REFERENCE NO. 30

GERAGHTY & MILLER SPECIAL REPORT

The New Jersey Ground-Water Situation

by David W. Miller

August, 979 (see telecon note - 02-8803-32-SI

GERAGHTY & MILLER, INC.
Groundwater
Consultants

HACKENSACK, NEW JERSEY
7 Atlantic Street
Hackensack, New Jersey 07601
(201) 646-1400

SYOSSET, NEW YORK
North Shore Atrium
6800 Jericho Turnpike
Syosset, New York 11791
(516) 921-6060

THE TRIASSIC LOWLANDS AND THE HIGHLANDS REGION OF NORTHERN NEW JERSEY

The geology and hydrology of northern New Jersey are considerably more complex than the Coastal Plain region. To simplify, it has been divided into two broad areas, the Triassic Lowlands and the Highlands Region (Figure 1). Unlike the Coastal Plain, where the aquifers consist of extensive beds of unconsolidated deposits, the primary water-bearing units in northern New Jersey are sedimentary and crystalline rocks (Figure 11). These vary considerably in their ability to yield water, depending on rock type and location. Both regions are also heavily dependent upon unconsolidated glacial deposits for water supply and where these occur in buried, eroded rock channels and are thick and permeable, the glacial sediments represent the most important source of ground water in both the Triassic Lowlands and the Highlands. Figure 12 shows the general major deposits of glacial origin that may have some ground-water potential.

Geology and Hydrology

Triassic Sediments: The Triassic Lowlands are almost entirely underlain by sedimentary Brunswick Shale. Although its primary permeability is low, appreciable amounts of water are found in joints and fractures. However, unless a significant number of these joints and fractures are penetrated by a well, yields can be relatively small. The direction of highest permeability and of the greatest movement of water in response to pumping tends to parallel the strike of the beds, generally southwest to northeast.

In general, the principal water-bearing zone of the Triassic rocks ranges from less than 200 feet to 600 feet in depth. The median depth of industrial and municipal supply wells in Bergen County is 260 feet. High-yield wells tapping this aquifer in Essex County are between 300 and 400 feet deep. There appears to be a direct relationship between well yield and thickness of overlying unconsolidated glacial deposits. Wells generally produce more where the overlying deposits are relatively thick, stratified, and coarse-grained. These surface deposits are often in direct hydraulic connection with the bedrock, and act as a source of recharge because of their greater capacity to receive and store precipitation (Figure 12).

A number of high capacity wells tap the Triassic rocks. In Essex County, yields of 35 public supply, industrial, and commercial wells range from 35 to 820 gpm (gallons per minute) and average 364 gpm. Wells over 300 feet deep and larger than 8 inches in diameter have a median yield of 230 gpm in Passaic County. However, the ability to develop high capacity wells is not uniform throughout the region. Many wells drilled during exploration programs are never equipped as production wells because of poor yields.

Igneous rocks associated with the sedimentary formations, principally diabase and basalts, are highly resistant to erosion and form the ridges of the Watchung Mountains and the Palisades. They are poor aquifers, tapped primarily for domestic purposes by wells yielding 5 gpm or less.

Glacial Sediments: Unconsolidated deposits overlying rock in northern New Jersey consist generally of till, clay, or stratified drift. These deposits are thickest in the valleys and thin or absent in upland areas. Permeable sands and gravels contained within the valley fill sediments that are suitable for ground-water development range in thickness from 50 to several hundred feet. Individual beds that can support high capacity wells are not extensive, and lithology may change radically over as little as 100 feet within the same valley. Well yields commonly reported for the glacial sediments represent successful wells located from a program of test drilling and pumping.

Although the rock aquifers have been mapped in some detail throughout both the Triassic Lowlands and the Highlands Region, the areal extent of important glacial aquifers is relatively unknown except in some of the more heavily developed areas of eastern Morris and western Essex Counties, Union County, the Ramapo River subbasin, and the Rockaway River subbasin (Figure 12).

Public supply and industrial wells tapping the more permeable stratified drift are almost uniformly capable of producing several hundred thousand gpd to more than one mgd. For example, yields of wells completed in Union County in 50 to 200 feet of sand and gravel sediments in Kenilworth-Newark Valley, Summit Valley, Union Valley, and Rahway Valley, average approximately 400 gpm. Wells in Essex and Morris Counties tapping glacial sands and gravels adjacent to the Passaic River and its tributaries produce one to 1.5 mgd. Total pumpage from the system of buried valleys in this latter area is about 20 mgd, with the highest yields from formations receiving recharge from adjacent streams.

Finally, land-use planning in the heavily urbanized northeast portion of the Triassic Lowlands has generally failed to consider the adverse effects of paving potential recharge areas, and/or the impact of construction of regional sewers on ground-water availability. In addition, many communities wholly dependent on ground water are so built up that there is not enough remaining open space to carry out the exploration necessary to locate additional production well sites.

In the preparation of this special report, factors affecting ground-water availability such as recharge rates, pumpage, diversion rights, consumptive use, and interference with surface-water supplies were evaluated on a county-by-county basis. This information was supported by interviews with ground-water users and public agency personnel, and review of data from organizations involved in water-resource management (state, USGS, interstate agencies, and private consultants). Table 2 summarizes ground-water pumpage in northern New Jersey.

Bergen County: Generally, the eastern section of the county is supplied by surface water and the western section by ground water. Portions of the central and southwestern sections are served by both.

Because yields are generally higher, about 75 percent of the pumpage in the Ramapo River basin is from stratified drift, even though it underlies only a small percentage of the total basin area. Wells in valley-fill deposits supply most of Mahwah and all of Oakland.

Industrial and public supply pumpage is concentrated in a central

north-south band, east of the Passaic River, and near the Saddle River. Most of the southern and central part of the county is sewered; only public supply pumpage in the extreme northern section of the county is not used consumptively. The percentage of industrial pumpage used consumptively is unknown, but many of the industrial plants along the Passaic and Saddle Rivers discharge to the rivers, and the water is essentially lost from the ground-water system. There are indications of areawide water-level declines in southern Bergen County from overpumping the Triassic shales.

The opportunity for further development of ground water depends to a great degree on the future industrial pumpage, and the ability to develop surface water and ground water conjunctively in basins containing significant glacial deposits. The bedrock aquifer already appears to be overstressed in areas of concentrated pumpage.

Essex County: Ground water accounts for about 28 percent of the total water used in the county. More than 80 percent of the 35 mgd pumped for public supply is obtained from stratified drift deposits, mostly in the western portion of the county. This heavy pumpage and urbanization in the Livingston-Florham Park-Millburn area have resulted in severe water-level declines in both the unconsolidated and sandstone aquifers, which function as a single hydraulic unit in the area (Figure 12).

Heavy pumpage from the Triassic sediments in the Newark area has exceeded the average recharge to the system, and water levels have been declining for years with serious salt-water intrusion from Newark Bay and the Passaic River. Newark and the western valley-fill aquifer areas are of

Figure 1 - PRINCIPAL GEOLOGIC REGIONS

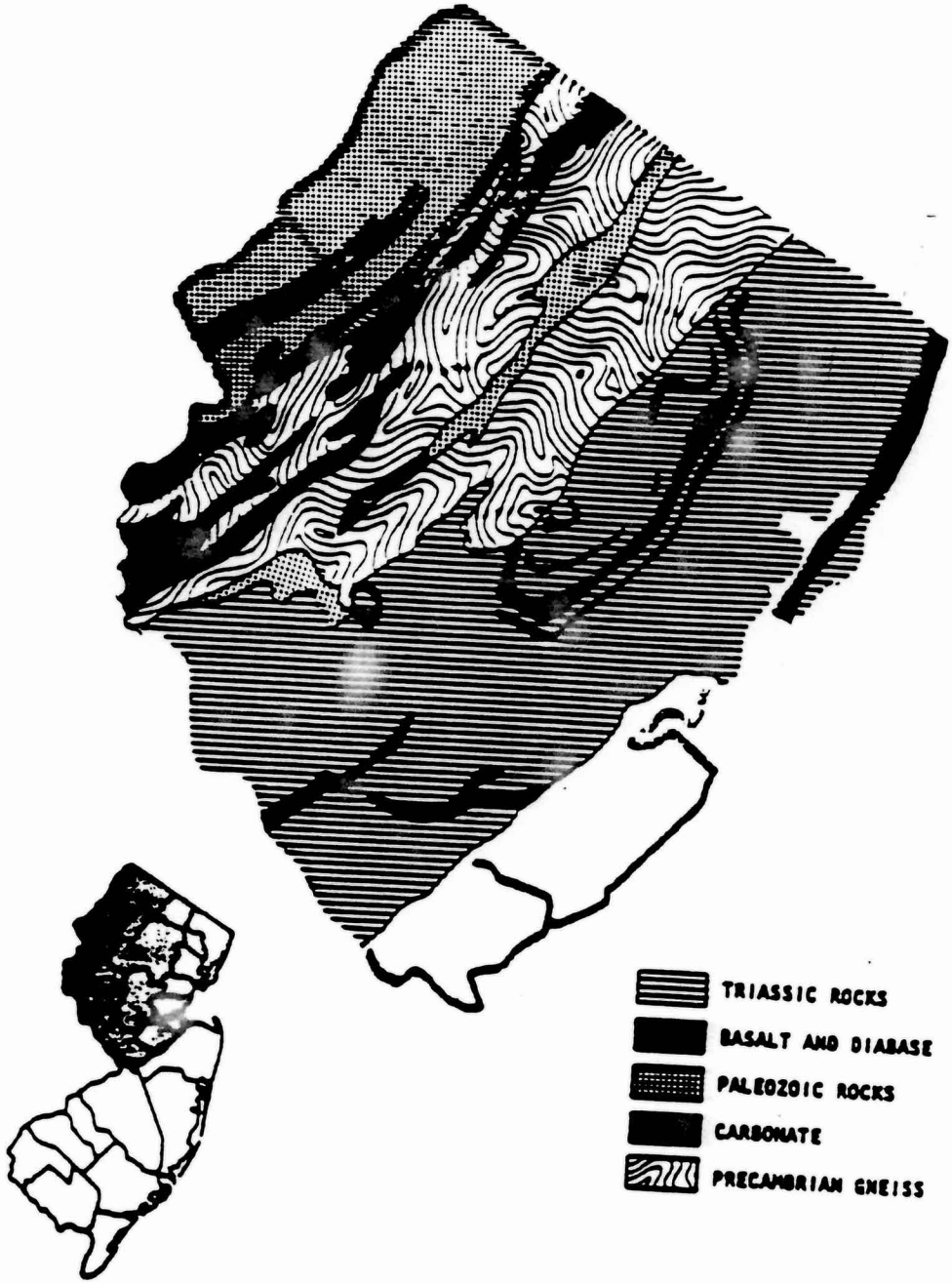


Figure 11 - BEDROCK GEOLOGY IN NORTHERN NEW JERSEY

Figure 12 - POTENTIAL UNCONSOLIDATED AQUIFERS IN NORTHERN NEW JERSEY

REFERENCE NO. 31

NUS CORPORATION

TELECON NOTE

CONTROL NO:	DATE:	TIME:
	2/7/90	1500

DISTRIBUTION:

US Printing Ink File
TDD NO: 02-8910-32

BETWEEN:	OF:	PHONE:
Bob Siery	Wallington Public Works	(201) 777-1726

AND:

Peter Babich

DISCUSSION: (NUS)

I asked Mr. Siery about water useage in Wallington. He informed me that only 1 private residence uses groundwater for drinking. The residence is located on Kossuth Street.

Other uses include 3 commercial businesses and 1 farm (approx 7 acres) for irrigation.

Drinking water for Wallington is supplied by Passaic Valley Water Dept. For emergencies Wallington uses Hackensack Water Dept. as backup.

ACTION ITEMS:

REFERENCE NO. 32

NUS CORPORATION

TELECON NOTE

CONTROL NO:	DATE:	TIME:
02-9002-17	2-28-90	2:35

DISTRIBUTION:

GOULD INC.

BETWEEN:	OF:	PHONE:
Mrs. Kamper	Saddle Brook Water Company	(201) 587-2905

AND: Dave Benfer

DISCUSSION: (NUS)

Called Saddle Brook Water company and spoke with Mrs. Kamper. Mrs. Kamper does not have alot of information she did tell me that 90% of Saddlebrook gets water from Hackensack water Company, 5% from Lanzfield water Company and 5% from private wells.

ACTION ITEMS:

NUS 067 REVISED 0581

REFERENCE NO. 33

PC80-1-B32
N.J.

CHARACTERISTICS OF THE POPULATION

General Population Characteristics

NEW JERSEY

1980

Census of Population

LIBRARY
PROTECTION AGENCY

U.S. Department of Commerce
BUREAU OF THE CENSUS

Table 44. **General Characteristics for Counties and County Subdivisions: 1980**

[For meaning of symbols, see Introduction. For definitions of terms, see appendixes A and B]

Counties / County Subdivisions	Race: Total persons: Total	Total persons: Male	Total persons: Female	Total persons: Under 18 years	Total persons: 65 years and over	Total persons: Median age	Total persons: In group quarters	White: Persons	White: Households: Total	White: Households: Persons	Black: Persons	Black: Households: Total	Black: Households: Persons	Spanish origin[1]: Persons	Spanish origin[1]: Households: Total	Spanish origin[1]: Households: Persons
Atlantic County	194 119	91 163	102 956	51 062	30 787	33.0	2 807	154 831	58 886	152 721	34 134	11 540	33 592	7 590	2 008	7 [illegible]
Absecon city	6 859	3 294	3 565	1 893	778	32.9	20	6 624	2 219	6 613	166	58	157	72	22	[illegible]
Atlantic City city	40 199	17 359	22 840	9 737	9 446	38.5	1 431	18 614	9 032	17 596	20 029	7 290	19 703	2 323	621	2 [illegible]
Brigantine city	8 318	4 101	4 217	1 641	1 324	34.5	15	8 136	3 377	8 144	76	36	74	101	33	[illegible]
Buena borough	3 642	1 774	1 868	946	465	31.7	4	3 320	1 172	3 309	58	18	59	483	134	[illegible]
Buena Vista township	6 959	3 418	3 541	2 387	704	28.7	6	5 289	1 624	5 274	1 386	399	1 389	527	119	[illegible]
Corbin City city	254	125	129	42	76	50.3	-	244	107	...	10	2	...	1	-	[illegible]
Egg Harbor township	19 381	9 418	9 963	6 185	1 843	28.9	27	17 154	6 137	17 137	1 961	594	1 968	344	100	[illegible]
Egg Harbor City city	4 618	2 160	2 458	1 284	625	31.1	30	3 626	1 389	3 603	509	162	493	716	199	[illegible]
Estell Manor city	848	429	419	277	87	29.6	-	799	257	799	43	11	...	2	1	[illegible]
Folsom borough	1 892	947	945	702	122	26.8	-	1 814	544	1 817	54	17	55	24	3	[illegible]
Galloway township	12 176	6 149	6 027	3 367	1 088	27.6	55	11 340	3 674	11 316	698	209	701	181	52	15
Hamilton township	9 499	4 691	4 808	2 677	1 070	29.7	202	7 964	2 856	7 850	1 378	419	1 281	211	60	[illegible]
Hammonton town	12 298	5 915	6 383	3 307	1 530	32.7	118	11 722	3 944	11 597	125	35	120	939	230	[illegible]
Linwood city	6 144	2 985	3 159	1 788	710	34.3	142	6 078	1 922	5 934	20	5	19	57	18	[illegible]
Longport borough	1 249	549	700	153	475	58.2	70	1 247	561	...	2	-	...	5	2	[illegible]
Margate City city	9 179	4 214	4 965	1 688	1 969	46.0	-	9 105	3 824	9 126	12	1	...	55	14	[illegible]
Mullica township	5 243	2 549	2 694	1 779	538	28.9	47	4 310	1 391	4 247	423	124	428	706	158	[illegible]
Northfield city	7 795	3 725	4 070	2 072	1 052	35.2	218	7 654	2 485	7 469	90	20	64	68	15	[illegible]
Pleasantville city	13 435	6 146	7 289	3 950	2 111	31.2	280	6 321	2 564	6 106	6 712	1 993	6 648	538	142	[illegible]
Port Republic city	837	410	427	228	88	32.9	-	834	297	836	1	1	...	-	-	[illegible]
Somers Point city	10 330	4 829	5 501	2 381	1 910	33.2	136	9 997	4 164	9 880	243	98	242	88	35	[illegible]
Ventnor City city	11 704	5 357	6 347	2 188	2 623	40.6	3	11 499	4 966	11 506	35	15	32	115	41	[illegible]
Weymouth township	1 260	619	641	390	153	29.2	3	1 140	380	1 137	103	33	105	34	9	[illegible]
Bergen County	845 385	405 372	440 013	199 135	105 276	35.4	7 684	784 834	281 975	779 184	33 043	10 858	31 929	28 514	8 362	26 [illegible]
Allendale borough	5 901	2 852	3 049	1 804	556	33.7	181	5 811	1 680	5 641	15	5	12	61	14	[illegible]
Alpine borough	1 549	787	762	410	124	36.4	-	1 488	480	1 496	19	2	7	36	8	[illegible]
Bergenfield borough	25 568	12 306	13 262	6 145	3 167	34.1	-	24 044	8 408	24 066	456	155	451	1 251	350	[illegible]
Bogota borough	8 344	3 979	4 365	2 159	965	31.4	11	8 094	2 784	8 094	51	18	41	527	154	[illegible]
Carlstadt borough	6 166	2 978	3 188	1 399	805	33.7	-	6 081	2 283	6 086	10	5	...	153	43	[illegible]
Cliffside Park borough	21 464	10 216	11 248	3 806	3 406	39.6	38	20 518	8 709	20 508	215	92	202	939	327	[illegible]
Closter borough	8 164	4 012	4 152	2 145	818	35.5	-	7 654	2 484	7 665	81	26	73	205	42	[illegible]
Cresskill borough	7 609	3 689	3 920	1 964	1 014	37.6	93	7 251	2 262	7 170	50	17	42	194	51	[illegible]
Demarest borough	4 963	2 446	2 517	1 390	473	36.2	28	4 640	1 449	4 629	37	5	18	133	33	[illegible]
Dumont borough	18 334	8 764	9 570	4 593	2 296	34.1	-	17 752	5 944	17 769	87	24	79	704	173	[illegible]
East Rutherford borough	7 849	3 715	4 134	1 523	1 183	34.5	161	7 529	3 016	7 395	184	62	166	191	64	[illegible]
Edgewater borough	4 628	2 325	2 303	849	503	32.3	-	4 337	1 981	4 375	64	26	62	218	74	[illegible]
Elmwood Park borough	18 377	8 709	9 668	3 889	2 670	37.2	-	17 812	6 546	17 802	75	25	76	768	230	[illegible]
Emerson borough	7 793	3 745	4 048	2 040	860	35.4	280	7 476	2 152	7 228	34	5	19	133	36	[illegible]
Englewood city	23 701	10 997	12 704	5 770	3 334	35.7	190	12 641	5 016	12 511	9 629	3 201	9 598	2 076	587	2 [illegible]
Englewood Cliffs borough	5 698	2 757	2 941	1 423	633	40.5	81	5 066	1 597	5 021	44	10	20	220	54	[illegible]
Fair Lawn borough	32 229	15 546	16 683	6 790	4 609	40.6	17	31 787	11 454	31 797	65	19	51	560	180	[illegible]
Fairview borough	10 519	5 059	5 460	2 098	1 643	36.3	9	10 181	4 120	10 164	14	4	...	610	186	[illegible]
Fort Lee borough	32 449	15 410	17 039	5 368	5 470	40.1	10	28 599	13 538	28 659	551	298	520	1 342	488	1 [illegible]
Franklin Lakes borough	8 769	4 470	4 299	2 801	570	34.3	-	8 583	2 468	8 612	13	-	...	74	11	[illegible]
Garfield city	26 803	12 699	14 104	5 541	4 177	34.2	25	26 214	10 551	26 196	298	107	301	953	296	[illegible]
Glen Rock borough	11 497	5 533	5 964	3 010	1 342	36.1	14	10 863	3 559	10 869	317	104	315	142	42	[illegible]
Hackensack city	36 039	17 257	18 782	6 760	4 939	33.5	708	26 730	12 501	26 177	7 497	2 711	7 306	3 741	1 175	3 [illegible]
Harrington Park borough	4 532	2 225	2 307	1 399	350	33.4	-	4 291	1 290	4 298	44	9	42	75	13	[illegible]
Hasbrouck Heights borough	12 166	5 807	6 359	2 524	1 869	37.7	-	11 987	4 397	12 011	11	3	...	261	72	[illegible]
Haworth borough	3 509	1 708	1 801	965	389	36.8	-	3 304	1 041	3 322	62	14	...	61	10	[illegible]
Hillsdale borough	10 495	5 135	5 360	2 927	869	33.9	-	10 236	3 157	10 252	41	13	41	185	46	[illegible]
Ho-Ho-Kus borough	4 129	1 973	2 156	1 076	477	37.8	-	4 057	1 362	4 068	6	-	...	63	8	[illegible]
Leonia borough	8 027	3 765	4 262	1 828	1 236	37.8	-	7 483	2 919	7 510	198	78	194	343	103	[illegible]
Little Ferry borough	9 399	4 621	4 778	2 031	954	32.7	-	8 964	3 550	8 945	117	76	124	411	143	[illegible]
Lodi borough	23 956	11 346	12 610	5 228	2 769	31.5	144	22 954	8 973	22 836	354	136	337	1 082	363	1 [illegible]
Lyndhurst township	20 326	9 606	10 720	4 324	2 828	35.8	11	20 016	7 309	20 022	8	4	...	482	153	[illegible]
Mahwah township	12 127	6 053	6 074	3 266	938	31.3	678	11 277	3 536	10 779	381	80	261	208	49	[illegible]
Maywood borough	9 895	4 715	5 180	2 187	1 506	37.3	-	9 669	3 578	9 701	21	4	17	318	99	[illegible]
Midland Park borough	7 381	3 553	3 828	1 850	924	32.9	-	7 298	2 539	7 314	3	3	...	67	20	[illegible]
Montvale borough	7 318	3 619	3 699	2 227	499	32.7	18	7 204	2 245	7 185	15	4	17	113	29	[illegible]
Moonachie borough	2 706	1 333	1 373	552	256	35.1	-	2 665	996	2 662	3	2	...	47	14	[illegible]
New Milford borough	16 876	7 937	8 939	3 590	2 440	37.0	226	16 264	6 030	16 046	115	42	111	421	120	[illegible]
North Arlington borough	16 587	7 596	8 991	3 115	2 740	40.3	22	16 315	6 395	16 306	7	2	...	557	174	[illegible]
Northvale borough	5 046	2 459	2 587	1 471	420	32.4	-	4 888	1 468	4 888	3	1	...	251	64	[illegible]
Norwood borough	4 413	2 200	2 213	1 291	379	33.9	-	4 239	1 256	4 252	8	2	...	92	20	[illegible]
Oakland borough	13 443	6 693	6 750	4 005	789	31.3	186	13 164	3 809	12 986	94	26	99	209	52	[illegible]
Old Tappan borough	4 168	2 043	2 125	1 341	321	33.5	42	4 069	1 154	4 048	16	4	11	56	14	[illegible]
Oradell borough	8 658	4 221	4 437	2 256	1 010	37.6	22	8 393	2 707	8 374	12	2	...	88	23	[illegible]
Palisades Park borough	13 732	6 481	7 251	2 819	1 976	34.5	-	12 790	5 237	12 815	35	18	33	618	199	[illegible]
Paramus borough	26 474	12 774	13 700	6 471	2 807	37.3	1 165	25 343	7 399	24 269	112	13	47	604	164	[illegible]
Park Ridge borough	8 515	4 168	4 347	2 376	719	32.9	10	8 281	2 697	8 285	47	9	38	134	33	[illegible]
Ramsey borough	12 899	6 316	6 583	3 886	1 074	33.0	28	12 600	4 054	12 576	68	21	69	137	41	[illegible]
Ridgefield borough	10 294	4 875	5 419	2 045	1 643	39.7	-	10 095	3 839	10 098	13	5	...	359	111	[illegible]
Ridgefield Park village	12 738	5 958	6 780	2 795	1 644	33.0	27	12 429	4 770	12 402	59	23	53	574	181	[illegible]
Ridgewood village	25 208	11 900	13 308	7 204	3 035	35.6	194	24 101	8 015	23 976	502	161	478	434	109	[illegible]
River Edge borough	11 111	5 254	5 857	2 417	1 725	38.9	-	10 815	4 036	10 832	6	1	...	254	77	[illegible]
River Vale township	9 489	4 598	4 891	2 753	593	33.8	72	9 170	2 774	9 121	44	11	32	152	33	[illegible]
Rochelle Park township	5 603	2 616	2 987	1 169	978	39.9	-	5 538	2 040	5 543	-	-	-	111	26	[illegible]
Rockleigh borough	192	106	86	72	23	31.0	46	186	56	146	3	-	...	3	1	[illegible]
Rutherford borough	19 068	8 975	10 093	4 118	2 798	34.6	604	17 986	6 567	17 519	471	132	387	540	147	[illegible]
Saddle Brook township	14 084	6 769	7 315	3 104	1 412	34.6	97	13 858	4 730	13 772	41	18	39	262	73	[illegible]
Saddle River borough	2 763	1 365	1 398	668	356	40.9	14	2 708	872	2 716	13	-	...	25	4	[illegible]
South Hackensack township	2 229	1 083	1 146	507	258	33.8	-	2 172	721	2 164	23	11	25	123	31	[illegible]
Teaneck township	39 007	18 622	20 385	9 388	4 933	35.1	1 570	27 826	9 766	26 595	9 184	2 668	8 970	1 888	493	1 [illegible]
Tenafly borough	13 552	6 439	7 113	3 514	1 973	39.4	127	12 777	4 486	12 719	81	10	34	404	108	[illegible]

[1]Persons of Spanish origin may be of any race.

THIS DOCUMENT IS CURRENTLY CLASSIFIED NON-CONFIDENTIAL BY EPA AS THE ~~ABOVE~~ SITE DOES NOT QUALIFY FOR FURTHER REMEDIAL ACTION AT THIS TIME

Flint Ink Corp. NJD002139145

CONFIDENTIAL-NOT FOR PUBLIC RELEASE

HRS

	S	S^2
Groundwater Route Score (S_{gw})	23.02	529.92
Surface Water Route Score (S_{sw})	1.59	2.53
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		532.45
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		23.07
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		13.34

WORKSHEET FOR COMPUTING S_M

PRO

	S	S^2
Groundwater Route Score (S_{gw})	32.65	1066.02
Surface Water Route Score (S_{sw})	1.59	2.53
Air Route Score (S_a)	0	0
$S_{gw}^2 + S_{sw}^2 + S_a^2$		1068.55
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2}$		32.69
$\sqrt{S_{gw}^2 + S_{sw}^2 + S_a^2} / 1.73 = S_M =$		18.90

WORKSHEET FOR COMPUTING S_M

CONFIDENTIAL-NOT FOR PUBLIC RELEASE

Ground Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multi-plier	HRS	Max. Score	PRO
1 Observed Release	45	1	0	45	0
If observed release is given a score of 45, proceed to line 4. If observed release is given a score of 0, proceed to line 2.					
2 Route Characteristics					
Depth to Aquifer of Concern	0 1 2 3	2	4	6	6
Net Precipitation	0 1 2 3	1	2	3	2
Permeability of the Unsaturated Zone	0 1 2 3	1	1	3	1
Physical State	0 1 2 3	1	3	3	3
Total Route Characteristics Score			10	15	12
3 Containment	0 1 2 3	1	3	3	3
4 Waste Characteristics					
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18	18
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	2	8	2
Total Waste Characteristics Score			20	26	20
5 Targets					
Ground Water Use	0 1 2 3	3	6	9	6
Distance to Nearest Well/Population Served	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	16	40	20
Total Targets Score			22	49	26
6 If line 1 is 45, multiply 1 x 4 x 5; If line 1 is 0, multiply 2 x 3 x 4 x 5			13,200	57,330	18,720
7 Divide line 6 by 57,330 and multiply by 100		S_{gw} =	23.02		32.65

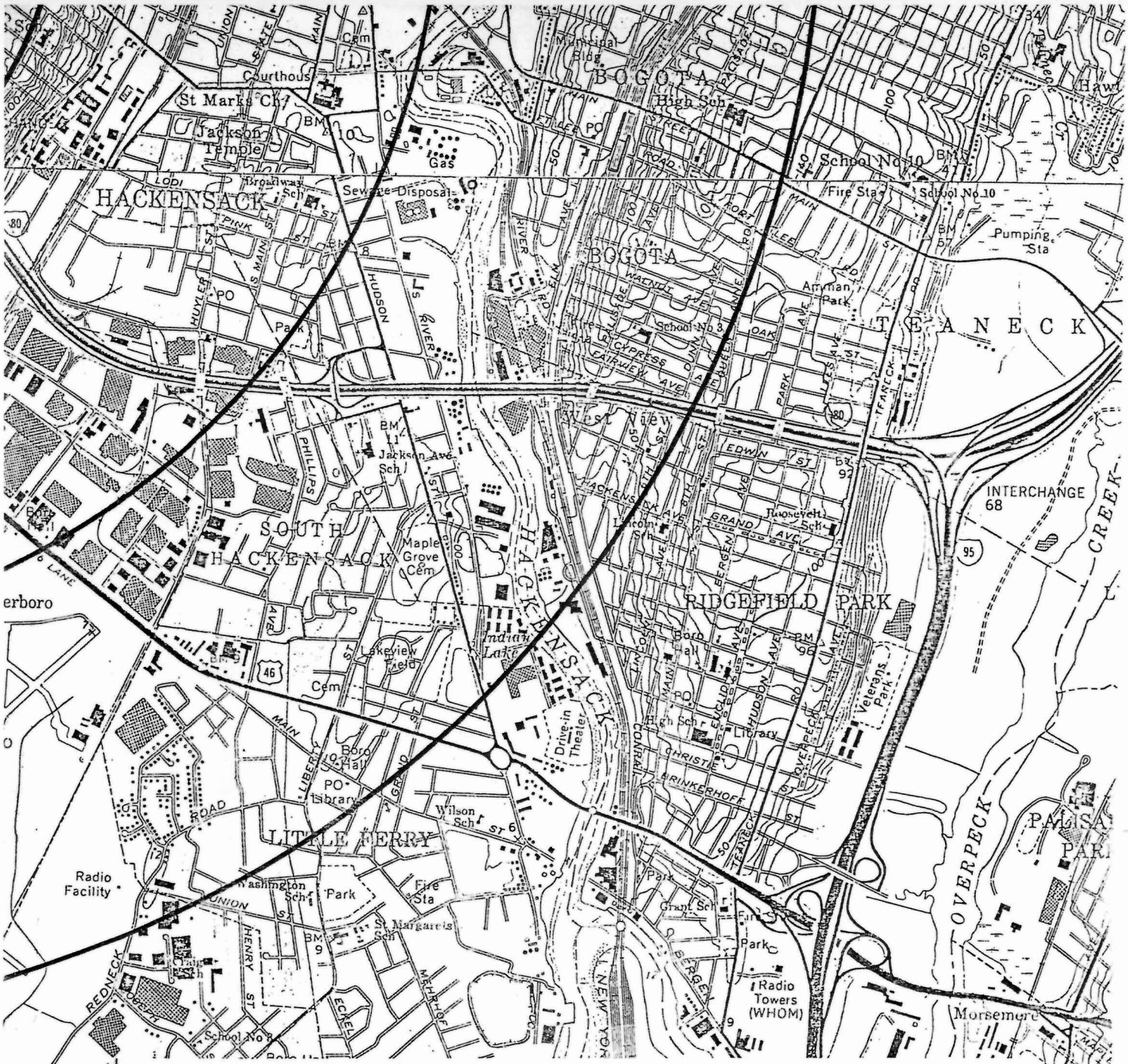
O = HRS
D = PRO

CONFIDENTIAL–NOT FOR PUBLIC RELEASE

Surface Water Route Work Sheet

Rating Factor	Assigned Value (Circle One)	Multi-plier	HRS	Max. Score	PRO
1 Observed Release	0 45	1	0	45	0
If observed release is given a value of 45, proceed to line 4. If observed release is given a value of 0, proceed to line 2.					
2 Route Characteristics					
Facility Slope and Intervening Terrain	0 1 2 3	1	0	3	0
1-yr. 24-hr. Rainfall	0 1 2 3	1	2	3	2
Distance to Nearest Surface Water	0 1 2 3	2	4	6	4
Physical State	0 1 2 3	1	3	3	3
Total Route Characteristics Score			9	15	9
3 Containment	0 1 2 3	1	1	3	1
4 Waste Characteristics					
Toxicity/Persistence	0 3 6 9 12 15 18	1	18	18	18
Hazardous Waste Quantity	0 1 2 3 4 5 6 7 8	1	1	8	1
Total Waste Characteristics Score			19	26	19
5 Targets					
Surface Water Use	0 1 2 3	3	6	9	6
Distance to a Sensitive Environment	0 1 2 3	2	0	6	0
Population Served/Distance to Water Intake Downstream	0 4 6 8 10 / 12 16 18 20 / 24 30 32 35 40	1	0	40	0
Total Targets Score			6	55	6
6 If line 1 is 45, multiply 1 x 4 x 5; If line 1 is 0, multiply 2 x 3 x 4 x 5			1026	64,350	1026
7 Divide line 6 by 64,350 and multiply by 100		S_{sw} =	1.59		1.59

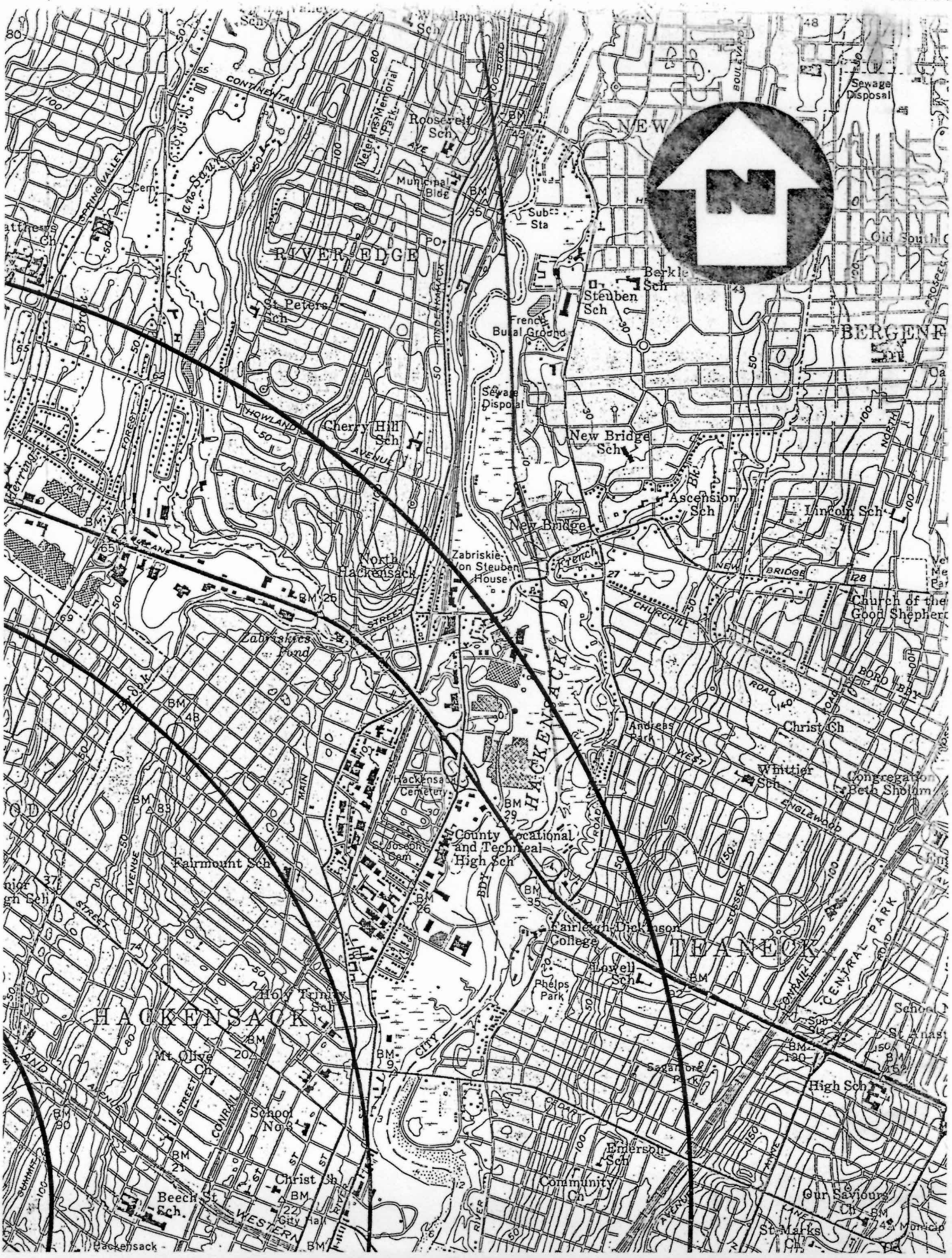
O = HRS
□ = PRO



NUS CORPORATION	TITLE: THREE MILE VICINITY MAP	
	SITE : FLINT INK INC. LODI, N.J.	
DATE : 02/28/90		
TDD : 02-9002-16		
QUAD HACKENSACK, N.J.	FIGURE NUMBER:	SCALE: 1"= 2000'

Radio Tower (WABC)
Sacred Heart Sch
Columbus Sch
Holy Trinity Sch
HASBROUCK HEIGHTS
Swimming Pool
Holy Trinity Sch
Roosevelt Sch
Hospital
GARFIELD
Grant Sch
St Johns Ch
Sch No 15
Sch No 6
Pulaski Park
PASSAIC
EIGHTS
Sch No 11
Sch No 4
General Hospital
High Sch
PASSAIC
St Johns Ch
Sch No 1
St Marys Hospital
Hospital
Boro Hall
WALLINGTON
Wallington Sch
Sacred Heart Sch
Franklin Sch
Carlton Hill
McKenzie Sch
Rutherford Memorial Park
Menorah Cem
Ridgelawn Cemetery
St Stephens Ch
Delawanna
Sch No 8
CLIFTON
Union Sch
Washington Sch
Fairleigh Dickinson University
St Marys High Sch
Library
Boro Hall
Lincoln Sch
Sewage Disposal
MOONACHIE
1 MILE
6000
7000 FEET
1 KILOMETER

FAIR LAWN
Berdan Heights
Milnes Sch
Jefferson Jr High Sch
Roosevelt Sch
High Sch
Lyncrest Sch
Hamlin Sch
Warren Point
School No 1
St Annes Sch
16th Avenue Sch
Fairview Sch
Boro Hall
Barnet Hospital
East Side Park
ELMWOOD PARK
Reservoir
Americus Cem
B'nai Israel Cem
Gilbert Ave Sch
Gilbert Avenue Sch
54th Street Sch
Memorial Sch
St Martins
Passaic Jun
INTERCHANGE 59 AND 60
BERGEN CO
PASSAIC CO
Calvary Cemetery
Sewage Disposal
St Leos Sch
Cedar Lawn Cemetery
Cherry Hills Sch
Ganter Avenue Sch
St Brendan Sch
INTERCHANGE 56
Dundee Lake
Jefferson Sch
St Stanislaus Kostka Sch
Wilson
SUSQUEHANNA
PASSAIC
RIVER
CONRAIL
TOLL ROAD
STATE
PARKWAY
NY S AND W


N
Roosevelt Sch
Municipal Bldg
Sub Sta
RIVER EDGE
St. Peters Sch
French Burial Ground
Steuben Sch
Sewage Disposal
Cherry Hill Sch
New Bridge Sch
Ascension Sch
Lincoln Sch
New Bridge
North Hackensack
Zabriskie-von Steuben House
Church of the Good Shepherd
Zabriskies Pond
Andrews Park
Christ Ch
Whittier Sch
Congregation Beth Sholom
Hackensack Cemetery
County Vocational and Technical High Sch
Fairmount Sch
Fairleigh Dickinson College
TEANECK
Lowell Sch
Phelps Park
Holy Trinity Sch
HACKENSACK
Mt Olive Ch
School No 3
Sagamore Park
High Sch
Emerson Sch
Community Ch
Christ Ch
Beech St Sch
City Hall
Our Saviours Ch
St Marks Ch
Hackensack