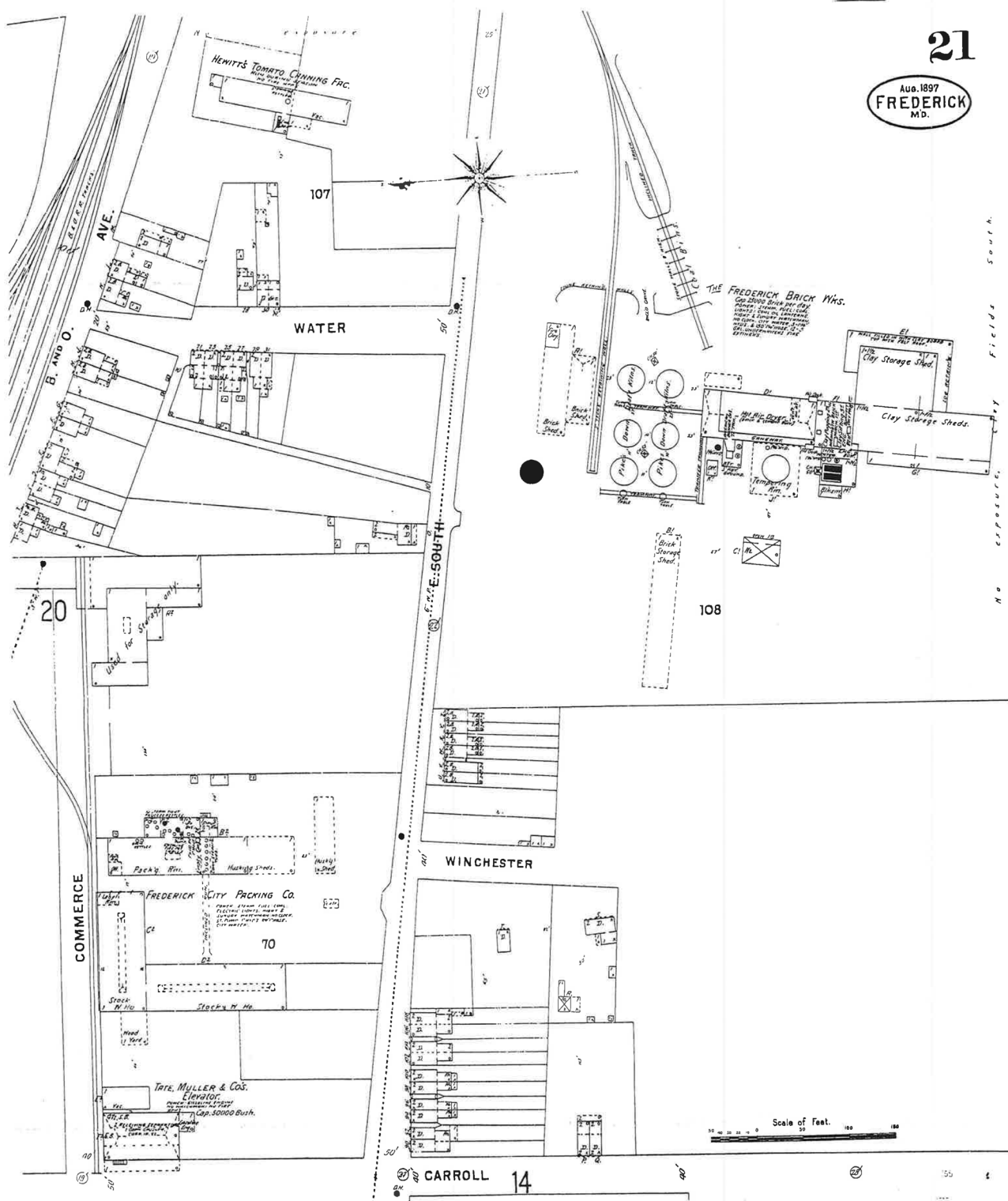


APPENDIX E.

Sanborn Fire Insurance Maps

21

AUG. 1897
FREDERICK
MD.



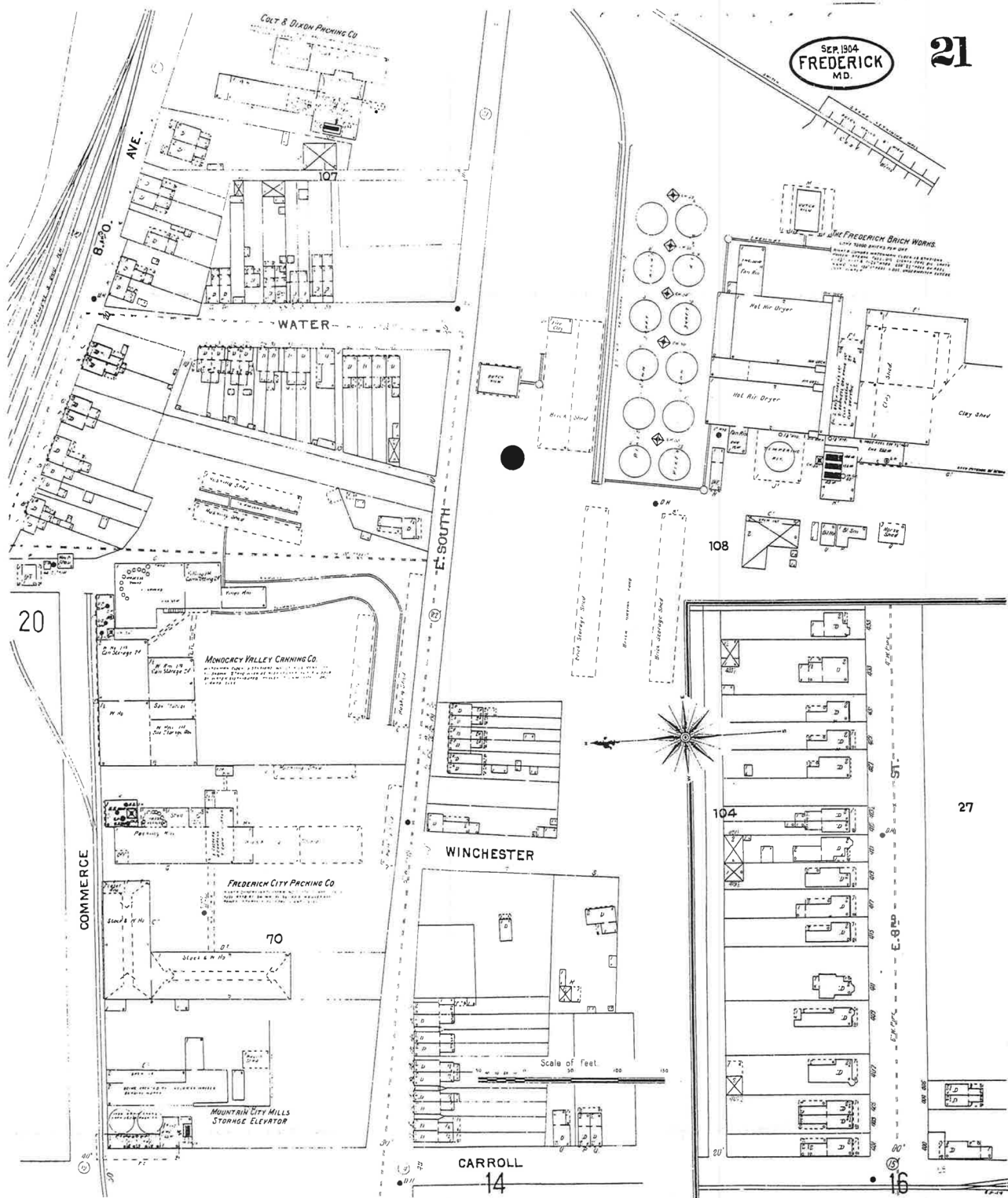
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SANBORN

1897



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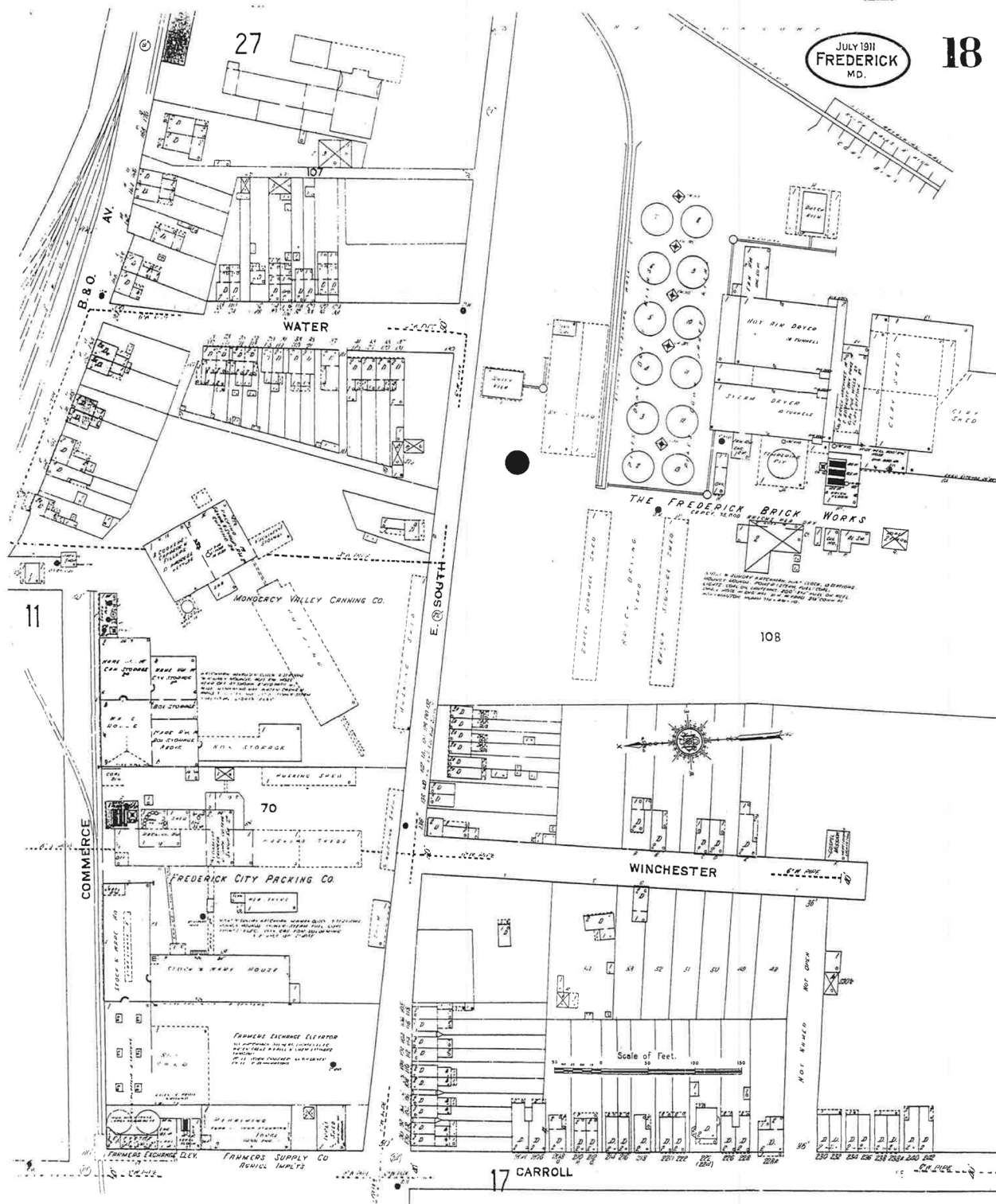
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SANBORN

1904

JULY 1911
FREDERICK
MD.

18



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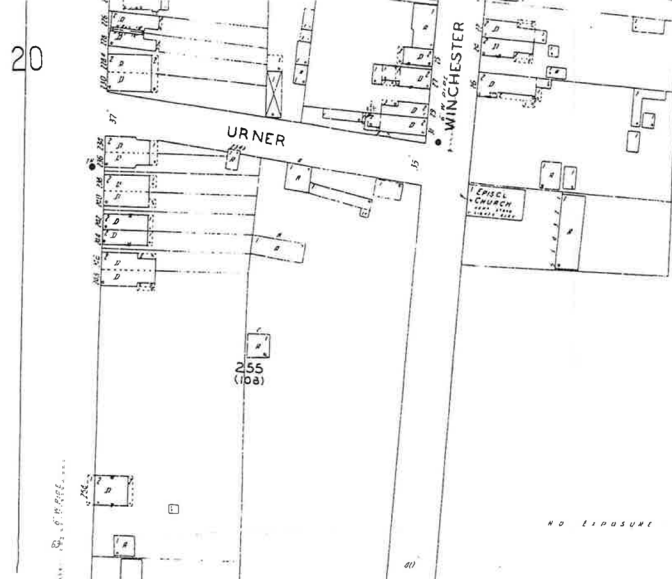
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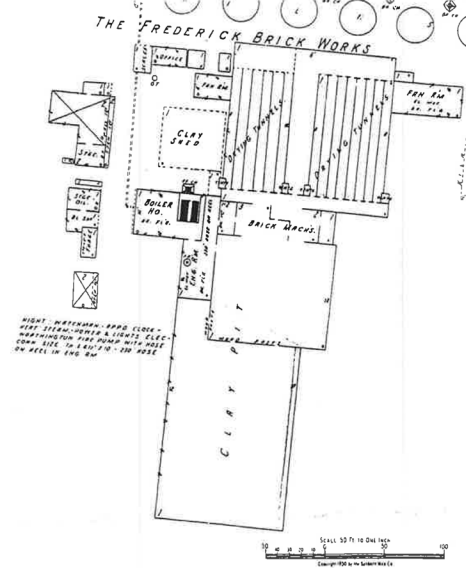
1911

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20



108



Environmental Risk Information & Imaging Services

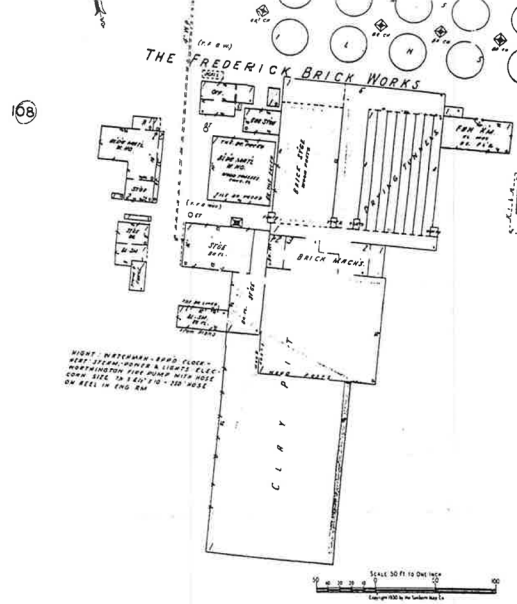
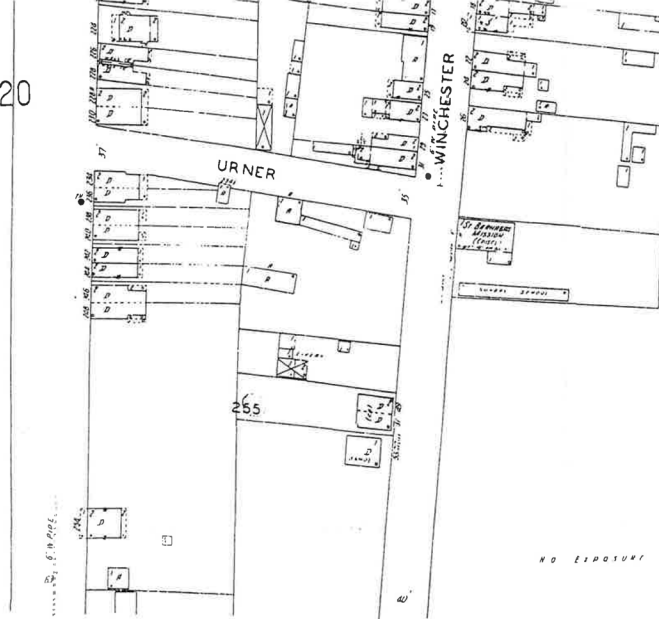
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SANBORN

1930



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SANBORN

194

SANBORN

1947



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SANBORN

1971

APPENDIX F.

Historical Topographic Maps



EDR® Environmental
Data Resources Inc

EDR Historical Topographic Map Report

**Frederick Brick Works
184 East South Street
Frederick, MD 21701**

Inquiry Number: 1898628.4

April 10, 2007

The Standard in Environmental Risk Management Information

**440 Wheelers Farms Rd
Milford, Connecticut 06461**

Nationwide Customer Service

Telephone: 1-800-352-0050
Fax: 1-800-231-6802
Internet: www.edrnet.com

EDR Historical Topographic Map Report

Environmental Data Resources, Inc.'s (EDR) Historical Topographic Map Report is designed to assist professionals in evaluating potential liability on a target property resulting from past activities. EDR's Historical Topographic Map Report includes a search of a collection of public and private color historical topographic maps, dating back to the early 1900s.

Thank you for your business.
Please contact EDR at 1-800-352-0050
with any questions or comments.

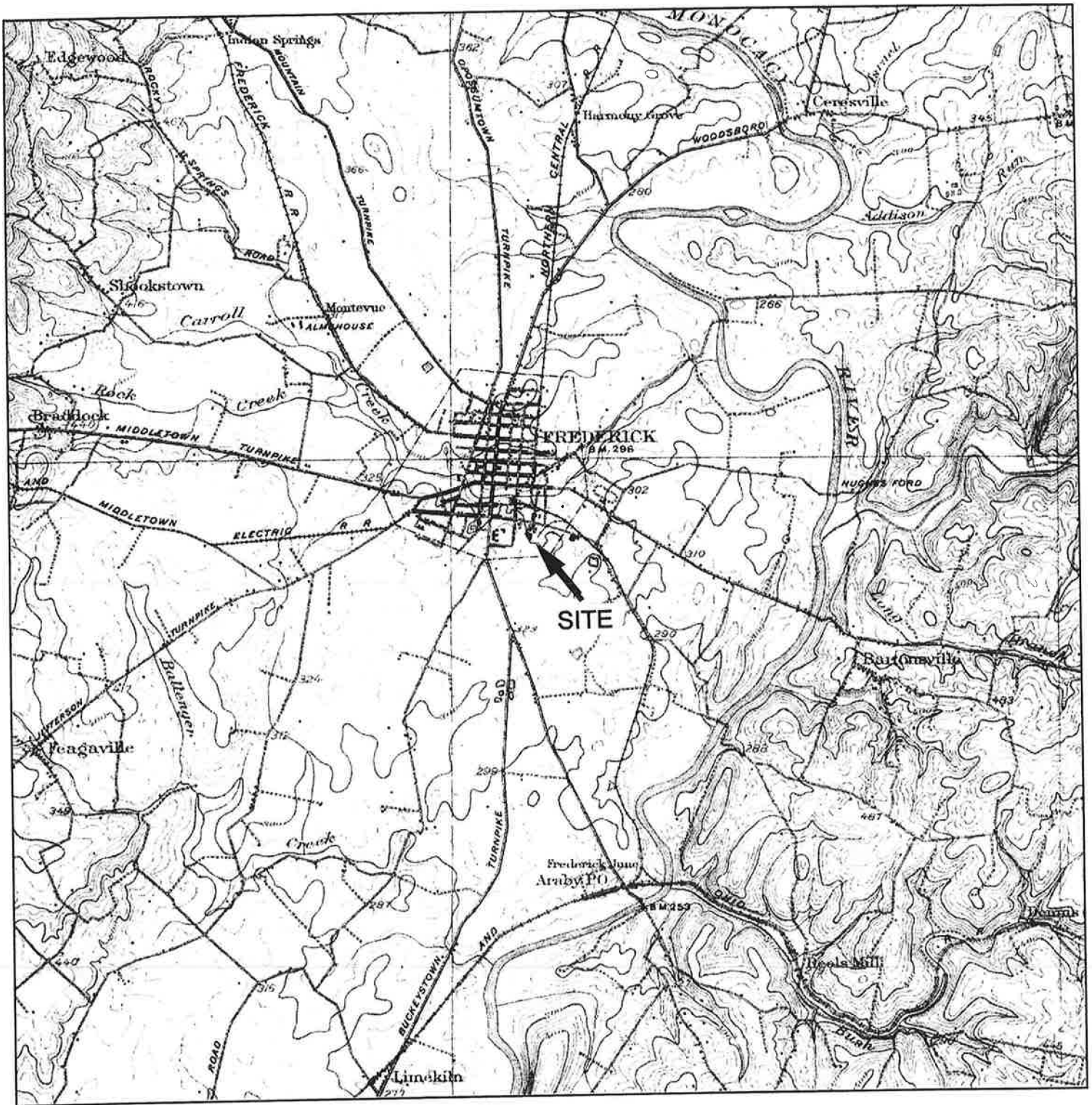
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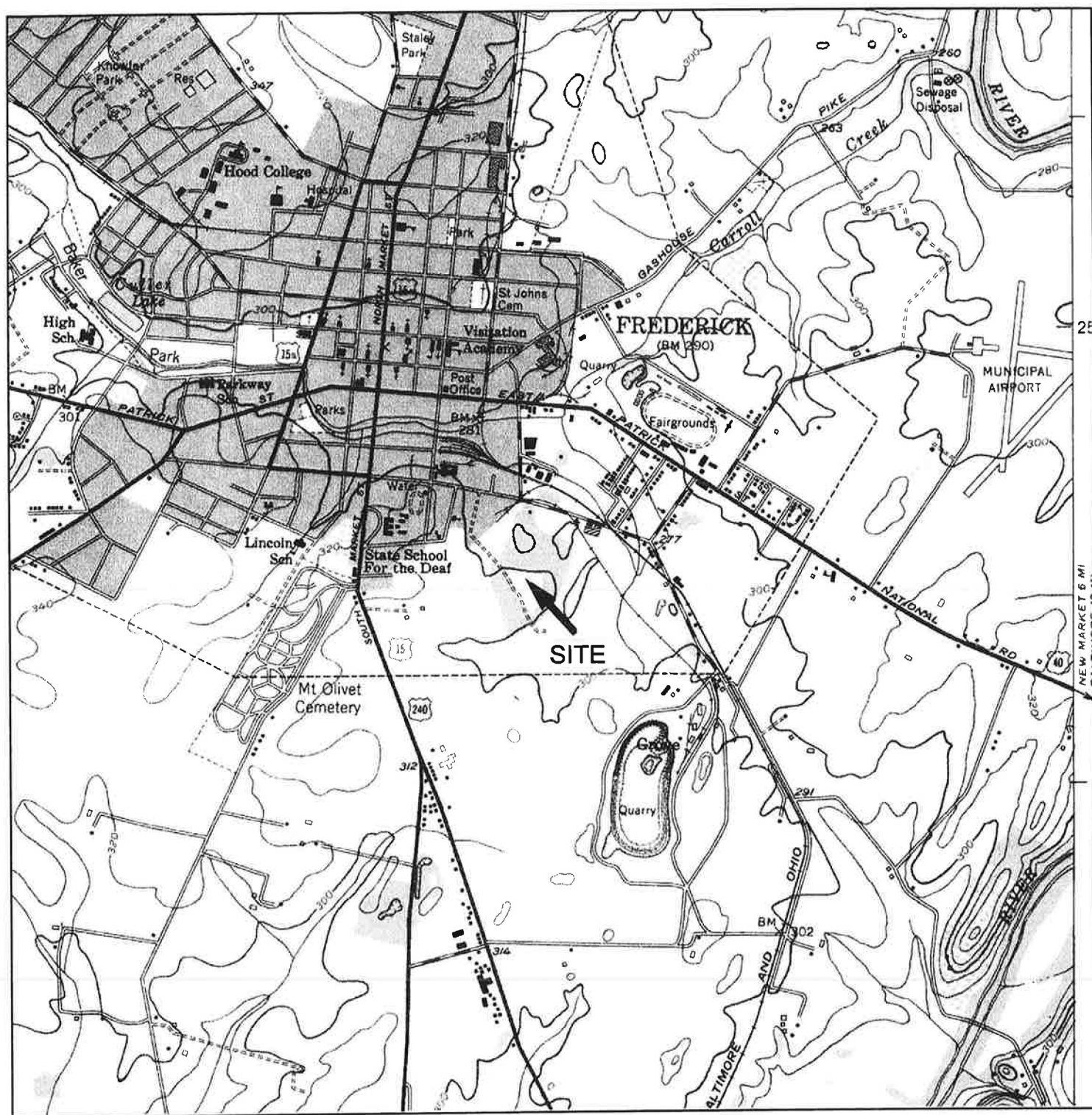
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Historical Topographic Map



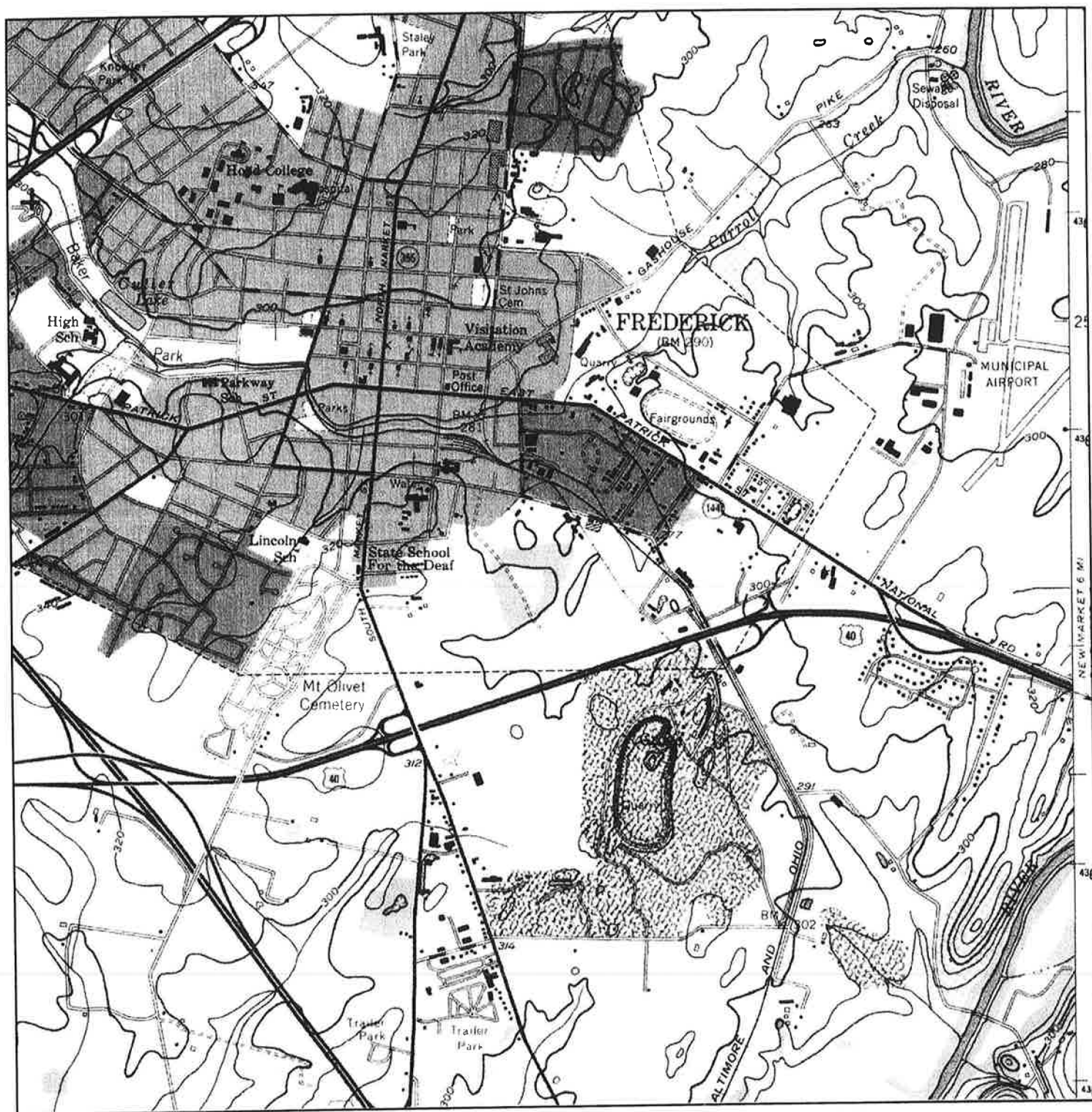
<p>N ↑</p>	<p>TARGET QUAD NAME: IJAMSVILLE MAP YEAR: 1909</p> <p>SERIES: 15 SCALE: 1:62500</p>	<p>SITE NAME: Frederick Brick Works ADDRESS: 184 East South Street Frederick, MD 21701 LAT/LONG: 39.4066 / 77.4022</p>	<p>CLIENT: Hydro-Terra, Inc. CONTACT: GARY PARKS INQUIRY#: 1898628.4 RESEARCH DATE: 04/10/2007</p>
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Historical Topographic Map



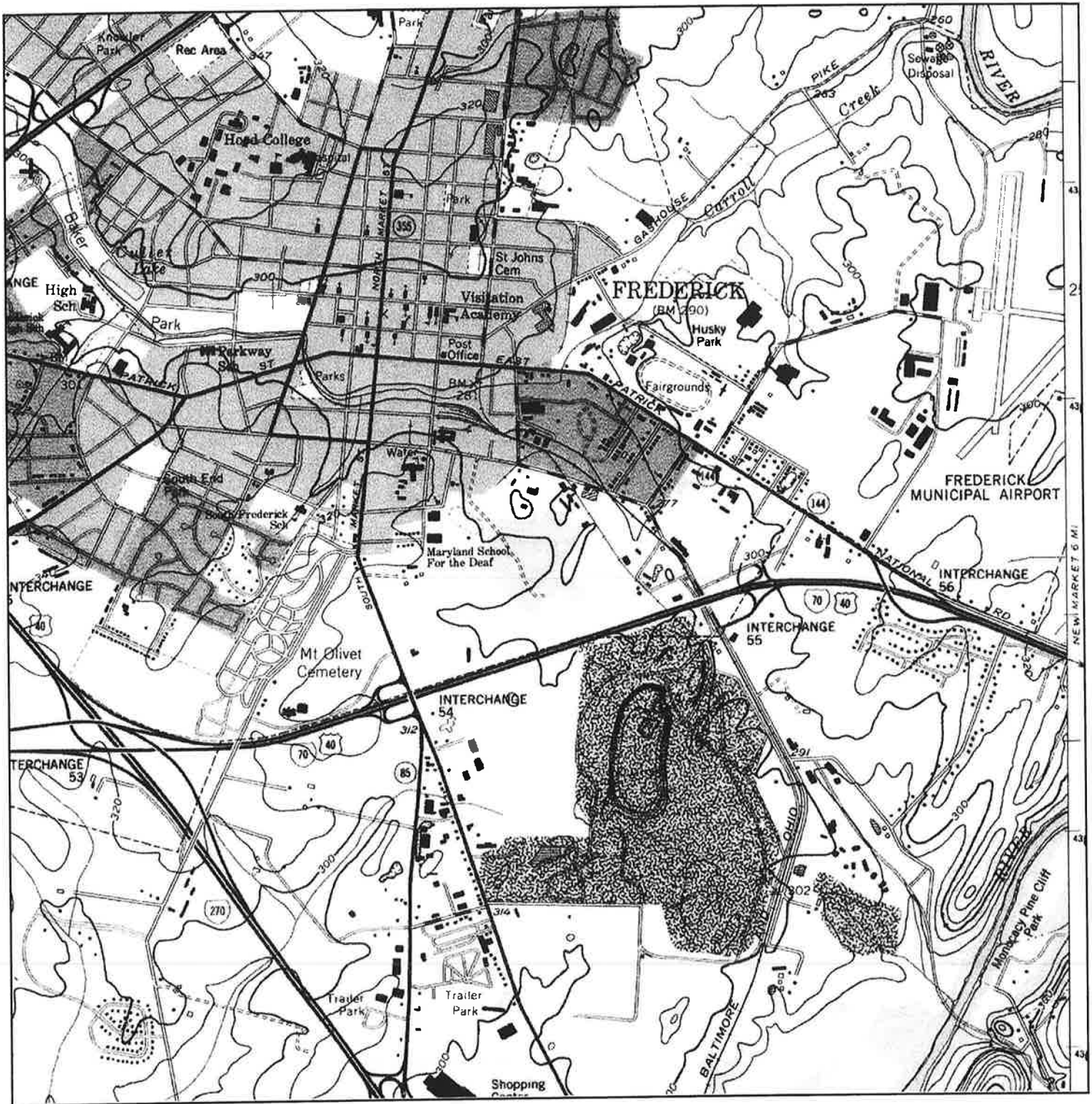
<p>N ↑</p>	<p>TARGET QUAD NAME: FREDERICK MAP YEAR: 1953</p>	<p>SITE NAME: Frederick Brick Works ADDRESS: 184 East South Street Frederick, MD 21701 LAT/LONG: 39.4066 / 77.4022</p>	<p>CLIENT: Hydro-Terra, Inc. CONTACT: GARY PARKS INQUIRY#: 1898628.4 RESEARCH DATE: 04/10/2007</p>
	<p>SERIES: 7.5 SCALE: 1:24000</p>		

Historical Topographic Map



<p>N ↑</p>	<p>TARGET QUAD NAME: FREDERICK MAP YEAR: 1971 PHOTOREVISED FROM: 1953 SERIES: 7.5 SCALE: 1:24000</p>	<p>SITE NAME: Frederick Brick Works ADDRESS: 184 East South Street Frederick, MD 21701 LAT/LONG: 39.4066 / 77.4022</p>	<p>CLIENT: Hydro-Terra, Inc. CONTACT: GARY PARKS INQUIRY#: 1898628.4 RESEARCH DATE: 04/10/2007</p>
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Historical Topographic Map



<div data-bbox="110 1774 142 1879" data-label="Image"> </div> <div data-bbox="170 1743 495 1921" data-label="Text"> <p>TARGET QUAD NAME: FREDERICK MAP YEAR: 1985 PHOTOREVISED FROM: 1953 SERIES: 7.5 SCALE: 1:24000</p> </div>	<div data-bbox="532 1732 917 1858" data-label="Text"> <p>SITE NAME: Frederick Brick Works ADDRESS: 184 East South Street Frederick, MD 21701 LAT/LONG: 39.4066 / 77.4022</p> </div>	<div data-bbox="985 1732 1323 1858" data-label="Text"> <p>CLIENT: Hydro-Terra, Inc. CONTACT: GARY PARKS INQUIRY#: 1898628.4 RESEARCH DATE: 04/10/2007</p> </div>
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Historical Topographic Map



<p>N ↑</p>	<p>TARGET QUAD NAME: FREDERICK MAP YEAR: 1993 REVISED FROM: 1953 SERIES: 7.5 SCALE: 1:24000</p>	<p>SITE NAME: Frederick Brick Works ADDRESS: 184 East South Street Frederick, MD 21701 LAT/LONG: 39.4066 / 77.4022</p>	<p>CLIENT: Hydro-Terra, Inc. CONTACT: GARY PARKS INQUIRY#: 1898628.4 RESEARCH DATE: 04/10/2007</p>
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APPENDIX G.

Bay Environmental Corporation Test Pit Logs & Chemical Analyses

Table 1. Test Pit Descriptions

Test Pit Number	TP Depth (Feet)	Description	Sample Number/ Depth/Material
TP-1	4.5	1.5 ft of fill material: bricks, composted trash; 3 ft of natural soils.	FBW-TP-1-1/4.5 ft/ soil (not analyzed)
TP-2	14	Main bottle dig area. Evidence of burned trash, ash, coal, bottles, clay pots, cans, brick. Visible layers of deposited fill materials. Depth to natural undisturbed soil varied from 11 to 13 ft over the length of the pit, averaged 10 ft.	FBW-TP-2-1/10.5 ft/ fill FBW-TP-2-2/12.5 ft/ trash and clayey soil interface
TP-3	1	1 ft of top soil to limestone bedrock	
TP-4	1	1 ft of top soil to limestone bedrock	
TP-5	2	1 ft of top soil to natural soils and limestone bedrock	
TP-6	2	1 ft of top soil to natural soils and limestone bedrock	
TP-7	2	1 ft of top soil to natural soils and limestone bedrock	
TP-8	4	Bottle Pit Location. Evidence of fill. 0.5 ft top soil; 0.5 ft burned layer; 1 ft earthy fill; 2 ft layer of mixed fill, scant bottles, evidence of burned materials	
TP-9	8	1 ft of top soil; 7 ft of layered fill materials to bedrock (at angle in pit). Brick, burned composted trash, ash, pottery shards, cementitious deposits	
TP-10	3	1 ft of top soil; 2 ft of apparently undisturbed soil. Evidence of quartz deposits	
TP-11	11	1 ft of top soil; 10 ft layer of fill: burned clinker, bottles, coal, bones, bats, ash, trash, dirt	
TP-12	5	.5 ft of top soil; 1 ft layer of fill-brick, burned fill materials, ash, metal rebar. Bedrock at angle starting at depth of 3 ft. Natural clayey soils at about 2.5 ft.	FBW-TP-12-1/3 ft/ soil (not analyzed)
TP-13	8	1 ft of mixed gravel and top soil; 5 ft layer of mixed fill: soil, roots, wooden stake; moist gray clayey sand with smooth gravel (creek material?); metal strap; reddish clayey soil at 6 ft below grade; perched water table at 6.25 ft below grade. No evidence of burned fill or trash.	FBW TP-13-1/6.25 ft/ soil water interface
TP-14	9	1 ft of mixed gravel and top soil; 4.5 ft layer of mixed fill: soil, concrete rubble, smooth rebar; 0.5 ft of fill layer: brick, wood debris, tree limbs, brush, soil; 3 ft of different soil layer, silty soil with traces clay; Terra cotta pipe at 8 ft below grade. No evidence of burned fill or trash; primarily construction debris	
TP-15	2	0.5 ft of mixed gravel and top soil to limestone bedrock	

Test Pit Number	TP Depth (Feet)	Description	Sample Number/Depth/Material
TP-16	3	0.5 ft of mixed gravel and top soil; 1 ft fill material: primarily soil with fine to medium gravel	
TP-17	5.5	3 in. of top soil; 0.5 ft of gray-ash fill material; 5 ft layer of fill material: composted trash, soil, bottles, newer screw top bottles, brick, ash, shoe leather, pottery shards, oyster shells, brick. Evidence of burning: burned bottles and ash	
TP-18	15	5 ft layer of dark fill materials: primarily soil with small pieces glass, brick, pottery plate, cup, wood; 2 ft layer of fill; 9 ft of various garbage layers: 7 ft below grade: Miller and Pepsi cans, Strohmman's plastic bread wrapper, motor oil paper label, clothing, plastic, evidence of burning, ash, metal straps, bottles, tar paper; 5 ft trash layers trash. 9 ft below grade: 1 ft ash layer with burned trash and brick; 10 ft below grade: brick, ash, bottles, burned bottles, cinder block, metal pieces, concrete, Mrs. Filbert's plastic butter tub, Coke cans, about 12 metal frames with heavy glass over label with Etchison & Son, dated 1964; date, person's name and age given in years, months and days (ash boxes from reported funeral home?) 11 ft below grade: styrofoam, large bricked construction debris; Nehi soda bottle, screw top bottles, clothing, tire 12 ft below grade: Pabst Blue Ribbon beer bottle, green plastic toy-watch strap, wood, Sunbeam bread wrapper, styrofoam cup, aluminum pull top from can, plastic, evidence of burned trash. 13 ft below grade: brick, ash, rubble, wood, bottles, cinder block, trash, four tires, vinyl chair cover, plastic garbage bags, metal strap. 13.5 ft below grade: soil, brick pieces, black top, (not as much garbage); natural soils apparent (reddish brown, fine to medium silty sand), Marvel bread wrapper	FBW-TP-18-1/15 ft/ fill and soil
TP-19	10	10 ft layered fill material: rock, brick. Fill and rubble at grade. 8 ft below grade: layer of dark silty soils, leaf matter. 10 ft below grade: resistance-apparent bedrock or large fill material. No evidence of burned fill or trash; primarily construction debris	
TP-20	7.5	1 ft of top soil, tree roots, rich humus; 6 ft layer of trash: ash burned material, metal, clam shell, plates, cork-top bottles, screw-top bottles, light bulbs. Apparent natural soil at 7 ft below grade	FBW-TP-20-1/7 ft/ soil

Test Pit Number	TP Depth (Feet)	Description	Sample Number/Depth/Material
TP-21	10.5	0.5 ft layer of top soil with red brick dust mixed in; 10 ft layer of fill: burned debris, screw top bottles, metal pieces, High's Dairy styrofoam cup, milk bottles, porcelain door knob, melted Pepsi bottle, brick debris. Bedrock at 10.5 ft below grade (bedrock ledge sloping west to east in test pit with west being closer to grade)	
TP-22	8.5	Adjacent to monitoring well FBW-2. 0.5 ft layer of top soil; 0.5 ft layer of gravelly fill; 0.5 ft layer of fill: ash, brick, soil; 6 ft layered fill: soil, brick, rock, rebar, dark soil layer, ash, pieces of brick, rocks, glass bottles, trash. No evidence of burned fill or trash; primarily construction debris	FBW-TP-22-1/8.5 ft/ fill
TP-23	8	Adjacent to abandoned monitoring well FBW-1. 0.5 ft layer of gravelly soil; 2 ft layer of fill: smooth stones, medium to coarse grained sandy soil; 5.5 ft layer of fill: limestone pieces, brick medium to coarse gravel, dark soil. No evidence of burned fill or trash; primarily construction debris	FBW-TP-23-1/8 ft/fill
TP-24	3	Apparent natural soils	
TP-25	9.5	Trash and evidence of burned trash at ground surface. 0.5 ft layer of top soil; 1 ft layer of light brown fine to medium silty sand; 0.5 layer of composted fill; 2 ft layer of soil and fill: brick, oyster shells, ash, milk bottle; 3.5 ft layer of fill: ash, bottles, brick-block, castoria bottle, burned trash, metal pieces; natural soils at 7.5 ft below grade.	FBW-TP-25-1/8 ft/ natural soil
TP-26	3.5	Edge of Bottle Pit Area. 1 in. layer of brick, fill and composted soils; 2.5 ft of apparently natural soils	
TP-27	3	1 in. layer of top soil, 2 ft of apparently natural soils	
TP-28	12	Base of Kline Fill Plateau. 2 ft layer of fill: large pieces of limestone, some brick; 3 ft layer of dark brown fill: soil and brick; 3 in. metal pipe at 3 ft below grade; 5 ft mixed fill layers of moist dark gray fine to medium silty sand with gravel, brick bits, charred wood bits, rounded stone, bricks, a metal strap, wood pieces. Fill material continued.	FBW-TP-28-1/10 ft/ fill
TP-29	3	Edge of Bottle Pit Area. 1 in. layer of top soil, 2 ft of apparently natural soils	
TP-30	5	Bottle Pit Area. 0.5 ft layer of top soil; 2 ft layer of fill: composted trash, ash, metal can top, bottles, brick, oyster shells; 2 ft layer of fill; 0.5 ft layer of dark reddish silty sand at 5 ft below grade. Bible found at surface dated 1966	

Table 2. Soil-Summary of Identified Chemical Compounds and Concentrations

Compound	RBC ¹	Hazard Rating ₂	Sample Number									
			2-1	2-2	13-1	18-1	20-1	22-1	23-1	25-1	28-1	AH-1
RCRA Metals (mg/kg)												
Arsenic	3.8	a, b*, c, d	5.5	ND	ND	2.4	0.7	9.0	1.1	ND	ND	ND
Barium	1.4x10 ⁵	b*, c	350	53	39	110	70	430	170	20	31	55
Chromium ³	3.1x10 ⁶	a*, b*, c, d	9.6	10	4.4	5.6	7.2	14	6.7	2.7	2.3	17
Lead	NR	b*, c, d	490	10	10	150	59	810	120	7	12	6.5
Mercury	NR	c	0.7	ND	ND	0.1	ND	0.5	ND	ND	ND	ND
Selenium	1 x10 ⁴	a*, c*, d	ND	ND	ND	ND	ND	0.5	ND	ND	ND	ND
Semi-Volatile Organic Compounds ⁴ (μg/kg)												
Acenaphthylene	1.2x10 ⁸	c, d	ND	ND	ND	ND	ND	63e	ND	ND	ND	ND
Anthracene	6.1x10 ⁸	c, d	ND	ND	46e	ND	ND	ND	ND	ND	120e	ND
Benzo(a)anthracene	7,800	a, c, d	91e	ND	98e	450e	ND	1400	150e	ND	310e	ND
Benzo(b)fluoranthene	7,800	a, c, d	130e	ND	160e	400e	ND	2300	110e	ND	310e	ND
Benzo(k)fluoranthene	78,000	a, c, d	170e	ND	150e	470e	ND	1800	ND	ND	380e	ND
Benzo(g,h,i)perylene	NR	c, d	ND	ND	ND	ND	ND	620	ND	ND	ND	ND
Benzo(a)pyrene	780	a, c, d	140e	ND	140e	520e	ND	2000	150e	ND	310e	ND
Chrysene	7.8x10 ⁵	c, d	130e	ND	130e	450e	ND	1600	160e	ND	290e	ND
Fluoranthene	8.2x10 ⁷	c, d	220e	ND	260e	810e	ND	1800	210e	ND	530e	ND
Fluorene	8.2x10 ⁷	c, d	ND	ND	ND	ND	ND	ND	ND	ND	41e	ND
Phenanthrene	NR	c, d	190e	ND	210e	750e	ND	260e	120e	ND	330e	ND
Pyrene	6.1x10 ⁷	c, d	190e	ND	260e	890e	ND	1900	350e	ND	480e	ND
Volatile Organic Compounds (μg/kg)												
Benzene	1 x10 ⁵	a, b, c, d	5	ND	2e	4e	ND	8	2e	2e	2e	1e
sec-Butylbenzene	8.2 x10 ⁷	NL	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethylbenzene	2 x10 ⁸	b, d	3e	ND	ND	1e	ND	5	ND	ND	ND	ND
Methylene chloride	7.6x10 ⁵	a, c, d	11b	ND	4eb	6b	2eb	7b	5b	4eb	7b	4eb

Compound	RBC ¹	Hazard Rating ₂	Sample Number									
			2-1	2-2	13-1	18-1	20-1	22-1	23-1	25-1	28-1	AH-1
Methyl-t-butyl ether	NL	NL	2e	ND	ND	ND	ND	2e	ND	ND	ND	ND
Tetrachloroethene	1.1x10 ⁵	a, c, d	2e	ND	ND	1e	ND	4e	1e	ND	ND	ND
Toluene	4.1x10 ⁸	a, c, d	22	1e	6	12	3e	39	7	6	6	5
1,2,4-Trimethylbenzene	1 x10 ⁸	None	ND	ND	ND	ND	ND	2e	ND	ND	ND	ND
Xylenes, total	4.1x10 ⁹	b, c	6e	ND	ND	1e	ND	12e	2e	ND	ND	ND

Notes:

1. RBC = EPA Risk Based Concentration. RBCs are listed for industrial soil. Except for RCRA metals, soils are reported in units of $\mu\text{g/kg}$.
2. Hazard Ratings: a - Carcinogen; b - Hazardous substance; c - Hazardous waste or hazardous-waste constituents; d - Priority toxic pollutant.
* Indicates rating applies to some but not all compounds associated with this chemical.
3. Risk-based concentration reported for Chromium III. The RBC for Chromium VI is 6,100 mg/kg.
4. Semi-volatile organic compounds can be formed in any hydrocarbon combustion process and may be released from oil spills. The major sources include refuse burning and coal refuse heaps.
5. Concentrations in **bold** are detected compounds. Concentrations in **highlighted** cells exceed allowable limits.
6. b - found in blank, suspected lab artifact; e - estimated value, less than reporting limit.
7. mg/kg (milligrams per kilogram) is equivalent to parts per million (ppm) and $\mu\text{g/kg}$ (micrograms per kilogram) is equivalent to parts per billion (ppb).
8. ND—not detected; NL—not listed; NR—not reported

Table 3. Ground Water –Summary of Identified Chemical Compounds and Concentrations

Table 3. Ground Water –Summary of Identified Chemical Compounds and Concentrations						
Compound	MCL ¹	Hazard Rating ²	Sample Number/Date			
			FBW-2 01/27/1999	FBW-3 01/27/1999	FBW-3 ³ 01/27/1999	FBW-3 03/2/1999
RCRA Metals (µg/L)						
Barium	2,000	b*, c	41	130	NA	130
Chromium (total)	100	a*, b*, c, d	ND	12	NA	ND
Semi-Volatile Organic Compounds (µg/L)						
2-Methylnapthalene	NL	NL	ND	ND	NA	3e
Volatile Organic Compounds (µg/L)						
Benzene	5	a, b, c, d	ND	ND	1e	1e
sec-Butylbenzene	NR	NL	ND	ND	2e	9
Isopropylbenzene	NR	NL	ND	ND	2e	6
p-Isopropyltoluene	NL	NL	ND	ND	1e	2e
Methylene chloride	5	a, c, d	ND	12eb	ND	ND
Methyl-t-butyl ether	30	NL	ND	90	97	67
n-Propylbenzene	NR	NL	ND	ND	ND	6
Tetrachloroethene	5	a, c, d	ND	ND	3e	ND

Notes:

1. The Maximum Contaminant Level is the maximum permissible level of a contaminant in water, which is delivered to any user of a public water system.

2. Hazard Ratings: a–carcinogen; b–hazardous substance; c–hazardous waste or hazardous-waste constituents; d–priority toxic pollutant.

*Indicates the rating applies to some but not all compounds associated with this compound.

3. The sample was analyzed February 18, 1999.

4. Concentrations in **bold** are detected compounds. Concentrations in **highlighted** cells exceed allowable limits.

5. *b* - found in blank, suspected lab artifact; *e* - estimated value, less than reporting limit.

6. µg/L (micrograms per liter) is equivalent to parts per billion (ppb).

7. ND–not detected; NL–not listed; NR–not reported

APPENDIX H.

KCI Technologies Chemical Analyses

Table 2
Subsurface Soil Sample Analysis Results

Table 2 Subsurface Soil Sample Analysis Results									
	Residential RBCs ¹	Industrial RBCs ²	Maryland SPG ³	Residential		Non-Residential		TCLP Leachate Max ⁶	
				CSS ⁴	CSS ⁵	DB-1	DB-2	DB-3	DB-4
Sample Number									
Sample Depth (feet)									
Sample Collection Date									
Sample Collection Time									
TPH (418.1)	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Units	-	-	-	230.0	620.0	240.0	230	570.0	120
Total Petroleum Hydrocarbons									
Polynuclear Aromatic Hydrocarbons (8270C)									
Pyrene	ppm	ppm	ppm	ppm	ppm	ppb	ppb	ppb	ppb
Units	2300	61000	99	230.0	620.0	ND	0.44	ND	ND
TCLP Metals (1311/6010B)									
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Arsenic	-	-	-	-	-	ND	ND	ND	ND
Barium	-	-	-	-	-	ND	ND	ND	ND
Cadmium	-	-	-	-	-	ND	ND	ND	ND
Chromium	-	-	-	-	-	ND	ND	ND	ND
Lead	-	-	-	-	-	ND	ND	ND	ND
Selenium	-	-	-	-	-	ND	ND	ND	ND
Silver	-	-	-	-	-	ND	ND	ND	ND
TCLP Mercury (1311/7471A)									
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Mercury	-	-	-	-	-	ND	ND	ND	ND
Total Metals (6010B)									
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Arsenic	0.4	3.8	-	23.0	6.2	15.0	14	4.0	16.0
Barium	5500.0	140000.0	-	550.0	1500.0	450	370	94	470
Cadmium ⁸	39.0	1000.0	-	7.8	21.0	0.46	2.1	0.21	0.65
Chromium ⁹	230.0	6100.0	-	23.0	62.0	14	18	18	18
Lead	-	-	-	400.0	400.0	1800.0	1710	99	750
Selenium	390.0	10000.0	-	39.0	100.0	1.9	1.1	ND	1.6
Silver	390.0	10000.0	-	39.0	100.0	0.32	2.1	0.15	0.45
Total Mercury (7471A)									
Units	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm	ppm
Mercury	23.00	610.00	0.0056	0.1	0.12	6.3	0.28	0.56	0.49

Shading indicates contaminant levels above RBCs and/or SSLs

A "-" indicates no information is available.

A - Indicates non-detect

ND = Not-Detect
NA = Not Analyzed

(1) = Risk-Based Concentrations for Residential (EPA Region III dated 10/7/99)

(2) = Risk-Based Concentrations for Industrial (EPA Region III dated 10/7/99)

(3) = Maryland Standard for the Protection of Groundwater (Interim Final Guidance dated December 2000).

(4) = State of Maryland Department of the Environment Cleanup Standards for Residential Soil, (Interim Final Guidance dated December 2000)

(5) = State of Maryland Department of the Environment Cleanup State

(6) = Toxicity Characteristic Leaching Procedure Regulatory Limits

(7) = MDE Guideline for TPH, is based on gasoline Range Organics(GRO), and Deisel Range Organics (DRO)

(8) = RBCs and CSS Based on Cadmium in Water

(9) = RBCs and CSS Based on Chromium III

(10) = RBCs and CSS based on Mercuric Chloride

(11) = DB-6 is a duplicate of DB-3

Sample Method: <i>Spoon & Jar</i>	Composite Sample Data						
Depth Sampled:	Sample	Time	Color / Description				
Sample Date & Time: <i>5/14/01</i>	<i>0-2</i>	<i>10:00</i>					
Sampled By:	<i>4-6</i>	<i>10:05</i>					
	<i>6-8</i>	<i>10:08</i>					
	<i>8-10</i>	<i>10:12</i>					
Signatures:	<i>10-12</i>	<i>10:18</i>					
Type of Sample							
<input type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input type="checkbox"/> Grab <input checked="" type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite	Sample Data <table border="1"> <tr> <td>Color</td> <td>Description: (Sand, Clay, Dry, Moist, Wet, etc.)</td> </tr> <tr> <td><i>Brown</i></td> <td><i>Moist medium to</i></td> </tr> </table>			Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	<i>Brown</i>	<i>Moist medium to</i>
Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)						
<i>Brown</i>	<i>Moist medium to</i>						
Analysis:	Description of Sample Location 						
		Organic	Inorganic				
	Date Shipped						
	Time Shipped						
	Lab						
	Volume						



SAMPLE LOG SHEET

- ☐ Surface Soil
- ☒ Subsurface Soil
- ☐ Sediment
- ☐ Lagoon / Pond
- ☐ Other _____

Page 1 of 1

By TEM

Project Site Name EAST STREET EXTENDED

Project Site Number 0197114-I

Source Location BORING DB-2

Sample Method: <u>5' aug + jar</u> Depth Sampled: <u>0.0' to 12.0'</u> Sample Date & Time: <u>5/11/01 0930</u> Sampled By: <u>TEM</u> Signatures: <u>[Signature]</u> Type of Sample <input type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input type="checkbox"/> Grab <input checked="" type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite Analysis: <u>PAHs (8771)</u> <u>PCRA & Metals (6010 + 7471)</u> <u>TPH (418.1)</u> <u>TCuP Metals (1311)</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="3">Composite Sample Data</th> </tr> <tr> <th style="width: 33%;">Sample</th> <th style="width: 17%;">Time</th> <th style="width: 50%;">Color / Description</th> </tr> <tr> <td>0.0' - 2.0'</td> <td>0900</td> <td>Damp to moist very stiff L</td> </tr> <tr> <td>2.0' - 4.0'</td> <td>0905</td> <td>med. stiff brown SILT +</td> </tr> <tr> <td>4.0' - 6.0'</td> <td>0910</td> <td>ashes, trace wood + coal</td> </tr> <tr> <td>6.0' - 8.0'</td> <td>0915</td> <td> </td> </tr> <tr> <td>8.0' - 10.0'</td> <td>0920</td> <td> </td> </tr> <tr> <td>10.0' - 12.0'</td> <td>0925</td> <td>↓</td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Sample Data</th> </tr> <tr> <td style="width: 20%;">Color</td> <td>Description: (Sand, Clay, Dry, Moist, Wet, etc.)</td> </tr> <tr> <td>Brown</td> <td>Damp to moist very stiff to med. stiff SILT w/ ashes</td> </tr> </table> <div style="border: 1px solid black; padding: 10px; min-height: 150px;"> Description of Sample Location <p style="text-align: center;">gravel road</p> <p style="text-align: center;">~11.0'</p> <p style="text-align: center;">DB-2</p> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th> <th style="width: 33%;">Organic</th> <th style="width: 33%;">Inorganic</th> </tr> <tr> <td>Date Shipped</td> <td></td> <td></td> </tr> <tr> <td>Time Shipped</td> <td></td> <td></td> </tr> <tr> <td>Lab</td> <td></td> <td></td> </tr> <tr> <td>Volume</td> <td></td> <td></td> </tr> </table>	Composite Sample Data			Sample	Time	Color / Description	0.0' - 2.0'	0900	Damp to moist very stiff L	2.0' - 4.0'	0905	med. stiff brown SILT +	4.0' - 6.0'	0910	ashes, trace wood + coal	6.0' - 8.0'	0915		8.0' - 10.0'	0920		10.0' - 12.0'	0925	↓	Sample Data		Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	Brown	Damp to moist very stiff to med. stiff SILT w/ ashes		Organic	Inorganic	Date Shipped			Time Shipped			Lab			Volume		
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SAMPLE LOG SHEET

- ☐ Surface Soil
- ☒ Subsurface Soil
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Page 1 of 1

By TEU

Project Site Name EAST STREET EXTENDED

Project Site Number 0197114-I

Source Location BORING DB-3

<p>Sample Method: <u>5' boom + auger</u></p> <p>Depth Sampled: <u>4.0' - 11.0'</u></p> <p>Sample Date & Time: <u>5/10/01 0940</u></p> <p>Sampled By: <u>TEU</u></p> <p>Signatures: <u>[Signature]</u></p> <p>Type of Sample</p> <p> <input type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input type="checkbox"/> Grab <input checked="" type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite </p> <p>Analysis:</p> <p><u>PAHs (8270)</u></p> <p><u>PCA & Metals (6010 + 2471)</u></p> <p><u>TPH (418.1)</u></p> <p><u>TCIP Metals (1311)</u></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="3">Composite Sample Data</th> </tr> <tr> <th style="width: 30%;">Sample</th> <th style="width: 20%;">Time</th> <th style="width: 50%;">Color / Description</th> </tr> <tr> <td><u>4.0' - 6.0'</u></td> <td><u>0905</u></td> <td><u>Moist, med. stiff to stiff</u></td> </tr> <tr> <td><u>6.0' - 8.0'</u></td> <td><u>0910</u></td> <td><u>brown SILT w/ ashes</u></td> </tr> <tr> <td><u>8.0' - 10.0'</u></td> <td><u>0920</u></td> <td><u>glass fragments rock</u></td> </tr> <tr> <td><u>10.0' - 11.0'</u></td> <td><u>0930</u></td> <td><u>fragments</u></td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Sample Data</th> </tr> <tr> <th style="width: 20%;">Color</th> <th style="width: 80%;">Description: (Sand, Clay, Dry, Moist, Wet, etc.)</th> </tr> <tr> <td><u>Brown</u></td> <td><u>Moist, med. to stiff, brown SILT w/ ash fragments</u></td> </tr> </table> <p>Description of Sample Location</p> <div style="text-align: center;"> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th> <th style="width: 30%;">Organic</th> <th style="width: 70%;">Inorganic</th> </tr> <tr> <td>Date Shipped</td> <td></td> <td></td> </tr> <tr> <td>Time Shipped</td> <td></td> <td></td> </tr> <tr> <td>Lab</td> <td></td> <td></td> </tr> <tr> <td>Volume</td> <td></td> <td></td> </tr> </table>	Composite Sample Data			Sample	Time	Color / Description	<u>4.0' - 6.0'</u>	<u>0905</u>	<u>Moist, med. stiff to stiff</u>	<u>6.0' - 8.0'</u>	<u>0910</u>	<u>brown SILT w/ ashes</u>	<u>8.0' - 10.0'</u>	<u>0920</u>	<u>glass fragments rock</u>	<u>10.0' - 11.0'</u>	<u>0930</u>	<u>fragments</u>	Sample Data		Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	<u>Brown</u>	<u>Moist, med. to stiff, brown SILT w/ ash fragments</u>		Organic	Inorganic	Date Shipped			Time Shipped			Lab			Volume		
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Duplicate Sample taken
of DB-3 ;
DB-6



SAMPLE LOG SHEET

Page 1 of 1

- ☐ Surface Soil
- ☒ Subsurface Soil
- ☐ Sediment
- ☐ Lagoon / Pond
- ☐ Other _____

By TEM

Project Site Name EAST STREET EXTENDED

Project Site Number 0197114-I

Source Location BORING DB-4

<p>Sample Method: <u>spoon + jar</u></p> <p>Depth Sampled: <u>0' - 10.5'</u></p> <p>Sample Date & Time: <u>5/9/01 10:15 am</u></p> <p>Sampled By: <u>TEM</u></p> <p>Signatures: <u>[Signature]</u></p> <p>Type of Sample</p> <ul style="list-style-type: none"> <input type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input type="checkbox"/> Grab <input checked="" type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite <p>Analysis:</p> <p><u>PAHs (8270)</u></p> <p><u>RCRA 8 Metals (6010 + 7471)</u></p> <p><u>TPH (418.1)</u></p> <p><u>TCLP Metals (1311)</u></p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="3">Composite Sample Data</th> </tr> <tr> <th>Sample</th> <th>Time</th> <th>Color / Description</th> </tr> <tr> <td><u>0.0' - 1.5'</u></td> <td><u>0940</u></td> <td><u>Top soil</u></td> </tr> <tr> <td><u>1.5' - 2.0'</u></td> <td><u>0945</u></td> <td><u>Moist soft brown SILT and</u></td> </tr> <tr> <td><u>2.0' - 4.0'</u></td> <td><u>0950</u></td> <td><u>ash, brick fragments, rock</u></td> </tr> <tr> <td><u>4.0' - 6.0'</u></td> <td><u>0955</u></td> <td><u>fragments</u></td> </tr> <tr> <td><u>6.0' - 8.0'</u></td> <td><u>1000</u></td> <td></td> </tr> <tr> <td><u>8.0' - 10.0'</u></td> <td><u>1005</u></td> <td></td> </tr> <tr> <td><u>10.0' - 10.5'</u></td> <td><u>1010</u></td> <td></td> </tr> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th colspan="2">Sample Data</th> </tr> <tr> <th>Color</th> <th>Description: (Sand, Clay, Dry, Moist, Wet, etc.)</th> </tr> <tr> <td><u>Brown</u></td> <td><u>Moist, soft, brown SILT and ash, brick fragments</u></td> </tr> </table> <p>Description of Sample Location</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th></th> <th>Organic</th> <th>Inorganic</th> </tr> <tr> <td>Date Shipped</td> <td></td> <td></td> </tr> <tr> <td>Time Shipped</td> <td></td> <td></td> </tr> <tr> <td>Lab</td> <td></td> <td></td> </tr> <tr> <td>Volume</td> <td></td> <td></td> </tr> </table>	Composite Sample Data			Sample	Time	Color / Description	<u>0.0' - 1.5'</u>	<u>0940</u>	<u>Top soil</u>	<u>1.5' - 2.0'</u>	<u>0945</u>	<u>Moist soft brown SILT and</u>	<u>2.0' - 4.0'</u>	<u>0950</u>	<u>ash, brick fragments, rock</u>	<u>4.0' - 6.0'</u>	<u>0955</u>	<u>fragments</u>	<u>6.0' - 8.0'</u>	<u>1000</u>		<u>8.0' - 10.0'</u>	<u>1005</u>		<u>10.0' - 10.5'</u>	<u>1010</u>		Sample Data		Color	Description: (Sand, Clay, Dry, Moist, Wet, etc.)	<u>Brown</u>	<u>Moist, soft, brown SILT and ash, brick fragments</u>		Organic	Inorganic	Date Shipped			Time Shipped			Lab			Volume		
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Lab																																																	
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Source Location _____						
Sample Method: <i>Spoon + Jar</i> Depth Sampled: <i>18' - 20'</i> Sample Date & Time: <i>5/3/01</i> Sampled By: <i>[Signature]</i> Signatures:		Composite Sample Data				
		Sample	Time	Color / Description		
Type of Sample	Description of Sample Location					
<input checked="" type="checkbox"/> Low Concentration <input type="checkbox"/> High Concentration <input checked="" type="checkbox"/> Grab <input type="checkbox"/> Composite <input type="checkbox"/> Grab - Composite						
Sample Data						
Color						Description: (Sand, Clay, Dry, Moist, Wet, etc.)
Analysis:						
	Date Shipped	Organic	Inorganic			
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	Lab					
	Volume					

APPENDIX I.

Descriptions of Areas on Figure 2

DRAWING NOTES

Attached is a drawing titled "Environmental/Geotechnical Description of Frederick Brick Works, Inc. Property" which shows Frederick Brick's property divided into areas exhibiting varying environmental and geotechnical features. The features observed in each of the areas are described below. Also presented is a discussion of remedial and construction measures that may be needed in rendering the areas suitable for mixed commercial/residential development. These findings are based on the results of subsurface investigations, analysis of the chemical and engineering properties of fill soil, and air-photo interpretation. Subsurface investigations completed to date include the excavation of 60 test pits and the completion of 28 hollow-stem auger borings and 24 air-track borings by Hillis-Carnes Engineering Associates of Frederick, Bay Environmental, and KCI. Testing work consists of the chemical analysis of 13 soil/fill samples collected by Bay Environmental and KCI and engineering characterization of fill materials by Hillis-Carnes. The drawing and this associated presentation of findings were prepared by Hydro-Terra with assistance from Hillis-Carnes in describing geotechnical features and construction practices.

AREA A-1 (Approx. 31.3 Acres, No Fill Except Along Railroad Right-of-Way)

Environmental Features: The area is agricultural and has not been disturbed by clay mining or waste disposal. No soil contamination of consequence is anticipated.

Geotechnical Features: A closed depression containing trash exists on adjoining property southwest of the area, and the depression intrudes onto Frederick Brick's property. Sinkholes appear to be present on adjoining property southeast of the area.

Remedial/Construction Measures: Environmental conditions should not warrant remedial action. Should sinkhole potential become a concern, use of deep foundations or mat foundations under buildings and placement of geofabric under roadways and critical fills might be required.

AREA A-2 (Approx. 1.3 Acres, No Fill)

Environmental Features: The area consists of a depression which probably is a remnant of a drainageway that once ran along the west side of the property. No waste of any consequence was found in the depression. Environmental conditions are unlikely to impede development of this area.

Geotechnical Features: No evidence of past or current sinkholes was observed.

Remedial/Construction Measures: It is unlikely that measures will need to be taken to remedy environmental conditions. Development would probably necessitate placement of an engineered fill. In lieu of the placement of a clean-soil fill, the depression could be

filled with waste materials removed from other areas of the property during grading that have suitable engineering properties. Per the presumptive remedial actions adopted by MDE under their Voluntary Cleanup Program (VCP), a one-story, lightly-loaded commercial building could be placed directly over the compacted waste even though the chemical quality of the waste exceeded cleanup standards. A multi-story building may require a deep foundation. Alternatively, use of the area as a paved parking lot or open space would, under the VCP, require capping contaminated waste with two and three feet of clean soil, respectively. The presence of this depression will probably facilitate development of the rest of the property.

AREA A-3 (Approx. 12.9 Acres, Est. Fill Depths: 0 to 10.5 Feet)

Environmental Features: Auger borings show soil fill over the area, containing, in some locations, rejected bricks. Environmental conditions significantly impeding development are not apparent. On the retail portion of the area, leaking underground storage tanks containing petroleum products were removed. In these limited areas, some petroleum-contaminated soil might be encountered during earthwork.

Geotechnical Features: No evidence of past or present sinkholes was observed. Bedrock is shallow in some locations and would impede excavation, should excavation be planned at these locations.

Remedial/Construction Measures: Minor amounts of petroleum-contaminated soil may have to be removed. Foundation conditions should not significantly impede development.

AREA A-4 (Approx. 3.3 Acres, Little or No Fill)

Environmental Features: Little or no fill of environmental significance is anticipated.

Geotechnical Features: No past or present sinkholes were observed. Elevated bedrock in areas could impede excavation, if excavations were planned.

Remedial/Construction Measures: Environmental conditions should not necessitate remedial action. Foundation conditions should not significantly impede development.

AREA B-1 (Approx. 10.0 Acres, Est. Fill Depth: 0 to 34 Feet)

Environmental Features: No municipal or brick-manufacturing wastes were observed in fill within this area, but limited amounts of very old waste could be present along the northern edge of the Kline fill at a depth not likely, in its present state, to result in significant human exposure during development. The Kline fill contains mostly soil from offsite construction sites. The soil contains some construction and land-clearing debris

consisting of mostly concrete, asphalt, and stone. Lesser amounts of wood and topsoil are scattered within the fill, material that might result in pockets of elevated methane concentration. However, the poorly-permeable clayey cover soil and the apparent lack of concentrated pockets of wood suggest that methane may not be a significant problem over much of the fill. Presence of inorganic and organic contaminants in the fill soil at concentrations of concern is unlikely.

Geotechnical Features: No past or current sinkholes were observed. The Kline fill was not constructed as an engineered fill, and, consequently, excessive ground settlement might occur under buildings constructed on the fill in its present state.

Remedial/Construction Measures: In dealing with environmental and geotechnical concerns, two options are apparent:

1. Should methane concentrations be relatively low, construct buildings on deep foundations, develop area for commercial use only, restrict use of basements, and install a relatively inexpensive vapor control system under the buildings similar to the type used to control radon gas.
2. Should methane concentration be relatively high over much of the fill, remove the fill and separate the methane-producing organic materials and the solid wastes that impede soil compaction. Use the remaining soil as clean-soil for capping waste material, treating other environmental or geotechnical conditions on the property, or constructing structural fills. Reconstruct the fill with waste materials from other areas having suitable engineering properties, including ash after being mixed with soil to make it a suitable material for constructing an engineered fill. If sinkhole development is a concern, install geofabric under the fill.

A considerable amount of clean soil could be obtained from the Kline fill area, and a significant amount of waste materials could be used in reconstructing the fill in a manner allowing commercial and residential development. Availability of the Kline fill as a source of borrow material for use in constructing engineered fills, capping wastes, and amending ash-laden waste in Area B-1 should facilitate development of the property. It could be the preferred option even if methane is not found to be a concern. Access to a portion of the low ground south of the Kline fill for disposal of excavated wastes should also facilitate development of the property.

AREA B-2 (Approx. 4.2 Acres, Est. Fill Depth: 0 to 10 Feet))

Environmental Features: The fill consists mostly of soil and demolition debris from construction sites. Some wood was observed in the fill which could be generating methane. It is unlikely that organic and inorganic contaminants of concern will be encountered at levels above their risk-based concentrations (RBCs).

Geotechnical Features: No past or current sinkholes were observed. Since the fill was not constructed as an engineered fill, excessive ground settlement could occur under structures built in this area.

Remedial/Construction Measures: Excavate any methane “hot spots” and backfill with clean soil and/or stable rubble. Excavate fill from beneath all building sites and backfill with suitably compacted clean soil having a permeability less than the surrounding fill. Restrict use of basements and require installation of a vapor-control system under the floor slabs and, should some organic material remain under open spaces, around the perimeters of the buildings. Remove the methane-producing material from excavated fill material, and dispose of the remaining soil and waste in Areas B-1 and A-2 as previously discussed. Alternatively, bury the remaining material under open spaces and/or roadways in the manner permitted by MDE.

AREA B-3 (Approx. 1.3 Acres, Est. Fill Depth: 0 to 9 Feet)

Environmental Features: Fill consists mostly of demolition debris and reject brick. Less soil is present than in Area B-2, and more wood waste was observed. Some coal ash is present in places. Methane concentration is likely to be the environmental concern rather than the presence of organic and inorganic contaminants above their RBCs.

Geotechnical Features: Same as B-2.

Remedial/Construction Measures: Same as B-2.

AREA C (Approx. 12.9 Acres, Est. Fill Depth: 0 to 16.5+ Feet)

Environmental Features: This area contains the oldest buried waste on the property. The fill consists primarily of a mixture of soil, coal ash, municipal solid waste composed mostly of composted organic materials and glass, and rejected brick. Considering the age and makeup of the fill, methane generation is probably not a problem. Screening-level sampling of fill material by Frederick Brick and the State Highway Administration has shown elevated levels (above RBCs) of lead, arsenic, mercury, and polynuclear aromatic hydrocarbon at some locations within this area. The likely source of the elevated chemical concentrations is probably the mix of coal ash and degraded municipal waste.

Geotechnical Features: No evidence of past or present sinkholes was observed in this area, although a sinkhole may be present on adjoining property to the west of the area. The pits scattered over the area appear to be dug by bottle collectors. Testing of ash samples showed dry unit weights below 100 pcf and elevated organic content which would require excavation and blending with clean soils to render the material acceptable for use in structural fills.

Remedial/Construction Measures: The presence of chemicals in some samples at concentrations above regulatory standards does not indicate the need for presumptive remedial actions as defined by MDE in their VCP, or that there are adverse human-health risks associated with exposure to the fill material, only that they are chemicals of potential concern. Should a more extensive sampling program be undertaken, pursuant to a more rigorous human-health risk evaluation, the calculated 95% upper-concentration-limits (95% UCLs) for these chemicals may be below levels requiring presumptive remedial action. Even if the 95% UCLs for one or more chemicals were found above the VCP cleanup standard, a quantitative human-health risk assessment could find the risks are within the acceptable ranges established by the U.S. Environmental Protection Agency and MDE.

The presence of low-density ash with elevated organic content within the fill material will negate dynamic compaction as a means of stabilizing the fill prior to construction. Since the area will probably be developed principally for commercial use and methane is expected not to be a problem, use of deep foundations will probably be the most cost-effective foundation-construction practice. Even if it is found that a chemical in the fill exceeds the regulatory standard, the floor slab of a building can be placed directly on the fill material, thus eliminating the need to remove and dispose of the material. However, should the 95% UCL concentration of one or more chemicals exceed regulatory standards, it would be necessary, unless a risk assessment indicates otherwise, to remove some fill material from open spaces and under roadways and to cap the remaining fill with clean soil. An alternative to deep foundations would be to excavate the ash-laden fill from beneath building locations, mix clean soil with the ash, and place the mixed material in the excavations as engineered fills. This should allow for use of strip foundations rather than deep foundations. Excess material, whether generated from foundation and utility construction or from grading, could, with some soil amendment, be disposed of under clean fill in Areas B-1 and A-2.

AREA D (Approx. 2.8 Acres, Est. Fill Depth: 0 to 15+ Feet)

Environmental Features: The area is underlain by a mixture of municipal solid waste, construction and demolition debris, coal ash, and soil. Wood and other organic material capable of generating methane are present. The fill was probably placed in the late 1960s and early 1970s. The age and composition of the fill material indicated that methane could be present in the fill at elevated concentrations. The presence of organic and inorganic contaminants at levels above regulatory standards is probably less likely than in Area C.

Geotechnical Features: No evidence of past or present sinkholes was observed. Since the fill was not placed as an engineered fill and due to the presence of organic material, construction of buildings on the fill is probably not feasible.

Remedial/Construction Measures: Methane concentration will probably necessitate excavation of the site to remove the methane-generating waste under and around building

01/25/02

sites, backfilling with compacted low-permeability soils, and installation of a vapor-control system under and/or around the buildings. Use of basements would need to be restricted. Use of the area or portions of it for open space would only require capping with clean soil. Construction of parking garages would probably be permitted, but deep foundations would likely be required.

APPENDIX J.

Hydro-Terra, Inc. Test Pit Logs

DRAFT**System 6\Projects\01020 Fred Brick\Test Pit Logs**

Test Pit Identification	Total Depth (Feet)	Description of Materials Encountered
TP-31	9.5 Refusal, Fill Material	Sparse vegetation on surface; Red & brown clay, silt, sand, cobbles, concrete and asphalt; black plastic bag at 4 ft.; broken brick at 7 ft.; refusal at 9.5 ft.; red clayey chunks at bottom (probably still in fill material); No municipal waste observed. Rubble outcrops downslope just above drainage to south. No odor. 0.0 ppm with PID ¹ .
TP-32	5.0 Refusal, Native Soil at Base	0-8" Surface debris (bottles and trash); dark gray sandy Silt with plant roots; 8"-5' light brown clayey Silt, trace sand, flat thinly bedded limestone chunks throughout; few animal bones. No odor. 0.0 ppm.
TP-33	12.5 Extent of back hoe reach, Native Soil 5-12.5 ft.?	0-8" Gray organic silt with plant roots; 8"-5' Medium tan silty Sand with scattered older bottles, few bones; 5'-12.5' Tan/orange silty Clay with small platy limestone sheets. No odor. 0.0 ppm.
TP-34	8.5 Refusal, Native Soil near Base	0-2.5' Brown silty Sand, boulders, small logs; 2.5'-5.0' slight treated lumber odor; silty Sand with some stone; 5.0'-8.5' Brown silty Sand, little mixed clay; 7.5-8.5 ft. plates of thinly bedded gray limestone. 0.0 ppm.
TP-35	4.5 Refusal, Kline Fill Area	0-2 ft. Brown silty Sand, rock cobble to boulder size, shopping cart at 2 ft.; 2-4.5 ft. Same with gray limestone mixed in. Gray platy limestone at base, couldn't determine if native or fill. 0.0 ppm.
TP-36	8.0 Refusal, Kline Fill Area	Brown, orange, gray, silty Sand, little clay, small to cobble size rocks (some gray limestone), 20% stone rest soil matrix with little clay content, cloth rag and small wood log at 2 ft. 0.0 ppm.
TP-37	11.5 Native?	0-10" Brown organic sandy Silt; 10"-4' brown sandy Silt to silty Sand, some bottles (old); 4 to 11.5 ft. orange silty fine Sand, trace clay, layer of platy gray limestone at 7 ft.; No waste material after 5.5 ft. Orange silty Clay at 11.5 ft. 0.0 ppm.
TP-38	9.0 Refusal, Native at Base?	0-1.5 ft. Reddish brown sandy Silt, some gravel; 1.5-2.5 ft. Some burned wood & ash - chemical odor; 2.5-9.0 ft. brown silty Sand, little to no waste material, live roots to 7 ft.; limestone layer at 9.0 ft. Shallow limestone outcrop approx. 75 ft NNE. 0.0 ppm.
TP-39	8.5 Refusal, Undisturbed from 3.5-8.5 ft.	0-3.5 ft. Brown and light gray silty Sand (ash?), jars/bottles, few animal bones and red brick; 80% ash and soil; 3.5-8.5 ft. Red and tan silty Clay (native), chunks of thin bedded limestone at 4-4.5 ft., Thin bedded limestone at 8.5 ft. 0.0 ppm. No odor.

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Test Pit Identification	Total Depth (Feet)	Description of Materials Encountered
TP-40	8.0 Refusal	0-5.0 ft. Brown to light brown silty Sand, very loose (ash), bottles & jars mixed in upper 5 ft. very little metal, 5'-8' tan on weathered gray on fresh surface thin bedded limestone (native). 0.0 ppm, No odor.
TP-41	8.0 Refusal	0-6.0 ft. Brown silty Sand (ash?), mixed bottles, live tree roots to 5.5 ft., minor metal tubing; 6-8 ft. tan silty Clay (native). (Logged pit after digging). 0.0 ppm. No odor.
TP-42	8.0 Refusal	0-3.0 ft. Brown & light brown silty Sand, few bottles, minor metal and red brick, 85% ash/soil, very loose; 3-8.0 ft. tan to light orange clayey Silt (natural), thin bedded limestone at base. (Near base of landfilled area). (Logged pit after digging). 0.0 ppm. No odor.
TP-43	11.5 Extent of Reach, Depression	Brown to light orange silty Clay, layer of thinly bedded and one massive piece of limestone at 4.5 ft.; moist, light red/orange silty Clay to 11.5 ft. (native); no landfill material observed, no odor, 0.0 ppm.
TP-44	4.5 Refusal	0-1.5 ft. Brown, sandy Silt (fill); 1.5-4.5 light orange, clayey Silt, large chunks of massive limestone (not natural deposit, dumped); No trash, no odor, 0.0 ppm.
TP-45	10.5 Refusal	0-9.0 ft. Brown and gray lumpy silty size ASH?, very loose, 18 in. layer of orange clayey soil from 1.5-3.0 ft.; Ash to 9.0 ft.; 9.0-10.5 red Clay with thinly bedded limestone layers near bottom of pit; Some bottles and minor landfill material to 9.0 ft., 90% of material is ash; No odor, 0.0 ppm.
TP-46	7.5 Refusal	0-6.0 Household trash (bottles, glass, clay tile, brick, mattress spring, metal straps, little plastic bottles, etc.), Ash seam at approx. 2.0 ft.; 6.0-7.5 tan, dry, Silt (may be natural); 80% material soil and/or ash; No odor, 0.0 ppm.
TP-47A&B	1.0 & 3.5 Refusal	Attempted two test pits approx. 10 ft. apart because of shallow refusal on TP-47A. 0-8 in. dark gray organic woodland soil, hit platy limestone and refusal at 1.0 ft.; Moved 10 feet, hit refusal at 3.5 ft. (limestone layer), No garbage observed; No odors, 0.0 ppm.

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Test Pit Identification	Total Depth (Feet)	Description of Materials Encountered
TP-48 ²	11.0 Extent of Reach, in Depression	Outcrops of Limestone either side of depression, 0-11.0 Tan silt with plates of thin bedded weathered tan limestone, dry, darker orange material in last foot (10-11 ft.), lumps of clay also present, 11.0 bottom of pit, didn't encounter well cemented bed during excavation, may be sinkhole, No garbage encountered in test pit; Surface trash near pit and probably landfilled trash around perimeter of pit. No odor.
TP-49	13.0 Extent of Reach	0-8" Dark organic Silt, 8"-5.0' tan Ash with glass bottles, bricks, little metal (ash is dry and very fine and loose, blows in wind easily); 5-13.0 ft. Mostly red bricks (broken or halves) mixed with ash matrix and little re crushed brick powder; pit was caving from 5.0 ft. making observations at bottom difficult. No odor.
TP-50	13.0 Extent of Reach	0-6" Thin layer of organic woodland soil; 6"-13' Gray and tan Ash (silty grained), dry and powdery, few bottles, very minor metal, live plant roots to 7 ft., Red/orange soil at very bottom of pit (may be native material), caving badly at 13.0 ft. No odors.
TP-51	12.5 Refusal	0-12.5 ft. Brown, very moist, loose Silt and Ash (Approx. 30% ash), brick, glass, pottery, compressed paper slabs (partially burned?). No odors.
TP-52	5.0 Refusal	Brown, moist, loose, Silt & ash, broken bricks, pottery shards, very little glass, no wood, no metal; 5.0 ft. refusal (massive limestone boulder). No odors.
TP-53	2.5 Refusal	Brown and tan/yellow silt, gray tin bedded limestone pieces throughout, minor charcoal at 1.5-2.0 ft., single layer of brick at 1.0 ft. No odor.
TP-54	3.2 Refusal	0-1.5 ft. Tan & brown Silt, little clay, with small chunk of gray platey limestone; 1.5-3.2 ft. mostly red Brick, little wood, few 4"-5" diam. asphalt pieces; 3.2 ft Refusal (Brick waste rubble at bottom), No garbage observed. No odor.
TP-55	4.5 Refusal	0-3.5 ft. Light brown & red, Silt, some platey limestone chunks to 8" diam., trace clay, one piece of small steel plate; rare broken brick pieces; 3.5-4.5 Tan Silt, gray limestone at 4.5 ft. (Refusal). No odor.
TP-56	1.5 ft. Refusal, Excavated through water	Excavated through standing water in shallow trench along old railroad service line. 0-1.5 ft. Tan Clay, gray limestone pieces, broken red brick, No odor. Couldn't see base because of water.

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Test Pit Identification	Total Depth (Feet)	Description of Materials Encountered
TP-57	1.5 Refusal	0-1.5 ft. Tan fine mortar sand, to gray limestone, little red clay chunks, water entering pit from surrounding pool. Couldn't see base of hole because of water. No odor. Located immediately west of unloading trestle at Frederick Brick Works facility.

1 PID is photoionization detector that is capable of measuring total volatile organic compound (VOCs) concentrations within a determinable range of compounds.

2 Test pits TP-48 through TP-57 were not checked with PID for VOCs. PID not available on that date.

Appendix K.

Kline Fill Test Pit Logs and Chemical Analysis Report

tapering to shallower depths towards the tree-lines to the east and west. The fill consisted mostly of a sandy silt soil matrix with considerable construction fill and rubble including, but not limited to, concrete, brick, rebar, ash, shot-rock, and crushed aggregate (i.e. CR-6). Some organics (branches, roots, etc.) were encountered, but generally appeared to be minimal. Perched water was encountered in several of the test pits at depths between 4 to 8 feet below existing grade.

The four test pits excavated on Parcel 9 indicated the presence of natural ground. This parcel was observed to be agricultural field and appeared to consist of orange-brown clayey silt underlying a 12"-16" plow zone.

Logs of the test pits are provided in the Appendix. Photographs of typical conditions are on file at our office and are available upon request.

Table 1: Summary of Fill Depths

Test Pit	Depth of fill below existing grade (feet)	Test Pit (cont.)	Depth of fill below existing grade (feet)
TP-1 K	6	TP-18 K	0
TP-2 K	9.5	TP-19 K	2
TP-3 K	20.5	TP-20 K	2
TP-4 K	6.5	TP-21 K	25
TP-5 K	10	TP-22 K	17.5
TP-6 K	4.5	TP-23 K	34
TP-7 K	5.5	TP-24 K	12
TP-8 K	4	TP-25 K	17
TP-9 K	4.5	TP-26 K	13
TP-10 K	4	TP-27 K	14
TP-11 K	0	TP-28 K	8.5
TP-12 K	0	TP-29 K	19
TP-13 K	6	TP-30 K	20.5
TP-14 K	9	TP-31 K	25
TP-15 K	2.5	TP-32 K	29
TP-16 K	7	TP-33 K	29.5
TP-17 K	0	TP-34 K	30.5

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-1 K
Job # 03905A

Datum MSL
Surf. Elev. 309.6
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schabert
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
309.60	SURFACE	0.0		
	Sandy SILT with brick and rock fragments (ML) [FILL]	2.5		
306.1		3.5		
	Ash	5.0		
303.6		6.0		
	Tan, sandy SILT with rock fragments (ML)	7.5		Natural Ground
302.1				
	Bottom of hole @ 7.5 ft	10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-2 /K
Job # 03905A

Datum MSL
Surf. Elev. 307.65
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
307.65	SURFACE	0.0		
		2.5		Along Haul Road
		5.0		
		7.5		Photo 1 taken
298.7		9.0		
297.7	Tan, sandy SILT (ML)	10.0		Natural Ground
	Bottom of hole @ 10.0 ft	12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works Test Pit# TP-3 K
 Location Frederick, Maryland Job # 03905A

Datum MSL Equipment: PC 220
 Surf. Elev. 305.8 Inspector E. Schabert
 Date Started March 1, 2005 Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
305.80	SURFACE	0.0		
		5.0		
		10.0		
		15.0		
285.8		20.0		
284.3	Tan sandy SILT[ML]	21.5		
	Bottom of hole @ 21.5 ft	25.0		
		30.0		
		35.0		
		40.0		

Ground Water Depth

Encountered n/a
 After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works Test Pit# TP-4 /K
 Location Frederick, Maryland Job # 03905A

Datum MSL Equipment PC 220 Inspector E. Schaberl
 Surf. Elev. 302.3 Date Completed March 1, 2005
 Date Started March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
302.30	SURFACE	0.0		
	Mulch, rock, brick, metal, silty SAND (SM) [FILL]	2.5		Test pit tapers to NG @ grade against tree line beneath thin layer of mulch
		5.0		
295.8		6.5		
	Tan sandy SILT [ML]			Natural Ground
294.8		7.5		
	Bottom of hole @ 7.5 ft			
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
 After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works Test Pit# TP-5 K
 Location Frederick, Maryland Job # 03905A

Datum MSL Equipment: PC 220
 Surf. Elev. 307.6 Inspector E. Schaberl
 Date Started March 1, 2005 Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
307.60	SURFACE	0.0		
		2.5		
	brick, metal, and rock fragments with silty SAND (SM) [FILL]	5.0		
		7.5		
297.6		10.0		Photo 3 taken
297.1	Tan, sandy SILT (ML)	10.5		Bag sample taken @ 10.5 ft Natural Ground
	Bottom of hole @ 10.5 ft	12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
 After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-6 K
Job # 03905A

Datum MSL
Surf. Elev. 301.7
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
301.70	SURFACE	0.0		
	Brick, rock, metal, etc.; BROWN silty SAND (SM) [FILL]	2.5		Woods
298.2		3.5		Test pit tapers into NG at grade on far wooded side (north)
	Tan, sandy SILT (ML)	4.5		Natural Ground
297.2		5.0		
	Bottom of hole @ 4.5 ft	7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
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TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-7 K
Job # 03905A

Datum MSL
Surf. Elev. 306.4
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
306.40	SURFACE	0.0		
				Woods
				Old landfill, not Kline, fill
	Brick, glass, and metal with ash (FILL)	2.5		Photo 4 taken
		5.0		
300.9		5.5		
300.4	Tan, sandy SILT (ML)	6.0		Natural Ground
	Bottom of hole @ 6.0 ft			
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-8 /K
Job # 03905A

Datum MSL
Surf. Elev. 309.1
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
309.10	SURFACE	0.0		
	Silly SAND with Wood, brick, concrete, rock fragments [FILL] (Kline fill)	2.5		
305.1		4.0		
	Old landfill with trash [FILL]	5.0		
		7.5		
300.6		8.5		
	Refusal on rock @ 8.5 ft	10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works Test Pit# TP-9 K
 Location Frederick, Maryland Job # 03905A

Datum MSL Equipment PC 220 Inspector E. Schabert
 Surf. Elev. 310.9 Date Completed March 1, 2005
 Date Started March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
310.90	SURFACE	0.0		
309.9	Mulch	1.0		
	Silty SAND with rock fragments, trace organics (SM) [FILL]	2.5		MDD 124.2 OM 10.6%
306.4		4.5		
	Natural Ground	5.0		
	Bottom of hole @ 4.5 ft			
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
 After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works Test Pit# TP-10 /K
 Location Frederick, Maryland Job # 03905A

Datum MSL Equipment: PC 220
 Surf. Elev. 306.6 Inspector E. Schaberl
 Date Started March 1, 2005 Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
306.60	SURFACE	0.0		
305.1	Mulch	1.5		Test pit tapers to mulch from natural ground towards woods
	Tan, sandy SILT with rock fragments (ML)	2.5		
302.6		4.0		
	Bottom of hole @ 4.0 ft	5.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
 After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-11 K
Job # 03905A

Datum MSL
Surf. Elev. 300.4
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
300.40	SURFACE	0.0		
	Topsoil = 6"			
	Tan, sandy SILT with rock fragments (ML)			Base of mulch pile Natural Ground
297.9		2.5		
	Bottom of hole @ 2.5 ft			
		5.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-12 K
Job # 03905A

Datum MSL
Surf. Elev. 303.2
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
303.20	SURFACE	0.0		
	Topsoil = 6"			
	Tan, sandy SILT with rock fragments (ML)			Bottom of hill Natural Ground
300.7		2.5		
	Bottom of hole @ 2.5 ft			
		5.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works Test Pit# TP-13 K
 Location Frederick, Maryland Job # 03905A

Datum MSL Equipment: PC 220 Inspector E. Schaberl
 Surf. Elev. 291 Date Completed March 1, 2005
 Date Started March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
291.00	SURFACE	0.0		
		2.5		
		5.0		
285.0	Brown, silty SAND with concrete, brick and debris [FILL]	6.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		
	Bottom of hole @ 6.0 ft			Natural Ground

Ground Water Depth

Encountered n/a
 After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-14 K
Job # 03905A

Datum MSL
Surf. Elev. 278.1
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
278.10	SURFACE	0.0		
		2.5		
		5.0		
		7.5		
269.1		9.0		
268.6	Tan, sandy SILT (ML)	9.5		Natural Ground
	Bottom of hole @ 9.5 ft	10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works Test Pit# TP-15 K
 Location Frederick, Maryland Job # 03905A

Datum MSL Equipment: PC 220
 Surf. Elev. 276.5
 Date Started March 1, 2005 Inspector E. Schaberl
 Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
276.50	SURFACE	0.0		
	Brown, silty SAND, trace brick, rock fragments, and organics (SM) [FILL]			
273.0		2.5		
273.5	Tan sandy SILT (ML)	3.0		Natural Ground
	Bottom of hole @ 3.0 ft			
		5.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
 After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-16 K
Job # 03905A

Datum MSL
Surf. Elev. 278.6
Date Started March 1, 2005

Equipment PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
278.60	SURFACE	0.0		
		2.5		
		5.0		
271.8		7.0		
		7.5		
	Tan sandy SILT (ML)			Natural Ground
269.6		9.0		
	Bottom of hole @ 9.0 ft	10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-17 K
Job # 03905A

Datum MSL
Surf. Elev. 272.7
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
272.70	SURFACE	0.0		
	Topsoil = 1"			
	Tan, sandy SILT, trace rock fragments (ML)			Natural Ground
270.2		2.5		
	Bottom of hole @ 2.5 ft			
		5.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-18 K
Job # 03905A

Datum MSL
Surf. Elev. 274.8
Date Started March 11, 2005

Equipment PC 220

Inspector E. Schaberl
Data Completed March 11, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
274.80	SURFACE	0.0		
	Topsoil = 0"			
272.8	Tan, sandy SILT, trace rock fragments (ML)	2.0		Natural Ground
	Bottom of hole @ 2.0 ft	2.5		
		5.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - GARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-19 K
Job # 03905A

Datum MSL
Surf. Elev. 295.8
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
295.80	SURFACE	0.0		
	Shot rock mixed with reddish brown, wet, sandy CLAY (CL)			
293.3	B.O.H. @ 2.5	2.5		Natural Ground
		5.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-20 K
Job # 03905A

Datum MSL
Surf. Elev. 280.2
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
280.20	SURFACE	0.0		
278.2	Brown and reddish brown, sandy SILT, trace clay and rock fragments (ML) B.O.H. @ 2'	2.0 2.5		Natural Ground
		5.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-21 K
Job # 03905A

Datum MSL
Surf. Elev. 304.8
Date Started March 2, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 2, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
304.80	SURFACE	0.0		
		5.0		Bag sample taken
		10.0		
	Brown, silty SAND with rock fragments, concrete, and wood (SM) [FILL]	15.0		
		20.0		Photo 5 taken
280.3		24.5		
279.8	Tan, sandy SILT (ML)	25.0		Natural Ground
	Bottom of hole @ 25.0 ft	30.0		
		35.0		
		40.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-22 K
Job # 03905A

Datum MSL
Surf. Elev. 304.8
Date Started March 2, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 2, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
304.80	SURFACE	0.0		
		5.0		
	Brown to dark brown, silty SAND, trace clay, wood, and rock fragments (ML) [FILL]	10.0		Bag sample taken
		15.0		Photo 6 taken @ stock pile
287.3		17.5		
286.8	Tan, sandy SILT with rock fragments (ML)	18.5		Natural Ground
	Bottom of hole @ 18.5 ft	20.0		
		25.0		
		30.0		
		35.0		
		40.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-23 /K
Job # 03905A

Datum MSL
Surf. Elev. 301.2
Date Started March 1, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 1, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
301.20	SURFACE	0.0		
	Brown, silty SAND with rock fragments, trace brick (SM) [FILL]			
297.2		4.0		
	Gray brown, GRAVEL with CR-8	5.0		
295.7		5.5		
	Reddish brown, sandy SILT with rock fragments, trace brick (ML) [FILL]	8.0		Photo 6 taken
293.2				
		10.0		Small bag sample taken at 8.9 ft
	Brown, sandy SILT with large rock, trace brick (ML) [FILL]			
		15.0		Photo 7 taken
281.2		20.0		
	Sandy CLAY with gravel, trace brick (CL)			
		25.0		
273.7		27.5		
	Brown, sandy SILT with rock and gravel (ML)	30.0		
268.7		32.5		
	Sandy, wet, CLAY with wood and roots (CL)	34.0		
267.2		35.0		Natural Ground
	Bottom of hole @ 34.0 ft			
		40.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-24 K
Job # 03905A

Datum MSL
Surf. Elev. 307.8
Date Started March 2, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 2, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
307.80	SURFACE	0.0		
	Mulch			
305.8		2.0		
		2.5		
		5.0		
	Shot rock with silty SAND (SM) [fill]			MDD 130.1 OM 8.1%
		7.5		
		10.0		
295.8		12.0		
	Tan, sandy SILT (ML)	12.5		Natural Ground
294.8		13.0		
	Bottom of hole @ 13.0 ft			
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-25 K
Job # 03905A

Datum MSL
Surf. Elev. 306.3
Date Started March 2, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 2, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
306.30	SURFACE	0.0		
	Orange brown, moist, SILT with sand, trace rock fragments (ML) [FILL]			
303.8		2.5		
	Brown and gray brown, silty SAND with rock and pockets of gravel, trace brick (SM) [FILL]			Bag sample taken @ 3.0 to 3.5 ft
300.8		5.0 5.5		
		7.5		
		10.0		
	Brown, silty ROCK FRAGMENTS with sand (GM) [FILL]			
		12.5		
		15.0		
289.3		17.0		
	Tan, SILT with sand and rock fragments (ML)	17.5		Natural Ground
288.3		18.0		
	Bottom of hole @ 18.0 ft			
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-26 /<
Job # 03905A

Datum MSL
Surf. Elev. 306.2
Date Started March 2, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 2, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
306.20	SURFACE	0.0		
		2.5		
		5.0		
	Brown, rocky SAND with silt, concrete, rebar, and brick (SM)	7.5		Photo 8 taken
		10.0		
293.2		12.5		
		13.0		
292.2	Tan, SILT with sand and rock fragments (ML)	14.0		Natural Ground
	Bottom of hole @ 14.0 ft	15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-27 K
Job # 03905A

Datum MSL
Surf. Elev. _____
Date Started March 3, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 3, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
	SURFACE	0.0		
		2.5		
		5.0		Perched water @ 4.0 ft
		7.5		
		10.0		
		12.5		
		14.0		
		15.0		Natural Ground
	Bottom of hole @ 14.0 ft	17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-28 /K
Job # 03905A

Datum MSL
Surf. Elev. 310
Date Started March 3, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 3, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
310.00	SURFACE	0.0		
		2.5		
		5.0		
		7.5		
301.5		8.5		
301.0	Tan, sandy SILT (ML)	9.0		Natural Ground
	Bottom of hole @ 9.0 ft	10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works Test Pit# TP-29 K
 Location Frederick, Maryland Job # 03905A

Datum MSL Equipment PC 220
 Surf. Elev. _____ Inspector E. Schabert
 Date Started March 3, 2005 Date Completed March 3, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
305.70	SURFACE	0.0		
	Brown, silty SAND with rock fragments (SM) [FILL]	2.5		
303.7		3.0		
	Gray stone, CR-6	4.0		
302.7		5.0		
		7.5		
		10.0		
	Brown, silty SAND with rock fragments, trace brick, concrete, and rebar (SM) [FILL]	12.5		
		15.0		
		17.5		
288.7		19.0		
286.2	Tan, sandy SILT (ML)	19.5		Natural Ground
	Bottom of hole @ 19.5 ft	20.0		

Ground Water Depth

Encountered n/a
 After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-30 K
Job # 03905A

Datum MSL
Surf. Elev. _____
Date Started March 3, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 3, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
	SURFACE	0.0		
	Brown and orange brown, silty CLAY with sand (CL) [FILL]	2.0		
		5.0		
	Brown and gray rock SAND with silt, some concrete (SM) [FILL]	10.0		Photo 10 taken
		15.0		
	Shot rock with silty SAND (SM)	20.0		
	Tan, sandy SILT (ML)	21.0		Natural Ground
	Bottom of hole @ 21.0 ft	25.0		
		30.0		
		35.0		
		40.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-31 K
Job # 03905A

Datum MSL
Surf. Elev. 297.3
Date Started March 3, 2005

Equipment: PC 220

Inspector E. Schabert
Date Completed March 3, 2005

ELEV.	SOIL DESCRIPTION <i>Color, Moisture, Density, Size, Proportion</i>	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
297.30	SURFACE	0.0		
294.3	Orange brown SILT with clay, trace sand (ML) [FILL]	3.0		
292.3	Dark brown, SILT with sand, rebar, brick, concrete, and asphalt (ML) [FILL]	5.0		Photo 11 taken
				Photo 12 taken
	Gray brown, silty SAND with debris (SM) [FILL]	10.0		2x6x1 concrete encountered
284.3		13.0		Perched groundwater @ 8.0 ft
	Orange brown, SILT with sand and rock fragments (SM) [FILL]	15.0		
279.8		17.5		
	Gray brown, silty SAND with rock fragments (SM) [FILL]	20.0		
272.3		25.0		Photo 13 taken
271.3	Tan, sandy SILT (ML)	26.0		Natural Ground
	Bottom of hole @ 26.0 ft			
		30.0		
		35.0		
		40.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project	<u>Frederick Brick Works</u>	Test Pit#	<u>TP-32 /K</u>
Location	<u>Frederick, Maryland</u>	Job #	<u>03905A</u>
Datum	<u>MSL</u>	Equipment:	<u>PC 220</u>
Surf. Elev.		Inspector	<u>E. Schaberl</u>
Date Started	<u>March 4, 2005</u>	Date Completed	<u>March 4, 2005</u>

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
	SURFACE	0.0		
	Dark brown, silty SAND with rock fragments, brick, and concrete (SM) [FILL]	5.0		N.M. 20.9% NM 22.2%
	Orange brown, CLAY with rock fragments and brown, sandy SILT with rock fragments (CL/ML) [FILL]	10.0		Bulk bag sample taken MDD= 119.7 O.M. 13.8%
	Orange SILT with sand (ML) [FILL]	15.0		
	Brown, sandy SILT with rock fragments and concrete (ML) [FILL]	19.0		NM 16.8%
	Orange silty CLAY w/sand and RF (CL)	20.0		NM 15.3 % NM 13.1% NM 19.3%
	Silty ROCK FRAGMENTS with sand	25.0		
	Bottom of hole @ 29.5 ft	27.0		NM 12.6%
		28.0		NM 13.0%
		29.5		Natural Ground
		30.0		NM 18.6%
		35.0		
		40.0		

Ground Water Depth

Encountered	<u>n/a</u>
After	<u>n/a</u>

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-33
Job # 03905A

Datum MSL
Surf. Elev. 303
Date Started March 3, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 3, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
303.00	SURFACE	0.0		
300.5	Dark brown, silty SAND with rock fragments (SM) [FILL]	2.5		
	Orange brown, SILT with sand and rock fragments (ML) [FILL]			
298.0		5.0		
297.0	Gray, SAND with silt (SM) [FILL]	6.0		
		10.0		
	Brown, sandy SILT with rock fragments (ML) [FILL]			
		15.0		
283.0		20.0		
	Silty SAND with rock fragments (SM) [FILL]	25.0		
274.0		29.0		
273.0	Tan, SILT with sand (ML)	30.0		Natural Ground
	Bottom of hole @ 30.0 ft			
		35.0		
		40.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-34/K
Job # 03905A

Datum MSL
Surf. Elev. _____
Date Started March 4, 2005

Equipment PC 220

Inspector E. Schaberl
Date Completed March 4, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
299.90	SURFACE	0.0		
297.4	Brown, sandy SILT with rock fragments (ML) [FILL]	2.5		
294.9	Brown, silty CLAY with sand and rock fragments (CL) [FILL]	5.0		
292.4	Reddish brown, sandy SILT with rock fragments and concrete (ML) [FILL]	7.5		Perched water @ 6.0 - 7.0 ft
287.4	Silty SAND with rock fragments and brown, sandy CLAY (SM/CL) [FILL]	10.0		
286.4	CR-6 [FILL]	12.5		
		13.5		
		15.0		
279.9	Brown, sandy SILT with rock fragments (ML) [FILL]	20.0		Mix MDD 125.2 OM 11.3
		25.0		
269.9	Gray brown, CLAY with sand and rock fragments (CL) [FILL]	30.0		
268.9	Tan, sandy SILT with rock fragments (ML)	31.0		Natural Ground
	Bottom of hole @ 31.0 ft	35.0		
		40.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-A1 K
Job # 03905A

Datum MSL
Surf. Elev. _____
Date Started March 4, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 4, 2005

ELEV.	SOIL DESCRIPTION <i>Color, Moisture, Density, Size, Proportion</i>	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
	SURFACE	0.0		
	Plow zone = 12"			
	Orange brown, clayey SILT (ml)	2.5		
5.0		5.0		
	Bottom of hole @ 5.0 ft			
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-2 K
Job # 03905A

Datum MSL
Surf. Elev. _____
Date Started March 4, 2005

Equipment: PC 220

Inspector E. Schabert
Date Completed March 4, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
	SURFACE	0.0		
	Orange brown, clayey SILT (ML)	2.5		
5.0	Bottom of hole @ 5.0 ft	5.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

**HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.**

TEST PIT LOG

Project Frederick Brick Works
Location Frederick, Maryland

Test Pit# TP-A3 K
Job # 03905A

Datum MSL
Surf. Elev. _____
Date Started March 4, 2005

Equipment: PC 220

Inspector E. Schaberl
Date Completed March 4, 2005

ELEV.	SOIL DESCRIPTION Color, Moisture, Density, Size, Proportion	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
	SURFACE	0.0		
	Plow zone = 16"			
	Orange brown, clayey SILT (ML)	2.5		
5.0		5.0		
	Bottom of hole @ 5.0 ft			
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

HILLIS - CARNES
ENGINEERING ASSOCIATES, INC.

TEST PIT LOG

Project Frederick Brck Works
Location Frederick, Maryland
Datum MSL
Date Started March 4, 2005
Equipment PC 220
Inspector E. Schabert
Date Completed March 4, 2005
Test Pit# TP-44
Job # 03905A

ELEV.	SOIL DESCRIPTION	DEPTH SCALE	SAMPLE BLOWS 6"	BORING & SAMPLING NOTES
	Color, Moisture, Density, Size, Proportion	0.0		
	Plow zone = 14"			
5.0	Orange brown, clayey SILT (ML)	2.5		
	Bottom of hole @ 5.0 ft	5.0		
		7.5		
		10.0		
		12.5		
		15.0		
		17.5		
		20.0		

Ground Water Depth

Encountered n/a
After n/a

March 17, 2005

Mr. Clayton Minnick
General Manager
Frederick Brick Works, Inc.
184 East South Street
Frederick, Maryland 21701

RE: Environmental Inspection of Cline Fill

Dear Clayton:

During the period of March 1 through March 4, 2005 Hydro-Terra inspected the excavation of 29 test pits (TP-5 through TP-34) completed on the Cline fill located in Frederick Maryland on property owned by Frederick Brick. The purpose of the inspection was to ascertain the possible existence of elevated levels of inorganic and organic contaminants in the fill soil and also to assess whether wood present in the fill might result in elevated levels of methane in the fill. The environmental inspection was performed by Thomas R. Mills, a professional engineer and geologist employed by Hydro-Terra.

Field Observations

The test pits were dug to the base of the fill, and the excavated soil was visually inspected for evidence of possible contamination. Additionally, the soil was periodically checked with a photoionization detector (PID) for the presence of organic vapors (excluding methane) indicative of contamination by volatile organic compounds (VOCs). No organic vapors were detected in the soil from any of the inspected test pits. Also, no visual evidence of contamination from organic compounds or inorganic chemicals was noted.

Some wood was observed in the test pits and was estimated to occupy less than one percent of the volume of the fill soil.

Testing of Soil Samples

Composite soil samples were obtained from the excavated soil at three test pits (TP-27, TP-29, and TP-32) and analyzed by Phase Separation Science for the presence of VOCs, semi-volatile organic compounds (SVOCs), and eight metals (RCRA metals). The concentrations of detected constituents were compared to residential and non-

residential cleanup standards for soil developed by the Maryland Department of the Environment (MDE) and used in their Voluntary Cleanup Program.

No VOCs were detected in any of the samples. A few SVOCs, all polynuclear aromatic hydrocarbons (PAHs), were detected in the samples from TP-27 and TP-32. In both cases, the concentrations of the PAHs were below their detection limits and, therefore, are estimated concentrations. None of the PAHs exceed their residential or non-residential cleanup standards. These PAHs are commonly present in urban soils and are mostly formed from the combustion of fossil fuels. No other SVOCs were detected in the samples.

Two metals of potential concern (arsenic and mercury) were detected at concentrations above their cleanup standards. A third metal, total chromium, may also exceed a cleanup standard in one of the test pit samples. Lead and barium were also detected, but at concentrations below their cleanup standards.

MDE's risk-derived residential and non-residential cleanup standards for arsenic are 2.0 and 3.8 parts per million (ppm) or mg/kg, respectively. The detected concentrations were 3.4 ppm at TP-27, 6.3 ppm at TP-29, and 18 ppm at TP-32. All of the concentrations exceed the residential standard, and two also exceed the non-residential standard. The anticipated typical concentration (ATC) or background concentration of arsenic in soil at other sampled sites in Western Maryland (including Frederick County) is reported by MDE to be 11 ppm. The average concentration of arsenic from the three test pit samples is 9.2 ppm. A participant in the voluntary cleanup program can propose to MDE that the ATC be used in place of the cleanup standard.

The residential and non-residential cleanup standards for mercury are 0.1 and 0.12 ppm, respectively. At TP-27 and TP-32, the detected concentrations were 0.13 ppm, slightly above both cleanup standards. No mercury was detected in the sample from TP-29. The average mercury concentration is 0.103 when, as is proper, the metal is assumed to be present at TP-29 at one half the detection limit of 0.1 ppm. The average concentration is still slightly above the residential standard, but below the non-residential standard. No ATC exists for mercury in Western Maryland, but they do exist for Eastern Maryland and Central Maryland at concentrations of 0.51 and 0.14 ppm, respectively. Total chromium was detected in TP-29 at a concentration that might exceed the residential cleanup standard for one of two types of chromium (chromium VI) that comprise total chromium. The other form of chromium is chromium III. The total concentration of chromium detected at TP-29 was 61 ppm. The residential cleanup standard for chromium VI is 23 ppm, and the non-residential standard is 61 ppm. At TP-29, the non-residential standard is not exceeded, but the residential standard could be exceeded depending on how much chromium VI is present in the sample. At present, the

Mr. Clayton Minnick
March 17, 2005
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laboratory is determining the concentration of chromium VI in the TP-29 sample. The result will be reported separately. Total chromium was also detected in the samples from TP-27 and TP-32, but at concentrations that cannot exceed a residential or non-residential standard for any form of chromium.

The laboratory reports are attached to the back of this report.

Conclusions & Recommendations

Based on the amount of wood observed in the fill soil, it is unlikely that methane is present at concentrations of public-health/safety concern in most, if not all, of the fill placed by Cline. However, in the event the fill is to remain, a more definitive determination is recommended. The determination should be made by installing with a Geoprobe 10 to 15 one-inch diameter, gas-monitoring wells to a depth of approximately 12 feet and monitoring the wells for the presence of methane monthly for three months.

The results of the limited sampling and testing of fill soils indicate that at some locations in the fill, metals are present at concentrations above residential and non-residential cleanup standards. However, if the comparative or exposure concentration for metals of potential concern were statistically determined from a larger set of samples, as is the case when assessing human-health risks, it may be found that the exposure concentrations do not exceed the cleanup standards. The relevant exposure concentration for each metal of potential concern would be the 95 percent upper confidence limit of the mean concentration. For a representative exposure concentration to be determined, collection and analysis of samples taken from depths of 0 to 1 and 4 to 5 feet at about 15 locations would probably be needed. If exposure concentration did not exceed cleanup standards, it could be strongly argued that no remediation is required. If one or more concentrations exceeded cleanup standards, a presumptive remedial action would be required over the entire fill. The most appropriate presumptive remedial action allowed by MDE for mixed residential and commercial development would be encapsulation of the fill with three feet of clean soil underlain by a geofabric marker horizon.

For costing purposes, it should be assumed at this time that, in the event the fill stays on Frederick Brick's property, encapsulation will be required. A less likely option in our opinion would be "hot spot" removal.

Prior to MDE's approval of encapsulation or any other remedial option, including use of the fill soil in roadway construction, it is highly probable that downgradient ground-water quality will need to be investigated. This would involve installation of one or two wells near the south end of the property and testing of the water to determine if metals or other constituents of potential concern are leaching into the ground water at concentrations exceeding drinking-water standards.

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Should it be decided that the fill or a portion of the fill should be removed by the state and used for highway construction, another environmental approach involving the entire property should be considered. The approach would be to remove 15 or more feet of material from the Cline fill. Excavation would be followed by the placement on the fill site of a compacted layer of largely inert ash and solid waste removed by other areas on the property and possibly mixed with cement-kiln dust. The waste material would then be covered by 6 to 8 feet of clean soil.

More thorough sampling of the areas containing buried wastes will be required by MDE, and it should be anticipated that some environmental problems will be identified. Should ground-water contamination and/or a methane problem not be found, the remedial outcome in the waste areas will likely be encapsulation. After stabilization of the waste materials, encapsulation could occur in the areas containing the waste or at a deeper depth in the area of the Cline fill, provided, in the latter case, that the state removes all or a portion of the Cline fill. Offsite disposal of waste material would probably cost on the order of \$70 a ton for disposal alone and should be avoided, if at all possible.

Before any further environmental investigation of the Cline fill or any other portions of the property, it is recommended that Frederick Brick participate in MDE's Voluntary Cleanup Program. The entry fee is \$6,000, and, by following their approach, it is expected that analytical costs would be reduced by approximately 40 percent. There is also a liability benefit that would have a beneficial effect on land value.

If you have any questions, please give me a call.

Sincerely,

HYDRO-TERRA, INC.

Thomas R. Mills, PE, PG
President

Tm/05060
1 attachment
cc: T. Machamer
D. Schestag
J. Cheok