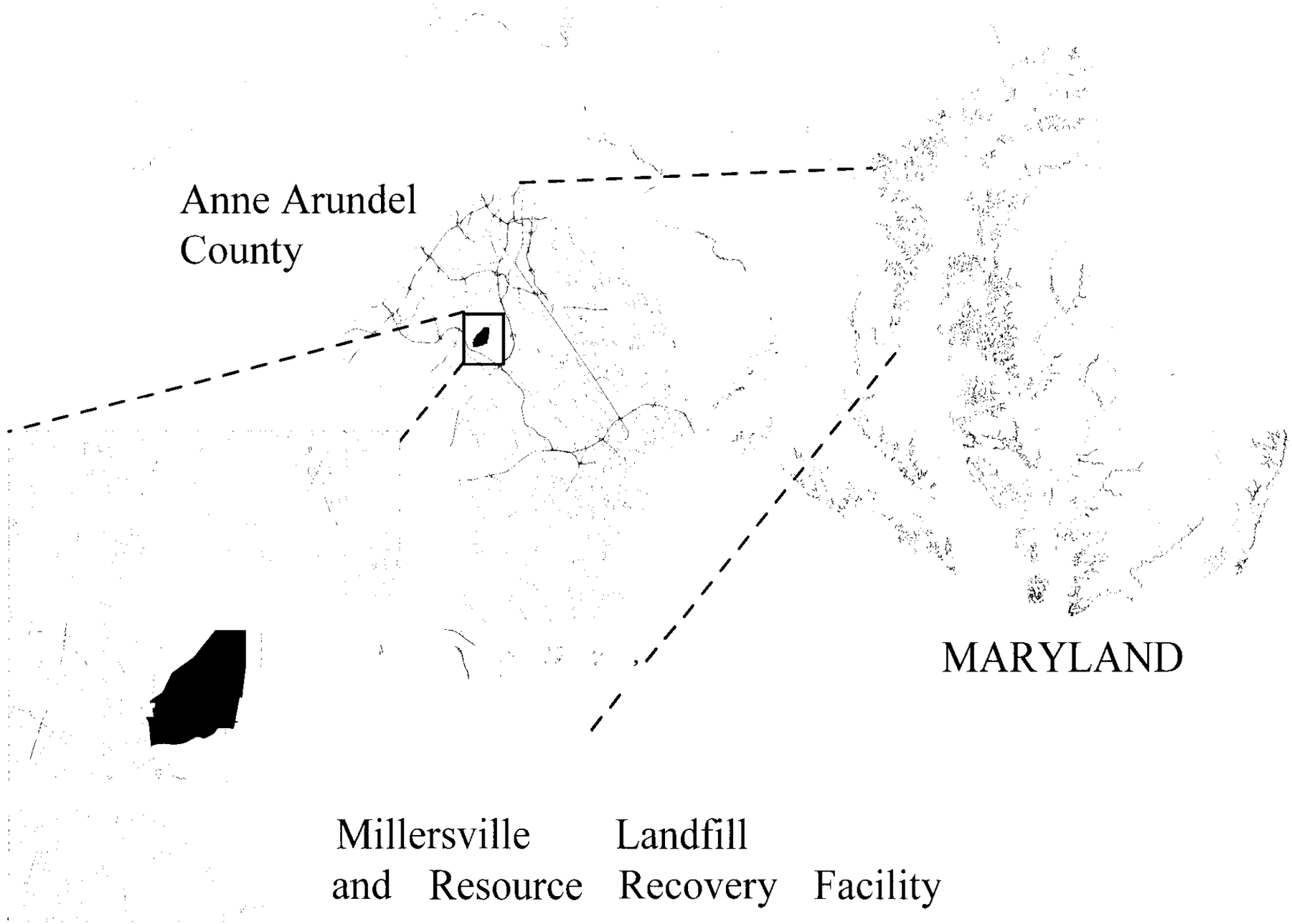
ATTACHMENT I

Vicinity Map
and
Capital Investment Map

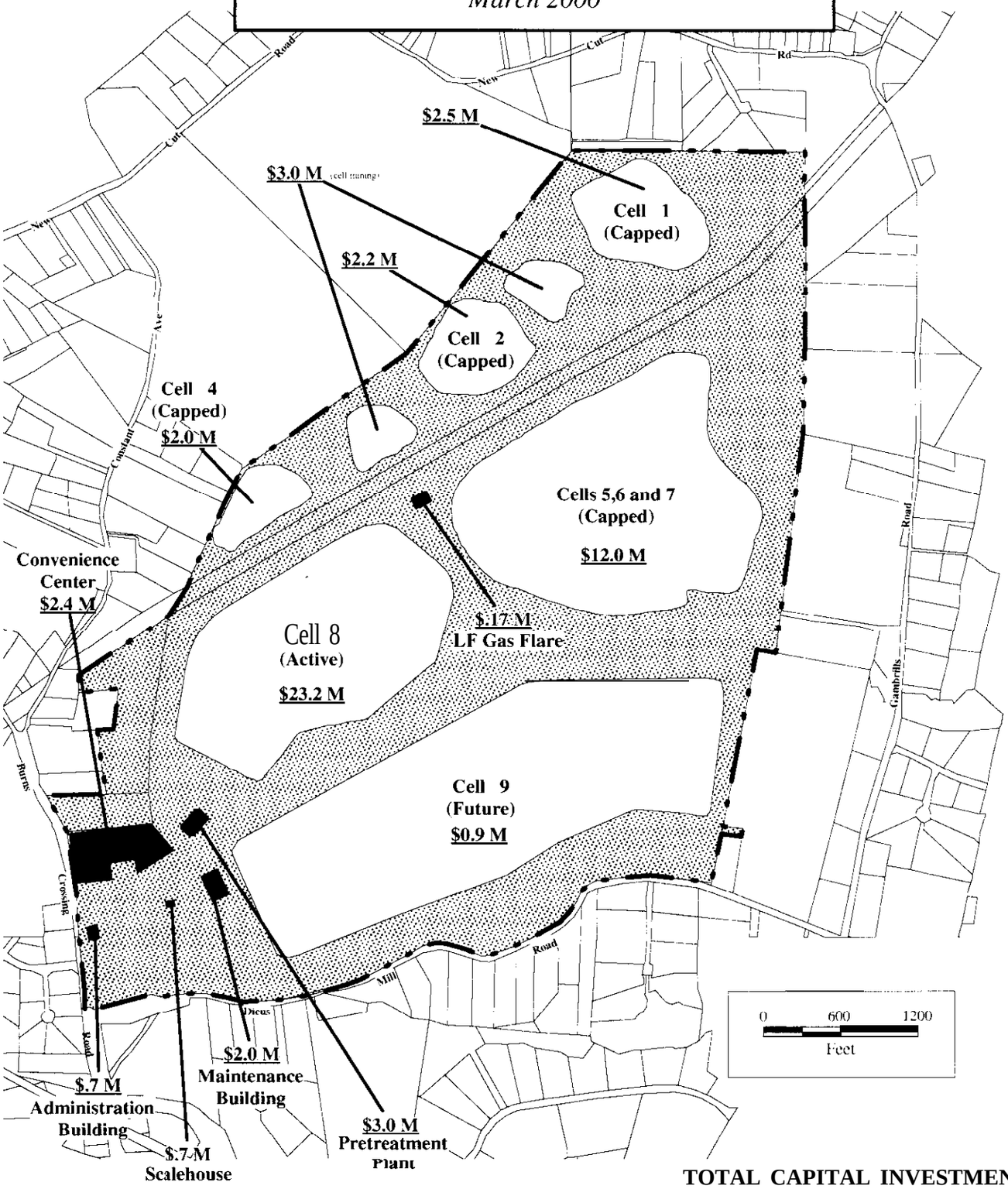


Millersville Landfill
and Resource Recovery Facility

ANNE ARUNDEL COUNTY

MILLERSVILLE LANDFILL AND RESOURCE RECOVERY FACILITY

March 2000



TOTAL CAPITAL INVESTMENT
$54.9 M

Note: Capping Includes LF Gas System Components

ATTACHMENT H

U.S. EPA Approval Letter for Alternate Liner System

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 191074431

Barry S.

MAR 30 1994

RECEIVED
APR 4 1994
WASTE MANAGEMENT ADMINISTRATION

Honorable David A.C. Carroll, Secretary
Maryland Department of the Environment
2500 Broening Highway
Baltimore, Maryland 21224

Dear Mr. Carroll:

In a letter dated March I, 1994, the Maryland Department of the Environment submitted a petition to EPA, as allowed under 40 CFR 258.40(e), for our approval of an alternate liner system proposed for an expansion of the Millersville, Anne Arundel County municipal solid waste landfill. The letter contained extensive technical documentation supporting your position that the liner, which is an alternate to the composite liner system required by the EPA regulations, meets the EPA performance standards.

Our review has confirmed that the proposed liner system does meet the EPA performance standard, and I am therefore pleased to inform you that EPA hereby approves your determination for the alternate liner design for the expansion of the Millersville landfill.

Our review and approval is limited to only the acceptability of the liner system for this expansion under the 40 CFR 258.40(e) petition process, and does not imply approval of any other state or EPA requirements pertaining to this landfill.

Should you have any questions or concerns on this action, please contact Andrew Uricheck of the RCRA program, at 215-597-7936.

Sincerely,

Stanley L. Laskowski
Acting Regional Administrator

'cc: Mr. Richard W. Collins, MDE (with attachment)
Mr. Edward M. Dexter, MDE (with attachment)

MARYLAND DEPARTMENT OF THE ENVIRONMENT
2500 Broening Highway • Baltimore, Maryland 21224
(410) 631-3000

Wii Donald Schaefer
Governor

David A.C. Carroll
Secretary

March I, 1994

Mr. Thomae Valtaggio, Regional Administrator
U.S. Environmental Protection Agency
Region III
841 Chestnut Building, 3HWO0
Philadelphia PA 19107

Dear Mr. Valtaggio: Tom

I request that, in accordance with 40 CFR Part 258.40(e), you review the enclosed materials documenting our evaluation of a proposed alternative liner design for Cell 8 of Millersville Sanitary Landfill in Anne Arundel County, Maryland. To facilitate your review, enclosed please find a brief summary of the site history, a copy of materials that we used to document our evaluation process and the technical information submitted to us by Anne Arundel County Department of Public Works which is the owner and operator of this landfill. Based on our extensive review of the enclosed technical information and modeling results, I hereby certify that the alternative liner design meets EPA's performance standard established in 40 CFR Part 258.40(a)(1).

Should you require further information concerning the petition, please contact Mr. Edward M. Dexter, Chief, Solid Waste Compliance Division, at (410) 631-3364. Thank you for your assistance.

Sincerely,

Rick

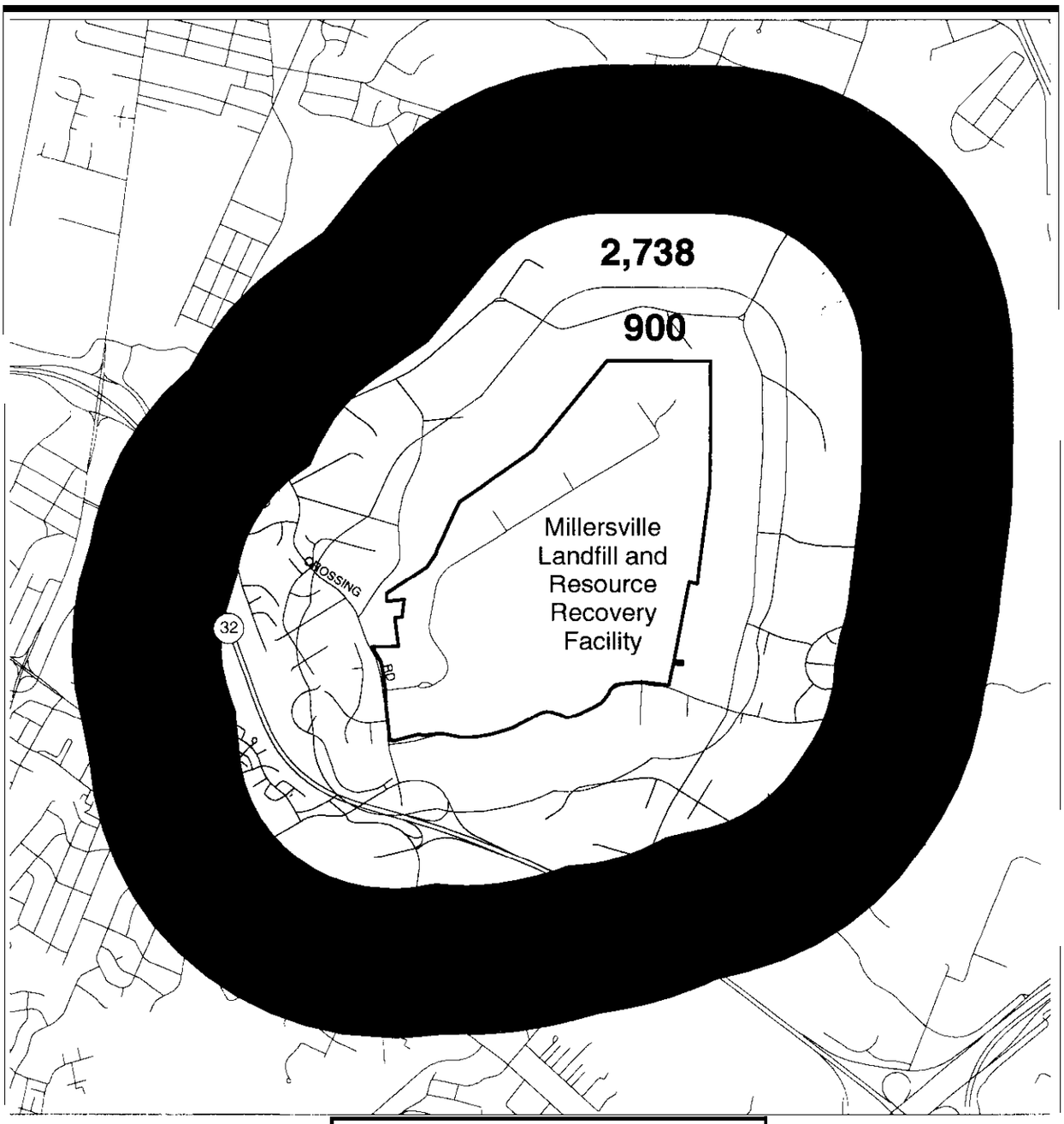
Richard W. Collins, Director
Waste Management Administration

RWC:lak

Enclosure

ATTACHMENT HI

Resident Population around Landfill



Millersville Landfill and Resource Recovery Facility

389 Burns Crossing Rd.
Sevem, MD 2 1144

Regional Population

Legend

Buffered Distance from Landfill with Population Inside Buffer

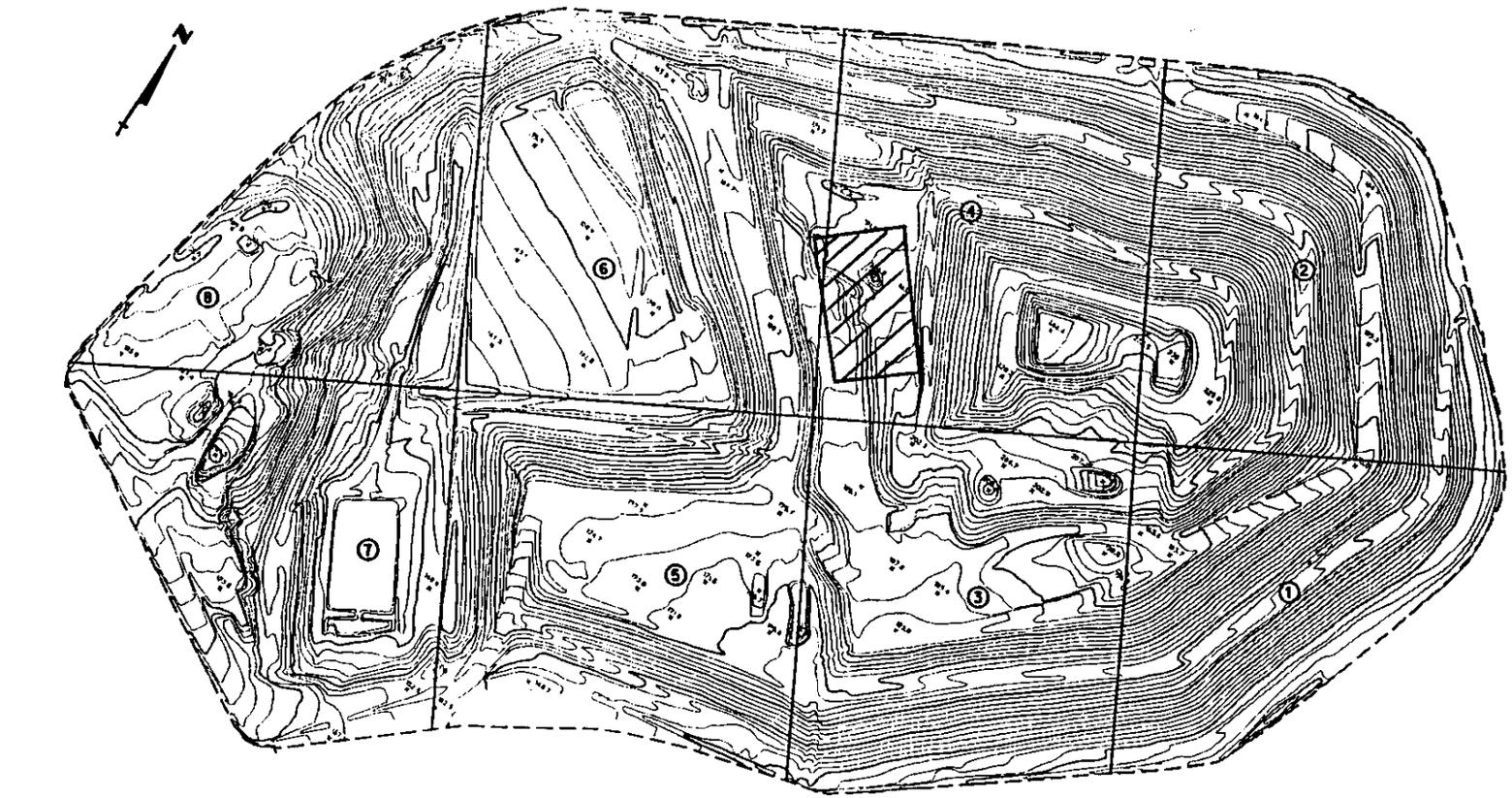
- 0.25 Mile 900 People
- 0.5 Mile - 2738 People
- I Mile 5789 People

ANNE ARUNDEL COUNTY
MARYLANI

DATE:March 7, 2000
, ILE: g:\mapdata\wastemgt.bj\MI I-population buffers
MAP PRODUCTION: Department of Planning and Code Enforcement
GIS Section

ATTACHMENT IV

Test Area Location



300 150 0 300 600

Gannett Fleming

BALTIMORE, MARYLAND

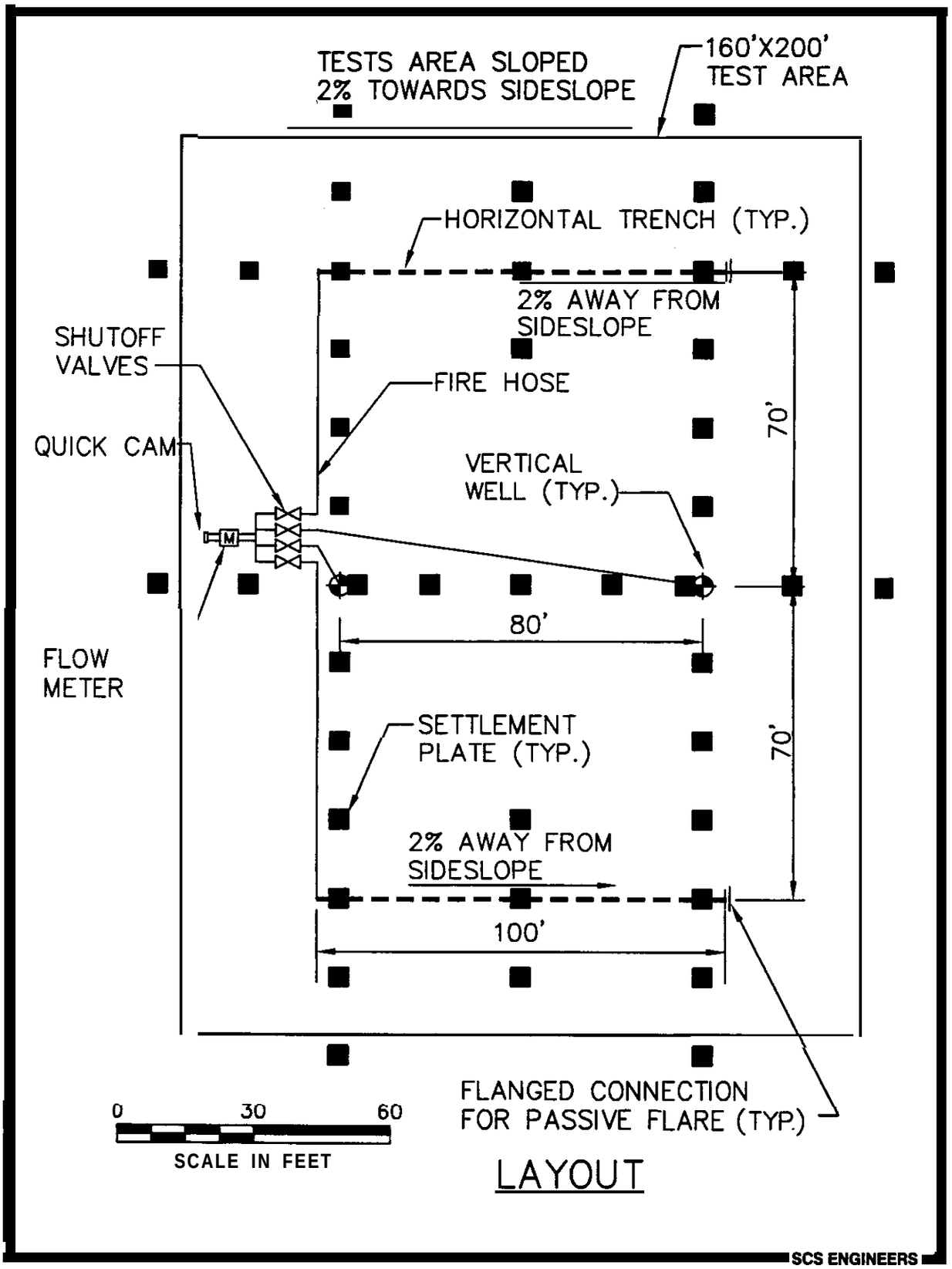
FILL SEQUENCE

MILLERSVILLE LANDFILL
CELL 8

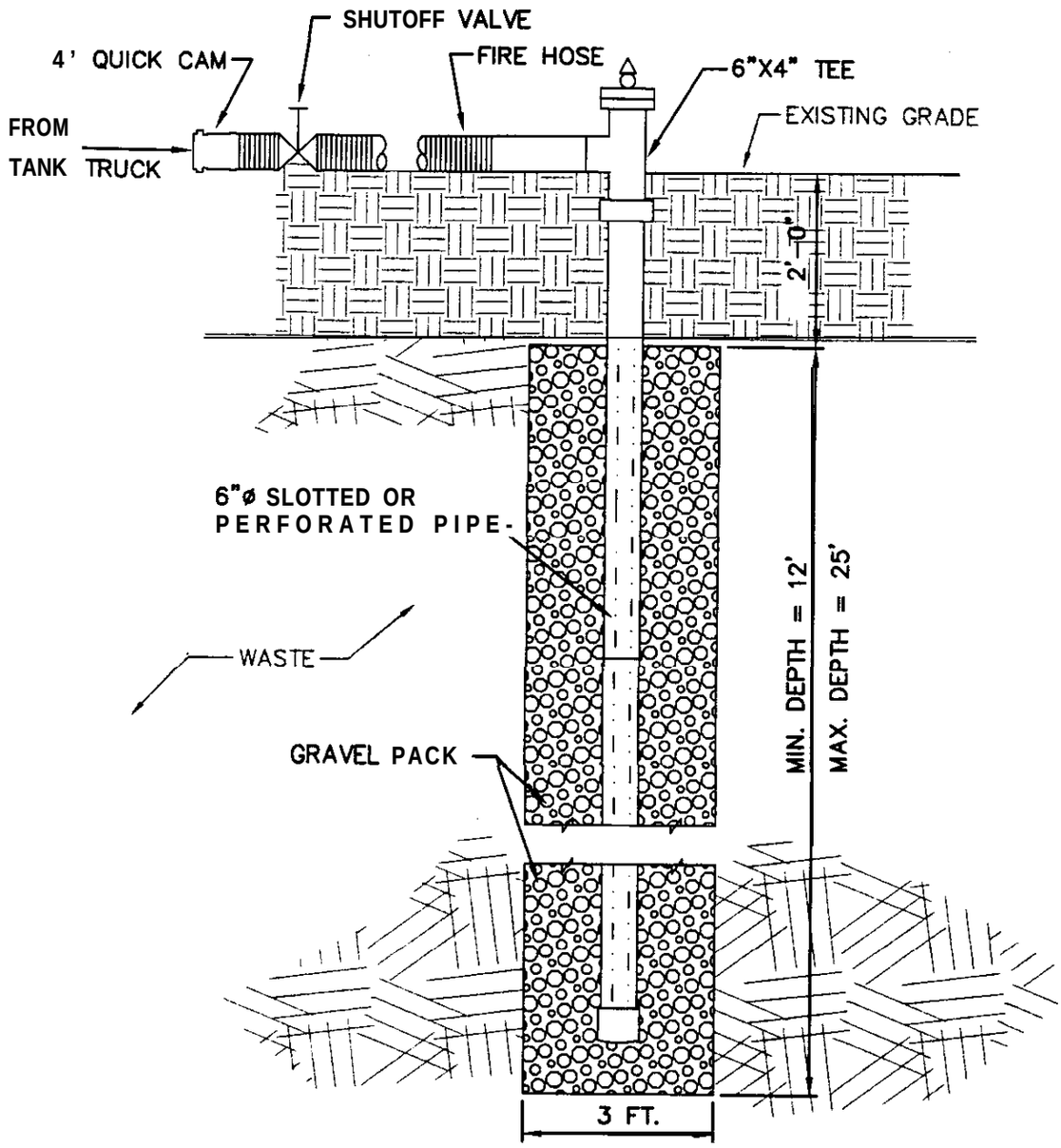
NOVEMBER 11, 1999

ATTACEMENT V

System Layout and Details



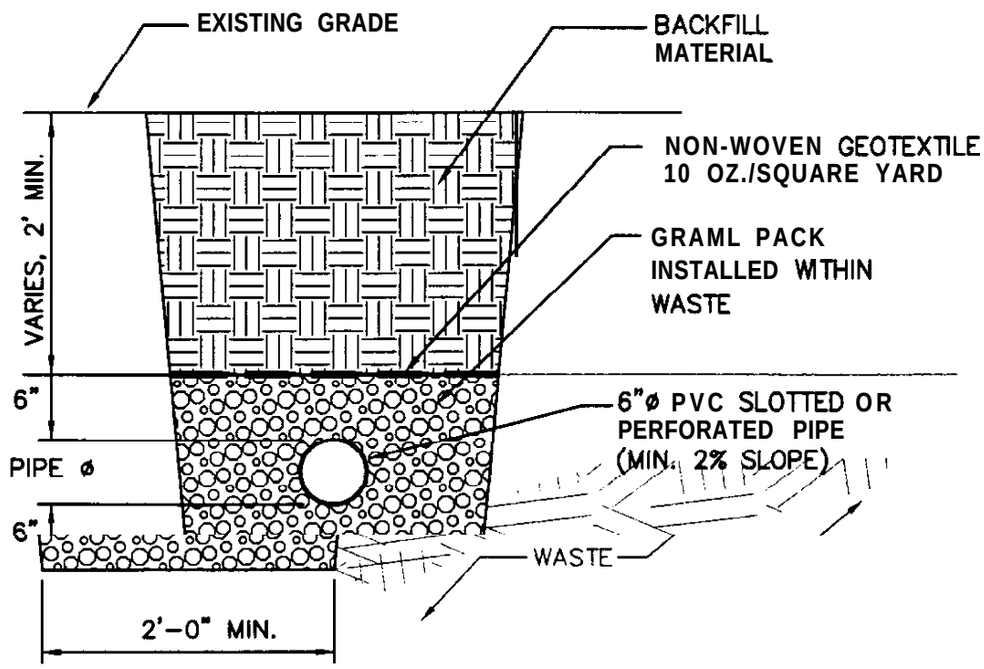
DRAWN BY: JOR DATE: 8-18-99 FILE NAME: M:\297054\HIN.WELL-B



VERTICAL INJECTION WELL DETAIL

NO SCALE

SCS ENGINEERS



HORIZONTAL INJECTION DEVICE DETAIL

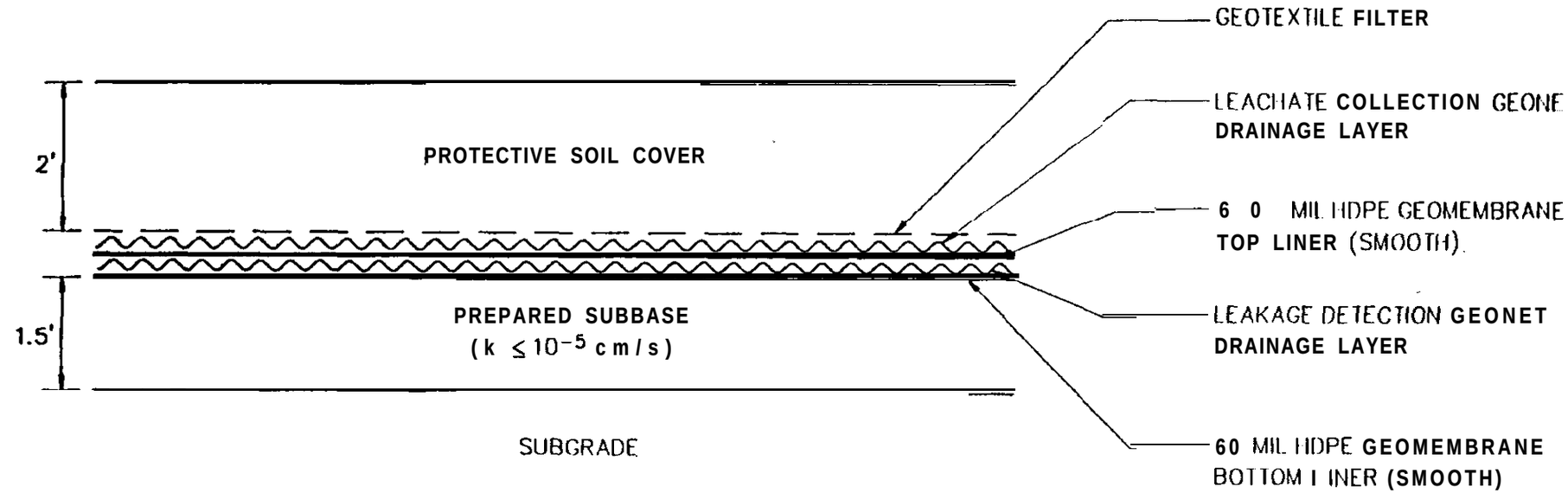
NO SCALE

DRAWN BY: JCR DATE: 8-18-99 FILE NAME: M:\297354\MNJWELL-B

SCS ENGINEERS

ATTACHMENT VI

Liner Detail



4a / 8 DETAIL

BASE LINER SYSTEM

SCALE: NTS

ATTACHMENT VII

Leachate Analytical Results

FILE 559

GCI ENVIRONMENTAL SERVICES

1250 East King Street • Lancaster, PA 17602-3236 • phone: (717) 295-9145 • fax: (717) 295-1742 • GCIenvirsvc@redrose.net

November 18, 1999

Mr. Ray Riggin
Anne Anmdel County
Department of Public Works
Bureau of Waste Management Services
Sevem, Maryland 21144

RE: **Data Report for Leachate Samples Collected from Subcells September - October 1999 at Millersville Landfill**

Dear Mr. Riggin:

GCI is pleased to provide you with two copies of the referenced report. The scope of work for this sampling event included the collection of six leachate samples from six discrete subcells at the referenced site. GCI personnel collected these samples, with assistance from AAC personnel, on September 30 and October 1, 1999. These samples were tested for volatile organic compounds (VOCs), total metals and general chemistry parameters. The attached Tables 1 and 2 show the analytical results for the six samples.

Maryland Spectral Services and Atlantic Coast Laboratories provided analytical services in support of this project. The analytical data reports prepared by the analytical laboratories are attached to this letter report.

If you have any questions concerning the information in this report please do not hesitate to give me a call at your earliest convenience.

Sincerely,

Department of Public Works
Waste Management Services
OPERATING RECORD

Steven A. Brown

file: lf\aac\leac\subcells\oct99\subcltxt.doc

RECEIVED
NOV 23 1999
MILLERSVILLE WMS

TABLE 1

POSITIVE VOLATILE ORGANIC COMPOUND RESULTS (ppb) FOR LEACHATE SAMPLES COLLECTED MARCH 1998 - OCTOBER 1999

Millersville Landfill, Anne Arundel County, Maryland

Sample Designations	SUBCELL 8.1				SUBCELL 8.2				SUBCELL 8.3			
Sample Dates	**3/98**	**6/98**	**10/98**	**10/99**	**3/98**	**6/98**	**10/98**	**10/99**	**3/98**	**6/98**	**10/98**	**10/99**
Acetone	3,380	379	49	41	1,480	15	188	16	53	92	16	11
Benzene	ND	ND	ND	2.2 J	ND	4.5 J	ND	8.6	3.5 J	ND	ND	4.2 J
2-Butanone	8,850	618	ND	36	3,210	ND	254	ND	51	ND	ND	ND
Carbon disulfide	ND	ND	ND	ND	ND	2.5 J	ND	4.1 J	ND	8.8 J	ND	10
Chloroethane	43 J	22 J	17	16	48 J	20	10	14	5.1	12 J	ND	ND
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	4.9 J	3.8 J	ND	ND	6.3
1,1-Dichloroethane	28 J	ND	ND	ND	ND	11	ND	5.7	2.6 J	ND	ND	ND
Dichlorofluoromethane	ND	ND	ND	ND	ND	4.4 J	ND	2.3 J	ND	ND	ND	ND
Ethylbenzene	ND	ND	ND	4.5 J	ND	6.8	24	15	23	13 J	24	29
4-Methyl-2-Pentanone	ND	ND	ND	ND	274	63	ND	ND	ND	ND	ND	ND
Methylene chloride	167	ND	ND	2.0 J	ND	6.4	ND	ND	ND	ND	ND	ND
Toluene	1,130	275	21	4.6 J	300	80	150	7.2	4.3 J	25	ND	10
Vinyl chloride	ND	ND	ND	ND	ND	2.4 J	ND	ND	2.9 J	ND	ND	ND
o-Xylene	ND	ND	ND	3.9 J	ND	5.4	15	20	15	18 J	17	24
m+p-Xylene	ND	ND	5.4	7.8	32 J	12	37	49	32	44	39	54

Notes: 1) ND = None detected; 2) J = Estimated value between reporting and detection limit.

file: lf\aac\leachate\subcells\oct99\vocres.doc

TABLE 1, cont'd

POSITIVE VOLATILE ORGANIC COMPOUND RESULTS (ppb) FOR LEACHATE SAMPLES COLLECTED MARCH 1998 - OCTOBER 1999

Millersville Landfill, Anne Arundel County, Maryland

Sample Designations	SUBCELL 8.4				SUBCELL 8.5				SUBCELL 8.6			
Sample Dates	3/98	6/98	10/98	10/99	3/98	6/98	10/98	10/99	3/98	6/98	10/98	10/99
Acetone	4,480	8,320	7,710	57	2,790	50	22	209	5,990	2,760	950	137
Benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
2-Butanone	9,350	14,500	14,200	38 J	7,450	532	ND	454	24,200	7,050	4,770	340
Carbon disulfide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloroethane	116	ND	ND	13J	ND	48	30	ND	63J	ND	ND	5.5 J
1,4-Dichlorobenzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,1-Dichloroethane	ND	ND	ND	ND	ND	ND	ND	ND	166	ND	ND	ND
Dichlorofluoromethane	ND	ND	ND	ND	ND	ND	ND	ND	90 J	ND	ND	ND
Ethylbenzene	37 J	ND	ND	23 J	ND	28	27	23 J	ND	ND	ND	11
4-Methyl-2-Pentanone	ND	ND	ND	76	ND	60	ND	ND	ND	ND	ND	ND
Methylene chloride	ND	ND	ND	ND	ND	ND	ND	14 J	782	ND	ND	ND
Toluene	1,750	2,630	1,070	705	4,230	792	14	1,170	476	ND	770	288
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
o-Xylene	ND	ND	ND	25 J	ND	16 J	15	13 J	ND	ND	ND	6.0 J
m+p-Xylene	63	ND	ND	56	54 J	45	39	37	81 J	ND	ND	17

Notes: 1) ND = None detected; 2) J = Estimated value between reporting and detection limit.

file: lf\aac\leachate\subcells\oct99\vocres.doc

TABLE 2

TOTAL METALS AND GENERAL CHEMISTRY PARAMETER RESULTS (ppm) FOR LEACHATE SAMPLES COLLECTED MARCH 1998 - OCTOBER 1999

Millersville Landfill, Anne Arundel County, Maryland

Sample Designations	SUBCELL 8.1				SUBCELL 8.2				SUBCELL 8.3			
Sample Dates	3/98	6/98	10/98	10/99	3/98	6/98	10/98	10/99	3/98	6/98	10/98	10/99
Arsenic	0.014	0.03	ND	ND	0.041	0.055	ND	ND	0.065	0.083	0.057	0.065
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.004	ND	ND
Chromium	0.02	0.032	0.031	0.076	0.027	0.034	0.042	0.020	0.072	0.052	0.056	0.046
Copper	ND	ND	ND	0.034	ND	ND	0.019	ND	0.005	0.032	0.048	ND
Iron	388	98.7	56.2	54.3	173	77.7	67.1	70.3	17.2	9.88	20.0	7.63
Lead	ND	ND	ND	0.053	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	0.058	0.060	0.092	0.124	0.032	0.025	0.039	0.025	0.136	0.108	0.104	0.081
Silver	0.02	0.02	ND	ND	0.01	0.01	ND	ND	0.01	0.02	ND	ND
Zinc	0.036	0.062	0.039	0.527	0.004	0.003	ND	0.013	0.03	0.015	ND	0.013
BOD	>2,170	256	97	61	545	66	67	9	75	77	168	47
Nitrate	ND	ND	0.162	ND	0.24	ND	0.186	ND	ND	ND	0.235	ND
Nitrite	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total alkalinity	2,300	3,040	3,700	4,000	1,700	2,370	3,700	1,800	5,600	4,770	5,500	5,200
Orthophosphate	0.02	0.36	ND	0.02	0.01	0.66	0.03	0.15	1.4	1.5	0.11	0.46
Total suspended solids	302	244	228	1,950	326	184	138	272	39	31	126	22
Ammonia	280	430	410	510	200	280	340	260	990	800	900	870
COD	4,400	800	490	674	1,000	420	430	250	1,000	860	880	819
Total kjeldahl nitrogen	320	450	490	590	140	350	390	290	980	870	1,000	920
Cyanide	0.05	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloride	NA	614	350	789	NA	365	300	323	NA	1,070	475	1,150
pH, SU	NA	7.19	7.00	6.85	NA	6.90	7.10	6.69	NA	7.26	7.32	7.34
Specific conductivity, mS	NA	7.08	6.76	8.24	NA	5.07	5.62	4.38	NA	11.42	11.72	11.76
Total dissolved solids	NA	2,870	3,470	3,700	NA	1,900	2,370	1,500	NA	4,360	5,070	4,380

Notes: 1) ND = None detected 2) NA = Not analyzed

file: 1f\aac\leachate\subcells\oct99\inorgan.doc

TABLE 2, cont'd

TOTAL METALS AND GENERAL CHEMISTRY PARAMETER RESULTS (ppm) FOR LEACHATE SAMPLES COLLECTED MARCH 1998 - OCTOBER 1999

Millersville Landfill, Anne Arundel County, Maryland

Sample Designations	SUBCELL 8.4				SUBCELL 8.5				SUBCELL 8.6			
Sample Dates	3/98	6/98	10/98	10/99	3/98	6/98	10/98	10/99	3/98	6/98	10/98	10/99
Arsenic	0.029	0.047	0.077	0.058	0.007	0.009	ND	ND	0.009	0.020	ND	ND
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium	0.027	0.079	0.060	0.026	0.024	0.022	0.020	ND	0.02	ND	ND	ND
Copper	ND	ND	ND	0.013	ND	ND	ND	ND	ND	ND	ND	ND
Iron	454	490	260	48.1	203	21.6	25.9	76.1	476	490	180	72.0
Lead	0.059	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Mercury	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Nickel	0.028	0.059	0.083	0.078	0.051	0.074	0.088	0.017	0.024	ND	0.013	0.029
Silver	0.02	0.02	ND	ND	0.01	0.01	ND	ND	0.02	0.01	ND	ND
Zinc	0.142	0.065	ND	0.022	0.025	ND	ND	0.022	0.038	ND	ND	0.028
BOD	>2,110	6,200	3,950	204	2,140	71	58	233	>4,220	1,960	2,360	ND
Nitrate	1.00	ND	ND	0.22	ND	ND	0.116	ND	ND	ND	0.145	ND
Nitrite	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total alkalinity	2,000	3,110	2,900	3,000	1,400	3,250	3,700	940	1,500	1,240	2,200	1,920
Orthophosphate	0.04	0.15	0.04	0.01	ND	ND	0.17	ND	0.31	ND	ND	0.01
Total suspended solids	240	382	340	248	348	35	38	154	165	211	155	135
Ammonia	160	290	370	360	220	420	420	140	92	49	63	12
COD	4,500	10,000	4,700	690	3,800	490	450	318	7,300	3,600	770	216
Total kjeldahl nitrogen	210	420	420	420	250	520	500	150	170	130	70	21
Cyanide	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chloride	NA	438	350	637	NA	738	400	140	NA	155	200	51.4
pH, SU	NA	6.43	6.87	6.95	NA	7.08	7.08	6.47	NA	6.11	6.63	6.46
Specific conductivity, mS	NA	7.43	7.38	6.55	NA	7.41	7.35	2.01	NA	3.50	2.10	1.09
Total dissolved solids	NA	5,720	5,000	2,910	NA	3,190	3,370	881	NA	2,180	1,010	264

Notes: 1) ND = None detected 2) NA = Not analyzed

file: 1f\aac\leachate\subcells\oct99\inorgan.doc