment
1,1,2,2-Tetrachloroethane	79-34-5	1	Primary	STATE MCL
Tetrachloroethylene (PCE)	127-18-4	1	Primary	STATE MCL
Thallium	7440-28-0	2	Primary	FEDERAL MCL
Toluene	108-88-3	1,000	Primary	FEDERAL MCL
Toxaphene	8001-35-2	3	Primary	FEDERAL MCL
Trichloroacetic acid	76-03-9	See Haloacetic Acids	Primary	FEDERAL MCL
1,2,4-Trichlorobenzene	120-82-1	9	Primary	STATE MCL
1,1,1-Trichloroethane (TCA)	71-55-6	30	Primary	STATE MCL
1,1,2-Trichloroethane	79-00-5	3	Primary	STATE MCL
Trichloroethene (TCE) (Trichloroethylene)	79-01-6	1	Primary	STATE MCL
2-(2,4,5-Trichlorophenoxy)propionic acid (Silvex) (2,4,5-TP)	93-72-1	50	Primary	FEDERAL MCL
Trihalomethanes	trihalom	80 (total of four individual THMs)	Primary	FEDERAL MCL
Uranium	7440-61-1	30	Primary	FEDERAL MCL
Vinyl chloride	75-01-4	2	Primary	FEDERAL MCL
Xylenes (Total)	1330-20-7	1000	Primary	STATE MCL
Zinc	7440-66-6	5,000	Secondary	STATE RUL - Recommended upper limit

Drinking Water Explanation of Terms

**** Coliform bacteria standards are based on the presence or absence of coliforms in a sample. The number of samples collected by a public water system is determined by the size of the population served. A system collecting at least 40 samples/month can have coliform in no more than 5% of the samples. A system collecting fewer than 40 samples/month can have no more than one coliform positive. Any number exceeding these amounts triggers an MCL exceedance.***

For more information of Drinking Water Standards contact the Division of Water Supply, Safe Drinking Water Technical Assistance at (609) 292-5550

N. J. A. C. 7:9B

Surface Water Quality Standards

Statutory Authority: N.J.S.A. 58:10A-1 et seq., 58:11A-1 et seq., and 13:1D-1 et seq.

Re-adopted: November 16, 2009 (41 N.J.R. 4735(a))
Last Amended - January 4, 2010 (42 N.J.R. 68(a))
For regulatory history and effective dates, see the New Jersey Administrative Code

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7:9B-1.14(d) General Surface Water Quality Criteria for FW2, SE and SC Waters:
(Expressed as Maximum concentrations unless otherwise noted)

Substance	Criteria		Classifications
1. Bacterial quality (Counts/100 ml)	i.	Shellfish Harvesting: Bacterial Indicators shall not exceed, in all shellfish waters, the standard for approved shellfish waters as established by the National Shellfish Sanitation Program as set forth in its current manual of operations.	Shellfish Waters
ii. Primary Contact Recreation:			
(1) Enterococci levels shall not exceed a geometric mean of 35/100 ml, or a single sample maximum of 104/100 ml.			SE1 and SC
(2) E. Coli levels shall not exceed a geometric mean of 126/100 ml or a single sample maximum of 235/100 ml.			All FW2
iii. Secondary Contact Recreation:			
(1) Fecal coliform levels shall not exceed a geometric mean of 770/100 ml.			SE2
(2) Fecal coliform levels shall not exceed a geometric mean of 1500/100ml.			SE3
2. Dissolved oxygen (mg/L)	i.	Not less than 7.0 at any time;	FW2-TP
ii.	24 hour average not less than 6.0. Not less than 5.0 at any time (see paragraph viii below);		FW2-TM
iii.	24 hour average not less than 5.0, but not less than 4.0 at any time (see paragraph viii below);		FW2-NT (except as in iv below), SE1
iv.	Not less than 4.0 at any time;		Tidal portions of FW2-NT tributaries to the Delaware River, between Rancocas Creek and Big Timber Creek inclusive.

7:9B-1.14(d) General Surface Water Quality Criteria for FW2, SE and SC Waters:
(Expressed as Maximum concentrations unless otherwise noted)

	Substance		Criteria	Classifications
v.	Not less than 5.0 at any time;			SC
vi.	Not less than 4.0 at any time;			SE2
vii.	Not less than 3.0 at any time; and			SE3
viii.	Supersaturated dissolved oxygen values shall be expressed as their corresponding 100 percent saturation values for purposes of calculating 24 hour averages.			FW2-TM, FW2-NT, SE1
3.	Floating, colloidal, color and settleable solids; petroleum hydrocarbons and other oils and grease	i.	None noticeable in the water or deposited along the shore or on the aquatic substrata in quantities detrimental to the natural biota. None which would render the waters unsuitable for the designated uses.	All Classifications
4.	pH (Standard Units)	i.	6.5-8.5	FW2 waters listed at 1.15(d), (f), (g) and (i), All SE
ii.	4.5 – 7.5			FW2 waters listed at 1.15(c), (e) and (h)
iii.	Natural pH conditions shall prevail.			SC
5.	Phosphorus, Total (mg/L)	i.	Lakes: Phosphorus as total P shall not exceed 0.05 in any lake, pond or reservoir, or in a tributary at the point where it enters such bodies of water, except where watershed or site-specific criteria are developed pursuant to N.J.A.C. 7:9B-1.5(g)3.	FW2

7:9B-1.14(d) General Surface Water Quality Criteria for FW2, SE and SC Waters:
(Expressed as Maximum concentrations unless otherwise noted)

	Substance		Criteria	Classifications
ii.	Streams: Except as necessary to satisfy the more stringent criteria in paragraph i above or where watershed or site-specific criteria are developed pursuant to N.J.A.C 7:9B-1.5(g)3, phosphorus as total P shall not exceed 0.1 in any stream, unless it can be demonstrated that total P is not a limiting nutrient and will not otherwise render the waters unsuitable for the designated uses.			FW2
6.	Radioactivity	i.	Prevailing regulations including all amendments and future supplements thereto adopted by the U.S. Environmental Protection Agency pursuant to Sections 1412, 1445, and 1450 of the Public Health Services Act, as amended by the Safe Drinking Water Act (PL 93-523)	All Classifications
7.	Solids, Suspended (mg/L) (Non-filterable residue)	i.	25.0	FW2-TP, FW2-TM
ii.	40.0			FW2-NT
iii.	None of which would render the water unsuitable for the designated uses.			All SE, SC
8.	Solids, Total Dissolved (mg/L) (Filterable Residue)	i.	No increase in background which may adversely affect the survival, growth or propagation of the aquatic biota. Compliance with water quality-based WET limitations or $LC_{50} \geq 50$ percent, whichever is more stringent, shall be deemed to meet this requirement.	FW2
ii.	No increase in background which would interfere with the designated or existing uses, or 500 mg/L, whichever is more stringent.			FW2
iii.	None which would render the water unsuitable for the designated uses.			All SE
9.	Sulfate (mg/L)	i.	250	FW2

7:9B-1.14(d) General Surface Water Quality Criteria for FW2, SE and SC Waters:
(Expressed as Maximum concentrations unless otherwise noted)

	Substance		Criteria	Classifications
10.	Taste and odor producing substances	i.	None offensive to humans or which would produce offensive taste or odors in water supplies and biota used for human consumption. None which would render the water unsuitable for the designated uses.	All Classifications
11.	Temperature	i.	Temperatures shall not exceed a daily maximum of 22 degrees Celsius or rolling seven-day average of the daily maximum of 19 degrees Celsius, unless due to natural conditions	FW2-TP
ii.	Temperatures shall not exceed a daily maximum of 25 degrees Celsius or rolling seven-day average of the daily maximum of 23 degrees Celsius, unless due to natural conditions			FW2-TM
iii.	Temperatures shall not exceed a daily maximum of 31 degrees Celsius or rolling seven-day average of the daily maximum of 28 degrees Celsius, unless due to natural conditions			FW2-NT
iv.	No thermal alterations which would cause temperatures to exceed 29.4 degrees Celsius (85 degree Fahrenheit) Summer seasonal average			SE
v.	No thermal alterations which would cause temperatures to exceed 26.7 degrees Celsius (80 degree Fahrenheit) Summer seasonal average			SC
12.	Toxic Substances (general)	i.	None, either alone or in combination with other substances, in such concentrations as to affect humans or be detrimental to the natural aquatic biota, produce undesirable aquatic life, or which would render the waters unsuitable for the designated uses.	All Classifications
ii.	None which would cause standards for drinking water to be exceeded after appropriate treatment.			FW2

7:9B-1.14(d) General Surface Water Quality Criteria for FW2, SE and SC Waters:
(Expressed as Maximum concentrations unless otherwise noted)

	Substance	Criteria	Classifications
iii.		Toxic substances shall not be present in concentrations that cause acute or chronic toxicity to aquatic biota, or bioaccumulate within an organism to concentrations that exert a toxic effect on that organism or render it unfit for consumption.	All Classifications
iv.		The concentrations of nonpersistent toxic substances in the State's waters shall not exceed one-twentieth (0.05) of the acute definitive LC_{50} or EC_{50} value, as determined by appropriate bioassays conducted in accordance with N.J.A.C. 7:18.	All Classifications
v.		The concentration of persistent toxic substances in the State's waters shall not exceed one-hundredeth (0.01) of the acute definitive LC_{50} or EC_{50} value, as determined by appropriate bioassays conducted in accordance with N.J.A.C. 7:18.	All Classifications
13.	Turbidity (Nephelometric Turbidity Unit-NTU)	i. Maximum 30-day average of 15 NTU, a maximum of 50 NTU at any time.	FW2, SE3
ii.		Maximum 30-day average of 10 NTU, a maximum of 30 NTU at any time.	SE1, SE2
iii.		Levels shall not exceed 10.0 NTU.	SC

(e) Surface Water Quality Criteria for Ammonia are derived in accordance with the formulas set forth below. Acute criteria are expressed as three-hour average using MA1CD10 flow and chronic criteria are expressed as 30-day average using MA30CD10 flow. No exceedance of criteria shall be permitted at or above the design flows specified.

	CAS Number		Criteria	Classification
Ammonia, un-ionized (mg NH_3-N/L)	7664-41-7	(1)	at pH < 8.30 $0.179*10^{0.026(Temp-20) + 0.41 (pH-7.80)}$(a) $0.046*10^{0.026(Temp-20) + 0.41 (pH-7.80)}$(c) at pH ≥ 8.30 $0.179*10^{0.026(Temp-20) + 0.20}$(a) $0.046*10^{0.026(Temp-20) + 0.20}$(c)	FW2-TP, FW2-TM
		(2)	at pH < 8.30 $0.201*10^{0.026(Temp-20) + 0.41 (pH-7.80)}$(a) (Summer[1]) $0.054*10^{0.026(Temp-20) + 0.41 (pH-7.80)}$(c) (Summer[1]) $0.232*10^{0.026(Temp-20) + 0.41 (pH-7.80)}$(a) (Winter[2]) $0.060*10^{0.026(Temp-20) + 0.41 (pH-7.80)}$(c) (Winter[2]) at pH ≥ 8.30 $0.201*10^{0.026(Temp-20) + 0.20}$(a) (Summer[1]) $0.054*10^{0.026(Temp-20) + 0.20}$(c) (Summer[1]) $0.232*10^{0.026(Temp-20) + 0.20}$(a) (Winter[2]) $0.060*10^{0.026(Temp-20) + 0.20}$(c) (Winter[2])	FW2-NT
		(3)	at pH < 8.30 $0.238*10^{0.026(Temp-20) + 0.41 (pH-7.80)}$(a) $0.061*10^{0.026(Temp-20) + 0.41 (pH-7.80)}$(c)	PL
		(4)	0.115(a); 0.030(c)	All SE
		(5)	0.094(a); 0.024(c)	SC

1	Summer spawning period from March 1st through October 31st.
2	Winter non-spawning period from November 1st through February 28/29th.
(a)	Acute aquatic life protection criterion
(c)	Chronic aquatic life protection criterion

(f) Surface Water Quality Criteria for Toxic Substances are as follows:

1. Acute aquatic life protection criteria are determined with no exceedance at or above the MA1CD10 flow and expressed as one-hour average except,
   i. for copper the criteria are expressed as 24-hour average, and
   ii. for cadmium, chromium, lead, mercury, nickel, silver, and zinc the criteria are expressed as 6-hour average.
2. Chronic aquatic life protection criteria are determined with no exceedance at or above the MA7CD10 flow and expressed as four-day average.
3. Freshwater aquatic criteria for cadmium, chromium III, copper, nickel, silver, and zinc are expressed as a function of water hardness. Criteria can be calculated at any hardness using these equations as listed below. Criteria thus calculated are multiplied by appropriate conversion factor (CF) to convert total recoverable metal into dissolved metal and by the default Water Effect Ratio (WER) of 1.0.

General formula $WER\ [e^{(V[\ln(\text{hardness})] + \ln A - V[\ln Z])}]\ CF$

where:

V = pooled slope
A = FAV at given hardness
Z = selected value of hardness

Cadmium:

Acute dissolved criterion $WER\ [e^{(1.0166\ (\ln[\text{hardness}])-3.924)}]\ 0.651$

Chronic dissolved criterion $WER\ [e^{(0.7409\ (\ln[\text{hardness}])-4.719)}]\ 0.651$

Chromium III:

Acute dissolved criterion $WER\ [e^{(0.819\ (\ln[\text{hardness}])+3.7256)}]\ 0.277$

Chronic dissolved criterion $WER\ [e^{(0.819\ (\ln[\text{hardness}])+0.6848)}]\ 0.277$

Copper:

Acute dissolved criterion $WER\ [e^{(0.9422\ (\ln[\text{hardness}])-1.7)}]\ 0.908$

Chronic dissolved criterion $WER\ [e^{(0.8545\ (\ln[\text{hardness}])-1.702)}]\ 0.908$

Nickel:

Acute dissolved criterion $WER\ [e^{(0.846\ (\ln[\text{hardness}])+2.255)}]\ 0.846$

Chronic dissolved criterion $WER\ [e^{(0.846\ (\ln[\text{hardness}])+0.0584)}]\ 0.846$

Silver:

Acute dissolved criterion	$WER\ [e^{(1.72\ (ln\ [hardness])-6.59)}]\ 0.85$

Zinc:

Acute or dissolved criterion	$WER\ [e^{(0.8473\ (ln\ [hardness])+0.884)}]\ 0.950$
Chronic dissolved criterion	$WER\ [e^{(0.8473\ (ln\ [hardness])+0.884)}]\ 0.950$

4. Freshwater criteria for pentachlorophenol are expressed as a function of pH. Criteria are derived in accordance with the formula set forth below:
   $Acute\ criterion = e^{(1.005[pH]-4.869)}$
   $Chronic\ criterion = e^{(1.005[pH]-5.134)}$
5. Human health noncarcinogenic effect-based criteria are expressed as a 30-day average with no frequency of exceedance at or above the MA7CD10 flow.
6. Human health carcinogenic effect-based criteria are based on a risk level of one-in-one-million and are expressed as a 70-year average with no frequency of exceedance at or above the design flow as specified at N.J.A.C. 7:9B-1.5(c)2iii.

7. SURFACE WATER QUALITY CRITERIA FOR TOXIC SUBSTANCES:

(µg/L)

Toxic Substance	CAS Number	Fresh Water (FW2) Criteria			Saline Water (SE & SC) Criteria		
		Aquatic		HumanHealth	Aquatic		Human Health
		Acute	Chronic		Acute	Chronic	
Acenaphthene	83-32-9			670(h)			990(h)
Acrolein	107-02-8			6.1(h)			9.3(h)
Acrylonitrile	107-13-1			0.051(hc)			0.25(hc)
Aldrin	309-00-2	3.0		0.000049(hc)	1.3		0.000050(hc)
Ammonia, un-ionized	7664-41-7	See N.J.A.C. 7:9B-1.14(e)			See N.J.A.C. 7:9B-1.14(e)		
Anthracene	120-12-7			8,300(h)			40,000(h)
Antimony	7440-36-0			5.6(h)(T)			640(h)(T)
Arsenic	7440-38-2	340(d)(s)	150(d)(s)	0.017(hc)(T)	69(d)(s)	36(d)(s)	0.061(hc)(T)
Asbestos	1332-21-4			$7x10^6$fibers/L >10µm(h)			
Barium	7440-39-3			2,000(h)(T)			
Benz(a)anthracene	56-55-3			0.038(hc)			0.18(hc)
Benzene	71-43-2			0.15(hc)			3.3(hc)
Benzidine	92-87-5			0.000086(hc)			0.00020(hc)
3,4-Benzofluoranthene (Benzo(b)fluoranthene)	205-99-2			0.038(hc)			0.18(hc)
Benzo(k)fluoranthene	207-08-9			0.38(hc)			1.8(hc)
Benzo(a)pyrene (BaP)	50-32-8			0.0038(hc)			0.018(hc)
Beryllium	7440-41-7			6.0(h)(T)			42(h)(T)
alpha-BHC (alpha-HCH)	319-84-6			0.0026(hc)			0.0049(hc)
beta-BHC (beta-HCH)	319-85-7			0.0091(hc)			0.017(hc)
gamma-BHC (gamma-HCH/Lindane)	58-89-9	0.95		0.98(h)	0.16		1.8(h)
Bis(2-chloroethyl) ether	111-44-4			0.030(hc)			0.53(hc)
Bis(2-chloroisopropyl) ether	108-60-1			1,400(h)			65,000(h)
Bis(2-ethylhexyl) phthalate	117-81-7			1.2(hc)			2.2(hc)
Bromodichloromethane (Dichlorobromomethane)	75-27-4			0.55(hc)			17(hc)
Bromoform	75-25-2			4.3(hc)			140(hc)
Butyl benzyl phthalate	85-68-7			150(h)			190(h)
Cadmium	7440-43-9	(a)	(a)	3.4(h)(T)	40(d)(s)	8.8(d)(s)	16(h)(T)
Carbon tetrachloride	56-23-5			0.33(hc)			2.3(hc)
Chlordane	57-74-9	2.4	0.0043	0.00010(hc)	0.09	0.0040	0.00011(hc)

Toxic Substance	CAS Number	Fresh Water (FW2) Criteria			Saline Water (SE & SC) Criteria		
		Aquatic		Human Health	Aquatic		Human Health
		Acute	Chronic		Acute	Chronic	
Chloride	16887-00-6	860,000	230,000	250,000(ol)			
Chlorine Produced Oxidants (CPO)	7782-50-5	19	11		13	7.5	
Chlorobenzene	108-90-7			210(h)			2,500(h)
Chloroform	67-66-3			68(h)			2,100(h)
2-Chloronaphthalene	91-58-7			1,000(h)			1,600(h)
2-Chlorophenol	95-57-8			81(h)			150(h)
Chlorpyrifos	2921-88-2	0.083	0.041		0.011	0.0056	
Chromium	7440-47-3			92(h)(T)			750(h)(T)
Chromium^{+3}	16065-83-1	(a)	(a)				
Chromium^{+6}	18540-29-9	15(d)(s)	10(d)(s)		1,100(d)(s)	50(d)(s)	
Chrysene	218-01-9			3.8(hc)			18(hc)
Copper	7440-50-8	(a)	(a)	1,300(h)(T)	4.8(d)(s)	3.1(d)(s)	
Cyanide (Total)	57-12-5	22(fc)	5.2(fc)	140(h)	2.7(fc)	2.7(fc)	140(h)
4,4'-DDD (p,p'-TDE)	72-54-8			0.00031(hc)			0.00031(hc)
4,4'-DDE	72-55-9			0.00022(hc)			0.00022(hc)
4,4'-DDT	50-29-3	1.1	0.0010	0.00022(hc)	0.13	0.0010	0.00022(hc)
Demeton	8065-48-3		0.1			0.1	
Dibenz(a,h)anthracene	53-70-3			0.0038(hc)			0.018(hc)
Dibromochloromethane (Chlorodibromomethane)	124-48-1			0.40(hc)			13(hc)
Di-n-butyl phthalate	84-74-2			2,000(h)			4,500(h)
1,2-Dichlorobenzene	95-50-1			2,000(h)			6,200(h)
1,3-Dichlorobenzene	541-73-1			2,200(h)			8,300(h)
1,4-Dichlorobenzene	106-46-7			550(h)			2,200(h)
3,3'-Dichlorobenzidine	91-94-1			0.021(hc)			0.028(hc)
1,2-Dichloroethane	107-06-2			0.29(hc)			28(hc)
1,1-Dichloroethylene	75-35-4			4.7(h)			100(h)
trans-1,2-Dichloroethylene	156-60-5			590(h)			43,000(h)
2,4-Dichlorophenol	120-83-2			77(h)			290(h)
1,2-Dichloropropane	78-87-5			0.50(hc)			15(hc)
1,3-Dichloropropene (cis and trans)	542-75-6			0.34(hc)			21(hc)

Toxic Substance	CAS Number	Fresh Water (FW2) Criteria			Saline Water (SE & SC) Criteria		
		Aquatic		Human Health	Aquatic		Human Health
		Acute	Chronic		Acute	Chronic	
Dieldrin	60-57-1	0.24	0.056	0.000052(hc)	0.71	0.0019	0.000054(hc)
Diethyl phthalate	84-66-2			17,000(h)			44,000(h)
2,4-Dimethyl phenol	105-67-9			380(h)			850(h)
4,6-Dinitro-o-cresol	534-52-1			13(h)			280(h)
2,4-Dinitrophenol	51-28-5			69(h)			5,300(h)
2,4-Dinitrotoluene	121-14-2			0.11(hc)			3.4(hc)
1,2-Diphenylhydrazine	122-66-7			0.036(hc)			0.20(hc)
Endosulfans (alpha and beta)	115-29-7	0.22	0.056	62(h)	0.034	0.0087	89(h)
Endosulfan sulfate	1031-07-8			62(h)			89(h)
Endrin	72-20-8	0.086	0.036	0.059(h)	0.037	0.0023	0.060(h)
Endrin aldehyde	7421-93-4			0.059(h)			0.060(h)
Ethylbenzene	100-41-4			530(h)			2,100(h)
Fluoranthene	206-44-0			130(h)			140(h)
Fluorene	86-73-7			1,100(h)			5,300(h)
Guthion	86-50-0		0.01			0.01	
Heptachlor	76-44-8	0.52	0.0038	0.000079(hc)	0.053	0.0036	0.000079(hc)
Heptachlor epoxide	1024-57-3	0.52	0.0038	0.000039(hc)	0.053	0.0036	0.000039(hc)
Hexachlorobenzene	118-74-1			0.00028(hc)			0.00029(hc)
Hexachlorobutadiene	87-68-3			0.44(hc)			18(hc)
Hexachlorocyclopenta-diene	77-47-4			40(h)			1,100(h)
Hexachloroethane	67-72-1			1.4(hc)			3.3(hc)
Indeno(1,2,3-cd)pyrene	193-39-5			0.038(hc)			0.18(hc)
Isophorone	78-59-1			35(hc)			960(hc)
Lead	7439-92-1	38(d)(s)	5.4(d)(s)	5.0(h)(T)	210(d)(s)	24(d)(s)	
Malathion	121-75-5		0.1			0.1	
Manganese	7439-96-5						100(h)(T)
Mercury	7439-97-6	1.4(d)(s)	0.77(d)(s)	0.050(h)(T)	1.8(d)(s)	0.94(d)(s)	0.051(h)(T)
Methoxychlor	72-43-5		0.03	40(h)		0.03	
Methyl bromide (bromomethane)	74-83-9			47(h)			1,500(h)
Methyl t-butyl ether (MTBE)	1634-04-4			70(h)			

Toxic Substance	CAS Number	Fresh Water (FW2) Criteria			Saline Water (SE & SC) Criteria		
		Aquatic		Human Health	Aquatic		Human Health
		Acute	Chronic		Acute	Chronic	
Methylene chloride	75-09-2			2.5(hc)			310(hc)
Mirex	2385-85-5		0.001			0.001	
Nickel	7440-02-0	(a)	(a)	500(h)(T)	64(d)(s)	22(d)(s)	1,700(h)(T)
Nitrate (as N)	14797-55-8			10,000(h)			
Nitrobenzene	98-95-3			17(h)			690(h)
N-Nitrosodi-n-butylamine	924-16-3			0.0063(hc)			0.22(hc)
N-Nitrosodiethylamine	55-18-5			0.00023(hc)			0.13(hc)
N-Nitrosodimethylamine	62-75-9			0.00069(hc)			3.0(hc)
N-Nitrosodiphenylamine	86-30-6			3.3(hc)			6.0(hc)
N-Nitrosodi-n-propylamine (Di-n-propylnitrosamine)	621-64-7			0.0050(hc)			0.51(hc)
N-Nitrosopyrrolidine	930-55-2			0.016(hc)			34(hc)
Parathion	56-38-2	0.065	0.013				
Pentachlorobenzene	608-93-5			1.4(h)			1.5(h)
Pentachlorophenol	87-86-5	(b)	(b)	0.27(hc)	13	7.9	3.0(hc)
Phenol	108-95-2			10,000(h)			860,000(h)
Phosphorous (yellow)	7723-14-0					0.1	
Polychlorinated biphenyls (PCBs)	1336-36-3		0.014	0.000064(hc)		0.030	0.000064(hc)
Pyrene	129-00-0			830(h)			4,000(h)
Selenium	7782-49-2	20(s)	5.0(s)	170(h)(T)	290(d)(s)	71(d)(s)	4,200(h)(T)
Silver	7440-22-4	(a)		170(h)(T)	1.9(d)(s)		40,000(h)(T)
Sulfide-hydrogen sulfide (undissociated)	7783-06-4		2			2	
1,2,4,5-Tetrachlorobenzene	95-94-3			0.97(h)			1.1(h)
2,3,7,8-Tetrachlorodibenzo -p-dioxin (TCDD)	1746-01-6			0.0000000050(hc)			0.0000000051(hc)
1,1,2,2-Tetrachloroethane	79-34-5			4.7(h)			110(h)
Tetrachloroethylene	127-18-4			0.34(hc)			1.6(hc)
Thallium	7440-28-0			0.24(h)(T)			0.47(h)(T)
Toluene	108-88-3			1,300(h)			15,000(h)
Toxaphene	8001-35-2	0.73	0.0002	0.00028(hc)	0.21	0.0002	0.00028(hc)
1,2,4-Trichlorobenzene	120-82-1			21(h)			42(h)

Toxic Substance	CAS Number	Fresh Water (FW2) Criteria			Saline Water (SE & SC) Criteria		
		Aquatic		Human Health	Aquatic		Human Health
		Acute	Chronic		Acute	Chronic	
1,1,1-Trichloroethane	71-55-6			120(h)			2,600(h)
1,1,2-Trichloroethane	79-00-5			13(h)			350(h)
Trichloroethylene	79-01-6			1.0(hc)			12(hc)
2,4,5-Trichlorophenol	95-95-4			1,800(h)			3,600(h)
2,4,6-Trichlorophenol	88-06-2			0.58(hc)			1.0(hc)
Vinyl chloride	75-01-4			0.082(hc)			8.1(hc)
Zinc	7440-66-6	(a)	(a)	7,400(h)(T)	90(d)(s)	81(d)(s)	26,000(h)(T)

(a) Criteria as listed at (f)3 above as formula

(b) Criteria as listed at (f)4 above as formula

(d) Criterion is expressed as a function of the Water Effect Ratio (WER). For criterion in the table, WER equates to the default value of 1.0.

(fc) Criteria expressed as free cyanide (as CN)/L

(h) Human health noncarcinogen

(hc) Human health carcinogen

(ol) Organoleptic effect-based criterion with no frequency of exceedance at or above the MA7CD10 flow

(s) Dissolved criterion

(T) Total recoverable criterion

(g) Site-specific surface water quality criteria listed below apply to specific waterbodies that supersede the State-wide criteria listed at (d) through (f) above. Any site-specific criterion developed through a Total Maximum Daily Load (TMDL) adopted as an amendment to the Statewide Water Quality Management Plan or the applicable Areawide Water Quality Management Plan in accordance with N.J.A.C. 7:15-6.4 shall be incorporated into this section. The Department shall publish a notice of administrative change in the New Jersey Register.

Toxic Substance	CAS Number	Freshwater Criteria			Saline water Criteria			Waterbodies
		Aquatic		Human Health	Aquatic		Human Health	
		Acute	Chronic		Acute	Chronic		
Copper (μg/L dissolved)	7440508				7.9	5.6		Newark Bay, Raritan Bay, Arthur Kill, Kill Van Kull, saline portions of the Passaic, Hackensack, and Hudson Rivers and saline portions of tributaries to all of these waters.

APPENDIX D

City of Englewood Zoning Map

REVISIONS		
2-1-2001	CRAIG F. REMINGTON	23924
11-30-2001	CRAIG F. REMINGTON	23924
5-30-2002	CRAIG F. REMINGTON	23924
2-18-2009	CRAIG F. REMINGTON	23924

ZONING DESIGNATIONS

ONE FAMILY RESIDENCE	R-AAA	CENTRAL BUSINESS 1	CBD-1
ONE FAMILY RESIDENCE	R-AA	CENTRAL BUSINESS 2	CBD-2
ONE FAMILY RESIDENCE	R-A	CENTRAL BUSINESS 3	CBD-3
ONE FAMILY RESIDENCE	R-B	SERVICE BUSINESS	SBD
ONE FAMILY RESIDENCE	R-C	LIGHT INDUSTRIAL	LI
ONE FAMILY RESIDENCE	R-D	ATTACHED TOWNHOUSES	ATH
ONE FAMILY RESIDENCE	R-E	MULTIPLE RESIDENCE	RM-H
MULTIPLE RESIDENCE	RM-A	MULTIPLE RESIDENCE	RM-C
MULTIPLE RESIDENCE	RM-D	OFFICE INDUSTRIAL	OI
MULTIPLE RESIDENCE	RM-E	RETAIL/COMMERCIAL/ RESIDENTIAL OVERLAY ZONE	RCR
OPEN SPACE	OS	PLANNED UNIT DEVELOPMENT OVERLAY ZONE	PUD-1
MULTIPLE RESIDENCE	RM-B	MIXED USE RESIDENTIAL RETAIL OVERLAY ZONE	MURR

BOROUGH OF ENGLEWOOD CLIFFS
COUNTY OF BERGEN

BOROUGH OF TENAFLY
COUNTY OF BERGEN

BOROUGH OF FORT LEE
COUNTY OF BERGEN

BOROUGH OF LEONIA
COUNTY OF BERGEN

BOROUGH OF BERGENFIELD
COUNTY OF BERGEN

TOWNSHIP OF TEANECK
COUNTY OF BERGEN

TOWNSHIP OF TEANECK
COUNTY OF BERGEN

ZONING MAP
CITY OF ENGLEWOOD
BERGEN COUNTY NEW JERSEY

SCALE: 1" = 600' DATE: 2/1/2001

CRAIG F. REMINGTON LAND SURVEYOR LIC. NO. 23924

REMINGTON & VERNICK ENGINEERS
232 KINGS HIGHWAY EAST HADDONFIELD, N.J. 08033
(856) 795-9595, FAX (856) 795-1882
WEB SITE ADDRESS: WWW.RVE.COM

K. ALBERT ASSOCIATES
PROFESSIONAL ENGINEERS
PROFESSIONAL PLANNERS
9 EAST STREET, ENGLEWOOD, N.J. 07631
(201) 569-7590 FAX: (201) 569-5132
City Engineer, City of Englewood

02151005

APPENDIX E

NJDEP Natural Heritage Database Search

CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Parks and Forestry
Office of Natural Lands Management
Natural Heritage Program
P.O. Box 404
Trenton, NJ 08625-0404
Tel. #609-984-1339
Fax. #609-984-1427

BOB MARTIN
Commissioner

April 28, 2010

Sara Weimer
Dewberry-Goodkind, Inc.
600 Parsippany Road, Suite 301
Parsippany, NJ 07054

Re: Englewood Natural Resources Inventory

Dear Ms. Weimer:

Thank you for your data request regarding rare species information for Englewood City, Bergen County.

We have checked the Natural Heritage Database and the Landscape Project habitat mapping for occurrences of any rare wildlife species or wildlife habitat in Englewood City. Please see Table 1 for species list and conservation status.

Table 1 (on referenced site).

Common Name	Scientific Name	Federal Status	State Status	Grank	Srank
eastern box turtle	*Terrapene carolina carolina*		SC	G5T5	S3
wood turtle	*Glyptemys insculpta*		T	G4	S2

We have also checked the Natural Heritage Database for occurrences of rare plant species or ecological communities. The Natural Heritage Database does not have any records for rare plants or ecological communities in Englewood City.

A list of rare plant species and ecological communities that have been documented from Bergen County can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/countylist.html. If suitable habitat is present at the project site, the species in that list have potential to be present.

Status and rank codes used in the tables and lists are defined in EXPLANATION OF CODES USED IN NATURAL HERITAGE REPORTS, which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/nhpcodes_2008.pdf.

In order to red flag the general locations of occurrences of rare and endangered plant species and ecological communities, we have prepared computer generated Natural Heritage Index Maps. Enclosed please find these maps for the Yonkers and Central Park USGS quadrangles. If individual projects are to be located in the areas of these maps that contain letter codes, the Natural Heritage Program can be contacted for additional information.

If you have questions concerning the wildlife records or wildlife species mentioned in this response, we recommend that you visit the interactive I-Map-NJ website at the following URL, http://www.state.nj.us/dep/gis/depsplash.htm or contact the Division of Fish and Wildlife, Endangered and Nongame Species Program at (609) 292 9400.

PLEASE SEE 'CAUTIONS AND RESTRICTIONS ON NHP DATA', which can be downloaded from http://www.state.nj.us/dep/parksandforests/natural/heritage/newcaution2008.pdf.

Thank you for consulting the Natural Heritage Program. The attached invoice details the payment due for processing this data request. Feel free to contact us again regarding any future data requests.

Sincerely,

Herbert A. Lord

Herbert A. Lord
Data Request Specialist

cc: Robert J. Cartica
NHP File No. 10-4007388-4778

(by Patricia Sziber)

NATURAL HERITAGE GRID MAPS

The Natural Heritage Database documents rare species and natural community habitat to inform decision-makers who need to address the conservation of natural resources. Requests can be made for custom searches of the Natural Heritage Database to identify species and natural communities documented to occur in localized areas. Because illegal collection and vandalism threaten many rare species, release of sensitive information is restricted to limited areas and interested parties.

The Natural Heritage Grid Map is produced using geographic information system (GIS) software to provide a general portrayal of the locations of rare plant species and natural communities for the entire state without providing sensitive detailed information. It does not contain data for animal species. By consulting the map, users can do broad scale analysis of potentially sensitive areas, and learn of specific areas where a custom search of the Natural Heritage Database is needed for land use decision-making. A custom search can then be initiated by submitting a Natural Heritage Data Request Form for the specific parcels in question.

The Natural Heritage Grid Map uses a computer-generated grid that divides each USGS 1:24,000 scale topographic map into 100 cells, each cell being between 358 and 372 acres in size. If a rare plant species or natural community has been documented from anywhere within a cell, the entire cell will be coded as containing an occurrence of a rare plant species/natural community. To use these maps, locate the area of interest on the USGS topographic quadrangle base map. Determine if the cells in this area contain a letter code. There are three possible codes:

S – The location of an occurrence of a rare plant species or natural community is precisely known and falls somewhere within the cell.

M – The location of the rare plant species or natural community occurrence is not precisely known; the documented location is only known to within 1.5 miles.

B – Both precisely known (S) and less precise (M) occurrences for rare plant species or natural communities are found within the same cell.

This map is not a complete record of rare and endangered species habitat for this area. **It does not contain data for animal species.** It reflects data on known occurrences compiled as of the date printed in the lower right corner of each map. It includes both historically and recently documented habitat. Uncoded cells may also contain unsurveyed habitat that is occupied by imperiled plant species and natural communities. This product will be updated on a periodic basis. For more information, contact the Office of Natural Lands Management, PO Box 404, Trenton, NJ 08625.

The Natural Heritage Grid Map is available as an ArcView GIS shape file. The zipped version of the file is under 1 MB in size, and will be sent as an email attachment. Contact the Office of Natural Lands Management to obtain a copy of the file via email.

NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

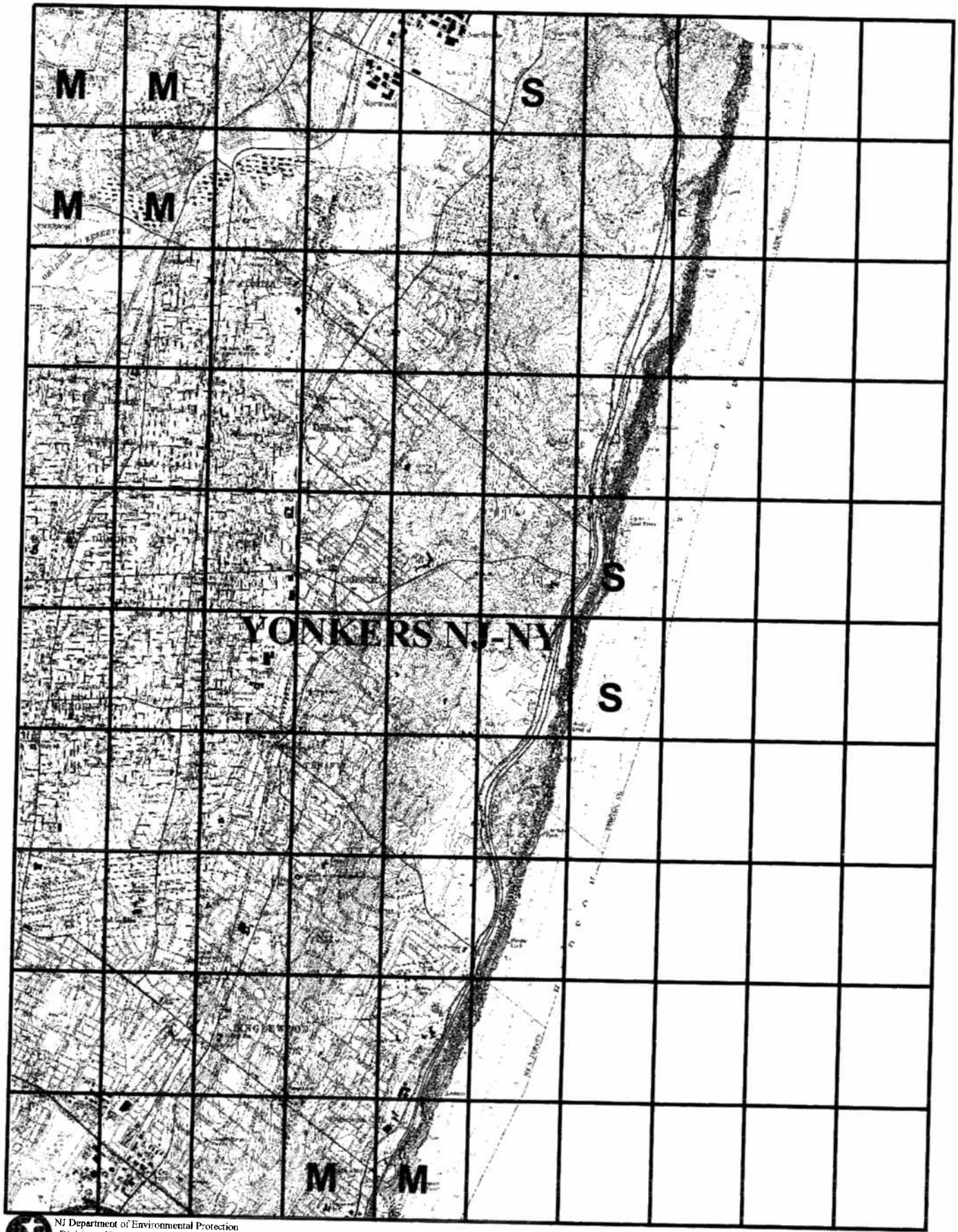
Natural Heritage Grid Map

Rare Plant Species and Natural Communities

S - Documented Location Known Precisely

M - Documented Location Known Within 1.5 Miles

B - Both 'M' and 'S' occurrences



NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

0.5 0 0.5 1 Miles

February 2004

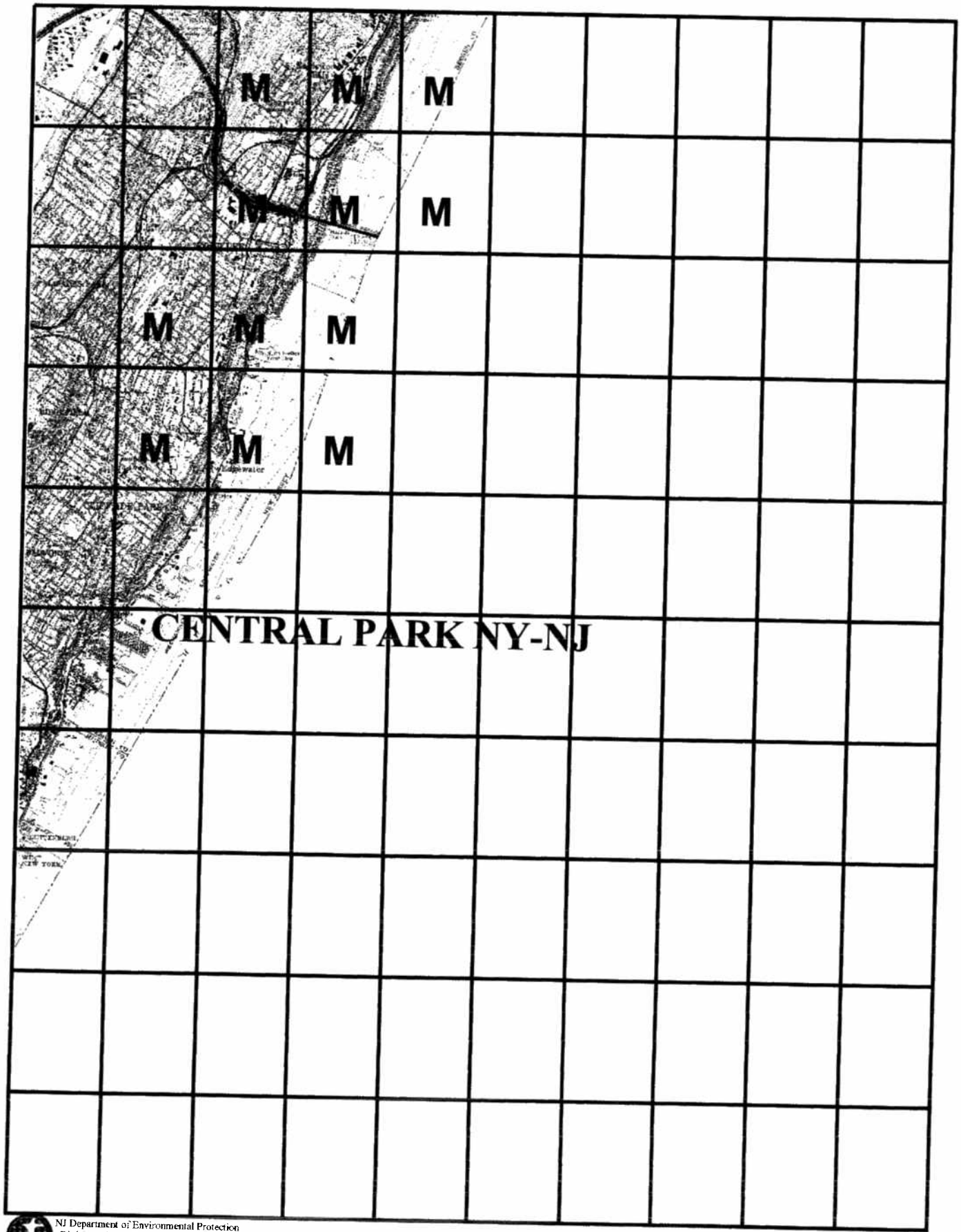
Natural Heritage Grid Map

Rare Plant Species and Natural Communities

S - Documented Location Known Precisely

M - Documented Location Known Within 1.5 Miles

B - Both 'M' and 'S' occurrences



NJ Department of Environmental Protection
Division of Parks and Forestry
Natural Lands Management

0.5 0 0.5 1 Miles

February 2004

7/30/2008

Rare Plant Species and Ecological Communities Presently Recorded in the NJ Natural Heritage Database

Scientific Name	Common Name	Federal Status	State Status	Regional Status	G Rank	S Rank
County: **Bergen**						
Nonvascular Plant						
Sphagnum contortum	Sphagnum		E	LP, HL	G5	S1
Sphagnum majus ssp. norvegicum	Sphagnum		E	LP, HL	G5?TNR	S1.1
Vascular Plant						
Adlumia fungosa	Climbing Fumitory			HL	G4	S2
Agastache nepetoides	Yellow Giant-hyssop			HL	G5	S2
Agastache scrophulariifolia	Purple Giant-hyssop			HL	G4	S2
Alopecurus aequalis var. aequalis	Short-awn Meadow-foxtail			HL	G5TNR	S2
Amelanchier humilis	Low Service-berry			HL	G5	S1
Ammannia latifolia	Koehn's Toothcup		E	LP, HL	G5	S1
Anemone canadensis	Canada Anemone			HL	G5	SX
Aplectrum hyemale	Puttyroot		E	LP, HL	G5	S1
Arabis hirsuta var. pycnocarpa	Western Hairy Rockcress			HL	G5T5	S1
Asclepias verticillata	Whorled Milkweed			HL	G5	S2
Athyrium pycnocarpon	Glade Fern		E	LP, HL	G5	S1
Betula papyrifera var. papyrifera	Paper Birch			HL	G5T5	S2
Botrychium oneidense	Blunt-lobe Grape Fern			HL	G4Q	S2
Bouteloua curtipendula	Side-oats Grama Grass		E	LP, HL	G5T5	S1
Callitriche palustris	Marsh Water-starwort			HL	G5	S2
Carex disperma	Soft-leaf Sedge			HL	G5	S1
Carex haydenii	Cloud Sedge		E	LP, HL	G5	S1
Carex pseudocyperus	Cyperus-like Sedge		E	LP, HL	G5	S1

County: **Bergen**

Carex tuckermanii	Tuckerman's Sedge	E	LP, HL	G4	S1
Carex utriculata	Bottle-shaped Sedge		HL	G5	S2
Castilleja coccinea	Scarlet Indian-paintbrush		HL	G5	S2
Cercis canadensis	Redbud	E	LP, HL	G5T5	S1
Chenopodium simplex	Maple-leaf Goosefoot		HL	G5	S2
Corallorhiza wisteriana	Spring Coralroot		HL	G5	SX
Coreopsis rosea	Rose-color Coreopsis		LP, HL	G3	S2
Crataegus chrysocarpa var. chrysocarpa	Fireberry Hawthorn		HL	G5TNR	S1
Cryptogramma stelleri	Slender Rockbrake	E	LP, HL	G5	SH.1
Cuphea viscosissima	Blue Waxweed		HL	G5?	S3
Cypripedium reginae	Showy Lady's-slipper	E	LP, HL	G4	S1
Dirca palustris	Leatherwood		HL	G4	S2
Doellingeria infirma	Cornel-leaf Aster		HL	G5	S2
Dryopteris celsa	Log Fern		HL	G4	SX
Elatine americana	American Waterwort		HL	G4	S2
Eleocharis halophila	Salt-marsh Spike-rush		HL	G4	S2
Epilobium angustifolium ssp. circumvagum	Narrow-leaf Fireweed		HL	G5T5	S1
Equisetum pratense	Meadow Horsetail	E	LP, HL	G5	S1
Eriophorum gracile	Slender Cotton-grass	E	LP, HL	G5TNR	SH
Eriophorum viridicarinatum	Thin-leaf Cotton-grass		HL	G5	S3
Gnaphalium macounii	Winged Cudweed	E	LP, HL	G5	SH
Gymnocarpium dryopteris	Oak Fern		HL	G5	S1
Hemicarpha micrantha	Small-flower Halfchaff Sedge	E	LP, HL	G4	S1
Hottonia inflata	Featherfoil	E	LP, HL	G4	S1
Hydrocotyle ranunculoides	Floating Marsh-pennywort	E	LP, HL	G5	S1

County: **Bergen**

Hypericum adpressum	Barton's St. John's-wort		E	LP, HL	G2G3	S2
Hypericum majus	Larger Canadian St. John's Wort		E	LP, HL	G5	S1
Isotria medeoloides	Small Whorled Pogonia	LT	E	LP, HL	G2	S1
Juncus brevicaudatus	Narrow-panicle Rush			HL	G5	S2
Lemna perpusilla	Minute Duckweed		E	LP, HL	G5	S1
Lemna trisulca	Star Duckweed			HL	G5	S2
Lemna valdiviana	Pale Duckweed		E	LP, HL	G5	S1
Limosella subulata	Awl-leaf Mudwort		E	LP, HL	G4G5	S1
Linum sulcatum	Grooved Yellow Flax		E	LP, HL	G5T5	S1
Luzula acuminata	Hairy Wood-rush		E	LP, HL	G5T4T5	S2
Lycopodiella inundata	Northern Bog Club-moss			HL	G5	S1
Lysimachia hybrida	Lowland Loosestrife			HL	G5	S3
Malaxis unifolia	Green Adder's-mouth			HL	G5	S2
Melanthium virginicum	Virginia Bunchflower		E	LP, HL	G5	S1
Menyanthes trifoliata	Buck-bean			HL	G5	S2
Mimulus alatus	Winged Monkey-flower			HL	G5	S3
Muhlenbergia glomerata	Eastern Smoke Grass			HL	G5	S2
Nuphar microphyllum	Small Yellow Pond-lily		E	LP, HL	G5T4T5	SH
Obolaria virginica	Virginia Pennywort			HL	G5	S2
Phaseolus polystachios var. polystachios	Wild Kidney Bean			HL	G4TNR	S2
Platanthera hyperborea var. hyperborea	Leafy Northern Green Orchid			HL	G5T5	SX
Poa autumnalis	Flexuous Spear Grass		E	LP, HL	G5	SH.1
Potamogeton oakesianus	Oakes' Pondweed			HL	G4	S2
Prenanthes racemosa	Smooth Rattlesnake-root		E	LP, HL	G5TNR	SH
Ptelea trifoliata	Wafer-ash		E	LP, HL	G5T5	S1

County: **Bergen**

Pycnanthemum clinopodioides	Basil Mountain-mint	E	LP, HL	G2	S1
Pycnanthemum torrei	Torrey's Mountain-mint	E	LP, HL	G2	S1
Ranunculus ambigens	Water-plantain Spearwort		HL	G4	S2
Ranunculus flabellaris	Yellow Water Buttercup		HL	G5	S3
Ranunculus micranthus	Rock Buttercup		HL	G5	S2
Rotala ramosior	Toothcup		HL	G5	S3
Saccharum alopecuroidum	Silver Plume Grass		HL	G5	SH
Sagittaria subulata	Awl-leaf Arrowhead		HL	G4	S2
Salix candida	Hoary Willow		HL	G5	S2
Salix lucida ssp. lucida	Shining Willow		HL	G5T5	S1
Salix pedicellaris	Bog Willow	E	LP, HL	G5	S1
Schoenoplectus torreyi	Torrey's Bulrush	E	LP, HL	G5?	S1
Scirpus maritimus	Saltmarsh Bulrush	E	LP, HL	G5	SH
Scleria pauciflora var. caroliniana	Carolina Nut-rush		HL	G5T4T5	S2
Scleria verticillata	Whorled Nut-rush	E	LP, HL	G5	S1
Scutellaria leonardii	Small Skullcap	E	LP, HL	G4T4	S1
Silene caroliniana var. pensylvanica	Wild-pink		HL	G5T4	S3
Solidago rigida	Prairie Goldenrod	E	LP, HL	G5T5	S1
Sphenopholis pensylvanica	Swamp Oats		HL	G4	S2
Sporobolus compositus var. compositus	Long-leaf Rush-grass		HL	G5T5	S2
Stachys hyssopifolia	Hyssop Hedge-nettle		HL	G5	S2
Thuja occidentalis	Arborvitae	E	LP, HL	G5	S1
Tiarella cordifolia	Foamflower	E	LP, HL	G5T5	S1
Triphora trianthophora	Three Birds Orchid	E	LP, HL	G3G4	S1
Trollius laxus ssp. laxus	Spreading Globe Flower	E	LP, HL	G4T3	S1
Utricularia intermedia	Flat-leaf Bladderwort		HL	G5	S3

County: **Bergen**

Verbena simplex	Narrow-leaf Vervain	E	LP, HL	G5	S1
Viola canadensis	Canadian Violet	E	LP, HL	G5TNR	S1
Viola septentrionalis	Northern Blue Violet	E	LP, HL	G5	S1
Vitis novae-angliae	New England Grape	E	LP, HL	G4G5Q	S1

APPENDIX F

NJDEP Air Quality Monitoring Data

TAPS Station : NEW MILFORD, NJ6146
Start yr. - 1971 End yr. - 2000
Temperature: 0 years available out of 30 requested in this analysis
Precipitation: 30 years available out of 30 requested in this analysis

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	2 yrs in 10 will have max temp. >than	2 yrs in 10 will have min temp. <than	avg # of grow deg days*	Precipitation (Inches) avg	2 yrs in 10 will have less than	2 yrs in 10 will have more than	avg # of days w/.1 or more	avg total snow fall
January	---	---	---	0	0	0	3.54	1.76	5.25	6	0.0
February	---	---	---	0	0	0	2.77	1.45	4.02	5	0.0
March	---	---	---	0	0	0	3.78	2.12	5.31	6	0.0
April	---	---	---	0	0	0	3.74	2.02	5.39	6	0.0
May	---	---	---	0	0	0	4.09	2.09	5.91	7	0.0
June	---	---	---	0	0	0	3.64	2.03	5.03	6	0.0
July	---	---	---	0	0	0	3.99	2.23	5.59	6	0.0
August	---	---	---	0	0	0	4.01	2.02	5.99	6	0.0
September	---	---	---	0	0	0	4.48	2.25	6.22	6	0.0
October	---	---	---	0	0	0	3.61	1.66	5.38	5	0.0
November	---	---	---	0	0	0	3.87	1.98	5.63	5	0.0
December	---	---	---	0	0	0	3.40	1.48	5.12	6	0.0
Yearly : Average	0.0	0.0	0.0	---	---	---	---	---	---	---	---
Extreme	---	---	---	---	---	---	---	---	---	---	---
Total	---	---	---	---	---	0	44.92	36.88	49.80	70	0.0

Average # of days per year with at least 1 inch of snow on the ground: 0

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minumum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold : 40.0 deg. F)

TAPS Station : WOODCLIFF LAKE, NJ9832
Start yr. - 1971 End yr. - 2000
Temperature: 0 years available out of 30 requested in this analysis
Precipitation: 30 years available out of 30 requested in this analysis

Month	Temperature (Degrees F.) avg daily max	avg daily min	avg	2 yrs in 10 will have max temp. >than	2 yrs in 10 will have min temp. <than	avg # of grow deg days*	Precipitation (Inches) avg	2 yrs in 10 will have less than	2 yrs in 10 will have more than	avg # of days w/.1 or more	avg total snow fall
January	---	---	---	0	0	0	3.73	1.81	5.41	6	0.0

February	---	---	---	0	0	0	3.05	1.69	4.34	5	0.0
March	---	---	---	0	0	0	4.22	2.20	6.10	7	0.0
April	---	---	---	0	0	0	4.29	2.31	6.02	6	0.0
May	---	---	---	0	0	0	4.53	2.55	6.39	7	0.0
June	---	---	---	0	0	0	4.25	2.18	6.20	6	0.0
July	---	---	---	0	0	0	4.64	2.29	6.94	6	0.0
August	---	---	---	0	0	0	4.47	2.33	6.51	6	0.0
September	---	---	---	0	0	0	4.71	2.03	6.90	6	0.0
October	---	---	---	0	0	0	3.96	1.99	5.88	5	0.0
November	---	---	---	0	0	0	4.07	2.16	5.89	5	0.0
December	---	---	---	0	0	0	3.74	1.56	5.68	6	0.0
Yearly :											
Average	0.0	0.0	0.0	---	---	---	----	----	----	---	---
Extreme	---	---	---	---	---	---	----	----	----	---	---
Total	---	---	---	---	---	0	49.66	40.65	54.85	71	0.0

Average # of days per year with at least 1 inch of snow on the ground: 0

*A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minumum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (Threshold : 40.0 deg. F)

BERGEN COUNTY

Bergen County Average 1999 NATA Modeled Air Concentrations Compared to Health Benchmarks

Pollutant	Modeled Air Concentration (ug/m^3)	Health Benchmark (ug/m^3)	Risk Ratio	% Contribution from Major Sources	Area Sources	On-road Mobile Sources	Nonroad Mobile Sources	Background
Acetaldehyde	3	0.45	**6**	2%	4%	63%	12%	20%
Acrolein	0.03	*0.020*	***13***	0.03%	32%	51%	17%	0%
Arsenic Compounds	0.0001	0.00023	0.5	4%	96%	0%	0%	0%
Benzene	2	0.13	**18**	0.1%	9%	53%	19%	19%
Bis(2-ethylhexyl) phthalate	2	0.42	**4**	0.1%	0.002%	0%	0%	100%
1,3-Butadiene	0.2	0.033	**7**	0.003%	8%	41%	20%	31%
Cadmium Compounds	0.00008	0.00024	0.3	7%	93%	0%	0.7%	0%
Carbon Tetrachloride	0.3	0.067	**4**	0.004%	0.6%	0%	0%	99%
Chloroform	0.2	0.043	**4**	0.2%	76%	0%	0%	24%
Chromium (hexavalent form)	0.0002	0.000083	**2**	2%	85%	12%	0.6%	0%
1,4-Dichlorobenzene	0.01	0.091	**1.2**	1%	99%	0%	0%	0%
1,3-Dichloropropene	0.02	0.25	0.8	0%	100%	0%	0%	0%
Diesel Particulate Matter	2	0.0033	**670**	0%	0%	41%	59%	*
Ethylene Dibromide	0.03	0.0017	**19**	.03%	0.02%	0%	0%	100%
Ethylene Dichloride	0.05	0.038	**1.2**	0.2%	0.4%	0%	0%	99%
Ethylene Oxide	0.008	0.011	0.7	0.3%	100%	0%	0%	0%
Formaldehyde	3	0.077	**34**	2%	4%	43%	17%	35%
Methyl Chloride	1	0.56	**2**	0.08%	0.8%	0%	0%	99%
Naphthalene	0.1	0.029	**5**	0.2%	72%	21%	6%	0%
Nickel Compounds	0.002	0.0064	0.3	2%	94%	4%	0.5%	0%
Perchloroethylene	0.4	0.17	**2**	0.2%	64%	0%	0%	36%
1,1,2,2-Tetrachloroethane	0.07	0.017	**4**	0.09%	0.6%	0%	0%	99%

- Chemicals with risk ratios greater than or equal to 1 are in **bold**.
- Risk Ratios in *italics* are based on noncarcinogenic effects.

- The symbol ug/m^3 is micrograms per cubic meter, the amount (in micrograms) of a chemical in a cubic meter of air. This is also known as a concentration.
- * For diesel particulate matter, onroad and nonroad concentrations include a model-estimated background concentration.

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Last Updated: November 21, 2006

What are Air Toxics
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1999 Risk Results for NJ

▸ Air Toxics of Concern
▸ State Maps
▸ County Risk Ratio Tables

To determine whether the concentrations of air toxics estimated in USEPA's 1999 National-Scale Air Toxics Assessment (NATA) could be a potential human health problem in New Jersey, NJDEP compared the NATA air concentrations to their chemical-specific health benchmarks. To do this, we divided the modeled air concentration by the health benchmark concentration to get a number we call a risk ratio. If the risk ratio for a specific chemical is less than one, the air concentration should not pose a health risk. If it is greater than one, it may be of concern. The risk ratio also shows just how much higher or lower the estimated air concentration is than the health benchmark. For more information, see **How We Estimate Risk from Air Toxics**.

New Jersey's methods for estimating risk using the 1999 NATA results are somewhat different from USEPA's methods. Therefore, risk results presented here are different from the risk estimates found on the USEPA NATA web site. For a discussion of these differences, **What's Different about 1999 Nata?**

Results of NJDEP's risk assessment are presented two ways:

- State Risk Maps
- County Risk Ratio Tables

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THE 22 AIR TOXICS OF GREATEST CONCERN IN NEW JERSEY

Our analysis of the state and county average air toxics concentrations generated by NATA indicates that 22 of the pollutants were predicted to exceed their health benchmarks in one or more counties in 1999. 21 of these are cancer-causing (carcinogenic) chemicals, and one (acrolein) is not carcinogenic. Predicted concentrations of these pollutants vary around the state, depending on the type of sources that emit them. This is summarized in the table below. For more information click on point, area, and mobile sources, and background concentrations.

1999 NEW JERSEY CHEMICALS OF CONCERN

The following chemicals that USEPA included in the 1999 NATA modeling are of concern in New Jersey, because their modeled average ambient concentrations are above their health benchmarks in a county or across the entire state.

1999 CHEMICALS OF CONCERN IN NEW JERSEY

Pollutant	Number/Name of Counties Above Health Benchmarks	Primary Emissions Source
Acetaldehyde	21	Onroad, background
Acrolein	21	Mobile, area
Arsenic Compounds	4 (Atlantic, Camden, Cape May, Gloucester)	Major, area

Benzene	21	Mobile
Bis(2-ethylhexyl)phthalate	21	Background
1,3-Butadiene	21	Onroad, background
Cadmium Compounds	1 (Warren)	Area
Carbon Tetrachloride	21	Background
Chloroform	20	Area, background
Chromium VI	14	Area
1,4-Dichlorobenzene	4 (Atlantic, Essex, Hudson, Passaic)	Area
1,3-Dichloropropene	1 (Hudson)	Area
Diesel Particulate Matter	21	Mobile
Ethylene Dibromide	21	Background
Ethylene Dichloride	11	Background
Ethylene Oxide	2 (Hudson, Warren)	Area
Formaldehyde	21	Mobile, background
Methyl Chloride	21	Background
Naphthalene	14	Area
Nickel Compounds	1 (Camden)	Area, major
Perchloroethylene	10	Area, background
1,1,2,2-Tetrachloroethane	21	Background

* For more information on which areas are impacted by the chemicals of concern, see the chemical-specific maps below.

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MAPS SHOWING THE DISTRIBUTION OF THE 1999 AIR TOXICS OF CONCERN IN NEW JERSEY

To see a state map showing the spatial variation in modeled air concentrations for one of the twenty-two chemicals of concern, click on the chemical name:

- Acetaldehyde
- Acrolein
- Arsenic Compounds
- Benzene
- Bis(2-ethylhexyl)phthalate
- 1,3 Butadiene
- Cadmium Compounds
- Carbon Tetrachloride
- Chloroform
- Chromium VI
- 1,4-Dichlorobenzene
- 1,3-Dichloropropene
- Diesel Particulate Matter
- Ethylene Dibromide
- Ethylene Dichloride
- Ethylene Oxide
- Formaldehyde
- Methyl Chloride
- Naphthalene
- Nickel Compounds
- Perchloroethylene
- 1,1,2,2-Tetrachloroethane

For information about using Health Benchmarks, click here

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COUNTY RISK RATIO TABLES

To see a statewide or county -specific table containing the 1999 NATA-predicted air concentrations, health benchmarks, risk ratios, and source category contributions for each of the 22 air toxics of concern, click on the state name or county names below.

Statewide

Atlantic Gloucester Ocean

Bergen	Hudson	Passaic
Burlington	Hunterdon	Salem
Camden	Mercer	Somerset
Cape May	Middlesex	Sussex
Cumberland	Monmouth	Union
Essex	Morris	Warren

In Each Table:

- Chemicals with risk ratios greater than or equal to 1 are in **bold**.
- Risk Ratios in *italics* are based on noncarcinogenic effects.
- The symbol ug/m^3 is micrograms per cubic meter, the amount (in micrograms) of a chemical in a cubic meter of air. This is also known as a concentration.
- * For diesel particulate matter, onroad and nonroad concentrations include a model-estimated background concentration.

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Historical Air Quality Data: Ground-level Ozone, 8-hour Exceedances

Exceedances of the 8-hour Ozone Standard in New Jersey, 1998 - 2005

The table below lists all of the sites and days when the 8-hour-average health standard for ground-level ozone was exceeded since 1998, the year this new standard went into effect. The status of the standard is now in question. Under the standard there is a plan to phase out the previous 1-hour ozone standard, but even under that plan, the 1-hour standard remains in effect for most of New Jersey (see our list of 1-hour exceedances).

The 8-hour ozone standard is 0.08 parts per million (ppm). For concentrations to be considered exceedances, they must be 0.085 or above (that is, they must round up to 0.09 ppm). To provide prompt notice of unhealthy air quality, the current ozone levels we report in our maps, bar charts and meters are still based on 1-hour averages, where a 1-hour average of 0.100 ppm is equivalent to 101 on the AQI scale. This 1-hour level corresponds closely to an 8-hour average of 0.085 ppm based on historical data. Using this 1-hour "surrogate" avoids delay in notifying you when peak ozone levels are occurring.

2005 Ozone Exceedances Summary (8-hour averages)

Site Name	Exceedances	Site Name	Exceedances
Ancora St. Hosp.	12	Millville	4
Bayonne	6	Monmouth Univ.	8
Camden	5	Nacote Creek	3
Chester	3	Ramapo	8
Clarksboro	6	Rider Univ.	7
Colliers Mills	14	Rutgers Univ.	10
Flemington	13	Teaneck	8

Total # of Days the 8-hour Ozone Standard was Exceeded	22
Total # of Sites above the 8-hour Ozone Standard	14
Total # of Site-Days above the 8-hour Ozone Standard	107
Maximum 8-hour Ozone Concentration: 0.110 ppm at Millville on 07/22/2005	

2005 Ozone Exceedances (8-hour averages, parts per million)

April

Date	Site Name	Concentration	Date	Site Name	Concentration
04/19/2005	Ancora St. Hosp.	0.088	04/20/2005	Ancora St. Hosp.	0.088
04/19/2005	Colliers Mills	0.091	04/20/2005	Colliers Mills	0.087
04/19/2005	Flemington	0.090	04/20/2005	Flemington	0.087
04/19/2005	Nacote Creek	0.086	04/20/2005	Ramapo	0.087

May					
Date	Site Name	Concentration	Date	Site Name	Concentration

June					
Date	Site Name	Concentration	Date	Site Name	Concentration
06/08/2005	Camden	0.086	06/25/2005	Bayonne	0.085
06/08/2005	Flemington	0.085	06/25/2005	Flemington	0.088
06/08/2005	Monmouth Univ.	0.088	06/25/2005	Ramapo	0.091
06/08/2005	Ramapo	0.086	06/25/2005	Rider Univ.	0.099
06/08/2005	Rider Univ.	0.088	06/25/2005	Rutgers Univ.	0.097
06/08/2005	Teaneck	0.089	06/25/2005	Teaneck	0.086
06/21/2005	Ancora St. Hosp.	0.089	06/26/2005	Flemington	0.100
06/21/2005	Chester	0.088	06/26/2005	Ramapo	0.085
06/21/2005	Clarksboro	0.087	06/26/2005	Rider Univ.	0.094
06/21/2005	Colliers Mills	0.096	06/26/2005	Rutgers Univ.	0.090
06/24/2005	Flemington	0.088	06/26/2005	Teaneck	0.100
06/24/2005	Rutgers Univ.	0.086			

July					
Date	Site Name	Concentration	Date	Site Name	Concentration
07/21/2005	Bayonne	0.090	07/22/2005	Clarksboro	0.097
07/21/2005	Camden	0.092	07/22/2005	Colliers Mills	0.088
07/21/2005	Chester	0.085	07/22/2005	Millville	0.110
07/21/2005	Clarksboro	0.094	07/22/2005	Monmouth Univ.	0.096
07/21/2005	Colliers Mills	0.104	07/22/2005	Rutgers Univ.	0.091
07/21/2005	Millville	0.092	07/26/2005	Ancora St. Hosp.	0.087
07/21/2005	Monmouth Univ.	0.086	07/26/2005	Colliers Mills	0.109
07/21/2005	Nacote Creek	0.087	07/26/2005	Rider Univ.	0.089
07/21/2005	Rider Univ.	0.085	07/26/2005	Rutgers Univ.	0.089
07/21/2005	Teaneck	0.091	07/26/2005	Teaneck	0.094
07/22/2005	Ancora St. Hosp.	0.096	07/27/2005	Ancora St. Hosp.	0.088
07/22/2005	Bayonne	0.096	07/27/2005	Colliers Mills	0.092
07/22/2005	Camden	0.100	07/27/2005	Rutgers Univ.	0.087

August					
Date	Site Name	Concentration	Date	Site Name	Concentration
08/02/2005	Ancora St. Hosp.	0.092	08/05/2005	Monmouth Univ.	0.100
08/02/2005	Monmouth Univ.	0.089	08/11/2005	Ancora St. Hosp.	0.087
08/03/2005	Ancora St. Hosp.	0.092	08/11/2005	Colliers Mills	0.086
08/03/2005	Camden	0.087	08/11/2005	Monmouth Univ.	0.086

08/03/2005	Clarksboro	0.088	08/12/2005	Bayonne	0.091
08/03/2005	Colliers Mills	0.095	08/12/2005	Flemington	0.093
08/03/2005	Millville	0.088	08/12/2005	Ramapo	0.088
08/03/2005	Nacote Creek	0.091	08/12/2005	Rutgers Univ.	0.095
08/04/2005	Bayonne	0.092	08/12/2005	Teaneck	0.090
08/04/2005	Colliers Mills	0.100	08/13/2005	Bayonne	0.093
08/04/2005	Flemington	0.085	08/13/2005	Flemington	0.085
08/04/2005	Monmouth Univ.	0.088	08/13/2005	Ramapo	0.091
08/04/2005	Teaneck	0.086	08/13/2005	Rutgers Univ.	0.093
08/05/2005	Ancora St. Hosp.	0.088	08/13/2005	Teaneck	0.093
08/05/2005	Colliers Mills	0.104	08/14/2005	Flemington	0.090

September

Date	Site Name	Concentration	Date	Site Name	Concentration
09/08/2005	Ancora St. Hosp.	0.097	09/13/2005	Ancora St. Hosp.	0.093
09/08/2005	Chester	0.091	09/13/2005	Camden	0.098
09/08/2005	Clarksboro	0.091	09/13/2005	Clarksboro	0.091
09/08/2005	Colliers Mills	0.095	09/13/2005	Colliers Mills	0.093
09/08/2005	Flemington	0.093	09/13/2005	Flemington	0.093
09/08/2005	Ramapo	0.085	09/13/2005	Millville	0.085
09/08/2005	Rider Univ.	0.093	09/13/2005	Monmouth Univ.	0.088
09/08/2005	Rutgers Univ.	0.091	09/13/2005	Ramapo	0.095
09/12/2005	Colliers Mills	0.086	09/13/2005	Rider Univ.	0.089
09/12/2005	Flemington	0.085	09/13/2005	Rutgers Univ.	0.095

2004 Ozone Exceedances Summary (8-hour averages)

Site Name	Exceedances	Site Name	Exceedances
Ancora St. Hosp.	6	Millville	2
Bayonne	1	Monmouth Univ.	2
Camden	3	Nacote Creek	0
Chester	0	Ramapo	2
Clarksboro	4	Rider Univ.	1
Colliers Mills	8	Rutgers Univ.	2
Flemington	6	Teaneck	2

Total # of Days the 8-hour Ozone Standard was Exceeded	14
Total # of Sites above the 8-hour Ozone Standard	12
Total # of Site-Days above the 8-hour Ozone Standard	39

Maximum 8-hour Ozone Concentration: 0.103 ppm at Ancora St. Hosp. on 07/21/2004

2004 Ozone Exceedances (8-hour averages, parts per million)

April

Date	Site Name	Concentration	Date	Site Name	Concentration
04/18/2004	Camden	0.085	04/19/2004	Colliers Mills	0.085
04/18/2004	Clarksboro	0.085			

May

Date	Site Name	Concentration	Date	Site Name	Concentration
05/11/2004	Ancora St. Hosp.	0.092	05/12/2004	Colliers Mills	0.088
05/11/2004	Colliers Mills	0.094	05/12/2004	Flemington	0.087

June

Date	Site Name	Concentration	Date	Site Name	Concentration
06/08/2004	Bayonne	0.088	06/09/2004	Clarksboro	0.092
06/08/2004	Flemington	0.091	06/09/2004	Colliers Mills	0.103
06/08/2004	Rider Univ.	0.093	06/09/2004	Monmouth Univ.	0.094
06/08/2004	Rutgers Univ.	0.099	06/16/2004	Ramapo	0.090
06/08/2004	Teaneck	0.089	06/24/2004	Flemington	0.090
06/09/2004	Ancora St. Hosp.	0.085	06/30/2004	Colliers Mills	0.085

July

Date	Site Name	Concentration	Date	Site Name	Concentration
07/01/2004	Flemington	0.085	07/21/2004	Colliers Mills	0.088
07/02/2004	Ancora St. Hosp.	0.087	07/21/2004	Millville	0.085
07/02/2004	Camden	0.090	07/22/2004	Ancora St. Hosp.	0.088
07/02/2004	Clarksboro	0.092	07/22/2004	Colliers Mills	0.092
07/02/2004	Colliers Mills	0.086	07/22/2004	Flemington	0.098
07/02/2004	Flemington	0.086	07/22/2004	Millville	0.090
07/21/2004	Ancora St. Hosp.	0.103	07/22/2004	Ramapo	0.096
07/21/2004	Camden	0.093	07/22/2004	Rutgers Univ.	0.088
07/21/2004	Clarksboro	0.096	07/22/2004	Teaneck	0.089

August

Date	Site Name	Concentration	Date	Site Name	Concentration
08/04/2004	Ancora St. Hosp.	0.090	08/04/2004	Monmouth Univ.	0.099

2003 Ozone Exceedances Summary (8-hour averages)

Site Name	Exceedances	Site Name	Exceedances
Ancora St. Hosp.	9	Millville	6
Bayonne	2	Monmouth Univ.	10

	Camden	4		Nacote Creek	4
	Chester	5		Ramapo	2
	Clarksboro	6		Rider Univ.	7
	Colliers Mills	9		Rutgers Univ.	5
	Flemington	7		Teaneck	4

Total # of Days the 8-hour Ozone Standard was Exceeded	20
Total # of Sites above the 8-hour Ozone Standard	14
Total # of Site-Days above the 8-hour Ozone Standard	80

Maximum 8-hour Ozone Concentration: 0.131 ppm at Monmouth Univ. on 6/25/2003

2003 Ozone Exceedances (8-hour averages, parts per million)

April

Date	Site Name	Concentration	Date	Site Name	Concentration
4/16/2003	Ancora St. Hosp.	0.085	4/16/2003	Millville	0.085
4/16/2003	Colliers Mills	0.088	4/16/2003	Monmouth Univ.	0.086
4/16/2003	Flemington	0.085	4/16/2003	Rider Univ.	0.086

May

Date	Site Name	Concentration	Date	Site Name	Concentration

June

Date	Site Name	Concentration	Date	Site Name	Concentration
6/11/2003	Clarksboro	0.085	6/26/2003	Camden	0.108
6/23/2003	Nacote Creek	0.085	6/26/2003	Chester	0.109
6/24/2003	Ancora St. Hosp.	0.096	6/26/2003	Clarksboro	0.123
6/24/2003	Camden	0.092	6/26/2003	Colliers Mills	0.116
6/24/2003	Clarksboro	0.090	6/26/2003	Flemington	0.115
6/24/2003	Flemington	0.087	6/26/2003	Millville	0.120
6/24/2003	Millville	0.085	6/26/2003	Monmouth Univ.	0.128
6/24/2003	Monmouth Univ.	0.112	6/26/2003	Nacote Creek	0.108
6/24/2003	Rider Univ.	0.085	6/26/2003	Rider Univ.	0.107
6/25/2003	Ancora St. Hosp.	0.115	6/26/2003	Rutgers Univ.	0.113
6/25/2003	Bayonne	0.097	6/26/2003	Teaneck	0.098
6/25/2003	Camden	0.106	6/27/2003	Ancora St. Hosp.	0.094
6/25/2003	Chester	0.108	6/27/2003	Chester	0.099
6/25/2003	Clarksboro	0.112	6/27/2003	Clarksboro	0.086
6/25/2003	Colliers Mills	0.111	6/27/2003	Colliers Mills	0.095
6/25/2003	Flemington	0.110	6/27/2003	Millville	0.092
6/25/2003	Millville	0.104	6/27/2003	Monmouth Univ.	0.093

6/25/2003	Monmouth Univ.	0.131	6/27/2003	Nacote Creek	0.089
6/25/2003	Nacote Creek	0.110	6/27/2003	Rutgers Univ.	0.086
6/25/2003	Rider Univ.	0.110	6/27/2003	Teaneck	0.085
6/25/2003	Rutgers Univ.	0.117	6/28/2003	Rutgers Univ.	0.085
6/25/2003	Teaneck	0.099	6/29/2003	Flemington	0.086
6/26/2003	Ancora St. Hosp.	0.131	6/30/2003	Ancora St. Hosp.	0.090
6/26/2003	Bayonne	0.102			

July

Date	Site Name	Concentration	Date	Site Name	Concentration
7/01/2003	Ancora St. Hosp.	0.086	7/04/2003	Flemington	0.092
7/02/2003	Chester	0.090	7/04/2003	Millville	0.092
7/02/2003	Flemington	0.093	7/04/2003	Monmouth Univ.	0.094
7/02/2003	Monmouth Univ.	0.088	7/04/2003	Rider Univ.	0.094
7/02/2003	Ramapo	0.088	7/04/2003	Rutgers Univ.	0.091
7/02/2003	Rider Univ.	0.085	7/04/2003	Teaneck	0.090
7/04/2003	Ancora St. Hosp.	0.097	7/05/2003	Monmouth Univ.	0.086
7/04/2003	Camden	0.090	7/15/2003	Ramapo	0.085
7/04/2003	Chester	0.090	7/27/2003	Colliers Mills	0.088
7/04/2003	Clarksboro	0.097	7/27/2003	Monmouth Univ.	0.087
7/04/2003	Colliers Mills	0.094			

August

Date	Site Name	Concentration	Date	Site Name	Concentration
8/15/2003	Ancora St. Hosp.	0.090	8/22/2003	Monmouth Univ.	0.099
8/20/2003	Colliers Mills	0.096	8/22/2003	Rider Univ.	0.086
8/22/2003	Colliers Mills	0.087	8/25/2003	Colliers Mills	0.086

2002 Ozone Exceedances Summary (8-hour averages)

Site Name	Exceedances	Site Name	Exceedances
Ancora St. Hosp.	27	Millville	20
Bayonne	6	Monmouth Univ.	17
Camden	19	Nacote Creek	11
Chester	27	Newark	8
Clarksboro	24	Ramapo	13
Colliers Mills	30	Rider Univ.	26
Flemington	19	Rutgers Univ.	26
		Teaneck	18

Total # of Days the 8-hour Ozone Standard was Exceeded	44

Total # of Sites above the 8-hour Ozone Standard	15
Total # of Site-Days above the 8-hour Ozone Standard	291
Maximum 8-hour Ozone Concentration: 0.138 ppm at Colliers Mills on 7/09/2002	

2002 Ozone Exceedances (8-hour averages, parts per million)

May

Date	Site Name	Concentration	Date	Site Name	Concentration
5/24/2002	Ancora St. Hosp.	0.092	5/24/2002	Nacote Creek	0.089
5/24/2002	Colliers Mills	0.093	5/24/2002	Rider Univ.	0.091
5/24/2002	Millville	0.091	5/24/2002	Rutgers Univ.	0.090
5/24/2002	Monmouth Univ.	0.089			

June

Date	Site Name	Concentration	Date	Site Name	Concentration
6/05/2002	Chester	0.092	6/22/2002	Rutgers Univ.	0.092
6/11/2002	Ancora St. Hosp.	0.093	6/22/2002	Teaneck	0.093
6/11/2002	Camden	0.111	6/23/2002	Camden	0.089
6/11/2002	Chester	0.098	6/23/2002	Chester	0.088
6/11/2002	Clarksboro	0.106	6/23/2002	Clarksboro	0.088
6/11/2002	Colliers Mills	0.100	6/23/2002	Colliers Mills	0.098
6/11/2002	Flemington	0.096	6/23/2002	Monmouth Univ.	0.090
6/11/2002	Millville	0.094	6/23/2002	Newark	0.085
6/11/2002	Monmouth Univ.	0.104	6/23/2002	Rider Univ.	0.088
6/11/2002	Rider Univ.	0.102	6/23/2002	Rutgers Univ.	0.091
6/11/2002	Rutgers Univ.	0.103	6/23/2002	Teaneck	0.095
6/11/2002	Teaneck	0.104	6/24/2002	Ancora St. Hosp.	0.104
6/12/2002	Ancora St. Hosp.	0.097	6/24/2002	Camden	0.086
6/12/2002	Clarksboro	0.091	6/24/2002	Clarksboro	0.098
6/12/2002	Colliers Mills	0.092	6/24/2002	Colliers Mills	0.094
6/12/2002	Millville	0.093	6/24/2002	Millville	0.100
6/12/2002	Nacote Creek	0.086	6/24/2002	Monmouth Univ.	0.103
6/20/2002	Chester	0.091	6/24/2002	Nacote Creek	0.099
6/20/2002	Colliers Mills	0.086	6/25/2002	Ancora St. Hosp.	0.106
6/20/2002	Flemington	0.093	6/25/2002	Camden	0.105
6/20/2002	Rider Univ.	0.088	6/25/2002	Chester	0.095
6/20/2002	Rutgers Univ.	0.094	6/25/2002	Clarksboro	0.109
6/21/2002	Flemington	0.089	6/25/2002	Colliers Mills	0.094
6/22/2002	Ancora St. Hosp.	0.092	6/25/2002	Flemington	0.092
6/22/2002	Camden	0.102	6/25/2002	Millville	0.092

6/22/2002	Chester	0.090	6/25/2002	Nacote Creek	0.093
6/22/2002	Clarksboro	0.101	6/25/2002	Rider Univ.	0.100
6/22/2002	Colliers Mills	0.107	6/26/2002	Chester	0.088
6/22/2002	Flemington	0.088	6/26/2002	Flemington	0.090
6/22/2002	Monmouth Univ.	0.089	6/26/2002	Rider Univ.	0.090
6/22/2002	Rider Univ.	0.099	6/26/2002	Rutgers Univ.	0.091

July					
Date	Site Name	Concentration	Date	Site Name	Concentration
7/01/2002	Ancora St. Hosp.	0.089	7/09/2002	Ramapo	0.092
7/01/2002	Camden	0.089	7/09/2002	Rider Univ.	0.109
7/01/2002	Chester	0.088	7/09/2002	Rutgers Univ.	0.110
7/01/2002	Clarksboro	0.092	7/09/2002	Teaneck	0.112
7/01/2002	Colliers Mills	0.099	7/13/2002	Flemington	0.085
7/01/2002	Flemington	0.089	7/15/2002	Ancora St. Hosp.	0.085
7/01/2002	Monmouth Univ.	0.085	7/15/2002	Colliers Mills	0.089
7/01/2002	Rider Univ.	0.097	7/17/2002	Ancora St. Hosp.	0.107
7/01/2002	Rutgers Univ.	0.095	7/17/2002	Clarksboro	0.108
7/01/2002	Teaneck	0.089	7/17/2002	Colliers Mills	0.116
7/02/2002	Ancora St. Hosp.	0.106	7/17/2002	Millville	0.092
7/02/2002	Bayonne	0.091	7/17/2002	Monmouth Univ.	0.086
7/02/2002	Camden	0.101	7/17/2002	Nacote Creek	0.093
7/02/2002	Chester	0.092	7/17/2002	Rider Univ.	0.092
7/02/2002	Clarksboro	0.112	7/17/2002	Rutgers Univ.	0.088
7/02/2002	Colliers Mills	0.125	7/18/2002	Ancora St. Hosp.	0.112
7/02/2002	Millville	0.095	7/18/2002	Bayonne	0.089
7/02/2002	Monmouth Univ.	0.103	7/18/2002	Chester	0.102
7/02/2002	Nacote Creek	0.086	7/18/2002	Clarksboro	0.108
7/02/2002	Rider Univ.	0.093	7/18/2002	Colliers Mills	0.110
7/02/2002	Rutgers Univ.	0.085	7/18/2002	Flemington	0.089
7/02/2002	Teaneck	0.088	7/18/2002	Millville	0.102
7/03/2002	Ancora St. Hosp.	0.105	7/18/2002	Monmouth Univ.	0.101
7/03/2002	Camden	0.087	7/18/2002	Nacote Creek	0.102
7/03/2002	Clarksboro	0.086	7/18/2002	Newark	0.095
7/03/2002	Colliers Mills	0.095	7/18/2002	Ramapo	0.090
7/03/2002	Millville	0.088	7/18/2002	Rider Univ.	0.098
7/03/2002	Monmouth Univ.	0.099	7/18/2002	Rutgers Univ.	0.100
7/03/2002	Nacote Creek	0.088	7/18/2002	Teaneck	0.104
7/07/2002	Ancora St. Hosp.	0.097	7/19/2002	Ancora St. Hosp.	0.096

7/07/2002	Millville	0.086	7/19/2002	Camden	0.104
7/08/2002	Ancora St. Hosp.	0.105	7/19/2002	Chester	0.086
7/08/2002	Bayonne	0.093	7/19/2002	Clarksboro	0.106
7/08/2002	Camden	0.112	7/19/2002	Colliers Mills	0.093
7/08/2002	Chester	0.101	7/19/2002	Ramapo	0.088
7/08/2002	Clarksboro	0.125	7/19/2002	Rider Univ.	0.093
7/08/2002	Colliers Mills	0.128	7/19/2002	Rutgers Univ.	0.093
7/08/2002	Flemington	0.093	7/19/2002	Teaneck	0.096
7/08/2002	Millville	0.091	7/22/2002	Chester	0.099
7/08/2002	Monmouth Univ.	0.114	7/22/2002	Flemington	0.087
7/08/2002	Nacote Creek	0.088	7/22/2002	Newark	0.086
7/08/2002	Newark	0.086	7/22/2002	Ramapo	0.087
7/08/2002	Ramapo	0.091	7/22/2002	Rider Univ.	0.086
7/08/2002	Rider Univ.	0.095	7/22/2002	Rutgers Univ.	0.087
7/08/2002	Rutgers Univ.	0.094	7/22/2002	Teaneck	0.091
7/08/2002	Teaneck	0.099	7/23/2002	Chester	0.087
7/09/2002	Ancora St. Hosp.	0.118	7/23/2002	Newark	0.092
7/09/2002	Bayonne	0.094	7/23/2002	Rider Univ.	0.085
7/09/2002	Camden	0.109	7/23/2002	Rutgers Univ.	0.087
7/09/2002	Chester	0.102	7/23/2002	Teaneck	0.096
7/09/2002	Clarksboro	0.126	7/28/2002	Rider Univ.	0.087
7/09/2002	Colliers Mills	0.138	7/29/2002	Ancora St. Hosp.	0.091
7/09/2002	Flemington	0.101	7/29/2002	Colliers Mills	0.085
7/09/2002	Millville	0.109	7/29/2002	Millville	0.088
7/09/2002	Monmouth Univ.	0.125	7/31/2002	Ancora St. Hosp.	0.090
7/09/2002	Nacote Creek	0.095	7/31/2002	Monmouth Univ.	0.086
7/09/2002	Newark	0.095			

August					
Date	Site Name	Concentration	Date	Site Name	Concentration
8/01/2002	Ancora St. Hosp.	0.094	8/11/2002	Rutgers Univ.	0.103
8/01/2002	Clarksboro	0.086	8/11/2002	Teaneck	0.102
8/01/2002	Colliers Mills	0.114	8/12/2002	Ancora St. Hosp.	0.102
8/01/2002	Millville	0.107	8/12/2002	Camden	0.112
8/01/2002	Monmouth Univ.	0.101	8/12/2002	Chester	0.129
8/01/2002	Rutgers Univ.	0.086	8/12/2002	Clarksboro	0.108
8/02/2002	Ancora St. Hosp.	0.096	8/12/2002	Colliers Mills	0.119
8/02/2002	Bayonne	0.087	8/12/2002	Flemington	0.109
8/02/2002	Camden	0.116	8/12/2002	Millville	0.094

8/02/2002	Chester	0.091	8/12/2002	Ramapo	0.097
8/02/2002	Clarksboro	0.113	8/12/2002	Rider Univ.	0.116
8/02/2002	Colliers Mills	0.088	8/12/2002	Rutgers Univ.	0.115
8/02/2002	Flemington	0.090	8/12/2002	Teaneck	0.101
8/02/2002	Millville	0.091	8/13/2002	Ancora St. Hosp.	0.111
8/02/2002	Ramapo	0.090	8/13/2002	Bayonne	0.098
8/02/2002	Rider Univ.	0.103	8/13/2002	Camden	0.114
8/02/2002	Rutgers Univ.	0.104	8/13/2002	Chester	0.102
8/02/2002	Teaneck	0.096	8/13/2002	Clarksboro	0.115
8/03/2002	Camden	0.096	8/13/2002	Colliers Mills	0.125
8/03/2002	Chester	0.093	8/13/2002	Flemington	0.098
8/03/2002	Ramapo	0.090	8/13/2002	Millville	0.104
8/03/2002	Rutgers Univ.	0.094	8/13/2002	Monmouth Univ.	0.097
8/03/2002	Teaneck	0.092	8/13/2002	Nacote Creek	0.088
8/04/2002	Camden	0.104	8/13/2002	Newark	0.099
8/04/2002	Chester	0.095	8/13/2002	Ramapo	0.091
8/04/2002	Clarksboro	0.091	8/13/2002	Rider Univ.	0.106
8/04/2002	Colliers Mills	0.087	8/13/2002	Rutgers Univ.	0.104
8/04/2002	Flemington	0.088	8/13/2002	Teaneck	0.105
8/04/2002	Ramapo	0.089	8/14/2002	Ancora St. Hosp.	0.098
8/04/2002	Rider Univ.	0.115	8/14/2002	Camden	0.099
8/04/2002	Rutgers Univ.	0.094	8/14/2002	Chester	0.123
8/05/2002	Ancora St. Hosp.	0.094	8/14/2002	Clarksboro	0.097
8/05/2002	Clarksboro	0.085	8/14/2002	Colliers Mills	0.095
8/05/2002	Millville	0.085	8/14/2002	Flemington	0.116
8/10/2002	Camden	0.094	8/14/2002	Millville	0.086
8/10/2002	Chester	0.095	8/14/2002	Newark	0.087
8/10/2002	Clarksboro	0.088	8/14/2002	Ramapo	0.109
8/10/2002	Colliers Mills	0.088	8/14/2002	Rider Univ.	0.105
8/10/2002	Flemington	0.096	8/14/2002	Rutgers Univ.	0.101
8/10/2002	Rider Univ.	0.105	8/16/2002	Colliers Mills	0.094
8/10/2002	Rutgers Univ.	0.101	8/16/2002	Rider Univ.	0.088
8/10/2002	Teaneck	0.088	8/17/2002	Colliers Mills	0.089
8/11/2002	Ancora St. Hosp.	0.087	8/17/2002	Monmouth Univ.	0.095
8/11/2002	Camden	0.091	8/19/2002	Ancora St. Hosp.	0.097
8/11/2002	Chester	0.092	8/19/2002	Clarksboro	0.088
8/11/2002	Colliers Mills	0.085	8/19/2002	Colliers Mills	0.098
8/11/2002	Flemington	0.099	8/19/2002	Millville	0.086

8/11/2002	Ramapo	0.097	8/22/2002	Chester	0.086
8/11/2002	Rider Univ.	0.110			

September					
Date	Site Name	Concentration	Date	Site Name	Concentration
9/08/2002	Chester	0.105	9/09/2002	Clarksboro	0.089
9/08/2002	Ramapo	0.101	9/09/2002	Colliers Mills	0.099
9/08/2002	Rutgers Univ.	0.094	9/09/2002	Monmouth Univ.	0.096
9/08/2002	Teaneck	0.099	9/09/2002	Rider Univ.	0.086
9/09/2002	Ancora St. Hosp.	0.091	9/09/2002	Rutgers Univ.	0.090
9/09/2002	Chester	0.097	9/10/2002	Chester	0.108

2001 Ozone Exceedances Summary (8-hour averages)

Site Name	Exceedances	Site Name	Exceedances
Ancora St. Hosp.	17	Millville	14
Bayonne	6	Monmouth Univ.	8
Camden	19	Nacote Creek	9
Chester	15	Newark *	1
Clarksboro	17	Ramapo	9
Colliers Mills	21	Rider Univ.	15
Flemington	12	Rutgers Univ.	17
		Teaneck	10

Total # of Days the 8-hour Ozone Standard was Exceeded	35
Total # of Sites above the 8-hour Ozone Standard	15
Total # of Site-Days above the 8-hour Ozone Standard	190

Maximum 8-hour Ozone Concentration: 0.121 ppm at Colliers Mills on 8/07/2001

* Newark start-up date was August 7, 2001

2001 Ozone Exceedances (8-hour averages, parts per million)

May					
Date	Site Name	Concentration	Date	Site Name	Concentration
5/01/2001	Colliers Mills	0.087	5/04/2001	Ancora St. Hosp.	0.098
5/02/2001	Ancora St. Hosp.	0.088	5/04/2001	Camden	0.092
5/02/2001	Chester	0.086	5/04/2001	Chester	0.095
5/02/2001	Clarksboro	0.089	5/04/2001	Clarksboro	0.093
5/02/2001	Colliers Mills	0.095	5/04/2001	Colliers Mills	0.108
5/02/2001	Flemington	0.085	5/04/2001	Flemington	0.099
5/02/2001	Nacote Creek	0.085	5/04/2001	Millville	0.085
5/02/2001	Rutgers Univ.	0.085	5/04/2001	Ramapo	0.088

5/03/2001	Ancora St. Hosp.	0.099	5/04/2001	Rider Univ.	0.100
5/03/2001	Camden	0.096	5/04/2001	Rutgers Univ.	0.102
5/03/2001	Chester	0.101	5/10/2001	Colliers Mills	0.085
5/03/2001	Clarksboro	0.097	5/11/2001	Ancora St. Hosp.	0.092
5/03/2001	Colliers Mills	0.109	5/11/2001	Camden	0.086
5/03/2001	Flemington	0.098	5/11/2001	Chester	0.091
5/03/2001	Millville	0.089	5/11/2001	Clarksboro	0.092
5/03/2001	Nacote Creek	0.088	5/11/2001	Colliers Mills	0.093
5/03/2001	Ramapo	0.092	5/11/2001	Flemington	0.090
5/03/2001	Rider Univ.	0.103	5/11/2001	Nacote Creek	0.087
5/03/2001	Rutgers Univ.	0.106	5/11/2001	Ramapo	0.087
			5/11/2001	Rutgers Univ.	0.097

June					
Date	Site Name	Concentration	Date	Site Name	Concentration
6/11/2001	Chester	0.085	6/20/2001	Rutgers Univ.	0.109
6/11/2001	Flemington	0.088	6/20/2001	Teaneck	0.109
6/12/2001	Ancora St. Hosp.	0.092	6/26/2001	Ancora St. Hosp.	0.098
6/12/2001	Camden	0.091	6/26/2001	Millville	0.093
6/12/2001	Clarksboro	0.086	6/26/2001	Monmouth Univ.	0.090
6/12/2001	Colliers Mills	0.085	6/26/2001	Nacote Creek	0.088
6/12/2001	Millville	0.086	6/27/2001	Ancora St. Hosp.	0.111
6/13/2001	Ancora St. Hosp.	0.088	6/27/2001	Camden	0.094
6/13/2001	Camden	0.104	6/27/2001	Clarksboro	0.094
6/13/2001	Chester	0.107	6/27/2001	Colliers Mills	0.090
6/13/2001	Clarksboro	0.097	6/27/2001	Millville	0.089
6/13/2001	Colliers Mills	0.099	6/27/2001	Nacote Creek	0.096
6/13/2001	Flemington	0.095	6/27/2001	Rider Univ.	0.088
6/13/2001	Millville	0.085	6/27/2001	Rutgers Univ.	0.089
6/13/2001	Rider Univ.	0.101	6/28/2001	Ancora St. Hosp.	0.107
6/19/2001	Ancora St. Hosp.	0.093	6/28/2001	Camden	0.092
6/19/2001	Bayonne	0.117	6/28/2001	Clarksboro	0.094
6/19/2001	Camden	0.094	6/28/2001	Colliers Mills	0.097
6/19/2001	Chester	0.109	6/28/2001	Millville	0.092
6/19/2001	Clarksboro	0.086	6/28/2001	Monmouth Univ.	0.087
6/19/2001	Colliers Mills	0.095	6/28/2001	Nacote Creek	0.096
6/19/2001	Flemington	0.113	6/28/2001	Rider Univ.	0.090
6/19/2001	Millville	0.086	6/29/2001	Camden	0.101

6/19/2001	Rider Univ.	0.115	6/29/2001	Chester	0.086
6/19/2001	Rutgers Univ.	0.120	6/29/2001	Clarksboro	0.090
6/19/2001	Teaneck	0.111	6/29/2001	Flemington	0.087
6/20/2001	Ancora St. Hosp.	0.087	6/29/2001	Millville	0.094
6/20/2001	Bayonne	0.103	6/30/2001	Bayonne	0.087
6/20/2001	Camden	0.087	6/30/2001	Chester	0.087
6/20/2001	Chester	0.092	6/30/2001	Colliers Mills	0.106
6/20/2001	Colliers Mills	0.090	6/30/2001	Monmouth Univ.	0.115
6/20/2001	Flemington	0.101	6/30/2001	Rider Univ.	0.094
6/20/2001	Ramapo	0.090	6/30/2001	Rutgers Univ.	0.091
6/20/2001	Rider Univ.	0.105	6/30/2001	Teaneck	0.095

July					
Date	Site Name	Concentration	Date	Site Name	Concentration
7/10/2001	Ancora St. Hosp.	0.092	7/21/2001	Clarksboro	0.085
7/10/2001	Colliers Mills	0.092	7/21/2001	Colliers Mills	0.087
7/10/2001	Millville	0.096	7/21/2001	Monmouth Univ.	0.086
7/10/2001	Monmouth Univ.	0.086	7/21/2001	Rutgers Univ.	0.086
7/17/2001	Ancora St. Hosp.	0.101	7/21/2001	Teaneck	0.085
7/17/2001	Camden	0.098	7/22/2001	Teaneck	0.086
7/17/2001	Clarksboro	0.098	7/23/2001	Rider Univ.	0.086
7/17/2001	Colliers Mills	0.103	7/23/2001	Rutgers Univ.	0.095
7/17/2001	Millville	0.104	7/25/2001	Bayonne	0.087
7/17/2001	Rider Univ.	0.088	7/25/2001	Chester	0.085
7/17/2001	Rutgers Univ.	0.086	7/25/2001	Rutgers Univ.	0.093
7/21/2001	Camden	0.086	7/25/2001	Teaneck	0.097

August					
Date	Site Name	Concentration	Date	Site Name	Concentration
8/01/2001	Chester	0.085	8/07/2001	Rutgers Univ.	0.107
8/01/2001	Colliers Mills	0.094	8/07/2001	Teaneck	0.116
8/01/2001	Rider Univ.	0.090	8/08/2001	Ancora St. Hosp.	0.104
8/02/2001	Ramapo	0.086	8/08/2001	Camden	0.098
8/02/2001	Rutgers Univ.	0.086	8/08/2001	Clarksboro	0.096
8/03/2001	Rutgers Univ.	0.087	8/08/2001	Colliers Mills	0.100
8/05/2001	Camden	0.085	8/08/2001	Flemington	0.085
8/05/2001	Clarksboro	0.085	8/08/2001	Millville	0.109
8/05/2001	Teaneck	0.092	8/08/2001	Monmouth Univ.	0.091

8/06/2001	Camden	0.104	8/08/2001	Nacote Creek	0.093
8/06/2001	Clarksboro	0.093	8/08/2001	Rider Univ.	0.085
8/06/2001	Colliers Mills	0.096	8/09/2001	Ancora St. Hosp.	0.094
8/06/2001	Rider Univ.	0.093	8/09/2001	Bayonne	0.091
8/06/2001	Rutgers Univ.	0.086	8/09/2001	Camden	0.118
8/06/2001	Teaneck	0.088	8/09/2001	Chester	0.097
8/07/2001	Ancora St. Hosp.	0.112	8/09/2001	Clarksboro	0.108
8/07/2001	Bayonne	0.108	8/09/2001	Colliers Mills	0.110
8/07/2001	Camden	0.114	8/09/2001	Flemington	0.103
8/07/2001	Chester	0.109	8/09/2001	Millville	0.102
8/07/2001	Clarksboro	0.108	8/09/2001	Monmouth Univ.	0.098
8/07/2001	Colliers Mills	0.121	8/09/2001	Nacote Creek	0.097
8/07/2001	Flemington	0.103	8/09/2001	Ramapo	0.088
8/07/2001	Millville	0.110	8/09/2001	Rider Univ.	0.106
8/07/2001	Monmouth Univ.	0.112	8/09/2001	Rutgers Univ.	0.102
8/07/2001	Nacote Creek	0.101	8/09/2001	Teaneck	0.094
8/07/2001	Newark	0.109	8/10/2001	Camden	0.086
8/07/2001	Ramapo	0.092	8/19/2001	Ramapo	0.088
8/07/2001	Rider Univ.	0.104	8/24/2001	Ancora St. Hosp.	0.085

September					
Date	Site Name	Concentration	Date	Site Name	Concentration
9/7/2001	Chester	0.085	9/19/2001	Camden	0.085
9/7/2001	Ramapo	0.087			

2000 Ozone Exceedances Summary (8-hour averages)

Site Name	Exceedances	Site Name	Exceedances
Ancora St. Hosp.	10	Millville	6
Bayonne	3	Monmouth Univ.	5
Camden	6	Nacote Creek	4
Chester	6	Ramapo	1
Clarksboro	8	Rider Univ.	11
Colliers Mills	11	Rutgers Univ.	10
Flemington	9	Teaneck	2

Total # of Days the 8-hour Ozone Standard was Exceeded	19
Total # of Sites above the 8-hour Ozone Standard	14
Total # of Site-Days above the 8-hour Ozone Standard	92

Maximum 8-hour Ozone Concentration: 0.132 ppm at Colliers Mills on 6/10/2000

2000 Ozone Exceedances (8-hour averages, parts per million)

May

Date	Site Name	Concentration	Date	Site Name	Concentration
5/6/2000	Ancora St. Hosp.	0.091	5/8/2000	Rutgers Univ.	0.095
5/6/2000	Colliers Mills	0.090	5/9/2000	Ancora St. Hosp.	0.085
5/6/2000	Rider Univ.	0.090	5/9/2000	Camden	0.085
5/7/2000	Colliers Mills	0.087	5/9/2000	Clarksboro	0.095
5/8/2000	Ancora St. Hosp.	0.091	5/9/2000	Colliers Mills	0.104
5/8/2000	Chester	0.090	5/9/2000	Monmouth Univ.	0.091
5/8/2000	Clarksboro	0.086	5/9/2000	Rider Univ.	0.087
5/8/2000	Colliers Mills	0.102	5/12/2000	Ancora St. Hosp.	0.090
5/8/2000	Flemington	0.086	5/12/2000	Clarksboro	0.094
5/8/2000	Rider Univ.	0.098			

June

Date	Site Name	Concentration	Date	Site Name	Concentration
6/1/2000	Ancora St. Hosp.	0.099	6/10/2000	Bayonne	0.103
6/1/2000	Clarksboro	0.089	6/10/2000	Camden	0.121
6/1/2000	Colliers Mills	0.090	6/10/2000	Chester	0.115
6/1/2000	Flemington	0.086	6/10/2000	Clarksboro	0.124
6/1/2000	Rider Univ.	0.089	6/10/2000	Colliers Mills	0.132
6/1/2000	Rutgers Univ.	0.091	6/10/2000	Flemington	0.106
6/2/2000	Ancora St. Hosp.	0.110	6/10/2000	Millville	0.103
6/2/2000	Bayonne	0.090	6/10/2000	Monmouth Univ.	0.118
6/2/2000	Camden	0.088	6/10/2000	Nacote Creek	0.099
6/2/2000	Chester	0.099	6/10/2000	Ramapo	0.097
6/2/2000	Clarksboro	0.104	6/10/2000	Rider Univ.	0.120
6/2/2000	Colliers Mills	0.115	6/10/2000	Rutgers Univ.	0.112
6/2/2000	Flemington	0.095	6/10/2000	Teaneck	0.086
6/2/2000	Millville	0.106	6/11/2000	Ancora St. Hosp.	0.102
6/2/2000	Monmouth Univ.	0.101	6/11/2000	Camden	0.101
6/2/2000	Nacote Creek	0.088	6/11/2000	Chester	0.090
6/2/2000	Rider Univ.	0.104	6/11/2000	Clarksboro	0.108
6/2/2000	Rutgers Univ.	0.100	6/11/2000	Colliers Mills	0.116
6/9/2000	Ancora St. Hosp.	0.119	6/11/2000	Flemington	0.090
6/9/2000	Bayonne	0.090	6/11/2000	Millville	0.094
6/9/2000	Camden	0.102	6/11/2000	Monmouth Univ.	0.099
6/9/2000	Chester	0.099	6/11/2000	Nacote Creek	0.085
6/9/2000	Clarksboro	0.114	6/11/2000	Rider Univ.	0.093

6/9/2000	Colliers Mills	0.125	6/11/2000	Rutgers Univ.	0.091
6/9/2000	Flemington	0.102	6/24/2000	Chester	0.090
6/9/2000	Millville	0.113	6/24/2000	Flemington	0.092
6/9/2000	Monmouth Univ.	0.104	6/24/2000	Millville	0.085
6/9/2000	Nacote Creek	0.099	6/26/2000	Flemington	0.088
6/9/2000	Rider Univ.	0.108	6/26/2000	Rider Univ.	0.087
6/9/2000	Rutgers Univ.	0.102	6/26/2000	Rutgers Univ.	0.088
6/10/2000	Ancora St. Hosp.	0.121	6/26/2000	Teaneck	0.090

July

Date	Site Name	Concentration	Date	Site Name	Concentration
7/3/2000	Rider Univ.	0.087	7/13/2000	Flemington	0.085
7/3/2000	Rutgers Univ.	0.085	7/18/2000	Colliers Mills	0.085
7/9/2000	Camden	0.086	7/18/2000	Millville	0.085
7/9/2000	Rider Univ.	0.088	7/21/2000	Rutgers Univ.	0.091
7/9/2000	Rutgers Univ.	0.087			

August

Date	Site Name	Concentration	Date	Site Name	Concentration
8/7/2000	Colliers Mills	0.087	8/10/2000	Ancora St. Hosp.	0.088

1999 Ozone Exceedances Summary (8-hour averages)

Site Name	Exceedances	Site Name	Exceedances
Ancora St. Hosp.	25	Millville	17
Bayonne	17	Monmouth Univ.	12
Camden	16	Nacote Creek	14
Chester	21	Newark	6
Clarksboro	21	Ramapo	16
Colliers Mills	23	Rider Univ.	24
Flemington	23	Rutgers Univ.	23

Total # of Days the 8-hour Ozone Standard was Exceeded	46
Total # of Sites above the 8-hour Ozone Standard	14
Total # of Site-Days above the 8-hour Ozone Standard	258

Maximum 8-hour Ozone Concentration: 0.135 ppm at Rutgers University on 7/17/1999

1999 Ozone Exceedances (8-hour averages, parts per million)

May

Date	Site Name	Concentration	Date	Site Name	Concentration
5/22/1999	Ancora St. Hosp.	0.085	5/30/1999	Bayonne	0.095
5/22/1999	Camden	0.088	5/30/1999	Clarksboro	0.088

5/22/1999	Clarksboro	0.090	5/30/1999	Millville	0.092
5/22/1999	Colliers Mills	0.093	5/31/1999	Ancora St. Hosp.	0.105
5/22/1999	Millville	0.088	5/31/1999	Bayonne	0.106
5/22/1999	Rider Univ.	0.085	5/31/1999	Camden	0.105
5/29/1999	Ancora St. Hosp.	0.092	5/31/1999	Chester	0.099
5/29/1999	Bayonne	0.087	5/31/1999	Clarksboro	0.105
5/29/1999	Camden	0.085	5/31/1999	Colliers Mills	0.101
5/29/1999	Chester	0.086	5/31/1999	Flemington	0.100
5/29/1999	Clarksboro	0.089	5/31/1999	Millville	0.104
5/29/1999	Colliers Mills	0.089	5/31/1999	Monmouth Univ.	0.087
5/29/1999	Flemington	0.087	5/31/1999	Newark	0.098
5/29/1999	Millville	0.085	5/31/1999	Ramapo	0.086
5/29/1999	Rider Univ.	0.087	5/31/1999	Rider Univ.	0.114
5/29/1999	Rutgers Univ.	0.088	5/31/1999	Rutgers Univ.	0.104
5/30/1999	Ancora St. Hosp.	0.103			

June

Date	Site Name	Concentration	Date	Site Name	Concentration
6/1/1999	Bayonne	0.087	6/8/1999	Ancora St. Hosp.	0.101
6/1/1999	Chester	0.085	6/8/1999	Camden	0.085
6/1/1999	Flemington	0.088	6/8/1999	Clarksboro	0.092
6/1/1999	Rider Univ.	0.087	6/8/1999	Colliers Mills	0.091
6/1/1999	Rutgers Univ.	0.092	6/8/1999	Millville	0.090
6/2/1999	Bayonne	0.085	6/8/1999	Monmouth Univ.	0.087
6/2/1999	Chester	0.097	6/8/1999	Rider Univ.	0.085
6/2/1999	Flemington	0.092	6/8/1999	Rutgers Univ.	0.085
6/2/1999	Ramapo	0.087	6/9/1999	Ancora St. Hosp.	0.095
6/2/1999	Rider Univ.	0.086	6/9/1999	Millville	0.090
6/2/1999	Rutgers Univ.	0.091	6/23/1999	Ancora St. Hosp.	0.087
6/6/1999	Rutgers Univ.	0.093	6/23/1999	Bayonne	0.096
6/7/1999	Ancora St. Hosp.	0.109	6/23/1999	Chester	0.092
6/7/1999	Bayonne	0.098	6/23/1999	Flemington	0.094
6/7/1999	Camden	0.090	6/23/1999	Monmouth Univ.	0.100
6/7/1999	Chester	0.086	6/23/1999	Rider Univ.	0.088
6/7/1999	Clarksboro	0.099	6/23/1999	Rutgers Univ.	0.091
6/7/1999	Colliers Mills	0.101	6/26/1999	Bayonne	0.093
6/7/1999	Flemington	0.098	6/26/1999	Chester	0.088
6/7/1999	Millville	0.096	6/26/1999	Flemington	0.090
6/7/1999	Monmouth Univ.	0.096	6/26/1999	Rider Univ.	0.103

6/7/1999	Newark	0.092	6/26/1999	Rutgers Univ.	0.098
6/7/1999	Rider Univ.	0.095	6/27/1999	Ramapo	0.085
6/7/1999	Rutgers Univ.	0.097			

July					
Date	Site Name	Concentration	Date	Site Name	Concentration
7/3/1999	Bayonne	0.086	7/19/1999	Flemington	0.098
7/3/1999	Camden	0.091	7/19/1999	Millville	0.105
7/3/1999	Rider Univ.	0.090	7/19/1999	Monmouth	0.096
7/5/1999	Nacote Creek	0.092	7/19/1999	Nacote Creek	0.097
7/6/1999	Ancora St. Hosp.	0.101	7/19/1999	Ramapo	0.085
7/6/1999	Clarksboro	0.089	7/19/1999	Rider Univ.	0.109
7/6/1999	Millville	0.098	7/19/1999	Rutgers Univ.	0.105
7/6/1999	Monmouth Univ.	0.088	7/23/1999	Ancora St. Hosp.	0.119
7/6/1999	Nacote Creek	0.098	7/23/1999	Bayonne	0.085
7/6/1999	Rider Univ.	0.097	7/23/1999	Camden	0.100
7/6/1999	Rutgers Univ.	0.091	7/23/1999	Clarksboro	0.101
7/7/1999	Ancora St. Hosp.	0.086	7/23/1999	Colliers Mills	0.104
7/7/1999	Colliers Mills	0.085	7/23/1999	Flemington	0.092
7/7/1999	Nacote Creek	0.086	7/23/1999	Millville	0.091
7/8/1999	Nacote Creek	0.085	7/23/1999	Rider Univ.	0.107
7/9/1999	Ancora St. Hosp.	0.098	7/23/1999	Rutgers Univ.	0.122
7/9/1999	Camden	0.096	7/24/1999	Ancora St. Hosp.	0.104
7/9/1999	Chester	0.091	7/24/1999	Bayonne	0.104
7/9/1999	Clarksboro	0.095	7/24/1999	Camden	0.103
7/9/1999	Colliers Mills	0.094	7/24/1999	Chester	0.094
7/9/1999	Flemington	0.115	7/24/1999	Clarksboro	0.108
7/9/1999	Millville	0.096	7/24/1999	Colliers Mills	0.103
7/9/1999	Nacote Creek	0.095	7/24/1999	Flemington	0.099
7/9/1999	Rutgers Univ.	0.090	7/24/1999	Millville	0.093
7/15/1999	Bayonne	0.097	7/24/1999	Newark	0.092
7/15/1999	Chester	0.098	7/24/1999	Ramapo	0.095
7/15/1999	Colliers Mills	0.098	7/24/1999	Rider Univ.	0.106
7/15/1999	Flemington	0.091	7/24/1999	Rutgers Univ.	0.110
7/15/1999	Ramapo	0.090	7/25/1999	Monmouth Univ.	0.109
7/15/1999	Rider Univ.	0.104	7/26/1999	Ancora St. Hosp.	0.086
7/15/1999	Rutgers Univ.	0.104	7/26/1999	Monmouth Univ.	0.093
7/16/1999	Ancora St. Hosp.	0.093	7/26/1999	Nacote Creek	0.095
7/16/1999	Bayonne	0.122	7/27/1999	Ancora St. Hosp.	0.102

7/16/1999	Camden	0.096	7/27/1999	Clarksboro	0.089
7/16/1999	Chester	0.117	7/27/1999	Colliers Mills	0.089
7/16/1999	Clarksboro	0.091	7/27/1999	Millville	0.090
7/16/1999	Colliers Mills	0.106	7/27/1999	Monmouth Univ.	0.086
7/16/1999	Flemington	0.114	7/27/1999	Nacote Creek	0.103
7/16/1999	Monmouth Univ.	0.094	7/28/1999	Ancora St. Hosp.	0.095
7/16/1999	Nacote Creek	0.087	7/28/1999	Clarksboro	0.087
7/16/1999	Newark	0.107	7/28/1999	Colliers Mills	0.098
7/16/1999	Ramapo	0.103	7/28/1999	Millville	0.089
7/16/1999	Rider Univ.	0.129	7/28/1999	Nacote Creek	0.095
7/16/1999	Rutgers Univ.	0.132	7/29/1999	Ancora St. Hosp.	0.098
7/17/1999	Ancora St. Hosp.	0.094	7/29/1999	Bayonne	0.098
7/17/1999	Bayonne	0.131	7/29/1999	Clarksboro	0.089
7/17/1999	Camden	0.096	7/29/1999	Colliers Mills	0.096
7/17/1999	Chester	0.104	7/29/1999	Flemington	0.086
7/17/1999	Clarksboro	0.093	7/29/1999	Millville	0.087
7/17/1999	Colliers Mills	0.101	7/29/1999	Nacote Creek	0.088
7/17/1999	Flemington	0.110	7/29/1999	Ramapo	0.099
7/17/1999	Newark	0.112	7/29/1999	Rider Univ.	0.095
7/17/1999	Ramapo	0.097	7/29/1999	Rutgers Univ.	0.098
7/17/1999	Rider Univ.	0.129	7/30/1999	Ancora St. Hosp.	0.096
7/17/1999	Rutgers Univ.	0.135	7/30/1999	Chester	0.091
7/18/1999	Bayonne	0.115	7/30/1999	Colliers Mills	0.110
7/18/1999	Camden	0.108	7/30/1999	Flemington	0.090
7/18/1999	Chester	0.108	7/30/1999	Nacote Creek	0.086
7/18/1999	Clarksboro	0.097	7/30/1999	Ramapo	0.104
7/18/1999	Colliers Mills	0.106	7/30/1999	Rider Univ.	0.103
7/18/1999	Flemington	0.110	7/30/1999	Rutgers Univ.	0.108
7/18/1999	Monmouth Univ.	0.086	7/31/1999	Ancora St. Hosp.	0.097
7/18/1999	Newark	0.104	7/31/1999	Camden	0.119
7/18/1999	Ramapo	0.099	7/31/1999	Chester	0.100
7/18/1999	Rider Univ.	0.125	7/31/1999	Clarksboro	0.117
7/18/1999	Rutgers Univ.	0.108	7/31/1999	Colliers Mills	0.094
7/19/1999	Ancora St. Hosp.	0.109	7/31/1999	Flemington	0.098
7/19/1999	Bayonne	0.094	7/31/1999	Millville	0.095
7/19/1999	Camden	0.106	7/31/1999	Ramapo	0.099
7/19/1999	Chester	0.092	7/31/1999	Rider Univ.	0.107
7/19/1999	Clarksboro	0.117	7/31/1999	Rutgers Univ.	0.093

7/19/1999	Colliers Mills	0.117			

August

Date	Site Name	Concentration	Date	Site Name	Concentration
8/1/1999	Ancora St. Hosp.	0.091	8/11/1999	Rider Univ.	0.096
8/1/1999	Monmouth Univ.	0.091	8/12/1999	Camden	0.094
8/1/1999	Nacote Creek	0.092	8/12/1999	Chester	0.093
8/4/1999	Chester	0.086	8/12/1999	Clarksboro	0.092
8/4/1999	Flemington	0.092	8/12/1999	Colliers Mills	0.090
8/4/1999	Ramapo	0.088	8/12/1999	Flemington	0.096
8/5/1999	Ancora St. Hosp.	0.086	8/12/1999	Rider Univ.	0.103
8/5/1999	Clarksboro	0.088	8/12/1999	Rutgers Univ.	0.098
8/5/1999	Colliers Mills	0.092	8/13/1999	Chester	0.086
8/5/1999	Millville	0.086	8/14/1999	Flemington	0.086
8/6/1999	Colliers Mills	0.085	8/17/1999	Chester	0.102
8/7/1999	Ancora St. Hosp.	0.085	8/17/1999	Flemington	0.100
8/7/1999	Colliers Mills	0.086	8/17/1999	Ramapo	0.096
8/11/1999	Camden	0.092	8/17/1999	Rider Univ.	0.099
8/11/1999	Chester	0.094	8/17/1999	Rutgers Univ.	0.088
8/11/1999	Clarksboro	0.095	8/18/1999	Nacote Creek	0.092
8/11/1999	Flemington	0.098	8/24/1999	Ramapo	0.085

September

Date	Site Name	Concentration			
9/2/1999	Ramapo	0.087			

1998 Ozone Exceedances Summary (8-hour averages)

Site Name	Exceedances	Site Name	Exceedances
Ancora St. Hosp.	29	Millville	17
Bayonne	7	Monmouth	20
Camden	15	Nacote Creek	24
Chester	22	Newark	5
Clarksboro	22	Ramapo *	8
Colliers Mills	28	Rider	17
Flemington	21	Rutgers	15

Total # of Days the 8-hour Ozone Standard was Exceeded	47
Total # of Sites above the 8-hour Ozone Standard	14
Total # of Site-Days above the 8-hour Ozone Standard	250

Maximum 8-hour Ozone Concentration: 0.113 ppm at Colliers Mills on 6/25/1998

* Ramapo start-up date was June 5, 1998

1998 Ozone Exceedances (8-hour averages, parts per million)

May

Date	Site	Concentration	Date	Site	Concentration
5/16/1998	Ancora St. Hosp.	0.107	5/21/1998	Ancora St. Hosp.	0.086
5/16/1998	Camden	0.110	5/21/1998	Millville	0.086
5/16/1998	Chester	0.104	5/21/1998	Nacote Creek	0.089
5/16/1998	Clarksboro	0.111	5/28/1998	Ancora St. Hosp.	0.085
5/16/1998	Colliers Mills	0.097	5/28/1998	Chester	0.086
5/16/1998	Flemington	0.099	5/28/1998	Colliers Mills	0.086
5/16/1998	Millville	0.101	5/28/1998	Rutgers	0.089
5/16/1998	Monmouth	0.091	5/29/1998	Bayonne	0.087
5/16/1998	Nacote Creek	0.099	5/29/1998	Chester	0.089
5/16/1998	Rider	0.102	5/29/1998	Colliers Mills	0.086
5/16/1998	Rutgers	0.099	5/29/1998	Flemington	0.087
5/19/1998	Ancora St. Hosp.	0.091	5/29/1998	Newark	0.091
5/19/1998	Chester	0.087	5/29/1998	Rutgers	0.092
5/19/1998	Colliers Mills	0.086	5/30/1998	Ancora St. Hosp.	0.097
5/19/1998	Nacote Creek	0.096	5/30/1998	Camden	0.093
5/20/1998	Ancora St. Hosp.	0.097	5/30/1998	Clarksboro	0.097
5/20/1998	Camden	0.086	5/30/1998	Colliers Mills	0.086
5/20/1998	Clarksboro	0.092	5/30/1998	Millville	0.088
5/20/1998	Colliers Mills	0.088	5/30/1998	Nacote Creek	0.088
5/20/1998	Millville	0.101	5/31/1998	Chester	0.087
5/20/1998	Nacote Creek	0.089			

June

Date	Site	Concentration	Date	Site	Concentration
6/2/1998	Ancora St. Hosp.	0.086	6/21/1998	Rider	0.092
6/2/1998	Millville	0.085	6/21/1998	Rutgers	0.088
6/2/1998	Nacote Creek	0.088	6/25/1998	Ancora St. Hosp.	0.090
6/20/1998	Ancora St. Hosp.	0.087	6/25/1998	Bayonne	0.087
6/20/1998	Clarksboro	0.089	6/25/1998	Camden	0.095
6/20/1998	Colliers Mills	0.088	6/25/1998	Chester	0.096
6/20/1998	Millville	0.089	6/25/1998	Clarksboro	0.100
6/20/1998	Monmouth	0.102	6/25/1998	Colliers Mills	0.113
6/20/1998	Nacote Creek	0.090	6/25/1998	Flemington	0.091

6/21/1998	Ancora St. Hosp.	0.085	6/25/1998	Monmouth	0.105
6/21/1998	Camden	0.091	6/25/1998	Rider	0.091
6/21/1998	Chester	0.095	6/26/1998	Ancora St. Hosp.	0.090
6/21/1998	Clarksboro	0.093	6/26/1998	Clarksboro	0.088
6/21/1998	Colliers Mills	0.100	6/26/1998	Colliers Mills	0.088
6/21/1998	Flemington	0.086	6/26/1998	Monmouth	0.090
6/21/1998	Monmouth	0.085			

July					
Date	Site	Concentration	Date	Site	Concentration
7/3/1998	Ancora St. Hosp.	0.089	7/21/1998	Colliers Mills	0.105
7/3/1998	Monmouth	0.086	7/21/1998	Millville	0.094
7/3/1998	Nacote Creek	0.088	7/21/1998	Monmouth	0.093
7/4/1998	Ancora St. Hosp.	0.092	7/21/1998	Nacote Creek	0.089
7/4/1998	Bayonne	0.108	7/21/1998	Rider	0.087
7/4/1998	Chester	0.097	7/22/1998	Ancora St. Hosp.	0.086
7/4/1998	Clarksboro	0.088	7/22/1998	Colliers Mills	0.088
7/4/1998	Colliers Mills	0.091	7/22/1998	Monmouth	0.085
7/4/1998	Flemington	0.094	7/22/1998	Nacote Creek	0.090
7/4/1998	Millville	0.086	7/23/1998	Ancora St. Hosp.	0.091
7/4/1998	Monmouth	0.093	7/23/1998	Colliers Mills	0.086
7/4/1998	Nacote Creek	0.090	7/23/1998	Millville	0.085
7/4/1998	Newark	0.097	7/23/1998	Monmouth	0.092
7/4/1998	Ramapo	0.090	7/23/1998	Nacote Creek	0.089
7/4/1998	Rider	0.092	7/24/1998	Ancora St. Hosp.	0.087
7/4/1998	Rutgers	0.104	7/24/1998	Monmouth	0.091
7/13/1998	Ancora St. Hosp.	0.088	7/27/1998	Chester	0.089
7/13/1998	Chester	0.086	7/27/1998	Flemington	0.090
7/13/1998	Colliers Mills	0.093	7/27/1998	Rider	0.086
7/13/1998	Flemington	0.091	7/27/1998	Rutgers	0.085
7/13/1998	Monmouth	0.085	7/28/1998	Chester	0.090
7/13/1998	Rider	0.095	7/28/1998	Flemington	0.092
7/13/1998	Rutgers	0.100	7/28/1998	Ramapo	0.085
7/14/1998	Chester	0.089	7/29/1998	Ancora St. Hosp.	0.092
7/14/1998	Flemington	0.085	7/29/1998	Chester	0.088
7/14/1998	Ramapo	0.088	7/29/1998	Clarksboro	0.090
7/16/1998	Flemington	0.097	7/29/1998	Colliers Mills	0.099
7/19/1998	Colliers Mills	0.088	7/29/1998	Flemington	0.086
7/19/1998	Flemington	0.086	7/29/1998	Millville	0.087

7/19/1998	Nacote Creek	0.085	7/29/1998	Monmouth	0.087
7/19/1998	Rider	0.088	7/29/1998	Rider	0.085
7/19/1998	Rutgers	0.086	7/29/1998	Rutgers	0.085
7/20/1998	Ancora St. Hosp.	0.090	7/30/1998	Ancora St. Hosp.	0.097
7/20/1998	Colliers Mills	0.086	7/30/1998	Camden	0.099
7/20/1998	Nacote Creek	0.088	7/30/1998	Clarksboro	0.088
7/21/1998	Ancora St. Hosp.	0.102	7/30/1998	Millville	0.086
7/21/1998	Camden	0.087	7/30/1998	Nacote Creek	0.092
7/21/1998	Clarksboro	0.098			

August					
Date	Site	Concentration	Date	Site	Concentration
8/3/1998	Camden	0.085	8/23/1998	Colliers Mills	0.104
8/3/1998	Clarksboro	0.087	8/23/1998	Millville	0.092
8/4/1998	Bayonne	0.095	8/23/1998	Nacote Creek	0.090
8/4/1998	Camden	0.087	8/23/1998	Newark	0.088
8/4/1998	Chester	0.100	8/23/1998	Ramapo	0.087
8/4/1998	Clarksboro	0.088	8/24/1998	Ancora St. Hosp.	0.105
8/4/1998	Colliers Mills	0.086	8/24/1998	Bayonne	0.091
8/4/1998	Flemington	0.091	8/24/1998	Camden	0.090
8/4/1998	Rider	0.095	8/24/1998	Chester	0.099
8/4/1998	Rutgers	0.087	8/24/1998	Clarksboro	0.098
8/5/1998	Chester	0.087	8/24/1998	Colliers Mills	0.109
8/5/1998	Ramapo	0.087	8/24/1998	Flemington	0.099
8/16/1998	Ramapo	0.092	8/24/1998	Millville	0.095
8/21/1998	Ancora St. Hosp.	0.093	8/24/1998	Monmouth	0.110
8/21/1998	Clarksboro	0.089	8/24/1998	Nacote Creek	0.089
8/21/1998	Colliers Mills	0.098	8/24/1998	Newark	0.090
8/21/1998	Flemington	0.085	8/24/1998	Ramapo	0.096
8/21/1998	Monmouth	0.092	8/24/1998	Rider	0.102
8/21/1998	Nacote Creek	0.090	8/24/1998	Rutgers	0.102
8/21/1998	Rider	0.090	8/25/1998	Ancora St. Hosp.	0.098
8/22/1998	Ancora St. Hosp.	0.086	8/25/1998	Clarksboro	0.085
8/22/1998	Camden	0.092	8/25/1998	Millville	0.089
8/22/1998	Chester	0.093	8/25/1998	Nacote Creek	0.088
8/22/1998	Clarksboro	0.100	8/29/1998	Ancora St. Hosp.	0.096
8/22/1998	Colliers Mills	0.093	8/29/1998	Bayonne	0.089
8/22/1998	Flemington	0.096	8/29/1998	Camden	0.087
8/22/1998	Millville	0.101	8/29/1998	Chester	0.085

8/22/1998	Monmouth	0.091	8/29/1998	Clarksboro	0.094
8/22/1998	Nacote Creek	0.085	8/29/1998	Colliers Mills	0.098
8/22/1998	Rider	0.096	8/29/1998	Flemington	0.089
8/22/1998	Rutgers	0.088	8/29/1998	Rider	0.093
8/23/1998	Ancora St. Hosp.	0.093	8/29/1998	Rutgers	0.094
8/23/1998	Bayonne	0.085	8/30/1998	Colliers Mills	0.087
8/23/1998	Camden	0.085	8/31/1998	Nacote Creek	0.086
8/23/1998	Clarksboro	0.090			

September					
Date	Site	Concentration	Date	Site	Concentration
9/4/1998	Chester	0.086	9/12/1998	Flemington	0.089
9/4/1998	Rider	0.086	9/12/1998	Millville	0.098
9/6/1998	Camden	0.088	9/12/1998	Monmouth	0.090
9/6/1998	Chester	0.094	9/12/1998	Nacote Creek	0.103
9/6/1998	Clarksboro	0.089	9/12/1998	Newark	0.086
9/6/1998	Colliers Mills	0.086	9/12/1998	Rider	0.092
9/6/1998	Flemington	0.091	9/12/1998	Rutgers	0.090
9/6/1998	Monmouth	0.093	9/14/1998	Flemington	0.090
9/6/1998	Nacote Creek	0.088	9/15/1998	Chester	0.089
9/6/1998	Ramapo	0.089	9/15/1998	Flemington	0.085
9/6/1998	Rider	0.093	9/16/1998	Monmouth	0.087
9/6/1998	Rutgers	0.086	9/27/1998	Ancora St. Hosp.	0.089
9/12/1998	Ancora St. Hosp.	0.098	9/27/1998	Clarksboro	0.087
9/12/1998	Camden	0.089	9/27/1998	Colliers Mills	0.094
9/12/1998	Chester	0.086	9/27/1998	Millville	0.090
9/12/1998	Clarksboro	0.098	9/27/1998	Monmouth	0.092
9/12/1998	Colliers Mills	0.094	9/27/1998	Nacote Creek	0.085

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Field Office Guide to Climatic Data

Table of Contents

Introduction [TOC]

The Natural Resources Conservation Service is charged with management of not only soil, but all five SWAPA resources (soil, water, air, plants, animals), and human considerations. SWAPA management requires an understanding of the resources, as well as interactions between resources. Many concerns about the resources can be addressed through climate information and specific climatic data.

Climate is an important factor driving the agriculture of a given region (along with soils, water available for irrigation, societal influences, economics, others). Under many situations, climate is THE determining factor which defines which crops can be grown in an area. For instance, although the soils and economics of North Dakota may support growing cotton, the climate there (specifically temperature and precipitation) would not allow cotton to grow and mature.

This publication concerning climatic data is oriented to the NRCS role in American agriculture and natural resource conservation. It describes the NRCS National Water & Climate Center (NWCC) and its network of liaisons in each NRCS state office.

How to Use this Guide [TOC]

This guide is divided into 7 sections. Section 1 contains detailed information about climatic data elements, measurement methods, and problems associated with collecting climatic data. Sections 2, 3, and 4 provide material to help understand data collection systems. Section 5, Climate Terminology, contains definitions of climatic terms. Section 6 explains how climatic information can be obtained. Climatic data needs associated with a particular conservation practice are listed in Section 7.

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1 Climatic Data Element Descriptions, Measurement Methods, and Errors Associated with it's Collection. *[TOC]*

The following description of climatic data elements is a condensation of the material contained in the National Weather Service Observing Handbook No.2, Cooperative Station Observations, the Weather Station Handbook an Interagency Guide for Wildland Managers, and the American Meteorological Society Glossary of Meteorology.

Statistical analysis of climatic data generates descriptive information which reflects the average atmospheric conditions at a location, as well as generating probabilities that extreme events will occur. Any statistical analysis of climatic data, due mainly to the limited number of samples available, must follow the rules for statistical analysis. An important rule governing small sample analysis requires a minimum of 30 samples. This does not mean that climatic data with less than 30 years of data can not be analyzed, but that some adjustment be made to estimate what a 30 sample set would produce.

AIR TEMPERATURE - Temperature is a measure of the hotness or coldness of air. It is measured on some definitive temperature scale. Two scales are commonly used. The Fahrenheit and Centigrade temperature scales establish the freezing of water at 32/0 degrees respectively and boiling point at 212/100 degrees respectively. The Fahrenheit scale is used most frequently in the US and Centigrade throughout the rest of the world. Air temperature is usually measured with either a liquid-in-glass maximum and minimum thermometer mounted in a vented, wooden box or with an electronic sensor.

It is important that thermometers be shaded from sunlight to avoid an erroneously high measured temperature. Instrument shelters are designed to rectify this problem. For more information on instrument shelters, see the Weather Station Handbook - an Interagency Guide for Wildland Managers.

EVAPORATION - Evaporation is the physical process by which a liquid is transformed to a gaseous state. Evaporation is influenced by solar radiation, air temperature, vapor pressure, wind, and possibly atmospheric pressure. Evaporation varies with latitude, altitude, season, time of day, and sky condition. Accurate evaporation readings requires careful maintenance of an evaporation pan which contains water. The water depth is measured daily and adjusted for any precipitation which may occur.

PRECIPITATION - Precipitation refers to all forms of water, liquid or solid, that fall from the atmosphere and reach the ground. Precipitation includes, but is not limited to, rain, drizzle, snow, hail, graupel, sleet, and ice crystals. It is one of the most basic data elements collected by any climate station. Dew, frost and rime are excluded, since they are a result of water vapor in air condensing or freezing onto a surface.

The standard U.S. precipitation gage has an eight inch diameter mouth and height of about 30 inches. Non-recording gages simply collect precipitation; amount of precipitation must be measured by an observer. Recording gages have instrumentation which records the time, duration, and intensity of precipitation. Most recording gages store information on a paper strip, which is generally changed weekly by an observer. Precipitation intensity and duration, useful information for many NRCS design activities, can be derived from information gathered by precipitation gages.

The biggest factor in precipitation measurement error is wind. Strong winds during precipitation events can cause considerable differences between measured and actual precipitation. Measurement errors can also result from small amounts of dew, frost, and rime accidentally included in the total measured precipitation. Even with careful placement, all gages underestimate the real precipitation, particularly with snowfall.

NEW SNOW - New snow is the incremental amount of snow that has fallen since the last snow depth observation. Delineating between new snow and old snow presents a challenge. A snow board (generally a sheet of plywood) can provide an artificial surface at the top of the existing snow. Snow boards are laid on top of old snow when there is any possibility of new snow falling. After each observation of new snow, the board is cleaned and placed in a new location. Board placement and measurement location are the greatest source of error in determining new snow.

SNOW DEPTH - Snow depth is the actual depth of snow on the ground at the time of measurement. Snow depth is usually measured daily and determined to the nearest whole inch with a calibrated stick, such as that used with the 8-inch non-recording rain gage, or a ruler or yardstick. Snow should be measured in several locations and averaged to avoid errors induced by drifted snow.

SNOW WATER EQUIVALENT - The water equivalent of snow is the depth of water that would be obtained by melting the snow cover. Water equivalent of snow is continuously measured (weighed) by recording gages which are winterized with an antifreeze solution. For non-recording gages, the snow catch collected by the standard rain gage (with the funnel and small tube removed) is melted by adding a known amount of warm water. The total amount is then measured and the added amount of warm water subtracted to yield the observed water equivalent. Most snow water equivalent measurement errors are associated with not selecting a representative location or the mechanics of subtracting water added to the total catch.

SOIL TEMPERATURE - Soil temperature measures the hotness or coldness of soil. Soil temperature is very important to the agricultural industry. Most seeds require a certain soil temperature in order to germinate. Soil temperatures are commonly measured at 2, 4, 8, 20, 40, 60, and 120 inches with the 4 inch reading being the most frequently observed. Readings are usually observed and recorded daily. Maximum, minimum, and current temperatures are generally recorded above 8 inches. At greater depths, where temperature changes more slowly, only the current temperature is normally recorded. Different species of plants have specific soil temperature ranges in which they will grow.

SOLAR RADIATION - INCOMING - Incoming solar radiation is the total electromagnetic radiation emitted by the sun striking the earth. Much solar radiation is absorbed by air molecules, reflected back into space, or refracted as it passes through the atmosphere. A pyrheliometer measures the direct solar radiation that passes through the atmosphere unimpeded. It consists of an enclosed radiation sensing element with a small aperture through which the direct solar rays enter. A pyranometer measures the combined incoming direct solar radiation and diffuse sky radiation. It is mounted such that it views the entire sky. Both instruments can be connected to electronic recording devices to collect the measurements. Solar radiation sensors must be cleaned regularly and exposed properly to accurately measure solar radiation.

WIND - Wind is the motion of air relative to the surface of the earth. Wind speed and direction, the two primary elements, are usually measured with an anemometer and wind vane, respectively. Wind speed is generally measured in miles per hour; direction is measured in degrees to the nearest ten(s) (10 to 360) with 360 degrees being north, 90 degrees being east, 180 degrees representing south, and 270 degrees being west. Wind measurement accuracy is primarily influenced by sensor height and nearby objects.

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2 Climate Station Metadata *[TOC]*

Climate Stations are locations at which climatic data are gathered. Biographical and index information describing the climatic station, called "Metadata", are used in conservation applications and resource evaluations.

STATION ID - Identification number for the climate station assigned by the agency responsible for the particular station.

STATION NAME - The full name of the climate station as recognized by the agency responsible for the climate station.

STATION LATITUDE - Latitude defines a site's location based on its relative distance from the equator going toward the North or South poles. Station latitude is measured in degrees, minutes, and seconds, with 0 degrees being on the equator, and 90 degrees north or south being the North and South Poles, respectively. The latitude of a particular climate station is determined by the agency managing the station and is generally recorded to the nearest minute.

STATION LONGITUDE - Longitude defines a sites relative distance, up to 180 degrees, west or east of a North-South line running through Greenwich, England. The longitude of a particular station is determined by the agency managing the station. Measurement is generally made to the nearest minute.

STATION ELEVATION - The elevation of a climate station is usually measured in feet above mean sea level.

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3 Climatic Element *[TOC]*

A climatic element is a measured parameter which helps to specify the climate of a specific location or region, such as precipitation, temperature, wind speed and humidity. Descriptive terminology for climatic elements are:

ELEMENT NAME - The full description of the element being referenced at the climate station (i.e. maximum temperature).

ELEMENT ID - Is a shortened identifier for the element, usually 4 characters in length (i.e. TMAX(maximum daily temperature), TMIN(minimum daily temperature), PRCP(precipitation, etc).

ELEMENT DURATION - The interval between measurements of a data element. Common data element durations available for the station could include monthly, daily, or hourly.

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4 Climate Data Measurement Networks *[TOC]*

National Weather Service Cooperative Station Network

Cooperative stations generally record daily precipitation and/or maximum and minimum temperature. Several other weather parameters may also be observed, such as evaporation, wind movement, and soil temperature.

The following table lists specific climate elements and the number of National Weather Service stations which measure it:

DATA ELEMENT	NUMBER OF MEASURING STATIONS
Precipitation	10,700
Snow Depth	10,700
New Snow	10,700
Temperature	7,000
Wind	500
Evaporation	300
Incoming Solar Radiation	250
Soil Temperature	300

Natural Resources Conservation Service (NRCS)

The NRCS operates an automated network of approximately 600 stations in the western U.S. called SNOTEL (SNOwpack TELemetry). Begining October 1st these stations report accumulated seasonal precipitation , snow water equivalent, and temperature (maximum, minimum, current and average) daily. This network was established in the late 1970s to support water supply forecasting. It uses meteorburst technology to transmit data from remote sites to data gathering locations. SNOTEL augmented and partially replaced the cooperative network of manual snow courses that NRCS acquired and established the mid 1930s.

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5 Climate Glossary *[TOC]*

The following lists terms which provide descriptive information for climatic datasets:

ALBEDO - The ratio of the amount of radiation reflected by a body to the amount of radiation incident upon it; expressed as a percentage.

CLIMATE - the synthesis of weather, or averaging of weather conditions over a given time period.

DEGREE DAYS, **COOLING** - A value used to estimate the energy requirements for air conditioning of homes and buildings. One cooling degree day is given for each degree the daily mean temperature is above 75 degrees Fahrenheit.

DEGREE DAYS, **GROWING** - Growing degree days (GDD) measures the day to day accumulation of the difference between the average daily temperature and a threshold temperature for a specific crop. GDD's give an indication of the amount of heat available for crop growth.

DEGREE DAYS, **HEATING** - A value used to estimate the energy requirements for heating homes and buildings. One heating degree day is given for each degree the daily mean temperature is below 65 degrees Fahrenheit.

DEWPOINT - The temperature to which air is cooled for water vapor to begin condensing.

DRIZZLE - Very small, numerous, and uniformly dispersed water drops that may appear to float while following air currents. Unlike fog droplets, drizzle falls to the ground.

DURATION - the period or time increment to which an observed or computed value applies.

EVAPORATION - Evaporation is the physical process by which a liquid is transformed to a gaseous state.

EVAPOTRANSPIRATION (ET) - The combined processes of evaporation and transpiration.

FOG - A visible collection of minute water droplets suspended in the atmosphere near the earth's surface. Fog reduces visibility below one kilometer (0.62 miles).

FREEZE - A freeze occurs at any time the surface air temperature reaches 28 degrees or less. This temperature causes damage to most vegetation except certain species which are resistant to freezing.

FREEZE FREE PERIOD - Freeze free period is the number of consecutive days where the air temperature does not fall below 28 degrees Fahrenheit.

FREEZE, **KILLING** - A killing freeze occurs at or below 24 degrees Fahrenheit and causes permanent damage to almost all vegetation.

FREEZE FREE PERIOD, KILLING - Killing freeze free period is the number of consecutive days where the air temperature does not fall below 24 degrees Fahrenheit.

FROST - Frost is the process of deposition of frozen atmospheric water vapor on surfaces whose surface air temperature is below 32 degrees Fahrenheit. A frost can occur at any time the surface air temperature falls to 32 degrees Fahrenheit or less. This temperature may cause damage to very young vegetation or vegetation that has no resistance to frost. Most fruit falls in this category.

FROST FREE PERIOD - Frost free period is the number of consecutive days where the surface air temperature does not fall below 32 degrees Fahrenheit.

FROST, FIRST - First Frost is the first date following the growing season that the minimum temperature drops below an index temperature, usually 32 degrees Fahrenheit. The first frost usually occurs in the fall of the year, but it may occur during the winter months, or in some locations may not occur at all.

FROST, **LAST** - Last Frost is the last date preceding the growing season that the minimum temperature drops below an index temperature, usually 32 degrees Fahrenheit. The last frost usually occurs in the spring of the year but may occur very early in the summer or not at all in some locations. First and Last frosts are analyzed at three temperatures (32, 28, and 24 degrees Fahrenheit) specifically relating to damage caused to vegetation by the sub-freezing temperatures.

GROWING SEASON - Growing Season is the number of consecutive days where the temperature has not gone below an index temperature for specific vegetation. If vegetation is more resistant to cold temperatures the index temperature would be lower. The index temperatures used in growing season analysis usually include 24, 28, and 32 degrees Fahrenheit.

GROWING SEASON PERIOD - Growing Season Period is the period of time, beginning date and ending date, that defines the period that the temperature has not dropped below the index temperature.

HAIL - Precipitation in the form of balls or irregular lumps of ice with a diameter of 5 mm or more, always produced by convective clouds, nearly always cumulonimbus.

HUMIDITY, **RELATIVE** - A measure of the amount of water in the air compared to the amount of water vapor the air has the potential to hold. (Note: the potential of air to hold water changes with air temperature. Therefore, relative humidity can change as air temperature changes without an actual change in the amount of water vapor.)

INDEX TEMPERATURE - A temperature which denotes the beginning of a specific event such as 28 degrees Fahrenheit. The 28 degree temperature denotes a freeze that can damage plants.

NORMAL - "Normal" is an average of any of the climatic elements calculated for a specific time period. The beginning and ending years of the normal period are established by the World Meteorological Organization. This organization has defined the current standard averaging period for "Normals" as 1971 through 2000. Normals have been established as the standard period that will be used in analysis of climatic data to allow for comparable descriptive information representative of average conditions over the time period.

PERIOD OF RECORD - The time interval during which meteorological and climatic data have been gathered at a climatic station.

PRECIPITATION - Precipitation refers to all forms of water, liquid or solid, that fall from the atmosphere and reach the ground. Precipitation includes, but is not limited to, rain, drizzle, snow, hail, grapple, sleet, and ice crystals.

PROBABILITY - Probability is a statistical process that provides for the analysis of data to determine the potential of an individual value to occur at a specified time, in a given year, or in a given period of time. An example might indicate that a certain value has a 10 percent chance of occurrence in any year, or that the value has a chance of returning once in a period of ten years.

RAIN - Precipitation in the form of liquid water drops which have diameters greater than 0.02 in (0.5 mm).

WIND ROSES - A type of analysis that describes wind measurements graphically and tabularly as a combination of the cardinal direction that the wind was coming from and the average speed from that direction for a particular time interval.

SLEET - A type of precipitation consisting of transparent or translucent pellets of ice 5 mm or less in diameter. Sleet forms when raindrops fall through a layer of below-freezing air near the earth's surface.

SNOW WATER EQUIVALENT - The water equivalent of snow is the depth of water that would be obtained by melting the snow cover.

SOLAR RADIATION - The total amount of energy emitted by the sun.

SOLAR RADIATION, **INCOMING** - Incoming solar radiation is the total electromagnetic radiation emitted by the sun striking the earth.

TEMPERATURE - Temperature is a measure of the internal energy of molecular motion in a substance.

THRESHOLD TEMPERATURE - A temperature that denotes the boundary condition for a specific event. For example, a crop specific temperature below which the growth of that crop is minimal.

TRANSPIRATION - The process by which water in plants is transferred to the atmosphere as water vapor.

WEATHER - the instantaneous or short-term state of the atmosphere.

WIND - Wind is the motion of air relative to the surface of the earth.

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6 National Water & Climate Center/Climatic Data Access Network *[TOC]*

The Natural Resources Conservation Service's National Water & Climate Center was created to provide the climatic data analyses needed by NRCS employees and offices to perform conservation activities. Each state and national center has been assigned a Climatic Data Liaison (CDL) to deliver climatic data to field offices as well as other offices in the state requiring climatic data. These Climatic Data Liaisons make up what is known as the Climatic Data Access Network (CDAN). CDAN provides a corp of knowledgeable individuals to assist NRCS field offices in the analysis of climatic data.

The mission of NWCC/CDAN is to access, obtain, evaluate, manage, and disseminate the climatic data needed to support agency programs and activities nationally. The Vision of NWCC/CDAN is "A dynamic, agency-wide climate service network -- providing data and analyses required for integrated ecosystem management."

A wide variety of daily, monthly, and annual data are available through NWCC/CDAN, including air and soil temperature, evaporation, wind movement, snow depth, snow water equivalent and precipitation. Climatic interpretations (probabilities and statistical summaries) for temperature and precipitation, growing season and construction information,

rainfall frequency, and information for agronomic and engineering models are available through the Network.

The following examples demonstrate the variety of information available through NWCC/CDAN:

TEMPERATURE AND PRECIPITATION SUMMARY (TAPS) [TOC]

The TAPS table gives a month by month summary and probability analysis of temperature and precipitation.

TAPS Station : DECORAH, 192110
Start yr. - 1971 End yr. - 2000
Temperature: 30 years available out of 30 requested in this analysis
Precipitation: 30 years available out of 30 requested in this analysis

	Temperature						Precipitation				
Month	avg daily max	avg daily min	avg	2 yrs in 10 will have >than temp.	2 yrs in 10 will have <than temp.	avg no of grow deg days*	avg (in.)	2 yrs in 10 will have less than (in.)	2 yrs in 10 will have more than (in.)	avg no of days w/ 0.10 inch or more	avg snow-fall
January	23.7	5.3	14.5	49	-29	1	0.74	0.27	1.14	2	7.0
February	29.6	10.7	20.1	54	-22	3	0.82	0.32	1.29	2	7.2
March	42.0	23.6	32.8	73	-10	55	1.89	1.05	2.64	4	7.5
April	58.2	36.3	47.2	84	14	256	3.42	1.96	4.71	6	1.6
May	70.8	47.7	59.2	89	27	597	3.82	2.60	4.94	7	0.0
June	79.7	56.7	68.2	95	39	846	4.20	2.29	5.89	6	0.0
July	83.7	61.4	72.6	97	46	1010	3.99	2.28	5.51	6	0.0
August	81.5	59.0	70.3	95	42	937	4.03	2.04	5.76	6	0.0
September	72.7	50.7	61.7	91	29	651	3.93	1.53	5.95	6	0.0
October	61.0	39.9	50.5	84	18	339	2.27	1.07	3.31	4	0.2
November	43.8	27.0	35.4	67	1	65	1.68	0.65	2.64	4	3.4
December	28.3	12.1	20.2	56	-21	5	1.21	0.63	1.73	3	9.7
Yearly :											
Average	56.3	35.9	46.1	---	---	---	---	---	---	---	---
Extreme	101	-39	---	98	-31	---	---	---	---	---	---
Total	---	---	---	---	---	4764	32.01	26.89	36.67	56	36.5

*A growing degree day is a unit of heat available for plant growth.
It can be calculated by adding the maximum and minumum daily temperatures,
dividing the sum by 2, and subtracting the temperature below which growth
is minimal for the principal crops in the area (Threshold : 40.0 deg. F)

FROST FREE DAYS (FROST) [TOC]

The FROST table provides information on the average date of the last temperature below 24, 28, and 32 degrees Fahrenheit in the spring, and the average date of the first temperature below 24, 28, and 32 degrees Fahrenheit in the fall, at probabilities of 10, 20, and 50%.

FROST Station : DECORAH, 192110
Start yr. - 1971 End yr. - 2000
Requested years of data: 30 Available years of data: 30
Spring: Missing data years 24 deg = 0, 28 deg = 0, 32 deg = 0
  Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
  Data years used 24 deg = 30, 28 deg = 30, 32 deg = 30
Fall: Missing data years 24 deg = 1, 28 deg = 1, 32 deg = 1
  Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
  Data years used 24 deg = 29, 28 deg = 29, 32 deg = 29

	Temperature		
Probability	24F or lower	28F or lower	32F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	April 22	May 9	May 22
2 year in 10 later than--	April 17	May 3	May 16
5 year in 10 later than--	April 8	April 23	May 5
First freezing temperature in fall:			

1 yr in 10 earlier than--	October 8	September 26	September 23
2 yr in 10 earlier than--	October 13	October 1	September 26
5 yr in 10 earlier than--	October 23	October 12	October 4

GROWING SEASON (GROWTH) [TOC]

The GROWTH table gives average length of growing season using three index temperatures (32, 28, and 24 degrees Fahrenheit) at 10, 20, 50, 80, and 90% probabilities.

GROWTH Station : DECORAH, 192110
Start yr. - 1971 End yr. - 2000
Requested years of data: 30 Available years of data: 30
Missing data years 24 deg = 1, 28 deg = 1, 32 deg = 1
Years with no occurrence 24 deg = 0, 28 deg = 0, 32 deg = 0
Data years used 24 deg = 29, 28 deg = 29, 32 deg = 29

	Daily Minimum Temperature		
Probability	# days > 24F	# days > 28F	# days > 32F
9 years in 10	177	148	131
8 years in 10	184	156	138
5 years in 10	197	170	151
2 years in 10	210	185	163
1 year in 10	217	193	170

WETLANDS DETERMINATION (WETS) [TOC]

The WETS table gives a month by month summary and probability analysis of temperature and precipitation. The table also provides average length of growing season using three index temperatures (32, 28, and 24 degrees Fahrenheit) at 50 and 70% probabilities.

WETS Station : DECORAH, 192110
Start yr. - 1971 End yr. - 2000
Temperature: 30 years used out of 30 requested in this analysis
Precipitation: 30 years used out of 30 requested in this analysis

	Temperature			Precipitation	
Month	avg daily max	avg daily min	avg	avg (in.)	3 yrs in 10 will have less than (in.)	3 yrs in 10 will have more than (in.)
January	23.7	5.3	14.5	0.74	0.37	0.96
February	29.6	10.7	20.1	0.82	0.44	1.07
March	42.0	23.6	32.8	1.89	1.28	2.42
April	58.2	36.3	47.2	3.42	2.36	4.45
May	70.8	47.7	59.2	3.82	2.96	4.96
June	79.7	56.7	68.2	4.20	2.80	5.46
July	83.7	61.4	72.6	3.99	2.75	5.19
August	81.5	59.0	70.3	4.03	2.55	5.23
September	72.7	50.7	61.7	3.93	2.07	5.11
October	61.0	39.9	50.5	2.27	1.37	2.95
November	43.8	27.0	35.4	1.68	0.89	2.18
December	28.3	12.1	20.2	1.21	0.78	1.57
Yearly :						
Average	56.3	35.9	46.1	---	---	---
Extreme	101	-39	---	---	---	---
Total	---	---	---	32.01	28.58	41.55

GROWING SEASON DATES

```
WETS Station : DECORAH, 192110
Start yr. - 1971   End yr. - 2000
Requested years of data:    30              Available years of data:    30
Missing data years              24 deg =  1, 28 deg =  1, 32 deg =  1
Years with no occurrence        24 deg =  0, 28 deg =  0, 32 deg =  0
Data years used                 24 deg = 29, 28 deg = 29, 32 deg = 29
```

	Temperature		
Probability	24F	28F	32F
	Growing Season Length Beginning and Ending Dates		
5 years in 10 --	189 days 4/15 to 10/21	161 days 4/31 to 10/ 9	143 days 5/13 to 10/ 2
7 years in 10 --	197 days 4/ 9 to 10/23	170 days 4/24 to 10/12	151 days 5/ 6 to 10/ 4

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7 Climatic Data and Conservation Practices [TOC]

The following table provides recommendations on the most appropriate climatic data to use in analysis of the practice for application on a particular field. Values refer to the average or normal values for a particular element and time interval but may refer to a special type of analysis for that time interval ie. probability.

The Practice Names are linked to the appropriate standard which can be retrieved in pdf format by selecting the practice name.

			Elements			
Practice #	**Conservation Practice Applied**	**Type**	**prec**	**temp**	**evap**	**wind**
560	Access Road		F			
575	Animal Trails and Walkways		F			
310	Bedding		M	M	M	
314	Brush Management		F	M		
322	Channel Vegetation		F	M	M	
324	Chiseling & Subsoiling		M			
326	Clearing & Snagging		M	M		
397	Commercial Fishponds		F	M	M	
317	Composting Facility		M	M	M	M
327	Conservation Cover		F	M	M	
328	Conservation Crop Rotation		M	M	M	R
332	Contour Buffer Strips		F	M	M	
330	Contour Farming		M			
331	Contour Orchard and Other Fruit Area		M	M	M	
335	Controlled Drainage		F	M		
340	Cover & Green Manure Crop		M			
342	Critical Area Planting		F	M	M	M
589A	Cross Wind Ridges		M		M	R
589B	Cross Wind Stripcropping		M		M	R
589C	Cross Wind Trap Strips		F		M	R
348	Dam, Diversion		F		M	
402	Dam, Floodwater Retarding		F		M	
349	Dam, Multiple Purpose		F		M	
356	Dike	Earthen	F		M	
362	Diversion		F		M	
382	Fence		M			M
386	Field Border		M	M	M	
393A	Filter Strip		M	M	M	
394	Firebreak		M	M	M	
398	Fish Raceway or Tank		F	M	M	M
395	Fish Stream Improvement		F	M	M	M
399	Fishpond Management		M	M	M	M
400	Floodwater Diversion		F		M	
404	Floodway		F		M	
511	Forage Harvest Management		M	M	M	

655	Forest Harvest Trails & Landings		F		M	
490	Forest Site Preparation		M		M	M
666	Forest Stand Improvement		M		M	M
410	Grade Stabilization Structure		F		M	
412	Grassed Waterway		F		M	
548	Grazing Land Mechanical Treatment		M	M	M	
561	Heavy Use Area Protection		M	M	M	
422	Hedgerow Planting		M	M	M	
422A	Herbaceous Wind Barriers		M	M	M	R
423	Hillside Ditch		F		M	
320	Irrigation Canal or Lateral		M		M	
388	Irrigation Field Ditch		M		M	
464	Irrigation Land Leveling		M	M		M
552B	Irrigation Pit or Regulating Reservoir	Regulating Reservoir	M		M	
552A	Irrigation Pit or Regulating Reservoir	Irrigation Pit	M		M	
436	Irrigation Storage Reservoir		F		M	
442	Irrigation System	Sprinkler	F		F	
447	Irrigation System	Tailwater Recovery	F			
441	Irrigation System	Trickle	M	M	M	
443	Irrigation System	Surface & Subsurface	F	F	F	
430	Irrigation Water Conveyance	Pipeline	F		M	
428	Irrigation Water Conveyance	Ditch and Canal Lining	M	M		
449	Irrigation Water Management		FD	D	D	
460	Land Clearing		M		M	
453	Land Reclamation	Landslide Treatment	F		M	M
456	Land Reclamation	Highwall Treatment	F		M	
451	Land Reclamation	Fire Control	F	M	M	M
454	Land Reclamation	Subsidence Treatment	F		M	
455	Land Reclamation	Toxic Discharge Control	F	M	F	M
544	Land Reconstruction	Mine-Current	F		M	
543	Land Reconstruction	Mine-Abandoned	F		M	
466	Land Smoothing		M			
468	Lined Waterway or Outlet		M		M	
634	Manure Transfer		M	M	M	
457	Mine Shaft & Adit Closing		M		M	
482	Mole Drain		M			
484	Mulching		M	M	M	
590	Nutrient Management		M	M	M	
500	Obstruction Removal		M			
582	Open Channel		M		M	
512	Pasture & Hayland Planting		F	M	M	
595A	Pest Management		M			
516	Pipeline		M			
378	Pond		M		M	
521A	Pond Sealing or Lining	Flexible Membrane	M		M	
521B	Pond Sealing or Lining	Soil Dispersant	M	M	M	
521C	Pond Sealing or Lining	Bentonite Sealant	M		M	
521D	Pond Sealing or Lining	Cationic Emulsion-Waterborne Sealant	M	M	M	
521E	Pond Sealing or Lining	Asphalt-Sealed Fabric Liner	M	M	M	
462	Precision Land Forming		M			
338	Prescribed Burning		M	M	M	F
528A	Prescribed Grazing		M	M		
532	Pumped Well Drain		M			
533	Pumping Plant for Water Control		M		M	
550	Range Planting		F	M	M	
562	Recreation Area Improvement		M			

566	Recreation Land Grading & Shaping		M	M	M	
568	Recreation Trail & Walkway		M			
554	Regulating Water in Drainage Systems		M		M	
344	Residue Management	Seasonal	M	M	M	
329B	Residue Management	Mulch Till	M	M	M	
329C	Residue Management	Ridge Till	M			
329A	Residue Managment	No-till & Strip Till	M			
391A	Riparian Forest Buffer		F		M	
555	Rock Barrier		M			
558	Roof Runoff Management		F		M	
557	Row Arrangement		F		M	
570	Runoff Management System		F		M	
350	Sediment Basin		F		M	
571	Soil Salinity Management-Nonirrigated		M	M	M	
572	Spoil Spreading		M			M
574	Spring Development		F		M	
584	Stream Channel Stabilization		F		M	
580	Streambank & Shoreline Protection		F		M	
585	Stripcropping	Contour	M	M	M	
586	Stripcropping	Field	M		M	
587	Structure for Water Control		F		M	
606	Subsurface Drain		H		D	
607	Surface Drainage	Field Ditch	F		M	
608	Surface Drainage	Main or Lateral	F			
609	Surface Roughening		F			
600	Terrace		F		M	
610	Toxic Salt Reduction		F	M	M	M
612	Tree/Shrub Establishment		M	M	D	F
660A	Tree/Shrub Pruning		M	M		
614	Trough or Tank		M		M	
620	Underground Outlet		H		M	
472	Use Exclusion		M			
630	Vertical Drain		M			
312	Waste Management System		M		M	
313	Waste Storage Facility		F	F	F	
359	Waste Treatment Lagoon		F		M	
633	Waste Utilization		FD	M	M	
636	Water Harvesting Catchment		F		M	
641	Water Table Control		F		M	
638	Water & Sediment Control Basin		F	M	M	
640	Waterspreading		M		M	
642	Well		M		M	
351	Well Decommissioning		M			
657	Wetland Development or Restoration		F	M	M	
645	Wildlife Upland Habitat Management		M	M		
648	Wildlife Watering Facility		F	M		
644	Wildlife Wetland Habitat Management		M	M		
380	Windbreak/Shelterbelt Establishment		F	M	M	
650	Windbreak/Shelterbelt Renovation		F	M	M	

M=monthly, D=daily, H=hourly, 15=15 minute, F=frequency, R=roses

prec = Precipitation, temp = Temperature Max & Min, evap = Evaportation, wind = Wind Movement

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HEALTH EFFECTS OF AIR TOXICS

Air toxics can be broadly grouped into two categories according to their health effects: **carcinogens** (cancer-causing) or **noncarcinogens**. Carcinogens are those chemicals that have been shown to cause cancer, either in people or animals. Noncarcinogens have other kinds of health impacts, affecting development, reproduction, respiration, the liver, kidney or other organs.

Health effects of specific chemicals are determined in a number of ways. Researchers can study groups of people that have been exposed to the chemicals in the past, usually in a workplace. They can also expose volunteers to specific amounts of a chemical and record the effects. However, most health effects information comes from studies of animals that are exposed in the laboratory to specific doses of a chemical for specific periods of time.

DEVELOPING HEALTH BENCHMARKS

Government agencies, such as USEPA and the California Office of Environmental Health Hazard Assessment (OEHHA), have established procedures for developing human toxicity values from chemical studies in order to determine a "safe" level of human exposure. Groups of experts look at all of the available health effects studies done on a chemical, and refine the information into a dose-response value that can be used to estimate the risk to public health effect from exposure to that chemical. These toxicity values are referred to as **unit risk factors** and **reference concentrations**.

Unit risk factors are toxicity values used for carcinogens that estimate the increased risk of getting cancer that is associated with the concentration of the chemical in air that you are breathing. A cancer risk of less than one in a million is usually considered to be negligible.

Reference concentrations are toxicity values developed for noncarcinogens. Exposure to a chemical below its reference concentration, even over a long period of time, is not expected to have any negative effect on health.

These unit risk factors and reference concentrations can be used as health benchmarks. For carcinogens, the health benchmark is the air concentration that would result in a one in a million increase in the risk of getting cancer if a person inhaled that concentration over a whole lifetime. For noncarcinogens, health benchmarks are set at the reference concentration.

RISK ASSESSMENT

The process of estimating the chance of developing health problems as

a result of exposure to a chemical in the environment is called **risk assessment**. Risk assessment can be used to evaluate the potential health effects of air toxic concentrations measured by air monitors, or predicted by air pollution models such as those used by USEPA for the National-Scale Air Toxics Assessment (NATA).

One way of doing a risk assessment is to compare a chemical's health benchmark to a monitored or modeled air concentration to calculate a risk ratio. A risk ratio that is equal to or less than one (below the health benchmark) is not expected to be harmful to human health.

It is not always clear, however, how far above the health benchmark an air concentration has to be before it becomes harmful. Types of harmful effects and actual harmful levels will vary from pollutant-to-pollutant, and person-to-person, and some chemicals have more than one effect. Still, comparison to a health benchmark is a useful tool for evaluating air concentrations like those predicted in NATA. If the modeled air concentration is below the health benchmark (the risk ratio is less than or equal to one) there is probably no need for further concern. If the risk ratio is greater than one (the air concentration is above the health benchmark), there may be some cause for concern, and further assessment is warranted. The risk ratio also indicates just how much higher the air concentration is than the health benchmark, and indicates how much reduction may be needed.

SOURCES OF INFORMATION

The health benchmarks used by NJDEP to evaluate the NATA data are also used by the NJDEP Air Quality Permitting Program in a routine risk assessment screening process that evaluates potential health effects from facilities seeking permits to emit air toxics. The unit risk factors and reference concentrations that are used as the basis for the health benchmarks and risk assessment can be found at:

Risk Screening Tools

For more information on compiling a risk assessment, see:

Technical Manual 1003: Guidance on Preparing a Risk Assessment Protocol for Air Contaminant Emissions.

Risk Assessment for Toxic Air Pollutants: A Citizen's Guide

Evaluating Exposures to Toxic Air Pollutants: A Citizen's Guide

Air Pollution and Health Risk

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